

# The Concise HOUSEHOLD ENCYCLOPEDIA 

A Practical Guide Written by the Leading Experts in all Branches of Homecraft

6,000 ILLUS'TRA'IONS


Complete in One Volume

> LONDON

The Amalgamated Press Ltd. The Fleetway House

## THE EDITORS FOREWORD

AI no period of our modern social history has the need been more pressing for such service as the Concise Household Encyclopedia provides. The high cost of labour, arising from post-war conditions, has so increased every item of domestic expenditure that even in houscholds where formerly economy was little studied it is now usual to avoid calling in outside assistance on all sorts of repairing jobs that can be done by members of the family with such guidance as may be given by printed instructions.

The practicability of written instruction has long been recognized, but never so effectively proved as by the subscribers to the original six-volume Household Encyclopodza, now out of print for some years. The editor has received from numerous subscribers the assurance that by following its instructions they have saved its total cost several times over. No wonder, for the work contains the greatest body of practical information on every aspect and detail of domestic life ever brought together.

The Concise Household Encyclopedia is a completely revised and condensed version of the original, produced under the same editorship and, in the main. by the same staff of experts. It has the great advantage over the parent work that all the practical information has been retained unimpaired, improved indeed, by being reduced to that conciseness of statement
which has made it possible to embody in one large but not inconvenient volume the essential text and illustrations of the whole six volumes.

Wherever newer methods than those described in the original work have been devised they will be found in this Concise edition; and recent years have seen great advances in the perfecting of household appliances as well as many ingenious inventions that render the task of the housewife more pleasant and the results of her work more efficient. All these, and most of the approved devices, old or new, that help in a practical way to the increased comfort of the home, are hare recorded and illustrated in some ten thousand clearly written articles.

THis immensely valuable treasury of information and advice for the housewife and the handyman-be the latter's bent towards woodworking, decorating, gardening, poultry-keeping, or amatear mechanics-arranged as it is in alphabetical order, is instantly accessible for consultation when the need for the specific information arises. No other work of the kind exists.

In order to give the reader some idea of the comprehers sine nature of the Concise Household Encyclopedia we print below the synoptical table which was framed as a guide for its departmental editors in preparing the contents of the work. These editorial divisions do not of course, appear in the printed pages.

## THE CONCISE

HOUSEHOLD ENCYCLOPEDIA

ARERDEEN TERRIER. The Aberdeen or Scotch terrier is an excellent house. dog, a good ratter, and readily teachable. From 9 in. to 12 in high, it las a short, hard, wiry coat of iron-grey, brindle, black or sandy, and soft under-fur. A white variety should have no admixture of other tints. The outer coat is of uniform density, about 2 in . long, end without silkiness or curling The dog is short-hacked and rather fint-sided, with strong hindquarters; short legs, and small, short-hajred feet.

The head is rather long and domed, with a drop between the eyes to the muzzle, which tapers to the broad, black nose projecting over level jzws. Neck short and muscular, shoulders slopins, chest broad and deep : amall, pointed, velvety ears See Dog.


Aberdeen or Scotch Terrier, prize-winning apecimen

ABSCESS. This name is given to a collection of matter or pus, of which there are two distinct kinds, acute and ohronic.

Acute Abscess. The entry into the body of germs which cause suppuration may give rise to an acute abscens. If an ahscess occurs the regult is the collection of a thick yellowish Huid sarrounded by a thickened layer of tissue which consticutes the wall of the ahscess. This may occur anywhere; it may be superticial or it may be deep. The lluid is always under pressure, and this fcrees it along the path of least resistance, usually to the surface.

An :cute abscess produces pain and tenderness. There is also swelling, at first hard and biawny, but later soft, particularly in the centre. The pus is finding its way out, and is said to point at the spot where it will reach the surfact, indicated by a deeper redness. The akin becomes very thin, with an increase of pain, and finally the abscess bursts. The patient suffers from fever, not very much, perhapis, in the case of small abscesses, and may have a rigor-that is, feel cold, even to the extent of his teeth chattering. Then he will feel hot, and finally his skin, which has lreen bot and dry, will be covered with profuse perspiration. There will be sevcral fits of this alternute heat and coldness, but the discomfort will subside as the abscess gradually ceases to discharge.

Treatment is a matter for a surgeon. While the abscens is forming, relief may he afforded by resting the part; and it will usually be found that if the afflicted member be raised (e.g. with a sling) the pain will be less. Fomestations may aiso be useful, and these can bo wrung out of hot water in which boracio acid has been dissolved (l oz. to the quart) and covered over with gutta-percha tissue or jaconet. But when pus is definitely present it must be let out.

Chronic Abscess. The second kind of abscess, which is generally painless and may dry up without hursting, is a form of tuberculosis (q.v.), heing caused by the tubercle bacillus.

ABUTILON. Evergreen shrub with bellshaped flowers and handsome lea ves, a desirable climber for raftera or pillars, or planting out. The best varieties for growing under glass to flower in Aprilare: Darwini, orange ; fleur d'or, orange and red; canary bird, yellow : houle dc neige, white; Princess Marie, rose lake.

Propagation is lyy cuttings of young wood struck in a temporature of $60^{\circ}$ in summer. Also from seeds in a propagator or over bottom heat. They are generally $80 \times \pi$ in spring. Pron. A-bu'ti-lon.

ACACIA. One of the acaeias is commonly known as the wattle or mimosa (q.v.). The so-called acacia tree of suburban gardens is Robinia, or false acacia (ๆ.v.).

ACANTHOLIMON. Dwart cvergreen plants, somewhat resembling thrilt, but with stiff, spiny leaves, suitable for the rockery. A popular species is glumaceum, which hears a profusion of rose-colourcd flowers in summer. Venustum also has a rose flower.
Those sea lavenders thrive in warm. gritty, well-drained soil. They are propagated by cuttings or layers taken in the late summer. The slipe must be wintered in a cold frame, and do not make good plants until the second year Pron. Ak-an-tho-li'-rnon.

ACANTHUS. Of the two species of acanthus, spinosus is so called from its spiny leaves; mollis, or bear's breech, is characterised by large, deeply out leaves, with soft spines. The plant grows about five feet high, flowering in summer, and is well adapted for herbaceous borders. Latifolius, a form of mollis with heart-shaped leaves and white or pink flowers, is unsuitable for small gardens.

The best way of raising a stock is to sow secds in a warm frame or greenhouse in spring. Further increase can be effected by division in autumn or spring. See illuatration below.
ACCELERATOR. This is a mechanical device, used in connexion with petrol motors, gas and oil engines, by ineans of which the speed contmler nay be rendered inoperative. See Governor; Motor. car: Thmotle.
ACCIDENTS. There aretwo senses in which the word accident is used in speech and by lawyers: (1) An occurrence which happens neither by negligence nor design; and (2) an untoward event which causes in. jury or damage, even though it may be caused by somebody's negli. gence or design this we speak of a man being in. jured by nn accident if he is knocked down by a motor-car, the fault of the
 of a common variety
driver or the fault of the injured man himself Householders should always insure against liability under the Workmen's Compensation Act. hecause under it an employer is liable to compensate a servant who meets with an accidental injury arising out of and in the course of the employment Accidental is here used in the wide, popular sense
For accidents caused by a person's negligence, he is resimonsible For accidents caused by a wife's negligence. the husband is responsible. For accidents caused by a servant in the course of his work, the employer is re. sponsible; for example, if a house maid, cleaning the windows, negligently drops the bucket on the head of a passer.by, her master is responsible Alower spray, showing
drooping blossoma and vine-like leal responsible for the accident. A parent is not responsible
for accidents caused by the negligence of his child-unless, of course, the child is in the parent's employ and the accident is caused by something done during the employment

Accident Insurance. Insurance of this nature is a wise precaution, and is generally effected through an agent. Owners of motorvehicles are now compelled to insure against accidents causing hodily injury to third parties. In filling up a proposal form, care should be taken in answering the questions as to age, state of health, and other matters, because if this is not done correctly the policy will be void. It is not "ise to allow the agent to fill up the form. Many eases have occurred in which agents, with an ege to commission, have filled in untrue answers, and in such cases, where this insured has signed without reading the paper carefully, it has heen decided that the agent in filling up the form does so as the insured's agent; with the result that the policy is void.

When an accident brings on a disease causing incapacity the insured is entitled to compensation under an accident policy, lecause there is one chain of events leading from the accident to the disahlement.
Everyday Accidents. The majority of the accidents that nccur in the home are preventable. Firesshould never be lighted with paraftin or other inflammahle liquid, owing to the risk of serious injury or even death. Gas has its dangers also if jets are not kept clean and in good working order. A blow-out in the gay oven may set u flimsy apron alight, or a lighted match in searching for an eacape of gas will cause an explosion and considerable damage and injury.
Everywhere in the home where there is gas, attention should be paid to loose taps that may get turned on by accident. It is also better to leave the gas turned on at the meter all night rather than risk the asphyxiation of someone whose bedroom light has been in use when the meter tap was turned off.
To use the proper utensils for the small details of cooking is a sensible way of avoiding accidents. Severe cuts, for instance, often occur through the careless use of a sharj,
knife for chopping suet, etc. Splitting kindling wood with a large knife or a heary axe is not worth the danger it involves when a proper wood chopper costs only a trifling sum Awkwardly placed pans on the atove are easily upset, with consequent scalding accidents. Similarly the spout of a boiling kettle should be turned sideways instead of towards the front of the stove.

Floor coveringa are л cause of accident when insufficiently tacked down, or when slippery with too high a polish. A loose stair rail or a mat in an awkward place may cause a broken neck. Stairs should be lighted at all times.
The use of a step-ladcler for putting up draperies, pictures, etc., is safer than the nakeshift method of using a chair perched on the top of a table. It should be ascertained that the ladder itself is quite firm before it is mounted.

Low window-sills are a serious danger Persons who walk in their slcep have heen known to step right out of a low window and fall several storeys. Children playing near such a window are only too likely to venture too far over the sill.

Lastly, there is always the danger of live. In addition to gas and paraftin the following should be guarded against : failure to damp coal or wood fires when leaving a room; taking candles to look into a cupiboard in which clothes are hanging; amoking cigarettes in loed; placing a candle too near bed draperies; and carelessly dropping glowing cigarette ends on a carpet or in a wastepaper basket.
ACCORDION. Suited to the needs of those who wish to play only a simple melody, the accordion or melodeon is so constructed as to furnish an elementary accompaniment of chords. Its drawback is that it etands in one key (C) slone, and that as modulation is impossible, except by iniplication. the choice of music is restricted. It consists of a small pair of bellows, worked by the left hand, which also controls certain valves, viz. the wind valve (thumb), the accompaniment valve (index finger), and the hase valve (little finger).

At the other end of the hellows is a key. board having a varying number of keys which are played by the fingers of the right hand. On being depressed these keys adnit wind to the reeds, which produce one sound when the hellows are pressed in and another when they arc drawn out. The compass varies accurding to the size of the instrument, that of the accordion with 12 keys being
the notes required. If there is a long series of push-in notes, they may be fully inflated. The music is written on the treble staff.

After use an accordion ahould be wiped and placed where it will be kept free from dust and damp.

ACCORDION PLEATING. In concertina form instead of flat, this pleating is chiefly suitable for dancing akirts and frillings. It should be put in by machinery, is it requires heavy jressure. Re.plenting is done by cleaning firms at moderate cost.

## ACCOUNTS: How to Keep Them.

 The simplest way of keeping accounts is in n cash book ruled with three columns for the $£$ s d. On one side, the left, or debit, is entered all that is received, and on the other, the right, or credit. all that is paid out. The amounts in each can he added up every week or month as desired. and the balance shown compared with that which actually exista in cash. The itcms on the right-hand side can be examined and put into classes, thus showing olearly what has heen spent in a par. ticular oirection. In keeping a banking account one method is to enter all re ceipts and all payments, whether made in cash or by chergue. in the one accomit. The halance will be that of the two combined the cash in hand and the cash at the bank. Another method is to kicep two accounts. one for cash and the other for items that pass through the banking account. The cash accomit ann then he cherked hy the amount of cash in hand and the other by the pass book provided by the bankHouschold accounts can be kept in an account book with the pages prepared and ruled. for n quarter or a year, as shown in the form ahove.

Daily amounts expended should be entered in the places intended for them and amounts receicerl in the spaces below. At the end of
payment column at the bottom of the page and the amount of cash in hand ascertained and enterad.

Tho last column on the right-hand side of the sample is provided to check exper diture more carefully. In it are entered weekly the ainounta spent up to date on each housekeeping item, and also the total obtained by adding the totals for the waek in question to those on the previour page of the account hook. Thus at the end of any atated period the hol sewife can tell whether her housekeeping is coutin! more than it ought to do or whether any particular item is exceeding the allotted araount.

ACCOUNT STATED. When tuo people have accounts, one against the other, and they agrec the account at so much, it is called an account atated. The account may be relipened on ahowing fraud or mistake, but the innport ance of an account stated is that it gires rise to a new cause of action, and the statute of limitations runs from the date when the account was atated
hoderemeping account fon the Weak Ekding Saturday (dalk) Particulars Sali. Mon. Tue. Wetl. Thu. Fri. Sat. the week to date


ACCUMULATOR. Electric accumu lators are employed for providing eectric light and to a lewa extent for traction. as in electric carriages and motor launches The necumulator is an indispensable adjuict of the small, arlf-contained electric-lizhting jlant. On motor-cycles accumulatols are used for lighting; and on cars for lighting and for the electric atarter, horn, and other devices. As a source uf low tension and, to a less ixtent, of high tension current, the accumulator is used in a great number of wireless 8 eta.

Whatever the compass, all have one fenture in nommon : there is a diatonic succession of notes in the middle, with gaps at each end. The accordion with 21 keya has them disposed in two rows, one in $G$ and the other in $C$, a simple modulation being thus possible

In auch types of accordion every C., $\mathbf{F}$, and $G$ is a pressed-in note, all the rest being drawn out: They form the tonic or key-note chord, while the others mostly belong to the dominant chord (the fifth degree of the scale). It is possible not only to play with the fingers $n$ melody with or without a simple harmonisation, but by means of the accompaniment valve to add therefo the following chords:

and by the bass valve these notes:

For playing, the intrument rests on the performer's knee. The bellows must first be inllated by means of the wind valre, to what extent depending on

each week the accounts are marle up by adding the amounts in each daily column and the amounts in each line, after which the totals of the six daily columns and the totala of the various headings ahould he added up. If no mistake has been made these two totals will agree. The daily total is tranaferred to the


Accordion. The 21-note instrument, taken apart. A, bellows. B, melody kegboard. C, valves for accombaniment. etc.

An electric accum ilator, known also as a accondary battery and as a storage battery, differs from a primary electric cell in that the accumulator deas not generate encrgy, but is charged by sending an electric curment thmugh the cell from an outside source.

The lead-acid type of accumulator it common use consiats of a rectangular conta ner of glass, celluloid, etc., in which are a num ber of grid-like lead plater, grouped into pasiti*e and negative clements. The plates are imiaersed in an electrolyte consisting of sulphuric acid in distilled water. The interstices of the grids are filled with a preparation of lead, and the plates are kept from touching by spaners of aome non-conducting material. The pisitive and negative plates alternate, all the positive being connected together and all the negative grids being similarly coupled

When a auitable electric current asont through such a cell, hydrogen passes fiom the anode or positive plate, which is said thus to hecome peroxidised, to the other pla e-the cathode or negative-where it combines with
somo of the oxygen of that plate, which thus hecrames reduced. This chemical change is the measure of energy put into the cell and atored. The plates will remain in this charged condition for some time, though they will gradually run down if left alone: but if the terminals of the cell be connected outside, chemical action reatarty in the opposite direction, the hydragen removed from the onc plate returns, and an electric current passes through the connexion in the opposite direction to that in which the current entered the cell. The cell is thins dischargerl. J.hese operations of charging and discharging may be repeated indelinitely. It is while discharging that the electricity which has heen put into the accumulator (stored) is utilised.
While essentially simple, accumulators require enreful attention. The inost serious trouhle arises from sulphating. The sulphate is a is hite scale which forms on the plates and rendars them useleas. Sulphating may arisc from over-discharging, running down the hattery below the limit voltage; by leaving the hattery discharged for a time, or from too atroug a solution. If not ton bad the scale may be acraped off the plates, and by alow and careful charging pmper conditions may be rentored. If hadly sealed the plates may hecome huckled or the preparations disintegrated. necessitnting renewal of the pintes Any acid which may be apilled from tho vents should be wiped of carefully, and the termi nalṣ ahould de coated with petroleum jelly to prevent corrosion.
Now accumulatore are generally sent out dry, i.e. without the eleclrolyte. The maker's instructions should be followed carefully as to the rate of charging, apecific gravity of the electrolyte, etc.

If it is necessary to prepare acial of the reguired strength, the strong acid should be slinoly added to the distilled water, stirring it in a little at a time. Never, in any circum. slances, add uxiter to the acid.
Ancumulators are made up of 2 -volt. units, usually sepsrate, although two or more cells may be housed in a single outer container. The output, expressed in amperes, is govcrned by the size of the cells.

The electrolyte in the cell should cover the platus. Any loas cauned by evapioration must De made good by adding distilled (not tap) water until the electrolyte is at least half an inch ahove the top of the plater. The heat time to do this is just before oharging, as the charging procers facilitatea the mixing of the water and acid. Vent holea should always be clear so as to allow gas to eacape.

The aperifie gravity of the cells can be tested with a hydrometer. A handy type of apparains comprises'an outer tube into which a small quantity of the liquid may be withdrawn by compressing a rubber bulbat the topoif the tube. Inside the tube is the hydro. meter proper, which lloats in the liquid. After teating, the electrolyteis returned to the accumulator. The table above gives average readings for an accumulator in different
states of charge or discharge The hydrometer should be used in conjunction with a voltmeter.

Condition of Cell.
Fully charged
Half discharged
Sp. Gravity
Fully disclinged
1.285

The voltage of n cell should not be allowed to fall helow l-85. On charging, the voltage rises to about $2 \cdot 2$. It is useful to rememher. in connecting cells together, that joining them in series adds voltage, and that connecting them in parallel ndda amperage.

ACETIC ACID. The acid principle of vinegar is acetic acid, of which vinegar contains six to twelve per cent. The kinds and strengthe of acetic acid are:

Pyroligneous Acid. A crudo torm sold ns Essence of Smoke to flavour bacon and dried tish

Glacial Acetic Acid. So called because in cold weather it solidifies and hecomes like ice. It consists of pure acetic acid hurns the skin if applied frcely, and liay a pungent smell. When perfunied it forms aromatic vinegar. used to wet the sponge with which vinaigrettc hottles are filled. The formula is as follows :

Invender oil
Clove oil
Lemon ail
Bergamot oil
Cinmamon oll
Neroliall
40 dopy

Glacial acetic act 40 dmps 40 drops 201 drops
10 drops varts, applied once a day with a small camel. hair hrush. 'The skin mund the wart is ameared with vascline to prevent. hurning the sound skin.

Ordinary Acetic Acid. This contams a thind of its weight of acctic ncid and is userl as a pickling vinegar where the colour of ordinary vinegar is an objection. One part of acetic acid mixed with four parts of water forms white vinegar. which is suitable for pickling vegetahles.

To make spicel vinegnr, hoil for 10 min . the following bruised spices in a gallon of white vinegar:


## ACETYLENE GAS FOR LIGHTING

## Its Use as an Indoor and Outdoor Illuminant

For other Forms of Lighting sce Air Gas: Gas: Elactric Lighting, etc.

Acetylene is a colourless gas, and when pure should he filled and then the doors of the has a rather agrecable odour, but it usually generators talien off, the water cock. $h$ opened, contains impurities which give it a distinctive disagreen ble smell. The gas will explode with great violence when mixed with oxygen or even air in any proportion from 3 jo. to 83 p.c It is not poisonous in small quantities. and burns with a white llame.

Acetylenc gas produced from calcium carhide is largely used for lighting farman and other detached residences which are remote from public sources of supply of gas or electricity : and for lanijs of motor vehicles, etc.
In Fig. 1 is seen a diagrammatic view of a small acetylene-prowlucing plant of the autnmatic, water-fed type, suitahle for private houses. A is the gas-holder tank, of iron, partly filled with water, and into the lower portion of which two gas generators are fixed side by side: 13 gives a sectional view of one of these generators. It is a atrong cast-iron cylindrical vessel, solid at the back end and closed at the front by a removable door. C is an imn tray which slips into the generator body and ia divided into four compartments which are partly filled with carbide.

A pije, a, connects the generator with the automatic control cock, D. which is in turn connected with the water tank, $E$. $F$ is the gas bell which rises as the gas accumulates in it, the movement being controlled by the brackets, $b, b^{\prime}$, which alide up and down the guide colunins. One of these brackets is extended at $c$ to embrace the twisted bar, L, which is attached at the lower end to the control cock, D , and turns at the top in the bracket, $d$.

A pipe, $e$, is attached at the bottom end to the generator, and has the upper portion hent round so that the free end dips under the water in the gas-holder tank. Thus, while gas can escape freely from the open end, water cannot get back through it into the generator. $f$ is the gas outlet pije to the purifier, $G$; $g$ is the gas delivery pipe; $J$ is a drain trap to catch particles of water that may he carried over from the holder ; $K$ is the main gas oock.

When starting to work the apparatus the gas bell is in its lowest position, and every. thing empty. The first thing to do is to close all cocks and fill the gas-holder tank with water, which is poured over the edge into the space hetween the tank and the bell. As the water enters the bell will rise. The water tank
and careful observation made to see that no water drops or llows into the generator budies. The cock, $h$, is now to be closed: the generator budies must be thoroughly dried, after which the trays may receive their charges of carbide and be replaced.

The water trap, $J$, should be nearly filled with water, and the drain cock opened. The purifier door may be taken off, and the maill gns cock, $K$, ojened. The bell will then descend and drive out the air. The purifier may then he closed upind the main gas cock closed, when everything will be ready for gaa making.

At this stage the water control, I), is open. and water is only prevented from flowing into thic generator by the cock, $h$. heing elosed.


Acetglene. Fig. 1. Diagram illustrating tha working parts ot a gas plant

To start, therefore, all that is necessary is th open this cock, $h$; water will then drip into the generator, and, coming in contact with the carbide in the first compartment. will immediately produce gas. The bell rised as the pressure develops, but before it reaches its limit it turns the twisted bar, $L$, and thus closes the water control cock, D, whereupon water will cease to flow into the generator, althoug'.
cock, $h$, remains open, and the production of gas should then stop.

When gas is drawn off, the hell will fall, twist back the bar, $L$, and reopen the control cock. When No. 1 generator is finished, water automatically flows over into No. 2: either generator being recharged with carbide while the apparatus is at work. The residuc left in the generators after all the gas has been taken off is simply slaked lime, and may be used on gardens or fields If it smells it ahould be dumped in water. The purificr will require to be recharged from time to time, according to the rate at which gas is made. Special preparations can be bought ready for use.
The gas-producing apparatus cunnot be placed in the house to be lighted, and must not be put in a basement or cellar. It must have its own independent house or shed outside the building to be lighted. The gas should be supplied to the house at a pressure of from $2 f$ to $2 \frac{\mathrm{in} \text {. of water, though when }}{}$ the apparatus is first tested it should be tewted to 10 in . Simple gauges for showing the preasure can be bought.

The gas fittings for acetylene may he the same is used for ordinary coal gas, only they may be smaller. Iron or "compo" pipes may be used and brass fittings.

No pure copper must be used, as the ace!ylene atlacks it, and makes a high explosive at the same time.
Burners for acetylene gas are illustrated in Fig. 2. They utilise the Bunsen principle, the aim being to get as much air as possible to the pas at the point of issue from the burner: $a, a$, arc air passages, and $b$ the gas outlet. When burning properly, acetylene light is exceodingly white and brilliant; colours and shades appear the same as by daylight: it is valuable in photography, being rioh in actinio rays
Acetylene Lamps, Acetylene is used a good deal for the hearlights of motor-cyoles and some motor vehicles A typioal form of acetylene lamp, as used for this purpose, is illustrated. This type hasa separate gencrator, but in the smaller lamps the apparatus is selfoontained, the burnerbcing mounted on the front of the generator. In use, water is allowed to drip from the bottom of the feed-tube into the perforated distributor; it first dmps down to the bottom of the container, spreads out there and nttacks the carbide, whereupon gas is given off and parses at once to the burner. The pressure developed by the pas itself helps to check the supply of water and the production of gas, but mechanical means of regulating are usually provided. In the lamp illustrated the How of water is regulated by turning a disk on the water reservoir : a full light or a low one may thus be secured. The supply of carbide will last three or four burning hours, when the onntainer must be taken out and cleaned and thoroughly dried before recharging with new oarbide.
Owing to the explosive mature of acetylene, it is unwise to open an acetylene lainp while having a lighted cigarette or pipe in one's mouth. No lamp ahould be allowed to burn out : the light should be blown out while still good or, in detached lainps, the feeding.tabe momentarily pinched, so putting out the light. The golden rule for uaners of acetylene
lamps is "Keep them clean" Ninety per cent. of the troubles of acetylenc lighting is caused by failure to observe this rule. The carbide container should he clcancd out after any long night ride, the perforations in the watertube clcared, and fresh water always placed in the water container. Lamp-burners may be kept clear by dipping in liquor potassae and washing afterwards with petrul. The small holes in the hurners are best cleared by wire prickers. It is always alvisable, however, to carry a sparo burner: The containers should never be more than three-quarters filled at the most, and preferably only twothirds with carbide, as the latter expands on contact with water

Portable table lainps on a similar prinoiple to that of the motor-car lamp are available: they give a powerful light, do not require inore attention than an oil lamp, and arc not really more dangerous. In snother self-contained type there is a rising aml falling bell to the generator, and the wupply of gas is automatically regulated by the hell carrying up the carbide container out of the water as the hell becomes full. As gas is used up, the hell and carbide container fall agail.

ACHILLEA. Both for borders and the rockery the achillea or inilfoil (q.v.) is useful. Millefolium, ptarmica and tournefortii aro three good speciea for borders. The most popular is the double Pearl, producing white Howers in suminer and nuch esteemed for cutting. For rockeries the beat are the white-Howering olavennas and tomentosa. The achilleas can be raised from seed, and thrive in plain anil. Pron. Ak-i-lee'-a.

ACID. Acids are of two classes, organic and inorganic or mineral acids. Instances of organic acids are acetic, carbolic, citric, gallio, Inctic, salicylic, tannic, and tartaric ; and of mineral acids, boracic (or boric), hydrochloric, sulphuric, and sulphurous. See Acetic Acid: Boracic Acid; Fertiliser: Prussic Acid. etc.

ACDD DROPS. Boil $1 \frac{1}{2} \mathrm{lb}$. loaf sugar, $\underline{1}$ pint water and $\frac{1}{2}$ tcaspoonful of cream of tartar together until mixture turns a pale yellow, when add cssence of lemon to taste and turn out on to oilcd slab. Sprinkle preparation with one dessertspoonful tartaric acid, work thoroughly in, and when sufliciently oool to touch form into thin rolls. Cut off small pieces with rcissory and roll to shape by hand. Sift with sugar and dry before placing in tin

ACIDITY. Term for excess of acid, usually organic acid, in the stomach, in certain kinds of dyspepsia (q.v.). Where this exists, with occasional risinge of sour, bitter material in the back of the throat, the following mixture, often gives rolief :

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Blanuth oxycarbonate
Sodlum blearbonite
Mucl!age of tragacanth
I drams
Peppermint watcr enough to nuke 1 ounce
```

Take two tablespoonfuls half an hour to one hour after a meal. See Diet; Indigestion


Acetglene Lamp. Type with separate generator, as

ACID STAINS : Their Removal. Stains, as from sulphuric or hydrochloric acid, can usually be removed by washing the stainel part with a solution of ammonia A strong solution may remove many old acid atains as well, though not generally effective, as the material and dye are oxidised, especially h.. nitric acid. See Ammonib: Strin.
ACNE. This is a chronic skin discase oharacterised by pimples, blotchee black. heads, and a greasy skin, on the chin, foreliead, shoulders and back. In another form of it. acne rosacen, a prominent symptorn is a chronically inflamed, reddened nose. Sto Blackheal: Nose: Pimple.

ACONITE. There are numerous species of aconite, which belongs to the buttercup family. They are all poisnnous. the roots bearing some


Aconite. Left, flower and seed pods at yellow wolls-
bane. Right, typical aconlte root
resentblance to horseradish. The conlmon monkshood is Aconitum Napellus, a British native which favours shade near water. Hesides the blues, there are several varieties bear ing pale vellow flowers, like lyouctonum, which is the wolfabane, anthors and pyrenaicuu. all summer bloomers. The winter aconitw (Eranthis) does well in shade, and is often grown uncler trees, its clear yellow cups on thein green Toby frills appearing in January.

Aconite root has been mistaken for horse radish, with futal consequences.
Horseradiah is a pale vellowish colour outside, whitish inside : aconite root is a dark brown colour outside. whitish inside. Horseradish is oylindrical in shape, aconite conical.

In medicine aconite is a powerful poison. sometimes prescrihed to slow the action of the heart. The symptoms of poisoning are severe vomiting, an icy wat skin, completc prostration, accompanied by a very slow, often irregular pulse. See Monkshood: Poisoning.

ACRE. A land neasure containing 4,840 sq yards, divided into four roods oach of 1,210 sq yarcls. In addition to this imperial acre, acres of other sizes are occasionally used in various parts of the United Kingdom, among such being the Scot tish and Westmorland acres.

ADAM STYLE: In Furniture. The brothers Rohert and James Adam wenc architects, famous as designers of buildings in the Adelplii and other house: in London and the country built during the lattar half of the 18th century. They designed fumiture and decorations to harnoonise with these.

Their atyle was based upon the lighter details of the olassic orders (Doric, Ionic, Corinthian, etc.). Swags, festoons of fruits and llowers, flutes, paterac (mund and oval ominments), festouns of drapery, mythical figures, husks, the vase and urn. key borders, and rams' heads, honeysuckle and acanthus, dentil and egg-and-tongue are the prominent


Adam Style. 18th century steel grate in Adam style which has influenced modern designs Thetoria and Albert Museum
features found in all Idam work. Much of the furniture was painted, though made of mahogany, and Wedgwood plaques were often inserted as panels. Many of the original Adam drawings are in the Soanc Museum, Lincoln's Inn Fields (London), and specimens of the furniture at South Kensington. lig. 1 shows $\begin{array}{ccc}t h e & u \\ n \\ \text { notit Fig } 2\end{array}$ notif, Fig. 2 the honeyment, buth frequent in Adam recoration. Figz. 3, 4, 5 and 6 bhow the character. istic table legs, round. tapered or ${ }^{8}$ quare, eqrived and fluted. Fig. 7 is a chairback with rame' beads, key pattern and ionoy. gucble on theyplat nnd busks in low reliei
 typical of this style. Sea tert in low reliet
 carved all round the frame
Tho photograph of the grate abuve has un almost familiar prosent day look uwing to the catent to which Adam designs have in Huenoed modern decomation in this direction. From about $17 \overline{7} 5$ Robert Adam did much to decelop painted and inlaid satinwood furniture, which then became the foshion. He adso designed some pieces in lacqucr. The typical Adam ceiling has complicated mouldings of festoons, ovals and medallions.
K . and J . Adam were really the last deaigners to create a characteristic British style which has lived. See Anaglypta; Antique l'urniture : Chair: Chimney lyece, etc.

ADDER BITES : How to Treat. The hites of the rariety of adrler found in Great Britain are rarely fatal except in children and debilitated persons. There may be a burning pain at the site of the puncture, but the accident may not be noticed, and the first warning inay be the onset of the general symptoms, which are prostration, with perhaps vomiting and diarrhoea, the skin being covered with a clammy sweat : and the person may poasibly become unconacious. The doctor should be sent for and told the nature of the accident at the time of summoning. so that be may bring with bim such remedies as he may require.
A ligature (q.v.) should be applied round the limb above the wound to prevent the joiscn entering the system, or any more of it
if general symptoms have actually manifested the mselves
The bite should be thoroughly sucked, and no fear need be entertained of evil consequences, as there is no danger in sucking if there are no broken surfaces on the lips or mouth. The month should be rinsed out with water or spirits, if any are available. Any bleeding should be encouraged.
Meanwhile the patient is kept warm, and the limbs may be chafed for this purpose. Stimulants should be given, spirits, sal volatile in teaspoonful doses in water, or hot tea. It is necessary to keep the patient cheerful. The wound will subsequently nced to be kept covered with an antiseptic dressing.


## ADDER'S TONGUE.

This dwarf-growing fern is grown at its best in the partially shaded section of the rock parden, and likes a moist, loamy soil. It may be planted or transplanted at any time during the spring or summer months, and may be propagated by putting sporeladen fronds in a cold frame towards the end of summer. It was once argely used in window fern boxes.

## Adenoids: Cure and After Treatment

How these Troublesome Growths may be Detected and their Consequences Prevented
See further under Breuthing; Nose; Throat; Tonsils, etc.
An overgrowth of lymphoid tissue called an become deformed, flattened from before adenoid is often to be found in children at the backward, or from side to side, with a proback of the nose on the vault of the nasopharynx. This lymphoid tissue is similar to that of which the tonsils are largely composed and is present in every body. It is the overgrowth of this tissue in the shape of small bosses or finger-like processes which constitutes adenoids. These processes may be roft and friable, or may be tough and firmly attached. Adenoids are usually associated with enlarged tonsils.

From their position they more or less block up the air passage between the nose and thront, making it difficult or impossible to breathe through the nosc. They may obstruct the opening of the Eustachian tubes, which lead


Clair back, ornamented with Adam natterns on splat and frame
blocking up of the mostrils causa breathing of the mostrils canser difficulty in breathing, suckling may be seriously interfered with, and the nutrition of the child suffer in consequence. When the child is somewhat older say, perhaps 3 or 4, it may suffer from a constant " wot nose," and the discharge may contain pus or be tinged with blood; the mouth is always open, and it will be found that the child always breathes through the mouth.
The cavity of the nose is so constructed that it warms, moistens and cleanses the air, but when the air passes through a large cavity like the mouth, which is always swarming with microbes, it is neither cleansed nor warmed. The result is that the child with adenoids is liable to suffer from catarrh of the throat and air tubes, and an irritating cough is frequently present. The voice tends to become thick and nasal in quality, and snoring at night is usual. Deafness is very common, and infection may extend into the car.

If the condition is not relieved, the face assumes a characteristic appearance, with a compressed nose and prominent upper teeth, like a rabbit. Owing to the difficulty in taking sufficient air into the lungs the chest may
minent breastbone-the so-called pigeon breast. The liability of such a person to contract tubcrculosis of the lungs is notorious. Sleep is apt to be disturbed, and while awake the child may be peevish and irritable. The expression is often dull and stupid, and the child may bo inattentive at achool, so that the mental development is retarded.
Treatment of adenoids is a matter of controversy. If they are small and recent, if they are only swollen becausc of inflammation, it is possible that the procedures which we shall mention in connexion with the tratment necessary after operation may do good. They should not, however, be persisted in too long. But when the adenoids are actual overgrowths, and perhaps tough growths, operation is the only treatment, and it should be performed without delay. It is usually also necessary to remove the whole or part of the tonsils at the same time. The operation is simple.

It must be remembered that failure to carry out the after treatment is responsible for any incompleteness in cure

The child should be supervised in (1) clearing out the nose by blowing it tivice a day; and (2) in performing simple exercises with the mouth shut. This treatment should be commenced a week or ten days after the operation. In clearing the nose the


Adenoids. Section of the mouth and nasal carities showing the common site of the growths
child should stand erect and grasp the nose with the right hand across the bridge, not on the compressible part. It should then take a deep breath through the nose and finally blow down forcibly into a piece of soft paper held in the left hand. This is repeated several times.

In blowing the nose only one nostril at a time should be compressed. Compressing both at once may result in forcing infectious material into the ears.

W'ith regard to the exercises, a simple one is to make the child stand crect and stoop about 10 or 12 times a minute. The mouth must be shut, and the child bieathes out in descending and in when raising the body. The exercises should be performed, if possible, in the open aip, and should be continued for at least lour or tive months. The tendency to sleep, with the mouth open may persist, and it nuay be neccssary to bandage up the lower jaw to prevent this.
After complete recovery from the operation the patient's health should be buift up in every way possible by plenty of outdoor exercise. plain, nourishing foorl, long hours of sleep and freedom from schoo! if necessary. A month at the seuside or in the country will often work wonders in these cases


ADHESSIVE PLASTER. I mixture ol resin, lead plaster, and hard soap, melted together and spread on strips of linen, are the componenta of an adhesive plaster. Inother form, which has a rubber basis. Mead's jlaster, is obtainable in various widtha, and does not require warming before application These plantors are useful for bringing the edger of a wound together, and for strapping un diessings They are sometimes used round luils to protect the surrounding skin from infection A hole is cut in the centre to permit of the discharge escaping.

ADMINISTRATION, LETTERS OF. When a man dies without a will, liefore his money or property can be dealt with someone must takc out letters of ndininistration lingland is divided into districts, and the proper thing to do is to apply at the registry of the distict wherc the deceased resided. The following is a list of the towns where the district registries are situated:

Group 1. Newcustle, Durhaun, Carlisle Group 2. Lecds, Sheffiedd, York Group 3. Manchester. Group 4. Liverpool, Lancaster. Group 5. Chester, with aub-rgistrics at bangar and Shrewsbury. Group 6. Lincoln, Nottingham, Leicester, with a sul.registry at Dorby. Group 7. Peterborough, Norwioh, Ipswich Group 8. Birmingham and Oxford, wit it a suh-registry at Northampton. Group 9 . ('ardiff, with sublergistries at Hereford, Gloncester, and Carinarthen. Group 10. Bristol and Exeter, with a suh-registry at Bodmin. Group 11. Southampton and Lewes, with a sub-regist ry at Salisbury.
In nny other part of the country, or when lie decensed lived abroad, application should le made to the Principal Prolate Registry at Somerset House, Strand, Iondon.

The widow or widower is the firat peraon entitled to take out letters of administration. and then the children. Fail. ing children, a grandchild; fail. ing doroend. ants, a parent, brother, sister, nephew, nicce, grand parent. "ucle, aunt oonsin, the Crown, and creditors-ill thatorder The regiatry sup plies forms to till in, and ex plains where to swear the necessary aftidavit: lout unless the estatc


Adze used lop smootbing a plank It is a very dangerous tool is a very small one mileed it is generally advisuble to entrust the business to $n$ solicitor. See Executor : Will
ADOPTION: The Legal Aspect. Not until 1921 in Eingland and la30 in Scotland was it made legally possible for an adult to adopt a child under 21 so as to exclude the rights of the natural parents
An adoption order must be obtained from the conrt and the case will he heard in camera. The adopting person must not le under 25 nor, except where the purtien are related, less than 21 years older than the child to be adopted. No malc person can adopt a female ohild as sole adopter except in special circumstances The consent of the pirent or guardian of the child must be obtained to any adoption before an order will be made. A husband and wife may adopt jointly or one of them mny adopt alonc. but in that case the consent of the other must lie obtained unless they are living apart. Money may be given for the adoption, but this must be sanctioned by the court.
The adopting parent has the same rights over the adopted child as over his own children as to custody, maintenance, and education. The adopted child does not lose any rights it may have of succceding to property through its natural parents, nor does it acquire any right torncceed to property as the child of its adopting pasent. A special register is kept of anopited children at Sonierset Housc. London. IV.C.

ADULTERATION OF FOOD. The different kinds of adulteration may be classed under the following headings

The mixing of a cheaper subatance with a more expensive one, the misture leing sold under the title of the latter constituent. Exainules of this are glucose and sugar, sold as sugar, or chicory and cotlee as cotfee.

The addition of worthless substances fraudulently to increase the bulk, such as the addition of coarsely ground shells of fruit stones to pepper and spices, dilution of milk with water.
The addition of preservatives to delay putrefaction and conceal the use of stale food. This, however, is allowed by law in particular cases, and under ccrtain conditions.

The addition of artificial colouring matters, allowed in some cases.

Anyone who suspects that food or drink supplied has been adulterated should interview the medical officer of health of the diatrict. Any private purchaser may submit a sample to the public analyst, who must analyse it and report on payment of 10 s . ( Cl .

Any medical officer, sanjtary inspector, inspector of markets, inspector of weights and measures, or police constable acting on the instruction of the local authority can compel any retail trader to sell him n sample of food exposed for nale. Samples inay also be taken in the course of delivery, with the consent or at the request of the purchaser. In the case of milk no consent or request is required. See Food: Preservatives.

ADZE. This is an edged tool having " curved blade set at right angles to the handle, so that the cutting stroke is always towarda the worker It is used principally for rough planing timber. The tool is extremely danger ous for all amateur to use

AERATED WATERS. Certain kinds of mineral waters which have had carbonic acid gas dissolved in them under pressure. Small quantities can be made with the aid of a gasogene or seltzogene, and the steel capsorles sold at chemista' containing carbonic acid gas under pressure. If pure water is used in the ghsogenc the product is simply mineral vater. F'r soda water dissolve 80 grains of sodium bicarbonate to the gallon : for lithin water $\mathbf{8 0}$ grains of lithium carbonnte ; for potash water 32 to 64 grains of potassium bicarbonate; and for seltzer water 80 to $1 \mathbf{1 0}$ grains of' is mixture of chloride, bicarbonate. sulphate and phosphate of sodium, all to the gallon. Lemonade and similar aerated waters merely require the necesanry fla vouring agenta to be added. See Mineral Waters : Suda Water.
AERIAL: How to Erect. In erecting a hroadcast receiving aerial it is necessary to bcar in mind the limitations imposed by the P.M.G. The combined height and leugth must not exceed 100 fcet. Thus an "L" acrial with a 75 feet horizontal span and a downlead of 25 feet would he permissible. An aerial which crossea above or is liable to fall upmor to be blown on to any overhead power wire (including electric lighting and tramway wirea) must be gurded to the reasonable satis. faction of the owner of the power wire concerned. With present -day broadcasiting conditions it is not always necessary to use an aerial of the full length allowed, and greater selectivity mny be obtained in many cases with a shorter one.

The inverted "L " aerial gives good results and is in the main the easiest to erect. It will be assumed that the aerial is to be attacheal at one end to the house, e.g to a chimney stack, and supported at the other by means of a inast.


Aerial. Layout ol a broadcast recelving aerial of the usual inverted $L$ type

A straight, sound, scaffold pole 30 feet loug may be used: it can be painted and the lower end tarred For foundation place it on a square of York stone, let 2 to 3 feet into the ground. 'The side of the hole on which the pull of the acrial will come should he vertical To the pole must he fixed 8 guy wires for holding it in an upright position. This wire should be about 7-32 S.W.G. galvanised steel wire. Cut suitable lengths and seize four of them round the pole about a foot from the top and four more half way up its length Anchor the guy wires by fastening them to stout stakes ariven into the ground A good anchorage may be made of a stout imn bar formed into an eye at the top end. and hent over at an angle at the lower end. This
is embedded in a mass of wet concrete in a hole. Before proceeding to erect a pole, fasten a pulley-block to the top threaded with the halliard or rope for running the aerial up and down. The halliard must be made endless by joining up the ends. Help will be necessary for erection of the pole. Put the foot of the inast into its foundation, and while one person lifts, two others should be pulling on the opposite guy. When the pole begins to go ul, the side guys must be laid hold of to steady the lift, and as the mast assumes the vertioal the person lifting should lay hold of the remaining guys. The mast erect, roughly fix the top outer guys and then shovel carth into the hole to the depth of a foot or so, ramming it in hard. Then the pole can be straightened up by the guys. After this, lasten the inside centre guys, which, having trimmed, slack off and trim the outer guys. The filling-in can then be completed.

The next thing is to erect the house-end fixture. If there is a convenient chimney, a galvanised iron strap may be fixed round it to take the aerial; a pulley-block should be attached to the strap, and the halliard or suspending rope passed through this. Care must be taken that the strap is kept below i third of the total height of the stack, or in stormy weather there is a danger of the stack being pulled over. Do not attempt to hammer or screw a fastening into the bricliwork. The landlord's permission may be needed for any fixture of this kind.

The aerial wire should be of stranded hard drawn copper wire $7-22$ to $\mathbf{7 - 2 5}$ S.W.G. Run it out on the ground, taking care to avoid kinks, loops, etc. Fix a shell insulator to the


Aerial. Left, adjustable ruy strainer attached to
mast end of the wirc, and, judging the amount required for leading in, fix an insulator into the wire at the point where the aerial will leave off, and the leading-in wirc or down-lead commence. Where the aerial lead is to enter the house a proper lead-in tube should be fixed. The lead-in should he kept at least 4 ft . away from walls or trees. Hoist up the acrisl, hint do not ilraw it too taut, as wind and wet may cause too great a strain. Every three months the stay wires must be examined, and, if neces sary, adjusted. Insulators should be cleaned and dried periodically.

Nothing is gained in broadcast reception by using aerials with more than one wire, except, of course, in the cage type, which is useful in confined spaces.

AEROPLANE: Making a Model. The actual making of model aeroplanes is simple The main consideration is lightness, and it is therefore impossible to obtain much con. structional strength. An illustration is given of a popular type of biplane. The fuselage is marle with four longeron spars of bamboo cane, glued and pinned to a light wonden nose or cap A smaller block is glued and pinned to the tail ends. The length of the fuselage is $2 t \mathrm{in}$., its width at centre of planes $\stackrel{1}{4}$ in. and depth 5 in. l'our vertical compression struts and four horizontal struts are glued and lashed in place between the longerons, as shown dotted in Fig. 1. The whole fuselage is then criss crossed with cotton, and ultinately covered with Jap silk
"he nose is drilled to take the airscrew shaft, which should have a sinall ball-bearing between the propeller boss and the nose to take the pull of the six rubher strands that provide motive power. Detailed construction of the nose is shown in Fig. 2. The tail block is drilled out to $5 \cdot 16 \mathrm{in}$. and a plug fitted in to the hole; the wire hook for the tail-end of the rubber is fixed to this plug, and bent over at right-angles at the outer end to prevent it pulling through. The airscrew is 8 in . in diameter with hlades 1 in . wide, and may be carved by hand. The angle of the blades is shown in the end view, Fig. 3. The shaft of the propeller and the hook to hold the rubber should be made from stout piano wire. A cockpit opening is left in the silk covering of the fuselage near the nose end, and the rubber strands can be reinoved or replaced hy unhooking them from the nose and pulling them through the hole in the tail.

The planes and rudder are attached by thin wires and rubber bands encircling the fuselage. The planes measure 26 in . across and 4 in . wide; the tail plane 9 in . by 4 in wide. The planes are made of bamboo cane $\ddagger \mathrm{in}$. wide. The front length should be a little over $1-16 \mathrm{in}$. thick, but the other long pieces, as well as the ribs, need not be more than $1-32$ in. The joints require to be nailed with fine brads as well as glued, and the whole should be covered with proofed model acroplane silk. The framing of the tail planes may be piano wire, hound with flower wire and soldered.
The chassis is made from thin wire; the whels cut from cork, and mounted on a hent axle, lashed to a bainboo crosblar. A rubber shoek-absorber is fitted near the nose.

AFFILIATION ORDER. Any single woman, or married woman living apart from her husband, who has an illegitimate child may obtain an order at the police court against the father for the payment of a suin not exceeding 20s. a week until the child is 13 or in special cases 16, and of a further sum for the expenses of her confinement. Application may be made hefore the child is born and must be made within 12 months after the birth unless it can be proved that the alleged father paid money for the maintenance of the child within 12 monthe of the birth, in which case the application may be made at any time. Where the alleged father went abroad withit 12 months of the birth, the application may be made within 12 months of his return.

The evidence of the mother as to the paternity must be corroborated by some other evidence, such, for exainple, as some statement or the behaviour of the alleged father.

AFRICAN LILY. A native of South Africa, the African Lily, or Agapanthus, has long, sword-shaped leaves and beautiful blue flowers, the latter being borne on a stem about 3 ft . in height. There is a single species, umbellatus, also several varieties, including whites, and a double form. It is usually grown in small tubs or large pots, which may be placed outside in the summer, and is propagated by suckers. A fairly rich compost is necessary, preferably three parts of old turf, one part of decayed cow manure, one of leaf. mould and a fair proportion of sand III. below.
AFTERNOON TEA TABLE. This light tea table is designed on Japanese lines The
framework is of the slightest consistent with strength.

The legs are $\frac{3}{3}$ in quare t!ıroughout their length They are cut with stıb tenons to enter the top, mortised for the rails as they occur, and notch. ed for the shelves. two at the right hand side and one at the left. Thic si\%es are given in Fig. 1. The top rails are tenoncd to the legs, and the two longer ones (C) may he bridle-jointed to the intermediate


Alrican Lily. Blue towers of this large pot plant
uprights (B), which are 7 in. square.
The table top may be in one piece finishing 8 in. thick. It overhangs an inch at each side, and is held by thumb-screwing through the rails and by glue-blocking. The middle uprights project in below the bottom shelf.

Lower rails may be arranged as shown in the perspective sketch, or two cross rails (lig. 1, K ) and one central stretoher rail (L) only may be fixed. The rails, $\frac{3}{}$ in. by $\stackrel{f}{2}$ in. in section, will be tenoned to the legs, the stretcher rail being tenoned to the two cross rails (Fig. 2, P).

The shelves are notched to the legs and uprights laee Fig. 2, 0). Each shelf may be strengthaned by screwing a stecl picture eve

(angle-wise) into the ley mmediately below the shelf. The shell finds an additional bearing on this and may be screwed through the picture eye from below
Oak, walnut, or mahogany may be used for the table. The wood should be thoroughly sound and tree from knots. A cutting list is given; the lengths quoted allow for joints and paring but all thicknessos are intended to be net finished sizes

```
lekg (A)
uprights (B)
top malla (C)
2 end rails (D)
Top (K)
Stiffening inp rall (F)
Left hand whelf (G)
Right. linnd whelf (H)
Ditto (J)
Stretcher rall (L)
```



AGAVE. With its large, succulent, shiny leaves, and big trusses of greenish-yellow funnel-shaned flowers borne on tall spikes, this

plant is fre quently grown in large pots or tubs. It blooms but rarely and grows slowly It needs little attention, and is able to with stand a great amount of drought and hot sun. The best known rperies is Americana, the American aloe, whichattains an imposing size, and is grown ont of dours.
Two varieties often grown are picta and variegata, both with variegated leavea. Other good sorts are filanentosa and Sartori. A suitable compost is composed of three parts loam, one part lenf-mould, and one part decayed hotbed manure, with sand. To propagate the plant, pot up the small suckers which form at the bese, and grow them on. During hot weather the agave needs copious suppliea of water Pron. A-gay'-vi

AGERATUM. While not iastidious in the matter of soil, the ageratum prefers a dry hut gritty soil to a stiff, damp medium if put out in May the plants flower from June till Octuber. The dwarl garden forms of the species Mexicanum may be ured as bedding plants Such sorts as Imperial Dwarf Blue, Countars of Stair, Swanley Blue, and Heavenly Blue, with slate blue Howers from May to September. are commonly grown as annuals. Pron. Ajer-ray-tum.

AGREEMENTS. Before any ugreement will be enforced by English law there must be present what the law calle "consileration," or else the agreement must be made by a deed-ie a document under seal. "Con sideration " in all agreement means that one party to the ngreement is promising to do something in consideration of the other party promising to do or to forbear to do some thing elae.

Agreements are created by an offer made by one party and the acceptance of it by the other. The acceptance must be in exactly the same terms as the offer For example, if a man offers to buy some boots from another and stipulates the exact quantity and quality and price, and alan that delivery must be on "certain day. and the other replies, agreeing to all the terns except the date of delivery. there is no completed agreement, na the offer


Auternoon Tea Tabie. Fig. 1. Sectional pian aron: and end elevations, tor lettering see cutting list. Fir, 2 (bottom, right). Principal joints: M, top, ler
and rail: $N$, section of leg and rails: 0 , notched and rail: $N$, section of ler and rails; 0 . notched
and acceptance differ on this one point What purpurts to be aceeptance is really another offer
Agreements may take any one of three lorms They may be by deed under seal-in which case we have seen they require no con-sideration-in writing, or by word of mouth. A transfer of shares in a company or a lease for more than 3 years (but not a mere "agreement for a lease ") inust be by deed Tlie following agreements must be evidenced by some written document, (I) guarantces; (2) agreements for the sale of land: (3) ayree. ments by executors to be personally liable for the dobts of the estate; (4) agreements in consideration of marriage; (5) agreements which cannot be performed within a year of the date on which they are made; (0) agreements for the sale of gonids, over $£ 10$ in value, unless some of the goods liave been accepted by the bllyer or some money has been paid. Where some performance of these agreements bas taken place. written evidence is not


Aureale rerrier. Prize-winning sdeciman of this wire-bared terrier which is an excellent house dor
necessary. Agrecments with moneylenders not made in $\pi$ special form ane void.
When a man has been induced to enter into some agreement by some fraudulent untruc statement made by the other party to the agreement, he can in some cases have the agreement set aside and in all cases he can sue the fraudulent person for daniages.
If one party to an agreement fails to carry out his promise, the other party can in some caser complel bim to do so. In all cases, however, the innocent party is entitled to sue for damages and to recover all that he has leist through the failure of the other.
The law of agreements in Scotland differs on many points from that of England. In particu!ar, no consideration is required and a large class of agreements have to be proved by written evidence or by the sworn evidence of the person who is sucd. See Hire-pur chase ; Insurance. Landlord ; Lease; Rent : Repairs, eto.
AGRIMONY. Any fertile soil is suitable for this small genus of hardy herbacenus peronnials, growing from " to 3 feet high, with yellow, fragrant flowers It can be planted at any time of the year except the summer, and is propagated by division in spring. Eupatoria, odorata and suavenlens are a few of the best species. The hemp agrimony is Eupatorium cannabi nuin, a good native perennial, growing about a yard high, with purplish flowers Pron $\mathrm{Ag}^{\prime}$ - ri-mo-ni.

Ague. S'ec Malaria.

## AIGRETTE. It is

 now illegal to import the osprey or aigrette formed from the tuft of feathery on the head of the sinaller white heron, as the capture of the bird for the sakc of the plume involves its death during the nesting season Imita tion aigrettea for mil. linery purpuses are composed of various feathers or of wired jewels.
ot the berbaceous plant
AIR-BRICK. These are of tine same superficial size as the edge of an ordinary brick, namely, 9 in by 3 in . Air-bricks are usually of cast-iron, and are plawed in the base of all exterior walls. immediately below the damp course, for the purpuse of ventilating the space between the ground level and the Hooring See Damp Course.

AIR CUSHION. In round, square, and oblong shnpes, the best cushions are made of pure para rubber, but cheapel kinds are of material like that used for mackinturhes. Air is blown into the cushion through a valve. It should not be fully intlated or undue atrain will be put on the rubber.
When not in use, cushions ought to be bung up by a string fastened to the valve and should alwaye contain a little air, folding them induces cracks in the material. In the event of leakage, cushions can be repaired with a thin cycle-tire patch or sheet rubber attached with rubber solution. This substance can be smeared along the joints if not air-tight, taking care that the material is quite clean.

AIREDALE TERRIER. This is a modern breed of wire-haired terrier and makes an excellent house dog. A large, rather gauntlooking dog square built, standing 20 in at the shoulder, its wiry coat is closeffitting, dense, and a bright, deep tan in colour, except that the baok and neek are dark grey and the nose is black. It has a long, straight and that-
opped head with medium $V$-shaped ears and small dark eyes. The tail, always docked for show purposes, is carried nearly erect. See Dog.

AIRER: For Clothes. Several hinds of airers are used. One is a raci suspended from the ceiling and held in position by cords running over pulley wheels; another is a rack attached to the wall having a number of inovable arms (Figs. 1 and 2). Both may be made by any amateur. Ordinary yellow deal may be used, but beech, birch, or oak will makr a stronger job


Airer. Fig. 1. Convenient form attached to wall. with arms that fold down when out of use
For the airer shown in Fig. 2, the back piece is 11 in by $8 \frac{1}{2}$ in by 1 in., with the comers cut off 1 in each way Two grooves. each 1 in wide and $\frac{3}{8}$ in. deep, are cut in the back, the lower one being 5 in up and the space between If in. Two $7 \frac{1}{2}-\mathrm{in}$. lengths of $1-\mathrm{in}$. wood are fitted in the groover, the width being $8 \frac{1}{2}$ in. with the end of each trimmed to a semicircle. Six holes should be bored in the top piece $\downarrow$ in. a way from the edge and equally spaced along the circumference, the boles being just large enough to take a 3 -in. wire nail. The six arnis must be cut to a length of 2 ff . is in. from straight-grained wood, and carefully planed to $1 \frac{1}{1}$ in by $\& \mathrm{in}$, the edges being rounded and smonthed off. A hole, similar to those in the top, should be hored at one end of each arm, l in. away and exactly in the centre. The bottom piece must be supported by a bracket cut to a triangular shape and measuring 5 in . on the two right-angular sides Fit the work together by nailing the bottom piece from the back of the groove and then nail on the bracket. Next nail on the top piece, and finally nail the arms in position.

Many housewives prefer a ceiling airer: (Fig. 3) which can be drawn up out of the way when not in use, and at the same time has the benefit of the hotter air which always rises It may be made about 3 ft wide by between 5 ft . to 10 ft . long, and is raised or lowered hy
means of pulleys and rope. A serviceable size is 6 ft by 3 ft The end rails should finish $\frac{7}{6} \mathrm{in}$. thick, and may be about 3 or 4 in wide The lianging rails, of which five are shown, but which inay be increased to seven or eight, can be of stout bamboo or $1 \frac{1}{2}$ in. hy 3 in . laths is preferred The latter should be mortised right through the end rails and double wedged The canes. if used, should lie plugged with wood well glued in for several inches at each end. Corresponding holes, equally spaced, will previously have been hored in the end rails to receive them.

A hole in each glued joint, bored and screw. entered from the underside up through the cane and plug into the end rail, will stiffen the frame generally. About 12 yards of stout cord can be allowed, two lengths of which will be cut off for the slings. These can be attached to the end rails by means o! stout galvanised eyes, or the end rails can be holed for the cord to pass through and be linotted

Two single and one donble pulley will be required They should be entered into the joists for a firm fixing. The ends of the remain-


Airer. Fig. 2. Sunple form with gix movable arms. Fig. 3. Kitchen airer with five hanging rails, flteu with cords and pulloys for the purpose of raising it to the ceiling
ing length ol cord can next be passed over the double pulley by way of the single pulleys and knotted securcly to the slings. The oleat hook is screwed to any a vailable woodwork in the roon Sec Clothes Horse Laundry

# AIr Gas for Country Houses <br> <br> Safe Use of Petrol Mixtures for Lighting and Heating 

 <br> <br> Safe Use of Petrol Mixtures for Lighting and Heating}

For other methods sec Acetylene : Electric Lighting; Gas, erc.

Air or petrol ges plants arc cxtensively employed for the lighting (and cooking and heating) of privatc houses in the country, where no public supply of gas or electricity is available. Petrol is highly volatile at ordinary tomperatures, and it is thus possible to vaporise it by mechanical means without the aid of heat.
There are two classes ut apparatus use. Both use incandescent mantles, as the Hame in each case is non-luminous. Lir gas containing from 1.25 to 20 per cent. of petrol hurns safely with proper arrangements; but if the proportion of petrol be anything between 2 per cent. and 5 per cent. the mixture is explosive. Hence in one of the two systems gas containing just under 2 per cent. is used, and in the other gas with over 5 per cent. Both are equally safe, while each clains to have its own

special adviuntages.
The cssentia! features of a repreventative type of apparatus are illustrated in Fig. 1. $A$ is a fixed circular casing of iron supported, together with the gearing and other parts, on a suitable wooden or iron stand. The casing is divided by the diaphragm, $\mathbf{C}$, into two compart ments, $D$ and $E$, the former being the mixing or carburetting chamber, and the latter the gas chainber. $F$ is a drum rotated by the shaft, $a$, and gear, $b$. This drum is in effect a series of circular hollow coils, usually four. Each makes several tums spirally round the drum; a portion of the coils is shown exposed at $d$. A cross-section of this coil drum is shown in Fig. 2 . The outer ends of the coils $1,2,3$. t. open into the carburetting chamber, D, Fig. 1: the other end of each turns down into the small chamber, $e$, formed by onlarging the end of the axle of the drum.

The casing is filled with petrol up to alout the level shown, and
the outer end of each coil dips in succession into the petrol as the drum turns round, the rotation heing in the direction shown by the large arrows in Fig 2. Each coil, as it passes through the petrol, picks up a certain amount of the spirit; this spirit is carried round inside the coil and, as it goes, drives the air before it through the coil, hecoming intimately mixed with it in the process, 1 ill both issuc from the chamber. $e$. Any petrol not taken up by the air drops into the bottom of the rasing E , and finds its way back into the carburetting chamber through a small communicating passage, $\int$. The air gas passes by the opening, $g$, into a small receiver; whence it is drawn as required.

Air is admitted into the carburetting chamber through the opening, $h$, fitted with a valve which, though permitting air to enter, allows nothing to escape. Petrol is put into the apparatus through the opening, $j$. Very little power is needed to drive the machinery, and in small plants it is supplied by a heavy weight and system of pulleys, as shown at G. The frame carrying the upper set of pulleys is attached to a beam in the ceiling. The weight is shown in dotted lines in its lowest position. It is wound up by means of the handle, $k$, the wire cord being at the same time wrapped round tho drum, $l$.

When gas is being taiken from the machine, the weight, m, falls gradually and turns the gearing. As soon as the gas oeases to be taken, the pressure which develops in the casing, A, stops the action of the weight, whereupon gas ceases to be made. The only labour needed is that for winding up the weight once a day, and putting in the supply of petrol

Air gas has many recommendations. Though as a light it has not the briliance of acetylene, it is adequate for ordinary purposes. It can be used for heating and cooking, though it may become expensive when used for thesc purposes. There is little risk involved in its use, provided only that proper burners are: employed and arrangements made to prevent back-Hash through the pipes. Low percentage burners must be gauze packed, and in any case, for either system, a safety chainber.
should te paced on the gas main between the gas-making apparatus and the hurners. One point to be noted is to have the pipes large cnough and the connexions easy; the free passage of the gas must not be impleded by sharp corners
warm water before drying. Alternatively wash with borax and water, half an ounce of the former to a pint of the latter. Dry with a


Trigger
Piston
Cam holding Piston
Pistor ardinary type of air weapon

AIR GUN : How to Look After. The principles on which the various types of air gun work are more or less identical. An air chamber in the form of a cylinder having inside an accurately-fitting piston driven by a powerful spring is attached to the stock. A lever, usually connected to both stock and harrel, which are hinged together, compresses the spring when the harrel is pulled down; the jimton is held in position by the trigger, and when the bullet or pellet is inserted, and the barrel replaced and locked by the catch, the gun is ready for use. On the relcase of the trigger the pellet receives the full force of the compressed air formed by the sudden release of the spring-driven piston

The only part of an air gun likely to get out of order with ordinary usc is the spring. To elfect repairs, and also to clean the internial mechanisin, the metal cover must be unscrewed together with any parts attached thereto If the spring is weak or broken, a new one must be fitted. The piston should he taken out, the new spring compressed in a vice, tied up with twine, and fitterl in position. The trigger catch or attached rocking cam should he examined for signs of wear, and, if necessary, new ones fitterl. The parts should he replaced, and, when secure, the string attached to the apring may be burnt with a red-lot wire and the bits pulled out with a wire hook.

AIR LOCK. In a hot water system an air lock is generally caused by faulty pipe arrangeinents permitting a gap to form in the colunn of water. The How of hot water is thereby impeded by the imprisoned air. The remedy is to provide a release value which can be opened to release the air. It should remain open until the water flows freely. See Central Heating.

AR-PROOF PAPER. A dozen or so sheets of paper may be laid on a table and ironed rapidly with a very hot iron, against which is held a piece of wax. The melted wax is absorbed by the paper through a number of the sheets. Another method is to dissolve one pound of white soap in one pint of water, and in another pint $2 \frac{1}{2} \mathrm{oz}$. of glue and $\frac{3}{4} \mathrm{oz}$. of gum arabic. Mix the two solutions and warm together, then soak the paper before drying. Air-proof paper is used for jam-pot covers.

AITCEBBONE. The thick top piece of the leg of beef next to the rump is economical on account of the small proportion of bone compared to the thickness of meat. It is a suitable cut for salting and boiling. See Beef.

AKEBIA. Quinata is the species mostly grown of this pretty rambling plant with its Japanesc name and its violet or purple, frag. rant, drooping flowers, which are procluced in the axils of the leaves in late spring or early summer. It is best to grow it on a wall in cold districts It likes a fertile and friable soil, preferably one which contains loam and peat. Pron. A-kee ${ }^{\prime}$-bi-a.

ALABASTER. A translucent form of gypsum which is largely used for ornamental purposes. Strong soap-and-water is best for cleaning alabaster. Rinse afterwards in clean
piece of soft silk
in inelted white heeswax
The commonest way of mending broken alabaster ornaments is to use plaster of Paris, but this should on!y be done where the joints are not easily seen. It can be applied cold. A good formula is equal parts of yellow resin, plaster of Paris, and heeswax, this cement heing applied hot.

ALARM. Fire, burglar, and call alarms are the three kinds in general use. The two former are descrilsed under their respective titles.

Call alarms are chiefly used to rouse one from slecp in the early morning. The alarm clock is dealt with separately in the next article, but any person can set up for liinself a simple and effec tive call alatin. The necessary materials are: a plain clock, an electric
bell, a snaall elec-
 Alabaster may be polished

by rubbing with pumicestone and then with a paste consisting of whitening. soap and milk, finally linishing withadry flanncl. Another method is to polislı with a eloth dipped | ax |
| :--- | bell, a small electric hattery (one

or two Leclanché cells will do), and sufficient insulated

## copper wire.

The diagram shows the arrangement: the bell, $A$, is near the bed head ; the battery, B , in any convenient place ; the wire lead, $\mathrm{C}_{1}$ is fixed to the metal frame of the clock, twisted round any accessible part with bare wire against the metal, and goes to the bell. Another lead, $D$, goes from the bell to the battery. from which a third, E, goes back to the clock. Here it is fixed near the end to the woolen part of the clock, leaving a short free piece.

The tip of this piece is exposed and bent into a small hook. If the bell is to go off at 5 o'clock, say, this bare tip is set so that when the hourhand of the clock gets to that time it will touch the tip, and thus complete the circuit, whereupon the bell will ring and keep on ringing until the hand of the clock is released. See Burglar Alarm; Fire Alarm.

ALARM CLOCK. The movement of an ordinary lever drum alarm clock is illustrated.


Alarm Clock. Works of an alarm clock removed
from the case to show details of action. See from the case to show details of action. See text

The motive power consists in a spring connected to the great wheel, $a$, which engages with its 48 cogs an 8 -point pinion on the spindle of the centre wheel, which has also 48 teeth This centre wheel makes a complete revolution once an hour, the minute hand being attached to the spindle, $b$. The centre wheel engages with a 0 -point pinion on a 45 toothed train wheel, which in its turn engages with a 6 -point pinion on the apindle which holos a second train wheel.

The toothed escapement wheel is driven by the second train wheel acting on a connecting pinion. The escape palleta strike against the tectlo of the escapement wheel, and the speed of the lever holding the pallets is regulated by the balance-wheel acting on the pronged end
The hour hand is attached to a loosc sleeve, $c$, which lits oll the spindle of the centre wheel; it has a pinion underneath which is fixed to the centre-wheel spindle, and this pinion drives a train wheel, d, to which is fixed a pinion engaging the wheel, $e$, on the loose hour sleeve.

The alarm action is driven by a spring attached to the wheel $A$, which drives through a pinion the escapement wheel $B$, the teeth of which engage a projection $C$ and vibrate the atriking hammer. The screw D turns the alarm hand $E$ to the desired hour on the alarm dial A slotted sleeve $F$ is attached to the toothed wheel $G$, which revolves at the same speed as the clock hour hand.

On the stationary spindle of the alarm hand is a projection H parallel with the alarm hand. At the hour at which the alarm is set the slot in the sleeve allows the toothed wheel G to slip forward, propelled by the steel catch spring $J$. In moving forward $J$ releases the wire arm K attached to the alarm hammer spindle, and allows the alnmm hammer to work until the spring is fully unwound. See Clock.

ALBUMEN. The chief source of albumen is eggs. It is contained in both white and yolk, but the latter has in addition a proportion of fat. Albumen is imported, and also prepared in this country in a dried condition known as desiccated egge. Only the best qualities are adapted for use in conking.

Preparations of liquid egg are also imported. This form of albumen is sometimes employed in cake-making and pastry. Another form, obtained from milk, is used as a fond for infants. See Diet ; Egg.

## ALCOHOL AND ALCOHOLISM. AI-

 cohol for household purposes is generally used in the form of rectified spirit, which contains about 9 per cent. of pure alcohol by volume and 10 per cent. of water. In beverages. the highest proportion of alcohol occurs in liqueurs and spirits, the lowest in beers and light wines. Brandy and whisky contain from 40 to 50 per cent. of alcohol by volume; liqueurs from 40 to 52 per cent. ; port wine from 20 to 30 per cent. ; sherry 16 to 22 per cent.; ohampagne 9 to 14 per cent.; hock, hurgundy and claret 8 to 12 per cent.; beers from 2 to 9 per cent.; stout from 2 to 5 per cent. ; and cider usually less than 4 per cent.While it may be said that alcohol is never essential or beneficial to a healthy person, on the other hand there is no evidence that. in strict inoderation, it is harmful. The effect of small doses on the stomach is to cause the blood-vessels to dilate, and stimulate the secretion of gastric juice. Hence, in some forms of dyspepsia a moderatc amount of alcohol promotes the digestive processes. Nevertheless, it is better to cure dysjeptic conditions by appropriate treatment. Large doses of alcojool, taken habitually. cause chronic gastritis and permanens digestive disorder.

The effect of alcohol on the hcart is to cause it to heat more powerfully and more rapidly, but this stimulating effect soon passes off, and the heart is left in a more exhausted state than before. Hence the practice of giving alcohol
for fainting or conditions of collapse is not to be recommended. (See First Aid.) It has been found that alcohol is of no value in assisting Aretic explorers to resist the cxtreme cold.

The evil effects of excessive addiction to atcohol may be manifested as acute alcoholism or ordinary drunkenness, and chronic alcoholism. When a large quantity has bcen taken, the best simple treatment is to empty the stomach by administering an emetic such as a tablespoonful of mustard in a glass of warm water. A doctor may think it necessary to pass a stomach tube and wash out the stomach.
Many preparations have been advertised as cures for alcoholism, but no drug is known which will abate the craving, except at the cost of producing other habits and symptoms equally scrious. Real cure can only be obtained by completc abandonment of alcoho!. The practice of surreptitiously adding so-called "cures" to an inobriate's food is useless.

Alcohol is not required in convalescence from illness. Most of the medicated wines contain port or sherry, with meat or malt extract, pepsin, iron, or ot her food or medicinal substance. Alcohol is best avoided hy nursing mothers, and should never be given to children.

ALCOVE. This is a recess in a room or in a garden wall. An alcove was a common feature of bedrooms in older housce, and the fashion has been renewed by some modern architects. The head of the bed with the bedside-table and a chair may be placed in the alcove, the advantage of this arrangement being that there is shelter for the head of the sleeper from any draught, so that the windows can be kept wide open.
In a dining-room which is also used as a sitting-room, the alcove can accommodate the dining-table: or it may serve in a general living-room as a quiet corner where the children can do their lessons or the elders their writing. A shallow alcove may be fittexd with a built-in settee and cupboards as in the illustration given.

ALE. The terin ale is now conlined to lighter coloured beer, the black leers being calleal porter or stout, according to their specific gravity One recipe of many for nulled ale is to add to a pint of good ale two or threc yolks of eggs, two tablespoonfuls of loaf sugar, a pinch of ginger, and the same of nutmeg. Make the ale hot, but do not let it boil : then take it from the fire and stir in the eggs, beaten with the sugar and spice. Pour it from one ressel to another five or six times until it froths, and drink hot.

Ale cin be brewed at home, but it must not be made without a licence, the penalty for brewing without such a licence being $£ 500$. The occupier of a house not exceeding f8 annual value may, under certain conditions brew without clarge, but he must first obtain the necessary licence from the local exciso authorities. See Beer; Ginger Ale, ctc.

AEEXANDDRA SOUP. Take a cupful of lentils and two heaped tablespoonfuls of barley and soak them together for at least 12 hours. Next day chop up an onion and fry it in half an ounce of margarine, add the lentils and barley with three breakfastcupfuls of water, and cook until the lentils are tender. Add a couple of fresh tomatoes when the soup is nearls ready. Rub all through a sieve and heat before serving. See Lentil Soup.

ALIMONY. The term alimony is used in law to denote a sum of money agreed, or oriered, to be paid by a husband to a wife at a time when the marriage is still in existence. Thus alimony is payable either (1) while proceedings are pending for divorce, nullity or judicial separation (alimony 'pendente lite'); or (2) after the making of a decree for judicial separation, whether the petition has hepn presented by the husband or by the wifo
(permanent n!imony). When a clecree has been made in a suit for divorce or nullity, and the marriage relationship is thus ended, any money ordered to be paid by the husband is called. not 'alimony,' but 'maintenance.' Alimony pendente lite will usually a mount to such a sum as will make the wife's total incoine (including any private income she may have) equal to about one fifth of the combined incomes of husband and wife. In permanent alimuny the proportion is usually one third. See Maintenance ; Separation Order.

ALKALIES. The group of chemicals known as alkalics have a strong cleaning action and an alkaline reaction. The four chief alkalies are :
(1).Ammonia, which has the advantage of being in both liquid and solid forms, and which as a liquid leaves no residue behind.


Alcove in a aodern dining-sooin fitirel with a buill-in Easton \& Roberison. F.R.I.B.A.
(2) Freshly slaked lime, a useful scouring agent and water softener. It is best mixed with twice its bulk of dried oarbonate of soda for use as a water softener.
(3) Potashes and pearlashes are obtained by burning wood. They are in the form of coarse, white powder, and are used for scouring saucepans, and cleaning sinks and watercloset pans. For the two last-named purposes, the potashes or pearlashes are dissolved in hot water in the proportion of a tablespoonful to a pint. A stronger form of potash is known as caustic potash. It burns the skin unless it is washed off quickly.
(4) Soda. This is the common name for a crystallised carbonate of soda, also known as washing soda. It is the most used alkali for softening water employed for cleaning purposes. Caustic roda is a st ronger form of soda.

Alkalics shouid not be used for cleaning alaminium ware, as they have a corroding effect on the metal. See Immonia; Lime; Soda.

ALL FOURS : An old Card Game. This card game for two or four players is also called seven up.

Two-handed All Fours. Players cut for deal, and the dealer then gives six cards, three at a time, to his opponent and himself, and turns up the thirteenth card for trumps. If the turn-up is a knave, the dealer scores a point. The elder hand then plays a card, or says, "I beg," according to whether ho is satisfied with his hand or not. If he says, "I beg," the dealer must either allow him to score a point or deal three more cards to his opponent and himself, turning up the seventh
card for fresh trumps 11 trumps remain unchanged threc more cards must be dealt each player, and the seventh card turned up until there is a cliange Any new knave turned up gives the dealer a point.

The clder hand, when he decides to play, leads any card he chooses, and the dealer may take it with a higher card of the same suit or with a trump, the right to play the latter not being affected by his holding cards of the suit led But if, having a card of the suit led, he neither trumps nor follows suit, he is penalised for a revoke

The following are the methods of scoring and the names of the scores High: the highest trump played, scoring one to the original holder. Low: the lowest trump played, scoring one to the original holder Jack: knave of trumps, scoring one to the dealer if turned up, or one to the winner of the trick to which it falls. Game : one point scored by the player who finally holds the greatest numbel among the cards won by him, that number being reckoned as follows: For each ten, 10 ; for each nce, 4 ; for cach king, 3 ; for each queen, 2 ; for each knave, 1.
The order of counting the sooring is High, Low, Jack, Game, except where Jack is the turn-up. The object of the game is to capture the Jack and those cards whioh count in Game. In the case of equal scotes in Game, the elder hand scores a point. If only one trump is ouri, the player holding it counts it High and Lov: If no player has an ace, ten, or court card. the elder hand counts a point for Game.

If a player revokes, he cannot win the game on that hand, nor Jack and Game, his opponent adding two to his score when Jack is out and one if Jack is not out. The player first scoring seven points wins the game, though sometimes nine or eleven points are played for.
Four-handed All Fours The rules are similar to two-handed. but the players cut for partners, and each player plays in rotation, the dealer and elder hand alonc looking at their cards in the first instance, elder hand having tho option of begging. The other two players must not look at their cards until the dealer has decided whether he will give onc or deal three fresh cards.

ALLOWANCE. This term is used for a payment which is voluntary and is not necessarily given in return for servioes rendered. It is thus entirely distinct from a salary or wage, which is a logal obligation. The sum of money given by a hushand to his wife or by a father to his daughter is known as an allowance, the amount varying in accordance with the income and the expenses of the person who makes it. A tenth of a man's income would be a good allowance for a wife, while in most cases much less is given for her personal use.

It is desirable from overy point of view for a wife to have a definite sum as an allowance which should be paid to her weekly or monthly according as the husband receives his salary, and from this she should meet.certain defined expenditure. A wife's allowance should be sufficient to provide her with clothes and pocket-money, but she is not expected to pa! from it the expenses of her holidays or her doctor's bills. Another form of allowance is the separation allowance (q.v.).

A voluntary allowance is not subject to income tax.

ALLSPICE. Sometimes known as Jamaica pepper, this pea-like berry, when dried and crushed, provides a spice which seems to combine the flavours of cinnamou, cloves, and nutmeg.

Its cominon uses are in making gingerbread and pickles, and in curing hams, and it is one of the component parts of burry. powder. It is also used for these purposes and for adding to spiced wine as a tincture, made by letting tiro tablespoonfuls of
powdered allspice soak in a pint of brandy for a fortnight, shaking occasionally to extract the flavour. It should be stiained and bottled at the end of that time.

ALMOND. The Prunus Amygdalus of botanists is cultivated almost exclusively for ornament in British gardens, where its delicate pale pink blossomsopen before its lenves in March and even in February. The swect almond is rather earlier in bloom than the common, and has rosy Howers. The bitter almond, amara, has paler Howers. The dwarf, nana or Besseriana, only grows about a yard high, and has rose-pink flowers There are also white varieties.

The almonds may bo planted as standards between November and February inclusive. They are not at all particular as to soil, but they like a drained site, and should be well staked. Little pruning is required the yolks of two eggs, the white of the head of a young tree contains straggly orange blower water and a fery drops of branohes it may bo regulated.
In Cookery. The Jordan almond from Malaga is the best variety of sweet almond. As a food almonds are highly nutritious, and bulk largely in a vegetarian dietary. They contain iittle starch, and for that reason are invaluable in the dieting of persons suffering from diabetes. (hrushed almonds yield a flour for the bread and biscuits recommended to diabetic patients. Powdered almonds are used for marzipan and macaroons. Essence of almond is a favourite Havouring for cakes and puddings.

To blanch almonds, soak them in boiling water for fire or six ininutes until the skin can easily be removed by pressing each nut between the thumb and finger. After peeling, rinse the almonds in cold water, then drain dry or rub them in a clean cloth. See Bitter Almond.

ALMOND CAKE. The ingredients are 6 oz. margarine or butter, two thin slices of citron peel, 6 oz. castor sugar, 1 teaspoonful bakingpowder. 10 oz . best white Hour, threo large eygs, $\frac{1}{2}$ gill milk (if required), and 1 teaspoonful almond flavouring. Grease a round cake-tin and line with greased paper. Sieve the flour and baking-powder together. Beat each egg separately into the creamed sugar and butter and beat well for a few minutes. Lightly fold the flour into this mixture, which should be soft enough just to drop from a spoon, but not to run off. Add a little milk if too stiff, and last the flavouring.

Put the mixture into the cake-tin already prepared. Bake in a moderately hot oven for three-quarters to one hour. Decorate the top of the cake with the slices of citron peel when about half cooked. When ready the cake should be placed on a sieve to cool.

ALMOND CHEESE CAKES. Take 2 oz. ground almonds, 2 oz. castor sugar, $\frac{1}{2}$ oz. cornflour, $\frac{3}{4} \mathrm{oz}$. butter, 1 egg , and some raspberry jam. Add the well-bcaten eggs gradually and smoothly to the cornflour, following with the sugar, almonds, and butter (melted). Line some patty-pans with scraps of short paste, and spread a little jam in the bottom of each, then pour in sufficient of the mixture to reach within $\frac{1}{l}$ in. of the top of the paste. The cakes should be baked for 20 minutes in a moderate oven. They are suitable either for tea or as a dinner sweet.

ALMOND FINGERS. These are made with $\& \mathrm{lb}$. flour, $\& \mathrm{lb}$ ground almonds, $\& \mathrm{lb}$ butter, 2 oz almonds (peeled and chopped) 2 oz sugar, 1 egg, and a little raspberry jam Rub the butter into the flour (margarine may be used instead of butter), add one teaspoonfuil of sugar with the yolk of the egg and inix all to a stiff dough. Roll this into a strip 3 in . wide, place on a greased tin and spread the jam on the strip Mix together the white of the egg, the ground almonds, and the rest of the sugar, and work to a paste, which should be spread on the top of the jam together with the chopped almonds. Bake for 30 minutes in a moderate oven and cut into fingers.

ALMOND PASTE. Use $\frac{1}{2}$ Ib ground almonds (in the proportion of one bitter almond to four sweet), the yolks of two eggs, the white of
b. castor sugar, 1 teaspoonful of essence of almonds. Put the almonds, sugar, and yolks of eggs into a pan and stir them over gentile heat until reduced to a paste ; add the orange flower water and the beaten white of egg. This will cover a cake of about 3 lb .

ALMOND PUDDING. A good recipe consists of 2 oz . sugar, 2 oz . ground almonds, 2 oz. hutter or margarine, 2 tea cups of breadcrumbs, 1 egg, 2 oz . chopped peel, and a gill of milk. Beat butter and sugar to a cream, add the ground almonds, breadcrumbs, and warmed milk, and stir well. Add the peel and the egg well beaten. Pour into a greased pie-dish, and bake for 10 or 15 minutes till firm. Serve with custard sauce flavoured with almond essence. This is ample for four persons.

ALMOND ROCK. This needs a-teacuplul of best golden syrup, I teacupful of water, 3 teaspoonfuls of vinegar, $\mathbf{1} \mathrm{lb}$. Demerara sugar, 4 lb . butter, and a few drops of almond essence. Boil all together for about 15 minutes. Put a little into cold water, and if crisp it is ready. Add one or two tablespoonfuls of blancher almonds and pour all into a luttered tin.
ALMOND TOFFEE. This is made from $\frac{1}{2} \mathrm{lb}$. almonds, $1 \frac{1}{2} \mathrm{lb}$. loaf sugar, $\neq$ pint water, a little almond essence, and a small pinch of cream of tartar. After blanching the almonds, halve them and dry in a warm oven. Let the sugar dissolve in the water, put in the cream of tartar, and boil until the syrup becomes a deep a mber colour. Do not add the almonds until the stew-pan hus been taken off the fire ; then boil the mixture up again and pour it on to a buttered tin.

ALOE. The true medicinal aloes are evergreen. greenhouse plants, ranging from 1 ft . to 30 ft . in height. They thrive best in large tubs, in a mixture of loam, sand and lime, and are increased by seeds sown in pans of sandy soil, and kept at a temperature of at least $65^{\circ} \mathrm{F}$. The American aloc is the agave (q.v.).

ALPACA. This fine material with a natural lustre is used principally for black linings, aprons, servants' dresses, and men's office coats. It is woven from the hair or wool of the alpaca, which is a South American animal of the camel family. The natural colours are brown, grey, and black. Alpaca cloth is liable to be confused with mohair, whioh it somewhat resembles. Alpaca is washable in any flaked
soap and warin water. If dried without wring. ing, it will be orisp and glossy. See Mohair.

ALPINE PLANTS. The name is applied indiscriminately to plants which are natives of the Alps, Apennines, and other mountainous districts of Europe, and in Britain figuro chiefly in the rock garden. Alpine plants do not need anything special in tho way of rockwork or stonework to protect them. They will do perfectly well on gritty ground in our cool climate if they are not overrun by coarser plants. Alpine plantsare generally low-growing herbs of perennial habit, and thrive in drained soil in which the roots can be kept cool. A garden devoted to these plants is soinetimes called an alpine garden. See Rock Garden.

ALSATIAN, or Shepherd Dog. Introduced into Great Britain in 1918, this breed has achieved remarkable popularity. During the last year or two muoh has been madr. of the fact that a few ferocious Alsatians have been banned in the courts, but the breed, like many others, has its bad-tempered representatives. Most Alsatians are goudtempered and obedient.
The Alsatian lias been produced by the union of two or three strains of shepherd doge, and though molf-like in appearance, the cross with the wolf is fairly remote. In colour these doge may be black, brown, fawn, black and tan, iron grey, cinder groy and sable. White specimens are not favoured. The gait should be a wolf-like lope.

Dogs should stand about twenty-four inches at the shoulder, and bitches a couple of inches less. The ears should be stiffly erect, and broad at the base. Faulty ear carriage (a soft car or ears) is common. The head ought to be clean in its outline, long and strong in the inuzzle, and broad in the skull, with dark almond-shaped cyes. A deep chest, straight big-boned limbs, with well-placed. hocks and strong feet are points of importance. The tail should be carricd down-never curled over the back. Obedience classes for these dogs are a feature at all the leading shows.


Alsatian Wolfhound. Champion of the breed originally bred by the shepherds of Alsace

ALTERNATING CURRENT. This is an electric current which continually changes its direction round a circuit, as distinct from direct current, which flows always in one direction. Both systems are used in electric lighting. For certain purposes, e.g. the charging of accumulators, alternating current cannot be directly employed. The alternating current in such $a$ case must be transformed by a rectifier (q.v.). One complete chango or alternation of current is called a period or cycle. The voltage of the mains, together with the periodicity in cycles, is marked on the supply meter ; the periodicity is shown thus ( $\sim$ ).

The majority of broadcast receivers can be operated entirely from the mains, provided A.C. valves are employed, and sets which utilise ordinary valves can obtain their high tension supply from this source.

See Broadcast Receiving Scts: Electric Lighting; Eliminator; Valves.

ALUM: Its M? any Uses. The kinds sold as in Fig 3, the metal of the pan being en are potash and ammonia alum. Both have the same properties and are used for like purposes. Alum is sold as crystals and as a powder: the latter is the usual kind
Alum is much employed as a mordant in dyeing and as a fire-proofing material. It acts na a water purifier when a small proportion of a solution of alum is added to a large bulk of water The reason for its action is that a gelatinous precipitate is formed when alum solution is much diluted, and as this precipitate settles to the bottom of the vessel it takes down with it any organic impurities in the water. The amount added is not sufficient to give an unpleasant taste to the water.
As $n$ medicine alum is not often given internally As a lotion to check excessive areating of the hands and feet, a tablespoonful of alum should be dissolved in a pint of water As a gargle. mouth-wash, or spray for swollen tonsils, the strength used is ten grains in one ounce of water, sweetencd with honey. Care should he taken to rinse the mouth afterwards, ns alum has a very injurious effect on the teeth
ALUMINIUM. Conking utensils of aluminium become beated through inore quickly and unifurmly than those made of other metals. and this means economy of fuel and generally better cooking. With its lightness and freedom from corrosion, it can be recommended for the kitchen. It re quires less polishing. and does not readily tarnish Gritty polishes should be avoided Lecause ita anrface easily shows scratches A good comporition is-stcaric acid 1 part, fuller's earth 1 part, rottenstone 6 parts
Sodn darkena aluminium and cats it away For this reasnn alu minjum cooking utensils should not be cleanal in sodawater or have soda put in them when in use. Aluminium can be furned white again by nitric acid


Alyssum. Flower clusters of this spring rock plant followed by careful washing. The acid attacks the exterior and leavea fresb metal exposed.

Pure aluminium easily hends, and is mostly alloyed with amall proportions of other metal, usually zinc or enpper For culinary utensils, and articlea which have to be bent and pressed considerably in manufacture, it is almost pure For mout ither purpmeses there is nearly 10 per cent. of other matal. For motor vehicles its lightness hus caused it to be extensively used.

Repairing Aluminium Pots and Pans To a large extent articles made of aluminium have no joints. They are cast in solid metal or pressed from a single piece of sheet. Hanilles of saucepans and similar articles are generally riveted on. as seen in Fig. 1 The hody of the sancepan is a single piece of aluminium drawn to shape in a die, and the bandle is of malle. able iron. Rivets sometimes become loose and the handle of the utensil no longer holds tightly. The remedy is to tighten the rivet by bammering one end while the other heara on solid metal. If rivets come out and are lost the best method of mending is to use small bolts.
Fig. 2 shows a stove bolt. This is the most suitable kind and is easier to insert than a rivet After it is screwed up the projecting end should be nipped off or filed till it is nearly flush with the nut The end can be bammered as well to prevent any risk of the nut working back. If n rivet hole bas become too large a washer can be used between the bolt head and the sheet metal. Sometimes damage to the rivet holes in the pan may be made good by covering them with another piece of metal,
losed hetwcen.
A hole lower down in n saucepan is not easy


Fig. 3

Aaminiam. Fig. 1. Saucepan with iron bsadle attached by rivets Fig. 2. Stove bolt. Pig. 3. Methird of attaching handle by atove bolt
to deal with. The quickest and perhaps most satisfactory way is to use one of the potmenders which are obtainable at most ironmongers. Aluminium is a difficalt metal to solder. Fluxes are considered useleas, and the general practice is to tin the surface as quirkly as possible after it has been cleaned. Solder specially made for aluminium is employed The efficiency of the joint depends on the adbesion bet ween the tinning coat and the aluminium The parta can then be united. As heat is conducted rapidly the metal near the joints should be heated almont to the melting point of the solder. The parts should be kept pressed closely together till the solder is set.

ALYSSUM. The various species of Alyssum or Madwort are dis tinguished by hardiness, freedum of bloom, hright ness ol colour, and ease of cultivation. Of those which are grown as unnuals, the white swect Alyssum (maritimum) is 10.12 inches high, but a more useful variety is the low-growing white compactum or Little Dorr.t, 4 inches high. which blooms throughout the summer. A Lilac Queen, 4 inches high, has


Key to the illastration below. 1. Glue Pot. 2. Stove. 3. Bracket. 4. Brace. 5. Sawing dog. 6. Mallet. 7. Hand Saw. 8. Auger. 日. Tool Rack. 10. Bevel 8naare. 11. Marking Gange. 12. Wing Compasses 13. Combination Pliers. 14. Pincers. 15 and 18. Qimlets. 17. Bradawl. 18, 20.21 and 2. . Chisels. 18. Firmer Gonze 23. Keghole Sam. 24. Martlse Gauxe. 25. Aml. 32. Block Plane. 33. Spokeshave. 34. Bench Stop. 35. Work. 36. Block Plane. 33. Spokeshave. 38. Bench Stod. 35. Work 40. Vice. 41. Bench. 42 and 43. Bammers. 44. Tenou Saw. 45. Bo Plane. 49. Taps and Dies. 47, 48. and 48. Eand-tarning Tools. 51. Bead Stock

50 and' 52. Calipers. 53. Vice. 54. Lathe


Amateur Carpentry. Equipment of an amateur's workshop; a key to the tools and accessories is piven above
successfully tackled by the home carpenter with a modestly equipired workshop

A simple and inexpensive kit of tools may include a jack and a smoot hing plane, half-rip handsaw, tenon saw, 4 to 6 firmer chisels from $f$ to 1 in or $\frac{1}{8}$ to $I f$ in., ratehct brace and 6 assorted bits, claw hammer, pair of pincers, axe, medium grade India oilstone A work bench is required, and a suitable sizc would be 4 ft .6 in . to 5 ft . long, 2 ft . 6 in . high and 16 in wide on top

A workshop of some kind is desirable. Wherever the work has to be carried on, be sure that it is well lighted. Get a corner of the room near the window or the best lighted attic, and, if possible, a window that faces north. Probably, however, the ultimate choice will fall on a shed in the garden, and this can be arranged to give the maximum of efficiency. The following notes are hased on this assumption, but those who have to be content with a space in the house should endeavour to adnpt the suggestions as far as possible to their personal needs.

A minimum size for the workshop or shed would be 10 ft . long and 8 ft . wide, with an eaves height of 7 ft . A building with a span roof is preferable to a lean-to, as the roof space is valuable as a storage loft for drying off timber However, details are given of both types of building in the article Workshop A portable building may be purchased in sections from a reputable firm This would be delivered in sections ready to .crect. A wooden floor may be used, or one of concrete may be constructed on the site chosen

The work-bench must be, above all else, strong and rigid. It can be built into the walls The carpenter's bench shown in the illustration has the advantage of portability, and can also be purchased ready for use. The vice, made of hard wood, can be used, or an allmetal one ohtained which has only to be bolted firmly to the bench. While attaching the vice, fixup a benoh stop. This is used to keep a piece of wood in place while it is being planed
The illustration in page 13 shows the equip ment and arrangement of the workshop. The tools, representing a fairly complete range, are identified in the key. In addition to the carpentry implements a tradle lathe with hand turning tools is depicted. See Bench; Cabinet Making: Tools; Wood; Workshop.

AMBER. Ornaments of amber are supposed to bring good luck, and even to bestow on the wearer the gift of eloquence The usual form of a mber necklace is the yellow opaque varicty moulded into beads; but there is also a clear amber both in yellow and reddish brown. Sicilian amber is red with green or blue lights in it. Amber is seldom worn otherwise than as a nerk ornament and usually in the form of beads
To join amber, cover the parts with linseed oil, warm carefully over a flame until the oiled surface feels sticky, and then press firmly together until oold. Caustic soda may be used in place of linsecd oil. A cement for amber may be made by dissolving sufficient gum copal in ether to form a syrupy Huid. Warm the braken portions, apply the cement and bind the two pieces together until the ceinent has set.
Amber Jelly. See Jelly.

## AMBER PUDDING.

A light steamed pudding is made with these ingre. dients: 2 oz flour, 6 oz. breadcrumbs, $\ddagger \mathrm{lb}$. suet (chopped), 2 oz. sugar 1 teaspoonful baking.


American Blight. 1. Wlaged temale. 2. Wing less female and young. 3. Twig of an apple tree
powder, 2 tablespoonfuls golden syrup and 2 egge. Add a little grated lemon rind for lla vouring Mix the auct with the breaderumbs, flour sugar and baking-powder. Warm the syrup and add it, then the well-beaten eggs. Milk may be added if tor dry. Grate in the lemon rind and stir. Place the mixture in a greased bowl and cover tightly with greased white paper. Stean two hours, the water bo:ling quickly all the time. The pudding may be served with a sauce, and is sufficient for six persons

AMBOYNA. This scarce, fragrant wood comes from Amboyna and other Molucca flarils and New Guinea, is hard and durable and is chielly used as vencer for fumiture, taking n good polish It is chestnut brown or reddizh orange in colour with mottled and curled figure

AMBRINE. The name is given to a waxy preparation used in the treatment of burns, frostbitc, chilblains, ulcers, etc. It does not adhere to the wound, and this is a great comfort in the subsequent dressings. It is used in a liquid state, and the melting is done in a water bath: that is to say, the wax in small pieces is put into a receptacle, e.g. a tin or enamel cup, and this is placed in a larger vessel containing a little water, which is kept at boil. ing point for ten minutes. As soon as the water begins to boil the heat is withdrawn a little to prevent spurts of water from entering the inner vessel.

Although ambrine can he applied without discomfort at a temperature of $140^{\circ}-150^{\circ} \mathrm{F}$., there will be burning if there is any admixture of water. The water bath is removed from the heat for a minute or two before applying to allow the ambrine to cool down a little, and it should le used somewhat cooler for varicose ulcers than is comfortable in other conditions The application is made with a sterilised soft camel's-lanir brush, and the ambrine is not brushed but dabbed on Meanwhile a thin layer of absorbent cotton wool has leeen pre pared, and this is applied above the ambrine and overlapping it all round. A layer or two of gauze and a bandlage complete the operation.

For the first few days the dressing should not be left on longer than 24 hours, but as the discharge becomes less an interval of 48 hours will be possible. Raw surfaces should be washed with boiled water, and thoroughly dried with absorbent cotton wool before putting on the war. It is important that strong antiseptic lotions should not be used. See Bandage; Bum; Chilblain
Ambulance. See First Aid; Stretcher.
AMERICAN BLIGHT. Woolly aphis is anotlier name for Imerican blight, which has the appearance of small tufts of cotton wool on the trees. The insect protects itself with the Hufty white copering ; when the latter is removed the pest is revealed as a small plump aphis-like hody. It is a common apple pest sucking the sap and so causing swellings or wounds which become the brceding places of other insect peats and fungus. In its earlier stages the blight can be got rid of by using a brush dipped in methy. lated spirit or paraffin oil, but in the case of larger cultures vigorous spraying or syringing will be required.

In winter an effective wash may be made up of soft soap, $\frac{1}{2} \mathrm{lb}$.; paraffin (or solar distillate), 5 pints; caustic soda ( 98 p.c. purity), 2 to $2 \frac{1}{2} \mathrm{lb}$; water, $9 \frac{1}{2}$ gallons. In summer use the following. Dissolve 20 oz . of soft soap in a bout $\frac{t}{2}$ gallon of hot water. Make up to 10 galions, and then add 1 lb . of

Wohurn Tobacco Extract This should be applied with the aid of a small atomiser to each tuft of aphis.

AMERICAN CLOTH. Consisting of canvas cloth treated with oil and varniah, American cloth is easily washed and kept


American Cloth. used for curtains in a modern house It is obtainable in many attractive colours
clean, and is useful for the surface of desks, wash-standa, kitchen tables, etc. It can be had in different qualities and colours, or in the plain white used for kitchen tables and shelves. The writing-table cloth usually has a mottled surface, whioh is less likely to show scratches than the smonth varicty, and has not the shininess associated with the cheaper kinds. In the kitchen it is handy to have side tables and shelves covered in white American cloth, as they are easily cleansed by a simple application of a damp duster.

American cloth is decorative for curtains in houses of modern style. In bright green, yellow, or scariet, hordered either with black American cloth, or with braid or tinsel galon, they are suitable for living-room or staircase windows. In check patterns they may be used in kitchens or bathrooms. American cloth is also used for pelinets only, in the same colour as the plain repp or satin employed for the curtains, the edges bound in gold or silver American cloth. This scheme looks nell carried out in black. See Curtains.

AMERICAN COWSLIP. The dodecatheon or American cowslip thrives in rich soil in cool places. Seeda are sown in a frame in spring. The Meadin variety is suitable for border or rockery, leing a hardy perennial 15 inches high, with drooping rellexed lilac llowers. Other varieties are Clevelandii, giganteum, album, and frigidum.
AMIDOL: In Photography. The average strength of this developer is $1 \frac{1}{2}$ grains to eaclo oz. of water. It requires to be used with sodiun sulphite, which prevents oxida. tion and discoloration of the developer, as follows: Amidol 50 grains, sodium sulphite 1 oz., potass. bromide 10 grains, water to make 20 oz . Dissolve the sodium sulphite in the water, then add the amidol, and shake until it is dissolved.

As the liquid developer does not keep very well, a dry form has been devised which can be obtained from dealers in photographic supplics See Developer; Photography.

AMMETER. This is an instrument for indicating the number of amperes of electricity Howing through a oircuit in which it is piaced, as distinguished from a voltmeter (q.v.), which indicates the E.M.F. (electromotive force) of the current.

There are scveral kinds of ammbter in use, but they nearly all take a round form with a graduated dial, over which an index travels when the instrument is in use. When used in conjunction with a voltmeter it provides a commercial unit by which electricity in this country is bought and sold. Thus one amperc supplied at a pressure of one volt equals one watt, and if supplied continuously for one hour constitutes a watt-hour ; 1,000 watt-hours make one kilowatt, which is the Board of Trade unit.

Motor-car and motor-cycle owners who use electric lighting battery sets usually have an ammeter included. The movements of the needle show whether tho battery is still discharging, and at what rate, and also may point out faults in the electric light system. See High Tension : Meter : Milliammeter.

AMMONIA: Its Household Use. Liquid ammonia is really a solution of ammonia gas in water. The strength usually sold is ten per cent., but a stronger kind is used by chemists. Liquid ammonia is poisonous. It is pungent to the nose and makes the eyes water when sniffed, and may injure permanently the sense of smell.

Ammonir is a strong alkali, and on this account is used as a cleansing agent. Added to the water in which articles are washed, it softens it in place of soda, and in cleaning windows, where soda is inadmissible, a little liquid ammonia added to the washing water is effective. Sponged on woollen cloth the colour is revived and grease spots are removed. It also revives the colour of carpets, and is excellent for cleaning tarnished silver. Ammonia often restores the colour to delicate fabrics like silks, especially where acid fruit stains have been the cause of discoloration. Brushes and combs are thoroughly cleansed from greasc by a tablespoonful of ammonia being added to the warm water in which they are to be washed. A few drops of liquid ammonia rubbed on the under side of diamonds will clean them and restore their brillianoy.

Cloudy ammonia is made by mixing common yellow soap, 8 grains; lavender water, 20 drops ; solution of ammonia, 1 pint. Cloudy ammonia is added to the bath as a refreshing and detergent agent.
Sal volatile, a solid form, is ammonia catbonate, and when dissolved in water in the proportion of one ounce to a pint, it can be employed for the same purposes as liquid ammonia. Sal volatile is, however, chicfly used as a baking powder-one teaspoonful to a pound of flour.
Sulphate of ammonia is the white powder used as a fertiliser. It is generally mixed with other fertilisers in the proportion of sulphate of ammonia, 12 parts; superphosphate, 50 parts; sulphate of potash, 20 parts. It is often employed for stimulating the growth of grass on lawns.

Ammonia has stimulating properties which make it a valuablo medioinal agent. Spirit of sal volatile, the form in which it is adminis. tered, contains both liquid ammonia and ammonia carbonate, with flavouring agents (lemon and nutmeg). It is a domestic remedy for nervous headache and faintness. The dose is a teaspoonful in a wineglassful of water. It must not be taken alone, as it causes a burning sensation in the throat.

Mindererus spirit is a solution of amınonia peetate. It is one of the oldest remedies for ieverish conditions and promotes sweating. The dose is from one to two teaspoonfuls. In larger doses it is given in alcoholism.

Poisoning. Strong solution of ammonia is sometimes taken in mistake for spirit of sal volatile, with serious effects. Ammonia is a corrosive poison, injuring the surface of the mouth, throat and stomach, in addition to which the vapour inhaled causes inflammation of the lungs. The treatment, which can be commenced while the doctor is being fetched, is to administer weak acids to neutralise the alkaline ammonia.

These are vinegar diluted with water, lemon juice and water, and tartario acid or citric acid dissolved in water, in the proportion of a teaspoonful of the acid to a breakfastcupful of water Then the patient should be given demulcent drinks such as milk. olive oil, white of egg.

AMMONIATED QUININE. Name of a popular remedy for inlluenza and cold in the head. The dose is half to one teaspoonful of the tinoture in a wineglassful of water or milk. When mixed with water an opaque white liquid is produced, but if aerated water is used no whiteness results. A solid form of smmoniated quinine is made as capsules.

AMMONITE. As it contains $\pi$ high proportion of nitrogen, ammonite, whioh is obtained from offal, is a valuable chemical manure. Ammonite is good for potatoes, cabbages, onions, leeks, and celery.

AMPERE. In electricity the name given to the unit of current or rate of llow of electricity. An ampere-hour is a current of one ampere flowing for one hour. See Acoumu. Intor; Ammeter.

AMPLIFIER. The amplifying portion of a wireless receiver may comprise two parts, viz., high-frequency and low-frequency. The high-frequency amplifier magnifies the oscillations received on the aerial, and so enables the listener to tune in distant stations which would otherwise be inaudible. The low-frequency amplifier or note magnifier then increases the volume to the degree necessary to operate a loud-speaker.

The modern long-range set utilises screened high-frequency stages, ench having a valve, tuning condenser, and tuning coil. Two tuned stages can be handled successfully, and if they are properly designed will give enormous amplification. Receivers with more than two high-frequency amplifying valves are outside the scope of the hume constructor.

On the low-frequency side, transformercoupling is the most popular. A well-designed transformer, if used with a suitable valve, will give excellent reproduction.

The maximum number of luw-frequenoy stages for an ordinary broadcast recciver may be taken as two. If still greater amplification is attempted, trouble is liable to occur owing to valve over-loading, and distortion. Even with a two-stage amplifier the transformers should have low ratios-certainly not above 4:1. See High Frequency ; Low Frequency ; Oscillation; Resistance Coupling; Selectivity : Sensitivity: Transformer-coupling.

ANAEMIA. This is the name given to $\Omega$ diminution of the whole blood or of some of its main constituents.
In two forms, chlorosis and pernicious anaemia, the cause is obscure, and these are known as primary anaemias. When, however, a definite cause is ascertainable, we speak of a secondary a naemia. Chlorosis. This form of primary anaemia is most frequently found in young women or in


Anagispta. Festoon in anaglypta used as a frieze
girls just approaching adult life. It is due to some abnormality in the formation of the blood, the chief deficiency being in the haemoglobin, or colouring matier in the red blood-cells.
Not infrequently the sufferer is plump, or even fat. In typical cases the face has a yellowy-greenish tinge, which gives the disease its common name of green sickness. The disease, which is now comparatively uncornmon, is one requiring medical attention.

Pernicious Anaemla. Whereas chlorosis is practically confined to girls and young women, pernicious anaemia is more frequent in men, and is commonest at about middle ago. It is a very severe blood disease in which there is an active degeneration of the blood-cells themselves. Its predisposing cause is absorption of poison from a septio mouth or the stomnch and intestines. It is considered that there is another poison of obscure nature and origin which breaks down the red blood-cells. In a scrious disease like this, the patient must be under medical care as soon as possible.
Secondary Anaemias. A quite mild type of anaemia, or "poorness of blood," is onte of the commonest conditions to be met with a mong sedentary workers, particularly women and girls. The chief outward sign is an unnatural pallor. The lips, instead of being bright scarlet, are dull.

Before any cure of the anaemia can be expected, the cause must first be sought out and removed. If this is possible the anaemia will pass off by itself under the influences of plenty of fresh air and rest, an iron tonic, suitable food and general attention to the ordinary laws of health. If necessary, the mouth should be cleaned up.

Anaemia in Children. This is a much more coinmon complaint than most mothers realize. Lack of fresh air and sunshine, too little outdoor exercise, and rapid growth in the child are among common causes. The diet on which literally millions of children are brought up in this country-bread and butter, cakes, sweet foods, potatoes, and other starchy vegetables, with tea several times a day-is in itself enough to induce anaemia of more or less severity. Bad teeth and the resulting constant pouring out into the mouth of " matter" or pus (which is swallowed and so tends to interfere with the digestion) are other not uncommon causes of anaemia in clildhood.

While an iron tonic is an important part of any treatment, it is equally essential to find out and remove the cause of the deficiency in the blood. Sometimes a tendency to rickets or chronic constipation may be the source of the anaemia. In many slight cases more play outdoors, less study or other brain activity indoors, more sloep, and simpler and more nourishing dietary, with some chemical food, may effect a cure. See Baby; Child; Diet.

ANAGALLIS. The best-known species of this free-Howering annual is linifolia, which grows to a height of about a foot, and is often represented by its $\nabla$ ariety Breweri. Sow seed in March in heat, or without heat in April, prick off, and pot the seedlings. A suitable compost has three parts loam, one of lesfmould, and a sprinkling of sand. See Pimpernel. Fron. An-er-gal'-is

ANAGLYPTȦ. A form of wiall and ceiling decoration which is termed anaglypta consists of a good quality pulp board pressed during the process



ARCHITECTURE: THE MEDIUM-SIZE HOUSE WHEN FINISHED
 together with the contract and sprequitred for the construction of the house.
of manufacture to form raised or embossed patterns. It is obtainable from the same sources as wallpaper. It is applicd to the wall


Anchusa. Bardy plant resembling the forget-me-not attractive in a sunny border
and fixed by a good adhesive paste, or Hour paste with a mixture of gluc. After fixing, it needs finishing with distemper in the case of a ceiling or cornice, or with paint or enamel it used as a dado (q.v.).
ANCHOVY. The anchovy is a small fish of the herring species, chiefly used in a preserved form to make savourics and sauces The foundation of these sances is anchory essence, which is made in this way: Talie 1 lb of preserved anchovies, 1 pint of cold water $\&$ pint of good vinegar, 1 saltspoonful of macc. and 1 saltspoonful of cayenne.
The anchovies must be reduced to a paste by pounding them in $n$ bowl with a wooden spoon, and afterwards passing through a sieve The parts which will not go through the sieve are then simmered with the inace, cayenne, and water. Sillmer half an hour, strain, then mix with the pounded anchovy already in the bowl Place the mixture back in the simmering pan, bring to the boiling point, add the vinegar and gently simmer for ten minutes more. When quite cold bottle for use. Anchovy sauce is made by adding one teaspoonful of anchovy essence to an ordinary white sauce or to $\frac{1}{2}$ pint of melted butter. See White Sauce

## ANCHOVY BUTTER.

Having soaked the preserved anchovies in warm water dry and re move skin and bones To six add 4 oz butter and pound in a nortar. Rub through sieve and then pat the anchovy butter into shape. This is a savoury forsand wiches or toast.


ANCHOVY EGGS. To make this cold savoury take as many hard-boiled eggs as are required, usually one for each person. Having shelled them, split them lengthways, and take out the pieces of yolk, which should be pounded in a busin with a small piece of butter, a inblespoonful of anchovy paste some pepper, salt and a sprinkling of cayenne Fill the eggs with the stuffing, and serve them garnished with parsley, cress, etc. The eggs may be made to resemble baskets by forning handles of parsley stalks

ANCHOVY TOAST. Wash and hone six anchovies and chop them roughly. Heat one ounce of butter in a small enamelled pan, and fry in it a small onion, chopped linely When the onion is lightly browned, add the anchovies, half a teaspoonful of chopped parsley, and the yolk of an egg. Season with cayenne. Stir this mixture till it thickens, then pour it on buttered toast and serve il very hot

ANCHUSA. This is the name of a sturdy family of biennial plants somewhat resem bling forget me nots, to which order they lelong, but attaining a height of over 2 ft . They Hower throughout the summer in sunny borders and need no special cultivation. Anchusas are raised from seed sown under glass in spring, and the seedlings are planted out in the usual way; or by root cuttings after flowering. Pron. An-kew'-7.n.

ANCIENT LIGHTS. Any person who has a window 20 yenrs old and upwards acquires the right that no one shall block out the light from it in such a way as seriously to diminish the amount of light that penetrates into the room. This means for practical purposes : to enlarge the window does not enlarge the right of light.
If anyone is starting to build so as apparently to interfere with an ancient light, the owner should write at once and say in effect: "You have started building, and seem as though you were going to block up my win dow. I give you notice this is an ancient light, and await yout assurance that you will not interfere with it." Failing such an assurance, $n$ solicitor should be instructed to apply for an injunction. It must not be imagined that an ancient light gives the right to n continued uninterrupted view. The only right is to a fair quantity of light.

ANCONA. This fowl, of Italian origin, was introduced into England in the early fifties. It is of active habit, and better suited to an unlimited range than to confinement. A prolifio layer of large white eggs, as a table bird it has few qualifications. There is a sub-variety, with a rose-comb instead of a single comb. See Egg; Fowl; Poultry

ANDALUSIAN. This is one of the best egg-producing fowls. A native of Andalusia, in Spain, it compares favourably with other Mediterranean types, producing a large white egg. It is also a good table fowl, its flesh being of delicate flavour. Although thriving in confinement, it is better adapted to a wide range. See Egg; Fowl; Poultry.

ANDIRONS. More generally known as fire-dogs, andirons were formerly used in open hearths for burning wood, each consisting of a stout horizontal har of iron raised on iron supports a few inches from the ground. The front support was extended in an upright form and finished with a knoh
shield, or other architectural device
The andirons were placed one each side the hearth, and the logs laid across the bars

The modern adaptation of the andiron is to be seen in the fire-dogs, whioh are now used to support the fire irons. See Fire Irons

ANDROMEDA. The most popular specien of Andromeda is known to botanists na Pieris Horihunda it is an American evergreen, with leathery leaves and denscrac emes of white flowers. appearing in Ipril. The height is commonly 3 to 4 feet. Anothor beautiful species is Japonica, with tufts ol creamy bells in abull dance. There is $\pi$ variety called variegata (or ele gantissimn).
indromedo

Andromeda Japonica. Creamy flowers of the evergreen shrub The only true distinct specics of Andromed with pink drooping Howers in late spring, and evergreen leaves, a native of our peat bogs It requires a moist site and a peaty compost Propagation is by seeds sown under glass when ripe, also by layers in autumn. The layers root very slowly. Andromedas thrive best in a position where they are not exposed to liot sun Pron. An drommy-da.

ANDROSACE. Some of the gems of the rook garden are found in the genus of Alpines known as Androsace or rock jasmine. They are distinguished for the most part by dense habit, great profusion of bloom, and beautiful colours. Among the best varieties are the pink sarmentosa, Chumbyi with rose flowers, pink-Howered carnea, lanuginosa, and the scented blush pink villosa. They need well drained gritty soil. 1’ron. An-dros'er-si.

ANEMONE. There are numerous species of the anemonc or windflower. Two of these are British: Pulsatilla or the violet Pasque Hower, and Nemorosa, which is the wond anemone. Coronaria, with its popprylike flowers, white, purple, or acarlet, is an old garden favourite from six to nine inches high; there arc also double-flowered sorts. The Alpine blanda flowers from Jan. to April. The Snowdrop anemone or sylvestris is about 18 inches high and hlooms in May. Fulgens and hortensis have scarlet or purple flowers.

The flower gardener should procure a selected strain of mixed varieties. This will give him a beautiful range of colours and forms, including both singles and doubles. The seed is best sown in pans or boxes in a frame in spring. If spring bloom is wanted, tubers ought to he planted in autumn; a succession can be obtained by planting more tubers in spring. Japanese anemones may be


Andirons. Modern adaptation of the old log fre-dogs. now used to support fire-irons

Waring \& Gillow, t.is.
plantod any time between autumn and spring. and they thrive in most garden soila on a shady or sunny border.
The Japanese anemone is among the most beautiful of late-llowering hardy perennials, the white varieties in par. ticular. Apen nina is sky blue, with tuberour roots. The Hepatica type, hoth single and double forms, is bliee. Pron. A nem'o.ni.

Aneroid See Barometer.


ANGELICA. Made from the stalks of the angelica plant, candied angelica is a beautiful shade of green, and is much used as a decoration for cakes, puddings, trifles, etc. Being pliable it can also he used to give the effect of a handle to a sponge cake basket filled with whipped cream and preserved cherries. See Crystallised Fruit.

ANGELS-ON-HORSEBACK. For this savoury dish take a thin slice of bacon for each oyster used, and an equal number of rounds of toast or fricd bread. Season each slice of bacon by dipping it in a mixture of chopped parsley, chopled onion, and cayenne pepper. lay an oyster on each slice, sprinkling a little lemon-juice over it. Wrap the bacon tightly round the oyster, fixing it with a small skewer made of the woorlen part of a large match. Fry till the bacon is quite crisp, then serve on the rounds of toat.


Angels-on-Rorseback. Savoury dish composed of oysters and bacon

ANGLE-IRON. An inon bar bent to form a right angle longitudinally is called angle-iron, and the shape greatly incresses the strength and rigidity of the bar Angle-iron mary be had from bar-iron denlers or retail from a blacksmith in sizes $1 \mathrm{in}, 1 \frac{1}{3} \mathrm{in}$., $1 \frac{1}{2} \mathrm{in}$., 2 in., and

## 3 in ., and is sold by weight. <br> ANGLE TEMPLATE.

An angle template is used for marking and testing angles on metal, wood, and other nuterials. The most commonly used angles are $45^{\circ}, 30^{\circ}$ and necessary templates are other angle. For use in made for any peture framing a when setting out the angles for hexaconal shapes and other types of framos.

Angle templates are commonly used in building for roof work and other mirpuses, and in such cases thoy arn made to a large size and framed up with strip inaterial. See Roof.

ANGORA RABBIT. One of the most attractive of rabbits, the Angora is conspicuous by its long coat of fine silky wool. either white, groy, fawn, bluc, or black in colour. The does are good mothers and. being very tractiable, are among the most popular rabbits kept as domestic pets When full grown and in good condition the Angora weighs about 7 lb . See Rabbit.

ANILINE DYES: For Domestic Use. Various dye soaps are made with which the dyeing procese is accomplished in one operation.

A bnse of equal parts of powdered soap and hisulphate of soda is cmployed, and to this is added the nniline dye required Generally the proper shadc is obtained by combining two or more dyes. In another variety the soap is mixed with boric acid instead of bisulphate of soda, and aniline dye added in the proportion of 1 lb . to each cwt. of soap) hase.
Aniline dye stains are often difficult to re move Aniline typewriting ink is removed by applying tartaric acid or lemon juice,


Anemone: three varieties.
1.


1. Double-flowered Wind wood anemone. 3. Violet Pasque flower or Pulgatilla
followed by plain water. Soap should not be used, as it tends to fix the ink on the skin. Other inks made with aniline dyes, if spilt on carpets, tablecloths, or other fahrics, may be removed with methylated spirits. Dyeing : Stain.

ANILINE INK. The great variety of aniline colours makes theso suitable for the manufacture of coloured inks. A simple solution of the dye in water is generally required, and although some recipes order the addition of gum-arabic, this is not generally necessary. For red ink, the best colours to use are eosine, erythrosine, phloxine and ponceau scarlet. For blue ink, soluble blue or indigo carmine. For violet ink, acid violet ; and for green ink, malachite green. The proportion of ench dye required is one dram to six or eight ounces of water. The ink used for copying-graphs consists of methyl violet 1 oz., dissolved in alcohol 1 oz ., water $\$$ oz Typewriter ribbons are coloured with an ink of similar composition

These inks may be used for homn dyeing. Red ink sufficiently difuted tints silk under-


Angle-Iron in section and perspective clothing $n$ delicate pink. It is as well to wear rubber gloves when using inks for dyeing. or to remove the articles from the dyeing water with two sticks and rinse well before touching. ANIMALS: The Legal Aspect. Sometimes a neighbour objects to noises made by animals such as cocks and dogs. Anyone is nt liberty to keep on his own premises any animal he chooses so long as it is not a nuisance to his neigh bour. A nuisance is some. thing which interferes with the neighbour's reasonable enjoyment of his own property.

What is reasonable depends on time and place in a great measure. A man living in the country must expect his neighbour to keep fowls, but a man in the centre of London is ontitled to object if his sleep is disturbed by the crowing of cocks in his neighbour's garden. An action for an injunction is the legal remedy for such nuisances. One must not keep animala on one's premises so as to be injurious to health.
Anyone who keeps a dog which he knows to be accustomed to bite human beings is liathle if his pet bites anybody. As to a dog worrying sheep or baiting cattle, horses, or pigs, tho
dog.owner is liable whether he knew or did not know that the heast was femcious.
Cruelty to animals in eaptivity or domestic mimals is an offence. It is cruelty to cause or permit unnecessary suffering, or cruelly to heat, abuse, infuriate or terrify the animal. In the casc of a wild animal, imprisonment for three months, with or without hard lahour, or $n$ finc of f 5 or less; and of a tame animal. three inonths or a fine up to $£ 25$ is the pennlty See Cat; Dog; Rabbit, etc.
ANISEED. As a cough remedy anisecd is much used on account of its sonthing effect, generally in the form of a balsam, which is made ns follows

| Liguorice juice |
| :--- | :--- | :--- | :--- | :--- | ---: |$\quad .. \quad . \quad . \quad . \quad$ I ounce

Firat boil the liquorice juice and gum-arabic (both broken up into small pieces) in half a pint of water, then auld the treacle. Allow it to cool, and add the other ingredients, adding sufficient water to make two pints The dose is one or two teaspoonfuls three times a day.

Anisced syrup, given to children for wind, is made by udding one drop of oil of anisced to two ounces of syrup. The close is a teaspoon $\mathbf{f u l}$.
Aniseed cordial, used by adults as an stomach cordial, is made on similar lines, hut is stronger in anisced, and contains a fair proportion of alcohol. It is taken noat or mixed with hot water.

ANKLE. The ankle is a hinge joint, the two main ligaments binding the bones together being the internal and external lateral liga. ments. These are torn in injurics to the ankle, which stretch them, and especially in those which displace the bones to any extent.

For treatment, a sprain requires the application of cold cloths and elevation of the joint on a pillow. In fracture or dislocation the foot is placed as far as possible in corroct position by pulling it downwards, and well-padded splints are fixed on the outer and inner sides of tho leg, roaching from above the knee to below the ankle. The two legs are then tied together and placed on a pillow. A bed-cradle may be used to take the weight of the bedclothes off the toes of the injured limb This will suffice till the doctor arrives.

The proper reduction of a fracture-disloca tion of the antile requires special manipulative skill and in first aid only gentle handling is permissible.
In sprains, as soon as the acute symptoms have moderated, perhaps after three or four days, the parts whould be masanged, and as the swelling subsides gentle movements are performed. In cases of slighter sprains, after two days the patient may be able to get about a littlc. This after-treatment is very necessary, otherwise a troublesome stiffness of the jointa may persist.
Care of the Ankles. Choice of footwenr is important to ankle slimners. Heels of more than 1 to $1 \underline{d} \mathrm{in}$. in height should not be worn for walking. High hoels, by forcing the foot into an unnatural position, strain and cramp the flexibility of the ankle joint. Weak ankles arc subject to swelling, and to remedy this condition remove shoes and stockings on returning home, apply a cold compress to the joint and then, lying down, raise tho foot on a cushion. Afterwards lightly massage the ankle and apply methylated spirit. Heels of shoes should be repaired at the first sign of crookedness Boots should not be wom habitunlly, except by inodical advice, as they provide too much artificial support
Anaemia may be responsible for swelled ankles ; or, in children, they may accompany a tendency to Hat feet, and are a sign of general
debility Sunshune fresh air and a bone-and-muscle-building diet are of importance. Paddling in the sea during the summer holidays is beneficial. as salt water has tonic properties

Skipping and dancing barefooted or in tlat. heeled shoes strengthen the ankles, and the following simple exercise imparts flexibility :

Stand with feet clnse wgether, toes as well as heels touching knees braced back and the balance on the balls of the feet. Raise the body on to the toes and hold the position for is moment, then fower the heels. Repeat short series of the exercise several times during the day when convenient to discard heeled shofa See Beauty Collure; Dislocation; First Aid : Flat Foot: Foor. : Fracture : Sprain.

## Annealing, Sec Temporing.

ANNUALS: In the Flower Bed. Including what are known as half-hardy anuuals which require more care and attention, the range of annusls is a wide one, with a great variety of beautifil colours. Few plants provide a moro charming pink groundwork for a bod of white tulips than campion or soapwort. Virginian stock, with its slim stems and abundance of mauvy pink and white ilowers, is just as useful, and blooms in spring if sown in August or September: 80 also do Californian poppies. Sume special favourites are cultivated in the samc way, although they are not true annuals, as, for example, pansies, lobelias. petunias, verbenas, Indian pinks, and the antirrhinum or snapdragon.

While chrysanthemums and other halfhardy annuals are raised in-seod-boxes, it is rare for the hardy kinds to he sown ander glass and transplanted. Mignonette and Everlasting Howers do not transplant weil. A dozen seeds of each may be sown in $5-\mathrm{in}$. pots, and the resulting seedlings thinned down to three and five respectively. In muny cases garcleners grow most of their annuals in groups, prorhaps along the front of mixed borders.
Ageratum, alyssum, campion, violet cress, soapwort, end Virginian stuck should be frm 2-3 in. apart. For lupins, double poppies, suntlowers, and tobacco plants the distance is from 18 to 24 in The following ase set at 4 to 5 in. apart : Arctotis, Californian bluebell candytuft. convolvulus minor, oornHower, gilia. Indian pink, limnanthes, lobelia, mignonette, phlox (annual), sweot pea, horned roppy, and Venus's luoking-glass.

A distance of 9 to 12 in . apart is requirod for the following: China aster, chrysanthemum (annual), clarkia, coreopsis, godetia, larkspur, love-in-a-mist. Inve-lies-bleeding, marigold, dwarf nasturtium. evening primrose, petunia, poppy, Prince's feather, salpiglossis, scabious, sweet sultan. verbena. and the zinnia. A temarkable annual recently introduced is the orange-coloured venidium fastuosum; seed is sown under glass in March. Sec Border: Flower Garden.

ANNUITY. An annuity in tho ordinary sense is a yearly income paid to a person for his or her life. It can be purchased, by those who wish to provide for their old age or for the old age of those dependent upon them, from uny insurance office or from the state through the Post Office : the price varies nccording to the age and sex of the person for whose benefit it is bought. The older the person the cheaper the annuity. Annuities for womon cost more than those for men of similar ages.

In addition to annuities of this kind, which are the usual type, there are perpetual annuities, i.e. a charge upon an estate which is paid to a person and his heirs for ever. Terminable unnuities are annuities issued by the Government in order to pay off the national debt.
An annuity can be bought by a single payment or on the instalment plan. The table in the next column shows the amounts payable to secure a Post Office annuity of $£ 1$.

| Aye laxd birlhday |  | Mate |  |  |  | Hemale |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | ¢ | R. | U. |  | $\dot{1}$ |  | d. |
| 10 |  | 18 | 6 | 0 |  | 19 | 10 | 8 |
| 15 |  | 18 | 14 | 1 |  | 19 | 0 | 5 |
| 20 |  | 18 | 1 | 7 |  | 18 | 9 | 5 |
| 25 |  | 17 | 8 | 8 |  | 17 | 18 | 7 |
| 30 |  | 10 | 14 | 11 |  | 17 | 7 | 10 |
| 35 |  | 15 | 18 | 8 |  | 16 | 15 | 6 |
| 40 |  | 15 | 1 | 0 |  | 18 | 0 | 5 |
| 45 |  | 14 | 1 | 1 |  | 15 | 2 | 2 |
| 50 |  | 12 | 17 | 0 |  | 14 | 0 | 0 |
| 55 |  | 11 | 12 | 0 |  | 12 | 16 | 1 |
| 60 |  | 10 | 4 | 8 |  | 11 | 8 | 7 |
| 65 |  | 8 | 16 | 6 |  | 9 | 19 | 0 |
| 70 |  | 7 | 8 | 7 |  | 8 | 8 | 5 |
| 75 |  | 0 | 2 | 1 |  | 6 | 18 | 4 |
| 80 |  | 4 | 17 | 11 |  | 5 | 10 | 3 |

From the figures the amount necessary to secure an annuity of $£ 100$ or any other income can easily be ascertained The state pays on death a sum which is equal to one-fourth part of the annuity

The nmount obarged for an annuity by the asurance offices varies. For instance, a man of 60 can purchase with $£ 100$ an annuity of £8 18s. 9d from one office, while another will give him as much as $\mathrm{f} 9 \mathrm{0s}$. Od a year. The variations are due partly to the class of business dnne by the various offices and partly to some slight differences in benefits. For in. stance, some insurance offices pay the whole or part of the stamp duty which is charged on annuities. Those wishing to purchase an annuity should remember that the main oliject is to ohtain a seoure income, and therefore only deal with the state or with an office whose reputation is sound See Insurance


Antaraclte stove. Fig. 2. Independent boiler installed by the side of a range
smuth id Woduleod, Led.
ANODE. In an electric battery the anode is the positive plate of a cell, by which the current enters the electrolyte or solution The anode of a wireless receiving valve, sometimes terined the "plate," is a metal cylinder surrqunding the grid and filament. Besides heating the valve filament, it is also necessary to apply a certain voltage to the anode before the valve will function. This voltage is derived from the high-tension battery or eliminator and may be between ( 60 and 150 volts (or even more), according to the particular work the valve is called upon to perform.

Suitable anode voltages for a broadcast receiver are as follows: Screened. grid valves, $120-150$ volts;
detector, 60-80 volts; low frequency valves. 120-15) volts.
The a node pin of a ralve is the one farthest away from the other three, and is usually indicated by a vertical ridge on the moulded base. The anode connexion on the screenedgrid valve is the terminal on the top of the vulb. See Cathode Eliminator; Resistance Coupling; Valve.
ANT : How to Destroy the Pest. These little insecte often prove very troublesome in the garden by their attacks on ripe fruit. They will swarm upon ripe straw berries, and an apple or plum whose skin has beer. pierced by a bird's beak will be hollowed out by them. If the direction of the stream ol ants is followed, they can be tracked to their nest, and this should be forked up and dusted liberally with sir-slaked lime. As many of the inmates will be in the ohrysalis stage and protected by tough cocoons-the so-called "ants'-eggs" -the operation must be repeated several times at two-day intervals. Kerosenc oil, diluted with six or seven tines its bulk of water, and carbolic acid in water ted times its bulk, are equally eflechive.

Wherc ants have invaded the house thc problem is more difficult. The principal offender is a


Anthracite Stove. Fig. 1. Cooising range in section, arrows indicating path of hot pases. malling ane of any strongis liable to make the fiod uneutable. So fas us possible all crevices should be sealed witb putty or cement, and a watch kept for the new entry these insects are certain to attempt.

It is, of course, very dangerous to lay poison anywhere in the neighbourhood of food. A simple syrup suffioiently viscid to clog the anta' limbs will serve as a trap. from whioh the insects can be plunged into boiling water. The syrup may alan be marde to kill by adding a few drops of formalin.

Ant bites are treated by the applicntion of ammonis (q.v.), sal volatile, rolution of permanganate of potash. or a strong solution of common salt. See Insect.
ANTHRACITE STOVE.
This stove, designed to burn anthracite on the closed fire

Anthracite Stove. Fig. u. Patern of stove osed for heating a sitting-room or hall
 principle, maintains a continuous fire day and night on an economical consumption of fuel. Its use obviates the dradgery of daily re-laying and lighting. The total absence of smoke and soot makes for health and comfort, and the attention and labour involved arr reduced to a minimum.

Fig. 1, showing an ar. thracite cooking range in section, is self-explanatory The path of the hot gases, as indicated by the arrows, is so' arranged that there is a maximum heating effect obtainel. Some of the ranges are provided with pressure boilers for the clomestic hot water supply.

Fig. 2 shows an independent anthracite boiler installed alongside a cooking range, an arrangement adopted whero a plentiful and continuous supply of hot water is needed.

An anthracite stove for use in sitting-rooms is shown in Fig. 3. In another type there is a small filling donr above the fire door, into which the end of a tapered coal hod may be inserted, so that the fire door need not be opened. These stoves will burn coke nuts satisfactorily. In another kind, in which there is an open fire, very small anthracite ("peas ") is the fuel.

ANTIDOTE. Substanco which neutralises or counteracts the effecte of poisons. A list of the appropriato antidotes is given under the heading poisoning.

## Antique Furniture in the home

## Notes for the Amateur on Its Collection and Care

## Detsils of Sryles and Pieces are glven under Chair; Chippendale: Hepplewhite, etc.

English furriture is divided into the four chairmaker in St. Martin's Lane about 1754. periods of oak, walnut, mahogany, and satinwood, many examples of which can be seen in the Victoria and Albert Muscum, South Ken. sington. In the reign of Elizabeth, ornamental carving was emplnyed for four-post bedsteads and tables. A reaction set in, mainly under the influence of Inigo Jones, when upholstered furniture came into fashion.

Hampton Court Palace has good examples of the furniture of the later Stuart period. This was the time of the gate-legged table, also of the "drawinge" table, one with $\Omega$ contrivance by which the two ends were drawn out for the purpuses of expansion. Chairs bad orrved hacks and sents with panels of canework which were often covered with loose cushions of zelvet; bedsteads had rich hangings of silk and velvet, and a good deal of luxurious furniture, carved, gilt and upholstercd, was imported imm Venice and the Netherlands, while lacquer from the East came into fashion.

With the accession of William III, walnut began to replace oak. Dutch furniture was brought over to England, and lacquered cabinets from China and Japan. Marqueterie, which may be defined as an inlay of coloured woods, came into vogue as a decorative treatsnent for surfaces of furniture, such as doors of cabinets, the drawer fronts of chests of Jrawers, clock cascs, and the tops, sides, and Ironts of the smaller picces. The curved or cabriole leg was introduced from Holland for ohairs and tables; ebony and silver, with ivory and mother of pearl, werc also uscd in inlay. Chairs and window seats were covered with beautiful needlework

Queen Anne and Chippendale Styles
Grandfather clocks, their cases inlaid with marqueterie flowers and birds, and also with a more delicate pattern of stained holly-tree wood, termed "scaweed marqueterie," on a groundwork of walnut, are of Queen Anne's time. Card tables with cabriole legs, sometimes carved with a nulled edge and a shell ornament on the knees of the legs, belong to this time, as do handsome cabinets, presses, and chests of drawers decorated with marqueterie or with different veneers of walnut arranged in geometrical designs. A peculiar and very beantiful feature of some of the Queen Anne walnut furniture is the veneer known as " oyster shell," which has a natural marking of the wood resembling the shell of the oyster; it was obstained from boughs of old and matured trees.

The name which stands out most prominently as a maker of mahogany furniture from the middle of the 18th century is that of Thomas Chippendale, but the first designer to use inahogany was William Kent, whosc best work was done between about 1735 and 1740 . Thomas Chippendale was established as a

ANTI-FREEZEF:. To prevent water freezing in radiators of motor-cars, houschold radiators, and in the generators of acctylene gas, certain substances are added, and from their action in lowering the freezing-point, these are known as anti-freczers. The substances employed ars zlycerine and liquid glucose, the proportion required of either being 32 oz to each gallon of water. See Radiator

ANTIMONY. Apart from its value in the making of type metal, one of the ohief uses of antimony is in the preparation of the Britannin metal and pewter (q.v.) employed for making teapots, coffee-pots, spoons, and other domestic artioles. It is also used for trinket boxes, dressing-table trays, and ornaments. It does not tarnish and oan bo kept clean by simply washing with soap and water. See Poisoning

His rococo style lasted until nearly the time of his death in 1779 Chippendale should lee taken more or less as a generic term, for it is impossible that a hundredth pait of the old furniture of his time and style could have been produced in his workshop. Gillow made a good deal of the so-called Chippendale furniture, and his book of designs, which were available to every contemporary cabinet maker furnished the patterns adopted by many craftsinen whose naines are now forgotten. Hepple white's designs come a little later than those of Chippendale and are more sovere, generally in good taste, and his work is invariably well constructed. The decoration of chairs and settees by beautifully executed japanning was also a partioular speciality of Hepplewhite's.

## Sheraton and the Adam Brothers

The name of Sheraton looms large in the bistory of furniture, but his work more properly belongs to the age of satinwood. The influence of Rubert and Jamics Adam, par ticularly the former, towards the end of the 18th century must he borne in mind, as the Adam style was a distinct reaction from the rococo ornament of Cluppendale to the more classical lines of design.

Satinwood came into use towards the end of the 18th century, being generally used as a veneer. The lines of satinwood furniture did not differ from those followed by mahogany, but this dainty wood suited smaller articles.
The following table of dates, corresponding with the various periods of British furniture making, will serve as an aid to the identifioation of the different styles
Elizabeth, 1558 to 1003
James 1, 1603 to 102i
Charles 1, 1625 to 1649
Commonwealth, 1048 to 1060
Jamea II, 1685 to 1688
WIllam ind Mary, 1888 to 1702 Anne. 1702 to 1714 Gcorge I, 1714 to 1727 Genrge II, 1727 to 1760
" Elizabethan "Jacor Tudo ". Jacobean "., ". Jacobean ", - Jacoberan ",
"Jacobean "
-. Jacobenn" $\because$ Qucen Anne", "Queen Anne".
Chippendale ${ }^{\circ}$ work about 1754
Hepplewhle's work, adain Bros.' work, about 1780 sheraton's work, abont 1781
There are at least two courses open to one who has decided to collect old decorative woodwork for pleasure or profit. The first is to employ an expert whose daily experiences render him difficult to trap. The other and more fascinating course is that of collecting personally. It is, however, better, until experience in the little ways of the sale room has been gained, to enlist a dealer of repute and pay him 5 p.c. for purchasing. It is a good plan to examine thoroughly old pieces on sade in the auction inarts-to watch their sales before attempting to buy personally.

Obviously there are several degrees of faking or imitating The piece in its entirety may be an absolutely modern copy of an old specimen; it may be a copy made so many years ago that it has acquired a certain amount of patina and wear and tear; or it may be, in part, genuinely of the period.

The steady appreciation in value of old decorative furniture offers irresistible temptations to the maker of pseudo antique wood work. It is an important weapon in his armoury to increase the value of plain but genuine old piecca by ornamenting their surfaces with the detail of the period. Formerly the process revealcd itself by incongruity or over-elaboration of detail, but the carver of today often produces work instinct with the spirit of the past. Jacohean, Queen Anne and Chippendale furniture all lend themselves to carring. Genuinely old pieces have their carving skilfully restored by lowering the ground.

The modern cheap copyist of Chippendale usually stints himself in the thickness of his wood, and is therefore unable to obtain the relicf and depth of the original in his carving. No such complaint of undue reticence in his use of fret-cut veneers glued together can, however, be made. He regards these as the hallinark of Chippendale, and applies them to plain friezes, chair legs, and other vacant spaces (leaving their cdges unfinished) with a prodigality undreamed of hy the master whose fret-cut work was finished by the carver

## Detecting the Conyist

Inlaying and veneering arc necessarily confined to "Queen Anne" pieces or to the periods identificd with the brothers Adam, Hepplewhite and Sheraton. However skilful the modern inlayer and polisher may be, the soft mellow tone effected by time cannot be attained, whilst the veneer used is scldom so rich yet subdued in tone-or so fine in figureas the old mahogany or walnut.

Over-elaboration is the pitfall of the imitator of these periods; he endeavours to atone for his inability to obtain the finely Ggured vencers of the originals by lavish use of vases, paterac, shells, lines, or other details of the typical style.
The black-stained, cheap, antique oak, ornately carved, deccives few nowadays. The colour of genuine old Stuart furniture is almost invariably warm, and differs radically from the dead toncs of the black imitations Its fine patina is better imitated by brown fuming.

Antiques are specially liable to the insidious attacks of the wood worm (q.v.).

ANTIRRHINUM. Snapdragon or antirrhinum is a true old English plant. It was originally a wall plant. Madern cultivation has raised its height from six or nine inches to two feet or so, diversified and multiplied its colourings and incrensed the size of the individual flowers.

While, strictly speaking, a perennial, the snapdragon is often at dits best if treated as an annual or biennial : the planta can be raised (1) from sced, sown in August wherc they are to flower, under the proteotion of a south wall, and thinned out in the following spring ; (2) sown in open secd-beds in exposed positions in June, and planted out during the early months of the next year; or (3) nown in a heated greenhouse in February, the seedlings being planted and out of doors in May. The snapdragon can also be propagated by cuttings.

Among the tall sorts, growing from 3 to 4 feet in height according to the nature of the soil in which they are planted, the following are noteworthy

White King (pure whito), Yellow KIng (atrong. arowing deep yclow). Crimson King (deep velvety crimson), Coftare Maid (plak nnd white), Monlight (apricot yellow fuahed with red), Vermillin Brilliant (orange scarlet). Pink Beauty' (rose plnk), Yenas (delicite pink), Nigrescens (dnrk crimeon).

The following are twelve fine intermediate 1 arieties ( 18 to 24 in. high)
White Heauty (pure white), Yellow Queen (large vellow flowers), Ainher Queen (canary yellow,
ilanhed plnk), Bonfre (orange buff, Carmine Quren (rose carmine), Coccinca (orange acarlet), Cottare Mnid (pink nid white), Fascination (pink), Flery iselt (omnge red with white tubc), Nelrome (dect rose pink), Noblle (white and crimson) The Fawl (terrn-cotion and pink).
Moat seedsinen have their own named varic ties. The tom thumbs (about 12 in . high) are generally grown under colours. Most of thesc choice varieties must be treated as annuals or biennials except in the favoured districts of the south and west of England, where they often establish themselves permanently.
Bedding antirrhinums are largely planted instead of the tom thumb varieties: they grow from 10 or 12 inches high and make a brilliant show, as most of thic flowering shouts are of uniform height.


Anturhinum. Intermediate variely of this oldfashioned E'ngisn garden flower
n. 1. Malbu

If sown in summer and planted in well. drained soil in sheltered places in September antirrhinums will stand most winters and flower a month earlier the following year than spring. sown plants. They are then biennials. When treated as annuala they are generally sown in February in boxes in a greenhouse where there is a gentle heat, or in a heated frame; germination is then rapid.

The most difficult stage in culture is before the seedlings obtain their second leaves. Thon they are liable to damp off or to be scorched out of existence by strong sunshine unless carefully looked after. When the plants are big enough to handle ensily they must be transplanted 2 to $2 \frac{1}{2} \mathrm{in}$. apart, into other boxes or frames where they will grow till planting-out time, being gradually hardened in view of this.

Planting or transplanting in the open leeds or borders should tako place in April or early May. If in lines, the intermediates ought to do well at 12 in . apart, the talls at 15 in ., while the tom thumbs reguire $? \mathrm{in}$. After the first t wo have grown to a height of $f$ or 9 in. each plant must be staked, ll-in. atakes for intermediates and $18-\mathrm{in}$, stakes for talls. Pron. An-ti-ri'-num.

ANTISEPTIC. The chief use of an antiseptic is to prevent the growth of organisms which cause putrefaction. Disinfectants (q.v.) have a different purpose. They are used to bill the microbes whinh ('ause communicable
diseases like diphtheria or enteric fever Some aubstances are both antiseptic and disinfectant, but a solution of sufficient strength to suffice for the former use would not serve for the Intter. A deodorant ( $q / v$ ) removes disagreeable odours due to decomposition, but it may do this without making things safer, e.g. in the case of can-de-Cologne, camphor, or tobacco smoke Some of the commonest antireptics are
Perchlorlde of mercury (eorrosive sublimate), Biniodlde of mereny. Solutions in water of strength 1 to 1,000 or 2,000 .
Carbolic Acid-1n water, 1 to 20,40 , or 60 . In milxing the water should be hot.
Tlincture of lodine. Cian be pulnted on or used as a
loilon, $n$ teasponiful to the pint of loilon, a teaspomifnl to the pint of warmi water. in water to produce a solution of a port wine thit. yolution of Potassium Pernanganate $\mathbf{B . P}$.-A table spoonful in a pint of water.
Mydrugen Peruxlde Solution.-Diluted with five parts of water, this makea a gord mouth minh, and ls used In pyorrhoes.
Compound Filyecrin of Thymol. B.P.C.-This makea it useful mouth wash.
Borncle Acld.-A raturated solution (obtsined by muling an execes of the powider In warm water and pouring off the clear solution). Thls can be uaed ns a lotion, gargle, or inouth wash. For an eve wash dilute the above with Ave parts of warm water. Cresol Snap Solution or Lysol.-A teaspmonful in a pint of wirm water.
Perchloride and biniodide of mercury are very poisonous, and if sold dry, to make the solutions, should be in the form of coloured tablets, which will tint the water and prevent their being drunk in mistake for water. Tablets of perchloricle of mercury are sold, which are blue, and biniodide of mercury red. Antiseptics are useful internally, e.g. for fermentation in the stomach, diarrhoen, enteric fever, dysentery, etc., but should only be employed in this way under the direct supervision or instructions of a doctor. See Sanitation.

ANTLER MOTH. This is a greyish-brown moth, with an expanse of wing varying from $1 \frac{1}{2}$ in. to $1 \frac{1}{2} \mathrm{in}$., the female exceeding the male in size The caterpillar feeds below the surface of the ground on the roots of grasses. In this why it frequently becomes a scourge, rendering acres of grassland, as well as smaller lawns, useless. Although it occurs throughout the British Islands, its devastating work is largely confined to the northern districts. The only remedy for its attacks is the enocuragement of ronks, lapwings, and other insectivorous birds that have a lill fitted for digging up the eaterpillars. The caterpillars' activities extend from March to lune, and the moths fly by night in Auguat and September.
ANTOFRET. Antofret is a form of woodwork decoration by which it is possible to create raised and sunk pancls and other features without emploving more than a single thickness of wood for the whole. The cutting of the wood is executed with a hand fretsaw or a treadle fret machine.
The basic principle is that all the pattern lines arc cut to a slight bevel. Fig. 1 shows a section of a piece of thin wond; the bevel cut of the freteaw is indicated by the thin lines at B. If the interior panel $\mathbf{C}$ is cut out all round at the bevel shown, it will be found to fit loosely in its surrounding wood by virtue of the loss of the thin line of sawdust which has been out from the path of the sall ; thercfore.


Similarly, if the bevel is in the opposite direction, as at Fig. 3, the central part C is depressed and produces $\Omega$ sunk panel, lrig. 4. This principle inay be applied to any sliape either of a raised sunk panel or af n formal Horal decoration

In practice the work itself is placed on the slant and the fretsaw is kept in a vertical position throughout the cutting. For this reason Antofret is best done on a machine with an adjustahle culting-table which can be tilted to any angle as well as used for horizontal work. Fig. 5 shows one of these adjustable tables in use. $A$ is the talile, $B$ the wood, and $C$ the saw blade fixed in a hand frame in the position of cutting. The card tray in Fig. 6 gives a good idea of the solid effect which can be obtained from one piece of wond. The rim is made by pressing up the various steps of wood, and the sharp corners shaped down by filing and sandpapering. In the diagram of a section through the tray, the various steps are marked oft, $A, \mathrm{~B}, \mathrm{C}$, etc. An emblellished diamond in the centre, also shown, is an additional improvement.

After the Antofret panels have all been cut each must be secured with glue. The parts should be pressed out to their final position and the glue applied on the reverse side to the face in the right angle made by the raised rings, etc.

Antofret is frequently used in comlination with ordinary fretwork. There exists a large number of specially printed designs which may be obtnined from Hobbies, Ltd., Derchan. Norfolk. Sce Fretwork; Woodearving.

## ANTO-TURNING.

This is a simple method of producing square turned columns, finials, or other similar woodwork decorations. A column such as that shown at Fig. 2, or any other pattern desined, can be produced with an ordinary fretsaw. The wood required for this work may be of ally suitable size, but it must be of square section and all surfaces should be planed up smooth.

First draw the design carefully upon a piece of good quality paper and then transfer the design to tiro surfaces of the wood as shown at Fig. 1. The tracing can be donc by means of carbon paper and a stylus or a liard pencil. It is important to see that the fenturess of the pattern come level with each other upon the two surfaces.

When the pattern has been placed on the wood, the latter is laid upon the fret-cutting table and the finc fretsaw blade enters the
word at the linc $A$ shown on the end of the wood. Thence it cuts alony the pattern line until it reaches the dotted line 1): the fret saw should nut be permitted to enierge from the wool at the other end. but should be unthreaded and witlidrawn ly re. leasing its clamp. After refixing, cut the line (: on the oppositeside, again cutting down the entire pattern line until it reaches the dotted line D, when again the blade is released and with. drawn from the cut.
The wood is then turned over so that the pattern on the side shown at $E$ will be uppermost and the previous process is repeated. When the four cuts have thus been made down to the dotted line D , the surrounding waste wood is severed from the finished column by cutting through the line $\mathbf{D}$ squarely with a tenon saw. In the case of terminals, the point or terminal end should come at the commencement of the cut. Anto-turncry is useful for the decoration of mantels, timepieces, cabinets, brackets, etc.

ANTWERP PIGEON. breeds. which are subdivided


Antwerp Pigeon, a broed which
thed and stroas lier
APARTMENTSS. Considerations of letting and obligations of landlady and tenant in both apartments and lodgings are similar in nature. Information on these points will be found under Lodging sce also Boarding Housc.

APERISNT. Under this name, and also under that of laxative, are grouped the milder purgatives, such as cascara, castor oil, sulphur, etc. Their effeot is to produce one or more soft motions. Doses of common 1reparations of aperients in general use are :

Jry extract of cascara sagradn, 2 to y grains in tablets.
Wquid extract of cascara ragrada, ito 1 drum
Castor oll, 1 to 8 teaspoonfuls.
('astor oil mixture, 2 to 4 tablespoonfuls.
Flowers of sulpliur, 20 to 60 grains.
Confection of sulphur, 1 to 2 teaspoonfuls.
Milk of sulphur, 20 to 60 grains.
8ulphur lozenge, 1 to 2 at bed-time.
Compound Ilquorice powder, 1 to iz teaspoonfule.
Syrup of flgs, one teaspoonitul for chlldren.
Lquid paraffin, 1 teaspoonful to 1 tablespoonful
30 er of 30 to 00 araln 1
30 grains, repeated doses; 30 to 00 grains as single dose.
Inquor of magnesium cltrate, is to 10 ounces.
Tame ol, 1 to 2 tablespoonfuls.
SeeConstipation; FpsonıSalts; Magnesia; etc

APEIS. This is the scientific name for the family of insect pests which inclucles the blue
fly ( $q$ v.) and the green Hy ( $q . v$.). The plural is aphides. See Ancrican Blight; Apple : Plum. ptc.

## Apiary. See Beehive

APOPLSEY. This is luss of consciourness due to sudden interruption of the normal hlood circulation through the brain. The commonest cause is the bursting of a brain vessel, the walla of which have beconio degenerated and brittle. Conditions conducing to this disease of the blood vessels are continuous hard drinking syphilis, kidney diseasc, prolonged severe physical exertion, and lead poisoning. The condition is not often seen before middle life and is more common among men than women.

How so to regulate one's life as to minimise the danger of apoplexy is one of the problems of this strenuous age. The disease is without doubt commonest in people who constantly work at high pressure, who regularly eat more than is good for them (particularly meats and rich, highly-seasoned foods), who take alcohol regularly in any quantity, and who are careless about their health generally. There arc certain warnings, such as dizziness on getting up from the lying down position, constant headache, numbness, or a slight lıns of strength of an arm or leg.
When an attack of apoplexy occurs, the patient suddenly loses consciousneso and collapses into complets helplessness. His face may be pale, but is usually Hushed, and the licad and eyes may be turned to one side, commonly the damager side of the brain. The breath ing is laboured and noisy.
Whenever there is the least doubt, a case of complete collapse should lin treated as if it were apuplexy till its true nature be determined. Unconscious. ness usually passes off in a few hours, perhaps three or our.
Treatment during an ttack begins with laying the patient on his back. Loosen everything about the

and if there is a slight swelling of the lining at the entrance, or if the appendix is kinked, secretions may be imprisoned and decompose Foreign bodies such as grape seeds and fruit pips are not found so frequently as was at one time supposed, but what is found quite frequently is a little piece of hardencd facces, probably resulting from chronic constipation, and this mass may ceven have ulcerated ita way into or through the wall of the appendix.
The symptoms of the disease in the first instance are pain around the navel (sec diagram), nausea and sickness, a rise in temperature, perhaps between $101^{\circ}$ and $102^{\circ}$, a quickened pulse, and constipation. After some hours there is tenderness at a point to the right of and below the navel, and the muscles of the abdominal wall become firm and resist any attempt to press in with the fingers. To ease the pain the patient often liss with the right leg bent up

The patient must be in the care of the surgeon at the earliest possible moment. Many cases have gol beller withoul operalion, l, ul " deplorable number of people lose their lices because operation has been delayed till too latc.
For relief of pain till the ductor comes a hotwater bottle may be laid by the side of the patient, or an ice-bag may be applied to the part, and as this should not press on the belly, it is suspended from a bed-cradle, placed undet the bed-clothes, so that the hag touches but no more.

APPETISER. Besides grape-fruit, hors d'oeuvres served at the beginning of a dinner are appetisers. They usually contain vinegar, something extremely savoury, like anchovy or sardine, and an active condiment, such as Chili pepper. Cocktails are used as appetisers, and often contain orange bitters to give them pungency. See Appetite; Bitters; Cocktail.

APPETIME. When the system requires nourishment there arises auto matically the natural craving for food which we call appetite. It is this and throat, raise the head a little.

Be sure to prevent anyone from moving him until the doctor comes. Many a life has been loat from a poplexy through over-zealous helpers carrying the rictim upstairs, lifting him into bed, undressing him, etc.
Beyond placing an ice-bag on tho head, there is absolutely nothing to be done until the physician's arrival.
APOTYECARIES' WEIGRT. This weight is chiefly used in the sale of drugs. It is as follows.

| 20 Grains |  | ( Scruple (b) |
| :---: | :---: | :---: |
| 3 Scruplex | 1 | Dram or draclın (ì) |
| 8 Drania | 1 | Ounce (3) |
| 12 Ounces |  | Pound (llo.) |

The pound in this weight is somewhat lighter than the lb . avoirdupois, containing 5,760 grains against 7,000 . The apothecaries' ounce, on the other hand, contains $\mathbf{4 8 0}$ grains against $437 \cdot 5$.

APPENDICITIS. This is an inflammatory diseaso of the vermiform appendix, a small blind tube of gut 3 or 4 in . long leading off from the junction of the large and small intestines. It may occur at any age, but is commoner in young. people, and especially males.

The appendix contains a large anount of adenoid tissue like the tonsil, and is sometimes
the laste of food which start the flow of the gastric juices. The appetite may be affected psychically and an ill-cooked and badly-served meal may do much to reduce it, as may any depressing emotion. To a certain extent appetite is a measure of the quantity and a guide to the nature of the food one should take; what we fancy is likely to be good for us. But there are exceptions to this, as a poor appetite may not represent the needs of the body, but may be due to faulty hygiene, such as sedentary habits, too little exercise. or the abuse of tohacco, tea, alcohol or other Iruge.

Where a poor appetite is part of a disease its treatment is inclucled in that of the particular disease. In cases where the habits are at fault the obvious thing to do is to correct such a habit. However, something may be done to improve the appetite by the use of " bitters," such as calumba, gentian, quassia, cascarilla, or a little orange peel. The following is an excellent example of an appetiser :


Take half a small wineglassful ten ininutes beforc dinner. See Diet; Digestion: Invalid Cookery.

## APPLES: HOW TO GROW AND USE THEM

Eractical Hints Concerning All Varieties of the Tree and its Fruit
Numerous separate entries give recipes for dishes in which apples are used. For insect pests and diseases that attack the apple see Apple Mlldew; Apple Sawily, cte.

There nre nearly 2,000 varieties of cessert and cooking apples, yet new ones are still sought for and produced 1 list of tho best sorts for doinestic use is given below

## Deseert Appli:

BEAUTI OF BATH. Bright red, nedlum size, witl/ white sponta, irulting early. It is crisp and sweet.
Blenheim Obanae. Good alike for deasert and baking, lut not boiling.
Cox's Oranar. Pmbably the best deasert apple
Jamps Gulive. Gond late autumn varicty witli large handsotne frult of eond Havour.
LaxTON's SUPRRH. The best of the new descert applen, of firat rate flavour, crops well, nt its best imm Chrlstmias to March
May Qoesn. A valuable inte apple, in seanon from January to A pril, very fortile and well tlavoured. Orleans IRfinktis. One of the very best winter dessert apples, of med'umsize, well coloured and firat rato lla vour.
Worchater Pealinais. Liarly autuind apple. Fine colour, inedlum size, and cond flavour. An excellent cropper.

## listolltw Applis

Brambey's Sepdiino. Iate apple, and an caellent keeper. Umeful where the soll is very heavs of damp, it has a red cheek and a tait finrou
Cfllini. Valuable early apple for small gardens. cspecially in or near towns. For those who like a pice of acid In the flavour, it is a good dessert apple. Grenadisk. One of the best enrly cooking apples, ycllow in colour and finc in flavour. Being ery prollfic, it is of great use in sinall gardens
Early Victoria. A remarkably prolific codlin sultable for uac in July-August.
LANR's Phinor Alifert. Large, striped frult
which "linnger and kerpe for half the vear. Jitie which "linnger and kerpm" for half the vear. Iike


Apple. Left, well-trained Dutch Mignon, Illostrating toe requlaity of the branches, leaving the centre

Apple: methoas of traning the tree. Left, King of the Pipping apple in full fruit. This is a cordon
tree which has been trained bortzontally and supported on props. Right, bush apple tree
icees actually break into leaf. Wide but not very deep holes should be made.

Nost of the manure should be put abovn the roots. The soil should be trodden firmly around and among the roots Stakes for standard trees should be driven down before the trees are planted. It is a good plan to inulch trees with manure after planting


Apple. Espalier trained tree. the best method with apples of prolifio habit, prodacing the maximom amonnt of trait in the minimam space

Some apples are self-sterile and if planted alone will not bear satisfactory orops. A mixed plantation of varieties alone is profitable: it is advisable to plant cooking and deseert apple near each other so that the flowers may le cross-fertilised.
Apples are best turned into good fmiting trees by shortening the heads for three successise years in decrensing degrees of severity, and subsequently summer pruning the side shoots If the tree grows very strongly root pruning may be desirable in winter. Whether for bush or standard the maiden is shortened to about half a vard The two-year-old tree is pruned back to about one-third, the threeyear old to about half.
Most varieties reach the maximum of health, streagth and fruitfulness with ten or a dozen strong branches a foot or half a yard apart near the base, all growing upwards and outwards, so that there is no intercrossing and with the head of the trce oup-shaped.
Grafting and Budding. Excellent methods of propagating apples are described by the Ministry of Agriculture in Leaflet 162, from which much of the following is taken.

Apples are grown in many forms, the most popular being standards-that is, trees with clenn ( $\mathbf{6}-\mathrm{ft}$. stems; half-standards. or trees with clean 3 or 4 -ft. stems; bushes, that is open-headed trees on short stems; cordons, ot trees restricted to one stem, whether perpencicular or horizontai : and espaliers, or trees trained on walls, fenoes, or wites. These and many other forms are developed from a young tree obtained from a bud or graft, and salled in its first year of growth a maiden.
The best stocks are the broad-leaved Paradise for divarf bushes, and the Cml) for the more vigorous and standard treve
Scions for budding or grafting should le cut from prolific and healthy trees. For budding, firm wood of the current year's growth should be cut just prior to use, and kept fresh by standing in a pail containing a little water. For g'afting, well-ripened yearling wood should be cut in the winter prior to pruning, and ufter Inbelling with the variety, bedded in a shady position. In this way the buds will remain dormant until after the stocks have commenced growth.
Bud the stocks in July or Aug., and graft any which have failed to take in the following spring. All stocks, and particularly those which are dwarfing, slould be grafted or
budded an close to the ground level as possible. There is then no difficulty in planting the young trees so that the union between the graft and stock if below ground level

The requisites for bud ding are a budding knile with bone handle: a pail in which to keep the scions raffia for binding For graft ing they are pruning knife hone or wood carving chisel to open the alits, raffia for binding, and wax or graft ing olay For top-graft ing a à $w$ is also required. Grifting wax can be bought ready prepared

The season for grafting is during April and May, when the atocks have just commenced growth, but while the scions are atill dormant Nuccess in gralting can only be accomplished by making clean level cuts so that the exposed surfaces of the graft and stock correspond in size and fit together tightly at least on one side


Apple : method ot prunung. Left, pyramid apple tree beiore praning Right. the same tree alter it bas been properly pruned

For the second method (b), when the stock is larger than the grait (Fig. 2), the graft is prepared in the same way as in (a), except that the tongue is made at the top instead of across the middle of the oblique cut surface.


Apple. Left a badly balanced young bush apple tiee wnich uas been wrongly pruned n earlier stages of growth. Right. the game tree alter correot pruning

The stock after trim ining, is cut almost square across: to 3 in. a bove ground level By an upward atroke of the knife expuse a olean surface on the longest side ol the stuck slightly wider than that cut on the graft At the top ol this surface make a tongue to receive the graft Apply
Tongue Grafting. Chere are two methods: the graft to the atock so that the tongues (a) When the stuck and acion are of the same size (Fig 1) First remove all the side shonts from the base of the stock. Then cut it off 2 in. or 3 in lrom ground level by an upward oblique stroke $1 \frac{1}{2}$ to 2 in long (Fig. 1 A) Across the middle of this cut surlace, and by means of a downward atroke of the knife, a thin tongue should be carefully raised pointing upwards (Fig. $1 \mathrm{~A}^{\prime}$ ).
Next cut a graft containing three or four well-developed wood buds from a piece of the wood selected for the scions. The uppermost out should be made slightly obliquely across the word just above the top bud The lower cut ahould be alout g in. below the lowest bud of the graft, which is known as the stock bud (Fiy 1 B) With a downward stroke of the knife make an oblique out $1 \frac{1}{2}$ in to 2 in. long actoss the graft on the oppositc side to the stuck bud, su that the exposed surface corresponds in size to that of the stock (Fig. 1 B.) Finally, by an upivard cut across the middle of the cut surface raise a thin tongue pointing downivards (Fig $1 \mathbf{C}^{\prime}$ ).

The graft is then applied to the atock and the two tongues fitted together tightly, so that the rinds of each coincide as far as possible (Fig. 1 D) The manner in which the tongues should lit into each other is well shown in Fig 2. Now bind the graft and stock tightly together with raffia, leaving the stock bud free (Fig. 1 E with arrow), and cover all the out surfaces with grafting wax (Fig. 1 F) or clay (pug) to prevent drying.
fit tugether closely and the rinds coincide (Fig. 2). Complete the operation as before by
binding tightly with raffia and covering all the cut aurfaces with wax or clay.
As soon as the gralts begin to grow it is a good plan to tie the main shoots to aticks to prevent the wind breaking them and to secure straight main stems. The raffia ties must be cut as soon as growth commences. otherwise the ties will cut into the wood When the main shoots are 18 in to 2 ft . long all the lateral growths from the grafta should be stopped. The suckers sent up from the stock should also be removed two or three times during the summer.

Shield Grafting or Budding. The seasun lor budding is from the end of June to the beginning of Sept. Stout well-ripened buds from the current year's growth should be used and all fruit buds or young unripened buds should be discarded. The method usually adopted is known ns "shield" or " $T$ " budding.

The bud is removed from the selected wood growth together with a semicircular shield of wood and rind, about if. in length (Fig. 4A) To remove this shield, the cut should commence about $\frac{1}{2}$ in below the bud and tinish about $f$ in above it. The blade of the leal is then re moved, leaving the leafsalk $A^{\prime}$, intact for preas ing the bud under the rind of the atock and preserving it from damage. Next, the portion of wood cut away with the shield is removed from the rind with the point of the knife (Fig. 4 C ), but leaving the hud on the shield unilamaged. Care must be taken to leave in tact the small protuberance at the base ol the bud, inside the rind (Fig \& $3^{\prime}$ )

To prepare the stock, remove all suckers and side growths within 6 in of the tround Next make a " $T$ " shinped cut in the rind as close to the ground level as possible ( Fig 5) The down stroke of the " $T$ " should be about 1 in. long and the cross-cut about $\frac{1}{\frac{1}{2}}$ in The liark on both sides of the downward cut is then raised slightly with the back of the budding knife. The bud shield is slipped beneath the lips of the downward out on the stock (Fig. 6) until the tap of the shield is below the crosscut of the "T" (Fig. 7) Tie with raffia over all the cuts, but take oare that the bud is left uncovered (Fig 8).

Later in the autumn, as soon ay the buds have taken, the ties of raffia should be cut th allow the stock to swell normally Fig. 9 shows the budded stock after the raffia has been iemoved. Suckers or ahonts arising fimm the


Apple: tongue gralting. Fig. 1. Metaod waea stock and scion are of equal size. A, stock cut to receive gratt: $A^{\prime}$. Dosition of tongoe: $K$ and C, grafts ready for applying to stocks: $\mathrm{B}^{1}$, stock bad : and lonk oblique cat suriace: Cp, Dosition of tongue: D, Rrait and stock fitted torether: E, gral lll the larger than graft (C). Fig. 3. Union of equal-sized stock and gratt after one year's rrowto
$B_{1 \prime}$ permisition of the Ministry of Agriculture and Fisheries
stock must be removed two or three times during the suinmer

Top Grafting. Rind or Crown Grafting is the method recoummended for top grafting. The trees whioh aro selected for this purpose should have their main branches sawn


Apple. Fir. 4. Pieparation of the bad sbield by removing core of hard wood. See tex! off during the winter and the faggot wood removed. Fig. 10 shows the tree out back in this wny. At grafting timethat is, whon the rind peels quitcessily from the woodthe branches are sawn square across (Fig. 11) where they are stout ennugh to support the large branches which will grow from rigorous grafts. The snwn surface at the end of each branch is then pared anooth with the pruning knife to facilitate healing (Fig. 12 A). Afterwards a longitudinal cut 2 in to 3 in . in length is made in the bark. and the rind at the top of this out is then raised slightly on either side (Fig. $12 \mathrm{~A}^{\mathrm{A}}$ ).
A graft (Fig. 12 B), containing 3 or 4 buds, similar to that used for tongue grafting but with no tongue, is cut and slipped beneath the raised lips of the rind on the stock It is then pressed downwards until the long out surface is level with the top of the branoh

Large quantities of apples may he laid in in the ove heaps, not more than 2 ft . decp, on 6 in . of are tender clean, dry whent atraw laid on the lloor, To stew apples, wipe eight large apples and and covered with a gond thicliness of straw ; but this is not the best method for small quantities. Apples may also be stored in boxes barrels, or baakets placed one upon the other in the store, so as to allow air to circulate. Special trays may be used which rest one upon another and economise space (see Fruit Tray).

The ripening of apples is usually well marked, the green part becoming distinctly yellow. As a rule. the later an apple ripens the longer it will kcep in good condition. Early apples should keep about a fortnight after ripening, Worcester Pearinnin a month, James Grieve six weeks, Cox's Orange and King Pippins two months.


Apple. Fir. 12. Rind or crown rialting. A, branch of stock prepared to receive rrait: $A^{A}$ pared surlace at top of branch ; A. longitudinal bnd. D, completion: grafts bound to the stock and cut suriaces' waxed Bu perniston of the Mtnistry of Ayriculture and Fuheriet

How to Cook. From the health point of quarter them. Stew gently with 1 teacupful view, for most children and adults apples are of sugar, strips of lemon-peel, and pher pint excellent, but in some cases only agrce with water, and serve with custard sauce or cream the digestion when cooked. For very young ohildren raw apples should be grated into a dish just before a nesal and made into sand. wiches with bread and hutter, or eaten with a spuon.

Apples are particularly good for cassernle


Apple : processes in budding. Fig. 5. T-shaped cot on the stock ready for the bud. Fir. 6. Bud abield slipped beneath lips of the downoward cut. Fig. 2. Bod shield pressed completely beneath rind of stock. Fir. 8. Budshield bound to the stock with raffia. Fir. 8. Bad onited to the stock alter removal of raffa $D_{1 /}$ permilaision of the Ninistriy of Auriculture und Fisheries
(Fig. 12 C ). The graft is then bound tightly to the stock with raffia, but the stock bud ( $C^{\prime}$ ) is left uncovered. The top tie shnuld be as tight es prosaible to effect a perfect union at this point and so prevent the graft from breaking when it commences to bear fruit. The operation is completed by covering the cut surfaces around the graft with wax or "pug" (Fig. 12 D) Onc graft is sufficient for branches under 2 in . in dinmeter Above this size two or even three grafts should be used Fig. 11 shows the tree depicted in Fig. 10 with the top grafting completed.

Picking and Storing. The right time to piok apples is when the fruit parts readily from the spur on being lifted gently, but certain varietics part more easily than others. Early varieties are often intentionally picked a little earlier than late varieties, which should hang until some of the fruit has dropped naturally. If picked ton soon fruit will shrivel. Fruit should be picked carefully and placed gently in the picking apron, or into a basket lined with soft material. The fruit should be handled as little as porsible.
For fruit to keep well the store must be (1) Slightly moist (2) Well ventilated: extra ventilation is required for apples during the first three weeks or so, while they are sweating. (3) Cool and of even temperature ; warmth causes shrivelling, and frost generally causes decay. (4) Dark or only dimly lit; daylight spoils the quality.
cookery : in this way the whole fruit is pre served, and can be served more cfiectively than when stewed to a pulp. Baked apples make a wholesome dish when peeled, the cores removed, and the centres filled with sugar and one clove in each. Having put them in a casserole, add a little water with some grated lemon-rind Cover the dish and hake


Apple. Fig. 10. Tree to be top arafted, having been cut back in the winter and with the lagrot-wood removed. Fig. 11. The same tree after top grafting, showing length at which top branches of stock are left By permission of the Ministry of Agricullure and Fisheries
leaves. The wind-borne spores alight on the later a pupa), which has eaten awny the hase fruit, germinnte, and penctrate the skin, of the flower- The blossoms attacked invaribeneath which they form a mass of fungus tissue. In time the skin of the fruit is broken, and dark-coloured spores escape.

Affecter wood is readily distinguished by its blistered appearance. It should be cut out when pruning the trees in winter. Badly diseased wood should be cut out as far as possihle without injuring the trecs, and this should be completed by the middle of March 'To prevent the new wood being affected, it is necessary to spray during spring and summer.
There are two mixtures which may le used, Bordeaux Mixture (q.v.) and Lime-sulphur (q.v.). Bordeaux Mixture is the most effective, though in the case of a few varieties of apples it is apt to cause scorching. These varicties include Beauty of Rath, Cox's Orange Pippin, I)uchess's Favourite, Gladatone, Janics Grieve, I ady Sudelcy. On all of these a lime-sulphur apray only should be used.
In bad cases of apple scab several applications arc necessary, the first immediately hefore flowering, the second is soon as the petals fall, and a third ahout three weeks later. On pears the lirst spraying should be given directly the fruit is set, and a second spraying three wecks or a month aftenvards.
APPLE APHIS. Blue bug blight, otherwise apple nphis. is a pest of apple trees. A description of the symptoms and treatment is given in the Ministry of Agriculture Leaflet 330. The damage is mainly to the foliage and young wood, though the fruit may be stunted.

The blue bug or rosy apple aphis causes the leaves to curl up, and beneath this shelter the lice reproduce, poisoning the foliage by their secretions. They swarm on the leafstalks, shoots, and fruitlets. and by their punctures deform them. The leaves may fall and only a fow stunted and galled apples remain. The green apple aphis feeds upon the young top growths. The oak apple aphis does little harm ad a rule, except when it invades the blossom trusses.
Apple aphides can he controlled by spraying. Limowash should be sprayed early in the season when the eggs are about to hatch. The nurmal time to apply this wash is when the leaf-huds are swelling and ahout to hurst. The whole tree must be corered, and especially the twigs and smaller branches. A contact insecticide, such as nicotine ( $q$.v.) and soap. or pyridene (q.v.) and soap, may he used during the period between the opening of the leaf-buds and the bursting of the hloom. A contact insecticide such as prarafin emulsion is used from the middle to the end of Octoher, when the leaves are falling. The aphides are then laying the winter egga, and can ho killed by a thorough application of aphis wash.
APPLE BATTER PUDDING. Put $\frac{2}{2} / \mathrm{h}$. flour into a hasin, making a well in the centre, and adding two unbeaten eggs, together with a pinch of salt. Work in ! pint of milk until the batter is smooth, then heat it well. and add a further $\frac{1}{\underline{p}}$ pint of milk. l'artly stew 2 lb. of sliced apples with lemon and sugar, put these into a greased pie-dish and cover them with the batter, baking the puilding in a moderate oven for one hour. This is suftcient for $\mathbf{f}$ or 8 persons. See Bntter.

APPLE BLOSSOM WEEVIL. A smnll black beetle harely a third of an inch long, known as the apple blossom reevil, feeds on the leaves of the apple tree in summer. During the spring the female weevil piences the buds of the fruit spurs and lays one egg in each bud. The Ministry of Agriculture Leaflet $1 \bar{J}$ describes its effect on the apple tree.
Certain of the hlossoms fail to expand, the petals having died and become brown in colour without falling off. Such blussoms are known as " anpped hlossom," and underneath the brown petals is a small yellowish grub (or

## ably die and fall off

Weevils hibernate on the trecs, and a winter wash or later a limewash, will leatroy many


Apple Blossom Weevis in various stares of lifie. 1. Larva. 2. bud containing weevil. In 1. 2 and 3 the insect is much enlarged before they lay their eggs. A large sheet is spread under the tree, and the beetles which fall down are tipped into a pail containing a little paraflin.

APPLE BLOSSOM WILT. This diкевя attacks the hossoms and shoots of an apple tree and spreads rapidly throughout an orchard unless suitable precautions are taken The Ministry of Agriculture Iesflet 312 describes its symptoms and treatment.

The first symptom is "blossom-wilt." After the Howers begin to open, the leaves on some of the spurs legin to wilt and hecome brown and withered. The llowers of such trusses will be found to have wilted and to be biown and dead. In moist weather the fungus develops externally on the llowers and flowerstalks in the form of small, rounded, grev. pustules similar to those found on the spurs On the wood the fungus may attack and kill the spurs, grow along the spur into the shoot and form a spur canker, and occasionally. extend considerably in the hranch.

Promising results have been obtained by a winter wash containing $l$ lh. caustic soda and I lb. soft soap in 10 gallons of water, applied immediately previous to the swelling of the buds. Tar-oil winter washes have a clcansing effect on the bark simnilar to caustic soda and are more potent against pests.

The most successful line of treatment is the cutting out and hurning of all infected spurs and cankers. Wherever possible, the cutting out should be done during the summer, when the brown withered leaves of infected spurs contrast with the living ones, and constitute a sure guide to places where the knife is required. Cutting out cant take place any time in winter, but it should he finished before the buds open. Another point to note is that it is necessary to cut back to the sound wood.

APPLE CANKER. A minute fungus is the cause of this destructive disease of apple trees. The Ministry of Agriculture Leatlet 51 details its appearance and treatinent.

In a diseased tree, the early stagen will he seen as small depressed areas, which gradually break away from the surrounding parts of the shoot and are some what darker in hue. Such areas, which often begin around a dead twig, are caused by the fungus. The damnged area increases in si\%e and gradurlly assumes the form of an open wound surrounded in later atages by rugged hark. A marlied feature is the presence of inore or less regular concentric rings around the wound.

The fruiting bodies of the fungus are minute and occur eapecially in autumn and
spring. Those formed in spring and early summer consist of round tough hodies, deep crimson in colour and ahout the size of a poppy seed. In late summer and autumn the fungis develops another form of fruit, which shows as minute white spots on the rough bark around the wound.

Old and badly-diseased trees should he cut down and bumed. From others the cankered whoots and badly-cankered boughs should be cut out. During winter-pruning all infected shoots should be removed. In the case of large houghs the canker-patch may be cut out with a sharp knife or chisel. All cut surfaces should be covered hy a protective substance, such as coal-tar, Stockholm tar, paint, painters' knotting. styptic. or grafting wax. Earth should not be rubbed over the surface.

APPLE CAPSID. The most harmful species of this encmy of apples and currants is the green apple cajpid, almost always found on willows and sallows, and widely distrib. uted throughont England and Wales. Capsid bugs feed on the sap, sucking it up through proboscis: to reach the sap they drill small holes, which form the centres of more or less cxtensive in-


Apple Capsid. Burs whica teed the sap
Marnified three times juries. Apples attacked are usually deformed the skin shows rough russeted patches with scattered pits and pimples. Many fruits fall off before they reach maturity, while a large percentage of the remainder are badly scarred.
In Leaflet 319 the Ministry of Agriculture describes the insect and also recommends certain measures for getting rid of it. The hest time to spray is during the week or ten days preceding the bursting of the hlossom. A wntch should be liepit for the first signs of


Apple Capsid. Four stares in the destruction of an pple by the most barmful of the apple pest Hy vermission of the Ministry of Auriculture.
spotting of the leaves; then after an interval of ten lays, to allow the majority of the bugs to hatch, the spray should be applied very thoroughly. The hest insecticide is nicotine, combined with soap or paraffin emulsion. The following formula has proved satisfactory
Nicotine (98-99 p.c.)
Soft soap
Water
3 oz.
.. ... .. 40 gal!

AP-diE CHARLOTTE. Line a greased ne-dish or pudding basin with slices of bread and butter, leaving no crevices. Fill the dish with stewed and sweetened apples and add a clove, if this flavour is liked. Coven the top of the dish closely with slices of hread
and butter and bake in a moderate oven until the bread is crisp and brown. If the pudding is made in a basin it should be tumed on to $n$ dish to serve. If made in a pie-dish, a meringue of stiffly beaten white of egg poured over the top for the last five minutes of cooking is an improvement.

APPLE CHEESE. All that is required for apple cheese is 2 lb . apples, 1 lb . loai sugar, and the rind and juice of 1 lemon. Peel, core and cut the apples into pieces. Cook them gently with the sugar, grated lemon-rind and femon-juice until soft. Turn them into a basin and beat them with a fork until they are thick and smooth. Dip a mould into cold water and pour in the apple. Turn it out when cold, and serve it with cream or custard.

APPLE CHUTNEY. A good recipe is composed of 4 lb . sour apples, $\frac{1}{2} \mathrm{lb}$. Vemerara nugar, $\frac{1}{2} \mathrm{lb}$ onions, $\frac{1}{2} \mathrm{oz}$. dry chillies, $\frac{1}{2} \mathrm{lb}$. soedless raisins, 1 oz. salt, 2 oz .ground ginger, 1 oz. mustard seed, 1 quait vinegar, $\frac{1}{2}$ oz garlic (if liked). Peel, core and slice the apples, and simmer with the sugar and vinegar in a pan. Peel and mince onions, garlic and chillies Wash mustard seed and dry in oven Chop raisins Pound them in a mortar with the onions, etc., and the ginger. When the apples are soft ald the other ingredients and mix well together. Botille and cover as for pickles. The chutney improves by storing for two or three months previous to being used.

APPLE CORER. A
simple corer is made from a length of steel tule with half the upper portion cut away, and fitted in a handle. The tubing is ground and sharpened on the inside, and when the cutting edge becones blunt it can be sharpened with a small round oilstone, or, failing that, a strip of fine emery cloth may he wrapped round a penoil and rubled along the edge, On no account should the steel be sharpened on the outside.

APPLE DAINTY. This is made with 6 medium cooking apples, 2 tablespoonfuls brown sugar, 2 tablespoonfuls desiccated coconut, 2 oz . sponge-cake crumbs and a piece of butter the size of a walnut. Peel, core, and cut the apples into slices. Put them into a saucepan with sugar and a tcacupful of water, and stew until soft. Turn them into a pie-dish, sprinkle over them a layer of desiccated coconut, then a layer of cake-crumbs, and another layer of coconut. Place small pieces of butter on the top, and put the dish iuto a hot oven until it is a nice golden brown. It should be served with custard or cream. This will be enough for five persons.

APPLE DUMPLING. 'The ingredients required are $\frac{1}{2} \mathrm{lb}$. of Hour, $\frac{1}{\frac{1}{2}}$ teasponnful of baking powder, $\ddagger \mathbf{l b}$. of margarine, (i apples, is teaspoonfuls of sugar, and 6 cloves

Peel the apples and take out the cores with an apple corer. To make the short crust, sift the flour and baking powder into a basin, and rub in the margarine until it is as fine as breadcrumbs. If self-raising flour is used the baking powder must be onitted. Add a pinch of salt and mix with a tcacupful of water. Use a knife for this purpose, and when a ball of dough or paste is formed take this up in the hand, and use it like a sponge until all the flour is worked into a stiff paste. Mix more water as required in lightly without kneading it. Turn on to a floured board and divide into six pieces.

Roll each piece into a round shape, and place an apple on each. P'ut a clove and a teaspoonful of sugar into the centre hole of each apple. Damp the edges of the pastry, and draw it up round the apple to the top; squeeze the erges together and make it look as round as prossible. Press it well, and turn it down on to the sealed end. Brush it over with white of egg or milk, and hake in a hot oven alout 311 minutes.

Try with a skewer near the bottom to see when the apple is done The pastry should be a light brown in colour. Sprinkle with sugar, and serve hot or cold. This is sufficient for six persons.
APPLE FRITTERS. These reguire $\frac{1}{2} \mathrm{ll}$. of Hour, 1 lb of apples, 2 eggs, $\{$ pint of milk, and deep fat for frying. Put the flour into a basin and make a well in the centre. Break the eggs into a basin, and drop each into the flour unbeaten. Add half the milk gradually. stirring all the time. and letting the flour fall in from the sides of the basin to prevent lumps. Do not add all the milk at once, or the batter will be too thin Work it until it is smooth, like a thick custard, and beat it well for 10 ininutes. Stir in the remainder of the milk and stand on one side for an hour for the batter to thicken. A coating batter should be thick enough to cover the back of a wooden spoen as it runs off. If it is too thin, arld moro flour; if too thick, gently stir in more milk.
Peel the apples and take out the cores with an apple corer. Cut them into rings about $t$ in. in thickness. Put into a deep-fat frying. pan enough dripping, lard, or salad oil to fill half the pan. Heat this until it begins to send up a faint blue sinoke, dip the apple rings into the batter, and then take out and drop them into the hot fat-about four pieces at a time. Fry them a golden brown, turning them in the fat; then drain them on kitcben paper.

Bring the fat to smoking heat again and continue until sufficient apple-rings have been fried. Sprinkle with oastor sugar and serve very hot. The fat can be used again and again for frying. This makes a dish for six persons. See Illus. below.
APPLE GINGER. Take $\ddagger \mathrm{lb}$. of whole ginger, 3 lb . of sugar, 4 ll . of apples, $1 \frac{1}{2}$ pints of water, and the juice of 3 lemons. Boil gently together the sugar, ginger (bruised and tied in muslin), water, and lemon-juice. Boil for 15 minutes and add the apples, pared, cored and cut into quarters. Simmer gently for three-quarters of an hour, taking care not to break tho apples; let them remain until they are clear. Better still. if a hay-box is in use, after boiling the apples in the syrup for five minutes. put them into the haybox for one hour and a half. The ginger must be kept in a covered jar in a dry |llace, and will keep good for some time.

APPLE JAM. Goor! flavoured cooking apples should be sclected, and there should be enough to weigh 6 lb . after being peeled and corcd. Peel thom thinly, out into quarters, and, after vemoving the cores, slice them and put into a pan with a pint and a half of water. Pcel 2 lemons thinly, and tie the rind in a piece of muslin with 6 cloves, and add to the apples. Cook until the apples are a soft pulp, remove the clove-bar, and pass the apple purée through a sieve.

Put this pulp back into the pan, add $4 \frac{1}{2} \mathrm{lb}$. of lump sugar, boil for 1 hour, slim and stir frequently. Be careful to put it into clenn, dry
jars when it is cool. A few drops of cochineal improve the colour of this jam, and should be added when the jam is boiling. Tie the jars down closely: and keep them in a very dre. place. See Jam.
APPLE JELLY. An important requisite is to have a proper jelly bag ready for use.

The apples arc cut up in the rough, but should not be peeled or cored, though any bad parts should be carefully removed. Rinso the fruit and put it in a stew pan, covering with cold water. Add some strips of lemon peel and bring to the hoil It should be boilcd quickly until tender.

Next pour the pulp into the jelly bag and let it drain slowly. On no account squeeze the bag, or the jelly will be cloudy, and no boiling afterwards will clear it. Measure the liquid thus obtained, return it to the preserving pan, and bring it to the boil. Add the sugar, allowing 1 lb . of lump sugar to each pint of juice. Remove tho scum as it rises, and boil fast for 30 minutes. Drop a little on to a cold plate; if when cold this is formed into jelly it is ready for puttine into jars. When the jelly is set, the jars should be covered with air-proof papers and stored in a dry place. See Jelly Bag

APPLE MILDEW. In Leaflet 204 the Ministry of Agriculturo deals with this fungus pest of apples, which appears as a white mealy powder both on flower and leaf As new out. breaks commence each year from infected buds these should, as far as possible, be removed. When pruning, all shoots which were mildewed during the past summer, and are recognizable in winter by the whitencss of the young wood, should be cut away.

As the buds expand in the spring the treas should again be gone over and all affected shoots cut off and removed for burning. Should there be risk of infection to sound trees, spray them with lime sulphur shortly after the blossoms set and again later if necessary ( 1 gallon lime sulphur to 30 gallons water. except for the delicate varieties, Cox's Orange Pippin, James Grieve, Newton Wonder and Wellington, for which 1 in 60 must be used).


Apple Fritters. 1. Slicing the apples after ther have been cored. 2. Dropping
the batter-coated rings into fat. 3. The fritters as thes should be served


Apple Pudding. 1. Linlng the bagin wlth a suet crust ; it should be pressed well down. 2. Firing on the top crnst to the edges of the lining pastry
and then a flomed pudding cloth, and hoil $2 \downarrow$ hours For stenming, have sufficient boiling water to comc three parts of the way up the hasin. and add more hoiling water as it hoils away. Boiled puddings must be immersed in boiling water, and be kept covered and boiling fast all the time.

To serve, loosen the edges from the
APPLE PIE. The ingredients arc I lh. sides of the basin with a knife, put a flat diah on flour, 3 oz lard, 3 oz . margarine, $1 \frac{1}{2}$ tenspoonfuls the top of the pudding, gently and carefully baking powder, 3 lb п пpples, $\mathrm{f}_{\mathrm{oz}} \mathbf{o z}$. sugar, 1 oz. lemon rind and 3 cloves. First peel, core, and slice the apples. Put half of them into a piedish, in the middle of which is an in verted eggcup, add the sugar and ila vouring, and on this lay the remainder of the apple slices. Let no sugar be on top of the fruit next the pastry, as this makes it heavy. Pour in $1 \&$ teacupfuls of water.
To make the short crust that is usually employed to cover the apples, sift tho flour with the haking powder into a hasin, add a good pinch of salt, and then rub in the mar garine and lard: $;$ oz inargarine alone can be used. It sliould be well rubled in with the fingers till the whole Hour is mixed with it and looks like fine bipadcrumbs. Then pour in enough water to inake it a dry paste. The water should not be added all at once, hut gradually, though not too slowly. Mix it in with a knife, not a spoon. Turn the paste on to a well-foured hoard, and roll it out with short forward rolls, lifting the pin up between each roll

The crust should be alonit a quarter of an inch thick. Cut a strip from the pastry. Moisten the rim of the pie-dish, and put on it the strip, cut side outward. Damp this, and oover with the pastry, pressing the edges together. Cut off the rough elges, and mark the edge with the hack of a knife or fork dipped in flour. Bake in a hot oven for 36 min
The pastry ahould he a liglit brown and the apples soft. If the pastry browns ton quickly remove the top browning shelf of the gas stove, or put on to a lower shelf in the oven and cover with a greased paper. Sprinkle the pie with castor sugar, and serve hot or cold If the apples are not good cookers, they should be stewed before lheing put in the pie-dish, and allowed to get cold hefore adding the crust.
APPLE PUDDING. In the first recipe given, which contains suet, the folbowing ingredients aro required: $\frac{1}{2} \mathrm{ib}$. flour, $\frac{1}{1} \mathrm{~h}$. suet, $1 \nmid \mathrm{lb}$. apples, 3 oz . ]emerara sugar, 3 cloves, together with soine grated lemon rind.
Peel, core, and slice the apples. Chop the suet finely and inix with the flour, add a pinch of ralt. and mix to n stiff paste with water Cut off one-third of the pastry for the top of the pudding. Flour the board and rolling-pin, roll out the larger piece of crust to a round shape ahout one and n half times the size of the top of the hasin. Grease the basin and line with the pastiy, working the creaser evenly into the sides and pressing well up to the top of the hasin. Put in half of the sliced applea, sugar, and flavouring, and fill up with the remainder of the apples, and add a teacupful of water to make a syrup.

Roll out the amall piece of pastry to the size of the top of the hasin, moisten the edges, and fix on to the pastry lining the basin, not round the outside rim of the hasin. Cover with a greased paper, tie it onl, and steam for $3 \frac{1}{2}$ hours. If hoiling, cover with a greased paper,
the top of the pudding, gently and carefully
turn the pudding lasin over, shalic it, and the pudding should leave the hinsin quite clear. Prick with the knife to allow the syrup to run round the dish, and serve at once

A recipe in which no suet is used call be made thus: Mix four teacupfuls of flour with an cqual quantity of hreaderumbs, two teaspoonfuls of haking powder, and a good pinch of salt. Rub in 6 oz . of margarine, and then add enough cold water to make a stiff dough. Knead on Houred hoard, and roll the pastry into a round. Line a greased howl with it, and put in alices of apple covered with sugar. Cover it with pastry and then with greased paper. Steam for two to three hours

APPLE ROLY POLY. Prepare the pastry as for apple pudding. Roll it out into a strip 8 or 10 in. wide and fy in thick. Spread over it apple jam, or minced raw apples and sugar, leaving 1 in . at the sides untouched by the fruit. Moisten the edges. roll it ip, and put it into a greased 3 -lb. atone jam jar Cover with a greased paper, tie down, and atcam for 3 hours. If it is to be boiled, tie it in a floured pudding cloth, immerse it in boiling water, and boil for 2 hours. This is enough for six persons.

APPLF, SAUCE. Peel, core and slice 5 large apples Place them in a saucepan with half a teacupful of water. Simmer and stir over a slow fise until pulped. Turn them into a basin, licat well with a fork, add 1 teaspoonful of sugar, half a teaspmonful of made mustard, a pinch of salt. and a small piece of butter. Squeeze in sume lemon juice, a nd serve in a sauce tureen. This sance is eaten hot with roast goose, ruast duck, and roast pork.

APPLE SAWFLY. 'L'he injury caused ly the apple sawfly resembles that of the codlin moth. the attackel fiuit weldom growing to any size and generally falling off in July. 'The pest is dealt with in LeaHet ?(05 of the Mlinistry of Agriculture


Apple Sawfy. 1. Adult fiy. 2. Larva of the pest. Both are shown considerably enlarged
The measures which have been found of service are as follows, hut they are suited to amall garclens rather than to fruit-growing on commercinl scale. All attacked fruits should be pioked off the tree and destroyed hefore the larvae have left them. The pupae in the soil may be destroyed by carbon bisulphide injections or by the use of some other powerful soil fumigant. By thoroughly working the soil under attacked trees some of the pupae may be exposed to the attacks of birds, while others
may be prevented from emerging. A dressing of kainit is said to the beneficial.

APPLE SNOWBALLS. Peel four apples and remove the cores with an apple corer. Place them on a baking-dish, and put half a teaspoonful of sugar and a clove into the centre of each. Put a little water into the bottom of the baking-diah, and hake in a moderate oven $\underline{2}$ to 30 min . until tender Beat the whites of three eggs stiffly, and whip into them 1/ deasertsproonfuls of castor sugar. Remove the apples on 10 a shallow dish, and cover each with the white of egg mixture. Place in a warm oven for 15 min , to set the meringue Garnish with angelica or glace cherries and serve cold. The snowballs can tho made to look more attrac tive if surrounderl with chopped jelly.


Apple Snowballs. Attractive way of serving baked apples, the snow being white of err and sugar

APPLE SUCKER. The apple suoker is a recen, filmy tly ahout one-twelfth of an inch long. It is scen flitting about in autumn, and does double injury, as its larvac fced on the buds in spring. How to deal with, this pest by spraving limewnsh and contact insecticide is set out in Leaflet 16 issued hy the Ministry of . Igriculture. The formula for limewash is 10 to 15 lb . of best quicklime in lumps to 10 gallons of water. The trees are sprayed aboul the tine when the buds legin to awell Shortly before the blossoms open a contact insecticide of nicotine and soap should be applied. The following formula has proved satisfactory. Nicotine (98-99 per cent ), ${ }_{3} 0 \%$; soft soap, $\frac{1}{2}-1 \mathrm{lb}$. ; water 10 gallons.

APPLE TART. Pastry as for apple dumplings or apple pie is made. Line a shallow tart-dish with pasiry and spread over witlu stewed aples. Cut atrips of pastry and lay them in cross-bars over the tart. Bake in a goml oven for 90 min .

Another apple tart is made by lining a greased pastry ring with pulf pastry. lake in loot oven, scoop out the soft centre and fill with stewed and sieved apples. Whip the whites of - eggs to a stiff froth, and fold in lightly 1 tablesponnful of castor sugar. P'ut on the top of the apple to cover, and return to the nien for is to 10 min . to bake the meringuc a light brown. Decorate with a few glacé cherrics and serve cold.
APPLE TURNOVER. Make the pastry for apple pie. Cut it into rounds, and put in each a tablespronful of chopped apple with a aprinkling of sugar. Moisten the eriges and double the pastry over. Bake it in hot oven for 20 min.

APPLE WATER. Take 4 large cooking apples, - quasta of cold water, the juice of a lemon, a stijp of lemon peel. and enough sugaı to swecten. Cut the apples into rough pieces and hoil thein until soft with the lemon peel, water and augar. Strain off, add the lemon juice, and serve cold. This is a good drink in hot weather.

APPLIQUE NEEDLEWORK. This French word is used for a form of docorative trimming in which one kind of material is "applied" upon another to form a pattern.

Thus lace is often appliqued on washing satins and crôpes for blouses or underwear, and scraps of coloured silks, satins, velvets, linens or cretonnes can be utilised for making gay patterns on oushions, hags, curtains and table sets Motifs, ready made for appliqué can be purchased in lace and in such diverse materials as tinselled braid and brushed wool (the Intter in white 'animal' shapes for applying to nursery coverlets), but more originality can be displayed by cutting out designs suitable to the work in hand
Iace, for instance, particularly lends itself to gond elfects when a needlerun kind is chosen with a large flower design, which can be cut out and sewn or embroidered on to the garment, smaller pieces of the lace design being used to fill out the pattern as required. Special lace motifs can be made for liouschold linens, but a brighter note in decorntion is the coloured border to white linen, wide enough to take motifs designed rach from a different fruit, apple, pear, cherries, grapes, etc. These can either be drawn on the coloured linen selected or transfers can be obtained Flower designs can be applied in the same way if preferred. Luncheon sets and afternoon ten cloths are most successful with this appliqué, the colours of which should harmonise with the china and table decoration in use.

A simple form of appliqué is shown in the hag illustrated in Fig. 5 Such designs can be used for cushions, blotters, sachets, etc. Button hole stitch, Fige. 1 and 4, and satin stitch. Fig. 3, are the two simple stitches employed for appuqué, and the design should lirst be nently tacked on to the article in the correct position Where possible edges should be turned in, especially for linens which will have to be frequently laundered. Details too small for appliqué, such as stalks of Howers or tendrils of vines, can le embroidered, using stem stitch, Fig. 2.
The simpler the design the more effective the work. Conventional or geometrical pat-



Appliqued yeedlework: Stitches used in the work. 1 and 4, buttonhole; 2, stem stitch: 3, satin stitch. 5. Bag trimmed with a prigue work 8. Cushion decorated with geometrical patterns appliguéd with buttonhole stitch in coarse silk
terns are particularly good for colour notes on cushions or curtains. The stitch employed for the appliqué of the angular design in coloured satins on the cushion illustrated in Fig. $f$ is buttonhole stitch in conrse gilk. See Embroidery

APRICOT. A heary clay soil suits many fine plums, but the apricot requires a fertile, mellow and frinhle loam, with sand or chalk not far from the surface. If the soil is stiff it can be lightened and sweetened by breaking up, and adding lime rubbish and gritty matter. Do not overlo the use of yard manure, which is rich in nitrogen
The following is a good annual dressing: if no yard manure is used, an addition of one part of sulphate of ammonin may be ninde. 4 parts, by weight, superphosphates of lime; 3 parts sulphate of linie; 2 parts sulphate of potash : $\frac{1}{2}$ part sulphate of iron. The mixture is spread round the trces at the rate of $\$ \mathrm{lb}$. per square yard. Mulching with yard manure might he practined in early antumm. Every third year a dressing of ground lime or slatied lime at the rate of 1 th per sq. yd might be given.

Both for size and flavour of fruit no variety of apricot equals Moor Park, but there are other good kinds, as the following list shows:

Brfada.-Very old variety, fruit amall, but of gool Havour, ripe in August on a wall, hut somewhat later in the open. Ahout the best varicty for growing as a standard

Hemskirk. - Large fruit, ripe ahout midAugust, rusembles Moor Park, and must have a wall.

Iarge Ealley.-Large fruit, ripe early in August.
Moor Park.-Largo fruit, very rich in flavour. Ripe at the end of August. Liable to loss of branches by gumining.
lowell's Late-large frnit, paler than Moor Park, ripe in Sejtember

The apricut is 1 rained with main fruiting branches spacel a forst or more apart over the face of the wall, diagonally, in the familiar fan shape. It is hest to renciv the fruiting wood every few years by taking up shouts from word-buds at the hase, and turning them into Sruitors by summer pruning. Apricots are generally propagated by budding them in early aummer on Nussel or Nit. Julien Plum stocks, the former being used for Moor Park and other choice varietics, while the latter is employed for standards.

APRICOT BATTER. Take one small tin of apricots, a pinch of salt, 3 oz . of castor sugar, 13) of flour, 2 volks and 2 whites of eggs, $\frac{1}{2}$ pint of milk and water, 2 o\%. of dripping, and one gill of apricot syrup. Mis the Hour and salt together, and put through a wire sieve. Then nake a well in the centre of the flour and place in the yolks of the egge, gradually mixing the llour into them. Grad. unlly add the milk and water, and as it is added more llour must be mixed in. An even consistency
aliout the thickness of custard must be main tained all the time the hatter is being mixed When well mixed, beat it until the surface is covered with bubbles

Strain the syrup from the apricots and lightly stir one gill of this into the batter, and put aside for an hour. (Sut the apricots into quarters: use only about half of them, as too many would make the batter heavy. When ready to cook the hatter add the sugar and apricots and lightly fold in the whiaked whites of egg. Melt the dripping in a piedish, and when hot pour the hatter into it. Bake in n moderately hot uven for about forty-five minutes. Place carefully on to a hot dish, cut into six, and serve at once. This is sulficient for six persons.

APRICOT CREAM. Sieve enough tinned ol stewed apricots to maki $\frac{1}{2}$ pint. Dissolve without hoiling 1 oz . of gelatine in 1 gill of water, or in syrup from the apricots. Mix with 3 oz of castor rugar and the strained juice of half a lemon, and whip $\frac{1}{2}$ a pint of cicam until it will nearly, but not quite, hang on the whisk Having st rained the gelal ine into the fruit, mix and lightlyst in in the whippel cream. Pour the mixture into a mould that has lieen rinsed with cold water and ienve it till it is set. Dip the mould into warm water and turn the whole on to n dish. This is sulticient for 4 or 5 jersons

APRICOT EGGS. A simple sweet for children's parties is made from apricots without any cooking Cut some plain cakc into large rounds In the centre of each place the half of an a pricot to look like the yolk of an egg Surround the yolk with a thick layer of whipped cream Hattened till pericetly smionth The repult will resemble poached eggs on tonst

APRICOT GATEAU. Take one small tin of apricots in syrup, 2 eggs, 1 pint milk, \& small spongo cakers, and l dersertaponful oi


Apricot $\mathrm{O}_{\mathrm{a}}$ teau. Sweet made with sponge cakes. apricots and egr custard
sugar, with $a$ little vanilla llavouring and cochincul. Grease a border mould with margarine or butter. Heat the milk in a saucepan with the sugar and add it to the heaten eggr, crumble the sponge cakes and mix with the eggs and milk, and tinally add vanillat for flavouring, together with a few drops ol cochineal, sufficient to make the custarl lorok deep yellow in colour.

This mixture should be poured into the mould and covered with a greased paper, tho mouid being then put into a saucepan of boiling water, on an inverted saucer, the water reaching only half-way up the side of the mould. It should not boil, but simmer, other wise the custard will curdle. Steam until it sets, which will be in from 30 to 40 minutes. When cooked, turn it carefully on to a dish, and leave until cold. The apricots should be arranged round the top of the gatcau, the out side being placed downwards, and the
apricot syrup poured all round. The custard may be baked instead of stramed. This is sufficient for 4 or 5 persons.

APRICOT JAM. The ingredients arc 2 lb dried apricots, 6 pints cold water, 6 lh . lump sugar, and 2 oz almonds. Thoroughly wash the apricots in two or three warm waters and cut into quarters. Place in a basin, cover with the water and soak for 72 hours. Put the wholc into a preserving pan with the sugar, and boil the jam for about one hour. Blanch the almonds and split them in half. Add them to the jain about ten minutes before it has linished cooking.

To make jant of apricot pulp, which can be bought ready for this purpose in large tins, take 6 lb . of fruit and 4 to 6 lb . of sugar, 6 lb . if the jam is to be kept Boil all together until a little sets when put on a cold plate. Mix in 2 oz. of blanclied almonds when it is done
APRICOT JELLY. Add the grated rind and strained juice of a lemon to $1 \frac{1}{2}$ pints of apricot pulp, or 1 large tin of ajpricots pulperd and put through a fine sieve. Shell and slined four sweet almonds and add them. Dissolve $\frac{3}{3}$ or of gelatine in a gill of water, taking care that it does not boil, and strain it into the fruit, etc. Mix all thoroughly in a basin, and occasionally stir until it begins to set, then pour into a wet mould Serve with whipped cream.
APRICOT MACAROON. Take a small tin of apricots, half a dozen macaroon biscuits, a quarter of a teaspoonful of castor sugar, a little vanilla llavouring, and one gill cream. Place the biscuits in a dish, soak then with the apricot syrup and then place an apricot on each macaroon. Add to the crean the vanilla and sugar, and then whiski it lightly until it thickens, taking care not to overwhisk it, or it will curdle; it should he poured mound each macaroon and on the top of each apricot, placing a crystallised violet and angelica strip, for purposes of decoration

## APRICOT PUDDING

Sicve together 4 oz . of flour and half a teaspoonful of carlomate of soda. Beat 4 oz . ench of hutter and Demerara sugar till the whole is as soft as whipied cream. Beat 2 eggs till frothr, then work them gradually into the creamed mixture. Sit in ? tablesproonfuls of apricot jam and 2 tablespoonfuls of mill. Mix well and quickly, turn into a thickly greased mould or pud. ding hasin: twist a piect of greased paper over the top and stearn for 2 hours. This will be found suflicient for 6 persons.
APRICOT SAUCE. 'This userul sweet sauce can lx made "ith jam or sieved pulp, l'ut 1 large tallesponful of the jam on pulp into a saucepan with $\frac{1}{2}$ pint of water, and then heat until it boils. Mir 1 tablespoonful of cornflour smoothly with 2 tablesperonfuls of cold water. Stir this into the boiling jam or pulp, and stir and boil gently for 5 minutes. .idd 1 tablespoonful of cooking sherry or lemon juice and then at rain. Sufficient for 4 persons.

APRICOT TART. An open upricot tart, served either with custard or cream, may be miade by lining a greased dish with whort crust pistry, and covering this with apricots and a little of the syrup; one tin of 13 oz . will be ample for a large tart. Sprinkle the whole with castor sugar and bake in a fairly quick oven till the pastry is a light

| APRIL |  |  |
| :---: | :---: | :---: |
| What to do in the Garden |  |  |
| Flowers | er hard wonded | reguired for climbin: |
| Sow in the open: | house | purposes |
|  |  | etab |
|  | freguently, and reno- | late potat |
| cliryanthemum. an- | vate hare patelims with | plant out lettures |
| Masi ; clarkia: flax or | secd to mateh the turi | aill onlons troll |
|  |  |  |
| masturt ium: nemophila ; moppy; swect pea ; | Fru | lut in last sowing of |
|  |  |  |
| sweret sultan <br> l'ant boriler chryaan- | Graft apples and give | Sow carly betfroot : |
|  | a spraving of liordeanx | carrots; sulsify |
| themum, viola, bentste-mon. old, stored dahlin | mixiure to fruit trees | zoneria sweet and |
|  | before hlosmom ojens | pot-herbs; also bore- |
| risotn layer violet runners tor fresh supply dant out lierbaccous | Thin eurly grapes and | cole: broccoll: Hrus |
|  | pinch off tipa of shont | 8prouts : caulifo |
|  | leaving one leaf alove | savove for transplantin! |
| lerumials fromu glasalplant gladiolus bulbs | Plant out ntra | at , midgummer: dw |
|  | Uerries | Frencli beans |
| for nutumin llowering <br> Move seedlings from Llass to cold frames | Luok over gooseberry | wards the end of the |
|  | busher for caterplliary | noonti; and spinach, |
|  | Re-pot ${ }^{\text {ecedling }}$ | kceping on sowing at |
| líc-pot azaleas. callelliaa, heatlis, and | melons, and plach off the shoots of those not | Intervals of three |
| Food in Season |  |  |
| Fish |  | , |
| lliream; brill: dory ; llounder; haddock : | leecf: lamb : mutton | alinlower; early potion |
|  | pork ; veal | barb: forced Frenclit |
| halibut ; mullet ${ }_{\text {a }}^{\text {sal }}$ sal sole: turbot trout : whitebult: whiting | Poultry \& Game | hennis: Jerusalem ar |
|  | Chicken: duckiling | choke; hemtroot ; carrol |
|  | fowl ; gusing ; pigeon; |  |
|  | gulnear fowl ortolall ptarmigan ; rubbit | $\text { Appléruit }{ }_{\text {banana: }}^{\text {Fin }}$ |
| Shelltish | migan ; rubbit | grape: grape fruit : |
| Crab; craynsh: lobster: oyster; prawn ; scallop; shrinp | Vesetables <br> Witercress ; iettuce: | orange : pincupple : lemoni forced stran- |
| Notes Por the Month |  |  |
| APL. 1.-Refreshment louse licences require renewal <br> APL. 7.-Time limit for Fire Inshrance explies | Apl. 1.4.-Parish councila required to hold antural ineeting on or within meven days APL. 19.-1'rimurose Day <br> Arl. 23.-S. George's Day <br> Summer Tinue starts at 2 a.m on day followling thiril Sat. In A pril. |  |
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|  |  |  |
|  |  |  |
|  |  |  |

brown. This tart is sufficient for 6 or 7 per- for nurses, for cooking and general morn sons. A closed apricot tart is made in the ing wear, and fancy lawn or muslin for same way, except that enough syrup to half parlourmaids, often lace-trimmed or emfill the dish is poured over the fruit, and a covering of pastry added.
APRON, Domestic servants require a roided for aftcrnoon duty. These last stock of aprons. Plain white linen is used aprons may be in a coffec slade if

## Aquariums for the home

How to Construct and Stock Them
Related articles under Fern; Gold Fish; Plumbing; Slate, ecc.
The shape of an aquarium is very important The surface of water exposed to the air should be as great as possible, so as to allow the maximum absorption of oxygen in proportion to its bulk but it should be decp enough to allow the necessary water plants to grow properly.

Aquariums range from the simple, flat earthenware pan to expensive combinations of plate-glass, slate, and fountains. The type best suited for the fish and the plants is that which most resembles a pond, light only entering from above. The drawback is the difficulty of walching the movements and habits of the fish.

The commonest aquarium is of the type shown in Fig. 1. A disadvantage is its transparency, which causes discomfort to the fish, and the rapid growth of plants, but this can be partly overcome by placing the aquarium away from the light. In buying an aquarium of this kind, the broadest and shallowest should he chosen

An casily made tank is shown in Fig. 2. This is constructed of glass, wood, and slate : the ends and hottonn are of wood, the former being lined with window-glass, the latter with slate; and the sides are formed of plate glass An aguarium which is formed of slate and plate-glass is shown in Fig. 3.
procured of any slate merchant. The bottom, 30 in . long and 16 in . wide, and the ends, each 16 in. by 13 in ., will make an aquarium of good dimensions. At 1 in from the ex. tremity of each end, that is, across the broad part, cut a groove $\frac{1}{2} \mathrm{in}$. dee ${ }^{1}$ and 11 in . broad. The groove is cut in the fol lowing manner: First mark with an awl the exact place and dimensions of the groove, then get two straight-edged pieces of wood some inches longer than the breadtlı of the end;
 Simple glage. Fig. 1. place them cach side of
the line which is to be cut, and mail them to the bench-they should be just wide enoughi apart to admit a tenon-sill -and with the saw cut the line to the required depth, it in
Without some such preparation as this it is difficult to cut the sides of the grooves with the necessary accuracy. When both lines have lween sawn in this way take an old chisel and a mallet and cut out the slate which lies between them. Before chisel. er, take the precaution to put two or three folds of carpet between the slate and the bench to prevent all danger of a crack. These grooves are to. receive the ends of the bottom. As a rule, the slate can be split cleanly oul by st riking the chisel against the eilge and not on the top.

Now along hoth sides of the bottom and of cach end, cut, at a distance of 3 in . from the edge, grooves in. deep and ${ }_{i}^{3} \mathrm{in}$. broad. These grooves are In receive the plate.glass sides, \} in. thick. After this bore four holes, $\frac{\mathrm{in} \text {. in diameter, right }}{}$ through each end. Two of these are to $\mathrm{le} \cdot 1 \frac{1}{2} \mathrm{in}$. from the edge and 1 in. below the groove which is to receive the end of the bottom, and two 1 in. from the top and just within the grooves cut for the glass (Fig. 4)

The holes are for the liolts, which inin across from end to end to hold the aquarium together Bore them with an ordinary hrace und a bit used for metal The holts should preferably be made of lrass. Before puiting the aquarium together, place a little cement in all the grooves. Then raise the bottom on blockis of wood to such a height that it will be level with the grooves out to receive it in the two elfds When this has bcen done, put the ends, plate-glass, and bolts into position, and screw them all together, turning the nuts of the bolts with the linger and thumb only. Before the
nuts are quite screwed home, press the glass employed for making the back, but if it ahould gently downward, so that it is forced firmly not be convenient to use only one pane for into its place. Carefully finish filling up the this purpose, the necessary woodwork for


4
Agarinm Pig. 2. Tank in plass, wood and slate. fig. 3. Slate and plateof slate tank more than one may be tastefully covered inside with cork, with here and there a fern which may be planted in a receptacle made as follows:
Get a mall round tin canister with a few holes punched in the bottom, and sew round it two pieces of sufficiently ourved cork, using thin copper wire for this purpose.

Ferns in suitable backets may be hung from the roof of the frame. No fern should be liung in anch a way that the drip from it would fall inside the aquarium.
Fig. 6 represents a section of the grooves with coment, and the aquarium will fernery and nquarium combination: A, be completed Paint any iron bolta with Brunswich hlack.
The following are cements suitable for an aquarium :

1. Red and white lead mixed together into a stiff maste. The bed for this cenient ought to be painted inth cold size,
2. One plat each of plaster of Paris, Iltharge, and fine white eand, and one-third pint of finclypowdered resin. The mixtire should he kept in well-stoppered bottles, and, whicn wanted, the necessary quiantity

## 3. The hest Portland cenient

4. Four narts pitch and one part gutta-perchia applied when warm. These should be melted together in an lron lade over a gne-fome or lamp. This cenient is espiceially uscful for $n$ wooden aquarlum

An arrangement of an aquarium and fernery combined is shown in Fig. 5. This combination is fixed outside a window. The tank should be of slate and plate-glass, similar to that depicted in Fig. 3, and the stand should be so arranged that there will be a place for ferns heyond the aquarium. The framework to support and protect the aquarium and fernery may be as high as the window, hut its breadth may somewhat exceed that of the window. If the tank is made of slate, according to Fig. 3, only a piece of plate-glass will be seen as its front, no top har being necessary. The whole combination may be supported by a strong wooden stand outside the window (Fig. 6), or, if the room to which it is affixed is an upper one, iron brackets let into the wall must be used.

The frume. back, and sides should be glazed with tinterl cathedral glass. One large sheet is


Aquarinm. Fig. 5. Comblned aquarinm and lernery ared ontside a window. Fig. 日. Sectional view ; see tert for explanation ol lettering

They can be raised from seed sown in late spring, the seedlings being transplanted in autumn. The double Arabis albida produces large spilics of pure white double Howers Lucidn varicgata has light green leaves edged with vellow. Arabis Billardicrii bears pink blomms. Pron. Arrer-bis.


Arabls. Profusely flowering clump of this lowgrowing fock plant

ARBOR VITAE. There are two kinds of Arbor Vitne-the Eastern or Chinese, Thuya oricntalis, and the Western or Amcrican, Thuya occidentalis. They belong to the conifers, and are well adapted for small gardens, whore they may be used in shrubberies, on lawns, and even as hedges.
The Ameri can Arbor Vitae has many varic. ties, includ. ing Ellwan. geriana. The most popular of the other forms is dol. abrata, with drooping branclies, and leaves silvery beneath. There is a dwarf form. nana Gigantea is of pyra
 midal habit.

All these thrire in any good soil that is fairly substantial and moist. Light, thin, dry soils do not anit them. Ilanting should be done in April or Septemher and October. Pron $\mathrm{Ar}^{\prime}$-bor-vi'-tec.

ARBUTUS. The principal variety ol arbutus is the Unedo or common strawberry tree, which has many lance-shnped, brightgreen leaves, and drooping clusters of white Howers hone in September, and followed hy strawberry-like fruits. There are several varieties, such as coccinea rubra and crooniei.


Arbutas. Leavea a nd truit of the common strawherry tree

Andracine has smooth, oblong lenves and greenish white flowers. produced in spring. Most var. ieties attaina heightol 6-10 fect.

They thrive best in a sandy loam or peat, and are suitable for the shrubbery. Propagation is by seeds for species, and by layers or grafts for varieties. Planting may be done in Fel, Pron.Ar-bew'-tus.

## Arches as a Feature of the Garden <br> Decorative Firtures in Rustic and Plain Wood

## Further informatlon is given under Pergola; Rustic Work: Summer House, etc.

Arches for use in gardens are descrihed as be oak, beech, American whitewood, or red rustic when they are made of poles and deal Oak will be finished by varnishing; the branches in a natural state, with or without the hark. They are easily made if suitable material is available. Larch poles, about 3 in . in diameter, are best for uprights and framing; the smaller branches of oak, about 2 in. or so in diameter, provide good material for filling in spaces. The joints should bo as simple as possible, and strongly nailed with stont wire nails. An effective design is given with the necessary joints in detail.
Timber with the bark on gives the ideal rustic appearance, but it is more difficult to make and dues not last as long as timber whioh has had the bark removed. It is advisable in the latter case to varnish the wood in order to nreserve it. That portion of the arch which is placed in the ground should be coated with orsoaked in creosote, or given two or more coats of tar

Rustic Arches. An arch made from larch is shown in lig. 1 The end elevation will be as Fig. : and the side eleva ion ns Fig. 3. To build this arch, the four posts are first planted in the ground and cut off to the required level. The two horizontals are then fixed to the ton of the posts, allowing them to overhang he latter some six inches. The four rafters conic next. Nail them together where they cross at the top ends, and then lay in the top horizontal, and nail each of the rafters to this. The various other horizontal and diagonal picces can next bc fitted and fixed by side nailing.

Another style of arch is shown in Fig. 4, the difierent arrangement of the top of which gives it a more important appearance, especially when covered with climbing roses or creepers. Such an arch as this should le braced at the corners as shown.

There are certain rules of construction whioh should be carried out. The best way to fit a horizontal piece to an upright one is shown in Figs. 5 and 6 , outting a piece out of the underside of the former so that it will fit on to the fat top of the latter ; this will give tirmness and strength, while no depression will be formed in which water can lie. In all cuses where a horizontal piece comes to on upright, the former should be notched to fit on to the latter; but do not make the angle of the notch loo acute, or there will be a risk of splitting the wood in forcing it in. This will also apply to the fitting of the diagonal picces

In fixing the rafters, do not out the horizontal piece to make a flat bed for them, but out away the underside of the rafter slightly, which will answer the purpose better; it is quite as easily done, and makes not the slightest lodging-place for water. The proper method is shown in Fig. 7.
The mitre joint shown in Fig. 8 is a very good one, provided that the timber is nearly all of one size, and that the joint is always on the underside as shown. It has, however, the drawback of weakening the horizontal piece.

Timber and Trellis Arch. A garden arch of stronger build is shown in Fig. 9. It is designed for the best timber. The wood may
other woods will he well painted, a fresh coat being given each year The height must be in proportion to the width, and the width is usually determined by the path which the aroh spans.

Here we assume $a$ width of $: 3 \mathrm{ft}$. $\mathbb{i}$ in. over the posts. The height from the ground to top of the crossbar $(\mathrm{B})$ is 6 ft .6 in ., the total height to apex of arch being 7 ft . If the arch is wider, a little more may bc allowed in height, to give a pleasing proportion. The depth of arch over the posts is shown as 1 ft 9 in . In speating of height, it is, of course, the height above the ground that is referred to. For an arch of this size, the posts have to enter the ground from 18 in to 24 in


Fig 5

Arch. Fir. 1. Simple rustic arcb made of larch wood. Figs. 2 and 3. End and side elevations of the mple arch. Fir. 4. Side view or a larger rustio aroh

From Fig. 9 and the section shown at Fig. 13 it will be seen that reliated posts are used. The upright laths ( E ) are nailed to the top and bottum rails (C), the short horizontal laths (F) lying against the upight ones and resting in the rebate By this method the laths are not nailed over the post, and a better appearance is secured.

The posts (A) arc of $2 \frac{1}{3}$ in. by 2 in material, and a length of from 8 ft . to S ft .6 in . should be allowed. Framing timber $2 \frac{1}{2}$ in by 2 in . may be purchased with a rebate as indicated at Fig. 13 The posts are mortised for the rails (C) to enter, and should have a tenon cut to go right through the top crossbar (B). The lower ends must be well tarred for entering the ground.

The top crossburs ( B ) are 4 in . wide by $1 \frac{1}{2} \mathrm{in}$ thick, lengths of 3 ft . 2 in . being required. The ends should be ohamfered off as indicated, and the bars are mortised for the post tenons, which should pass right through and he wedged. They should also be mortised on the underside for short tenons on the shaped hraces (D).

The aection at Fig. 13 shows a rail (C) 2 in. by $1 \frac{1}{2}$. which will be tenoned (and pinned) to the post so that it is Hush at the outside. The upright laths (Fig. I3) are nailed to the rails from inside.

The rails (C) may be made 2 in . thick, so that they are flush wivh the nosts on both sides. In this case they must be mortised for the upright lathe to enter. The shaped bracce (D) may te straight if preferred, but the shaped ones shown are an improvenient. The shape may be taken from a width of about $4 \frac{1}{2}$ in The thickness may be the same as the posts ( 2 in) or may be reduced to $1 \frac{1}{2}$ in. It is well to provide $n$ short tenon for entering the top crossbar ( $B$ ), and the hraces may be dowelled or simply nailed to the posts.

The laths $E, F$ and $H$ are $1 \neq \mathrm{in}$. wide and may he $f$ in. or $i \mathrm{in}$. thick For the sake of appearance as well as for durability $\frac{g}{\text { g in laths }}$ are recommended. For an arch of this size, three upright laths may be fixed at each side. The horizontal ones may br spaced so as to give square openings, in which case twelve a side will be necessary, but probably the 6 in by 3 in. openings indicated in the illustration will be preferred. For the top of the arch, allow six laths on either side. In regard to the top cross-pieces, the apex of the arch is shown as a very wide angle, this being appropriate to the type of design illustrated
The wood for the top cross-pieces (G) may br $1 \frac{1}{2} \mathrm{in}$. square or 2 in . by $1 \frac{1}{2} \mathrm{in}$. (set 2 in. deep by $1 \frac{1}{2}$ in. wide), and to allow for the overhang and the halved centre joint, lengthe of 2 ft 6 in . should be proviled. The outer ends are chamfered, and the pieces should be cut as ahown to fit close down on the top bars (B). At the centre the pieces are lap-jointed (a Fig. 12) and pinned, care being taken to get all three pairs exactly alike These top pieces are nailed to the crossbars and the laths nailed on above.

All'joints should be painted before putting together, and every care taken otherwise to protect the arch from damage cause by rain. It will be found easier to fit up the tivo sides complete and fix these in the ground before putting on the top. The earth must be rammed down around the tarred post ends so as to a vaid the risk of any sinking. A plumb line can be used to keep the posta vertical

|  | $\left\lvert\, \begin{aligned} & \text { Long } \\ & \text { ri. } \mathrm{In} . \end{aligned}\right.$ | Wide In | $\begin{aligned} & \text { Thick } \\ & \text { in. } \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| Four posts (A) |  | 21 | 2 |
| Two top bars (B) |  |  | 13 |
| Four ralla (C) |  | $\stackrel{2}{1}$ | ${ }_{8}^{11}$ |
| Four ahaped braces. (D) |  | 11 |  |
| Sir lathe (E) Fiuteen crose lithe (F). | 5 3 <br> 1 6 <br>   | 18 |  |
| Six oross pleccs (G) | 2 | $\stackrel{9}{9}$ | 11 |
| Twelve top latha (1) | 30 | 14 |  |

whilst ramming, and if a couple of laths ame temporarily nailed across the top the two sides can be kept in line. The upper part is easily completed after the sides are erected.
The sizes of the rood required are shown in the above list, which is given for guidance only. The lengths allow for paring, but widths and thicknesses are net


Arch. Fig. 9. Heavier type of arch constructed of quartered timber and trellis work. Fig. 10. Side elevation. Figs. 11-13. Diagrams and working scale in making the arch. See text for an explanation ol the lettering

# Architecture : The Medium-Size House 

## Professional Advice on Choice of Site and Construction of Attractive and Economic Dwellings

The information here is supplied by two well-known experts of wide expericnce in domestic architecture and relates to the scalc plans and sketches in our colour plates, pages 16 itand 17 . For fuller details see numcraus separate entries throughout the Encyclopedia, e.g. Attic: Bungalow; Cesspool: Concrete : House; Roof; Septic Tank; Water Supply; ete.

Before selecting a site, the client will do well to consult his architect as to cost and condi tions of purchase, aspect, houndaries, easements, road charge liability, artificial lighting water supply, drainage, suhsoil, etc. The following points might be borne in mind:-
A good and uninterrupted view will provicle an amount of restfulness and satisfaction which cannot be over-estimated.
The entrance roadway is best on the nortl/ side of the site. The liest rooms can then be placed to the south and therelyy enjoy the advantage of a sunny aspect and the best available distant view
I site having a steep slope or gradient is costly to deal with, because the foundations will require to be much deeper than normal if sulisequent subsidence is to le guarded against. Avoirl a site containing live springs.
Chalk or stone subsoils are the best, but stone rubble, firm gravel and the like are quite good, and less costly to build "pon Rock is the best, but the most expensive to excavate. All the Iatter subsoils will yield good material ht little cost for concrete. patha, etc. Sandy sulisoils, unless free from running water and of very stiff formation, should be avoided.

Clay subsuil is generally considered to be damp, and not good for those suffering from rheumatism, asthina and similar complaints This is, however, frequently exuggerated. If building on clay the foundations should be not less than 3 ft below the surface of the ground to avoid unequal settlement of the suhsoil during very hot weather.

Tipped or made soil should not lue built upon unless it has been standing in its present position for at least 15 years. In any case, it is advisable that the house foundations should rest upon the natural subsoil. This involves additional excavation.

## How the Plans are Worked Out

The site settled, the client conveys to his architect in general terms the accommorlation desired and the a mount of money to be spent. The architect proceeds to scheme his plans in a manner calculated to give the best aitangement of the rooms in relation to each other. He will ulso give consideration to the aspect of the site, and any natural features it may possess. such as distant or near view points of interest, trees, etc. In the planning of the house he will, in addition, have clearly in mind the lay-out of the garden, so as to provirle an appropriate setting for the house.

The two sets of plans in pages 16 and 17 which illustrate this article are typical of the form in which the architect conveys to the buikier what is desired, and upon which, in conjunction with the written specitication, the builder bases his estimate. The first set deals with a medium sized house having four hedrooms, and the second set with a cottage dwelling of the better type, in which the general principles laid down in the first part of the article are worked out in detail.

The ground lloor plan of the medium priced house has first to be considered.

The architect first roughly slietches to scale (generally $\frac{1}{8} \mathrm{in}$. to 1 ft .) the entrince hall and main rooms with their fireplaces, doors, windows, etc., and then fits into their appropriate places the stairs and the various smaller apartments. In the same manner the rooms on the upper floor are dealt with.

These rough aketch plans in turn are auperseded by p!ans worked out to scale in the more
exact and careful manner shown in the illustrations. Here the front entrance porch is recessed to give shelter to visitors when waiting at the front door. The hall is so arranged that easy access is gained to the stairs, living-room, dining-room, and kitchen without an unduly long corridor A small cuphoard for hata and coats is providerl under the stails. If space and cost permit, n basin and w.c. in addition will be of great convenience.

The living-room, mensuring 18 ft . by 12 ft ., is planned with an outlook to the road on the nurth, a laiger window to trap the sun on the S.W side, and a pair of glazed doors to the S.E. giving access to the jergola and garden. The fireplace is shown in recess with a beam over the recess-denoted hy dotted linesthe ceiling of which is lower by 12 in than that of the room. The tire is of the open-hearth type with glazed tiles around the fireplace and hearth, at the side of which a small window has been placed as a peep into the garden. A picture-rail lixed to the wall, low skirting and the sparing use of enriched plaster on the ceiling, a point for electic light (or gas) in the centre of the ceiling or wall bracket, and a plug point or two for a standarll lamp or vacuund cleaner should be provided. The use of pale cream paint for the woodworl, cream distemper for the walls, and hrolien white distemper for the ceiling will produce a satisfying architectural expression.

## The Dining Room and Kitchen

The dining-room, measuring 16 ft by 14 ft ., is entered olf the hall near to the kitchen in order to reduce this distance to a minimum. The fireplace has heen arranged to back against the living-room fireplace, which makes for economy in cost of erection and gives additional heat. Owing to the more nccasional use of this room a gas or electric fire might be substituted for a coal fire. On each side of the fineplace cuphoards are placed for china and glass. On the opposite wall an arched recess is provided for the sideboard. A large window gives an outlook over the garden to the S.E., and in addition small windows are placed in the east and west walls to trap the eaily and late sun. A picture-rail and low skirting, and the use of enriched plaster on the ceiling, an electric or gas litting in the centre of the ceiling, together with paint and distemper as described for the living-room-of perhaps a darker shade appropriate to the use of the room-will make this a comfortable and pleasing room. I plug point for vacuum cleaner is desirable.
The litchen, measuring 12 ft . by 10 ft ., gains access of the enl of the hall, and is lighted on the south side. This room, in conjunction with the scullery, should he very carefully planned with the object of reducing labour as far as possible. The fireplace is situated on the wall at the side of the window (opening to its full height) which will ensure its good lighting.
$t$ cupboard for the storage of oddments and a separate store for dry goods are provided near the dresser.

The dresser is placed on the wall in close touch with the scullery, in which position it will be found to anve a great many ateps. It should be enclosed at the top where the china is kept. The lower portion can be arranged either with drawers or cupboards or left open with what is linown as a potboard. If the
potboard is not litted to the dresser, shelves must be provided for this purpose in a convenient position. The architect, by giving careful consideration to this fitting, will save a great deal of work and labour, and produce an article of great convenience. A good modern type of cabinet might to advantage take the place of the dresser at about $£ 7$ to $£ 12$ extra cost. Rails will also be provided for the dish-covers, etc.

The lloor might be made of tiles for cleantiness, or of wood blocks or ordinary boardswhichever is preferred-for comfort The walls might be linerd with tiles, or if this method is too expensive, painted or distempered. A drying line fixed to-ceiling, raised and lowered with cords attached to pulleys, will be found useful in wet weather

The larder (facing north) is entered ofl the scullerv. Iinple shelf room should he piovided, including, if possible, at least one slate shelf. A ventilating brick should be fixed in the external wall near the lloor and another near the ceiling. 'The window should have perforated wire lixed to a light frame, and le hinged on the inside to keep out the flies. The walls should be tiled or distempered, and the lloor cither tiled or cement finished. If space can be provided for a refrigerator so nuch the better.

## The Scullery and its Fittings

The scullery should be in the closest tonch with the kitclien, and in size about 70 to 80 square ft. It is lighted on the north side by a window about $3 \mathrm{ft}: 3 \mathrm{in}$. uff the floor. The sink should be placed near the window, and lic of glazed stoneware about 8 in . deep, 16 in . wide, and 24 in. to 27 in . long, with a grooved, hardwood draining board at each side if possible. A deal plate-rack will be fixed in a convenient position on the wall over the draining board, and glazed tiles should be fixed to the wall around sink and draining hoards.

The copper, if of the coal-consuming type, should he fixed near a fireplace for the easy connexion of the Hue. If a gas coppior is installed. a flue is not so essential. In the illustration the gas copper is shown under the draining hoard, which is made hinged to lift up for economy of space. The lloor should he of tiles or cement, and, if cost will permit. the walls also should be tiled. As an alter nalive, plaster and painting, or oven distempering diroct to the bricks, is often resorted to. The woodwork for the whole of the kitchen quarters will be painted or stained

Servanta' w.c., coals, and tradea entrance complete the ground tloor. The two former apartments are conveniently planned near the scullery door, and entered off the back entrance luhby, the floors in all cases being of cement, and the walls distempered.
The ground Hoor is 8 ft . 6 in high, and the staircase has 15 steps to the first lloor lancling.

## Arransing the Upper Floor

Coming to the first floor, the stairs are of deal about $: 3$ it. 3 in wide, the treads being 9.2 in or 10 in . wirle. with a "rise" of about of in. If un additional step can he introduced, the rise will be reduced to 7 in
The bedionms are entered of the landing, and are approximately alike in all particulars except size. Care must he exercised in their planning to permit of the convenient placing of the bed, dressing-table, wardrobe, etc Cupboards convenient in size, arrangement. and position should be provided Where practicable, a tireplace should be provided. hut the type of fire to be fixed is not of such importance as in the sitting-rooms.

The Hoors generally will be hoarded. and the walls and ceilings plastered and dis. tempered pale tints. A picture-rail will be provided in each room about 7 ft . off the lloor. and one window at least in each room should
open to its full height. IW here a bedroom is not provided with a fireplace, a ventilating brick should be placed in an external wall.
The bathroom should be placed as nearly as possible over the kitchen, thereby ensuring a ready supply of hot water and economy of service from the range. This room will be fittod with a porcelain enamelled bath fitted with taps of at least $\frac{3}{3}$-in. bore. The lavatory basin will he enamelled fireclay fixed on chromium brackets with chromium taps of easy cleaning pattern, and a towel-rail with hot-water circulation will be provided if cost permits. The walls should preferably be tiled or painted and the foor of deal or an impervious composition material. A ventilating brick should be fixed near the ceiling in an external wall. The w.c. should be separate from the bathronm and fitted with a washdown glazed stoneware pedestal w.c. with enamelled oistern as silent as practicable. A ventilating brick should be fixed in the external wall in addition to the window.
The elevations represent externally the tour sides of the house as they will appear to the spectator looking directly at it when completed. It is in the elevations that the external architectural expression of the house wilf be imparted by the architect, who will so arrange and treat the doors, windows, chim-ney-stacks and roof lines that not only will they be well suited to their various practical uses, but they will be of good proportion and have a proper relation to each other
The section is a form of elovation of the inside of the building. It is assumed to cut through the building in a vertical plane. It shows the depth of foundation, heights of the various rooms, together with certain features of construction and interior design

The perspective sketch shows a general view of the house. The general lines of the garden are here shown, since the setting of the house will have an important bearing upon its effect

## Predaring the Specification

Before reliable competitive estimates can be obtained, the architect must prepare a specification setting out in detailed form cverything needed for the erection and completion of the house

Good stone is the best material for external walls, and sound, well-burnt bricks are next in value. If exposed to weather, bricks known as facing bricks only should be used, but fre quently cheaper bricks are available locally at a much less cost and are therefore resorted to. In such cases the external surfaces are generally covered with cement roughcast in various forms to withstand the weather Where facing bricks are used for external walls it is usual to build them in two thick nesses with a cavity hetween. These are generally known as "hollow" walls

The ground floors may he of ordinary deal Hoor boards, pine blocks, concrete with cement mortar finish or some form of impervious composition material. Ordinary deal floor bonrds on joists are, as a rule, cheaper than any other form, and are less tiring to walk upon Pine blocks laid on cement concrete might be used to advantage on the hall, and are sometines used in the kitchen. Cement concrete lloors finished with cenment mortar are suitable for the floors of scullery, larder, etc. Skirtings might be of the saine material

Air bricks for ventilation should be inserted in all external walls under wood floors. A damp-proof course of asphalt or slates in cement is essential through the full thicknesy of the outer walls about 6 in above the ground.

Ordinary plastering remains the best material for finishing the internal surfaces of walls and ceilings

Deal is the timber most generally used for windows, duors, skirtings, stairs, picture rails, etc. It should be of good quality and
free from sap and loose or décayed knots. Similar timber is most generally used for floor joists, rafters, plates, lintels, ctc., and should be selected with equal care

Deal casements with sash bars cost sornc what less than iron casements. Leaded lights and glazing coat more than sash bars and glazing. Douhle-hung sashes are better for ventilation and are more weather-proof than casements. They are, however, less picturesque and more costly.
Tiles are generally preferred to slates for roofs. They need a stcejer roof and are therefore rather more costly than the commonest Welsh slates ; they look much warmer, however, and time improves their appearance Thick Westmorland or Cornish slates are very bcautiful in appearance, and vary consider ably in shade. Their cost, however, is much in excess of ordinary tiles. Hand-made sandfaced tiles are the best. Machine-made and pressed tiles are not so durable, nor aro they so beautiful. Asbestos alates are cheaper than any other form, but less beantiful Previous to fixing tiles to the roof cover the slope 3 with boarding and felt ; where both make the cost too high the boarding should be retained.

## Internal and External Decorations

With regard to the decorations, where plaster is used in new work, coloured wall. papers should be avoided for a year or two, until the surfaces are thoroughly dry Distemper is the best finish for all new plaster work, and the many shades in which it is now procurable make good decorations easy

Exposed joinery work is usually either painted or stained. The former is generally preferred for lasting effect, but it is more costly. New work if painted should have at least four coats, and all knots in the wood should be treated with a solution known ns knotting, or in due time they will deface the painted work. Enamel is more lasting than oil paint, ns a last coat or two coats
The house illustrated should under ordinary conditions of labour and materials, and providing the site is within fairly ensy reach of a railway station, say, within two miles, be built for about $£ 1,600$ to $£ 1,800$, which allows for good, sound, well-designed and executed work throughout. The cost can be reduced by the employment of inferior materials, but econo mically this is unsound because of the increased cost of subsequent upkeep. Approximatc estimates for a house are generally prepared by means of measuring up its cubical contents This is done as follows: Take the superficial area of the plans measuring to the outside face of the walls, then multiply the result by the height of the building measured from the top of the concrete foundations to half way up the
roof The price per foot cube will depend upon the quality of the materials specified, perhaps Is. 6d to 1s. 9d per cubic ft.

If it is found that the house is likely to cost more than was anticipated, a mere reduction of the size of the rooms will not produce a proportionally lower figure. The whole of the cssentials and more costly work such as stairs. doors, windows, lire-places, bath, and all the other fittings remain in the house precisely as before It will be more reliable, therefore, if the amount of the cubical contents reduced be priced at about one-half the figure taken as the original besis. If it is desired to add to the size of the rooms. the cost then would be increased by the additional cubical contents priced at about one-half the figure taken originally
What a Buildins Contract should Contain
To get the actual cost, the specification should be carefully compiled and invitations extended to several reliable builders to give competitive tenders. Estimates having been received and the builder decided upon, a contract is entered into between the olient and builder. This contract stipulates for the completion of tho house within a prescribed time, in accordance with the drawings and specification, and to the complete satisfaction of the architect. The work is thereupon commenced. During the process of building, the architect issues to the builder certificates for payments on account, in accordance with the contract, which certificates are honoured by his client when received from the builder. The architect, together with his client, selects the fittings required
A well-drawn contract should contain it clause that the builder shall not be entitled th be paid for any extras unless these have been ordered in writing by the architect or by the owner. A careful architect, if he is advising a client on this matter, will always make a stipulation with the builder that the extrey ordered shall be supplied at an inclusive or contract price. If he does not, the builder is entitled to charge a "reasonable" price; and the builder's idea of what is "reasunable" may differ very widely from the idea of the building owner. Out of the neglect to observe this simple precaution of stipulating for a fixed price for extras when they are ordered arise much litigation and consequent cost.
Upon completion of the house the architect certifies to the builder for the balance of the ainount of the contract not previously paid to him, less a bout 5 per cent. of the contract price, which amount is retained on behalf of the client for a period-usually about six monthsduring which time the builder is responsible for all defects arising in his work, and must rectify such defects to the architect's satisfaction beforre the balance is certified as due.

## Architecture: The Small House

## Detailed Description of the Coloured Plans in page 17

The plans and perspective sketch given in the colour plate, page 17, illustrato a small cottage dwelling designed for a family that do not require acconmonlation for a maid. It may be taken as a typical dwellin' for any self-contained family.
The design heing governed by strict ecunumy without undue cramping, every foot of space is thrown into the rooms, instead of being wasted on passages and staircasc. The inain considerations were that both living-room and parlour should look on to the high road, and that the living-room and scullery should also get the morning sun. The bathroom is placed downstairs, and the bath can be filled directly from the copper adjacent, and hot water obtained without the expense of any circulating system
The larder, facing north, opens from the scullery, near the sink and back door, whilat outside, under cover, are the closet and coal
house. The staircase rises between two walls, both for economy and to obviate dirt-collecting balusters, etc Upstairs there are three bedrooms, each with large hanging closet, and on the miniature landing, below the window, is it long cupboard with shelves The walls are 11 in hollow-that is, two $\frac{1}{2}$-brick walls with a cavity betwcen, and whitewashed outside

The problems which meet the designer hero are different from those in a larger building, but certainly no less difficult. He is in most cases bound by the strict limits of economy, and in planning must always bear in mind the need for economy of housework. At the same time many good examples, both new and old, show that charm is the result of care and sliil rather than money.

Is regards the site, this will probably be a compromise between one's own desires and what actually can be obtained. The presence
or otherwise of such services as water, gay electric light, and drainage will greatly affect the price of the land, and, inversely, of the building. The question of sewage disposal will depend upon the nature and extent of the land, prohably by a cesspool or septic system.
Considerinı internal ac commodation and the disposition of rooms. the question of the preparation of food and the elimination of useless walking to and fro will be the main factors. The arrangement shown here-that of a amall parlour, separate from the other rooms, with one large living-roon with range and dresser-is probably the most generally suitable. The adjacent scullery in this case becomes the working centre of the house, and it may be used for cooking if required A small gas. coolier may he provided if gas is available. Sink, Inrder, hot water, fuel, and copper are all concentrated here. If the hath is placed downstairs it must be in a separate room instead of in the scullery, otherwise all the ordinary work of the house must he interrupted every time a hath is taken.

The position of the larder is of importance It should be near the hack door, readily accessible to sink and range, and away from the heat of any flue. A north aspect is best.
The position of hath, sink, w.c.'s, etc., will mean a simple drainage scheme or the contrary. If these, in planning, can he arranged along one side or round one angle of the house, much piping will be saved. If the outside w.c. and fuel store can be approached under cover, especially the latter, it will be appreciated in had weather
In designing hedrooms, not only the position of beds should he considered in relation to doors and windows while in the plan stage but also the possibility of getting a dressing table in a good light before a wrindow.
Much room is often wasted by placing a housn in the middle of the frontage. If it is on a high road, and the light and other services run along this, it nust not be forgotten that the farther it is placed back, to avoid dust and noise, the greater the cost of connexions Externally, the charm of the amall building will be found to consist in simplicity and good proportion: to attempt absolute balance is usually unhappy in result

Brick still remains the most generally satisfactory material for walling. If cost precludes good surface bricks, or the building is in a distriot, such as miany parts of the Midlands, devoid of good brick earth, a good effect may be obtained by slightly raking out the jointe and covering with two coats of limewhite and Russian tallow, or one of the many substitutes now on the market. If the situation is at all exposed, it is advisable to build the walls hollow, that is, two $4 \frac{1}{2}$ in. brick walls with an air space between, bonded together by galvanised ties.

Roofs may be of tiles, slates, straw, or reed thatch. This last makes an excellent and warm roof with a life of 70 years or more. Straw thatch is cheaper and looks neater at first, but has a shorter life and is liable to fire.
As to windows, whether these are of stecl or wood, the main consideration is their proportion and placing. In considering the interior, light and simplicity should be aimed at. Plastering, for instance, if done with a wooden toat and left with a granular face, presents a
delightful suplace without the addition of paper or distemper of any kind In all simple huilding, and especially in the cottage, the three essentials are yond materials, good plan. and good proportion. The first two will give a sound and cconomical building, while the third will add an unconscious charm th the hoine.

ARCHITRAVE. The moulding employed for fixing around doorways, windows, etc., is known to the buikders as the architrave It is made in a variety of patterns, and in sizes 2 in . by $3 \mathrm{in}, 2 \frac{1}{2} \mathrm{in}$. by $\frac{\mathrm{in} ., 3 \mathrm{in} .}{}$ by $1 \mathrm{in} ., 3 \frac{1}{2} \mathrm{in}$. by 1 in . See ()oor.

AREA. Thic area of : house is the suntien space before the basement found in the older class of town houses. The basement is approached from the area, to which a llight of steps leads from the street. It is important to see that the arca steps are in good repair, while a watch should be kept upon the fittings of the gate that guards it See ljasement

ARECA NUT. This is the seed of the betel tree and resembles the nutineg, but is harder and red in colour. The powdered nut is used as a remedy for tapeworms in dogs, the correct amount being estimated as two grains for every pound of the dog's weight. It is not advisalile to give the powder to puppies under six months. Areca nut powder loses its strength on keeping The grantity to be administered to the dog is hest mised into a paste with a little butter. The remedy is not safe for cats. Pron. A-ree'ker or Arry-ker.
ARM : Fractures and Care. Extending from the shoulder to the hand, the arm is described as the upper arm abuve the ellow and the forearm below. The former has one honc, the humerus, and the latter two, the radius and the ulna
Fracture in any of these situations will be marked by pain, perhaps a sense of snapping,
detormity, and loss of power in the limb First-aid treatment consists in pulling on the lower fragment of the bone and the application of padded splints These are upplied on the outer and inner sides of the upper arin for fracture of the humerus and when one or both hones of the forcarm is broken, this is hent. to a right angle at the elbow. in a position midway betwren pronation and supination (that is, with the thumb Iooking upwards), and the splints are applied on the front and back of the limb, reaching from the elbow to beyond the wrist In fractures of the upper arm a lesser arm-sling is used, that is to say, the weight is taken on the wrist only. but for fractures below the elbow a greater arm-sling is put on, thus supporting the whole forearm

## Beauty Cultare for the Arms

For improving the colour, texture and shape a simple night treatment is as follows

Rest one hand, palm downwards, on the edge of the bath and with a loolali or mubber friction glove on the other hand, st roke firmly in one sweep from fingers to shoulder, returning down the arm with a light touch. Repeat the movement several times, apply to under side of arm and then treat the other in the same way. Sponge with warni water and while wet spread over the skin enough toilet almond meal, first nixed to a stilf paste with extract of witch hazel, to cover hands and arins. Leave on till quite dry, then brush off and gently massage the arms with this creain

Coconut oil, castor oil, swect almond oil, cach 2 oz .: hydrous lanolin and white vaseline, each 3 oz Melt together the coconut oil, lanolin, and white vaseline in a jar placed in hot water, stir in the enstor and almond oils, perfume, and allow the mixture to cool.

Should the arms be sore from exposure the cram only can be used without friction or massage for a few nights, smearing on thickly and leaving to soak in, covered liy a pair of old long white gloves, with finger-tops cut off. Ugly elhows can be iniproved by massaging with the palm of the hand each time an emollient is used for arms or face.

A safety razor for the armpit is more sensible than the use of depilatories (hair removers), which sometimes cause irritation See Bandage; Beauty Culture; Dislocation; First Aid; Sprain: Strain

## ARmCHAIRS: HOW TO CHOOSE \& HOW TO MAKE

## Antiques for the Connoisseur and New Chairs for Home and Garden

The first English armchairs were of solid wood and hox-seated. Often the backs were adjustable as tables and the wood oak. Many Tudor chairs were carved, had leather seats and low backs, legs and stretchers turned. Jacobean chairs were inostly high straight. backed, with scrolled carv. ing extending on the arms well beyond the suppiorts Late Stuart ahairs were luxuriously upholstered. and walnut was used in. stead of oak, as the former wood can be more finely carved. Cane


## Armchair by Repplewhite in walout, with shaped back and Prince

 of Wales's feathers splat Fictoria \& Alvert Museumpanelled backs ivere introduced witlin the framework of carved wood. Upholstery was kept within the hack framework, but often carried over the sides and finished with fringe or a hraid. Arms were not padded.

With the Queen Anne period came the fully upholstered winged armchair, needlcworked or tapestry-covered, with cabriole legs and delicate stictchers, loth turned and carved. In the great designer Chippendale's work a French influence is apparent, which continued throughout the Georgian periods of Hepplewhite, Sheraton and Adam, introducing inore refinement, well balanced frames and beautiful decoration and upholstery

Modern chairmakers either hase their work on these classical designs or break away completely with the lounge and divan types fully upholstered, springs being used in seats and hacks and also sometimes in arms

For garden, bungalow and bedroom armchairs, fine examples in canework are also made, while designs are also carried out with metal framework and proofed fabric upholstery.

Many inodern armchairs are upholstered all over. Some have mercly an upholstered seat, or seat and back, or perhaps havc padded arms as well. Others are hare wood. The chen pest variety are of wicker. Another kind.
costing a little more, is of cane wound over mortised in $d$ in. down from the leg tops sо a slender wood framework. After these come as to leave a space of $\frac{1}{2}$ in. each side of the rail the comparatively heavy and substantially built chairs of the cabinetmaker
The wood used may be oak, mahogany, birch, walnut, or beech. In a cheap class of chair, dcal may be employed for parts that aro covered by upholstery. A covering of moroccu leather is the most expensive, but it is durable and retains its colour, while roan leather is inferior Mnet of the imitation leathers are very good they consist of linen or duck coated with a composition. Other coverings are velvet, tapestry, cretonne, and linen. Tapestries may be wool, silk, or mercerised.
Best quality curled horsehair is used for the more expensive chairs, being more springy than any other kind of stuffing. Vegetable fibre resembles hair, and is often empluyed in combination with it Flok on coverings vary in quality. Springs are used in the seat of an armchair, sometimes in the back, and occasionally for the arms, other parts being padded only.

Adjustable Armchairs. The armehair shown in Fig. 1 has a movable scat and back, with separate cushions, and can be made by the amateur woodworker. The four legs should be prepared to $2 \mathrm{in} . \times 2 \mathrm{in}$., cut off to 2 ft . $\frac{1}{\mathrm{i}} \mathrm{in}$., with the lower ends trimmed off to $1 \nmid \mathrm{in}$. square. The rails are 1 ft .11 in . long, with tenons cut off $\ddagger \mathrm{in}$. on one side only and left $1 \frac{1}{2} \mathrm{in}$. long.

Fig. 2 shows details of construction. The top rail is 2 in . wide and 1 in . thick, and


Armchair. Modern easp chair upholstered in
Cordon a Rusoen, Lid.: Dhoto W' Denmis Mose
with it. Flock of various kinds and qualities is the tenon is Hlush with used, alone or with wood fibre or wood wool, mortise in the arin-pieces should be set bhe or a dried seaweed called Alva. Canvas in. to bring the back rail flush with the ends. sill tateta


Apmehair. Carved walnut ohair said to have belonged to Rell Gwyane. Charles II period in. to bring the back rail flush with the ends. Two rails, each $2 \mathrm{in}. \times 1 \mathrm{in}$. and 2 ft . long, should be tenoned into the scat rails and run from front to back 1 in . away from the legs. These lengths provide runners for the seat frame, the tenons being $1 \frac{\mathrm{in} .}{} \times \mathrm{i} \mathrm{in}$. The two sicle frames should now be glued up with very hot and thin glue.
The seat frame is composed of two sides, $1 \mathrm{ft} .10 \mathrm{in} . \times 2 \frac{1}{2} \mathrm{in} . \times$ 1 in., two ends, 1 ft . 8 in. $\times 2$ in $\times 1$ in., and four rails, 1 ft . $8 \mathrm{in} . \times 1 \frac{1}{2} \mathrm{in} . \times 1 \mathrm{in}$. The ends should be tenoned into the sides and the rails into the ends, all tenons being ${ }^{3}$ in. thick, and full width, with the ex. ception of the front and back, which should be $1 \frac{1}{b} \mathrm{in}$. wide. For a distance of 9 in . the front of the scat frame should be cut back $\frac{1}{1}$ in., to allow of it sliding between the front legs The back is composed of two sides, 2 ft .6 in . $\times 2$ in. $\times 1$ in., and six rails each $1 \mathrm{ft} .6 \mathrm{in} . X$ $1 \frac{1}{2}$ in. $\times 1$ in. with the exception of the top and botton rails, which are 2 in . wide. The seat and back frames should be hinged and fit easily in position.

In some adjustable chaira the hinged back frame rests against a hardwood or metal rod which lies in slots cut in the arms, as shown in Fig. 3. The back.
ward slope can be varied by changing the rod from one pair of slots to an. other. The cross rail which ties the arms to. gether forms
 a secondary support for the back frame, should the rod become dislodged.

The arms for a chair of this kind are shown in plan in the illustration, which also clearly indicates the shape and arrangement of the slots. Four slots are cut in each arm, 1 in. widc at the top and 8 in high by in deep, cut on the slope in the manner shown. The slots are I in. a part.

The cushions are both 1 ft .8 in . wide and 3 in . thick, one being 2 ft .3 in . and the other 1 ft .10 in . long. Two bags should be made of hessian to these dimensions, and filled with either horsehair, fibre or flock, and sewn at intervals of 4 in . all over to keep the filling in position.

The covers should be made separately and fitted on, but they may bo buttoned, especially if made of imitation leather or tapestry. A better decorative effect is given if cither brown velvetecn or hair seating is usod for the cushions, without buttoning. and the edges piped. Closely woven tweeds in tones of beige, piped with imitation brown leather, or heavy corded fabrics in geometrical patterns are suitable to the lines of this framework The seat and back may be upholstered direct, and in this case the inner rails of both frames should be omitted, and webbing used instead.

Garden Armchair. Fig. 4 shows a comfortable garden armchair. It should, if possible, be carried out in oak, but any of the harder whitewoods may be sub. stituted. The chair is as suitable for indoor use as for the garden, and, fitted with loose cushions, it will make a comfortable seat for the sitting.room or library. A feature of the design is that the legs are not square posts, but are of $2 \mathrm{in} . \times 1 \neq \mathrm{in}$. section.
The construction is simple and straightforward, and is shown in detail in Fig. 5 . The legs may be tenoned right


Fig. 2
Armchair. Fig. 1. Adjustable armchair with movablo soat and back Fig. \&. Working drawinga giving measurements and dotails of joints employed

The seat rails and back rails arc tenoned in the usual way, while the strut rail, the side slata, and the back slats are rebated in. The seat lathe are nailed on, and the side slats may be nailed or screwed to the side seat rails. The arm is tenoned to the back leg, and is secured to the front leg by means of a stubtenon.


The wood required is shown in inches in the above list. The lengths quoted allow for joints and paring, but all the thicknessey given are strictly net.
ARMORIAL BEARINGS. An Englishman may legnlly assume any armorial hearings he pleases. Thus a chimney sweep from Whitechapel can, if he pleases, assume the arms of the Stanleys, tho Grosvenors, or the Howards If, however, he has them painted on his carriage, he pays two guineas a year tax, and if he displays them in any other position, e.g. on his notepaper, he must pay onc guinea a year. If a man is left an eatate on condition that he assumes the name and arms of Blank, his best plan is to apply for a royal grant of the name and arms, whioh will probably be issued, but he will pay fivo. He may get the same royal licence on a voluntary application for $£ 10$. If he covets armorial bearings, and applies for the water garden and is a good plant to the crown or the College of Heralds for garden, but the water should a grant of a coat of arms, it will also cost him $£ 10$ The penalty for displaying arms on a carriage or elsewhere without paying the tax is a fine of $£ 20$.
ARNEBIA. The best known species of arnebia is echioides, a hardy perennial from Armenia. It is about 12 in . high, and produces yellow Howers in May. Each blossom has five dark spots, fabled to be the marks of the fingers of Mahomet, bence its popular name of the Prophet Hower. It is a ouriosity for the rock garden (q.v.) Pron. Ar-nco'-bi-a.
ARNICA. The flowers and root of Arnica montana are employed in making preparations for bruises and sprains. Arnica flowers are to he preferred to th:e root for the purpose.
Tincture of arnica is made by soaking an ounce of arnica flowers in half a pint of weak alcohol or brandy for ten days, then pouring off the liquid. Squeeze the Howers in muslin, so ns not to waste any of the tincture.
To make a lotion for sprains and bruises mix two tablespoonfuls of this tincture with enough water to make one pint of lotion.
Arnica opodeldoc is a bandy form for rubbing purposes. It is made by mixing
Soup
402
Couphor
1
5
502
02
02
Tincture of arnica
Strong alcoliol
10 oz
Carefully heat together until dissolved. It seta to a jelly when cold. To ure it rub a small quantity in until the paste disappears.
Aralica should not be used on braken skin, as a disagreeable rash may be produced
ARRAS. Named after the French town, the original Arras was handworked tapestry
 of the room, leaving Corntlour.

ARROWROOT.
A pure starch powder, obtsined from the maranta plant, grown in the Weat Indies and Bermuda. English arrowroot is prepared from potatoes. It is $\boldsymbol{\pi}$ valuable invalid food, being easily digested in cases of gastrio irritation. 'lo prepare, blend a dessert. spoonful of the powder with two tablespoonfuls of milk or water, and pour over it half a pint of hoiling milk or water. Stir briskly, then add a teaspoonful of sugar. If ordered, a teaspoonful of hung before the wall hrandy or cream can also be added See

ARROWROOT BISCUITS. Sieve $\frac{1}{\mathrm{lb}}$. of arrowroot together with $\downarrow \mathrm{lb}$. of flour and a dcsecrtspoonful of sugar into a basin and rub into them $\ddagger \mathrm{lb}$. of butter until the misture is free from lumps. The whole should then be formed into a stiff paste with the nid of a beaten egg, and, if necessary, a little milk. Knend the paste well, and when smooth roll out very thinly on a floured board. Cut into shapas and bake until golden brown in colour.

ARROWROOT PUDDING. Mix two dessertspoonfuls of arrowroot with a little cold milk, hoiling what remains from a pint of milk, and pouring it over the mixture. If the latter does not thicken immediately the arrowroot is not aufficiently cooked, and the whole necds to be hoiled up in the pan. After adding a dessertspoonful of sugar, leave the mixture to cool ; then add the yolks of two eggs and lastly beat
 age whites of froth, folding them lightiy into the mix. ture. Turn the pudding into a thickly buttered dish, and bake it in a fairly loot oven for a little more than half an hour.
ARSENIC. In medicine, arsenio is hest known in the form of the oxide or white arsenic : it is used in anaemia, and also as a general tonic. A favourite preparation is Fowler's Solution or Liquor Arsenicalis Arsenic is very useful in the debility which results from malaria. It is found in rat poisons and in weed-killer.
Arsenic Poisoning. In cases where an overdose of arsenic has resulted in acute arsenical poisoning the chief symptoms are vomiting, continuous diarrhoea, abdominal pain, and great weakness. Give the patient emetica of warm mustard and water (a tablespoonful of mustard to half a pint of water). The antidotes for arsenic are dialysed iron, tablespoonful doses in water every tén minutes, or magnesia given freely in water. Iater give the whites of two eggs beaten up in a glass of equal parts of milk and water. The patient should be kept warm in blankets,
with a hot water-bottle at the feet. Nothing but milk should be allowed for the first week after recovery

The earliest symptoms in chronic poisoning may be cold, running eycs, sneezing and cough; or there may be loss of appetite, nausea, romiting and diarrhoea. Itching of the eyes is a usual sign when a person is taking arsenic that the dose should be reduced More serious effects are observed-inflammation of nerves leading to weakness and unstendiness of the gait, arop-foot and drop. wrist, and increased sensitiveness of the skin.

The only treatment of any avail is to remove the patient from all possible contact with arsenic, and to build up his general health by some tonic, such as Euston's syrup, $\frac{1}{2}$ to 1 teaspoonful in a little water three times a day after meals, while nature expels the absorbed arsenic from the syatem. If the digestion has been greatly upset a very light diet, consisting chiefly of milk, milk puddings, custards, etc., is necessary Where there is the slightest suspicion of ohronic poisoning the advice of a physician must be songht. See Antidote; Poisoning.
ARSENICAI SOAP. This is a paste employed by taxidermists for preserving the skins of hirds and animals that are stuffed and mounted. Its use depends upon the fact that arsenic is a very powerful antiseptic and preservative, but its poisonous qualities render it necessary to use it with great care The paste or soap is made as follows:


It should be mixed in a inortar.
The charcoal gives the paste a grey colour that prevents it being inistaken for $a$ harmless preparation. The soap is used by spreading it on the inner side of the bird or animal skin it on the imner
See Taxidermy

ARSON. This word is used in Finglish law for the wilful burning of a house helonging to someone else, or of a place of worship, public building, or building owned by a public company. Arson in a felony. See Fire ; Insurance

ARTHRITIS. Term used by medical men for inflarnmation of a joint or joints. See Inflammation; Joints: Rheumatoid Arthritis.

ARTICHOKE : To Grow and Cook. Plants belonging to threc different genera are grown under the name of artichoke in Great Britain, namely, the true or Glove Artiohoke, Cynara scolymus; the Jerusalem or tuberous Artichoke, Helianthus tuberosus; and the Chinese Artichoke, Stachys tuberifera.

Jerusalem Artichoke. The plant is a hardy perennial, growing from 8 to 12 ft . high


Large patch of jerasalem artichokes, growing to well over 6 ft. high, showing their close resemblance in foliage and growth to giant sunfowers
in a season, the stiff green stem, without side branches, bearing roundish rough leares on short stalks The rootstock is tuberous. In the common species, the tubers are pink, very numerous, and varinble alike in size and shape. Each plant will produce from half a peck to a bushel of tuhers per annum. The white-tuber variety is superior in llavour to the other kinds.

Planting should be done in early spring and the sets covered 4 in deep. They may be planted about 18 in apart, rather more in rich soil A light hoeing up of the soil over the tubers once or twice during the summer is bencficial. In September the plants ceasc extension and the leaves lose colour and droop The stems inay be cut down in October. From that time the tubers may be taken up at intervals for use as required The plant enjoys a liberal dressing of decayed manure In fertile soil the smallest of setw or secdtubers will produce a strong plant and a heavy crop.

Globe Artichoke. This is a perennial and the young flower-head forms, with the fleshy receptacle, a close ball, globular in shape ; it is this which is the edible part. Scedsmen usually list at leart two varieties-the Green Glolve and the Purple Globe : the seed may be sown out of duors in spring in a drill and covered with an inch or so of soil. The scedlings should be thinned and planted out about 4 ft . apart when strong.

Thuse who have established plants can get strong plants from suckers In each case


Artichoke. Tubera of derualem or white artichokes ready for cooking
Photo from Sulton if Sons
three or four shoots should be left on the old plant. Those removed should be set 3 ft . apart, with 4 ft . between the rows, and bedded firmly in with moist soil.

The stage for gathering the globe is when the scales begin to spread and before the flowers have tinie to open: a portion of stens should be taken with each. When all have been gathered the stems may he cut hard back, together with the decayed leaves, and the soil round the plants mulched with fine ashes, seawecd, or stable litter In colld districts the soil ought to be ridged up over the stools and litter thrown on. In spring a dressing of manure may be given. After the fourth year the plants, having hecome exhausted, should be replaced by fresh stock.
The Chinese artichoke is an edible. rooted species of Stachys, growing alout a foot high The tuber ranges from 1 in . to about 3 in. in lenght and may aver. age an inch thick at the centre. The fiavour rescmbles that of the Jerusalem articholie.

Medium sized tubers are selected in spring and planted 3 in . deep and a toot apart in rows 18 in . asunder. Any well-drained soil will do, but it should be friable. Fresh manure is not desirable. In autumn the tuhers should be lifted and stored in dry sand.
How to Cook When Jerusalem artichokes arc peeled place them immediately in a bowl of water to which a little vinegar has heen


Artichoke. Basket of young fower-heads of the globe artichoke
Plioto from Sutton t Sons
added or they are apt to become discoloured. Have ready a pan of boiling salted water, add a little vinegar, put in the artichokes and boil gently for about twenty minutes. They break casily, hence the water must not bil too fast. When the artichokes are tender, drain thent, place in a vegelable dish and send to table well covered with white sauce
Jerusalen artichokes may be mashed if preferred. When builed, rub them through a fine siere, Havour with butter, pepper and salt, add a little cream and heat up in the oven.

To make artichokes and checse, boil six artichokes till tender, then mash then with a fork, and add pepper, salt, lemon juice, and some cayenne pepper. Place a layer of this in a small pie-dish, then a little grated cheese, and then a little more of the artichoke mixture. Scatter hreadcrumbs and cheese over it, bakc for 10 min . in a quiok oven and serve very hot. This is sufficient for four persons.
Globe artichokes are served as a separate course, usually after meat, with either a sauce made of equal parts of oiled butter and lemon juice or sauce Hollandaise (q.v.) Only the lower portions of the leaves and centre of globe artichokes are edible.

Before boiling take off coarse outer leaves and cut away the stalk. Wash thoroughly to remove any grit or insects. Place the arti chokes in boiling salted water, head downwards, and boil quickly without putting on the lid of the pan for about half an hour Drain in a colander and arrange in a diah, tops uppermost. The sauce is sent to table in " sauce-boat and not poured over the vegetable as with Jerusalem artichokes.
ARTICHOKE SOUP. Also known as Palestine soup, this requires 2 lb . artichokes, 1 small turnip, 1 onion, $\frac{1}{2}$ pint milk, 2 pints white stock ( 2 h pints milk if a meatless soup is preferred), 1 small head of ce!cry, t oz Hour, 1 oz margarine. Pare and wash the vegetables, cut up and boil gently in the atock till tender. Melt the margarine in a separate anucepan, stir in the flour and add milk, stirring till the thickening is smooth. Rub the vegetables through a sieve, return to the stock, add it to the thickening, seasun to taste and hoil up Serve very hot with dice of fried brearl Sufficient for five persons.

Artifcial Fertilisers. This term is used for manures manufactured by the aid of chernicals. See Fertiliser

## Artificial Flowers: How Amateurs Can Make Them

Using Materials of Many Kinds for Dress and the Decoration of the Home

Related information will be found under the particular materials used, e.f. Paper;
Raffia; Shells; Silk, ete.
Made of shells, fish scales, glass, knitting the tup of the petal and blend with a little yains, rnfia, ecraps of sill;, cotton, velvet or mauve from the base, where afterwards a small folt, of crépe puper and of lentlier, artificial llowers of all kinda can lie selected for dress, lancywork, table and Christmas decoration.
Nhells and glase lend themselves to original and striking designs for conventional vase sprays and for Horal treas of the weeping willow type on solid glass blocks and fanny stands. Glass flowers are brittle for personal wear, though ured in small posies, and shell flowers are rather stiff Fish scales are light and adaptable for this purpose For shell and glass flowers. leaves of the same material have a

better elfect than the ordinary artilicial fuliage hud all the petals would be pierced on the thin which is often used Mother of pearl shells, top edge A specinl calyx is obtninable for a which do not require tinting, are sold from ls. rose and double-ended yellow stamens a dozen (prices vary according to required size), miscellaneous shells from is a pound, and fish scales ahout ls an ounce. French enamel varnishes are suitable for colouring all shella and ecales, and cost 9d a bottle. These can be intermixed to obtain other shades and removed or lightened in colour by use of methylated spirit. Leaves and petals are supplicd in crystal or in coloured glass for a few shillings a hundred Where a pearly sheen is liked on glass Howers, a mother of peail solution is obtainable, to coat the petals.

Besides these materials, flower centres, varieties of stamens and folinge, stems, wire, brown or green gutta percha, various liinds of calyx and tuols for piercing shells can be obtained or ordered at art shops and art depart. ments in stores Small camel-hair brushes: are best for tinting: clean them with methy. Iated spirit after using the enamel varnish

## Anemones Made From Shells

Anemones are effectively made in shells and are easier to taclile than roses, water lilies, canellias or apple hlossom, though all these flowers are suitable for this work. Select fivo shells the required size of anemone petals. pierce, from inside, the thickest part of the shell where the linge is, with two holes, a quarter of an inch apart, thread with wire, working from inside shell. Wire the five thus, and then colour For a red anemone, a brushful of crimson enamel varnish would start from
dab of black should be used, as seen in the natural flower. The painted shells will dry in about five minutes. Both sides nust be coloured and various tints will be suggested by the real Howers for sufficient blooms to make an effective vaseful. Have at hand a littla cotton wool and dab off colour if wrongly a pplied.

Talie an anemone centre, Rurround witl stamens (ready made), wired together and spaced evenly round the centre, and then wire to a piece of galvanised wire for the stem Next wire the colnured petals to this stem by the wires already fixed to them Green sealing wax may be used to hide the mass of wires bencath tho petala After a short piece of rubber tubing has been pushed up over the wire stem a special readymade anemone stem is used to whioh short leaves, as found on the real flower, are attached This should be gummed on to complete thic flower.
By piercing the shells at the thin top cdge incurving petals are obtained. Thus, when making a rose or a water lily, the central petal shells are pierced at the thin edge and the outer or open petala are pierced, as in the anemone described, at the hinge side For a

Natural twigs are often used for almond or apple hlossom, gutta percha strips in a matching colour concealing the wiring of the bloom

to the twig. For large leaves, flat sun shells are obtainable from 3 to 4 in in diameter, and can be cut with special cutters to the desired shape and coloured after piercing.

With large shell Howers, rattling of petals caused by too loose wiring must be carefully avoided. Glass flowers are made in the same manner as shell, hut gold, silver or silk-covered wire is used For heavy flowers or tree elfects the stem wires must be extra stout.

Fish scales are good for making small Howers when an enamelled effect is liked for millinery purposes One side of the scale has a satin finish and should be used for the unper sidos of petals. These can be curled round on a knitting needle if desired, cut to shape with scissors and holes pierced for wiring with a stout needle

## Fish Scales Used for Violets

To make violets, select five fish scales, four about the size of a sixpence and one of a three-penny-piece: cut five lengths of wire, 7 in long, wire up the scales, and then colour both sides with violet enamel varnish. Talie a violet centre and arrange the coloured petals, two at the top, one at cach side and the small one at the bottom, overlapping. Twist the wires of the petals together firmly to make the stem foundation. Bind a narrow strip of green gutta percha round this and finish. Ordinary artificial violet leaves may be used, or leaves cut out of green suede, to complete a bunch of a dozen violets tied up with raffia

Wool or ohenille flowers for attaching to knitted work or for posies are usually very simple, effect being obtained by the use of bright colours. A wool needle may be threaded with the yam, a loose knot marle and loops worked with this, overlapping each other all round About $n$ dozen loops of wool should suffice. The centro is formed either with a bought flower centre with a wired stem, or by attaching the flower to the article to be trinmmed with French knots of wool in a contrasting shade Leaves are easily erocheted to


Artifcial Flowers. Left. glass camellias with glass leaves. Right, conventional flowers, buds and leaves made in glass and stack in sand. Above is a flower greatly enlarged to show the details of construction
shape and wired if necessary, or cut-out lelt leaves may be used for a posy.

Raffia llowers usually start with a eanvas foundation, from which the loops of raffia may he worked Daisy-like Howers (Fig. 1) can be


Artifcial Flowers. Narclasi made from shells, the leaves being of cardboard covered with green raffa
The rose is also in shell
made on a circle of canvas rather larger than a penny with an inner circle marked the size of a farthing. To start, thread a raffia necdle with the selected colour and darn into the canvas to a void a knot (Fig. 2); from the centre circle edge make a loop 1 in . in length, taking the needle back close to the starting point (Fig. 3). Pass the needle under the centre circle, bringing it out opposite loop iust made. Take needle back again, leaving a similar loop making it as olose as possible to the first one, and continue all round till the circle of petals is complete.
The centre may be of looped yellow wool or small wooden beads sewn on the canvas. The back is finished off by cutting away the canvas near to where the petals start and covering with green raffia in loops until the remaining canvas is hidden Through the hack, wire is passed to form the stalk about 8 in . long Use double wire and wind round with brown raflia. To keep the raffia in place, pass it through the Hower, when it may be bound with a little brown cotton. Wire in an occasional loop of green raffia on the way duwn the stalk, as shown in Fig. 3

## Flowers of Ribbon, Silk and Paper

Narrow ribhon flowers can be made in the same way. Circles of felt, skiver or suède, with slit edges, in diminishing sizes, form conventional asters with brad llower centres and wired atalks covered with gutta percha or raflia Noie ambitious leather flowers require a know ledge of tooling and use of leather implements (see I eather Work).

Simple shapes for cutting out Howers in silk, cotton or crếpe paper are shown in Fig. 4. Ready-made stems, centres, stamens and leaves can be used if an attempt at natural flowere is desined. After cutting out, if the petals are to be coloured, it is a good plan to pin material to white blotting paper, wet slightly with clean water on a sinall sponge, and tint with water colour to which add a little gum. Aniline dyes are quite useful for this purpose.

In using crêpe paper for decorative flowers suitable for Christmas, cut the paper with the grain, use as little adhesive as possible, and allow pasted petals, etc., to dry before using then. Fold the paper into several thick. neasers so that several petals or leaves may be
cut ont at onc time, draw or trace design oll top fold and use a sharp pair of cissors.

To make a daffodil or a bell flower, turn down the end of a wire and cover with the paper to make a small head on to which to fix six stamens, each made from a square inch of paper, twisted tightly between the fingers to form a thread. Cut the bell or cup three inches square and join with paste. Turn the top edge slightly over, stretching the paper a little. Put over the centre of the llower and bind with fine wire. For the daffodil cut six petals and also bind these with a sheath of brown crèpe, pointed at one end, at the hase. The bell Hower is finished underneath by a calyx cut from a circle of green paper into points. Stalks are bound with crêpe.
Many variations on these schemes will soon suggest themselves. Glass beads may be used for hlossoms with shell or glass leaves, and effective llowers can be made of American cloth with wool or bead centres.

## ARTIFICIAL LIMBS: Their Care.

 The sockets of artificial limbs (those portions which enclose the stumps or remains of the lost limbs) are made of wood, composition such as celluloid and certalmid, etc., or of metal such as alu. minium alloy. They should fit the stump accurately.For the sake of cleanliness the socket should be sponged out with warm water and then carefully dried with a cloth, at the end of each day's wear. In the case of a wooden socket, if the varnish has been rubbed off, it should be renewed; if the surface of the wood is rough or uneven it must be smoothed down with fine glasspaper before the varnish is applied.
Mctal jointa, except those which have leather bushes, should be kept lubricated with oil. If from wear they become too louse so ns to rattle, or allow improper movement, they will nead repair or renewal by the limb maker. The joints which are usually bushed leaving his hands flat against the patient's with leather are the knee and the ankle. The side. The tirst part of the movement should Ieather which is used for this purpose is occupy the time necessary to count slowly thoroughly impregnated with grease, and needs $1,2,3$, and the second, 1, 2. Care nust he no additional luhricant. When a hushed exercised that the handa are actually on the joint becomes too loose it must be Tehushed by the maker.
In some of the older pattern legs the anklejoint is of wood of the mortise and tenon type, connected by means of a leather-bushed bolt. When these joints become worn so as to allow of undesirable side play, they must be rebushed and packed. These joints are usually controlled by tendons and steel spiral apprings.
In the standard types of limbs generally supplied by the Ministry of Pensions, the ankle

Artifcial Flowers. Fig. 1. Daisy made in raffla. Fig. 2. How to start making the flower. Fig. 3. How the petals are formed. Fig. 4. Simple stapes for cutting out fowers in silk, cotton or crêne paper
joint is fitted with ruhber bulfers, which are compressed by tightening two nuts in tha sole of the foot. If adjustment of these nuts fails to make the ankle movement satisfactory, it is probable that new rubber buffers are required. The foot is easily detached when the nuts and locking plate have been removed Certain limbs are fitted with rubber feet. All others have a separate toe-piece, hinged on its lower edge and having ateel or rubber compression springs whioh maintain extension

As a rule, wearers of artificial limbs should not attempt to take them to pieces themselves, as apecial tools are needed and special experience to reassemble the parts. Oil gradually disintegrates rubber, and carc must be talien to prevent ite coming in contact with the buffers

ARTIFICIAL RESPIRATION. 'I'his is a method of reatoring breathing in cases of drowning, gas-poisoning, etc., by alternately expanding and contracting the patient's chest, so that air is draun into and expelled from the lungs. The method usually enployed is Prof. Schiffer's. The subject should lee placed face downward on the ground, with the arms stretched out in front, and the face turned to one side. The operator kneels astride or sometimes beside the prone body, facing the head, his knees being ahout the level of the unconscious man's hips. He then places his hands, one on each side of the patient, over the lowest ribs, with the thumbs parallel and nearly touohing. Leaning forward and downward, he presses the base of the ribs upwards and inwards

In this movement tho arms should be kept quite straight. The result is that the air is expelled, and any water in the lung tubes is pushed out through the nose and mouth. At the end of the movement the rescuer swings back into

Artifcial Respiration. In Schaler's
method the ribs are alternately commethod the ribs are alternately compressed (2) from behind and released pressed (2) from behind and released
(1), this last causing chest expansion

 ribs, 凤a seen in the illustrations, and not down on thic loins.

The whole double movement, consisting of the pressure forward and the withdrawal of pressure, should take alnout five seconds. and should be continued rhythmically until the patient shows signs of recovering consciousness.

When the patient legins to breathe by himself, artificial respiration may be discontinued and the operator should now turn

his whole attention to stimulating the circulation by various means

As soon as possible, in a drowning case, the patient's wet garments should be removed and lie should be wrapped in warm llannel blankets, and carefully protected hot-wate bottles or bricks warmed in the fire should be placed in the armpits and against the soles of the feet. The arms and legs should bus vigorously rubbed, always in the direction towards the body, to force the stagnant blood back to the heart.

After the patient is sufficiently recovered to swallow, a little hot water may be given, or small amounts of heart stimulants, such as a teaspoonful of brandy in warm water ot a small cupful of hot, strong cotfee or tea, or a teaspoonful of ammatic spirits of ammonia in a small wincglass of water.

ARTIFICIAL SILK. Artificial silks are made by different processes, and there are various qualities. They are made by forming artificially a gelatinous material, hardened in contact with air or in passing through a trough of hardening lluid. This jelly-like compound is obtained by dissolving raw colton or wood pulp For artificial silk it is made into fine threads by being forced through minute holes, and endless lengths of filament are thus secured. Usually about a dozen of these are twisted lightly together to compose $\Omega$ single thread for machinc-knitting or weaving. In the ordinary thick 2-ply cord used for knitting there are generally about 24 of such threads and nearly 300 origınal filaments.

Short-fibred artificial silk can be spun like wool or cotton, and certain mixed artificial silk and wool kuitting varns are mado by hending the two materialis together, when the bright silk speckles the yarn.
A good point in artificial silk for lurnishing fabrics is its brightness of surface, and this varies with the amount of twisting received in making the ultimate filaments into yarn. 'light twists wear better than slack ones, but they make the thread wiry and less liexible. To reduce the brilliance and obtain a crêpe-de-Chine lustre, several fancy-twisted knitting cords are made.
Reckoned per 4 oz. hank, artificial silk is cheaper than real silk, but it is not actually so much cheaper to use because it is heavier than natural silk, of which fewer hanks are required to knit the article. Artificial silk should not be knitted or crocheted too tightly or with ton fine a necdle.

Artificial silk can be distinguished from natural by touching an end of thread with a match fame. The artificial will burn frcely with a white flame, leaving little ash behind. Natural silk is nenrly non-inflaminable. The Hame does not run and the ash forms itself into a knob and at the same time a slightly unpleasant smell is emitted

Care must be exercised in washing. Tepid water should be used and a pure soap. On no account should the article be mangled. After rinsing, the excess of water may be gently squeezed out inside a towel.

Artilicial sills made by different processes behave differently in the dye bath, and an experiment should first be made by dyeing a sample of the material.
ARTIFICLAL SKIN. Collodion, or a preparation like it, is used to paint over fresh, clean cuts or hacks to protect them from irritation or infection. These preparations should not be used where the wound is dirty or discharging, as harm is done if the discharges are jent up See Collodion.

## ARTIFICIAL TEETH: Their Care.

 Kinowledge with regard to the care of sets of artificial tecth or dentures is necessary on account of the different nature of the material coinposing the teeth, and the base or plateto which they are attached. The artificial tceth or porcelain part should not be rubbed by anything in the nature of a tooth powder, ntherwise the translucency and polish of the enamel may be lost or injurd. When the surfaces of the tecth beconie discoloured, they should be well rubhed with the forefinger covered with white muslin moistened with soap and water.

The plate to which the teeth are attached may best be cleaned with $\pi$ amall tooth. biush and whiting, special attention being given to hollows and crevices. Time and trouble are avoided by placing the denture at night in water to which a few drops of antiseptic have bcen added. By moining matter which is apt to adhere tenaciously to artificial platea is casily removed.

The difficulty of koeping gold plates and clasps bright is greatly overcome by putting them into a chlorinated antiseptic. Special care is necessary in the cleansing of bands or clasps and the parts in direct contact with the natural teeth.
Artificial teeth should almost invariably be taken out of the mouth overnight. ParticuInrly is this necessary when anme natural tenth are still present. In addition to the cleaning of the denture in the morning, it should be rinsed after every meal. Artificial teeth are fragile and easily broken.


Arum Lily which has produced a considerable number of blooms although grown in a small pot
ARUM LILY. In spite of its naıne this beautiful plant, with its rich, green leaves and pure white llower spathe, does not belong to the genus Arum, but to Richardia, and as Richardia Africana it is also known as the Lily of the Nile. It is grown in a fertile compost of loam and a third of decayed manure (preferably cow manure) with sand. Splendid plants can be grown in $6-i n$. pots with abundant watering and liberal feeding with liquid manure.

In summer the plants are put out into the open garden in well-inanured soil, and given occasional soakings of water in dry weather. They are potted up in September, and kept in a cool greenhouse in winter. Little Gem is a favourite variety, of which Godfrey's arum lily is a special form. There are also two yellow- Howered species, Elliottiant and Pentlandii which are best grown in pots through out the year Pron. Air'-um.
ASBESTOS. Being a fibrous material which is non-combustible, asbestos has nany uses for fire protective purposes. It has a low thermal conductivity, and is thus an excellent heat insulating material. As an electric insulating material it has been extensively used in electric heating devices of
various typen It is made up in a number of different forms, such as cord, felt, mill-board, and in sheets suitable for building nurposes. Asbestos mill-board can be purchased in sheets from about $\begin{aligned} & \text { fin. thickness upwards. }\end{aligned}$ The thinner boards can readily be cut to slape with strung scissors or a sharp linife, and used, for example, on cooking stoves to protect the utensils. When such boards are covered with linen or some similar material they make excellent table miats. Asbestos can alsa be used to make joints in hot waterpipes, or on exhaust pipes of gas engines. Asbestos cord bound around the handlea of pots and pans or on the knob of an oven door prevents burnt or blistered fingers
Moulded asbestos is used in the form of briquettes, balls, etc., for gas heating stoves, the most efficient types being those with ample air spaces, as they radiate the heat better than the more solid patterns

For building purposes asliestos is genera'ly combincd with other matcrials, such as magnesin or Portland cement, and is treated in various ways to render it waterproof For amatcur usc sheets of such a material are very effective. There are scveral proprietary brands which can be obtained from most builders' merchants in convenient sizes It has to be cut to the desired shape and nailed in place. The joints between the shects are cuvered with strips of wood nailed to the "studding" or framework. The niaterial can also be obtained in the form of tiles.

ASH. Tough, flexible, and able to resist shock without breaking, ash is a wond that is extensively used in many trades. It is light brown or nearly white in colour, with rather coarse grain, and the several varieties show certain differences in colour and apparance. Fqr the handles of garden implements, hommers, hatchets, and other tools, ash is peculiarly well suited. It is used also for barrows, sticks and umbrellas, tennis rackets, lincliey sticks, oars, and in gymnasia. It is also employed for furniture, and a thin veneer of ash does well on other wood Sce Wood.

Ashbin. See Dustbin.
ASHES. The ashes from household grates may be utilised for various purposes. The first care is to see that all fucl and kitchen waste is so completely burnt that the ashes are thoroughly dry and powdery. Ashes should be well sifted and the coarser pieces burnt. The cinders are useful for the garden path or the hen-run. The fine, dry powdered ashes that pass through the sieve can be niade up into a paste with water and used for cleaning the outsides of eaucepans Sec Dustbin: Refuse.


Ash Tray made of thin metal sheat. A, Anished tray. B, punching the pattern. C. bending the edges
ASH TRAY. A simple form of tray is illustrated, which may he made without any of the special tools of the metal or repousse.
worker. A piece of thin brass or copper sheet of No. 18 standard wire gauge, measuring 5 in square, is required, both sides being birst cleaned with fine emery cloth and oil, nnd the design drawn on with a lead pencil. The pencil lines inay be lined in with a sharp metal point.
The plate must be secured to a picce of wood with strong tacks driven in close to the edge, and the background of the pattern covered with indentations made with the point of a large wire nail. The plate should next he removed from the wood and the edges lightly tapped over with a hamnier. holding the metal on the edge of a narrow strip of wood and at an angle of $45^{\circ}$. The surface of the metal sloould be rubbed over with dry pumice powler, applied with a hard nailbrush and, after being warmed, coated with colourless lacquer.

## ASPARAGUS : Culture and Cookery.

 Asparagus is propagated almost cxclusively from. seed. The kitchen garden species is officinalis, belonging to the order Liliaceac, a native of Great Britain Favourite sorts are Connover's Colossal, Rattersea and Reading Giant or Large Reading (Perfection is the modern type of this variety). The Giant French or Early Giant Argenteuil is grown by 1 hose who appreciate the large French type.No crop of any importance can be obtained until the plants are three years old. The seed may be sown in spring, in finc, friable, well-prepared soil, and covered an inch or so deep. If more than one drill is sown, it is wise to allow a space of 18 in apart. The seedlings may be thinned gradually to 6 in apart and alternate seedlings transplanted in the following spring, leaving the others a foot apart. They may remain for a year in order to make strong routstocks.

Asparagus is fond of salt at all stages, and sprinklings may be laid along the mus of secdlings during their lirst and second years When the grow'th of scedlings decays at the end of the seasun, it should be cut away, and a dressing of manure spread over them.
Soil Preparation. The plant likes abundance of moisture while in full growth in summer, but is not suited by stagnant soil during the dormant period of winter. It does not dislilie heavy soils, and will thrive on clay, provided the soil is well drained and is made friable. The soil should be laid up roughly in autumn or winter in order to let the frost get well into it. Any disintegrating material available may then be added. After lying for a few weeks exposed to frost, the soil may again be dug over, preferably with the fork. On a substantinl loamy or clayey soil asparagus will thrive for many years with nothing more than an annual top dressing of salt and wood ashes, hut in light land a heavy preliminary dressing of manure is desirable.

The laying out of the beds should be completed sufficient ly early in the spring to permit of planting before gronth is much adianced. It is not advisable to plant inore than four rows at the most, and three, or even two, suffice. The rows may be 2 ft . apart, with a foot and a half of space at each side.

Planting and Cutting. The correct time to ing is a deep pan in which the hund c can be plant asparagus is late in March or in April. In the first summer kesp down weods In


Asparagus : methods of planting and forcing. 1. Sail preparation and plantıng. 4. Where to cut stems. 3. Method of nanting with crowns on ridges of soil. 4othed of manure, with irame ventilated at A. 8. Forcing in a frame between annk pathways Glled with nugnura. B. 日. Messurements of bed for planting in the open
autumn the decaying tops can be cut away and the beds furnished with a suitable winter dreasing.
In the absence of seaweed, a dressing of salt may be given to the bed in spring, a ruarter ol a pound pice square yard being a suitable quantity; or the following dressing of chemical manure may be given :

Superphosphare of lime
Sulphate of ammonial
Sulphate of ammonia after the middle of April, according beds at or and district. With a strong leed any shoots of about the thickness of the little finger may he severed or broken off just helow the surface The first weakly shoots of young beds sliould be left intact. The crop is improved if soakings of water containing $\frac{1}{2} \mathrm{oz}$. of nitrate of soda per gallon can be given during May and June.

Cutting should cease at thic end of June, in order to allow the plants to make their annual grouth, which will extend with great rapidity in July and August. Afterwards with the routine advised alove a bed ought to pield heavy crops annually for a quarter of a century.

Forcing Methods. Only strong roots, three years old or inore, are suitable for forcing. These may be taken up in November and onwards thmughout the winter until the season of outdoor cutting a pproaches Inalarge places there are frequently houses or pits with bottom heat which can be utilised, the roots being paclied in hoses. Cucumber or melon frames may be used, the bottom hent being provided by a bed of manure and leaves. In this case, when the heat of the manure has begun to decline, a layer of three or four inches of soil may be placed on as a base for the roots, which may then be set close together and covered with the same depth of soil. A steady temperature of ahout $55^{\circ}$ to $(3)^{n}$ Fahr. is desirable. Produce may be oxpected to be ready for cutting in five to six weeks from the commencement of forcing. Tepid water may be given through a rose can if necessary to prevent the soil from becoming dry, and air should be admitted in favourable weather. The frame light should be covered in hard weather. The roots are of no further use after forcing.
How to Cook. Asparagus as a rule is served as a separate dish. If fresh when bought, the tips stand up firmly. The utensil used in cook-
placed straight, only the tips being above thic water. Should this not be at hand, put the bundle of asparagns flat in a large pana and, when done, lift out very carefully, so as not in break the puints Sauces in use are equal parts of oiled butter and lemon uice $\mathrm{Ho}^{\mathbf{\prime}}$ landaise, or, when cold, vinaigrotto.
To boil asparagus, cut the stems than even ength to fit the pan Scrape the stalks clean from the tips dounwards, taking care not to break off the heads Tie in bundles of about eighteen, rud place in cold salted water until needed. To cook them, put into boiling salted water and simmer until the heads are tender. Twenty minutes is long enough if the shoots are young Take out carefully and drain, then place in a dish upon a slice of dry toast, which will absorb remaining moisture The water in which asparagus has been boiled makes a good stock for soup. Drop a little butter over the tips of the asparagus lefore sending it to table. Serve the sauce in a sauce-ront.
ASPARAGUS AND CHEESE. Place $n$ layer of boiled tops of naparngus in a pie-dish, and over it grate Parmesan cheese Add a few pieces of butter and pepper and salt to taste: then add a second layer of asparagus with more chcese, etc., till the digh is full. Heat in the oven for 10 minutes.

ASPARAGUS BEETLE. A small bectle with black head dull red fore-body, and the wing-covers over the hind-body glossy black rith an outer edge of brown connected with four yellow spots. The greygreen grubs are a jest on asparagus. The surest way to be rid of them is by handpicking and destroying the sectles as soon as they cinerge In the gruh stage they may be treated in like manner. Where this is not practicable, when the foliage is wet with dew dust it with finely powiered charcoal, soot or lime, which
will adhere to the larvac
Rreatly magnifled

## and destroy them.

They may be syringed with a solution pre pared as follows: lloil 2 oz . of soft soap in a quart of water, stir in whilst hot 2 quarts of parafin oil, and dilute for use with 4 or 5 gallons of water.

ASPARAGUS FERN. The orange or black berries of the asparagus fern are pretty, hut it is the decorative lightness of the folinge which is most admired. Among several orna mental forms Sprengheri is a gond indoor plant, enduring the dry air as few others will.


Asparagns Fern. Foliage and flowers of a plant much used for table decoration Courlesy of Country Life. Lid

Retrofractus is a similar variety. Smilax (Asparagus medeoloides) is useful for table decoration. Plumosus and nanus are used with llowers for buttonholes. A compost of loam and leaf-mould in equal parts, with a sprinkling of sand, suits the plant best.

ASPARAGUS FLY. This is a small ty whose two wings are banded with brown. The lody is dark brown and its hinder division crossed by four lighter lines. The flies may bo scen from April to July, depositing eggs about the scales and leaves of asparagus. From the e'ggs, a fortnight later, emerge leglcss ycllow maggots with dark heads. These bore downwards into the shoots and stems, causing them o turn yellow and rot
The flies may be caught early in the mom ing, settled on the plants : or traps may be set for them overnight by thrusting in the ground sticks whose exposcd parts are smeared with bird-lime or other sticky substance, by which thic insects will be held. Egg-laying is discouraged by dusting the young shoots with charcoal in fine powder. The grubs can only be destroyed by cutting out all yellow or brown shoots and burning them

ASPARAGUS SOUP. Seasonable from March to July, for this soup buy the cheap bunches of slender green asparagus. Cut off the tips and boil gently for 10 minutes, then take out and set aside to garnish the soup when done Now take the stalks of the asparagus, cut into pieces, and place in the boiling salted water, together with 1 pound of well-washed spinach. When tender, rub this through a sieve, and also set aside for a few minutes. In the saucepan melt $1 \frac{1}{2} \mathrm{oz}$. of butter, and gradually rub into it 1 tablespoonful of Hour. When smooth, add to this mixture I pint of milk, hent, and put in the purée made of asparagus stalks and spinach, with enough boiling water to make the soup rich and creamy. Add pepper and snlt to taste. Take off and garnish with the asparagus tijs aiready boiled. Cream may be added. This is sufficient for four persons

ASPHALTE. Strictly speaking, usphalte is pure bitumen, or natural pitch. Rock asphaite is a limestonc naturally impregnated with asphalte. It is applied in its natural form, after suitable treatment, for the construction of road surfaces and other purposes. The term is frequently applied to natural and artificial compositions of a bituminous character.


Aspinode!. Flower spikes of the giant variety
Courlesu of Countril Lije. Lid.

The most prac. tical way to use asphalte for domestic purposes is to buy it in one of its many specially prepared forms. Bitumen or nsphaltic dampproof courses can be laid by obtain. ing the material in the form of $a$ sheet or roll, and setting it in position between the briok courses, or wherever needed. To render a flat roof watertight there are numorous asphaltic compositions on the market that givegood results. See Paths; Paving.
ASPERODEL. The sacred lily of Greek mythology is in gardening phraseology the Asphodelus, a hardy herbaceous perennial of Southern Europe, with white or vellow Howers. The species ramosus attains a height of 4 ft . in good soil; it has long, sword-shaped leaver and
benrs white flowers in late spring and summer It does well in a shady place. Albus, closely related, is a smaller plant; acaulis, 18 in ., bears pink blossoms, and comosus, 2 ft., white.

Closely related to the Asphodel is Aspho deline, the principal distinction lying in the upright stems. The species lutea produces a tall stem, sometimes 3 ft . high, clothed with dark green furrowed leaves, and studded with large yellow fragrant flowers in early summer It is a hardy perennial, well worthy of a place in the herbaceous border There is a double form Pron. Ass'-fo-del.

ASPHYXIA. The condition in which aeration of the blood has ceased or almost ceased owing to interference with respiration is termed aspliyxia. It may occur in the course of disease or it may be accidental. Thus it occurs in (1) Drowning, when water takes the place of air in the lurige. (2) Blocking of the air passages, as in strangling, hanging, or choking, where a piece of ment or other foreign body gets into the windpipe, or where a large mass sticks at the back of the mouth or in the gullet. Or the blocking may be duc to swel. ling produced by stings or by swallowing boiling water or corrosive poisons. Choking may also occur in diphtheria. (3) Compression of the chest, as when a person is buricd hy falling earth, etc (4) Inhalation of coal gas, chlorine, sulphurous acid, and other poisonuus grses. (5) Disease of the respiratory centre in the brain or paralysis of the nerves or muscles of respirntion, as by certain poisons.
 Aspidistra: dividing and re-potting. 1. Plant that needs re-potting, 2. Single
leaf division. 3. Six-leat division, the best way. 4. Roof. showing the leal buds The treatment is to remove the cause, loosen tight clothing about the chest, draw forward the tongue and see that the mouth and throat are clear, and if breathing has stopped begin artificial respiration. Reniember that nore than one cause niay be present. The cause will be dealt with as follows :
Strangling: loosen, or, if necessary, cut whatever is constricting the neck. Hanging : cut down. Chol:ing: prize open the jaws, if necernaty, with the handle of a spoon covered with a bandkerchief, and endeavour to hook forward the obstruction, or, especially in children, invert the body and slap the back. Cumpremsion of the shest: uncover properly if from falling earth, or secure space when the cause is compreasion in $a$ crowd. See Artificial Respiration; Suffocation.

ASPIC. This savoury jelly is made from meat stock and gelatine or from calves' feet, eet, do corporal hurt to mother" It is thus more and Havoured with herbs and sherry. Cutlets, than a threat, although it is still an assault if


Aspic. Savoury dish of hard-boiled eggs served in aspic jelly Courtesu of Waril, Loel: \& Co., Lid.
eggs, prawns and other foods are embedded in the aspio jelly, to form dainty entrees or supper dishes A recipe for aspic jelly is as follows:
Put $\frac{1}{2}$ pint of water and $2 \frac{1}{2} \mathrm{oz}$. French gelatine into a clcan snucepan, together with $\frac{1}{1}$ pint of sherry, the same quantity of chili, tarragon, and malt vinegar mixed, a bunch of mixed herbs, the juice of two lemons and the rind of one, a good sprinkling of salt, ten white peppercorns, the whisked whites of two eggs and their shells crushed, an onion, a carrot, and a turnip, and a stick of celery. Whisk all these together till they boil, and, after boiling up well, strain them through a cloth until clear. Serve in small moulds containing the prav ns or other food required.
ASPIDISTRA. Gicen and variegated are the two forms of the aspidistra. They benefit by having the leaves sponged frequently with soapy water
The variegated is the more delicate, and njtt to revert to the type. The green leaves should be
cut away as they come, and the plant kejt a way from draughts and fire heat. Compost, three parts loann, two parts leaf-mould, and one part sand. Propagation is by root division and suckers in spring. Pron. Aspy-dis'-trer.

ASPIRIN. Acetyl-salicylic acict, a drug used to relieve pain, reducc fever, and combat rheumatism, is equally known under its trade name of aspirin. It gives relief in most cases, but in some people it produces gastric acidity. In feverish conditions it induces perspiration, and exposure must then be a voided. Combined with quinine it is uscful at the beginning of malaria and influenza, and 5 grains of each might be given for the latter. The same close would help neuralgia.

Asplenium. See Spleenwort.
ASSAULT. In English law an assault is "an attempt or offer with force or violence to other with a stick or other weapon misses his aim. Battery is an aggravated form of assault in which actual injury has been done. The maximum punishment for a comimon assault is 12 months' im. prisonment with or with. out hard labour. If bodily harm has been doné, three yenrs' imprisonment may be given. See Separ. ation Order; Summons.

ASSESSMENT. The term assessment is upplicd to the annual value of land or income in order to ascertain the sum which a man should pay in rates or taxes. Houses and other property are asisessed at a figure, known as the rateable valuc, and on this the rates are calculated. The valuation in made by the assessment committee in each area.

Assessments are revised from time to time. A man who considers his property is assessed at too high a figure should apply to the clerk of the local assessment committec See Income T'ax; Rates.

ASSETS. In the case of a deceased person the assets are estimated by a valuation

Stocks and shares are reckoned at the price they stood at on the market on the day of the denth of the deceased. Shares in a company not quoted on any Stock Exchange should be valued by the directors or the secretary. If the deceased had a busincss, an estimate is made of the machinery, stock-in-trade, ctc., and something added for goodwill-from three months' to two years' profits according to the kind of business. But the test is, what price would be paid by a person who wanted to bisy a business of that kind. Sce Executor; Will

ASTER. This name is usually, but incorrectly, given to the popular summer Howering annual the China Aster The real aster is the perennial Michaelmas Daisy (q.v.)

ASTHMA: Self Help for the Pationt. The chief symptoms of asthina, which is a disease of the chest, are attacks of great difficulty in breathing. They often come on suddenly, and inay be followed by equally sudden relief. The discase is due to a sparmorlic contraction of the smaller branches of the windpipe Some shock to the nervous system is probably the primary cause.
The circumstances which bring about this nervous activity are numerous. The inhala. tion of such substances as pollen, horse dandruff, ent or dog hair, the ingestion of some foods, e.g. white of egg, or infection with pusproducing microbes, appear to be responsible in many cases. At other times there is irritation from some condition inside the nose. The discase is often an inberitance from parents who have themselves suffered from it. It affects mainly males, and frequently begins in childhood.

During the attack the patient should be allowed to place himself by an open window and to get into any position which appears to him to minimise his difficulties in breathing. When it can be taken, a mustard emetic (a tablespoonful of mustard in a glass of warm water), by making the patient voinit, sometimes relieves the spasm and terminates the seizure. I cup of strong coffee is useful.
Medicated papers and powders are sold by chemists to be burnt during asthmatic attacks, the resulting fumes having a sedative effect on the excited nerve-endings in the lung. A simple but useful fumigant of this kind can be prepared at home by soaking thick blotting paper in a atrong solution of nitrate of potash, and then drying. Bend the dried paper into a cone and set light to one corner, letting the patient inhale the fumes
It is not desirable, however; that the patient should rest content with a fumigant, a spray or anything else which relieves his paroxysms. The causes underlying these must be investigated, and he can help his physician by carefully observing and making notes of the circumstances which precede the attacks, e.g. the food he eats, or contacts with nnimals or plants. The pollen variety is likely to be seasonal. His adviser can help him to fix responsibility on anything suspect by testing solutions of it on scarifications on the skin If there is a reaction there, he will know what to a void, or his resistance to such a substance can be raised. Or it may lie
found that a vaccinc does good, or the cor rection of some intra-nasal condition

The medicinal remedies most in use are arsenic and the iodides. The patient should live a well-ordered life, with sufficient exercise and plenty of fresh air. His meals, of moderate size, should consist of good, plain food, and the evening meal should be small. He should avail himself of the bracing qualities of baths as cold as he can bear them, followed by a brisk rub down. It is worth repeating that if a man, early in his disease, explores every a venue for escape, there is hope for him but there is little if he accejts a destiny of invalidism in a drug-impregnated atmosphere
In children treatment should be under medical supervision.

## ASTIGMATISM

due to the bulging the eye (the cornea) not being equalls curved in all direc tions, produces astig matism. Rajs of light striking on the deformed cornea are not accurately eflected on the inner, sensitive part of the eye (the retina), with the result that the vision is inaccurate. It should be conect. ed by spectacles. See

Abnormality of vision transparent portion of

to six, or later, and tho guests. remain for the whole afternoon : othervise people come and go as they please, and move alrout the room to talk to their friends, or go to have tea, when this is served during the party in another room. Only at a small paity can the hostess talk to all her guests or introduce them generally. It is unnecessary to take leave of the hostess, unless she is standing near the door, or it is the gucst's first visit, when it would he more formal to do so Guests make their way to the hall, and servants call up cars or taxis, if required. Gratuities arc never offered to servants.
For the formal at Home party invitations are sent out a week or two weeks in advance, and acceptances are expected in writing. The card of invitation hears the printed name of the hostess, with At Home underneath then the date of the party beneath that. The address should be in the right-hand hotton corner, and in the left "Bridge," "Musio," or whatever form of entertainment is to be provided, and the time. The guest's name is written in ink on the top left-hand corner Sec Dinner Party: Etiquatte ; Recep. tion; Wedding.

ATMOSPHERICS. Atmosphericy, sometimes referred to as "Strays" or "Xs," are electromagnetic disturbances in the atmosphere. They can be readily recognized in the form of crackling noises. which occur on any wave-length to which the receiver may be tuned In the summer, when local lightning is prevalent, each Hash will produce a loud crackle in the loud speaker or telephones. Lightning is not an essential feature, and various "frying" and "hissing" sounds can also be caused by electrical discharges in the atmosphere in hoth summer and winter.

Although a great deal has been done to reduce the interference in commercial receiving stations, there is no simple method which can be applied to a broadcast receiver.

Generally speaking, it is only in the tropics or during the reception of long-distancesignals that atmospherics can causc scrious interference.

Atmuspherics often resemble the noises produced by a faulty battery, defective windings, or bad connexions. If thecrackling is due to atmospherics it should cease at once upon disconnecting the aerial and earth leads from the set.

## Atomiser. See Spray

ATROPINE. Atropine or atropia is the active principle of the belladionna plant or deadly nightshade. It is much used in eye diseases, as it dilates the pupil widely.
loth atropine and various preparations of belladonna are dangerous druge, and should never be used except on a physician's directions The practice of using drops of a solution of atropine in the eyes to make them lustrous is most dangerous. See Belladonna.

ATTACHE CASE: Its Renovation. 'The best attaché cases are madc of cowhide. but cases of similar appearance are made with a cardboard foundation covered with thin leather and lined either with leather or cloth. The solid leather caso will stand much wear and tear, but the leather-covered varieties are liable to break away at the corners and get out of shape. Cheaper kinds are made of compressed filure

The leather covering is kept in good condition ly rubbing over occasionally with brown boot polish; fibre covers should be trented with furniture polish. When the sewing at the corner of leather cascs gives way or shows signs of wear, a thin leather corner piece may be sewn on; further strengt h may be given inside by fitting a tin or thin brass corner plate, which is attached by means of bifurcated rivets. To clean an old leather attaché case, use a weak solution of oxalic acid, applied with n rag; polish when dry with a good brown boot polish.

ATTACHMENT. A person can be attached-that is, arrested-hy any judge of a court of record if he is guilty of conteinpt of court. Attachment of debte is the process by which ono person can obtain moncy which is owing to anolher who in turn owes money to him. For instance, A owes IS $£ 100$, which B cannot ohtain $B$, however, knows that $C$ owes A $£ 200$, so he can obtain an order of the court by which ho attaches $£ 100$ of this debt : i.c. $C$, instend of paying $£ 100$ to $A$. pays it to B. The order by which this is done is called a garnishec.
ATTESTATION. This word is used by Inwyers for the act of testifying or witnessing to anything, either by signature or on onth. fll wills inust be attested by two witnesses, who niust be present at the same time, and muat aign their names on the document in the presence of the testator and of each other. See Will

ATTIC. If left in an unfinialied state by the builder, the attic is not of much use until the walls and ceilings have been plastered


Attic. Scheme for the ariangement of on altic as a comfortable bedroom O.r Tomes and תar.lens. and papered; but this is ensily done. It the and swing mirror makes an elfective dressing. saine time it sloould be ascertained that the roof and window are watertight. The fircplace usually possesses a chimney that smokes in n high wind, so lighting and heating should be carried out, if possible, by gas or electricity.

An attic window sometimes lends itself to picturesque treatment with $\Omega$ window-seat. For an attic bedroom quaint chintz or cretonne may be used for the curtains, windowseat, chair cushions, and bed drapery. If children are to play in the roon a large talile should be provided, covered with brightly coloured American cloth, the same fabric being used for the curtains, as it can. le easily and frequently washed with a damp cloth and soap.

Any odd pieces of furniture may furnish an attic, and if they are shabby they may be scraped and enamelled in some suitable shade. The floor should be stsined or painted if good. or, if not, covered with parquet linoleum nad a rug or two. As draughts enter below attic doors, felt wenther stripping is of ten necessary, or a piece of boarding arranged to keep away the draught. The addition of a screen adds to the cosiness of the place.

It is not difficult to convert an attic into a sitting-room. As its window vill doubtless be small, the walls should be made light in colour ; cream or light grey distemper gives a satisfactory elfect, or primrose yellow, or pale green plastic paint for a bad wall surface. A thick coat of the paint is laid on and finely stippled.

A cheap seat ean be mado from a wood frame on short legs, adorned with cretonie hangings and provided with a cretonno. covered cushion. Easy clinirs which are no longer required for rooms downatairs can le given a new lease of life by means of loose covers of cretonne to match.

Wood aholving, enamelled or atained, will conveniently fill the odd corners. A bureau or tallboy alfords a good deal of storage space. and furnished in this way an attic sitting-room, with shaded candle lights, has at night tîne a fascinating appearance. whilo by day there is often a fine view from its window. The hurean ahould be placed beside this to enable the writer to see well.

Should the roon be disfigured by means of a chinney passing through it, the latter can te encased by boukshelves stained to match tho reat of tho woodwork. Treaterl in this way it will be hidden from view.
Many people who convert their attics into sitting-rooms have the walls panelled in such a way that one of the hig panels can be lifted out at a moment's notice. When this is done a large cupboard rumning the entirc length of the room is disclused, and t!!is contains trunks and a collection of other miscellaneous articles usually stored awhy in $\Omega$ loft. If an attic is converted into a bedroon, the furniture should be of the cottage type. A ward. robe is not reconmmended on account of the space it ocenpies, and because a curtaincll recess call bo fitted up with hooks and atretchers to do equally well.

In the case of a girl's bedroon, a long nirror can he fastened ngainat the wall. A pedestal desk with a glass top table, while for a "ash-stand $n$ small table with $n$ coloured rush mat hehind it will serve. A bedstend withont a foot rail gives an appearance of roominess.
A small bedside table, $n$ bookshelf made from a long narmw box and stained to mateh the rest of the furniture, together with an casy chair, brightly col. oured runs and a harmonising cre tonne will farnish a pretty room.

The storage space provided ty an nttic or loft is often wasted because therc is no ready access to it. Many attics are enterol only by a rect angular trap door, and steps or Iadders have to be carried up every time there is any reason to go into the attic. The illustration shows a type of disappearing stairway which can rcadily be brought into use when re. quired This is made in a vide range of standard sizes, and is sent out ready to be


Attic. How it may be transformed into an attractive sitting-zoom
leaf-mould and decayed manure with sand and giving plenty of water. There are white varieties, but the lest cookers are the Early Purple, Long l'urple and Nes Sork Purple.
Baked Auber gines. To pre pare these wipe and put in a casserole with a very littlc water at the bottom Cover them and bake in a moderate oven until tender They can be served in the casserole. In eating cut then
 open and mash them with it iittle butter, pepper, and salt

Fried Aubergines. Take two aubergines, one egg, and a little Hour, salt, pepper and bread crumbs. Kemorc the peel and cut the aubergines into slices. Soak these in strong brine for ahout ? hours, as the plant seems more bitter whel fried. Drain lliem in a cloth, dip in llour previously mixed with salt and pepper, hrush over with leaten egg, and coat with breadcrumbs Fry in hot fat, drain on soft paper, and serve hot A frying batter may be used instead of egg and crimblis. Pron O-ber-zheen

AUBRIETIA. Coming intu bloom before spring is far advanced, the purple rock cres or Aubrietia is generally at its best in April


Aubrietia. Clump of this gaick-spreading. brightly coloured plant which thrives in rock Rardens Photo from Sution \& Sons. Lid
or May, but loses brilliance in summer, and after being cut back moon liegins to grow ngain. On the rockery these plants form cascades of colour, while in beds they are a ground work for tulips. They are propagated by sced sown in spring. preferably under glass. The scedlings should he pricked out in a spare bed for the summer, and planted where they are to Hower in autumn.

Only one sjecies is in general cultivation. This is deltoidea, with purple flowers. Modern varieties of it includo Bougainvillea, Firc King, Royal Purple, Dr. Mlıles, Lavender, 11. Marshall, Leitchtlinii, J. S. Baker, Pritchard's Al, Violacea, Mocrheimi, Lloyd Edwards, Excelsa, and Violet Queen. Pron. O-bree'-sha.

## Auction Bridge. See I3ridge.

AUCTIONS AND AUCTIONEERS In most cases people prefer to do their oum bidding at auction sales, but a broker may be employed at a small commission to bid uil to a ccrtain figure for any articles desired, and his services are useful in a crowded sale-room. He is also useful in arranging for the removal of purchases the day after the sale-a matter of
oxpense whicl inust not be overlooked in determining limits of prices to be bid

There are special sales in various places, and on the premises of certain celebrated firms where the word antique in the catalogue is a genuine guarantec ; but in the mixed sale of furniture and effects antique is used indiscriminately to describe anything not in the style of the last thirty years.

For the casual buyer, cash payments are the rule-n deposit being paid to the clerk for each article as it is knocked down, and the remainder before the goods are removed. After one or two visits resulting in business a client's cheque will be accepted at the conclusion of the sale for the amount owing.
For the vendor also there is opportunity in the auction sale. Instead of bargaining with a private huyer, the haggling is done by the bidders, and there is the possibility of price being obtained in excess of expectation. In selling a housefil of furniture and effects, it is well to consider the question of a sale on the premises, placing the business in the hands of a good firm of local auctioneers The usual commission charged on each articie is $\mathbf{1 0}$ p.c. of the su:n realized.
A reserve price should be put on valuable pieces. The vendor is then responsible to the auctioneer for a commission on the highest figure bid, should it fall short of the reserve and result in no salc-but such commission is usually only $2 \frac{1}{2}$ p.c., with a minimum of 2s. 6.l.
Good furniture and cffects which have in trinsio or fashionable value are best sent to sale-roons which attract a large numher of well-todo buyers, where sales are held once or twice a week regularly, and goods rc ceived to be catalogned four or five days before the sale Sotheby's is a recognized mart for vare books, and Christie's for valuable china. Advice and valuation can be obtained from an expert for a small chaige

## Legal Aspects. Frons

 a legal point of view the auction is an offer of property to the highest bidder. It follows (1) that the owner of the property cannot bid himself, so as to run up the price. If he does so, the buyer can cancel the salc, return the property and demand his money brek: (2) that unless it is duly adverlised, or stated by the anctioneer, there can be no reserve price The only exception to (1) is that in the case of a sale of landed property the owner may eniploy onc person to bid for him The sale is complete on the fall of the haminer.Although a sale of goods, etc., may le advertised without rescrve for a certain day, the owner is not obliged to put them up on that day or at all. He may sell by private treaty beforeliand, or withdraw the property from the auction. This will not deprive the auctioneer of his right to be paid. The auctioneer need not accept a bid; but once he has accepted it he is hound to knock the property down to that
bidder unless there is a higher bid. If two versons simultaneously bid the same amount, the auctioneer can accept which of the hids he pleases. An auction
eer is not entitled to sell except for cash. Those who bid at an auction should read the conditions of sals carefully. Anyone entering into : 'linock-out.' i.c. an agreement among dealers not to bid against one another, is liable to a line of $£ 100$ or 6 months imprisoninent or both.

AUGER. This tool is used for bor ing holes to agreates depth than is practicable with brace and bit, especially in hard wood. It con. sists of a steel shank terminating in a twisted cutting-bit, tho wooden handle passing through the cye of the shank. Augers may be olstained in sizes from


Auger. Correct manner of in. up toldin. In using this tonl it is essential to keep the shank in a truc vertical position while cutting, watch ing it from two different angles. See Boring

AU GRATIN. A dish served au gratin is onc covered with sauce and grated checse or breadcrumbs, and brought to the tablo in the dish in which it is cooked. Fish and vegetables are frequently prepared in this way. Sec Caulillower: Egg; Macaroni; Sole, etc


## Notes for the Month

[^0]AURICULA Hardy and half hardy per ennial, easily raized from seed. The indoor or show varieties are always grown under


Auricula. Fine specimen of the plant allied to the primpose Hepinald T. 3ulbu
has the effect of lusintaining the recpuired temperature without the aid of much fire heat. Watering should be done in the morning so that the at mosphere may be dry by evening. See Gardening: September: October: November.
AV!:ARY. As generally understood this is an outdoor cage for captive birds, sufficiently large to permit the birds inside to fly. One portion should have close walls and roof, and be fitted with nesting boxes and natural branches for perching, the remaining portion (say three-fourths) being left open save for wire-netting of small mesh. This portion should be furnished with growing shrubs in tubs, drinking water, bath, etc.

For the construction of an aviary, the chief materials required are 2 in . deal quartering, feather boards and wire-netting. If possible, it should be built against a wall, and should face S. or S.W. Supposing the length decided upon to be 12 ft .. the height 8 ft . and the depth from back to front 6 ft., the quartering for the framework would be three lengths of 12 ft ., three of 9 ft ., five of 8 ft .4 in ., and nine of 6 ft ; the 8 ft .4 in . to have their lower ends tarred for 6 in ., of which 4 in . will be inserted in the ground.

The 9 ft . uprights having been fastened to the wall at equal distances apart, a 12 ft .


Aviary for hards birds, built against a garden wall. It is constructed with a boarded shelter to protect the inmates from the weather
horizontal is attached to their tops, a simple joint being made by cutting half through the wood, so that they interluck. The remaining two 12 ft . lengths and the five 8 ft 4 in . lengths are joined up in similar fashion to make the fraine of the front, which is then connected with the back by means of the $\mathbf{6} \mathrm{ft}$. lengths, as shown in the diagram. The side, front and roof of the eastern fourth are boarded in and tarred on the outside, roofing felt being added here.

The remainder of the structure is then covered with wirenetting. A small door should be contrived, hinged on an upright and opening inwards to a sort of wire "lock" to prevent birds escaping as anyone enters the aviary. In sclecting tenants, the sced-eating woodland and hedgerow birds will be found the most suitable. The tits, which are mainly insect eaters, may be included, and meaty boncs, suet, and coconut substituted for insect food. Sec Bird Cage ; Canary.

AVOIRDUPツIS WEIGHT. By far the most used of English weights is avoirdupois, food and materials being msually sold by it. It is as follows

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16 Drams - }1\mathrm{ Ounce (oz.)
10 Ounces = 1 Pound (lb
If Pounds = 1 Stone
112 l'ounds = 1 Hundredweight (cwt.)
20 Hundredwelglits =1 Ton
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In the case of certain articles the stone is less than 14 lb .

AWL. A fine-pointed tool, the awl is used by bootmakers, saddlers, cobblers, and all leather workers for making holes to receive the thread when handstitching is being clone. Its blade is not edged but pointed. See Boot, Repairing; Bradawl.

AWNING. The fittings of window aivn ings must be strong and well made, so that they may be drawn in and out with eass Where a large French window opens on to a garden a wide awning, the full width of the winduw, fitted in the same way as the ordinary awning used for shop winclows, adds to the amenities of a small house in summer.

Awnings for the garden range from the giant sun umbrella and the simplest auming spread over four uprights to what becomes virtually a summer-house. The favourite material for making these is striped cloth in red and white or green and white.

Awnings should not be exposed to dew and rain without being properly dried. Before they are put away for the winter they should a!ways be well laundered so as to keep) the material in sound condition. See 'Tent: Waterproofing.

AXE. Thistool for cutting wood and felling timber consists of a weighty head with sharp cutting edge, the helve or handle being of varying length nccording to the work required. It is employed with a wicle swinging stroke, at the beginning of which the right hand is just under the head, the left at the other end of the helve. During the swing the right hand slips down the handle, until, as the axe is brought down, both hands are together. For lopping light hranches a blow is given on the uniter-side of the branch.
For felling trunks the axe is wiclded first in a downward sloping direction, then in an upward direction, to take out a $V$-shaped chip:


Axe. How to bold to obtain the correct swing in felling a treo
the $V$ is then gradually increased to the centre of the trunk. A notch is then commenced on the other side, and continued to meet the first $V$ in the oentre, when the tree falle away from the cutter.
If the edge of an axe is rubbed occasionally with a carborundum, the tool will require less frequent grinding. The werge that securas the head is made of some hard wood. If a new werlge is needed, cut one longer than the depth of the cut in the handle and sufficiently wide. Hammer it in as far as it will go, and then saw it off level with the axe head See Chopper; Hatchet.

Axle. See Front Axle; Live Axle; Motor Car
AXMINSTER CARPET, A tufted, machine-made fabric, the pattern being formed by tufts of woollen yarn, cut off and inserted in the body of the carpet. It is made in different qualities and in two kinds, seamless squares and in breadths. See Carpet.
AZALEA. These flowering shrubs, now classified as rhododendron by the botanist, consist of scveral species and numerous varieties of three types:-the Indian azalea (thododendron indicum), the Ghent, and the mollis azaleas. The Indian azalea, largely imported from Holland, is grown chiefly under glass for spring blooming. The Ghent and mollis azaleas are used similarly and also as bardy summer flowering shrubs; the flowers are brilliantly coloured-orange, apricot, salmon, rose, etc. They thrive best in snil mixed with pent or leaf mould. The correct potting compost for Indian azaleas is peat and loam with sand added frcely.

When the plants are potted, room should be left for adequate watering, as many failures occur because of dryness at the root. Periodical syringing of the foliage hefore the plants come into lioom is also beneficial, and as the


Azalea. Laxuriant bloom of a potted plant Courteay of Sution i Sons
buds swell, an occasional top-dressing of manure should tie given. After Howering, the plants should be stood out of doors for the summer on a bed of ashes. Repot immediately after the Howers have faded.

T'o propagate azaleas, cuttings arc taken when the plants are making new growth. Young but sturdy shoots should be chosen, and they will root better if they are pulled off the stem, so that they retnin a heel of the old wood

Good varieties of A\%alea Indica: Dentsche Perle (white), Fielde:'s White (white, large flowers), Alice (deep rose, double), Bernard André (violet purple, double), Souvenir de Prince Albert (rosy salmon with white edge), Criterion (salmon pink), John Gould Veitch (lilac rose), Madame van Houtte (carnine and rose, flaked), and Verraeneana alba (white).

## Baby: The First Year of Life

## Practical Advice for the Young Mother

For infane care from the second year onwards sec Child; other information is given under Baby Chair; Cot; Pernmbulator; cte.

Mother ignorance is responsible for a tail: sickness is not so much a digestive disorder as proportion of the children we lose lefore a symptom caused by chemical changes in their first birthday. Unhealthy motherhood the borly at this time; it usually passes off accounts for many of these deaths, so that the first duty of every expectant mother is to care for her own health. The ante-natul period of life is also very important to the healt! of the haby. That is why ante-natal clinics have been organized so that mothers may attend during pregnancy to receive medical advice.
The expectant mother should always see a loctor three or four times before the baby is born, and before the first baby's birth this is especially necessary, as certain simple measurements have to be made in order to know that the poung mother is capable of bearing a fulltime child of average size.

The term " hygiene of pregnancy " includes proper diet and exercise for mothers during the months before the baby is born, and the provision of fresh air, rest and healthy sleep The expectant mother ought not to over-feed. Indiscretions in diet cause the dyspopsia with heart-hum which inakes so many mothers miserable at this time. Light, nourishing food, with Hesh meat served only once a day, must be the rule.
Eggs, cheese dishes, and fish can take the place of most at two of the three substantial meals, and, in addition to these, a cup of tea with biscuits or bread-and-butter at $4.30 \mathrm{p} . \mathrm{m}$. If an evening meal is not served later than 7 p.m., a glass of milk at bed-time is permissible. During the last month some doctors advise that no flesh meat should be taken at all

The breasts require a little special attention, in order to prevent cracked nipples, which interfere with natural fceding. The nipples should be washed daily with warm water, carefully dried, and a little vaneline or lanoline applied. If the nipples are small, gentle massage will improve them for nursing purposes. Clothing should be light and loose, without any constriction of the body, and supported from the shoulders. Special maternity corsets or helt may be worn if desired. Garters must be discarded and suspenders used instead. High-hceled shoes should be avoided; they are apt to cause loss of balance when walking during pregnancy.

## Expectant Mother Must Take Exercise

Regular exercise and a certain amount of work is far better for the health than the sort of sofa existence some women think justifiable at this time The expectant mother can do light housework, even light gardening. She can carry on her business or profession for several months at least, providing her mork is not physically or mentally exhausting. A hrief rest of 20 minutes after luncheon and also before the evening meal is excellent. Every effort should be miadc to obtain restful sleep by regular bedtime, a well-aired room, a comfortable bed and a tranquil mind. It is usually necessary to cultivate a restful outlook, and not to be emotional or to exnggerate trifling grievances.

Indigestion and constipation are perhaps the commonest ailments at this time. The only medicine which ahould be taken without a doctor's prescription is a tumbler of hot water, with a pinch of bicarbonate of soda added, $\frac{1}{2}$ to $\frac{1}{2}$ of an hour hefore meals.

For constipation take stewed fruit at meal times, regular exercise, and a tablespoonful of liquid paraffin or olive oil once or turice daily. If these simple measures are not successful consult a doctor without delay. Morning

Varicose veins are often quite painful in pregnancy. When they appear it is necessary to wear a crêpe velpean handage, and this must be apred round the instep first (not the ankle, or the feet may swell) and then upwarda to the knec. When resting, keep the feet up on a couch or stool, and do not stand more than is strictly necessary. The teeth should be watched at this time, and any necessary stopping attended to Decayed teeth should be removed before baby is born, as bad teeth, by infecting the milk, will jeopardise its health and development

## Feedink the New-Born Baby

The average normal child weighs from it to 8 lh at birth. He is well nourished and fairly contented with life, and usually shows signs of a healthy nppetite after the first fcw days. He does not require much in the way of food at this time; nevertheless one of the commonest mistakes is lack of patience because the breast inilk does not seem to satisfy the baby, and artificial feeding is resorted to to help the breasts. Nothin, should be given at this stage except a little sweetened water after the breast feed For one thing, the infant's stomach measures only 1 oz. in capacity, about the size of an egg-cup. Further, if the baby is not kept hungry he has not the same incentive to suck strenuously, and so the mills is apt to go.

During the first two days he sloould be fed every six hours; on the third day at four hourly intervals, and after that, either every three hours or every four hours. No night feeds are given to the modern haby from birth, unless in the case of a premature or very weakly child.
When the milk is insufficient, the haby should not lo weaned, but the natural food is supplemented by giving a half-feed, immedi. ately after the breast, of diluted cow's milk or one of the artificial foods Give alternate breasts each feed, so that each breast has six hours' rest by day.

When baby cannot be breast fed through abscesses of the breast or other serious canse. then the child must be brought up on the bottle. His chances of health and even of survival are diminished by bottle fceding. It is the duty of every woman to nurse her own child unless advised not to do so by the physician for serious health reasons Breast milk is freo from germs; it is most easily digested, and it is of the right temperature.

To improve the quality or quantity of the mother's milk, attend to her diet, for she may require extra eggs, milk or meat. See that she has more rest-two hours' rest in bed every afternoon may make all the difference-and teach her to douche and massage the brensts. This is done as follows :

Get a basin of hot water and a basin of cold water and put a piece of Turkish towelling in each. Bathe the breasts alternately with hot and cold water for 10 minutes once or. better still, twice daily. Dry and massage for 10 minutes. With proper care, 90 per cent. of women can nurse their babies

When bottle feeding has to be resorted to good clean cow's milk must be tried, as, like human milk, cow's milk contains vitamins. certain chemical substances only found in live food (milk, fresh meat, fruit juice, oils
etc.) and deatroyed by the preparation o artificial haby foods On the other hand, it is sometimes impossible to procure good clean milk. or to keep it frec from germs, and when artificial foods arc used the vitamins can be given in the form of orange, grape or apple juice, a teaspoonful to a tablespoonful. according to age once daily between two fecds.

Cow's milk should be pasteurised for the baby's use, that is, raised to a temperature of ahout $155^{\circ} \mathrm{F}$. This is done by placing the milk in a clean jug and the jug in a saucepan of cold water, which is hrought to boiling point and bniled for 20 minutes. The milk does not bnil and so the vitamins are preserved, yet thie germs are destroyed.

## How Milk is "Humanised'

The milk has now to be humanised, i.e. made as much like breast milk as possible. Milk is a perfect or complete food, because it contains proteid, fat, sugar. mineral salts, and water in the right proportion; hut in cow's milk there is about twice as much proteid (casein) as in human milk, so that for a new. born haby the milk has to he diluted by an equal quantity of sterile-boiled-water. Some doctors dilute to the extent of one part milk and two parts water.

Now we have too little sugar and fat, so we add half a teaspoonful of sugar of mills and half a teaspoonful of cream.

This table may be taken as a guide to the quantities of diluted cow's milk, although it must be modified as required


Artificial fonds are prepared according to directions They are either dried milks, when the usual mixture is 1 teaspoonful of the food to 1 oz . of water, or condensed milks, sweetened and unsweetened.

The most careful attention should he given to the bottles. They should he of the boat. shape variety, as illustrated, with teat at one end and $r$ ithber valve at the other. They should be washed in cold water and then in lot water after use, and placed in a clean enamel bowl full of cold water. Once daily, prefer ably in the morning, the bottles should
 Baby. HyRienic, boat-ghaped feedink bottle with rubber be boiled, a special saucepan being kept for this purpose. Place the bottles in cold water, boil for five minutes and conl before the bottles are removed.

The valves and teata should only he placerl in the water after it has boiled and left there for tiwo ininutes, as they perish easily. The milli-jug should be scalded with hoiling water, and the food is made up in bulk mornings and afternoons (diluted, and sugar and cream added), so that it is ready to pour into the hottles as required
Clothing, Bathing and Teething. Whilst the diet is the most important factor during the first year, attention must also be given to daily regimen and to clothing. After the cord is healed, at ahout five or six days, a knitted woollen binder may be substituted for the flannel binder. The clothing should consist of a soft wonllen vest, a flannel. a soft napkin, a woollen pilch, a dress and woollen shoes, with a little knitted matinée jacket in cold weather. The long clothes
slould reach only a few inches below the fect Nothing longer than 30 inches, which should be the lengil of the nightgowns Babies need their own pocket handlierchiefs, particularly soft and small ones

The baliy should he bathed in the morning and sponged at bedtime. A long and narrowshaped fattern, which stands equally well on


Baby. Folding bath oi rubber on a light wooden trame
wash tul does equally well not shillings. and saves many shillings. A face cloth and a huttock cloth, a piece of pure eoap, and a soft Turkish towe and one of old diaper for the face lowel complete the requisites for the hath. together with a pure powder for use after drying. At first the teniperature of the bath should he blood heat, $98^{\circ}$ to $100^{\circ} \mathrm{F}$., and the water is gradu. ally made less warmuntil it is about $80^{\circ}$ F., at six months or so. The bath water should be tested by a thermometer. Thorough remorni of soap and careful drying, especially of all crevices, are necessary to prevent scalding and eczema. After drying, dust the skin with a powiler consisting of equal parts of starch, zinc oxide. and boracic powders. After the bath the baby has a feed and is put to sleep. He should sleep in his own cot from the beginning, as it is both unsafe nnd unhygienic to s!eep with mother or nursc. He should lie on a firm hair mattress, and bed and bed-clothing should be thoroughly aired daily in a current of fresh air. It need not be emphasisad that a child must live and aleep in freah air every day of his life. The night air is just as healthy as the dav-time air, and the only time that indows should he closed is in very foggy weather.

A baby should be weighsd twice a week, as regular gain of weight is the best indication of progress. A few days' sickness or unsuitable food will immediately affect the weight. Ho should gain 5 oz . a week in the first month, perhaps 6 oz. a week the second month, and at three months his weight should be between 12 and 13 lb . At six months he should have doubled his weight at birth, and a fair average is 15 to 16 lb , his weekly gain at this time being about $40 \%$. At one year old he should weigh 2! lb., if he has progressed normally

Teething and weaning ale the two milestones during the first year He hegins to cut his teeth in the sixth month. although the teeth have, of course, heen in the gums since
birth. their formation beginning ahout the 16th weel: of pregnancy. The cutting of the teeth is a physiological process and ought not to be attended by any adverse signs or symptoms. There is an increased flow of saliva (dribbling) and some heat and tenderness in the guns, but he should not otherwiso he sick or sorry. Attend to his diet : give him, perhaps, rather less food than usual, with occasional sips of water, and see that the howels are acting well, and he should have no trouble with teething. The comforter or dummy teat does not find its way into any projerly conducted nursery.

## How the Teeth Appear

The first teeth are the lower cent ral incisors, or the biting teeth, which should appear a hout six months, the upper central incisors in the ninth month, and the lateral incisors a month later, i.e. at nine months, which is the time to begin weaning haby. At the end of the first year the first molars are cut; the remaining teeth helong to the second stage of child life.

When he cuts his teeth it is a sign that some change of diet from milk shoulil gradually be made. It may begin on the morning of his ninth month with a little dish of well conked arrowroot or ground rice and milk or
 egg custard, or suff. yolk of egg. He is promoted to onc: meal a day, and in a week he may have two mealsaday substituted for breast or bottle

By the time he is 10 months old he should be entirely weaned, and put on a three menls a day regimen. Suitabla foods, from nine to 12 months, are cow's milk, lightly-cooked eggs, gravy and breadcrumbs or potatoes or cauli Hower, bacon fat, crusta. vegetables and gravy soups, well-hoiled porridgo, rusks, milk puddings, cag custard, junket and cream. Break. fast, dinner, and tea-suppier should comprise his meal-times, and every effort should be made to maintain the morning and afternoon sleep and undisturhed nights for both mother and child.

Naplins are essential for a hahy's comfort. Less than two dozen will mean that they will


Baby. Hamper basket in wicker with tray in which to keep the toilet requisites trensure Cot Co., Lidd.
never be properly washod, liniled and aired, and three dozen is the number recommended. The most useful size is 22 in. square after the hems thave lieen turned. Suitable material is butter muslin, made of four thicknesses stitched together; or old soft sheeting torn into squares and nently hemmed.

Never allow a haby's legs to be cramped and deformed by the bulk of the napkins he wears. The better way is to use one at a time folded in a triangle, and over that a second square of Hannel called pilch. Some woolly jackets and a warm shawl complete the necessitics of the infant's wardrobe.

A small down pillow is required, and is not so expensive if the down is bought by weight and enclosed in a strong ease of calico or jaconet; also a piece of mackintosh to cover the hair mattress. It is economical and healthy to have another mattress on top filled with chaff, an old piece of blanket to cover that, and two new blankets, also an ciderdown. In choosing the hlankets remember that they may the required for a larger crib later, and also they must serve their turn in the perambulator.

It is handy to have a special hasket to hold his immediate requirements, and there are varieties to suit nost purses. In the basket the expectant mother should place in rendiness the following articles

One slanl; one nightgown; one long flannel one vest or wonlly sliirt; onc llannel tinder $z$ yd long and about 5 ill . wide ; $\frac{1}{\frac{1}{2}}$ dozen napking: one Hanmel pileh; one soft towel; one old slinivl or hlanket; IInen thread: one bov or string of safety pins: one tin of starcli. \%ine, and boracic powderone cake of super-fatted sonp one small tube of vasellice; a case containing necdies and white cot ton, for atitching the first. binders; thimble and aliarp, square-pointed ecisanis; a packet of white absorbent wool; a small linttle of puie olive oil: a soit linirbrush; a soft rubber lot-water bottle to ke the ent warm in readincas to receive the baliy.
Elaborate roles of any kind are not to be encouraged, but pretticr day gowns are easily managed by the addition of a little fine lace or, embroidery. Ba bies are rarely dressed in long rohes nowadays. Decp embroidery Houncing makes a dainty gown for any baby. There is a machine-made Shetland wool which is ideal for making a haby's layette. It is light in weight, easy to wash and wears well. A soft silk bonnet is less heating than one made of wool, and will licep the baby's ears in good position when he is sleeping out in his pram. The following list sumnarises a baby's accessories :
Thice day gowns (5\} yds of nuineook) ; three niphitgonvis ( 6 yils. of llanncl); three day flamnels (t vda.); three night Hannels (4 yds.) ; four soft Turkish towels: two innnnel pilches or spuares (is yds) ; two shawla (1 large, I gmall); \& yol. flannel, 27 in . wide. for linders; two knitted wool jackets; four long aleeve vests or shirts; onc flannel apron ( $2 f$ ! vas.) ; one macklntosh apron (if required by mother).

There are various types of fitted baskcts. A hamper basket is made of strong wicker or cane with side handles, the lid fastening with a rod which runs through cane loops and can be padlocked if necessary. It frequently lias fitted castors, which run easily over the floor. On removing the tray there is a deep recess for the baby's clothes. It can be linerl and trimmed to suit the colour scheme chosen for the cot curtains and any other decorations in the night nursery.

The tray has a pincushion attached, and two pockets for brush and comb and powderbox. Clean clothes can be kept in the lower plart of the hasket; those actually in use remain on the tray when discarded night or morning. This form of hasket is dustproof when closed and handy for travelling.

A table basket, trimmed and fitted, is easily carried from place to place and will rest on
any table. It is leas expensive and also makes a uscful work-basket. One of this typo has been successfully made out of a white chip basket, without a handle, used for


Baby Chair. Adjustable chair with play table attached. It can be raised to a higb position
picking fruit in the strawherry fields. The basket is wide and shallow and can he covered daintily with a length of white muslin.
BABY CHAIR. For sitting at table, a Jaby chnir needs to be high, but it should preferably lie low for play.

Baby chaire are often litted with a bar or board in front of the arms, and this must be easily removable. A footboard is generally provided, and in some chairs this is adjustable for height. In the folding chair illustrated the logs are hinged so that the lower part can be turned up the reverse way, the tray at the base serving as $\pi$ table as shown. It is provided with wheels, which allow it to be pushed ahout when in its low position.

Parts of chairs likely

to need repairing are, first, the rails or horizontal rocls which unite the legs. Often these rre plain parallel rods of small diameter, andif broken a new one must be put in, for a strong repair of the old one is difficult If it is turned to an ornamental pattern not ensily matched, a repair inny be attempted by glaing the broken place, and perhaps screwing astrip of metal heneath to assist in holding the parts together.

Often a rail becomes boose without breaking, and when this happens other rails soon go the same way and legs become rickety. The ends of rails are glued into hored holes, as in Fig. 1. If they come out it is generally sufficient to glue them in again, but the parts inust fit properly, and must be forced right home into their original positions. If the gluing does not seem satisfactory, a finc wire nail with small head can be inserted, as in Fig. 2, either crosswise or endivis. The latter is shown dotted. In some cases screws may be better than nails.

Next in importance to leg and rail joints are brealinges like that in Fig. :3, where a portion is split offi allat picce of board. Here also it is stronger to repair with nails, rather than trust to ghue, as is shown in the dotted lines on the diagram.

EABY WALKER. This well-known devics is easily made at home. Fig 1 is $\pi$ sketch showing how the child supports itself whilst learning to walk, the easy running castors fixed at the hottom allowing the frame to be rearlily pushed across the floor. The simplest way to nake the top and bottom rings at home is to cut roughly with a bow-saw a number of pieces of wood to the required
segments, and glue them up as shown at Fig. 2. The scgments should he cut out of $\frac{1}{2}$ in. wool, and a few screws may be put through the timber so ns to hold them tomether and assist the allhesion of the glue. The rings may then be worked up. Another method is to build an octagon, Fig. $: 3$. hy the use of lialving jointa
Fig. 4 shows a method of using square frames A frame lo in. aquore is made by halving joints. as shown in the inset diagram; simila!ly a 24 in . square is made for the bnttom. Thes frames are carefully bored at the correct angle. so as to receive four broom-handles, as shown. At each end of the circular uprights a saw-kerf is cut, nnd after gluing the ends and inserting them through the frames a small wedge is glued and knocked into the saw-kerf to secure them. After putting the work together round off all sharp edges. See Nursery.

BACHELOR FLAT. Bachicior flats in Westminster or other nxpenaive residential districte in London undertake to provide full service, including that of a valet, while meals are charged at fixed prices and, if a restaurant is attached to, the block, served there or brought to the flats. Accommodation includes a bathroom and either one room with sometimes an alcove for the bed curtained off, or a bedroom and sitting-ronm.

Many bachelor men and women aremanable to afford suites of this kin:l, but must simplify domestic arrangements so that they occupy the minimum of attention. In some cases wherc houses have been converted into single llats, with use of hathroom on each floor, cleaning service is provided but no cooking. In others no such arrangentent can be mado on the premises, and a charwoman may bo employed to clean, and, where there is a kitchenette, sometimes returns in the evening to prepare dinner.
Where only one room without service can be afforded, simple labour-saving devices should be installed where possible, and the idea of a bedroom should be renote cluring the day time. Comfort is essential to the worker. hut all unnecessary ornaments and draperies should be discarded. Colour schemes create beauty with simplicity of detail and thus reduce the cleaning problem.

Parquet floors with rugs or small carpet squares are idenl, but, failing thesc. unless the boards are good. linoleum, which can be easily


Baty Walker. Fir. 1 $\begin{array}{ll}\text { Circular } \\ \text { castors. } & \begin{array}{l}\text { irame } \\ \text { Figs. }\end{array} \\ \text { 2-4, }\end{array}$ Working diakrams.
polished, is more satisfactory than mere staining. A vacuum cleaner is a practical help, but a carpet sweeper will serve. A corner cupboard fitted as wardrobe utilises space, the bureau or chest-of-drawers on legs and the long mirror can all fit into a sittingroom schemc. A divan lounge with separatc maitress, ind under the padded spiral spring ${ }_{3}$
a box for linen, is a suitable berl. The eiderdown rolls up into a case and forms a bolster cushion by day, and a fitted loose cover concenls all bedclothes. Sinall dressing tables can be obtained, which open out to diaclose the toilet articles, but when shut look like an ordinary table. Unless accommodation provides a kitchenette or cupboard large enough to contain sink and small gas cooker and fitted with shelves for crockery and cooking utensils, the most convenient combination cooking and heating arrangement is a gas fire with a concealed boiling ring on top and a flap that lets down for grilling and reveals a small oven, logether with a separate gas ring alongside for a kettle.

A gate-legged folding table for meals, and shelves fitter below window seats, for which cushions can be made to measure, are space savers. While it may be possible to make arrangements with the caretaker to receive parcels, it is desirable to provide a store cupboard so that catering emergencies can be met. The tenant may have little time available when shops are open to do marketing. See Bed-Sitting-room.

## BACHELOR'S BUTTON.

 The name is locally applied to two distinct varieties of Howers. One is a form of the species of buttercup known as Ranunculus acris. which produces yellow Howers. It thrives in ordinary border gammon-buard is marked with a series of soil. The other is a variety of Ranuncu- 12 points at each end The points are lus aconitifolius which bears double white alternately coloured black and red, and each Howers: this plant, which is known also as player has six points on each side of his board Fair Maids of France, likes moist soil and To begin play the boand is placed between Hourishes by the waterside.BACKACHE. This


Bachelor's Button, the garden Ranunculus Sutton \& Sonx


Bachelor Flat. Cupboard in sittingroom fitted with tap, sink and hooks for cooking atensils

BACK FIRE. The expression is loosely applied to two entirely distinct troubles with petrol motors. One is the explosion of an unburnt charge of gas in the silencer, generally caused by improper adjustment of the car buretter, or partial failure of the ignition system. The other trouble is premature ignition usually when starting ihe engine. It may be due to imperfect valve setting or faulty carburation, but it is more frequently caused by too greatly advanced ignition. This causes the explosion of the gas in the engine before the piston has passed the top of its stroke ; hence it is driven violently downwards, and the engine then revolves backwards for a few turns.

The remedies are to retard the ignition. test the valve timing, correct if necessary. and overhaul and adjust the carburetter.

A praclical safeguard in starting up any petrol engine is to grasp the starting handle. belween the fingers and palm only-keep the thumb out of the way-as illustrated.

See Carburetter: Motor Car: Motor Cycle.

BACKGAMMON Backgammon, or tric-trac, is a game for two persons. It requires a special board and 30) draughtsmen, 15 white and 15 black or red. The board usually consists of two inged together. The backmay be part of a general condition, may be duc to a local cause, or may have its origin in one of the internal organs. Influenza and smallpox frequently commence with a severe backache, and it is found in anaemia, hysteria, and neurasthenia. Examples of the local cause are backache from lumbago, stiffncss from overexercise, chill or weakness. Bright's disease, gall-stones, and various feminine ailments are instances of pain referred from an internal organ. Pain between tho shoulder-blades occurs in Hatulence, and pain at the botton of the spinc is common in piles

Where the pain is due to muscular stiffness or lumbago, the surest relief is given by rest in bed with warmth applied to the back either by hot-water bags or a inustand plaster, and later the rubbing in of a soap liniment or other embrocation.

Some peaple find comfort in a menthol or a belladonna plaster. Internally 10 grains of aspirin will be useful. In backache due to other causes the application of a hot bag may give easc. See Bright's Discase: Lambago.

Back Axle. See Live Axle.



Backrammon-board with letters indicating the compartments and their respective points, and
the players, so that the points lie in the same direction as the players' face. One compart. ment of the bacligammon-bmard is known as the outer table, and the other as the inner or home table. These tables are not fixed by name, but depend upon the position of the men when the game starts. The figure shows the arrangement of the men at commencement of play, the right-hand compartment $\mathbf{B}$ B' in the figure being the inner or home table, and the left-hand $A A^{\prime}$ the outer table. $A^{\prime} B^{\prime}$ are the outer and inner tablos of one player, A B of the other player.

The hinged division $\mathrm{C}^{\prime} \mathrm{C}^{\prime}$ is known as the bar. The points in the inner table are known by special names. The points D D'are called the ace points, $E E^{\prime}$ the two or dence points, F F ${ }^{\prime}$ the three or trois points, $\mathrm{G} \mathrm{G}^{\prime}$ the four or quatre points, $\mathrm{H}^{\prime}$ ' the five or cinque points, and $\mathrm{J}^{\prime} \mathrm{J}^{\prime}$ the six points In the outer table the order of the points is reversed, $\mathrm{K} \mathrm{K}^{\prime}$ being the
acc (or more often the har) points, $L L$ the deuce points, $M$ M the trois points, $N$ N the quatre points, 00 the cinque points, and P P the six points.

With each backgammon-hoard two diceboxes and a pair of dice for each player should be provided After the men have been arranged as in the figure, the right of tirst move is settled by the throw of the dice, the higher throw giving that player the choice of play. The first player then throws two dice, and the two un mbers he throws decide his move. The object of his game is to get all his men into his own inner table, and to play them out ngain before his opponent is able to succeed in attaining a similar object.

Suppose the
 player throws trois deuce. This entitles him to move one man threc points onward and another two points, or to move one man five points. Double the usual number of moves is allowed when doublets are thrown. If two fours are thrown, for example, 16 moves are allowel instead of eight, which would have followed a throw of cinque trois, for example, or six rleuce.
The actual ability to move certain pieces depends upon the position of the opponent's pieces. A piece can only be moved to a vacant point, to a point occupied by thic player's own pieces, or to a point occupied by one only of his opponent's pieces. When a player has two pieces on a point he lias made that point, and the preventa such pieces being captured, and impedes his opponent's progress, which is one of the important ubjects of the game.

A single piece on a point is known as a blot. If such a piece is legitimately in the way of a player's move after a throw, it is removed and placed on the bar, and has to begin its move over again from his opponent's inner tuble. A further restriction on the moving of such a piece is that it cannot begin its journey again until its player actually throws a number corresponding with a vacant point or blot on the table. Until such a throw is made, too, none of his other pieces may be moved. When all the points of the home table are completely occupied by two or more pieces, that man's play is suspended until one or mone points of the home toble are available for play Of course, it many occur that a player is unable to play the full amount of his throw because of points being occupied, and in that case he loses that part of his throw. When he can play, however, he must do so.
A player, having succeeded in getting all his pieces into his home table, begins to remove them from the board, or bear them of. At this stage of the game each throw of the dice enables a player cither to advance his pieces accoorling to his throw, or remove one from


Backrammon. How a player bering to bear of his men alter retting them into his home tabla Courteny of Selfridue \& Co., Ltd.
the board He can only remove one, however, if his throw specifically allows it.

Suppose, as in Fig. 2, the player has three pieces on six point, none on cinque, four on quatre, four on trois, none on dence and four on ace point. Then, if he throws six trois, for example, for the six ho may either remove a piece from the six point or advance a man from the quatie point to the cinque point. And so in tho case of trois, he may remove a piece or advance it to the quatre point. But if he throws cinque trois he must play forward because he has no piece on cinque If he throws such numbers as are not occupied by pieces, then he is entitled to bear off a piece from the highest occupied point. The direction of movement of play of each player is from the nce point in his opponent's home table towards the ace in his own.

The game is won by the player who first succeeds in removing all his picces from the board. The value of game to the winner depends on the stage which has been reached by the loscr. The game of the winner is called a hit if his opponent has managed to get all his own oieces into his home table and has begun to bear off. Whien the winner has borne off all his pieces before his opponent has started to do so the game is called gammon, and if he succeeds in bearing off all his pieces while his opponent has still one or more pieces on the bar or in the winner's home table the game is called backgamnon For a gammon and hackigammon, double, treble, or other incrensed stakes are puid.

## Throws for Bexinning a Game

Wlien a fresh game is played tho winner of a hit starts, but he throw's a die against his opponent for the right to start if he wins gammon or backganmon. The movements of the pieces at the heginning of a pame are to a large extent standardised. The movements for every kind of throw are here quoted from Hoyle's Games Moderniscll
tors. (The hest possible throw at starting.) Play two men on the bar point, and two on the elique.
Droce: Ade. For a hit, plav the dence from the five men in your advernarys oirter able, nd the nce play the ace from the alx to the ace point ln your plan tuble

Dreces For a hit, play two from thic six to the quatre pkint in your own table and the other two iroun the ace to the trois point in your opponent's iuner table For a ganimon, play the second palr inem thic five men in lisis outcr tuble.
Tross Ace. Make your cingue point
Trois Drouce The appinved play is to carry two men from the five in sour advenary's outer table to the quatre and cincfue points in your own
outer tuble. This, of courac makea tivo blots To avoid this, Rotne, for a hit, play one man from the sume point to the delice point in the above-nientioned table, but holder play is better.
Double Trois. There are three ways of playing thla throw. Some players make the bar point Thie toore usuul play in, for al bit, to play two to the cinglle point in the plajer's own, and the other Two to the quatre point in the ndversary's table For "ummmon, play the last two from the vix to the trois polut in your own table.
QOATRE AOE. Play the quatre from the five men In your opponent's outer tulile, and the nee froun 1.1 is nce point.

Qdatre Dedof. Make your quatre point
QUatre Trois. Play two men from the five in your adversary's outer table.
Dotule Qdatre Play fiwo uen from the aec to the cinque point in thie adversirys linner tiible, und tivo from the five in hils outer tuble. For a gunmon, play two men only, fron the point lust inentloned to the cingue point in your own tuble
CinQte ACE. Play the cincuiue from the floc wen in your adversars' ${ }^{\prime}$ outer tahle and the nce frou the nec point In his inner inble. For "qummon, play the nec from the sls to thic cinque point !n your owil table
Cinque Deioce, Play both men from the five in your allversary's outer table

Cinqur Trois Make your tmols point
Cinque: Quatrr Move one man from your adversary's ace point to the trois point in his outer tible.

Dodrle: Cinqur. Catry two men frin the flve point.
Six Aof. Mukc your bar molnt.

Six Deros Move a man from the five in your ndversary's outer table to the cinque point in your own tnble
Six Trois, Gin Quatre, Six Cinqup Carry one mun from your adversary's ncc point as far ns the thmow will permit.
Sines. Place tiro men on your adverampys bar point, and two on your own
Of the above throws (at the outset of the game), double aces are reckoned the best and double sixes next best Double trois comes third, followed by trois ace and six ace.
Modern Developments. A variation called chouette has heen introduced in order to fit the game for more than two persons Any number may play up to five or six. The player who throws the highest die is said to sit "in the box" or play la chouette. The others combine against him and the one who throws the second highest die acts as their lealer, or as the active oppronent. He consults with the other players a hout playing, douhling
and accepting or rejecting doubles but in case of a difference of opinion lias the deciding voice If the man "in the hox" wins the game he continues therein and the other players move up one, the one who threw the third highest die lesoming the active opponent If he loses he becomes the junior of the opponents and the one who beats him takes his place "in the box." When he wins he collects the stakes from each of the other players and when he loses he pays to each
The popularity of the game has also been increased by the system of cloubling. An automatic double occurs when two players throw the same number; in this case they throw again and the stakes are doubled A player may also declare his intention of doubling before ho throws the dice. His opponent or opponents may accept or decline the louble: if the latter the game stops

## BaCON: THE CUTS AND THEIR COOKING

How to Choose and Prepare it for the Table

## Separate Kecipes follow, and related information will be found under Ham; Pig, etc

The thesh of the pig when cured, salted, or of hacon. Turn frequently and cook gently so otherwise treated comes from all parts of the that the lean is tender, but never let the fat world. Wiltshire bacon, sold under that name, is from Wiltshire, but Wiltshire Cut on a label may refer merely to curing after the method of that district. There are four principal cuts -back, gammon, collar, and Bath chaps, or cheeks The back is divided into best cut or loin, best streaky and Hlank. The best cut is favoured for brealiast rashers, though streaky parts are excellent. The Hank is good for baking and boiling.

The gammon is divided into threo cuts: "pper, middle, and bone end or hock. The upper part makes a substantial joint for boiling, the middle is excellent for thick rashers to fry ur grill. These are suitablefor lunch. The hock is useful for boiling, and with ycllow split peas the stock makes good pea soup.
Boiled Bacen. Bath chaps aro generally bought ready boiled and served cold. Prime or small back, gammon, corner and collar are all good boiliing cuts for serving hot with chicken, turkey, etc., or as a cold breakfast dish.

Put the bacon after washing it into $\Omega$ 'saucepun of cold water to cover it. Bring gradually to boiling point. skin well and simmer until it is very thoroughly cooked. For one pound allow an hour, and an extra half hour for each pound after that weight. When cooked, peel off the skin, which should come away quite easily, and dust thickly with browned crumbs. The liquor in which the bacon was cooked must be thoroughly skimmed when cold and the fat put into a basin. Then pour boiling water over it, and let it stand. The cake of fat that rises to the top can be used for making pastry.
Fried Bacon. In a clean, heated frying-pan lay slices


Bacon. Side marked off to show the Thick A. Fore hock. 1 . Collar. E . Thin streaky. F. Long loin. G. Flank. H. Glmmon hock. J. Corner gammon
become so hot that a smoke rises from it, or its value as bacon dripping is lost. When cooked, the fat should be tinged with brown and slightly crisp, but not chippy.

Toasted rashers are cooked either on a fork over a baking-tin in a Dutch oven before the fire, or can be grilled on a tin under a gas toaster. In cach case tho slices must be turned. Thin, trimmed rashers can be rolled to garnish chicken, veal, etc. Thread them on a skewer, running it through each and pushing them closely together to keep them rolled Lay the skewer on a tin in the oven till the bacon is delicately crisped and browned. then draw out the skewer.

For baked bucon, take a piece of flank or any streatiy cut and score the rind across with a sharp knife. Make the oven very hot and put the bacon in a baking-tin When the rind has become crisp reduce the oven heat and cook gently to avoid excessive shrinking, allowing 20 min . to the lb . It should be served cold for breakfast

Bacon Dishes. Eronch beans first boiled till tender, then fried in bacon fat with two sliced peeled tomatoes and served with rashers, are a change for breakfust. Bacout with cabbage is a favourite Welsh dish, being savoury for lunch or supper, as well as nutritious. Trim, wash carefully, and boil quickly about 21 b . of spring cabbage. Then drain off the water, pressing the greens well and chop. Trim and cut $\frac{1}{2} \mathrm{lb}$. of bacon into largish cubes, and fry till orisp and lightly browned. Keep the bacon hot, and into the fat from it stir the cabbage, and a sensoning of salt and pepper. Add the bacon, mix and heat well, and pile on a hot dish. Garnish with fried bread. Shake over two tablespoonfuls of grated cheese. Heat in a quick oven till cheese is
browned and serve. This quantity will be found sufficient for about four persons

Bacon with macaroni is a useful dish for brealifast or supper Break $6 \mathbf{o z}$ of macaroni into short lengths, ahout an inch long. Put into a saucepan with plenty of boiling water, salted, and boil until quite tender. Meantime tim and cut the bacon into cubes. Fry till lightly browned, and add the strained macaroni, one large peeled, sliced tomato and a careful seasoning Heat all these very thoroughly, serve them piled in a hot dish, with crisp lingers of toast. This is sufficient for about four or five persons

A good supper dish can be made from bacon and checse Toast on one side only as many slices of bread as there are persons to be served. Butter the side that has not been toasted and cover thickly with shredded checse, pepper, salt, and a little marle mustard. Lay on top of this two rashers of bacon and place in a moderate oven to cook slowly.

Bacon Curlng, This is only undertaken safely in the cold months of the year from November to March. The first point in home curing must be to obtain a stone cold side of best fed pork

Salt, sugar, and saltpetre are the usual ingredients employed in the cure, the lirst two being antiscptic, and the third bringing out the line, rich, colour of gond bacon. The sides can be cured cither by the dry-snlt process or the picklc proccss. The former commonces with a vigorous rubbing of salt, repeated several days in succession, and then the side is left with a thin covering of salt, followed by a light sprinkling of saltpetre and granulated sugar. In 10 days from the last rubbing in, the salt, etc., may lie remored and the side hung up in a cold, dry place. For protection from dust and other contam ination it slould he enveloped in a thin butter muslin covering
Tu ensure adequate curing, the thicker parts, such as the gammon and the fore end, should be injected with brine by an ordinary pickle pump. A gond pickle for this purpose is comprosed of 1 lb . of saltpetre. 1 lb . of

Demerara sugar, 11 ll of salt, and 4 gallons of water. This same pickle is suflicient for curing by the wet process. which is done by immersing the side, or parts, in the pickle and keeping it for 10 days $_{\text {c }}$ covered with the brine The result of this cure, either by the dry or the wet process, is known as green bacon. For added Havour the bacon can be smoked by being anspended in n square stone cubicle, with an opening at the top to lot out the smoke, the floor heing covered with peat and set alight, and the bacon kept thicrein from 36 to 40 hours.

BACON CUTTER. A bncon cutter suited to domestic needs consists essentially of a strong base, gonerally of cast-iron, heavily enamelled. Mounted upon an upright is a circular steel knife or cutter rotatable by a crank handle and gearing.

A tray or carriage provided with a safety guard is pushed along on guides on the hase, and carries the bacon or other food to be cut into slices, means being provided to adjust their thickness In operation the crank is turned with the right hand. the left holds the bacon on the carriage, which is pushed past the revolving linife, a nd a slice is cut off, the process being repeated as often os required. T'he same machine may alen be used to cut bread

## Bacteria. See Microbes.

BADGER BRUSH. For shaving, tooth and painter's brushes badger hair is used on nccount of its softness. It is grey on the end with a black portion under, the lower portion being of a creamy sliade. Being an expensive article, it is widely imitated, e.g. by dyeing hog and similar bristles. The real hair is fine, silky to the touch, straight and springy. A badger-hair shaving brush will wear right down to the stump and still remain soft and springy.

Painter's brushes must be cleaned directly after use. They should be washed in warm water with a little washing soda and rinsed in clean water. If used with vamish or varnish paint, this shonld be dissolved with turpentine before washing. See Brush; Shaving.


Bacon: principal cnts. 1. Gammon. 2. Gammon Rock. 3. Fore end. 4. Thick streaky. 5. Fore. bock. 6. Flank. 7. Thin streaky. 8. Corner gammon. 8. Long loin. 10. Back and ribs

BADMINTON : How to Play it. Nlthough played as an indoor anme, hadminton can be played on lawns which are neither large enough nor good cnough for lawn tonnis and it can be enjoyed by people of all nges.


The strokes are not unlike those in lawn tennis, but a shuttle takes the place of the ball. The shuttle is in play from the time that it is hit by the racket until it touclies the ground or the person or dress of any player, or until a fault or let occurs, this period being known as a rally. There is no first bound as in lawn tennis and the service may not be overhand. The shuttle, at the instant of being struck, must not be higher than the server's waist. Most players hold the shuttle loosely close to the cork part, and the object is to hit the shuttle in such a way as to make it diflicult for an opponent to return it.

## Scoring at Badminton

The scoring is adapted from that used in rackets. In the doubles, when one pair of players opposes another pair, and in the nien's singles, when there is one player on each side, the game usually consists of 15 aces. When the score happens to reach 13 all, the side "hich has first arrived at 13 has the option of setting the game to 5 . In other words, the side mny. and generally does, elect that the game shall continue until onc side or the other has won five adrlitional aces.
In the same way, when the score is 14 all. the side which has reached 14 first has the option of setting the game to three. In cither case, when the game is set, the score is called love-all, and the side which first scores $\bar{j}$ in the first instance or 3 in the second, wins the game. Generally in ladies' singles the gainc consists of 11 aces. Here agnin the game may be sct at 9 all to 5 , and at 10 all to 3 . Thie match is decided by the best of three games, which is the rubber.
In badminton, as in rackets, a side (or in singles a player) is either in or out. The scoring can only be done by the in side; the business of the out side is to put the other side out. In the doubles the side ( $A$ and $B$ ) which begins the game has only one liand in its first innings. Thus when A is put out, B does not serve, and the service gocs to the other side ( $C$ and D). But after 1) is put out the turn of the other pair comes, and so on to the end. The service is delivered alternately from cach half court into the half court diagonally opposite. After the service the players can take inp positions where they please till the rally is ended.

The diagrams show that the court for singles is as long as that for doubles, but not quite as wide. For convenience both courts are generally marked out in one, the dotted lines in the diagram of the doubles showing where the singles court comes.

## Bags and How to Make Their

## Some Atiractive New Ideas tor the Needlewoman

For details of Mcthnds employed sce Applique: Beadwork; Embroidery; Tapestry and for Bags in other Materials see Leather: Raffia, ere.

A shopping bag is shown in Fig. I. It may II there is no liandle to the frame, to make be of American cloth, hessian, or striped can- one cut a strip off the width of the material vas. It should be lined through with cretonne $1 \frac{1}{2} \mathrm{in}$. wide, fold double, and stitch along for or similar fabric to give extra strength, and requires $\frac{1}{2}$ yard of 24 -in. wide material, with the same quantity of another fabric for lining. Take the material for the outside, and out a 3 -in. wide strip from one of the cut edges, not the selvedges ; then cut this strip in half, to obtain two strips 3 in . wide and 12 in . long.


Bag. Fig. 1. Simple shopping bag. Fig. 2. How it
Cut a $V$-shaped piece out from onc end of each of the two strips, as in left-hand side of Fig. 2. Fold each strip lengthwise down the centre, and sew the edges of the $V$-shaped opening together. Now fold the larger piece of material to bring the selvedges together, as in Fig. 2, with right side inside. Join the long edges of the folded strips to the side edges of the larger piecc (Fig. 2) so that the narrow strips are sandwiched between the two layers; then turn the bag right side out.
Dlake up the lining in the same way, and slip it inside the bag with seam turnings

lacing, turn top edges in to meet, and oversew along with embroidery silk, a fine coloured twine, wool or raffia, finishing the remaining edges with decorative oversewing to match. Next cut small holes within the top edges to take handlea, and oversew or buttonhole the edges round for strength: then add handles of cord, or strips of material doubled and stitched along. Hand embroidery or appliqué work can be added as a decoration.

Frame-mounted Bags. Handbags of silk and other materials, mounted into a frame of ivory, tortoiseshell, or an imitation of either, or of metal, with chain handle, or one made of the material can be easily worked at home, frames being purchased. These are made with sows of tiny holes through which the bag is sewn on. The bags are lined and may be supplied with pockets to contain powder pulf or mirror, while the top of the lining is finished off with a narrow ruching, galon, or silk lloral trimming.

Details for making such a bag are shown in Figs. 3-5. The mount or frame illustrated measures about $6 \frac{1}{2} \mathrm{in}$. in width ; $\frac{1}{2}$ yd. of 18 in . wide silk for the outside of the bag is required, and also $\frac{1}{2} \mathrm{yd}$ of 18 in . wide silk for the lining.
strength.
Begin by taking the silk for the outside of cutting off the two top sets of corners to form a circle. Now turn in the edge of the silk circle to the wrong side and run in a gathering thread, leaving long ends of cotton. Open out the frame or mount to its full extent, so that it will lic flat on the table as in a circle, and measure all round the inside edge of the frame where the tiny holes are. Then draw up the gathering thread along the silk edges to make them the same size as the mount. New the bag into the mount, working from the inside, according to the pattern sketched in Fig. 3.
Pass the needle through the edge of the hag and through one of the holes to the outside; then carry the needle below the frame edge, and push it through the silk to the inside again, then pasaing on to the next hole. Take the silk for the lining, and from it cut a strip mensuring about 17 in . long (an inch less than the length of the bag ailk) and ahout $8 \frac{1}{2} \mathrm{in}$. wide; that is, 2 in . more than the width of the frame. Fold this strip in halves with the right side inside and curve off the top corners slightly. Then seam up the sides as far as the commencement of the curves.

A pocket for holding a small mirror and comb, and made of a square of material, hemmed at the top and having an elastic runthrough hem, can he stitched to one side of the lining before it is seamed up, as suggested in Fig. 4.

Turn in the curved topedges of the lining and gather up lightly, then slip then inside the bag, and hem them to the top of the latter. Furlly, add a strip of Horal trimming, or ruching wit the edges. Ruching is made by cutting on the ress a long strip of the lining silk, about $1 \frac{1}{2} \mathrm{in}$. wide, folding it over with the wrong side outside and running it along as though for an ordinary rouleau. Turn inside out with the aid of a small safety pin, and with sewing silk to match, run it in a zig-zag line from side to side, as shown in Fig. 5. When th's gathering thread is drawn up, a pretty $t$. mming is the result. This can be sewn to thie bag along the gathering thread, which should now run in a straight line down the middle


Bag. Fig. 6. Brocade bar mounted upon a silver frame and baving a bandle of covered cord

Flat shaped bags on stit, one-piece torloise shell or wooden mounts show off embroidery or make up well in heavier materials such as tapestry, tweed or moiré To make such a bag in brown moire silk, with shell mount and lining of moiré to tone, cut two pieces of moiré, one for cover and one for lining, 9 in . wide and 14 in. long: fold in half, making depth of bag 7 in . Join up the side seams and slip tlie lining into the bag, oversewing together at top; attach a small square tab on one side, made of double moiré. Turn in corners, fit into frame and finish off lining with a narrow gold galon.

An effective way of using strips of embroi dery with a right-angled silver frame and cord-padded handle is shown in Fig 6.


Bag. Fig. 7. Silk bag gathered on to a yoke plece the top of which is sewn to a gilt frame
A variation of the framed bag has a yoke piece as in Fig. 7. A paper pattern can be out to desired size from the diagram (Fig. 8). It requires a gilt frame, $\ddagger$ yd. black silk, nnd the same amount of lining sill, and may be embroidered on one side. Cut a strip of onvering and lining silk, each 23 in . long and 2 in. wide. The yoke part must be stretched Hat. Join the two main parts of bag to edge of $23-\mathrm{in}$. strip, letting in piping cord
covered with black silk (the lining requires no piping) Turn up the scal loped edge of yoke pieces and sew over a strip of cord. Fix lining to yoke and invisibly sew to gathered lower part. Sew top edge to frame and cover stitcheswith narrow bead trim. ming.


Bag. Fi: 8. Diagram with details for making the
Pochettes. Two pieces of material, for lining and for cover, gach mensuring 18 in by 9 in . and folded in thres: re needed for a simple pochetto bag. If to be embroidered, trace the pattern on the first 6 in. of cover and press before making up.

Interline with buckram to stiffen before folding the bag into three and oversewing the two sides. Such pochettes are uscful for evening bags, but not for hard wear. They may be fastened by press studs concealed under the Hap or by a jewelled button and tinsel cord.

For a more practical pochette side gussets are requircd. Fig. 9 could be carried out in heavy corded silk and lined and trimmed with the same in contrasting shade. The trimming has been edged with tinsel thread (six rows) and couched on to the flap. Cut cover and lining, as shown in Fig. 10, to measure 9 in . by 20 in ., also a piece of buckram $t$ in. smaller all round; draw and cut a paper pattern of the trimming, three times size of diagram, lay
on material and out out (soe diagram). Having marked position, tack neatly and sew the trimming to lasg, preasing afterwards with a slightly warmed iron on the wrong side of material. Tack cover to buckram, turning


Bag. Fig. y. Pochette in heavy corded slyx with as appliqué trimmlnz ontlined with tinsel thread
edges $0^{\text {i }}$ inaterial over the buckram so that the trimming comes on edge of bag. Then slipstitch lining to cover. Cut the gusacts in covering and lining ailks, turn in the edges and st itch together. Fold the bag and neatly sow in gussets. Such a shape lends itself to n variety of trimmings; a central appliqué ornament may be used, a mono. gram, or the whole thap may be gaily embroidered: or it may be cut out incan
 envelope shape and made of brocade.

BAGATELLE : How to Play. The baya telle board or table is usually from $\mathbf{0}$ to 10 ft . long, and from $1 \frac{1}{2}$ to 3 ft . wide. It is made to fold up, can be placed on a table for play, is of wood covered with green oloth, and the sides are cushioned with rubber. When open the top is in the form of a semicircle, and let into the surface are nine rounded holes or cups, each the size of the nine halls used.

Thesc holes are numbered


1 to 9 . Some tahles have pockets in addition to holes, hut with these the game is more akin to billiards.

The players, using a cue on the model of an ordinary cue, play from the end of the table op posite to the holes. Each player in turn takes eight balls, 4 white and 4 red, while a ninth, a black one, is placed on a spot in front of the holes. His object is to drive the bylls one by one into the holes, but before scoring he must hit the black ball.
The scores count according to the holes into which the balls are sent, save that the black ball counts double. A player will aim at driving all the balls into holes, reserving the black ball for the one marked 9 . The game is usually for an agreed
Bagatelle Board number of points, and
most boards have holes and pegs at the sides by which the marks can be reconded If the game is played by more than two persons, side will be chosen and members of each will play alternately

A number of other gnmes can be played on the bagatelle table. One is the cannon game, n which only three halls ame used, as at hilliards, by two players. 'Two of them are placed in position, the black on the spot and the white bet ween holes 1 and 9 . The striker plays with the third hall, and to score must cannon before driving a ball into $n$ hole. If he drives one without cannoning the score counts to his adversary. Two is scored for a cannon, while points go to the other side if the balls are mised. As in billiards, he con linnes to play until he fails to score. For this game there is a special table without holes
BAKED JAM PUDDING. Take 1 breakfastcupfuls breadorumbs and pour over half a pint hot milk to which has been added $1 \frac{1}{2}$ on. margarine or butter. Sweeten with 2 tablespoonfuls sugar, Havour with a few drops vanilla essence, and add the beaten yook of an egg, and hake in a moderate oven. Then add the white beaten up with sugar and spread on the top over a thick layer of jam The pudding must then be put back in the oven for the white of egg to brown Serve sprinkled with tine sugar

BAKELITE. This is a synthetic resin formed from phenol and formaldehyde. It is infusible, resists acids and solvents, and has great strength as a dielectric. For use ly manufacturers it is supplied in a form allowing of fusion, but after heating to a certain temperature the material solidifies, hardens, and thereafter resists fusion.

Bakelite is readily moulded into intricate forms, and is extensively employed for switches, plugs and other electrical apparatus, as well as for houschold utensils, being practically unbreakable.
BAKEWELL PUDDING. For serving either hot or cold, this is a convenient sweet To make it, line a pie-dish with ordinary short crust. On top of the crust sprend a layer of jam, and fill in remainder of dish with the following mixture. Cream togethar 2 oz each butter and castor sugar, and add to this a beaten-uplegg and 2 oz . ground almonds, with a little alinond essence. Beat well and put in the pie-dish on top of the jam. Then bake the pudding in a quick oven until thoroughly browned. Sufficient for 6 or 7 persons

BAKING AND ITS UTENSILS. While a roast of ment is cooking in its later stages, baked puddings, scones, buns and short-crust pastrv needing the same heat may share the

uven; but puff pastry, which requires a very hot and dry oven, would be apoiled if cooked in the same oven as meat. Bread requires to bake in a moderate oven. Joints of meat should first be placed in a very hot oven to seal up the surface and
prevent tou nuch of the juice cacaping. When the meat is well browned the heat can be mod erated. Nilk puddinga without eggs should at first be placed in a hot oven to bring near boiling point, then allowed to cook slowly. Eggs may be stirred in at this atage. Custard pudding, or any pudding containing eggs, requires a morlerate oven.

To bake a cake well is one of the most diffioult hranches of the cook's art. To ascertain the heat of the oven, sprinkle a little flour on a baking-tin and place in the oven. If the heut is just right for the cake the flour should be of n good yellow colour in about one minute. The oven should be kept at this moderate heat throughout.

Opening and shutting the oven door should bo avoided as much as possible, as draughts cause a sudden drop in temperature which often spoils cakes and pastry.

Special thermometers for baking are now made, and if used the following temperatures (Fahrenheit) should be recorded

## Meat Ples <br> Cakica ind pastry <br> Bread and puaf jostry <br> $300-(11)$ 290

All kinds of pastry require to be baked in a very hot oven at first, to expand the air enclosed in the pinatry, so that it raisea and lightens the flour If the temperature of the oven is not sufficiently high to set the pastry quickly the air or gas will escape, and the pastry sink again and hecome heavy A sharp hent is also nceded to swell quickly and burat the starch-grains in the flour, and thereby ensble them at once to absorb the fat used as it melts. Unless this happens the warin butter or lard merely oozes out on to the haking tin, and the pastry becomes hard and chippy. It must always be remembered that the richer the pastry the hotter must he the oven. When the pastry is set, the heat must be slackened to prevent it burning.

Heat the oven whilat preparing the dish for which the pastry is to he used. If a coal range is used, make sure that the flues at the back of the stove and mund and under the oven are clean and free from soot, otherwise a proper hent will never he attained

An oven with a gond bottom heat is desirable for pastry baking, and the top shelf is always the hotteat. This shelf throws down the heat on to the fond and thus browns it. Should the pastry secm likely to be too dark before everything is cooked through, this shelf can be pulled right out from the oven. Another plan is to lay a sheet of stout paper over the pnstry.

When putting pestry into or on to tins it is unnecessary to grease them, as there will be sufficient in the pastry itaelf to prevent it sticking, and to add more only wastes fat and increases the risk of hurning. After the pastiy is completely baked, let it cool down in a warm place, and not in a draught. It is a mistake to burry it away into a cold larder, as hy an doing the steam in it condenses and the pastry loses its crispness and becomes tough.


Baking Pan for meat with cover containlng basting colander. A bove, lett, double baking pan with rrid, basting well, rravg colander and lower pan for water Courteay of Selfriflge if Co.. Lid.

Baking Utensils. Double baking pans are best for oven roasting. They can be obtained in oblong or square shapes and in all sizes

BALL BEARINGS. These comprise all types of bearings where the working parts aro separated by means of metal balls, relatively small in diameter. The chief advant ages from the use ages from the use falls, and water is admitted As it rises in the of ball bearings are tank the ball floats on the water, and gradually tho easy running lifts the lever Finally, when the desired height qualities due to re- of water is attained, the lever has lifted suff. duced friction be ciently to close the water inlet by forcing the tween the bearing surfaces, simplicity of adjustment, and long life, if properly cared for
Thero are two great classes of ball bearings: (1)the cup and cone type, as
Ball Bearinga. Hub of a bioyele partly out away to show oup and cone bearinz

extensively used on bicycles: and (2) radial bearings, used on amall electric motors, and for bearings in motor-cars and uther purposes. Ball thrust bearings are adapted to take an endways thrust An example is the bearing in a oycle stcering-head

A typical cup and cone bearing, us usod on a cycle hub, is shown in the illustration. The cones are mounted on a spindle, one is firmly fixed thereto, the other works on a sorew thread, and provides tho means o: adjustment.

The balls run botwec: the cup and cone, and sufficient of them arr used $\omega$ form a complete circle. To adjust any bearing ol this type, slacken the lock. ing nut and rotate the movable cono until every trace of slackness or shake has been eliminated The looking uut is then tightened up hard.
To clean a ball bearing, take out the cones and spindle, placing a clean piece of paper or a large tray on the ground to catch the balls as they fall out. Then wash the balls, cups and cones in paraffin, and clean the hub or part from which the bearing has been removed Assuming there is no wear or clamage, the bearing may then be reassembled First fill one cup with vaseline or thick grease and place it on the bench with the cup horizontal Insert tho balls one by one into the cup (the vaseline will prevent them falling out), then insert the spindle and fixed cone. Hold the spindle in place and invert the bearing, thus allowing the spindle to rest upon the bench Support the bearing with blocky of wood if necessary. Insert the balls in the other cup as before. Finally, screw the adjusting cone on to the spindle and adjust as already described. See Bicycle ; Motor Cycle.

BALL COCK : In House Cisterns. The principal purpose of a ball cock is to regu late the flow of water into a tank or cistern,


Ball Cook. How the flostung ball controls inlet of water. Inset, valve part of high-pressure type
its action depending on the buoyancy of the ball, which is hollow and made of copper. It is attached at one end of a lever arm, the other end of whioh is pivoted to the valve
body or tank. Near this end of the lever


Ball Vapye, Beotion of the zimple type the ball must bo clean, must seat on a knife edge, or very narrow scating, and must be prevented from lifting too high off its seating. The diagram makes the construction of such a valve quite. clear.

BALM. The plants of the genus Melissa, a hardy herbaceous perennial with aromatic stems and leaves, are classitied as balm. They flower in the summer months, al which period thestems should be cut off and stored for winter use Balmi leaves make a good pot-herb and were formerly used exten sively. The plants may be increased by division of the roots in autumn, or by seed sown in March. Any ordinary garden soil suits them, but they prefera sunny border

BALM OF GILEAD. This is the popular name of Cedronella triphylla, a sage-like plant from the Canary 1sles: it bears purple Howers but is valucd chiehy for the sake of its fragrant leavos. It is handy only in mild districts. Propagation is by cuttings under glass in spring. When nosegays were fashionable, they nvariably contained $a$ few fragrant sprigs of Balm of Gilcad.

BALSAM. This is a half-hardy annual belonging to the genus Impatiens, the main types heing camellin-llowered and rose-


Howered The balsam ia linble to damage in bad weather and is more use ful for the greenhouso thnnfor flower beds. When balsam is grown in greenhouse or conservatory, it should be watered freely when well rooted and must be potted in rich soil.

It is raised fromed sown under glass in Feb.
ruary or March, and potted in a compost of three parts loam, one part manure, and a little sand. The wild yellow balsam has apotted llowers, and there is a dwarl type with large tlowers The double white camelliafowered balsam rivals the begonia in beauty.

The common Impatieus glandulifern has white and pink Howers, and in a shrubbery is often a nuisance because of its enormous faculty of rejproduction Pron. Ball'sum.

BALSAM. There are four varieties of balsam which are useful in coughs and bonchitis, namely, balsam of Peru and tolu, Lenzoin, and styrax or storax All are resinous bodies with an admixture of benzoic or cinnamic acids. Benzoin and balsam of Peru form a mild antiseptic for cuts and ulcers. Storax and balsam of Peru are used for removal of lice. The compound tincture of benzoin generally known as Friar's balsam is valuable in arresting bleeding when applied to fresh wounds on a piece of lint. If half a teaspoonful be added to a jug of steaming water and the vapour inhaled, much benefit may be derived by persons suffering from nasal catarrh and other similar affections of the respiratory passages. See Cold : Friar's Balsam.

BALUSTER. The term is given to the supports of handrails, harricades, etc., which may be turned, shaped, or aquare, the latter being sometimes fixed at an angle. Balusters are lest fixed by nailing only, where they are fitted to n sloping surface, as a stair string and handrail, but where fixed to level surfaces, morlise slots should be made to receive them See Railing: Staircase.

BAMBOO. The genus of grasses known as bamboos belong to three groups, Arundinaria, Plyllostachys and Bambusa. They are graceful evergreens which flourish best in moist soil and a sheltered position. They are most attractive from midsummer to early spring ; between February and July the leaves become shabby.

They do well by the side of a stream or pond : if the soil in which they are planted is not naturally moist they must be watered very freely in dry weather. The best time to plant or transplant bamboos is in April or September. Bamboos which flower usually perish a short time afterwards; they can be increased by sowing seeds under glass and subsequently planting the seedlings out of doors. The way to prune bamboos is, in April, to cut out some of the old shabby stems right to the base. Some of the best hardy bamboos for British gardens are

Arundinaria anceps, 8-10 feet, A. nitida, 8-10 feet, A Simioni, 12-15 feet; Phyllostachys fastuosa, $15-20$ feet, and $P$ nigra. 8 feet Attractive low-growing kinds are Bambusn tessellata 3 feet, with very large leaves; pygmaea, 15 inches, and Veitchit, 15 inches The two last named are improved by being out down almost to the ground each year,

Bamboo Work. Bamboo differs from wood, but is easy to deal with when its peculiarities are known. It is obtainable in lengths of pole or rod, is straight and parallel except for its nodes, and is light and comparatively strong, with a hard, glossy skin Dianeters stocked by English dealers are from about $\frac{1}{2}$ in to 2 in . The small diameters easily bend when heated, and remain bent when cold, but old bamiboo docs not bend so easily as does new.

Hot water ann be used for heating, hut more frequently it is done with a smokeless flame, as in Fig. 1. The flame can be allowed to touch the surface, but either bamboo or flame should be kept moving slowly As the diameter increases it becomes more difficult to bend, and then only slight curvatures are attempted In bending there is necessarily some amount of fattening or loss of cylindrical shape at the bends. The outer curve is longer than the inner, and in large diameters and sharp curves this must be assisted by making a number of shallow saw-cuts across the inner part. In bending, these close tightly and hardly show

As bamboo is hollow, it is nearly always plugged with soft wond at places where joints have to be niade A rasp of half-round section is used for preparing the interior. Figs 2, 3. 4, 5 show joints at right angles. Plugs are shown in both parts, but this is not always practicable. Glue and fine nails are used for holding the joints Glue does not hold well on the natural enamel of bamboo, and therefore it should be ras ped or glass-papered before glueing.

A diagonal joint may be made as in Fig 6, the end being gouged or rasped to fit the curve. Fig. 7 shows a piece of dowel put transversely through one piece to fit into the ends of pieces which cross the first. The ends are plugged in the ordinary way, and then a hole to fit the dowel is bored in the centre of each of the plugs, The dowel is smaller in diameter than an ordinary plug.

Many articles of furniture can be made of bamboo, either entirely or in conjunction with wood. Bamboo is often used for fancy tables, chairs, seats, bedsteads, washstands, bookcases, and cabinets. Also for music racks, curtain poles, overmantels, hall stands, and frames for screens. Unless holes are bored for nails there is risk of splitting. A bradawl may be used, but it is better to bore with a brace and bit or a drill. Bad jointa


Bamboo. Well-grown ghrub of Arundinaria metake. a fine foliage shrab for a large rarden
can be filled with a paste of sawdust and melted glue. Bamboo will not take stain, but may be vamished or enamelled.


Bamboo. Fig. 1. Showing how it may be bent. Figs. 2-7 Methods of making diflerent joints. on to bamboo curtain doles. Fig. 10 . Joining bamboo by \& wooden plag

For bamboo pole, a useful size is about If in. diameter. This is cut up for simple articles of furniture, and is used simply as a pole for numerous purposes, one of the commonest heir.g curtain poles. Fior this purpose it is supported horizontally on brackets, and the curtains are attached by means of riugs which can be alid along the pole. It is fitted with ornamental ends of wood or metal, which are large enough in diameter to prevent the rings from coming off The ends are generally put on in a way which permits of rumoval if it is desired to take the rings off

Two methods are shown in Figs. 8 and 9. In the latter the pole is plugged, and the knob fitted with a double-ended screw, so that the knob can be screwed on Poles may be joined end to end to obtain the required length They are united by inserting a wooden plug, as in Fig. 10. The ends of the bamboo should be cut to give sufficient length when the plug is driven in until it reaches the solid part at the node, as shown dotted.

BANANA. A nice sandwich cake can be made with 6 bananas, 3 eggs, $6 \mathbf{o z}$. flour, $\frac{1}{} \mathrm{lb}$. lump sugar, and lb icing sugar. Boil the sugar in pint water until it is clear ; then add the eggs and beat them for 20 min . Stir in the flour thoroughly and bake the mixture in two well-buttered tins for hour. Three bananas should then be reduced to a pulp and spread on the cakes, which can be laid one on the other to make the sandwich. If preferred, another thin layer of cake, made in a smaller tin, may be placed on top to give a decorative effect.

The icing is made from 2 bananas, skinned and reduced to a pulp, and $\frac{1}{2} \mathrm{lb}$. iring sugar. Mix these well together with a knife, and spread the mixture on the cake. Cut another
banana intu rounds, place theer on top of the icing. and put a small silver ball, obtainable from any confectioner, in the centre of each round.

As a sweet bananas can be prepared with coffee or ohocolate icing. Peel the necessary number, dip each into raspberry jam, and cover with almond paste; then coat either with coffee or chocolate icing.

BANANA CRARIOTTE. Line the bottom of a plain charlotte tin with a layer of sweet jelly and decorate with strips of angelica and glace cherries. Trim the required number of finger biscuits and line sides of mould so that they fit closely. Beat up 3 fresh eggs and stir into them a pint of boiling milk sweetened with 2 oz . castor sugar. Put this in the pan and stir over the fire with a wooden spoon; when the consistency of cream add the pulp of 4 ripe bananas.
Stir in $\frac{t}{2}$ oz dissolved gelatine, add $\frac{1}{2}$ tea. speonful vanilla, and lastly $\frac{1}{2}$ pint whipped cream. Just before the cream begins to set pour it into the prepared mould and place it on some ice to set firmly. The shape should be unmoulded carefully on to a cold dish and then served.


## Banana Chartroase, a rioh paris aweot

BANANA CRARTREUSE. Line a Huted jelly mould, having a pipe in the centre, with a layer of wine jelly, and decorate the bottom with halves of glacé cherries and slices of bananas. Cover with a layer of jelly and when set, or nearly so, put in another layer of banana slices and continue until the mould is filled. To set well place the mould in a pan and surround with crushed ice When firm dip the mould in tepid water for a few seconds, and turn out the shape on to a cold dish. Fill the centre with stiffly whipped cream, slightly sweetened, or some ranilla custard.

BANANA-ECLAIR. Put $\frac{1}{2}$ pint of water and 2 oz of butter in a saucepan. Boil and, having removed to a slow fire, add 6 oz . Hour and stir well with a wooden spoon for 10 min . When cold, add 4 egge, one by one. Next pass the mixture from a large pastry bag through a large piping tube on to a but. tered dish, making each piece about the size of a walnut and about an inch apart. These should be baked in a moderate oven for half an hour and then taken out to cool. To pre. pare the cream take 2 eggs, 1 oz . flour, 1 oz. sugar, $\frac{1}{2}$ pint milk, and 6 ripe bananas, Which should be passed through a sieve. Boil the milk, add the flour and sugar, and beat all up well with the eggs. Cook a little without boiling, add the banana purce, and


Banana Rolairs, a delicacy for afternoon tea
mix thoroughly. When oold, cut off the tops of the pastries and stuff each with the cream, afterwards replacing the tops and sprinkling them with sugar.

BANANA GATEAU. Make some short pastry with 8 oz self-raising flour short pastry with 8 oz. self-raising flour, fold and apply as shown in the illustration.


Banans Gatean, decorated with whipped craam
line a deep sandwich tin with it. At the bottom and sides put grease-proof paper and fill up with rice to keep the shape. Bake in a fairly brisk oven. When done remove the paper and the rice, cut 3 bananas into rounds and cover the bottom of the pastry case with them. Take $\&$ pint lemon or orange jelly when on the point of setting. and oover the bananas gently with it. Leave in a cool place until quite set, and then serve. If desired, it can be decorated with whipped creaı.
BANANA PRINCOSS PUDDING. Peel and mash 6 bananas, afterwards placing them in a greased pie-dish. Add a layer of apricot jam, and let it get warmed through in a moderate oven. Whip the whites of 2 eggs with castor sugar until they are quite stiff, cover the pudding with it, return to the oven and bake until a golden brown. This will take about 5 min . It may be served hot or oold.
BANANA TRIFLE. Take 8 sponge cakes, a pint of custard, some jam, 3 bananas, and 1 oz . of blanched almonds. Cut the ment, and to arreat haemorrhage. Various forms are employed, e.g. the triangular, the roller, the T-shaped, the many tailed. Of A triangular bandage is made by taking a piece of calico, 38 in . square, and cutting it diagonally across. The parts of the bandage are named, thus the longest border is known as the base or lower border and the others are the side borders. The angle opposite the base is the point and the others are the ends. The bandage may be used as the whole cloth, the broad fold and the narrow fold. If
the point is brought down to the middle of the base and the bandage again folded we get the broad fold; folded once again it is the narrow fold. In fastening the bandage the two ends are tied in a reef knot. The diagrams in the next column show the difference between a reef knot and a granny.
The various methods of fixing a triangular bandage or dressing are as follows:
(1) Grester arm sling. This takes the weight of the whole forearm. Use the whole cloth and place one end over the sound shoulder, the point being towards the injured limb. Carry the limb across the cloth and carry the other end over the shoulder on the injured side. Knot off behind the neck; take the point, carry it forward in front of the elbow and fasten with a safety-pin.
(2) Lesser arm sling. This takes the weight at the wrist. Use the broad or the narrow
sponge cakes in half and place a fow in the bottom of a large crystal dish. Spread them thiokly with strawberry jam, and add a layer of sliced bananas. Repeat the process until the dish is full. Make a good custard flavoured with vanilla essence, and pour over the trifle while hot. Leave it to soak well, garnish the top with blanched almonds and a few straw. berries out of the jam. The top may be decorated with whipped and sweetened cream and orystallised cherries, violets, and angelica.

BANBURY CAKE. These are scraps of pastry with a mincemeat of fruit in the centre. To make this mincemeat, cream 2 oz . butter and add to it $\& \mathrm{lb}$. ohopped orange and lemon peel, $\frac{1}{2} \mathrm{lb}$. currants, $\frac{1}{\frac{1}{2}}$ teaspoonful ground cinnamon, and the same of ground allspice


Banana Princess rucung with angeica and oberrias
Lay a little of this mincemeat between two oval pieces of puff pastry, pinch the edges. brush over with egg, and sift powdered sugar over the top of the cake. Bake in a quick oven till the pastry is browned lightly and has risen well. Sprinkle again with sugar and serve hot. This quantity is sufficient for 10 or 12 oakes.

## Bandages for WOUNDS and Dressings

## Simple Instructions and Diagrams for the Home Nurse

## For the Application of Principles given here see Arm; Bleeding; First Ald ; Practure; Leg, etc.

Bandages are used to fix on drassings and either sling by placing a folded bandage or a splints, to give support or to restrain move- piece of cotton-wool beneath it. these the triangular is the easiest to apply and and bring back; then knot over the dressing. is usually chosen in rendering first-aid. (4) For the thigh and leg use a broad fold
the centre over the dressing oross the place
(3) To fix a dressing on the neck, the forcarm, and arm. Take the narrow fold, place and bring back ; then knot over the dressing.
(4) For the thigh and leg use a broad fold
and tie as above. (5) For the elbow. Take a broad fold and place the centre over the point of the elbow. Cross in front and carry round the forearm, overlapping the lower edge of the bandage already applied. Cross again in front and carry back round the arm, knotting over the upper border.
(6) For the knee. Take a broad fold and apply the centre over the knee-cap, then proceed as above, making the knot, however, below the knee-cap.
(7) For the shoulder. Take the whole cloth and lay it on the shoulder with the point upwards. The lower border is placed opposite the middle of the upper arm. Cross the ends on the inside of the limb and bring back and tie off. Fix a lesser arm sling to carry the injured limb. Take the point first beneath, then down over the sling and pin off.


Bandage. Above, reet
knot, the beat to make.
Below, granny knot, which is uneate
(8) For the hand. Take the whole cloth and lay the hand on it palm down, with the fingers towards the point. Carry this back to the wrist and cross the ends over it. Cross


Bandage. Left, greater arm sling : the whole cloth is first placed with one end over the sound shoulder and the point towards and beneath the injured limb. Right, bandage for shoulder combined with lesser arm sling


Bandage. Three stages in the spiras application of a roller bandage to Three stares in the spirai appication of a roller
the leg; top, right, shows a reverse being made
free hand is placed in front of the turn which is heing made, the roll is twisted made, the round towards made. the operator, and the turn is completed with the reverse side of the bandage in contact with
the skin. When the bandthe skin. When the bandit is again reversed, and this is continued till it lies cvenly without reversing. The first met hod is the simple spiral, and the second the reversed spiral.

When a joint is reached a turn is taken round the joint, at the knee, for example, across the knee-cap. The next turn overlapping this turn goes below and the next ovcrlaps above, and so on, till the joint is covered in. This is the figure of cight bandage, one lonp of the eight being above the joint and the other below. When the bandage is completed it should be fixed with a safety pin.

Certain rules must he carefully observed: Do not apply a damp bandage, as it will shriuk on drying and be too tight. Apply the turns with uniform pressure and parallel to each other Do not reverse over a sharp, bony edgc. While again in front and tie off on the back. Pull bandaging, the nails should be left frec, the point up and carry down over the linot nind pin off on the back of the hand.
(9) For the foot. Place the sole on the cloth, toes towards the point, and proceed as above.
(10) For a wound on the top of the scalp. Take the whole cloth and make a hem on the lower border of about an inch. Place the centre of this border on the forehead over the nose, the point being thrown back over the head. Carry the ends round and oross lielow the prominence at the back of the head Then bring these ends forward and tie then securely in front, drawing the point well down under the bandage nt the back of the head, carry forward and pin into position.
(11) For a wound of the chest, in front. Take the whole cloth and lay the point over the shoulder on the wounded side. Carry the ends round to the back and tie, leaving one end long; then tie this end and point together.
(12) For the eye. Take a narrow fold and place the centre over the eye. Carry one end obliquely across the brow and the other over the ear. Cross below the prominence at the back of the head, bring forward and tie over the dressing.
The roller bandage may be from one to six inches wide and for fixing dressings should consist of cotton or linen ; for binding or splints calico is better; a Hannel bandage is very comforting for painful joints. To give support to the legs in cases of varicose veins a woven crêpe or elastic bandage is used.
In bandaging a limb always begin on the aside and unroll the bandage outwards, but do not uncover more than three or four inches at n time. First take a few turns round the limb to fix it, and then proceed upwards obliquely, cach turn covering two-thirds of the width of the preceding turn. (See diagram abovc.)
It will be found before one has gone very far that the bandage will not lie evenly, and then it is necessary to reverse The thumb of the
because pressure on them will show whether or not the bandage is interfering with the circulation. In removing a bnndage do not roll it up in the process, but before re-applying it. If no bandage roller is available it is possible to roll the bandage quite tightly betwcen the fingers, purchase being obtained by tating it over the back of a chair.

Finger Bandage. To cover a finger, using an inch-wide bandage, take a couple of turns around the wrist, not covering the free end of the bandage, but leav. ing this loose for tying later. Carry the roll from the inside of the hand over the backs of the wrist outwards. After it is firm at the wrist, bring it down across the back of the finger to be bandaged and then make a series af apir then make a series of spiral in fagure of 8 loops and spirally overlapping the other, downwards to the tip of the finger, and back again to the root of the finger, thence crossing over the base of the finger and over the back of the hand to circle the wrist in the opposite direction to the point where the end can be easily tied into a knot with the free end of the bandage.

## Foot and Leg Band-

 age. Laying the free end on the back of the foot, the roll is carried around the outer surface of the foot across the sole, up over the inner border of the foot across the instep, round the back of the ankle, and again over the instep. This figure of eight is repeated, each layer of bandage overlapping the one below by half its width, until the ankle

Bandage. Dse of a double roller 'capelline 'bandage lor a bead injury
one roll is brought round the head and the otner across tne top
scalp is covered, each horizontal layer serving as a fixation point for the overlapping vertical handages. When enough backward and for-
ward turms have been taken to cover the dome ward turns have been taken to cover the dome
of the head thoroughly, a few extra horizontal turns may be taken in order to keep the headdress firmly in place.

Thumb Bandage. Regin by fixing the bandage with a couple of turns around the wrist, carrying the bandage from the thumb side over the wrist, and leaving a free end of live or six inches After the second turn, bring the bandage down as far as it is necessary to bandlage, and make a loop around the thumb here by carrying the roll around the thumb from without inwards, crossing over the back of the thumb and the back of the hand from thumb side to little finger side as the hand is held palm downwards. The roll is again carried round the wrist, and a second loop is made around the thumb as before, this loop overlapping the former and not extending so far down as the first. The loops are continued until the thumb is covered with the bandage from the end joint well up to the wrist, when the bandage is finished off by tying with the free end around the wrist.
Band - pass Filter. A circuit used in wireless to assist sharp tuning by allowing a hand of frequencies to pass. See Selectivity.

BAND-SAW. The woorl-worker's bandsaw is a comparatively large and heavy machine saw used for cutting flat material into curved shapes. It is used extensively in the cabinet-making and joinery trades. The blade is made of thin steel varying in length from 12 to 24 ft . and in width from $t \mathrm{in}$. to $1 \frac{1}{2} \mathrm{in}$. The saw is joined by brazing the ends and forms a continuous band. See Saw.

Bangle. A thin bracelet made of metal, цlass, ivory, or jade. See Bracelet.

Banister. See Baluster; Railing; Staircase.
BANJO : How to Play. The banjo consists in the main of two portions, the body and the neck. The body is about 12 in . in diameter, and is made of vellum or parchment tightly stretched over a hoop, some 9 in. in diameter, the object being to reinforce the otherwise feeble resonance of the strings. The neck, about 20 to 24 in . in length, is flat on top, and is called the finger-board; the underpart is munded and highly polished. On the finger-board are fixed transversely the frets, which indicate the different sounds to be produced, and in a good instrument are 22 in number: Beyond the neck comes the head, which is slightly bent back from the fingerboard, and in it are placed the tuning pegs, one for each string, of which there are usually five, for the most part of thin wire, although gut and silk are also used.

Music for the banjo is always written on the treble stave, and always an octave higher than it sounds, with a view to avoiding leger lines below the stave as much as possible. The five strings are tuned thus:


The banjo should be held so that the neck rests between the thumb and first finger of the left hand, which must be able to move rapidly to any desired position. The fingers must be curverl and held over the strings. The right hand is held over the bridge, while the arm keeps tho instrument firmly in position against the body of the performer. The tip of the little finger rests on the vellum. Of the other fingers the bulk of the work is done by the thumb, which plucks the 5th, 4th, and 3rd strings ; and by the first and second fingers, which pluck the 2nd and lst strings. The
third finger is used but seldom, and then draw cheques on one's banking account. mostly in playing chords This can best be done by opening the account The frets are arranged at such distances as in the joint names with power for either or to produce a chromatic scale, the left hand the survivor to sign. In the case of the death


Banjo. Diagram of banjo flager-board and the corresponding notes of one of the parties this is of great value as the account is carried on without $a$ break in th. name of the survivor.
legally the rela. tionship between a banker and his customer is that of debtor and creditor. The former must pay any of the latter's money on demand. The law also provides that a banker must not disclose to anyone the state of a customer's account without justifiable cause. Sec Cheque: Pass Book.

## BANERUPTCY.

 Any man may be made a bankrupt, but a married woman cannot, unless she carries on a business moving along the finger-board into different or trade. When a husband has lent money positions so as to obtain the higher notes to his wife for the purpose of her trade or The diagram shows an octave upon each open business, and she is made a bankrupt, he string: 0 stands for an open string, the other figures indicating the finger to be used in playing the chromatic scale. It will be seen that in many cases the same sound can be produced in different ways, as for example, the note D on the fourth line, which is open on the first string, is played with the third fret on the second, with the seventh fret on the third, and with the fourteenth fret on the fourth string.BANKING. Banking accounts are either current or deposit. The latter is only for the investment of money, but a current account is useful even to persons of small means. It enables them to deal easily with cheques, dividend warrants, coupons, and the like. It is a convenience to pay by cheque, which minimises the risk of loss by reducing the amount of ready money a person must have in his house or on his person. Unlike a Treasury note or a coin, a cheque, if lost or stolen, can be stopped and probably traced.

The customers of a bank elljoy other advantages. These include the privilege of depositing deeds and other securitios and vahables in the custody of the bank, usually without charge, and that of obtaining drafts on foreign and other banks in case of travel abroad, while the bank will purchase and sell stocks and shares for them. It is useful also for certain purposes to be able to give a banker's reference.

A banking account may be opened by apply. ing to the manager at any convenient branch on production of a reference or introduction. The bank supplies a pass book for recording the customer's receipts and payments. The counterfoils and the book should be compared periodically with the pass book, which is made up by the bank every day and balanced every half-year.

The charges made by the bank vary as between London and the country, and, to some extent, with the nature of the account. Small accounts in London pay from $£ 1 \mathrm{ls}$. to £2 2s. a year ; in the country 2 s . 6d. is charged on every $£ 100$ turnover. If, however, a certain minimum balance, say $£ 50$, is kept in the bank, usually nothing is charged.

As a matter of convenience, it is sometimes desirable to allow a wife or other person to
cannot claim for his money until all other creditors have been paid in full. The same holds good when a wife has lent money to her husband for the purpose of his trade or business. The whole of a bankrupt's. own property belongs to the creditors except the tools of his trade, necessary apparel and bedding of himself, wife and children to the value of $£ 20$.
When a man has made a marriage settlement before his marriage, it holds good against his creditors.

If a man settles money or property on wife or children after marriage, and becomes bankrupt within two years, the transaction is void and the creditors take everything. If more than two but less than 10 years elapse. the creditors still take the money, etc., unless it can be shown that the bankrupt at the time of the settlement was able to pay all his debts without the money or property settlod.
BANNOCK. To make this milk scone, sift together 2 breakfastcupfuls flour, a teaspoo: iful baking powder and a teaspoonful salt, and rub in a piece of butter the size of a walnut. Mix quickly to a stiff dough with milk, form into a round or rounds and prick over with a fork Bake in a loot oven on a greased baking tin. Sugar, egg, or currants could be added.

BANNS: Marriage by. In England the most usual way of getting married is by banns. The minister is entitled to have seven days' notice in writing before publishing the banns. The banns must be published on three Sundays.

Residence in a parish since yesterday is sufficient to entitle a person to give notice for the publication of banns. If such notice accepted, then fifteen days' residence from the first to the last publication of the hanns will entitlo the parties to be married.

When the parties dwell in different parishes, the banns must be published in each parish. If the marriage is not solemnised within three months, the banns must be republished. Where either of the persons to be married is under 21, his or her parent or guardian may forbid the banns and make the publication void.
The publication of banns abroad is not confined to the announcement of the intending marriage given from the pulpit of the parish
churches of the contracting parties: in France, and stenoplyylla, twu vigorous evergreens, for example, the banns must be published at the town hall, not only of the contracting party, but also of that of the parent or guardian whos: consent is requisite for the lawful celebration of the marriage. See Marriage; Wedding.

BANTAM. Although regarded in many households as a pet for the children and nothing more, the hantam may be made a

source 0 prolit. Being
the smallest of all poultry, it eats less and takes up less rooms but it lays as well as most other fowls. Its egg, aver aging $1 \frac{1}{2} \quad \mathrm{oz}$ in weight, has a delicate ischness.
DARB Noted among pigeon fanciers for the antiquity of its line age, the barb has long been held in high estcen on the Continent and in the U.S.A. It was at one time largely lired in Eingland See Pigeon.

BARBED WIRE. Ordinary wire is made into barbed wire by having little cross pieces with roughly pointed ends woven into the strands. Practical applications of this material include the fencing in of small enclosures, the wire being supported on posts in the ordinary way. As a deterrent to trespassers, a few strands can be run along the top of a wall, and suppurted on small wood or nictal blocks Barbed wire, mounted upon a suitable wooden framework, makes an inexpensive but cffective harrow for use on a lawn or in the garden.

BARBERRY or Berberis. These are hardy slirubs, comprising both evergreen and deciduous sprecies. When given plenty of room they develop into fine specimens, clothed in hlomm from top to bottom. They thrive in any fairly good, friable ground.

The harberry may be raised by seed sown either in autumn or spring, or suckers springing up from the rootstocks niay be removed and planted. Cuttings of the ripened wood may be inserted in sandy soil in a frame in autumn.

Among the species and varieties of berberis are many of the hest hardy ornamental shruhis. They are valued for their flowers or fruits; the leaves of a few, notalily Berberis Thunbergii, become brilliantly coloured before they fall. The barberries are easily managed and thrive in well-cultivated onlinary soil.

The mahonia (Berleris aquifolium, 3-5 ft.). bears yellow flowers in spring and purple fruits in autumn; it will thrive under large trees and is a good covert shrub. Darwinii.


Barberry. Frait sprays of a variety of the shrub
and stenophylla, twu vigorous evergreens,
8 ft. or more, bear orange yellow and yellow fowers respectively in spıring; buxifolia, 8 ft. hears yellow fragrant blonms in April

In recent years many new barberries, valued for their brillinntly-coloured fruita, have been introduced from China, including Wilsonae, aggregata, polyantha and dictiophylla. Many seedlings which have been raised from them also bear profuse crops of brightly coloured fruíts. These new barberries are of low or medium height and are invaluable for the front of shrubberies.

The common barberry (Berlieris vulgaris) is a large leaf-losing hush or small tree which bears bunches of scarlet fruits in autumn. Berberis wallichiana has large evergreen leaves and lears primirose yellow Howers in spring: candidula is a low-growing evergreen, with purplish fruits, suitable for the molk garden.

## Barbola. See Gessn Work

BARGEBOARD 13argeboards, sometimes
called vergeboards, are employed to give a better finish to the ends of gabled roofs, and may consiat of a plain hoard only, or may be shaped to more or less claborate and orina-


Bargeboard. 1. Simple type, sbown in section at 2. 3. Finial apex, to which barkeboards are tenoned. 4. Tenons. 5-9. Patterns used in domestic architecture. 10. Section of 8 , showing doable ornamentation produced by mounting one board on anothe:
mental patterns. Any ornamentation of barge boards should be bold in style ; fine ornament is out of place, besides leeing non-effective.

BARK. The exterior covering of trees has many uses. The hark of onk trees is employed for tanning leather, a tan solution being made by boiling oak hark, broken into pieces, in rainwater for three or four hours. Bark can be removed from a tieetrunk by cutting round the tree with a sharp knife or saw. A second cut is made below the first, and the two cuts joined by a vertical cut. The bark can then be peeled off ; it should be laid out flat on the ground with the rough surface upwards and left to dry. To make it dry out Hat, lay the bark on a board, and weight it down with bricks or ot her handy objects.
Coloured barlis ate employed effectively as coverings for the walls and roofs of summer. houses and similar outdoor structures. Decorative effects are also to be got by covering flower pots with bark, and securing it with a few hoops of withy or thin cane. This can be wired to the bark before the pot is inserted, with thin galvanized-iron wire. A paper template should be cut to fit the pot, and used as a guide when cutting out the bark. The variety of bark known in the trade as virgin cork has a rough surface not unlike rock, and is used to some extent in building up internal ferneries and such-like greenhouse fitments It is preferable to wire this material to the wooden frameworl:. See Summer Housf.

BARK BEETLE The fruit tree inost often damaged by this insect is the plum, but the lieetles are also found on apple, pear cheriy, apricot, peach, and guince. In the case of an infested plum-tree it will usually be noticed that some of the twigs or smaller branches are dead, and that numerous holes have heen bored through the bark, which peels off casily, disclosing little tunnels between the bark and the wood of the tree The trouble may extend Plum Bark beeule, much entarged to the larger branches and even to the trunk itself, and the entire tree niay thus he killed
The adult beetles are brownish-black insects about onc-sixteenth of an inch in length During warm weather in spring the beetles leave their burrows, Hying awry in search of fresh trees to attack On discovering a suitable trec the female selects a twig or branch and bores a hole vertically through the bark It then turns and bites out a tunnel or brood chamber $\frac{1-\frac{1}{2}}{}$ in in length along the branch hetween bark and wood, laving eggs as it goes This information is given by the Ninistry of dgriculture (Leallet No. 49). Sce Plum
The measures to be adopted are preventive rather than remedial. Trees in an unhealthy state are preferred by the beetles, and a bad attack by aphides or brown rot on plums, for example, may cause an increased infestation by bark beetles. Wien the tree attaclied lias died and the wood has dried up the beetles are compelled to desert it and scek other quarters. Therefore all dying and badly damaged trees or branclies should be cut down and promptly burned. The beetles will come out freely for some time from trunks and hranches left lying about.

BARLEY. Pearl barlcy is the grain ceprived of husk and pellicle and rounded and polished by grinding. Pot or Scotch barley is more nutritious than pearl harley, being deprived of the outer husk only, and roughly ground.

Barley is valuable for thickening soups and broths, for making puddings, and for the preparation of barley-water. It contains no gluten, and therefore is not suitable for breadmaking, except with a slight admixture of wheaten clour. It unites well with the oily matter extracted from ment in boiling. If soaked overnight in sufficient cold water to cover, it needs less time to cook.
For a nutritious barley stew, lake $1 \frac{1}{2} \mathrm{lb}$ of boneless shin of beef or ox cheek. Wash and wipe this, then cut into large pieces and place it, in layers, in n saucepan, casserole ol stewing jar, with two large sliced onions, some carrots, and 1 gill of soaked Scotch barley. Un the top of the last lager arrange 1 lb . of washed, preeled, and thickly sliced potatoes Season two quarts of cold water and pour this over the mixture until the saucepan is three parts fill. Then cover and stew slowly on the fire or in the oven until tender. Small suet dumplings and well-cooked cabbage should be served with this dish. Mutton may take the place of beef, but the gravy will then be less rich

BARLEY BREAK. This open air game is usually played by six persons, three malea and thiree females, but it can be played by more. Three hases are marked out and each one is allotted to one of the piairs. The middle base, called prison, or hell in former days, and sometimes the barley field, is invaded by the pairs on either side, and the middle pair, with arms linked, attempt to catch them while they are on the middle base They can be eaught singly or together, and each pair can only retreat into their own base. When both nembers of a pair are caught. they replace the others in the centre base.

BARLEY CRE $\Lambda M$ SOUP.
butter in a 1 oz . flour; then add a pint white atock and stir it with a clean wooden spoon until boiling Put into the mixture $1 \mathbf{~ o z}$ washed pear barley, simmer till the latter is anft, which will take about $1 \frac{1}{2}$ hours, and rub all through a hair sieve Rinse out the pan, pour back the sieved soup, and simmer for 5 minutes

Allow the mixture to cool for a few min., and then strain into it the beaten yolks of 2 eggs and 2 gills milk or cream. Add seasoning and reheat the soup; it must not boil or the eggs will curdle. Serve in a hot tureen with fried croutons if no white stock is available use a mixture of half milk and half water, to which a small piece of onion has been added. Margarine may take the place of butter. Sufficient for about four persons.

BARLEY MEAL. A mixture of llour and barley meal is sometimes used for scones or home-made bread. Mix well 4 oz each of Hour and barley meal, $\frac{1}{2}$ teaspoonful each of salt and carhonate of anda, and 1 teaspoonful of cream of tartar. Rub in lightly and finely 2 oz of butter, and mix with about 1 gill of milk to as soft a dough as possible without making it actually sticky.

Having kneaded it lightly on a floured board, form into a thick mund and cut across into four or eight pieces, taking care not to cut right through to the board. Place the round on a Houred tin, brush over with milk to gloss. and bake in a quick oven for from 15 to 20 minutes. The scones should be broken (not cut) apart, and served hot, split and buttered They can be baked on a hot, greased girdle if preferred. Sufficient for eight scones.

For barley meal cheese mix two heaped tablesponfuls of barley meal with a little cold milk until amooth. Boil the rest of a pint of milk and atir in the barley meal. Cook for ten minutes, then add two tahlespoonfuls grated chcere with some made nustard, and salt and pepper to season. Put the mixture into a pie-dish and bown in the oven.

BARLEY PUDDING. Specially suitable for the nursery or for convalescents. To make mix if tablespoonfuls of ground barley to a smooth, thin paste with a little cold milk, and heat 1 pint of milk to boiling point: then atir in the mixed barley and cook gently for five minutes, continuing to atir frequently Allow the mixture to cool for two or three minutes, then stir in a well-beaten egg. Sweeten to taste, pour into a well-buttered pie dish, grate a dust of nutmeg over the top, and bake in a moderately hot oven for about 20 minutes

BARLEY SUGAR. Put 1 l lb . of loaf augar into an enamelled saucepan, add pint of water and half the beaten white of an egg. Mix well together and then bring to the boil and skim carefully When scum ccases to rise the sugar is clarified, but it is as well to strain through muslin Put back in the pan and boil to the crack, i.c. so that a little dropped into cold water becomes hard and brittle. Remove from the fire, add a teaspoonful of lemon-juice, and after letting it stand for a minute pour out on a greased dish. Before it sets hard, out into strips and twist.

BARLEY WATER. Wash 2 tablespoonfuls of pearl barley in cold water, put it into a saucepan with 2 pints of cold water, bring to the boil and boil gently till the liquid is reduced to 1 pint. Strain, and sweeten or salt according to taste. One cupful of this, added to one cupful of milk, hot or cold, makea a pleasant invalid drink, and for infanta the barley water is used in the same proportion as water in their milk allowance.

For large quantities of barley water as a wholesome drink make as above, adding to every pint, while hot, the juice of half a lemon and one tablespoonful of sugar. Barley water
should be frcslily made each day and kept in a cool place.

To make Imperial Drink add 1 teaspoonful of cream of tartar to 1 pint harley water while hot. This is used in febrile conditions and to stimulate the action of the kidneys.

## Barm. See Ycast.

BAROMETER. Mercury barometers for measuring weight or pressure of the atmosphere are not to be confused with the a neroid instrument, which arrives at the same reault by totally different means. A barometer such as the Fitzroy consists of a largebore glass tube about 3 ft long, filled with mereury, and inverted into a vessel also containing mercury. This allows the mercury to deacend a few inches, thus causing a vacuum at the top.
The surface of the mercury in the container s subject to atmospheric pressure. Hence, as the air pressure increases, the column of mercury is forced up the tube. Conversely, as the air pressure diminishes, the mercury column falls proportionally to the atmospheric pressure at the time. The average height of the top of the mercury column from the surface of the mercury in the vessel at the bottom is ahout 30 in , By arranging the tube so that the top of the mercury is risible it is possible to add a scale and take readings direct.
In general principle this system is used in the Fitzroy, Piesmic, Cistern, and Fortin barometers: the last mentioned is largely employed for observatory purposes. In other types a small float on the surface of the mercury is nttached to a cord passed over a drum on an axle provided with a pointer. from which readings are taken on a suitably graduated scale.
Important points to remember with any mercurial barometer are to keep it always perpendicular and to hang it in a position where the temperature is equable, otherwise it will act as a thermometer

Aneroid Barometer. The aneroid differs froun the mercurial harometer in having no long glass column to get broken, nor any quick. silver to get lost. Also, it works anywhere and in any position. On the other hand, it depends on metal springs, and is, therefore, aflected by changes of temperature, so that it requires to be checked from time to time by comparian with a good mercurinl instrument in the neighbourhood or on about the same height above the level of the sea.

In the illustration, which is a section, $a$ is a thin metal box with the top and bottom corrugated to ninke them more springy. This box is purtly exhausted of air, so that the cffect of the atmospheric pressure is to force the top and bottom inwards. A strong curved spring, $b$, is attached to the top of the box at one end nnd at the other to a fixed stand, $c$, and connected by the lever, $d$, to a bell-crank, $e$. The other end of this crank has another lever, $f$, attached; it joins a fine chain, $g$. which is wound round the spindle. $h$, of the pointer, $k$ A hair-spring, $l$, controls the move ment of the spindle and lieeps the chain taut.

The dotted lines show the move. ment in an exag. gerated form. In the dotted line


Barrel. Leaky barral mended by tightening staves with wire
ring and tar
trcatment
pressure falls the reverse action takes place, and the chain, $g$, pulls the pointer back.

BARONESS PUDDING. Take equal quantities of Hour, suet and raisins ; \& Ih. of cach makes a good-sized pudding for four or five persons. Add a pinch of salt and make into a stiff dough with milk. Steam in a greased bowl covered with greasad paper for three hours Serve with jam or sugar.

BARON OF BEEF. A joint consisting of two sirloins left uncut at the backbone is called a baron of beef. This cut is now seldom used See Beef ; Sirloin

BARREL. This is a cylindrioal wooden vessel made of curved staves bound tuygether with hoops and used for holding beer, tar, and other liquids. A barrel is also a measure of capacity, varying according to the liquid measured. A barrel of bear contains 36 imperial gallons, a barrel of onts equals 14 stone, and a barrel of tar equala 26itgalions.

When they are no longer required for trade purposen, barrels can be utilised in various ways in or around the house. A port wine pipe set up on lega or on a amall platforin serves as a rainwater. butt. It should be coated inside with tar, which is then act on tire and hurned out. A second coating of tar is given, and after the exterior has been painted the harrel is roady for use.
The char.
preserves the wood from rotting A draw-off tap near the bottom and overflow pips at the top and a lid to exclude dust and dirt are desirable additions.

When barrels have been left lying about for some time the staves generally lecome slack; they can be tightened by driving the hoops further down the barrel, or by wiring thent tightly. The wiring is done by twisting several turns of it in. diam. (16 gauge) galvanised wire round the barrel and tightening it up with a tourniquet. Secure the wire with clout nails, or by cutting a shallow groove for it to lie in, to prevent it shifting from its place.
To clean old barrels, wash and serub them with caustic soda solution, or use one of the paint removers.
Tapplng a Barrel. Barrels may be tapped by first metting the cask in such position that nothing will be lost

meter. Aneroid barometer shown in section. Explanatory details are given in the text during the process. Tlien remove the plug in the hole intended to scoeive the barrel tap. Wrap a piece of paper around the stem of the tap and drive it home tightly with a mallet. Set the cask in position with the tap to the bottom, drive position the atmospheric pressure is high, and the air release peg into the barrel, or preferthe hox is compressed in consequence : lever ably withdraw it if possible. The contents d has been drawn down, tae bell-crant: can then be drawn off by turning on the tap. pulled over, and the hair-apring has wound BARREL: In Gas Fitting. The trade the pointer round several degrees on the namc of barrel is given to wrought iron tubing dial in a clockwise direction When the used for gas and hot water pipes and similar
the air release peg int
purposes. Such tubes are made in three thicknesses or weights, according to the size of bore, and are butt-welded. The lightest and commonest class is used for gas fitting. Hot water pipe is stronger and of superior quality, and is usually tested to withstand a pressure of 300 lb . per square inch. Steam barrel is superior to water barrel, and with. stands 500 lb . per square inch.

There are many uses for such tube apart from their specific duties. Numerous fittings, such as angles, tees, and junctions, are svailable, and by their use a large number of articles can be produced by the home worker. Gas and steam barrel is measured by the bore or diameter of the hole. Thus $\frac{1}{l} \mathrm{in}$. gas pipe has $\ddagger \mathrm{in}$. diameter hole, and actually measures approximately A in. diameter on the outside. Gas barrel is connected by means of a screw thread cut on the exterior of the tube, two straight lengths being connected by a screwed socket or sleevc, screwed over the outside of the barrel. See Gas Pipe : Pipe; Tubing.

BARRENWORT. This is a hardy herbaceous perennial, equally attractive in leaf and bloom. The foliage, somewhat like that of a begonia, in autumn colours well ; it gets dingy later, but should be left on through the winter to protect the buds


Barrenwort, a hardy porennial somewhat like a begonia
lt is a spring. flowering plant, bearing yellow, white, blue, or violet flowers. The height of the different species varies from 6-18 in.
The barren. worts grow best in shade, especially in cool, peaty soil, or in a mixture of peat and loam. They are very useful for shady rockeries, and will thrive undertrees. Propagation is by division in spring, or by portions of the rhizomes, which will form plants if put into gentle heat in spring.
BARROW. A barrow is an article used for conveying goods. The commonest form of it is that more usually known as a wheelbarrow, but there are also hand-barrows without wheels, See Wheelbarrow.
BARTONIA. Growing about 15 in . high, the bartonia is a hardy annual with deeply cut, toothed, greyish leaves and large bright yellow flowers showing a mass of prominent stamens resembling those of the wild dog-rose in shape. It thrives in ordinary soil, the seed being sown in September for spring flowering, or in spring for blooming in late summer. Pron. Bar-tony-er.
BASEMENT. A basement is the lowest floor of a building when it is situated below the ground level and when access to it is attained by stepe outside or inside the building. The term half-bsement is used when the ceilings on such a floor are above ground level.

There are various sanitary, hygienic, and other objeotions to basements, and modern houses are built without them. In large buildings, where mechanical ventilation can be installed, there is less objection to them.
The decoration of basement living rooms and flata requires careful consideration of wall treatments, artificial lighting and window curtains. Semi-gloesy paints are helpful in pale, warm colours, avoiding dead white even for ceilings as uncomfortably harsh. Patterned papers should alao generally be avoided, but a distinctive note can be given to plain wall surfaces by the use of colour for woodwork; thus a
pale buff plastio paint may have coral enamel, a primrose yellow distemper, amber painted


Basement. Part of an ingenious and decorative converdion of a basoment into a fiat
advantage in dark rooms and give an effect of space. Wall lighting, which can be both bril. liant and yet diffused, is the best substitute for daylight. Where possible reflectors may be placed outside windows. In the case of bay windows the inner sides of the bay may be panelled with looking glass.

Window curtains may be of light, bright surfaced materials. Pelmets, if used, must be designed not to obscure light. Curtain rods should extend on either side beyond the window frames, so that curtains may be well drawn back. To hide out basement views somewhat, straight French net inner curtains with a light all-over pattern may be used completely to cuver the windows. See Area : Cellar; Flat : Mirror; Window.

BASIC SLAG. This is a valuable chemical manure, its worth depending on the percentage of phosphate of lime which it contains. As influencing the availability of the phosphate, the fineness of grinding is extremely important. Basio slag is slow in action and must be applied in autumn. It is beneficial in fruit, flower and kitchen gardens. See Manure.

BASII. Two species of this potherb are generally known, sweet and bush basil. They are nearly allied to the mint (Mentha) family
and their scientific name is Ocymum. The sweet basil grows about 12 in . high, and is densely covered with small oval leaves. The little white flowers appear in early summer and are borne in long clusters. The bush basil grows about half the size, forming a roundish bush. Both plants are highly aromatic. They are annuals and are easily grown from seed in spring. They like a light, sandy, friable soil.

The tips of the leaves are used to impart their distinctive clove flavour to soups and salads, and are also used for seasoning. By cutting down one or two plants as soon as they come into bloom, and drying the leaves slowly in the shade, the leaves can be used in the winter. A form of bush basil is sometimes grown as a pot-
plant for a green. house or window. It bears shining green leaves, and pale pink Howers. Pron. Baz'-il.
Basil. See Leather : Sheep. skin.
BASIN. Cook. ing basins a re made in enamelled ware and aluminium as well as earthen. ware. The former have advantagea, being light, unbreakable and easily cleaned.
Good quality enamel-ware is essential, as in-
 ferior enamel is liable to contain arsenic, and always chips easily, fragments of the coating getting mixed with the food.

To minimise the danger of chipping delicate chins, glass, etc., when washing it, papiermâché basins might be used with advantage. Clean them with a soft rag dipped in paraffin if marked and stained, and rinse well in hot water and dry. Mixing basins should be 11 or 12 in across. These are useful sizes.

Pudding basins differ from the ordinary bowl, on account of the deep rolled rim in. tended to prevent the string used for tying on the pudding cloths from slipping upwards. These basins can be obtained in sizes from 3 to 12 in. scross. Pudding basins with special covers obviate the need of pudding cloths. Spouted or lip.basins are handy, as milk, stock, etc., can be easily poured from them. See Aluminium : Crockery ; Enamel.

## BASKET MAKING AND REPAIRING

## How to Practise Simple Weaving with Osiers

Other Varieties of Basket Work are described under Linen Basket; Rafria, etc.

Basket making may be carried out with the aid of a few simple tools, and although elaborate baskets require skill in manipulation simple work may be produced after learning a few of the methods of weaving the rods. Most baskets are made with osiers worked up with the bark intact ; others are made with rods from which the bark has been removed, and either left white or stained to a buff colour.

All osiers must be thoroughly soaked in water before use, in order to render them sufficiently pliable for bending. Round baskets may be made with no other tools than a knife and bodkin, but for square-sided work a screw-block is required to hold the stakes whilst weaving. A simple round basket embodies the principal methods of weaving, termed strokes. Such an example is shown, which can be used for marketing purposes.

Short lengths of osier may be used ; either the sizes known as luke and small in brown osier or tack and long small in white and buff will be suitable.

The bottom should be commenced by preparing six 12 in . lengths cut from the thick ends. For the first stage these lengths must be tied together in two sets of three as shown in the illustration, but as there should be an uneven number of spokes, a whole rod should be used to provide the extra spoke, and also the material for binding the lengths together. The long rod will rest with its thick or butt end alongside one of the sets, and the remainder must be carried over and under the crussed lengths until it has been twice round.

The next stage commences the separation of the spokes, and the weaving of the rod is continued. first under and over each length until it is used up. Care must be taken to
bend the spokes evenly and to work the weaving length as olosely to the centre as possible. Having once singled out the spokes the suc ceeding work is quite strnightforward, and only needs care in kecping the weaving rods close up as each round is finished. New rods are started two apokes back and left projecting about 1 in . beyond the top of a apoke, or the end may be pushed down alongside one of the spokes and then bent out. When a dia meter of 9 in. is reacher the end of the weaver should becut off and pushed down alongside the nearest spoke, and the projecting ends of the spokes cut off close to the weaving.
The natural tendency in weaving will be to form a hollow tray, and this is just the formation required. The sides should now be formed by inserting the stakes, which are long lengths sharpiened at the butt end, and pushed in alongside the spokes. It is atill necessary to have an ordd number of rods, so. as there are 13 spokes, 25 straight rods should be trimued at the ends with a wlicing cut aalled a slype. Each rod should be pushed down by the side of a spoke, a hole being prepared if necessary with the bodkin, and the single rod placed at the point where two spokes are closest together. The bottom must be placed flat on a table with the crown uppermost, and each spoke turned upright. If the osiers have been properly soaked, and the point of the knife is dug slightly in to the angle of the bend this can be done readily enough The tops should be gathered together and placed in a hoop, as shown.

The next stage is known as the upsett, three rods being worked round the stakes to atifien them. Sharpen three rods and push the first alongside the single stake and the next two following. The three are now worked together, each one being carried in front of two spokes and behind the third, taking them in order, and continuing until they are used up. This should be done as tightly and closely as possible, working down on the corner in order to give a firn foundation to the succeeding wark.

## Three Methods of Weaving

The quickest way of filling up the sides, known is slewing, consisth of three or more rods worked in and out all the way up, new lengths being taken on required, and each length started with the top or thin end. The used end is left projecting on the inside and cut off later when the work is dry. The slewing should be continued to a height of 5 in ., and the rods worked out to leare the top level: if necessary short lengths of oxier can be worked in in order to obtain the required level

A band termed a wale has to be worked round the sides. Pick out four thin rods of medium length and, commencing with the tops, place them behind four stakes in order. and then carry them alternately in front of three and behind one, until the round has been completed and the commenoing ends coyered. The result of the work will be seen in the stiff. ening of the weaving. A single rod weaver should be worked, adding others to bring the sides up to the height of 8 in . This method of weaving is termed randing. The top should be left level, and if the weaving has been carefully done all the upright stakes will be equally spaced all round.

The sides are now ready for the border which may be quite simple or full. The simple horder is formed by bending each stake down in turn, and carrying the bent top in front of


Basket. Simple round basket, useful for marketing, and three lengths of osier
the first on the right, behind the next, and left outside the third, the ends being trinimed ff a little bevond the stake they rest against.
For the full border, commence by laying down four spokes, the first behind the second, and left in front of the third ; the second is taken behind the third and left behind the tages in weaviak it trom short

fourth, the third behind the fourth, and left behind the fifth. The fourth stake is taken behind the fifth together with the end of the first one laid down, the fifth stake is worked together with the second laid down and so on until the complete round has been worked, the last four stakes being worked together with their corresponding ends underneath the bends of the first four. The projecting ends which are now on the outside of the border are trimmed off quite cluse to the border, when the work is dry. The handle is formed from a atout length of rod, and bound in position with lengths of osier. A rod is cut to a length of 30 in ., with both ends sharpenerl. One end is driven down through the border to a depth of 6 in . alongside of the stakes. The rest of the rod is carefully bent, and the other end driven through the border alongside n stake on the opiosite side. The plain bow may be covered with a double spiral formed by driving the sharpened end of the rod each side of the handle. The rods should be wrapped mund and the ends worked across and through under the border on the opposite side in each сляе.

The basket should be finished by cutting off all the pro-
same method may be followed in recovering a large bow handle when the covering is broken.
The bottom rim of both square and round baskets can he strengthened by driving in, alongside the upright stakes, a number of single stakes, endeavouring to get them as far through the weaving as possible. The upright ends are treated much in the same way as a border, each rod being carried down behind the next, in front of the one following, and left either behind the next or in front of the next but one. When the ends are cut off, the new rim will form a solid foundation to the old work

BASKET BALL. Game played, especially by girls, on a stretch of ground between goals, which consist of a net shaped like a basket. It thus rescmililes net ball (q.v.).

BASKET PLANTS. The culture of plants in baskets is a great convenience to the amateur who possesses only a small greenhouse or conservatory. The baskets are usually made of galvanised wire, wood, or terracotta.

The number of kinds of planta available for basket culture is very great. The following may be named as suitable. Achinenes, asparagus fern, begonia, certain of the campanulas, buttercup oxalis, clianthus or glory pea, Cornish moneywort, fuchsia, ivy-leaved geranium, ivy-leaved groundsel, ivy-leaved toadliax, Cape cowslip, lobelia, mother of thousands, nasturtium, petunia, and thun. bergia.

Wire baskets are beat for ferns, and should be lined with moss. In hot weather the baskets should be dipped in soft water twice a day. Two parts fibrous loann, one part rough peat, one part leaf-mould, and sand make a suit..ble compost. The plants should be put into the


Basket plants and methods of arranging them. 1. Basket placed on fower-not tor convenience In planting. 2. Section of portion of basket: A. moss lining: B, rough soil for base planting. 3. Side plants in finer soil, leavinz space, A. for centre plant. 4. Section of basket witb plants in position. 5. Corract method jecting ends left inside, but as the rods alirink when dry, suffi- baskets in spring. A well-grown plant-one, cient should be left to prevent the end slipping past the stake on which it rests.
Basket Repairing. The handles of clothes baskets are formed with two thoroughly soaked rods which are driven through the border alongside suitable stakes. The ends should be driven down as far as possible. Bend the rod on the left and pass the top under the border fyom the outside alonggide the rod on the right and pull it right through to form a bow: Now twist the seoond rod on itself and carry it in the form of a spiral three times round the bow, carry it under and through the border and return to the commencing side and repeat. The end of the first rod can be treated in the same way, and this is continued until the bow is filled up. The
say, turned out of a 5 in. pot-should be put in the centre, leaving the crown just above the top. An old plant should be divided into a dozen or more young plants, and these should be planted mound the edge of the basket, as shown at 3 in the diagrain above. Several kinds mas be arranged in one basket, the small being ineerted in the sides, the fronds pointing downwards. A large kind should occupy the centre. See. Flower Basket.

BASQUE. That part of a bodice to which the waist is sometimes fitted, extending downwards from the waistline. A basque may be cut on circular linc3, or it may consist of two straight pieces, one attached to the fmnt and one to the back of the bodice, with openings at the side seams. See Blouse.

BAS RELIEF. The decoration of a head and hody are concerned the basset is modern house often includes some form of bas-reliof in the frieze or cciling of a room. The most common material is annglypta, or one of the other variants of fibrous plaster. Modern fibrous plaster, which, with gypsum as a basis, sets into a hard coment, is quite durable enough for ordinary purposes.

The depth of the relicf should depend upon the size and height of the room. In sinall rooms the reliof should rarely execed $\frac{1}{2} \mathrm{in}$. to 1 in . in depth See Anaglypta; Moulding

BASS : Cooking the Fish. To bake. Wish and clean one or two medium-sized lish. placing a little butter or dripping inside each, and seasoning to taste. Lay on a greased haking-tin, smear with more fat, and bake in a slow oven for a little less than half an hour, basting occasionally. Cut some potatoes into neat pioces, and when partly boiled put them into the baking-tin with the fish. and cook for 10 min . or so. When donc, arrange the fish on a hot dish with the potatores placed mund and garnish with fincly chopped pasley. If liked mustard sauce may be served separately.
Bass niay also be stuffed. Trko a fish weighing about 4 lb , wash and olean. and season it inside with salt, pepper and lemon juice Then stulf with oyster forcement, sew the fish up, and lay it on a grcased baking-tin, squcezing sorne more lemon juice over it, and placing a few thin slices of fat hacon on the top. Bake in a hot oven, basting occasionally with the fat. When cooked, place the fish on a hot dish and draw out the trussing tliread. Sprinkle with paraley and cut lemon, serving with it tomato or any other suitable sauce separately. It is sufficient for seven or eight persons.
BASS: A Useful Wood. Bnss or basswood comes from the lime, lut more usually from the tulip, tree of N . Anserica. Alternative names are American whitewood, American poplar, tulip wood, Bassoon. A. Rees. and canary wood. It is a B. Crook. C. Wing. soft wood, usually light D. Double Joint. yellowish-green in colour, is $\begin{gathered}\text { E. Lonf Joint } \\ \text { oltainable in largesizes, and }\end{gathered}$ obtainable in large sizes, and
is often used instead of pine for furniture, pancle, boxes, pianos, toys, and carving l3ass is as straight in grain and as free from knots as pine, and slightly harder. It talion stain and polish well, the usual stains heing obony or walnut. See Wood.

BASSET HOUND. Originally a sporting dog, the basset hound is now liept more as a companion than for hunting harea. So far as


Basset Bound. Once a sporting dor. Specimen of the smooth-coated variety
licad and hody are concerned the basset is
a full-sized hound, but it stands only 9 in. to 12 in . at the shoulder. The logs are so short that the deep cheat alnost brushes the masaive fore-paws. The ears are very long.

The dog weighs from $\mathrm{in}^{1} \mathrm{lb}$. up to 45 lb . the bitch rather less There are two types of basset-the rough, with a harsh, profuse coat variable in colour, with a dense under cont; and the smooth, with a short, fine, and glossy coat of black, white, and tan colour. It is good-tempercd and affectionate. See Distemper: Dog.

BASSOON. An instrument of extensive complass, the bassoon possesses a beautiful tone, and is so useful in an orchestra that compctent players are always in request. To fit the separate parts together, the reed is put into the narrow end of the crook, the broader end of which is inserted in the wing. The wing and the hass-joint are then plated side by side in the holes at the top of the double-joint, and finally the bell is put on. The instrument is held transversely across the person, sloping from the left shoulder to the right thigh. A strap round the nock takes the weight of the instrument, which lies in the hollow of the hands, the left being the higher of the two. The reed is taken into the mouth, but it must not come into contact with the teeth. The beginner will be wise to get at the outset a few lessons from an experienced person regarding the embouchure, the fingering, and other elementary points.

A good instrument ought to last for many years, but this is conditional on scrupulous cleanliness. After use the interior (particularly of the wing) should have a soft rag passed through it. All tone holes should be kept free from dirt, again with a suft rag. Keep the joints clean, greasing them if necessary to prevent moisture working in and thus causing splitting. The orook should be oceasionally washed in hot water. Should the how hole become clogged, free it by using carefully a soft brush or a fine needle. Reeds also should be gently wiped and put in some

Before fixing a bath in a house it is necessary to know exactly the lacation of the water supply, rain-water pipes, and gullics or drains required to take away the wastc. If the rooun is in a basement, a waste-water gully inust be available; if it is on the ground flonr, then it is necessary to ascertain the difference in level between the floor of proprosed bathroom and the level of the gmund outside, and of the gully to be used for the bath waste. The waste pipe must have a continuous fall from the bath outlet to the gully, and this must not be less than 3 in . in 10 ft ., and preferably more.

On upper floors it is oustomary to pass the waste into a rain-water head, or to fit a separate down pipe of cast-iron of at least 2 in . diameter, and having a head on the top and a shoe or bent nozale at the bottom, in both cases delivering the waste water into an open-trapped gully. The local building by-laws may require certain arrangements of the pipes, particulars of which can be obtaincd from the district surveyor, but generally all require the overflow and waste pipes to discharge through the heads and into gullies in the open air and be easily visible.

In the great majority of houses the batli, is made of cast-iron; the best kinds are covered with a vitreous enarnel, giving the porcelain appearance so much lilict, and a surface which will resist acids, cuabling it to be casily cleaned and liept in sound con-
warm place to dry after use. The instrument should be kept in a dry but not over-warm place, protected from dust.
BAST. This is the fistous matorial used for tying up bunches of cut flowers, and also for keeping in hand wayward branches of straggling perennial plants. The fihre, which is very tough, is the dried and dissacted stem of the hardy perennial Scirpus, allied to the bulrush and rush grass. See Raflia.

BASTING: A Cookery Term. A long basting spoon is used so that tho oven door noed not be opened wide enough to lot in cold iiir. The juices out of the mest, etc., collceting in the haking-tin are alluwed to drip from the
 spoon over the article that is cooking. This nrevents burning and improves the riavour.

Basting ladles, being round, are convenient for dipping into baking-tins made with a well in one Basting stitch showing how the needle should be inserted slantwise cornor. in able dripping is Nee Baking. Roasting
BASTING: In Dressmaking. Tacking employed to hold two thicknesses of material together before joining the seams. Begin with a knotted threarl, the knot being on tho top of the work so that the basting threads can afterwards be easily pulled out. Always bring the needle out $\frac{1}{-\frac{1}{2}} \mathrm{in}$. licyond where it is inserted, and make each stitch even. Finish off with two stitches on top of each other and leave an ond of thrend to avoid pulling the whole of the basting out by accident. Sep Dresemaking.

## The Bath: HOW to Fit and Connect It

## Installation Methods in Houses both Old and New

## For Fittings and Arrangements see Bathroom; other associated articles are Boiler; Enamelling: Geyserz; Plumbing; Water Supply, etc.

dition. The bath should be fixed in such a "ay that every part, underneath, at the sides or ends, cun be easily got at and olcaned.
Practionlly only two shajes of hath need be considered; these are known as the taper bath and the parallel, according to whether they narrow towards one end or not. Where safficient roon and adequate hot-water supply allows of the parallel bath, it is of great alvantage, giving the highest comfort in use and a decidedly better appearanco. The lest size for a bath is 5 ft . i in . long, and the roll ellge should be not less than 3 in.
The position of a bath in a room is of great importance. It should be quite clear of the walls at the sides and ends, so that there is no difficulty in being a ble to clean and dust all round it. It should also be raised from the Hoor with wooden supports, if the legs are not long enough, to pernit of swecping under it.

If a geyser is litted a good ventilation pije must be attached to carry the products of combustion to the outer air. A baffler should be fitted into the ventilation pipe to prevent a back drauglit into the room. All vent pipes, elbows, and the baffler must sucket inwards, that is, towards the geyser.

All geysers, of whatcier type and howerer hented, are unsafe unlcss provided with a ventilation pipe.
As to hot-water supply, haths hold from 31) to (6) gallons of water, and from 8 to 10 цallons
of very hot water are needed for a hot bath. If an efficient system is already installed, this can be tapped to supply the bath, other-

packed up to the necessary height with pieces of wood, wedge shaped, hut these so placed as not to be scell from the front The waste-pipe, which must be of lead hecause of its sinooth hore, and of not less than $1 \frac{1}{}$ in diameter inside, is to lso attached to the trap of the waste by means of a union which will allow for rapid disconnexion in case of need, and should be carried out to its destination quite independently of and not in any way connected with the overflow pipe. The union will be attached to the waste-pipe by means of what is known as a plumber's wiped joint.
The overflow, which is found a few nches below the top of the bath and helow the level of the supply taps, has a union connexion to which must be soldered by a wiped ioint the ahort outlet pipe carried obliquely through the wall with an open end in the same manner as the waste-pipe. Unions aie provided to the bath valves, and thesc make the connecting preces to the service pipes easy to fit, as well as simple for purposes of disconmexion. The main hot-water service pipes of the house heing in iron, must be connected to the bath tap by means of a union on the pipe to a piece of lead pipe soldered on to tlie bathtap. These joints must all be wiped on. The above methods only apply to the fixing of a single bath, and not

Bath. Fig. 1. Diagram showing connexions between bath waste and rain-water pipe and gullg. Fig.
wise a geyser is t/io easiest and probably nost efficient to install, requiring only the one cold-water supply pipe, with a branch to the bath. (See Hot-Water Supply.)
Essential connexion for the waste and over. !low pipes from a bath are shown in Fig. 1. When the bath is on the first (or "higher") floor, as at $A$, connect waste and overllow pipes to a rain-water head, $D$. If the down pipe, $N$, is continuous, remove onc section, cut off a piece about 12 in . long, and fit a rain-water head. The pipe, $P$, is 2 in . cast iron, has a head on the wall where the waste pipe emerges, and a shoe over the rain-water head, $D$. If the pipe has to go


Bath. Fig. 3. Method of carrying overflow and waste pipes through house wall to rain-water head
pipe could be taken as at $\mathbf{F}, \mathbf{G}$. With a bath on the ground floor as at $H$, connect by a similar pipe and deliver lyy a trough. Fig. 2, or directly over the gully by means of a slioe. To get the pipes through the wall, chip out the brickwork with a cold chisel (q.v.) or a jumper; it is preferable to chip out a header, or linick that goes through the wall from out. side to inside (Fig. 3). Fill the gap around the pipes with strong cement and bits of brick.
The bath must be placed with the foot as near as possible to the wall or place wherc the waste-pipe may be carried out Test the level of the bath when now in the final place desired, making sure that the natural flow of water will be to the waste. Should a test prove that the water does not run entirely away, then the bath should be
to a place where mose than one bath is fixed or connceted by pipes. for in any such casc proper ventilation must be provided for trap and waste-pipe

BATH BUN. Take I lts. llour, 2 oz mar garine or hutter, $\frac{1}{2}$ oz. compressed yeast, $\frac{1}{2}$ pint inilk and water, 1 oz . sugar. I egg, pinch mixed spice, $L$ oz. currants, $10 \%$ sul. tanas and a !ittle candied peel. Mix the ycast and sugar in a warm basin until it liguefies, then add the tepid milk and water and the egg well beaten up.
Put the Hour into a warm basin and, making a hollow in the centre, pour in the yeast mixture and mix in well. Cover with a eloth and set to rise in a warm place for one hour. Melt the fat and beat this and the fruit in well, again setting the mixture in a warm place for an hour heforc shaping into buns and placing on a greased haking sheet leave thein for 20 minutes, then bake in a hot oven for 10 to 15 ininutes. Just before taking the buns out brush them over with a glaze made of sugar and water, and garnish with pieces of candicd sugar
BATH CHAIR. Unless the working parts, of a bath chair, particularly the wheels. tires, and axles, are kept in good order, a great deal of effort will he wasted in overcoming unnecessary friction. Constructional details vary soniewhat acecording to the practice of in. dividual maliers, but the wheel hinb, axle. and spring arc the points that need attention in most bath chairs. Supposing the chair to have been out of use for some time, the following points should be specially noted.

The chair or loody if of wicker-work should be well brushed and cleaned The cushions or aquabs must be cleaned, and re-covered if need be, or loose covers of chintz or other material can be made without much trouble. A coach-built body, upholstered in leather or leather-cloth, can be cleaned up with a mixture of becswax, turpentine, and paraflin, or prepared wax can be used for the purpose. The coach body should be properly washed allowed to dry thoroughly, and polished.

The chair should now be supported on boxes or otherwise and the wheels removed With the hack wheels this is done by unscrewing
the dust-cap, removing the split-pin, nut, and washer, and withdrawing the wheel. On some machines a hall-bearing hub is used similar


Bath Chair. Diagram illustrating correct method ol making a joint in a wired-on solid tire
to that on a bicycle, and can be treated as such Most bath chair wheels are fitted with solid wired on tires generally circular in cross section. If those on the wheels are badly worn they may be replaced by new tires. (See diagram; also tho article on Perambulator.)
Clean the bearings and hubs with paraflin, and thoroughly lubricate with cycle lubricating oil. Replace the whecls. The front wheel generally rides on a spindle between the jaus of the front fork; it is removed by unscrewing the nuts and springing the forks open to allow the wheel to drop out. The stcering head and arm should be looked to, cleaned and lubricated. The springs must now be cleaned and lubricated. II only one leaf is used for the springs it will only neceasitate cleaning and oiling the supports, but if two or more leaves are used the best thing to do is to lift up the body; this will separate the spring leaves, when oil can le squirt ed betwcen them with the nid of a small oilcan with long spout, all surplus oil being wiped off. See Tire.

BATH CHAP. When hought uncooked a cured or pickled pig's cheek requires soaking for several hours hefore putting into a saucepan with warm water to cover, and hrought to the boil, afterwards being allowed to simmer slowly until tender. To dish, remove the skin and cover the ineat with browned breadcrumbs. See Bacon.

BATHING. Open-air bathing combines the tonic effects of immicrsion of the body in cold water with vigorous exercise of many muscles. In those who are unaccustomed to it over-fatigue and excessive chilling of the hody may easily be induced, perhaps to be followed by fainting, which is the most serious danger in this sport. When a person is seized with a cramp it is possible to turn on tho back: and lloat, but the swimmer who faints will sink

It is not advisable to bathe after a lull meal nor when one is fosting. The hest time is about an hour after breakfast, and if bathing is indulged in before breakfast a little food should be taken first. It is not good, of course, to go into the water chilled, but this can be obviated by a little sharpexercise just before the plunge.

The first swim of the season should he a short one. On coming out of the water there should be no dawdling in dressing, and a sheltered spot should be chosen for the purpose. A short run will help to remove the atiffness, and if ne:cesary profluce a glow. Those who remain chilled and blue in spite of this should discontinue bathing.

BATHING DRESS. The regulation bath. ing dress or swimming suit is worn by both men and women. Other styles, governed by fashion for women only, can be made from paper patterns to be obstained through any fashion journal, while regulation swimming suits can be purchased cheaply.

BATHING SHOES. Shoes in which to walk over the shingle to the water's edge can be made at home. Buy a pair of thin cork soles
of the samo size as the shoes generally worn and also a pair of straw soles one size larger. Cut tiwo pieces of canvas or proofed inaterial for the top of the shoe and two pieces of jap silk in the shape of a flat iron, and measuring
 sides of one piece of material and one piece of jap sils together, and sew along the straight edges. Turn the right side out, place over the toe-part of the smaller sole, turn the edges over to the under side, and sew firmly. forming the toe of the shoe. Now place this sole on one of the straw soles, and with crochet cotton sew the two firmily together, using a buttonhole stitch. Ribbon sandal straps of required length can be sewn on.


Bathing Tent. How to make a tent consisting of a wooden tramework to be covered with canvas

EATHING TENT. The framing shown above for a bathing tent is designed to stand considerable wear and yet be quite portable. Front and side elevations and plan are given in the diagrams. The main uprights are $1 \frac{1}{2}$ in square. The bottom framework is composed of two 4 ft .3 in . lengths of $2-\mathrm{in}$. by $1 \frac{1}{2}-\mathrm{in}$. materinl, into which two 3 ft .9 in. lengths of $1 \frac{1}{2}$-in. material arc tenoned.
The uprights are halved into the 2 -in. pieces, and the floor boards are nailed or screwed on to fillets nailed on the inside as shown at $A$. The top frame is screwed to the uprights, as at B, projecting pieces of iron wire or stout wire nails being driven in to provide a means of fixing the top. The struts are all of 18 in . by $1 \frac{1}{8} \mathrm{in}$. wood, to which lengths of thin iron bar are attached with screws, the tops being shown at $C$ and the bottoms at $D$.
Ordinary bolts and nuts should be used to attach the struts to the uprights and the botton frame The seat is placed on a bracket, halved at the corners and attaohed to the uprights, and the top is composed of two lengths of iron bar riveted togethor in the centre, and fitting on the top of the uprights through holes in the ends.

One length of canvas is attached to the sides and a separate piece cut out and shaped to go over the top. Tapes are the best means of securing the canvas to the framing, and also to close the opening. Give the whole of the woodwork and iron eeveral coats of oil paint.

## The Bathroom and its Fittings

Hints and Suggestions for the Modern Home

## The Technical Aspects of the Subiect are deale with under Bath: Boiler; Geyser, ete ; the Health

 Aspects in the article immediately followingColour is attractive in hathrooms. Even if white baths and fittings are retained, though these are to be had in almost every shade. bright colour is chosen for decorative schemes Floorings in mosaic, marbled rubber corktiling and linoleums; curtain materials of oiled or ruhberised silk, terry towelling and American cloths, tilings for dado and wall, panels of vitrolite, slate, or nicolite for sides of bath, etc., and of glass for ceiling, bath mats and towela-all can he carried out in harmonious colours. When it is a case of doing up a bathroom in a rented dwelling, hrightly painted woodwork and stean resisting enamel will remove a dingy appearance, and with simple accessories not involving much expense.
A bathroom entirely of glass, as illustrated, is highly decorative in hlack and a colour. Another scheme can he carried out in polished and enamelled slate for walls, and for the sides of a huilt-in hath, with capping and skirting in a contrasting colour. Slate can also be ohtained in panels with a marbled effect and used for dado and hath, with a rubber flooring to tone. To modernise a bathroom in an old house niuch can be done with attention to details such as electric fitting, new curtains and colour. A simple acheme, with white porcelain bath, white tiled dado, a colour-contrast in painted walls and ceiling and red cork-tiling for floor, is shown in the right-hand photograph below.

Besides the hath, an important requisite is a pedestal lavatory basin of glazed porcelain, with hot and cold water taps. The one illustrated has an easy-to-clean mirror abore, without frame but with bevelled edges. The curtains are of rubberised silk. Taps, like other fittings, should be nickel-plated. They require no polishing, only wiping with a clean cloth. If there is no hot-water supply laid on to the basin, it is possible to obtain a hath geyser which has taps on either side, and if the Cavatory basin is placed beyond the head of the bath the same geyser may serve both.
Above the lavatory basin may be one or two glass shelves, resting on nickel-plated fittings to hold various requisites Towelrails should he nicket-plated for choice. It is necessary to provide pegs on the door to hang dressing gowns, ete


The bath itself should be provided either with hanging baskets, or a rack, nickel plated, for holding sponge and soap, A crossway seat is liseful for persons who are old or weak

Bathronms arc difficult to keep neat unless overy member of the household using the room puts his or her belongings away tidily. As the hasin or the bath must be flushed out after oach use, it is well to provide, hanging in a convenient place, a suitable swab iVhere


Bathroom made entirely of glass. The use of black and one colour gives a beautiful effect Pholo from Jas. Clarl: \& Son. Led
the hathroom fittings are as described, the daily cleaning is reduced to a mininum, as nothing but a swab for the bath and another for the floor, and a dry cloth and a soft cloth for wiping the nickel fittings, is required. Where there are wooden fittings and an enamelled bath the process is more tiresome. as scrubhing and a weekly cleaning with some dry soap are necessary, and the wood must be kept polished. If unsuitable to be left constantly open, the bathroom window should be fitted with a ventilating pane


Bathroom. Left, modern design with marble bath, paper imitating green marble and sycamore tabla with glass top. Right, scheme with white porcelain bath, white tiled dado and coloured walla and floor H.ght, currte.sy of Country Life

BATHS : Hygienic and Medical. For a warm bath the temperatune of the water should be between $98^{\circ} \mathrm{F}$. (about body temperature) and about $103^{\circ} \mathrm{F}$. A hot bath should be two or three degrees higher. Such a bath induces increased perspiration and opens the pores of the skin. It is, therefore, usually best taken at night to avoid exposure, hut if this is unavoidable it should he followed immediately by a cold sponge and then a brisk rub down with a rough towel. If a hot bath is prolonged beyond ten minutes it is apt to be depressing

A warm bath at about $100^{\circ} \mathrm{F}$. is very useful in the case of shock following large hurns about the body, and especinlly in children it is a form of first-aid which can be quickly employed. This should be done also in the case of convulsions of children, and in the collapse following infantile cholera or any severe diarrhoea
The temperature of the tepid bath is a bout $90^{\circ} \mathrm{F}$. The cold bath varies from anything just above freezing point to ordinary tap temperature A cold bath should never be taken when the body is chilled

Peopl with vigorous circulations find that a cold bath taken immediately after jumping out of led in the morning gives a feeling of exhilaration and health After a momentary chilling a feeling of warmth comes over the body.

## When Cold Baths are Inadvisable

Some people do not have this reaction but remain bluc and cold after their dip, and should discontinue it. They may find that they are able to stand $\Omega$ cold sponging especially if they stand in warm water, or they may have to content themselves with cold sponging of the neck and shoulders The henefit of the cold bath is due to the sloock of the cold water on the skin, and if the water is cold enough to produce this, say $40^{\circ}$ below body temperature, there is no necessity to overdo it in the winter time.
Spartan temerity may be another name for foolhardiness. The cold bath should never last longer than two minutes, and as it is not sufficient to kecp the body healthily clean, a warm bath with plenty of soaping should be taken in addition at least once n week

Mustard baths, made by adding a tablespoonful of inustard to a footbath of very hot water, are sometimes used to check oncoming colds. The patient soaks the feet in the water for five minutes, while the rest of the body is enveloped in blankets

As $a$ rule, infants should have a bath night and morning, and older children a thorough bath once a day.

A thermometer should always be used in prepuring an infunt's bath, to avoid the risk of the infant being scalded by someone forgetting to add cold water.
The hath water should be brought to the re quired temperature, about $100^{\circ}$, by pouring cold water into the bath and then adding boiling water mintil the thermometer shows that.

BATH SALTS. A small varicty of crvatal suited for bath salts may he made by crushing equal parts of ordinary washing soda and borax and sifting until the crystals of one size are separated. These are then perfuned by spraying over them a solution of ionone (artificial violet) $\frac{1}{2}$ dram, in spirit 1 oz ., this being sufficient for 2 lb . of crystals.

Another simple prescription for bath salts is:

Oil of rose geranium
Oil of lavenider
Spirit of wine
Carbonate of soda crustal
Mix oils and spirit
Cover the bottom of a wide-mouthed twopound glass bottle with a two-inch layer of the soda crystals. Over this sprinkle a dozen or so drops of the mixed oils and spirit. Shake
well and stand by for a day in a cool corner Next day add another two inches of the sodn crystals and another dozen or so drops of the oil and shake well again Repeat this until the bottle is almost full, and then pour on the remainder of the mixture of oils Keep tightly corlied for two months before use
A tablespoonful may be added to a full bath or a teaspoonful to a hand basin
'lo colour the salts, a little cochineal may lic added or washing blue ; or, for a purple shade, a mixture of the first two. Just a drop of each should be dissolved in glycerine, or it will not colour the crystals evenly. Put a layer of these in $\pi$ jar, and a few drops of the colouring. shake well, add perfumc, transfer to anothe, receptacle and prepare the next layer.
Bath Sheet. See Towel.
BATIK. The process of colouring fabrics known as batik is carried on principally in Java, where it is used to make native dresses, and is to be recognized by the "crackle." a network of finc lines


Batik. Wooden bowl decorated with a barbaric design before being plunged into the dye bath
Although, in common with other applied arts, subject to fashion in its use, batik is suitable for the decoration of curtains, some ornamental objects, and of silk scarves, dressing-gowns and house coats Before commencing it would he well to study the examples of Javanese batik that are to be found in museums It can be applicd to all rabrics, silk being the ensiest, and it can also be employed for decorating wood and paper. The wooden bowl illustrated was decorated beforc plunging it into the dye bath.
To malie a batik, first draw a design on thin paper and measure to see that the size is correct. Then make a pounce of it either by pricking with n tine needle or using a little tracing wheel. The rough side of the pounce must be placed uppermost on the material and carefully rubbed over with an old piece of sandpaper in order to remove unevenness.
Having fixed the design on the material, which has either been stretched in a frame, laid on oiled manilla pajer or a sheet of glass, go over the surface with a pouncing pad dipped in pounce pouder. If this is not avail. able, make a wad of rag or cottonwool and use powdered charcoal.

Put a piecc of special wax into a small pan and allow
it to get hot, but not boiling, over a spirit lamp. Dip a round brush with long liair into the wax, and procecd to fill in the design If the wax is at the right tem. perature it will penetrate the material. The moment it clogs put the brush into the hot wax and heat thoroughly. The size of the brush varies according to that of the design, but No. 12 is a useful size, with a flat brush about $1 \frac{1}{2}$ in. wide for borders.

## Tools for Applying the Wax

The t.jantin or Javanese batiking spoon rescmbles a metal teaspoon with the edges turned up and a tiny spout at one end, through which the hot wax flows. A similar tool, called a pipette, is ohtainable When using this the work should be laid flat on a table. The point of the spout must not touch the material, as this closes the hole and stops the flow of the wax Do not hold it over a llame : fill by plunging into the hot wax, wipe with a rag, and work as quickly as possible. When cool hold it in the hot wax in the pan until the wax is melted ngain There is also a batik pencil which resembles $n$ stylo pen Small aticks of wax are inserted in a tube, and the pen is held over a flaine until the wax is melted, when it llows through the point It is useful for drawing on wood

To ensure a clean outline, outline the edges of large designs with a fine brush or the pipette, and then lill in with a large brush Before dyeing look nt buth sides of the material, and if the wax has not penetrated apply again on the wrong side.
The dye bath is prepared by mixing concen trated colour into water, either tepid or cold, until the desired shade is obtained. Take a small piece of material, wet, and dip into the dye bath. Leave it a few moments, and then squeeze and hold up to the light to get an idea of the colour when dry. If incorrect, allow morc water or more dye as may be necessary. India-rubber gloves should be worn when dyeing, to prevent staining the hands.

Household dyes can be employed, but those specially prepared are ensier to manipulate. One of the hall-marks of hand-made batik is the crackle, a network of line lines. This is produced by crushing the waxed inaterial between the hands before the final dipping. Good effects are obtained without using crackle.

If only one dye bath is used the material can be rinsed, hung up to dry. and then


Batik. Cornes of a silk scarl decorated in vivid Spanish coloura
ironed between sheets of newspaper to remove or electrodes. The action depends on the the wax. To have more than two colours, decomposition of the electrolyte and the effect portions of the design must be re-waxed. of the liquid on the clectrodes When a cell is If part has been wnsed, and
that material dyed grey, wax in some of the grey and dyo scarlet, then wax in some of the scarlet and dye black. In this way a multi-coloured design will be olitained It is best for the beginner to use the lightest colour first, and to nooid too much crackle, as, owing to the uneven waxing of the design, a certain amount of colour will be sure to gn through where the wax is thin and shade the work.

Another method is to colour the design in with a brush, then cuver with wax and dse the background some dark colour. The effect is quite pleasing, but it is a travesty of the real Javanesc batik. One of the charms of this is that a design can never be repeated

Batiste. A fino cambric, very sofl, for bandkerchicif, underwear, and summer dresses.

BATTEN. In the timber yard batten is the term used for unplaned wood of the following scantlings: 1 in. by in., 2 in. by $f$ in., 3 in. by $f$ in The $l \mathrm{in}$. by $f$ in. hatten is chiefly used for tiling, but the 2 in. by in. has a muititude of uses It is employed for tiling, joist plates, partition basen, framing for attachment of patent wall linings, for sholl supports, light cupboard franicwork, for making mouldings, architraves, and picture rails, and for forming brackets

BATTER. There are various recıpes for making batter. It can be made as follows : Take 4 oz . flour, $\frac{1}{2}$ pint milk, 1 egg and a saltspoonful of salt. If the llour is at all lumpy, pass through a wire sicve, or let it fall through the fingers into a good-sized basin. Having mixed in the salt, make a hole in the centre of the flour, beat the egg till frothy and add to it half the milk. Pour in alout four tablespoonfuls of this mixture, and with n wooden spoon atir in a little of the Hour, drawing it into the centre pool from tho sides. W'ien this centre pool is a bout as thick as rich crearn. add more milk and egg, and work in more flour, always keeping a pool of smoothly mixed batter in the centre. (io on adding the mixed egg and milk until all is used, by which time all the flour should have been drawn in

Next beat the batter well with a spoon, until the top of the mixture is well bubbled. Stir in the remaining milk, and put the batter aside to stand, thus softening the starch grains in the four by sonking. No more beating must lie dune after the last half of the milk has been stirred in Stand the batter for half an hour, after which it is ready for use. See Ipple Fritters; Pancake. Toad-in-the-Hole; Yorl:shire Pudding.

BATTER PUDDING. A richer batter is made from $\frac{1}{2} \mathrm{lb}$. of flour, 3 eggs, one pint of milk, and a good pinch of salt. Mix as in preceding recipe ; then place in a well-greased basin just large enough to hold it, tie a scalded Houred cloth over the top, and plunge the pudding in a saucepan of boiling water. It should be boiled quickly for alout lif hours, and served with meat gravy or fruit syrup. This pudding may also be steamed or baked.

BATTERY. Electric primary bntteries are pieces of apparatus for tranaforming ohemical energy into electric energy. The forms most usually found in the home are dry hatteries, such as are used in pocket flash-lamps, and Leclanché batteries for bell work. A battery consists of two or more primary cells connected according to the voltage or pressure required.

A primary cell consists of a liquid known as the electrolyte and two metals called elements


Cardboard Case
Diagrams showing the arrangement of thrae dry cells in ae case, as used in a pocket flash-lamp battery at work the electrolyte attacks one of the electrodes very vigorously. This is termed the positivc element or anode, the other element being known as the negative or cathode.
The flow of current in the connecting wires outside the cell will be from the negntive element to the positive, hence the negative element becomes the starting point of the current to the circuit. This is ca!led the positive pole or terininal and is painted red or distinguishod by the + sign. The other eloment becomes the negative pole, is painted black, and distinguished by the - sign. It is these poles that are referred to in all wiring diagrams, and not the elements of the battery themselves.
A dry cell consists of a zino pot, open at the top, which constitutes one element, and a carbon rod or plate surrounded by tho
 Leclanehe porous pot
together in series to form a battery for an electric bell circuit
electrolyte in parte form. The paste comprises sal-ammoniac, peroxide of manganese, powdered carbon, ohloride of zinc, glycerine, and water.

The ordinary dry cell has a voltage of almout $1 \frac{1}{2}$ volts. By connecting several cells in series (i.e. the carlion of one to the rine of the next), the voltage of each is added together, hence three cells in series yield $4 \frac{1}{2}$ volts. The quantity of electric current available depends on the size of the cell, and is called the amperage. The quantity cannot be increascd by series connexions, but only by parallel connexions, that is, by joining zinc to zinc, and carhon to carbon. It is imperative to remember this basic principle when doaling with any form of primary battery.

Of wet batteries the Leclancho is the most extensively used for electric bell work. It consists of a glass jar, usually square. The positive element is a round zino rod, the negative element a plate of carbon

Tho latter is contained in an inner pot made of porous earthonware, the carbon plate being packed in tightly with hack oxide of manganese and powdered carbon. The electrolyte is a solution of sal-ammoniac in water, about 2 oz of the former to 1 pint of water. The solution should about two-thirds fill the jar when the porous pot and zinc rod are in place
It is of importance to clean the zinc rods occasionally by washing them in strong soda wator, also to renew tho electrolyte if the hattery becomes feeble. See that the electrolyte does not crecp over the outer odge of the glass jar. If it does, wipo the jar clean and give it n coat of grease around the rim, where it is painted black. Sec also that the termina nuts are clan and free from deposit. See Accumulator: Beils, Flectric:

## tor; High Tension

BATTLEDORE. Similarly shaped to the tennis racquet but smaller, the frame of this bat is of wood with parchment stretohed across, or of gut or st ring fastoned tightly to the frame. From the gamo of hattledore and shuttlecock Badminton has evolved. See Badminton. Racquet; \&huttlecock
BAULK. The term baull: or balk is applied to a large solid piece of timber such us is used for piers or wharves or occasionally for the supports of houses erected on an insccure natural foundation. See Wnod.
BAY. The hay or sweet bay (Laurus nobilis). is an evergreen trce with ammatio leaves. It is frequently known as Poet's Lsurol. It is not perfectly hardy, and ought to have a sheltered place. Sandy loam, well drained, suits it admirably. Propagation is by cuttings in early summer. The cuttings are hest inserted in a frame or under a hand-light, and kept shaded for a week or two. Thero is a variety callod sassafras, the leaves of which in the United States arc used for flavouring swectmeats.

Bay Leaves. These are the aromatio leaves of the sweet bay. An ordinary faggot or bouquet garni for Havouring soup is generally comp-sed of paraley, bay and thyme. Bay leaf should not lie more than one-tenth of the whole.
BAYONET JOINT. Originally devised for rapidly fixing the bayonet to the rifle, the hayonet joint is now in morc extensive use for purposes requiring a securo but readily dernountable joint. Essentials of such a joint or catch are the L-shaped alot and a peg to engage it. An exnmple is the joint on the standard hayonet cap electric lamps. In this type a compression spring is incorporated to form a secure lock. See Joint.
BAY RUM. Originally imported from the West Indies, liay rum owes its distinctive odour to oil of bay, obtained from the leaves of Myrcia acris, the leaves of which are distilled with white rum. It is made as follows: Jamaica rum 8 oz ., spirit of wine 32 oz , distilled water 24 oz ., oil of bny $\frac{1}{2}$ oz. Shake together and after seven days filter through blotting paper

BAY WINDOW : Its Fittings. The decorative possibilities of a room arc often improved by this form of recessed window. The bay space may be used for a writing-table or dressingchest and furnished with a window seat.
The window requires a comice to hide the rod oul which the curtains are hung. The rod itself should be curved so as to allow of the curtains being completely drawn. If the ourtains are of silk or any thin material a second rod with a frilled valance may replace the cornice. If the curtains are of velvet or any heavy material the comice should be fitted with a Hat shaped pelniet. This may be cut in curves or in angular deaign and may be embroideredior edged with trimming to make a good upper part to the window scheine.


Still another method is to provide the windows with casement curtains and to put the rod for the heavier full-length curtains straight across the insidc line of the recess formed by the window, so that when they are drawn the recess is whut off
Window Seat with Locker. We give here a suggestion for fitting up the interior of a bay window about 4 ft . in width. The details shown will apply equally to any recess up to 0 ft . wide. A seat with return ends is shown, together with a locter in centre, the front of which is made to fall. Auserican whiteworl or pine, if available, will answer all requirements. A part plan of the seat is given, showing the intersection of the return end, and also part plan of under-framing.

A start may be made by cutting the battens or rails A which will fix the height of the seat. It must be decided at this point whether the seat will be cushioned or not, making allowance for the thickness of cushion (if any). Roughly speaking (within limits), the shallower the geat the higher it may be. In the present instance the seat is 12 in. decp only, and may, therefore, be made 1 ft . 6 in . high and even 1 ft .8 in . without disconfort. The rail A might be of 3 in . hy 1 in . material to be nailed to the uprights of the lay. In positions where these uprights do not show, the rails nay be screwed to an existing wainscot, or suitable lengtis of 2 in . bu 2 in . material may


Buy Window. Interesting treatment involving the use of casement curtains and the same material for pelmet, outer curtains and the seat cushion


Bay window fitted with a wooden seat having a locker in the centre. Working diagrams are given atove and explained in the text
be erected to and if the front edge is shaped back to not afford a bear less than 9 in . the effect will be improved. In ing at the dealing with the scat the returns can be put limits of the together as shown, and tongued. The front seat. In edges and outer corners will be best rounded additional off, and in fitting it should be notched to interbearing is ob- sect with posts and any other projections, tained upon so that it fits close up to the recess walls when the locker being nailed down. Where there is available sides 13 , which space, a sloping back about 1 ft .6 in . high or can be lin.less so is comfortable and also looks well. Sec thanthe Curtain; Pelmet. finished depth of seat.

In erceting these sides, lengthsof 2 in. by 2 in . wood arefirst nailed to the Hoor at (i, and thesides nailed to thesc. At the
top, two lengths of 2 in . by l in. are shown, cut in thash to the top edges of both sides IB and rails A and nailed, which should afford a firm atruot ure for further procedure. The pieces $C$ are cut back sufficiently to take the piece E, which butts between the locker sides, to which it is nailed, in addition to being fixed to blocks behind, which are nailed to the floor. When this piece is in position it will form a rail for hanging the locker fall to, both being I in. thick. The fall should thus close ensily flush between the locker sides and hed on to the rail D, which serves as a stop to prevent it pushing in. This fall is macle of boards tongued toget her and glied up, the panel effect being formed by lengths of mould or $\frac{i n}{}$. bead, glued and panel-pinned on.

For the sake of linish, a length of thin material ( $\frac{1}{f}$ in. or $y_{g}$ in.) is nailed in front of E , to linislı $\frac{1}{8} \mathrm{in}$. from outer edge of each end, and have its cilges rounded off at top and ends. The front supports or cheeks, F, oan also be fixed ly blocks to the Hoor, as indicated by dotted line, cut to set back so as to be practicully out of sight, and the further fixing can be by means of dowelling, or slot-screwing to uprights. Width can be 1 in . less than seat,

## BEADS AND THEIR

## How to Carry out Designs on Canvas, in Crochet and Knitting, and on the Loom

Other suggestions for the use of Beads are given under Embroidery; Lampshade; Tassel, ete.

Bead work mav loe divided into five classes: ncedle and thread bead work (on ceanras or on the thread only); crochet bead work; knitted lread work; loom bend work. and novelts bead work. The fashions come and go, buit by one of these methods bead-hags, bead-cmbroideries, necklets, hracelets, Howers, etc., can be inade.
I special loom bead can le bought for the finest work in this class. There are wooden millinery beads, Venctian necklet and Hower beads, rondles, a Hat glass disc for threading between beads to lengthen a necklet, applic, ueis, tubes for dress-trimming, large glass beads and long bugles, dianante, imitation cord, jade, ctc.; beads of papier mêché, of corl;, of leather and of metal. Nost of the small glass or crystal beads, and also tiny metal beads are sold in hanks.

Most of the metal beads have fairly large holes and can easily be threaded with a No. ? or 10 lsead needle. These needles run in sizes from 8 to 16 , and have elongated eyes which allow the passing of a thicker thread, although the actual needle is finer than the fincst darning needle. For necklet threading, special cards of silk in white and colours are sold with a threading wirc artaching to one end. The sizes range from 4 to 8 , the lower number being the finest.

Little cards of necklet wire in gold and silver colours, medium size only, are sold for threading heavy beads.

In Fig. 1 a design for working on canvas is shown. Ilesigns can be bought ready stamped on canvas. but an ordinary transfer can be used, with two-thread canvas that is. two threads going both ways of the canvas and prolucing a square mesh. When buying the beads, get $a$ size that will just cover the mesh, so that the canvas will not show afterwards. The beads should not be too large or the work will not set flat.
This work is done in rows from left to right. Join the thread on the wrong side, then bring up the needle at the left-hand lower corner of the mesh. Thread a bead and pass the needle down through the upper right-hand comer and up again through the mesh right unclerneath, making a stitch like the first half of a cross stitch with a bead resting on it. The work can be done in coloured sections, if desired. (See lig. 2, with the needle in position.) When the end of the row is reached, pass the necile and thread through the meshes just under the beads to get back to the left-haid side. The alternative is to fasten off at the end of each row, as you must begin the following one at the left-hand side. The patterin must be followed in each row Follow the


Bead. Fig. 1. Design for a bag on cauvas worked in beads. Fig. 2. Portion al canvas anlarged in order to Design lor a bar on cauvas worked in beads. Fig. 2. Portion of canvas anlarge
show how the pattern is followed. The work is done in rows from left to right
colours and the outline for the shape of the bag, as marked on the canvas.

Bags, purses, etc., can be worked in crochet bead work, in short rows. If a square or oblong bag is required, it is best to work in rounds like a stocking, beginning on a ring of ohain accord. ing to the width of bag required, and working from the inside so that the beads are always on the outside. In Fig. 3 the sides of the bag are worked in circles. and these are joined by a long crochet strip eight beads wide, sewn to the circles as far as the hinge of the metal top to which the purse will afterwards be sewn. The straight strip of crochet head work will give more capacity to the bag. Fig. 4 shows the work in progress.

## Bas in Crochet Bead Work

To work them, first procure a metal top so as to know what size to work to. Unwind the thread, passing it on an empty reel, and as you unuind, slip the thumb and forefinger of the right hand along the thread to feel for knots. If you leave a knot that is too large to take the beads you will find that they will not push down in the course of working, and all the labour of threading will be wasted. Sylko No. 8 can be used with a No. 10 bead needle, a No 3 steel crochet hook and No. 7 beads. If No. 9 beads are used fewer increasings must be done to keep the work thit. A whole bunch of beads can be passed on, and when all the beads are worked up the thread can be broken, another ball threaded, and the two thrends joined by a knot at the back of the work close up to the last bead. For the purse illustrated 25 amber and 25 brown beads were threaded alternately, and produced a maze design when worked up, no fewer than 3,100 beads being used in the whote design.
Make 4 chains and join into a ring by slip. stitching to the first stitch. lst round: * I double cruchet into the ring, push up a bead close against this stitch, and repeat from * 5 times. 2nd round : 2 double crochet in each stitch all round, always pushing up a bead after each stitch and taking up the back loop of the double crochet. The beads will apprear on the side of the work that is away. Now sew a piece of white cotton in the first stitch of the round to know when you come to it, as it is important to keep the rounds uniform Do three more rounds like the second onc 6 th round : * 1 double crochet in first stitch, 2 double orochet in next stitch, and repeat frum * all round. In the case of bigger beads increase in every 5th stitch 7th round: 1 double crochet in each stitch.
Now repeat the last two rounds until the circle is big enough to fit the top. The work inust be quite flat ; if loosely worked the circle may Hute a little. This is remedied by working un extra plain round or two without any
 of of bag and lining togetler, then sew oll the metal niount with st rong linen thread thus: Join the thread on the wrong side, push up through the first hole from wrong to


Bead. Fig. 3. Bag with beads crocheted on in circles Fig. 4 (above, left). The work in progress
right side, thread $a$ bead on the ncedle, then push the needle back through the same hole then repeat this in each hole around mount When the end of the clasp is reached draw up the sides of the bag a little to close them and fasten off securely
Fig. 5 shows head work on plain knitting 'Ihread the beads on the silk, then decide whether a plain bag or one that will be gathered on the mount is required, so that enough stitches are allowed when casting on.
For a striped bag, cast on any number of stitches divisible by 6 and 3 over for edge stitches, which are knitted plain Knit two rows plain without beads. 3rd row: Slip 1 . knit I , put the needle in the next stitch in position for plain knitting, then push up a bead against the last stitch and finish knitting the next stitch; repeat from * to the end. and knit plain the laat stitch without a bead. Now knit the next row without beads. If threaded correctly, you should now have 3 beadn of the same colour to begin each row so keeping the stripes intact. If knitting a pattern the beads should be carefully threaded in the right order before beginning to work Any cross-stitch pattern can be copied in cruchot. knitting, or loom bead woik.

Loom Bead Work. The loon is a simple wooden device marle in three sizes. The medium loom, $11 \frac{1}{2}$ by $7 \frac{1}{2} \mathrm{in}$., is used chiefly for necklets, purses, and bags. On this size a bag 7 in. wide oan be made (Fig. 6), but it is best to work wide designs in strips taking 20



Fig. 5. Beadwork applied in stripes to plain 4 nitting tor a bag
to 40 beads according to size and join the strips together afterwards by threading in and out of the bead on the edge of the strips. Extra long bead needles are sold for wide designs. Any cross atitch or tupestry design can be followed and there is no preliminary threading of the beads, as they are taken up each row according to pattern.

Ordinary strong linen thread or silk twist can be used. First prepare the warp threads. allowing some inches over the length of the intended article. Cut the threads in separate lengths, allowing one more thread than there are beads for ordinary Hat weaving, as in the case of a bag. The loom is always placed with the spool end farthest away from the worker, Fig. 6.

## How to Set the Warp

To set the warp, tie all the threads together on one end, and recure on one of the nails on the spool at the top of the loom. Then place the threads in rotation on the notches of the first bridge, and oarry this thread down to the corresponding notch on the lower bridge. When all the warp threads arc set, draw them down firmly, pass the ends through one of the holes at end of loom and push in the little peg to lieep these threads quite taut; then wind the remaining length of thread round the end of the loom and pegs.

Take the weaving thread, which can be the saine kind as the "arp thread, thread it intu the needle, and tie at the top of the first left. hand warp thread. Thread the full number of heads for the first ruw, pass the needle from left to right under the warp threads, and push the bead up in prosition between each warp. Where there are too many beads to keep on the needle let them slip down the thread, push them in position and hold under the warp threads with the forefinger of the left hand,

Fig. 7. The beads should be pushed well up the two sashes as in Fig. 2. Fig. 3 shows the vated for many yeara, but in dry soils sume between the threads so that the latter do not section of a bead used to break up the surface come up over the necdle when passing back. of flat panels, etc.. while the centre bead, Fig. 4,

Take the neerlle in the right hand, and pass it back from right to loft through all the beads, taking care that the


Bead. Fir. 6. Bead loom In position for working, with necklet in progress. Fir. 7. First position : beads pushed ap at back and held with torafnger. Fiz. 8. Second position: needle passed back through beads a bove warp threads

is a dado or chair rail bead. Fig. 5 is the common half-round beading. Beads are often used to break the joints between various parts of work, such as on the edge of matcherl boarding, the panels of some kinds of doors, a round door frames, to fix the glass in bookcases, shop fittings. etc.
BEAD PLANT. This popular plant has graceful feather-shaped leaves, and the flowers of different varieties are blue. white, or pink in colour. Usual green. house soil suits them, and they require to be kept moist and warm They are propagated by means of cuttings taken in spring.

BEAKER. These are either vessels used for mensuring liquids or large drink-
wet decayed material should bo put in a trench about the width of a spade blade and ahout 18 in deep. Over the manure replace several inches of earth, which should be well broken up with the ralie. Upon the surface spread wood ash liberally, or a lesser quantity of sulphate of potash, and place the beans upon the compost

Broad Beans. These may be sown 4 in deep and about 9 in apart, the first sowing being made in November, except in very cold districts and exposed positions. Seville longpods or the early mazagan may be sown in November.
The second sowing may be made in February, the third three weeks latcr, and the last in the fourth week of April. One pint of beans is sufficient to sow a row about 70 ft . long As soon as the plants are 2 in . high powder the ground on both sides of the row with soot or wood ashes, hoe thoroughly, and draw a little soil up to the beans. Beans should be hoed once in ten days, and slightly earthed up after hoeing. If the weather is very dry, water heavily once, and mulch with any available litter, covering it well with dry earth. Before the blossom sets, nip out the top blooms to check the brecding of black aphides, and burn them at once.

Scarlet Runners. Theso may be sown as directed fur broad heans They must not be sow $n$ in the south until late in April. and in the north in May. It is well to make a sccond कowing about the first wee! in June. In light

Fig. 8. Draw the thread up firmly. The ing cups. The former, made of passing of the thread under and over the work glass, are used by chemists and makes a sclvedge on both edges When marlied with the various quantithe loom is full wind the work round the ties. The latter are of interest spool away from you, but leave a little of the as antiques, and valued by colwork to project over the top bridge. as the lectors. See Glass.
threads can now only be pressed down the notches of the lower bridge. If they were passed down the upper bridge a gap would result in the work. Secure the ends firmly round the pegs again before beginning to weave. At the left-hand side of the spool there are three holes, into one of which a toose nail is passed to keep the spool in position when working, and so keep the warp threads taut ; they nust not be allowed to slacken in the working.

Embroidery is often enriched by head outlining, as also are tapestry and paisley designs. Novelty beadwork includes necklaces, flowers, and various methods of decoration in vogue utilising beads, such as fringes and tassels for fancy work and dress.

BEADING. This is used for making fancy senms to connect two edges of material, and is an imitation of hemstitching. Beading can be bought by the yard under tho name of vcining. See Henstitch
BEADING. Although often used to of birds and insects. Ground that strictly speaking, a half-round moulding


These can be seen in almost any housc. quantity of decayed vegetable matter or farmThus the staff bead which holds the bottom yard manure, placed well below the surface sash of the window in position is shaped as in Fig. 1, and the parting bead which divides

BEAM. In any building a heam is a piece of timber fixed and supported at each end, and itself supporting more or less weight. It follows, therefore. that the beam as a rule is placed edgeways, or, in other words, the depth when in position is greater than the width. Beams are called by particular names, according to the purposes which they serve. That which supports the joists of a floor is it girder or binder, over a window opening it is a lintel, when supporting the middle parts of long rafters it is a purl.

BEANS : How to Grow. Bean plants may produce very poor crops in dry seasons unless measures are adopted for resisting drought, blight. and the attacks Fig. 1, and the parting bead which divides manure in a garden that has been well culti-
lacks lime naturally must be improved by
timing, and shallow soils require a generous


Beans : methods of sowing and stakink. 1. Runner beans in ditll. 2. Section of deap drill for runners. 3. Broad beans in
shallow dri!l. 1. Stakine straight row. 5. Fenge of sticks and allow dri!l. 1. Staking straight row. 5. Fenne of sticks and
string. 6. Strings stretehed between horizontal wires
soil, sow in a trench and leave the earth slightly banked up on hoth sides. Hoc frequently along the rows and anoong the plants, and diess occasionally with soot or wood ash. In prolonged dry weather it will be necessary to drench the bean row with water once a week, and the leaves may be sprayed with a syringe two or threa times a week Growth should he checked when the runners are about 7 ft . high, by nipping off the top shoot. A mulch of manure or litter should be applied in a drought after a heavy soaking of water. When flowers appear weak, liquid manure may be given once in 10 days. Always stir the soil with the hoe after watering, unless the rows are mulched when the heans are young.

Dwarf or French beans should be sown late in April, and about once a fortnight till the end of June. Sow in thenches and treat as for runner beans.

Beans as Food. A combination of beans. potatoes and butter with a green vegetable
will supply all the elements necessary for a In the thrust bearing the load or pressure complete meal containing everything which health demands.

Haricot and brown or dried beans make a nourishing soup. French beans, runner beans, and broad beans are excellent as vegetables and in salads, while all the varieties of dried bean make savoury supper dishes in combination with tomato sauce, onion, cherse and other flavourings Beans tinned with pork and tomnto sauce are usoful for an emergency supper dish

Dried beans, though not so palatable as fresh ones, make a nourishing dish when properly cooked. Soak the heans for 12 hours in cold water. After this rinse well in several waters and leave for two days in a basin set in a damp, cool place, where the air can circulate íreely. Then put this basin in a larger one with a little water in it and cover the whole with a damp cloth. Within 12 hours it will he noticed that the beans are, beginning to sprout, and they are then ready for cooking. Usually dried beans require boiling for about 45 min , though young haricot beans will cook in less than 30 . Beans, like all other pulse foods, have in them a valuable form of anti-scurvy vitamins, and these are apparently non-existent until the beans germinate

BEAN CAPER. Bean capers are the flower-buds of a small tree of the genus Zygophyllum, sometimes used as substitutes for the true caper. Gather the buds on a dry day, lay them on a paper out in the sun for a few hours, and turn into wide-mouthed bottles or jars. Boil one pint good vinegar with $\frac{1}{2}$ oz salt and 6 peppercorns, for five minutes When the liquid is cold, strain this vinegar on to the capers and cork down tightly. They can be used in about a week's time, but will be better if they are kept for threc months or a little more. Sce Caper.

BEAN CUTTER. A handy machine which performs the cutting of French heans and scarlet runners with rapidity, thus saving time and labour. Most of theso machines also slice other vegetables, oranges for marmalade, etc.: a sprecial grooved attarhment being supplied for the cutting of beans. The machine should be kept clean and dry, and receive an occasional drop of lubricating oil

BEAN WEEVIL. The name is applied to several species of small bectles which attack beans and peas, but it belongs properly to Sitones lineatus. The wing cases of this tiny grey-brown weevil are streaked with white lines and the head drawn out into a broad snout. The female deposits her eggs in the nowly formed pod, and the young larvae feed in the seeds.

Similar destruction is wrought by two species of Bruchus (B. rufimanus and B. pisi), the first frequently found in the grub stage when green peas are being shelled. The young plants may be protected by sprinkling them with soot or fine road dust. Bean seeds should be examined before aowing, and any that have been attacked by the pest should be picked out and destroyed.

BEAR BERRY. 'This is the popular name applied to trailing heath-like plants belonging to the genus Arctostaphylos. They are useful for the moist side of the rock garden, and the best sort, A Uvaursi, hay pink llowers in early summer and red berries in the autumn The bear berry needs only the culture given to ordinary rock plants. See Ruck Garden.

## Beard Tongue. See Pentatemon.

BEARING. A bearing is any support for a rotatable shaft or aimilar driving part of a machine. In its simpleat form it is a plain hole in the part that forms the support for a cylindrical shaft. In the journal bearing the load acts at right angles to the axis of the shaft, and includes such examples as the bearings of a mangle and the axle of a railway carriage.

The two great enemies of a bearing are the ingress of grit and dirt and the absence of a suitable lubricant. Small or delicate instruments such as typewriters and sewingmachines should have their bearings cleaned with a small brush dipped in paraffin, and then be well oiled with light-grado oil. Heavier machines such as washing machines, mangles, chaff cutters, lathes and small machinery generally need a heavier-bodied oil, known as light machine oil.

The oil must be present between the two working surfaces, and any excess outside the bearing should be wipcd off, as an oily exterior only attracts and retains dust. Adjustments are made in many different ways; the point to bear in mind is that the bearing should allow of iree and casy morement of the shaft, but should prevent any shake or alack ness See Ball Bearings; Big End; Front Axle ; Live Axle, etc

BEATRICE STOVE. The name is applied to a particular variety of oil-heating stove burning paraffin oil. The heating elementa are the wick and the tall, oval-shaped chiminey or body, the vessel to be heated being placed upon the platform at the top of the stove The oil is contained in a cast-iron vessel forming the base of the stove. These stoves are malle with one or more burners Success with these atoves demands scrupulous cleanli. ness, attention to the wick and the use of a gord oil. See Lamp. improper diet and laziness are benuty's enemies. A short walk can generally be managed daily, and five minutes devoted to the following simple exercises will improve the circulation and the digestive organs and strengthen the body.
(1) Stand with feet slightly upart, head thrown back, and bring both hands so that the backs come under the chin, fingers pointing forward, el bows cluse to ribs. Send hands up and out in front, as in the breast-stroke in swimming, then separate them gradually, aweeping them back and down as far as they will go. Then draw elbows up to the sides again. With these arm movements noes a trunk and leg part. Crouch low and bring the hands under the chin as described. While rising to an upright position, finishing on the tips of the toes, send the hands out in front as described. Then beginning to crouch again, send the hands back and dow'n, bringing them once more under the chin when quite crouched Repeat six times. This exercise keejos the body supple and expands the chest.
(2) A trunk twisting exercise for strengthen ing ahdominal muscles and reducing the wrist


Beants Culture. Fir. 1. Correct nosition balt-way through exercise 5 as described in the text

BEAUMONTAGE: Hard Stopping. 'This is used in the home for filling amall holes, repairing damaged veneer, and similar purposes on all kinds of furniture

It is made by dissolving a lump of resin, about the size of a large walnut, in a gill of common orange shellac, and adding a piece of heeswar about half the size of a walnute This must be melted in an iron pot or tin can, either in the oven or on the top of a stove; only gentle heat is needed, and the mixture inust not be allowed to boil. Before heating, a suitable colouring pigment must be addel (about a teaspoonful) in powder form By suitable blending alnost any colour can be made to match the work to be repaired. The mixture is made into sticks by pouring some of it on to a wooden board, laying it in a line, and rolling with another boarl. The boards should be warned, as the stopping harlens rapidly.
To use the material, it is melted into the hole or over the damaged places by means of a rod of hot iron. Do not have the iron too hot, or the wood will be scorched and blis tered. Press the mixture well down into the hole, and leave a little of it above and around the damaged part. When dry and hard the surplus is removed with a chisel. knife, and fine or old sandpaper

BEAUMONTIQUE. In certain classes of cabinet and joinery work an adhesive known rs beaumontique is employed It is composed of equal parts of litharge, white lead and whit. ing, worked into a stiff paste with boiled oil.

## Beauty and Beauty Culture

## General Rules and Modern Methods for the Improvement of Personal Health and Appearance

Information on Special Aspects will he found under Ankle; Complexion; Diet; Figure; Hand, ete.

Want of daylight, freah air, and exercise, atand with feet apart and arms atretched
over head. Bend forward to touch right foot, keeping knees straight, then describe a cirolo with arms and rotate body to left, letting the trunk twist from the waiat and bending well back as arms come up and go down again to the right foot. Repeat the movement several times and then reverse direction, bending to left foot and circling towards the right.
(3) To flatten any tendency to bulge above the waist line-inhale deeply through the nostrils, and raise knee level with oheat; exhale slowly through open mouth, holding in the abdomen and put foot down, trannferring weight on to it. Repeat movement with other knee and foot and alternate up and down room, keeping hands on hips.
(4) A bicycling movement to flatten abdome: ahould be taken easily at first: lie on back with both knees drawn up towards chest. Raise right foot, but keep knees close together, and pedal with the feet.
(5) To combine stretching with strength ening the whole spine, lie on back, with arms at sides Slowly raise arms, while inhaling deeply, and extend beyond head till fingers touch Hoor. Stretch the whole body and begin to exhale slowly as arms return to sides. Begin another inhalation as body rises to sitting posture, taking care to let head follow shoulders and not come up first with a jerk. Then in slow continuous movement touch the thes with both hands. Do not bend knees. Exhale while returning to first pusition, relax whole body and repeat exercise.

At first it may be necesary to do the sitting up part of the exercise with feet hooked under a steady piece of furniture. Fig. 1 shows the correct posture assumed in this excrcise.
The benefit to be derived from outdoor sports hesides muscular development is the natural promotion of perspiration, thus eliminating poison from the system. In order to obtain full advantage from such activity of the pores, on returning home rub the body briakly with a fleah glove and take a tepid bath.

Carc of toeth cannot be too much insistel on. the physical exercises in the morning, as the In themselves they are an important point of beauty or the reversc, and proper mastication is essential to good digestion. Regular visits to the dentist and brushing the teeth night and morning should not be neglected.

Diet is the next factor to be considered. Tou great restriction in the case of normally healthy people is not to be encouraged. Plenty of green vegotables, fresh salads and sound ripe fruit supply the important natural asits, which keep thic blood healthy, and therefore help to secure a good complexion.

An excess of foods containing starch, sugar or fats should be avoided when there is $n$ tendency to put on flesh. For older people the mistakc of drastic measures for reduction is that after youth the skin loses elasticity and when the fleal, under it is reduced the stretched skin bags and wrinkles Soragginess, which comes from malnutrition caused by indigestion, together with the flaccid sagging of the muscles caused by lack of healthful exercise, is equally to be guarded against.

## Iniurious Eifects of Stimulants

Alcohol has a coarsening effect on the toxture of the slin. Also, coffee, tea. or cocos must not be indulged in to excess; the first two stimulants often causing indigeation, with flushing or sallowness as a result, and the latter overhenting and liver clogging. Roughness, blotchiness and redness of the skin are usually caused by acidity. In addition to the elimination of poisonous acid by perspiration and avoiding sugary and starchy foods and acid fruits such as currants, strawberries, plums, etc., the habit of frequently sipping a glass of water beforc mealy and at night should be cultivated-an internal bath, cleansing the system of many inpurities. Constipation should never be allowed, but drugs should only be taken on the advice of a doctor, as promiscuous dosing may have harmful results.

Eating between meals is a mistake. The digestive organs require a reat Constant chewing of sweets spoils the shape of the mouth, and over amoking is detrimental to clear cyes There are other bad habits to be avoided or corrected. In walking, too short or too long a step is tiring and throws out the balance of the body. A stride should suit the length of leg; there should be a free swing from the hips without wobbling, and steadiness of the sitoulders. When standing in incorrect att $i$ tude is to thrust one hip outwurds and distribute th ${ }^{3}$ weight of the body unevenly (Fig. 4). A bud habit in sitting is to Hop downso that the end of the spine, instead of supporting the tody correctly, is ourved under (Fig. 2). As this, if continued for any length of time at a sedentary occupation, causes a strain on the internal organs, backache, a stoop and restrioted brenthing, it is most important to practise sitting upright, the base of the spine touching the back of a chair and the head in line with the body (Fig. 3). When resting it is better to lie down Hat than to loll in an easy chair. Sorcwing up the eyes is sometimes imitative, and should bo checked; where caused by eyestrain, glasses should be worn.

## Proper Care of the Hair and Skin

Hair should be combed out at night, but vigorous brushing has a more beneticial effect when the body is not tired. If the hair begins to come out a good tonic should be used Dandruff must be prevented ; it is impossible to have beautiful hair unless the scalp is kept clean. Most hair, if properly hrushed, has sufficient gloss without recourse to brilliantinc.

Cosmetics have a place in beauty culture, their use being to preserve, whiten, smooth and brace the skin. To keep the contour of the face and the elasticity of the skin a sinnple form of massage may be gone through daily, after
muscles relax during sleep and want keying up Having apread a little skin lood or cold orean over the face, place the fingers of both hands on the cheekbones, the thumbs meeting undor the chin, and with firm pressure pass then upwards to the fingers on each side, repeating the movement for a bout two minutes Next place the tips of the fingers on the points of the jaw and work them firmly upwards pas the corners of the mouth to the base of the nose
Repeat this movement for about a minute. Then tap in a small quantity of creain round the eyes, using the third finger of each hand very lightly and working from the inner corner of the eye outwards for a minute, and for another ininute, having closed the eycs, very gently pass a finger along each eyelid, con tinuing the movement outwards to the edge of the hair. The whole process takes five minutes. After the massage the face should be bathed in cold water to which a littlo eau-de-Cologne has been added.
Allowing live minutes for the extra hinr hrushing, five minuter for the physical exercises, and five minutes for the facial massage, it will be seen that beauty culture only demands one quarter of an hour ench moning. Soaking daily in a hot bath enervates instead of braoing the muscles. A quick warm bath, using a long.handled bath brush and followed by a cold sponge, keeps the skin in gond oondition. On alternate nights cold cream and an astringent complexion milk, such as a cucumber and benzoin preparation, should be applied. The first should be lightly rubbed and tapped in with the third finger, thus a voiding the danger of stretching the skin, and any superfiuous cream wiped off; the

alse, be one for the individual, emphasisin! good points and glossing over bad, not a meaningless routine of cosmetics Artificial colour may be unnecessary, because by following hygienic ruies, sallowness and the whiteness of anaemin will be corrected. The clear, healthy fallor that is natural to some complexions is a beauty and should not be rouged. When colour is used the shade must be chosen to suit the skin, the smallest quantity applied lightly to the upper chcek bancs with absorbent wool if a powder, or with the tip of the finger if crean or liquid, and the face powdered afterwards. With regard to the lips, lipatick should tono with rouge or harmonise with natural colour. Castor oil used every night, applied by a camelhair brush, has a darkening and at rengthening effect on lashes and cyebrows. Should tunch. ing up be desired use mascara unobtrusively.

Siensitive akius may develop a rash from washing in unaccustomed hard wator away from home, and a oleansing cream may then be used instead of soap and water.

It is most impurtant to select the right orenm, sonp, and powder for the individual skin; once these have been discovered they should be adhered to. Cheap powders olog the pores and produce blackheads-a silk. sifted pure ricc powder delicately tinted to tone with the natural skin is the safest and most becoming.

Sound sleep in a well-ventilated room is important. It is in fact one of the best leauty specialists in the world. When late hours have to be kept at night, if possilile make up arrears of sleep in the afternoon

BEAUTY OF BATH. This is a smal!. flat, red and juioy apple, of prolifio habit, and flourishing at its best from July to September. It is recommended for culture in small gardens. being useful alike for dessert and oulinary purposes See Apple.

BEAVER. A line greyish-brown fur used for winter coats and expensivo fur trimmings, Though light in weight beaver has great durability and a beautiful quality which easily distinguishes it from its imitations.
A silk beaver for hats has been largely nusted by velour. See Fur; Velnur
BEAVER BOARD. A Canadian product named beaver board is used for the covering of internal partitions and similar purposes It is composed of wood fibre worked by a patented process, and resulting in a five-ply board approximately $\frac{i n}{}$. thiok It is clean
and pleasant tu handle, is made in a range $o$ convenient sizes, and obtainable from any good builders' merchants. Sec Partition.

Bed Bug. This is a variety of the insec known as the bug (q.v.).

BED CRADLE. A cuge minde ul mefa hoops and long wouden or metal struts is used under the name of $n$ bed cradle in cases of illness to raise the bedclothes off the patient This is necessarv in fractures of the lower limbs, ns the weight of the bedclothes may displace the foot. The apparatus can be used to give a liot nir or vapour bath or to suspend an icebag for the relief of pain in oppendicitis In case of an emergency, a three-legged stool a strong cardbuard box with ends cut arch. shajed, or a child's hoop cut in tivo pieces, crossed and screwed together, inake excellent cradles.

BEDDING. 'L'uo much importance oannut be attached to proper bedding, when it is remernbered how vital sound sleep) is to health and the amount of time spent in bed. The best kind of foundation is a good spring mattress. This may be either of the bon spring variety or the ondinary spring with $a$ stuffel overlay, or the wire spring mattress.

When an overlay mattress is used on box or spring it should be sent to be cleaned and remade periodically. Unless this is done every few years it is impossible for a stuffed mattress tu be hygienic or comfortable, as the stufting becomes mntted and cunsequently lumpy. A good mattress will last for many years with occasional re-covering if cleaned and restuffed.
The wire spring type of inattress consists of a series of springs sewn into pockets and placed inside a cover. Over the springs a padding of hair or felt is laid, obviating the necessity of an overlay and keeping the full resilience of the springs The mattress is then upholstered. There is no expense of uplieep with such a mattress, as it is fitted with vents for airing the bedding is automatically kept fresh and does not nbsurb or retain any perspiration from the body. Lsose washing covers for top mattresses and box springs are desirnble and wave the mattresses.

The pores of the slin are most active during sleep, and for this reason the thonough airing of bedding and bedcluthes is essential, and the temptation to make the beds immediately their occupants rise in the morning should be registed. The mattress itself shonld be turned every other day from end to end, and on alternate days frome $\begin{aligned} & \text { ide to side. so that each }\end{aligned}$ jpit in lurn bears the extia weight. It onghi to be taken into tho garden and expused $t$. sun and air at regular intervals. Ill blankets must be regnlarly sliaken and, if possibie, pul out at intervals in the sun. See Bedstend Bhanket ; Bulster; Bux Mattrow : Eiderilown Mattress; Pilluw.
BEDDING: In the Garden. The llower gardener always arranges for his principal lloral features to be diaplayed in the position where he can best enjoy them. The suburban or villa a:mateur cannot generally have his best Horal effects beside the approach to his front drior or under his front windurs, but the country gardener can make such a provision.

In laying out tedes the curverl plan is preferred by many, especially where there is a lawn with a curved line. Rectangular beds econonlisg working, and are more easily kept $t \mathrm{rim}$. The aize of the beds ought to bear some relation to the width of the walk and the area of the lawn, where there is one. Small heds are tmublesome if there are many of them, but very large beda have practical drawbacks too Fixtracere has to be taken in the planting, for every cultural process among the inner planta encans getting on to the beil

Neither bedding plants nor herbaccous perennials can give an unboken display of bloom throughout the year, but it is possible to have culour by the utiliastion of shrubs, eapecially those which are fairly sminll and compact, such as miczercon and other daphnes, azalens, heathes, and kahmias.
Sume evergreens are slow in growth and thrive in ordinary soil, notably some barberries, laurustinus, veronicas, box, selected cypresses and tree ivies. These would be long before they outgrew the arcommodntion of small heds. There nre small, neat evergreens in abundance which keep the beds green till spring brings in the Howers. Some of the bost spring subjects arc primroses, poly. anthuses, auriculas, wallfowers, forget-me nots, aubrietias, arabises, dnisics, yellow peremial alyssmm, and Brompton stuchs.

Beautiful beds can be provided at no greal cost. It is possible to buy most of the plants named in autumn, but it is far chenper and more satisfactory to raise them at home. By parchasing seed quite early une may get the very fincst strains for a small outlay. See Nlower Garden : Primose: Tulip; Wallfower, etc.
Bedding Out. While bedding simply means a rearrangement, hedding out impliez the transference of plants of a half-hardy nature from the shelter of the grecnhouse to the open bed in late spring or early summer.
BEDFORD CORD. The feature common to all fabrics known by this name is a raised tubular cord or rib running lengthwiso. Woollen Bedford cords are one of the best instcrials for riding breeches. The material is intended for breeches, and made in thousering width ( 27 in .). It looks a little clumsy in coats, but officers' complete uniforms have boen made from it. Cloths similar in weight and appearance are incule also in cotton and are cheaper: they are not su warm, aw more easily soiled and less suitahle for wet weather.
A ligiter make of ootton Bedford is used for summer dresses and is sometimes called piqué, although in true piqués the tubular ribs run

crussivise, nut lengthwisof the piece. The better qualities make excellent coats and skirts, white or in light colours. They wash and wear well, and are especially suitable for sporta wear. See Piqué.
BEDLINGTON TERRIER. An intelli. gent guarlian or the house: entirely depiondable with children, this dog stand in the front rank нy $\boldsymbol{a}$ destimyer of rats and othei vermin. But although affectionate where his owner's family is concerned, he in suspicious of strangers and jealous of his own kind. The Berllington has a
under-blanliet is used it should be large enough to tuek well in ull round so that it may be kept smouth and not cause bed sores. The lower shect is then put on in the ordinary way, and on top of it a draw sheet may be placed: 'This is an old sheet, folde.! to a suflicient width to reach from the sholidiler blades of the patient duwn to his linces, and laid across the bed. It is tucked in at cach side.
hard though rather woully coat of dark hlue, tan liver, or sandy. The head is narrow, with n long, tapering, sharp muzzle. The


Eedingtos Terrier. A goos house doz and ratte:
long, sharply pointed inil, which used often to be docked, is only slightly curved. The nnimal stands about 15 in high, and weighs ahout 24 lb . See Dug.
BED-MAKING. The bed should be stripped overy morning, the mittress thricd and the hedclothes left to air. The underblanket is then laid amoothly on the mattress The bottom slieet must he thoroughly tueked in all wund, so that there is no possibility of rucking (1p). Top sheet and blankets are then put on olle by one, and tucked in at the boltom. The top shect is turned down over the hlankets, the pillows put in place and the whole covered by the bedspread. The bedspuead is removed at night and the down quilt put in place.

Bed-Making for Invalids. A feather Led should never be used in cases of illness. A goul hair mattress is best, but a straw one dues very well, particularly in infectious enses, hecause the stutfing can be burned. Where the illness is likely to be prolonged it is best to dispense with the under-hlanket and to replace it by a mackintosh wheet. If the


Bed-Making. Cbanging an Invalid's sheet. Above, changing sheet from above downwards. Below, changing sheet from side to side
teginning with the greater part on one side and only a small turning on the other. It is shifted along a little every day until the hulk of the tucking in is done on the opposite side from which it started. In cases where the under blanket is rotained, a muckintosh shoet, mav be placed under the draw sheet.

The upper clothes should be warm but light. and no heavy, airproof counterpane should be used. A ventilated down quilt is the best means of obtaining extra warmth, as its weight is insignificant In some illnesses, e.g. acute rhemmatism or nephritis, the patient is nursed betwcen blanketa, and no slieets are used.

When the hed has to be made it can be done quite simply without disturbing the patient. First loosen all the bedclothes. Then let two people stand one on each side of the hed and take hold of the under hlankict or mackintosh sheet, pulling against cach other until all wrinkles are smonthed out. The same is done with the under sheet. Raise the patient slightly under the shoulders and shacke up the pillows. Then liy him down and make all tidy.
Shects can be changed as follows: When a clean top shect is required, have it aired, warmed and ready. Remove the top blanket from the bed and lay it over the clean shect. Then take sheet and blanket together and lay them on the bed, while n second jerson stands at the opposite side ready to assist. Ioosen the soiled sheet and the remaining blankets on both sides. The second person then seizes these and draws them quickly away, while the first holds the clean sheet and blanket in position. The clean shect is then tucked in

## Methods of Chankink the Under Sheet

There are two inethods of changing the under sheet, according to the nature of the patient's illness. The more usual is to change it from side to side. 'I'wo people should assist, one on each side of the bed. First the hod. clothes are looscned and the clean sheet, rolled lengthwise, is brought to the berlside. The soiled sheet is then rolled up until it reaches the patient, who should be lying on his right side, and the clean sheet is rolled along behind it. Thus the two shects will he resting against the patient's back in two long rolls down the middle of the bed. The patient is then rolled gently back on to his other side, and the second person draws the swiled slicet from under him, following it by the clean slieet. Once it is clear of the pratient it can be straightened out and tucked in. A draw sheet is changed in the same way.
If the patient has to le lifted, as in most surgical cases, the change is effected from top to bottom of the bed instead of from side to side, and the shect rolled widthwise instend of lengthwise. In this case the sheets will be rolled down until they are under his shoulders. The second person then raises him under the shoulders sufficiently for the sheets to lre passed on as lar as his hips. 'These are then raised, and the sheets can be drawn down bencath his legs and the change completed.
It is even more important in winter than in summer to are that a patient's lied shects are thoroughly aired and warm. When the invalid is not too ill to leave his bed during a change of linen, the best method is to fold back the upper sheets and blankets, and to iron the lower sheet backwards and forwards several times with a hot iron. When, as in cases of severe rheumatism, etc., it is nccessary to make a hot pack, the bed is prepared by putting a inackintosh covered with a hot blanket on it. A large sheet is rolled up lengthways and wiung out in boiling water, a large towel being used as a wringer. The patient is turned on one side, the shect, half umrolled, is placed alongside, and then he is rolled in the sheet. The blanket underncath is then tufned over to cover the jalient in the shect.

While anuther mackintosh and several more hlankets are placed over him See Bedspread Blanket - Nursing : Sheet

BED-PAN. The lreal-palu is a utensil which should bo in every liome. In many cascs of even slight illness patients suffer harm from chills, strain of the heart, cte., by getting out of lred. liefore use, the bed-pan should ha warmed and the margin coverell with finnnel After use it should be emptiell and clansed as soon as possible. It is wise always to keep some disinfectnat in it, such as Lysol or a carbulic solution.
BED-REST. A comlortable led-rest is a necessity in many cases of illncss. A chair placed upside down and covered with a large pillow can he used as a temporary substitute. hut where the patient has to face a long convalescence, us after a broken leg, it is usually worth while to buy a proper bed-rest. It is essential to have one in some types of chronio heart disease, where the patient cannot breathe comlort ahly if lying down.

Making a Bed-Rest. The ligure shows a simply made folding led-rest. The framework, 1 , is 27 in . hy 21 in and nade of woud $1 \frac{1}{i n}$ in $\mathfrak{i} \mathrm{in}$. for the uprights, and $1 f \mathrm{in}$ by in. for the raila, which are tenoned or dovelled into the sides 'The hack is welibed
as slown. Tlle lack, 13 has the notehed rails 2:3 in by $1 \frac{1}{2}$ in by in. and a stretcher rail 1 in by ${ }^{3}$ in temoned or clowelled. The


Bed-rest. Easily made lolding pattern. An explanation of the lettering is given in the text
 joined by a stretcher rail $1 \neq$ in by $\}$ in. B and $C$ are hinged to $A$ by iron bolts 2$\}$ in by $t$ in. A washer should be placed between the two pieces of work. Pine, beech or American whitewood are suitable for maling this atticle.

# THE BEDROOM: DESIGN AND DECORATION 

# Ideas that Produce Harmony and Hygiene in the Sleeping Room 

For the Furniture of the Bedraant sce Bedding; Bedstead; Dressing Table; Wardrabe, etc.;
also Bed-making; Bed-Sitting Room; Colour Scheme, cte

Fxciting designs and colours ane out ol place in a sleeping room, where the effect should be restlul; also, it is advisalle to dispense with heavy hangings and furniture not easily moved and cleaned.
In a small house, whicre the bedrooms open off one landing or corriclor, a pleasant schome allows of individuality in the separate cooms, hut is harmonious when the doors are open. Thus the pattern of a cretonne in one room repeats the colour-note of paint and carpet in another, and so on. Building a colour sclicme up to the alrcady chosen design of "all-paper or faloric for hangings is often a good way to start new decorations.
The aspuect of each room has also to be considered. In enst room which will get the moning sunshine may to in cooler colours, and the same applies to a south room, hut in a north room it is necessary to have walls which will suggest sunshine and reflect all the light there is Fur a room facing north, or where, as in the case of many town houses, the sunlight is intercepted by other buildings,


Hedroom. Small room in Georgian style with sprigred chintz canopy bed
hiere is nothing lietter for the walls than the colour-range from crenm to orange with clear vellows and discreet use of pinks; for a sunny south room, cool hlues and greys, and in a west room manves may be selected; but in the case of bedrooms, individual taste should make itself felt and the room be characteristio of its occupant.

If wall-paper is used it should be of smooth surface so that dust can he removed. For the tloor, parquet is alvays desirable, but ordinary boards can lie made dustproof before staining: by lilling up the cracks. Linoleum is a clean lloor covering, and easily swept and polished. Nothing more is required for the lloor in a small room cxcept mats which can be laken up and slanken. It is never advisable to have a carpet right inp to the akirting.
The most important piece of furniture is the bed, and the beat should be bought witli the means at dispesal. Bedspreads nnd day cushions can add to the colour of the room, in harmony with the curtains. In many houses hanging cupboncds and euploarde with shelves are built into the "alls, or built in Hush with the ivall, so that they form n kind of panelling.
The pedestal basin with hot and cold water is fitted into some houses, but the ordinary wash. stand is disappear. ing as a piecc of furniture. I well. fitted bathroom and a hall clonk $=00 \mathrm{~m}$ do away with the necessity of wash-hand stands in smaller houses
For the larger bedruom a wardrobe which has a hanging cupboard on the one side. sletives
on the other. and in the centre drawers and a chesta are available the hangings and bedoupboard may be chosen where there are no spread are of printed linens whioh reproduce bujit-in fixtures. If apace is limited a chest the designs of the period. If the cost of a good
 modern copy of the Jacobean bed is too great, have a divan bed with legs and a head-board which suits the style of room. If the centrul piece of the room is a good eighteenth century chest or tall. boy, a simple drop table with a reproduction of an eight. eenth century mirror will serve as a dreas-ing-table. and the window hanginga may be in daniask. For a room with
uf drawers may te selected which inill also serve as a dress. ing-table. A long mirrur placed panel like hetween two urindows, or elsewhere in a good light, is a distinct addition to the roons, as it catches and diffuser the light. It is of utmost importance to avoid overcrowd ing, butan armchair, small writing-table, a hedside table, and a couch are desirable additions, so that the occupant will be able to read, write, rest, study, or sew without disturbing or being disturbed by the rest of the household. In a sinall room, by the elimination of the washhand-stand, of
 the wardrobe in favour of the hanging cup- jainted furniture, hangings should emphasise board, and of the dressing-tablo in fivour of colour and type of painted decoration. Placing the bureau, there is usually apnce for a table furniture must dopend upon the shape of the and an easy cheir, thus giving additional room. Fresh air is indispensable. The window usefulness to the room as well as conifort.

Well placed lighting is important for the mirnor. Candle-lamps fixed to the dressingtable itself are convenient. A good readinglamp is essential : either of the hook on to the end of the bed type, a pendant, or a standard. Ingenuity is shown in adapting the rest of the furniture to antiques. Where Jucobenn
can then be gone over with the swecper and the surround with the soft polishing mop. If the room has only small mats thesc can be romoved daily and slaken. The room must ther, be thoroughly dusted. Once a week it should the turned out. A vacuum cleaner is holpful for carpet and hangings. All wond work has to be dusted, partioular attention heing paid to the tops of furniture, ourtainpoles, blinds, pictures, etc., which are out of reach in the daily dusting. Marble und tiles are washed, mirrors and furniture polished, and small rugs beaten.
The Invalid's Bedroom. The icleal prosition for the bed is between door and window; fail. ing that, it should be placed between dour and fireplace. A single bed is more convenient, and for any long illness a nccessity, as a double bed adds to the fatigue and diffioulty of lifting the patient, changing of sheets, etc. An iron bedstead about 3 ft . wide and not too low is hest. It should be devoid of valances or curtaing, and stand away from the wall ac that the air can get to it from all sides.
All furniture, except essentials, should be removed. The best covering for the flow is cork carpet or linoleum, because it can be wiped over eqvery day with a oloth wrung out in diainfectant. Even hare hoards are preferablo to $a$ fixed carpet, and the necossary warmth and quiet can be prooured by placing mats on the floor.

The top of the window should never be shut. and it ahould be possible to have the bottom open, too, for long periods at a time. If this places the patient in a draught a screen can be put mound the bed. For purposes of ventilation a fire should be kopt in night and day, unless the weather is exceptionally hot; not only does it ensure the ohimney being clear, but it makes the temperature of the mon casier to regulate. This should be from $60^{\circ}$ to $65^{\circ}$ Fahr, and kept even.

Heavy window curtains are unhygionic, but gaily patteried washable ones help to make the room bright and cheerful. Too many pictures, or two elaborate a wallpaper, are trying to the eva, and inclined to worry a patient. Plenty of Howers (not too heavily. scented) should be kept in the room and should be removed at night.
There should be a confortable chair or couch which the patient can occupy while his hed is being made, or when he begins to sit up.

BED-SITTING ROOM. One of the ohief considerations is space. Aocommodation must be found for clothes without introducing ordinary hedroom furniture. An antique style dressing chest or a flat-topped bureau are useful pieces with long wall mirror conveniently placed. Two large cupboards are shown in the illustrations, which provide in the une hanging room for olothes and space for


Bed-Sitting Boom. Left, general view of the room which forms a complete fat. Tbe cupboard on the left bolds all domestic necessitics, the one opposite all wearing apparel. The small gas cooker has a convenjent shelf beneath. Right, the other side of the room, showing the divan
bed linen, and in the other a sink for washing up and places for cooking utensils, otc.

A divan bed may be covered in cretonne or silk, the cover lined to give weight. The pillows have covers to match or contrast. A day-bed with narrow head and font-pieces and two bolater cushions at either ond during the day may be aubatituted for the divan. Another type of bed is the settee bed, which has railings on one side and at the head and foot, and wired springs with an upholstered mattress. The cover should be removable so that it can be washed.

There are hanging cupboards described as hall cupboards, which do not look out of place in a sitting room. The best type of table is the gate-legged variety of the drop-table, the lenves of which let down when not required. A gas fire is desirable, and also a amall cooking stove, as shown in the illustration, but if there is a coal fire it is useful to have a gas ring in arldition. See Bachelor Flat.

BED SORE. The cause of bed sores is the weight of the hody constantly filling on bony points not well protected by fat. The chief sites are the heels, ankles, elbows and the lower part of the back. Beginning with slight red. ness, the affected area soon turns a dusky purple, and the soft tissues slough out or the skin ulcerates, leaving an angry sore.

The nurse should be vigilant in her efforts to provent a sore forming. The shect must be kept smooth and dry, any soiling being quickly attended to. Every day the skin of the back and other susceptible parts, having been washed with soap and water and thoroughly dried, should be sponged with methylated spirit and dusted when dry with taloum powder. If possible the patient should at least occasionally change his position. The mattress should not be a feather one, and if necessary a water-bed should be procured: Goorl results have been obtained by dryrubbing the back with sonp till the surface is quite smooth. If the akin becomes reddened it should he painted with flexible collodion. If the condition progresses and a slough is scparating, fomentations may be npplicd in order to assist this.

These fomentations are nande by wringing out clean napkins in a very hot saturated solution of borscic acid and should be just large enough to cuver the affected area. They should he applied every two hours, being covered with oiled silk and a bandage to prevent too rapid cooling. When the slough has separated, wash the ulcer frequently with an antiseptic lotion and apply an ointment. Either of the following would serve: resin ointment and balsam of Peru, an ounce of eich, or camphor gr. x., zinc ointment to an ounce.

## BEDSPREAD. The bedspread should bo in

 relation to curtains and carpet. While them is nothing daintier than the linen embroidered bedspread enriched with fine needlework of all kinds or by coloured border and large central appliqué deaign, linen bedspreads are not always favoured hecause of the cost of laundering or suitable for the style of the room.For period roons a selection should be made from printed linens, silks or satins which are in the designs nearest to the period. Chinese lacquer demands the beautifully designed ailky of China, and if these are unobtainable the decorator may fall back on black or gold satin if matohing the curtains, and trimmed with Chinese embroideries.

For ordinary purposes artificial taffeta the colour of the walls may be selected with a bold embroidered design introducing colours of curtains, etc. ; or a patterned soít cretonne or print may be edged with casement cloth of the prevailing colour, or printed cotton bedapreads may be bought to tone with the mom See Appliqué Needlework; Embroidery ; Linen.

# Bedsteads: Antique and Modern Types 

Their Choice, Construction and Repair
For the arrangement of the Bedstead see Bedronm; other associated heatings are Bedding; Bed. Making:
Divan; Mattress; Shernion, etc.
The chenpest iron or brass bedsteads have of ailk or damask aro chosen, and for the the bars of head and foot placed transversely, painted four-poster there is the blocked print. but better types have the bars of the head and All thesc heds arc chosen for their decorative foot in a vertical position. They may be quality, and nust be justified by choice of obtained enamelled in black, in white, and in a variety of colours, or the brass may be lacquered. The best brass bedsteads have the minimum of decuration, and the uprights are square and not round in section. In cleaning thesc, only a soft polishing rag is necessary. Polishes of any kind should be used sparingly.

A wooden bedstead, with upright bars at head and foot, is the commonest type of bed chosen to go with plain or fumed onk furniture. The pattern can also be obtained in mahogany and in painted wood. If the bed is to stand by the wall it should alwaya be provided with anstors.

The cheaper kind of beds in the two foregoing types are of combination design, i.e. the wirespring is fixed to the frame of the bed itself, screws allowing the wire to be drawn taut. It is better to choose a bedstead with iron frame complete, but without tho wire. The wire or boxspring can be bought and superimposed.

For lasting value there is nothing better than the wooden bed with solid headboard and footboard made of mahogany or walnut. Where a fincly mark. ed piece of wood is used, it is in itself sufficiently decora.


Bedstead of English oak, dated 1593, with finely carved pillarg detached from the framework of the bed Vicloria and Albert Museum accessories. The Chinese four- poster, the most ornate of all, is made to accompany Chinese lacquered furniture in black, green or red.

The best model for a child's bedstead is one with half sides, which prevents all danger of falling out. These can be had in light and fumed oak, or in painted wond to auit the rest of the nursery fittings. In choosing a child's bed it is important to see that all the parts are solidly fixed, that the laths are solid, and cannot be displaced by the most energetic child. A folding bedatead for the use of all emergency visitor is a useful addlition to the household in a London flat or a country cottage. One wooden model, folding up on the concertina pattern, occupies a very small space when not in use, and the thin overlay can easily be stored in a cupboard. There are also several varieties of the inili. tary canvas folding. bed. These are provided with n stout canvas overall cover, and form a very useful part of the family holiday luggage.

For use in hot clinatea an iron or brass four-poster is the best type. No wood is used, as wood is accessible to variety of what is known as the French bed.

Period wooden bedateads are copies of old deaigus. A Tudor bed in Ilark oak will have a low footbnard and two low posts at the foot, or no footboard at all ; a Jacobean dark oak bed will have the twisted posts to be found in Jacobean furniture with upright hars at the head and fout; or if the solid head and footboard are chosen it will possibly have aome carving. These Jacobean hedsteads have added strength by a transverse beam placed bclow the footboard. Good beds in inlaid mahogany in the Sheraton style can be hud cither with solid head and font or with a central panel and upright bars.

A cane-panel bedstead looks right with furniture of 18 th and early 19th century design, or with the lighter types of French furniture. The four-poster is an interesting revival, though hardly the most practical. It can be had either with or without the canopy. It is not necessary to retain the hangingm behind the headboard, though this is usual Curtains must be fixed so that there is no great difficulty in taking them down to clean and replace. The hangings are narrow, so that they do not prevent a free passage of air, but are only for decorative purposes. For the older patterns draperies of costly stuffs are in keeping. Models with twisted posts have lacobean printed linen, or genuine embroidered hangings and an embroidered bedspread of the same pattern For others hangings and bed covers
ants and other insects. The high posts have thic transverse rods connecting them fitted with secondary rods for the mosquito curtain, but these are not always used, as niany people prefer the curtain to have no division between the canopy and the sides.

Between a wooden and a metal bedstead there is little to choose in the way of strength


Bedstead. Example in walnat with cane panels, adapted from a seventeenth century model Photo Irom lleal \& Son, LId.
provided both are good models The wooden bedstead has one possiblo point of "ealinesswhere the iron angle-picce which connects the iron bed-rail with the wooden head and footboards is fixed by four screws into the wood After years of hard service it is possible for these screws to become loosc in the wood; it is then necessary to take thic hedstead to pieces, plug the wood, and reset the acrews It is wise to count the cost of the spring and the mattress before choosing the bedstend.

Repairs and Renovations. These are well within the capabilities of most amateurs, provided they excrcise cominon sensc and nay due regard to the nature of the work to be done to the damaged piart, as this determines to some extent the inethod of repair

Four-Poster Bedstead The earliest English spccimens are few in number, those which have come down from Elizabethan times being chietly of Italian or Flemish make. They lost popularity in the 17 th century, and remained out of favour until the time of Hepplewhite and Sheraton, who gave the type a lease of life that lasted well into the 19th century.

Sheraton designed pieces are particularly graceful.

The majority of bedsteads of this type will he found to be more or less worm-eaten, and probably damaged. If the worm is still in the wood, it can be detected by the deposit of fine woud dust on the ground beside the part affected It can be treated by injecting petrol into the worm holes hy means of a very sinall syringe; a hypodermic syringe answers very well. Other effective methods are to steep the parts in turpentine or paraftin. The work is then cleaned and rejolisned, treating the worm holes with beaumontage ( $q$. v.) or other filling.

The joints were frequently held together with a form of coach screw ; this will probably no 'onger hold in the wool, so bore out the hole, plug it with n well-fitting wooden plug, well glued into place, and drill out a suitable size hole for the screw. If the original canvas mattress is badly torn, cither replace it with new or carcfully patch and stitch together all the torn places, and re-work the holes for the lacing, using a buttonhole stitch. Probably only the old framework will be retained and a box-spring mattress fixed to it. All that is needed are some extra battens at the head and foot or elsewhere to support the framework of the box-spring.

Iron Bedstead. The usual failing of iron bedsteads are chipping of the enamel, rusting and tarnishing of the ornamental brass knobs and other parts, and breakage of castors. The paint work is readily dealt with by filling the chipped places with hard stopping, after cleaning the metal, and re-enamelling the whole


Bedstead. Modern design by Joseph Emberton, A.R.I.B.A. Twin bedsteads linked together by one large head board
framework If the brass work is badly tar nished, or covered with a kind of black growth of spots, it is best to remove the partsgenerally by unscrewing them-then boil in strong soda water to remove the reminants of


Bedstead. Fig. 1. Single oak bedstead, the making of which is descrited in the text' below
the old lacquer. Polish with very fine and old emery cloth (that known us blue back is the best), then polish thoroughly with good metal polish, wash in hot water and re-lacquer. A good effect is often obtained by bronzing the brassworl, say, to blue grey, and cnamel. ling the metal worli in a contrasting colour.
Nissing castors are difficult to replace, as they are of ten cast on. One method is to cut off the old castor with a hacksaw, and drill out the end of the tubular leg. Obtain a new castor of similar size to the others on the bedstead a nd mount this on a hardwood, or preferably metal, plug that can be tightly driven into the hole of the log. An alternative is to fix a tube to the castor, either by riveting or brazing (q.v) and then fit the leg into the tube. A length of about $t i \mathrm{in}$. aliove the castor will serve the purpose.

All-brass bedsteady can be dealt with along the same lines, but the re-lacquering job is no easy one for an amateur, as the whole section must be done at one time and must be kept at proper temperature

Wooden Bedstead. With the so-called sanitary iron fittings, wonden bedsteads sometimes give trouble by the failure of the screws holrling the shoe or cast-iron fitment into which the side bars are fitted. The only remedies are to withdraw the old screws, plug the holes, glueing the plugs securely into place and fitting new screws. A drastic and effective remedy is to holt the shoes on with coach bults. The heads will, of course, be visible, but this need be no detriment.
Sometimes it is desirable to alter the colour of a bedateal so as to harmonise better with the scheme of decoration. When the bed is an enamelled one, the treatment is obvious re-enamel it in the desired tint. Many bedsteads are
made of oak, birch, or similar
material and then stained and polished Here the old colour can to a certain extent be removed with methylated spirit or turpentine. Follow this with a careful rubbing down with fine glass paper Re-stain the wood with a good quality water stain of the (lesired colour (olitainable from an oil shop) and then re-polish, or even work up a glass with a goond grade of furniture perlish.
Making an Oak Bedstead. The bedstead shoun in lig. $I$ is intended for a room of moderate dimensions. It is a 3 ft . size, hut the general character may be preserved in a 4 ft . 6 in. size, if a double bed is required, or " pair of 3 ft . bedstcads could be inade to stand side by side as twin beds. Width, as stated, is 3 ft ., but for n child's bedstead it is possible to get an iron fraine with diamond meshwire spring combined $2 \mathrm{ft} .3^{*}$ in wide. This hint might prove of service when space is limited, the accommodation being sufficient for comfortable


Fig. 2. Dovetail iron socket for angle iron sleeping without much sacrifice in appear ance with the low foot end. The height is 2 ft . 3 in, and may be as low as 1 ft . 10 in for any special reason. The length of bed is governed by that of the separate iron angle sides or combined apring, whichever is fittell, the aize


Bedstead. Fir. 3. Foot end. Fig. 4. Patterny Which may be applied to the foot of the bedstead.
usually supplied being $6 \mathbf{f t} .4 \mathrm{in}$. Fig. 2 shows a type of dovetail iron socket used in conjunction with angle imn bearers to connect the head and foot of a wouden bedstend. The height of head end is 4 ft . 3 in ., giving a sufficient display of curtain.
A start may he made with the fout end. The posts, allowing it in on for height of castors, will require two lengths of 2 ft 1 in . by 2 in by 2 in ., finished sizes being a shade under for a stout hed. It is prossible to use wood 2 in . wide on face by $1 \frac{1}{2} \mathrm{in}$. thick, if this happens to he inore accessible. For the former size the posts are square for their full length, but have the corners just nosed off. A $f$ in ovolo is in tended to be worked down the outer angle, and this can be carved effectively with pip-and-bean detail, or this ornamental portion can be ubtained scparately in long strips (about 10 ft .) from the woodivorkers' sundriesman, ready for grooving into the corner of the posts, to be glued and fastened here and there hy needle points. Castors are often omitted in a 3 ft . size, in which case it should be remembered to allow the slight extra length for he posts.
The top rail (A, Jig. 3) is murtised and tenoned into position, but is often dowelled, or might be dovetailed in. It looks well if the top edge is slightly rounded away, D-shape. This rail is shown $2 \frac{1}{2} \mathrm{in}$. wide, and should be at least 11 in. thick. The foot-rail (B, Fig. 3)
enters the pusts with a couple of shouldered tenons, and is $4 \frac{1}{2} \mathrm{in}$. wide.
The inner uprights (C, Fig. 3) take two pieces 12 in . by $\mathrm{t} \frac{1}{2} \mathrm{in}$. by $1 \frac{1}{2} \mathrm{in}$., to include $\frac{1}{\mathrm{~d}} \mathrm{in}$. tongues, entering top and bottom raila and uprights, and all three are grooved to receive the panel. The panel (D, Fig. 3) should be of 8 in. thickness, reduced at edges to enter the $\frac{1}{2} \mathrm{in}$ or in. grooving. A flat section of mould can then he mitred up, to drop in on face and be glued and pinned.
This finishes the construction of tho foot end, but if some relief is required the left-hand device at Fig. 4 might very well be introduced into the centre of panel. It is easily set out and cut fmm a piece of $\frac{1}{8} \mathrm{in}$. thickness for the centre diamond, this being notched for the smaller dimmonds out of $\ddagger$ in materinl to intersect. Size for the device to finish is 8 in . by 4 in ., and in mounting care must be taken to get the extreme pointa level. The casiest way is to pencil in centre lines on the panel, and glue up the pieces over these, the final being by the addition of a few needle points. The right-hand device is an alternative. The centre device is cut from a picce of $\frac{1}{4}$ in. niaterial cleaned up, with n four circle and crossbar opening, and the corner shaped ogec to form a centre panel. This last device would he very suitahle if the bed were made in-darls mahogany.

The head posts (lig. 5) are 2 in . by 2 in ., and are shown with 4 in. by 4 in moulded cappings stub-tenoned on. It will not be necessary to introduce the pip-and-hean mould on the angle of the posts as for the foot. end. The top rail ( E ) is $3 \frac{f}{f} \mathrm{in}$. wide, which will afford an opportunity of applying some relieving device in lieeping with the foot-end. The mid rail ( $F$ ) might he 2 ft . $\mathbf{6}$ in., or a trifle higher: width is allowed 6 in ; thickness of both this and the top rail (E) should be 1 in . The lower stretcher rail (G) can be $2 \frac{1}{2} \mathrm{in}$. by 1 in ., and can be fixed anywhere between $(\mathrm{i}$ in. and 10 in ., from lower end of posts.
The curtain rod (H, Fig. 5) ean he of $\frac{1}{2} \mathrm{in}$. brass tubing, and special fittings are obtainable in brass for a small sum from most furnishing firms.
Details are given in Figs. 6 and 7 of a 4 ft .6 in . bedstead of strnightforward design. The woodwork, as in the bedstend described above, consists only of the head and foot, which are joirred by dovetail sockets and angle iron sides. The posts, which are finished off with a moulded capping, are $2 \frac{1}{8}$ in. by $1 \frac{7}{4} \mathrm{in}$. the rails are 1 in . thick, and the central splat $\frac{t}{i n}$. thick. The upright slats are 1 in . by $\frac{1}{d}$ in. The top edges of the upper rails are finished. with a moulding, as shown. The panel on
width of the end, measured over josts, is 4 ft . 6 in . Tho upper edge of the lower rail for the head end is 1 it 9 in from the floor. that for the foot being 2 in. nearer the ground. These rails are 6 in wide, and the top rails are $2 \frac{1}{2} \mathrm{in}$. wide. The central splat is 8 in wide: the 1 in vertical slats are in pairs, as shown, spaced so ns to lenve intervals of 5 in . Tho dovetail sockets are attached so as to bring the angle-iron sides 1 ft . 3 in. from the floor

This design can be readily adapted lor a single bed. The overall height of the poats for hoth ends might be 3 ft ., and the overall width of the ends from 2 ft .6 in There would be a single pair of upright slats each side of the central splat. If a pair of tivin bedsteads is made, the head ends might be taken a little higher than the foot.

BED TABLE : For Invalids. The bed table shown in Fig. 1 has a double ad. vantage. The legs are hinged so that the article may be converted into an ordinary


Fig 1.
trav. 13y means of a very simple contrivance (Fig. 2) the legs are held down firmly, so that the tray will stand flat on a tahle or sidehoard. When the lega are unfolded for hed. table use the same arrangement provides for them being held rigid. A trny of this kind may he made in almost any wood. American whitewood, or even pine, will serve the purpose. For a stronger article oak may he used, or if a specially nice piece of furniture is wanted, mahogany may be taken.
The size suggested in Fig. 4 is n tray measuring 22 in . by 14 in . This might be Bedstead. Figs. 6 and folded with the spring 7. Simple design in lath holding them lown.
the centre splat is formed with amall moulding, which may he pinned and glued.
The posts for the head are 4 ft .3 in . high over all, including castor and capping. The latter is planted on, and has an ovolo moulding worked on its edges. The height of the foot posts is 3 ft .8 in . over all. The extreme
tionately shorter legs, if only a smatl tray were wanted ; or could be increased to ahout $2 x \mathrm{im}$. by 18 in . for a patient who was likely to do much writing in bed. The legs are shown, $8 \frac{1}{2}$ in. long, which places the table at a convenient height.
Fig 1 shows the bed tahle ready for use. At Fig. 2 is given a view of the underside, one pair of legs being up, while the other two legs are shown Fig. 3 shows the article when used as a tray, while
$t \mathrm{in}$. 3-ply would serve the purpuse for a light tahle. The front of tray may be gently curved inwards as shown.

To the underside of the top at each end are screwed two battens, which may he $12 \frac{1}{2}$. by 1 in by $\frac{1}{2}$. thick. These should he chamfered on the outer edge (Fig. 6) and at the ends, and each is held with four brass screws. A rail is required for the back and sides of tray. The height may be 3 in, with a finishing thickness of $\frac{{ }^{5}}{6}$ in. At the corners the rail may be simply notched, as lig. 5, D, or dovetailed, or mitred and keyed The top edges should he gently rounded, and the front chils of the side rails neatly finished off, as in Figs. I and 3. The raily are serewed with fine screws passed in from below. this being done before the battens are fixed.

The legs are $8 \frac{1}{2} \mathrm{in}$. long and 1 in . square, and are shown tapered on two sides. The leg rails shown in lig. 5 (A and B) are fixed with an angle bridle joint. They are $1 f$ in. wide by I in. thick. The outer side of each has a shallow piece cut away to take the spring lath when
the legs are folded. This is shown in Fig. 2, and also at Fig. 5 C. The part thus cut off will be $2 \hat{y}$ in. Wide and ${ }^{3}$ if in. deep, and must he in the centre of the rail. The cut provides for the spring lath lying llush with the legs when the article is used as an ordinary tray. so that the tray

lies quite flat when the legs are folded down. Each pair of legs is hinged to the underside of the tray as shown in Figs. 6 and 7. The perwpective sketch (Fig. 2) and the plan (Fig. 4) will also assist the worker. Strong back-Hap hinges, $1 \frac{1}{2}$ in. by 1 in., are used. They are so fixed that the lega, when up, will lie against the llat $\frac{1}{2} \mathrm{in}$. edge of the hatten. It is important to note this, as if the lega stood away from the batten, tho hinges would gradually loosen.
The spring lath holds the legs secure both when up and down. It is approximately $17 \frac{1}{2}$ in. long, but allowance should be made for a little adjustment when fitting. In width it miay
 $\ddagger$ in. hare. If the table is made in pine or American whitewood, it will he desirable to use sycamore or ash, or any other wood which vields a good spring, for the lath. If oali or mahogany is in use, the same wood may be taken for the lath.
BED-TICK. For a feather bed and for pillows and bolsters an all-linen tick of a close weave should be chosen, and the sewing must he close and strong; otherwise feathers and down will cacape when the outer covering is removed. For hair and wool mattresses it is safer to choose a stock pattern, as when mattresses are re-made there is usually a cortain amount of shrinkage and new tick may have to be added. See Feather Bed; Mattress; Pillow' Ticking.

## Bees And Bee-Keeping

## How the Amateur Apiarian May Secure Proftable Results

Instructions for making Bechives are given in page 86 See also Bec Pest; Beeswax Honcy, erc.

Bee-keeping is eminently suitable for small. holders, cottagers, and others with a limited area at their disposal. The prospective beekeeper should begin with not more than a couple of stocks, increasing the number as ho acquires experience. The following inatructions on bee-keeping are based on information given in Leallet No. 128 issued by the Ministry of Agriculture

A stock resulting from a cros; between the English, or so-called Black Bee, and the Italian, or Ligurian race, will probably be found the best: but on this point it would be well to take the advice of an exparienced bee-master in one's own neighbourhood. A normal colony of bees consists of the queen a large number of workers, which are rudimentary or undereloped females, and a few male becs or drones. A swarm is a mass of bees, frequently numbering 20,100 , with a queen. The first swarm from a hive is, as a rule, much larger than succeeding ones.

Bees thrive best when protected from frequent variations of hent and cold, and a steady temperature can only be minintained when the walls of the hive do not conduct heat. If they do this in summer the warm sunsline will soon make the interior of the hive excessively hot in the daytime. During the cool summer nights the reverse will be the case. In winter, when the temperature of the air outside is constantly lower than that inside, a steady loss of hent from the bec cluster occurs. This often results in the denth of the bees from exposure and starvation although ample food inay be accessible.


Bee. Fig. 1. Section of double-walled W.B.C. Beehive 1. Bee way. 2. Section. 3. Metal divider hallow frame box. 7. Shallow frame. 8. Air space. 8. End of brood chamber. 10. Bee space between frames and hive side. 11. Brood frame. 12. Lifts. 13. Queen excluder. 14. Metal runner for frames. 15. Outer case. 16. Porch. 17. Alighting board By permission of the Minfstris of Agriculture
A double-walled hive of sound pattern is that called the "W.B.C." Fig. I shows the arrangement of this hive, full instructions for constructing which are given in the artiole Beehive. It consists of a floor boa d having four splayed legs, and a brood chamber containing ten frames with a division board. These frames hang by ears or lugs on a metal runner, so that there is a space of $f$ in. bet ween the end bar of the frame and the side of the
hive. This is $n$ bee space, and therefore left olear. Betweon the hottom bar and the Hoor board $\frac{1}{2}$ in. spacc allows the leees free passage, and they are also able to clean out in comfort the dend and any dirt which accumulates. Their natural instinct teaches the hees to lenve this space open, and they therefore do not build coinb there

To obtain combs of the right thickness for brood rearing, i.e. $\frac{7}{7}$ in., metal ends are fitted on to the lugs of the frnmes; these are $1 \frac{1}{2} \mathrm{in}$. wide, so that when they are in position, and all the frames are pushed together until the metal ends touch each other, there is a space of $1 \frac{1}{2} \mathrm{in}$. from the centre of one comb to the centre of the next, allowing for ? in comb and a $\frac{A_{1}}{}$ in. passage hetween each comb to accominodate the bees when carrying out their work in the summer, and to cluster in during the winter

To compel the bees to build their comlis in the frames they are provided with comb foundation. This is pure becswax, in sheets impressed with the base of the cells. By its use straight combs oan be obtained in any desired position. To make the broorl comb strong, wire is first stretched across the frame; $n$ sheet of worker base foundation cut to fill the frame is then inserted into the saw-cut made in the top of the frame for this purposc and a serrated grooved wheel, called a spur embedder, is then heated in the flame of a spirit lampand run along the wire, thus melting the wax slightly in order that the wire may sink into it. This holds the foundation rigid, and when the comb is built the wire is right in the centre of it, and there is vers little fear cither of the comb dropping out if held in the wrong position, i.e. horizontally instead of vertically, or of the combs breaking down, should the hiven be sent any distance. The combs in these frames are reserved for the rearing of young and the storage of winter food, and should not be touched for surplus honey.

## The Siructure of the Chambers

A second chamber, or super as it is termed, contains ahallon frames, the combs in which are used for the production of extracted or liquid boney. The thind chamber is a section rack containing 21 sections (bottomleas wooden boxes $4 f \mathrm{in}$. square by 2 in . wide) in which comb honey is produced. Each section holds about a pound of honcy. Surrounding these chambers and the brood chamber there is all outer case which also carries the porch over the entrance; the size of the latter is jegistered by sliding doors. There are also lifte which fit on to the top of the outer case, and on one a nother to accommodate the supers during the honev season. A roof completes the structure.

The hive should be stocked as early as possible in the spring. It nay be populated in three ways : by purchasing a colony of bees, a nucleus, or a swarin. The first is the most expen. sive method, as the bees have already built the combs, are rearing broorls and have stored a certain amount of food. A nucleus consists of four combs, and undet favourable conditions may be worked into a full coloniin time to give a limited amount of surplus boney before the end of the season.


Fig 2. A nine-holed bottle feeder

The safest way for a lieginner to start is with n first swarm (not a cast, or afterswarm). The most satiafactory method of purcliasing a swarm is by weight. A swarm weighing 5 lb should be obtained, if possible After-swarma weigh about 2 lh . and have a virgin queen
The swarming season varies somewhat in Britain, according to the weather. There has heen, in a very early senson, a swarm on the 19th of April, the carliest in a 40 years' oxperience in the south of England. As a general rulc, however, the Intter part of May is the busiest portion of the swarming scason, extending as it does through June and into July. Most of the swarms issuing in July are casts or second swarms, and, except in the hands of all expert keeping many colonies, are of little use and should be returned to the parent colony.

When the box or skep containing the purchased swarm arrives, it must be placed in the shade near the hive the becs are to occupy. If the sivarm is in a box, the box shouli be placed upside down and the screws fastening the lid taiken out. The lid should then be wedged open at one end about $\frac{1}{2}$ in to allow the bees to fly. If the bottom is of perforated zinc it should be covered with a sack to exclude the light, otherwise the bees may escape If the swarm arrives in a skep, the cording nnd wrap, should be removed, and the skep placed on a board with a stone under one edge in order to allow of Hight and ventihation

## How to Hive a New Swarm

The hive must be made ready before the arrival of the swarm, and should face south. east. An ideal situation is by the side of but not under a standard fruit tree. The legs of the stand should rest upon bricks to prevent them from rotting. The hive must lee set perfect.ly level from side to side, with a lown. Ward inclination of about $\frac{1}{2} \mathrm{in}$. towards the front In the early evening the roof, lifts, and outer case should be removed. To prevent the bees ascending to the roof a thin quilt of ticking or unbleached calico is placed over the frames. The front of the brood chamber should be raised from the floor board about an inch by means of two wedges. A board the width of the alighting board should then be placed in front of and level with the latter, sloping down to the groind. Both bourds are covered with a cloth hanging over the sides to the ground, to stop the hees from crawling underneath.
The skep or box is gently carried mouth downwards until it is just above the sloping buard. With a smart jerk the bees are thrown out in front of the brood chamber, about 1 ft . awny from the entrunce, when they will at once begin to take possession of their new home. It is their natural inclination to run uphill. As they run in watch should be kept for the queen, to see that she enters safely. When all are in the wedges should be taken away and the front of the brool chamber gently lowered to ita proper position. Any bees in dan ger of crushing should be brushed away with a feather.
The swarn will benefit grently if it is fed for at least a week with warm thin syrup, made by adding threequarters of a pint of water to one pound of white cane sugar, and heating it over the fire until the sugar is dissolved. Add a tea spiconful of Bacterol to each pound of sugar. It is ad ministered by means of the bottlefeeder, Fig $\quad \underset{y}{c}$ Bown sugar must not be used. On the second day
after hiving. the becs are closed by means of the division board on to the number of fraines of foundation which they are able to cover.


Bee Fir. 3. Shallow irame super perforated with slots of a size to erclude the queen. Fig. 4. Bee escape, the $\nabla$-shaped springs only permitting egress Fig. 5. Clearing board fitted with bee escape Fig. 6. Ertractor for withdrawing honey from comb by rotation. Fig. 7 Bee smoker with bellows

If the swarm bas been obtained early in the season building up will proceed fairly rapidly until all the combs are completed, and brood rearing will bo carried out on such a scale that the hive will become overcrowded with bees before the honey flow is over. If this is allowed to continue the bees will swarm.
Swarming can bo prevented to a great extent. Remove the quilts and place a queen excluder in position over the brood frame tops. This is perforated with slots made so accurately to size that the workers can pass through, but not the queen. Thus boney. without intermingling of brood or pollen, is ob. tained in tho super that is now put on. If it is a shallow frame super, the frames should be fitted with sheets of wired drone base foundations.

When the combs in the first super put on are drawn out, and about two-thirds of the whole are filled with honey (i.e when the bees cominence to seal over the honey in the middle of the central combs), the super should be lifted and a second one placed underneath it. When the honey flow commences to decline it is better to allow the bees to complete those supers alrcady in situation than to givo extria ones

## Clearing the Supers

The bees are cleared from the supers by means of an cacapc. Fig. 4, which allows the bees to pass through a hole into a passageway in which there are two springs placed in a V -shaped position. This escape is fitted into n clearing board, Fig. 5, clented so that it entirely covers the top of the brood chamber. The clearing bourd, with the escape in position, is placed in the evening under the super or supers which it is desired to remove. The only means of exit for the bees is from the wide ends of the springs in the eacape, which are so finely adjusted that the bces can push them apurt to pass out at the points, but are unable to return when the aprings are closed.

The honey in the shallow combs nust be extracted as soon as it is removed from the hive, while atill warnı. Tho extractor, Fig. 6, is a tin cylinder with an inside cage revolring on a spindle when the handle is turned. The cage will accommodate cither two combs, one on cither side, or twelvo sections, six on either side.

The first operation in extracting honey is to uncap the combs with a speciad knife or an
ordinary sharp carving knife. A ung the deptli of the length of the knife blade, is filled with hot water and the knife inserted. If a cold knife is used it will spoil the comb, The cappings are removed by cutting "pwards from the bottom of the coinb with a see-saw movemont.
Two combs arc placed in the cage and the cage is turned slowly. When n portion of the honey has been extracted from one side, the combs are roversed, and the other side treatod in a similar manner. Extraction is completed by revolving the crge more rapidly. When the honey in the buttom of the extractor reaches to tho cage, it is drained off and atraincal through muslin into 28 lb . tins or other suitable vessels.

The wet combe are now given back to the hees to clean down. The clearing board is left in position over the colony, and the tin slide over the holc on the front side of the board is withdrawn so that the bees can jase frcely up into and down out of the super. When the empty combs are quite dry, the tin slide is pushed back over the hole, so that the only exit for the bees is through the eacape.

The most profitable system is to work for extracted honey. It takes from 10 to 20 lb . of honcy to mako 1 lb . of beeswax, so that when a section is sold the bee-keeper parts with $\Omega$ valuable asset in the form of wax.

At the close of the honey season the keeper should see that sufficient stores have been left in the body box for consumption by the bees throughout the winter. A knowledge of the amount or weight of atores can be gained by tilting the hive at the front; if it feels like lifting from 15 to 20 lb ., there is a suff. ciency; but if it feels light they must be fer until it does so feel. To feed them, place a piece of perforated zinc, 5 in . square, of a gauge similar to that used in a ment-safe, over the feed hole already made in the quilts. Fill $\quad 3 \mathrm{lb}$. glasa jam jar with syrup made as directed for the swarm, but using only half a pint of water to the pound of augar. Cover the mouth of the jar with two thicknessea of muslin and invert it on the zinc.

As the bees empty the jar, replenish it with syrup until they have had sufficient by weight. There will then be a perfect colony or stock to commence the next season. Should there be any doubt as to the sufficiency of the syrup to last through the winter, a cake of bee candy should be placed over the frames.

The ohief attributes necessary for handling bees succersfully are a knowledge of the habits of the bee, firm but gentle movements, adequate protection of the manipulator and proper subjugation of the bees. The only protection necessary is a veil for the face. This can bo made of black mos. quito netting, with an elastic band top and bottom, fitting tightly round the crown of the bat and under the collar of the coat to prevent


Bee. Shaking a swarm from branch on which the bees have settled
the ingross of the boes. Gloves should not he worn, os they conduce to clumsiness. which will irritate the beos.

Subjugation is carried out by frightening the bees When frightened they gorge them selves with honey, and are not inclined to ating. One of two subjugators can bo useda amoker (Fig 7) or a carbolic cloth. The former consists of a tin cylinder having a conical nozzlo. open at the pointed end This is fastened to a pair of bellows with a connexion between the two at the back. Ordinary thick brown paper, corrugated paper, or fustian is rolled into n cartridge, lightod, and placed in the furnace of the amoker, with lighted ond downwards. When the bellows are workod a volume of smoke is emitted from the nozzle and can be driven in any direction. A carbolic cloth is marle by sprinkling a picco of calion the size of the quilt with a solution of one part Calvert's No. 5 carbolic acid to two parta of water.

When manipulating it is inadvisable to stand in front of the hive. When handling or turning the combs, keep them vertical and not horizontal. Bright, warm woather should be chosen for manipulating hees, as they are then usually in a good temper.

## Economics of Bee-Keepine

The strength of a healtliy colony depends on the vigour and laying power of the queen, who is at her best in her sccond season, and should be replaced in the third by a young onc. The econnmy of $\Omega$ hive depends on : (1) the generation and keeping up of the warinth of the hrood nest (by means of the hent evolved from the bodies of the clustering bees) to such a point as will stimulate the production of eghs and enable young bees to be reared: (2) the nursing of the larvae, and the cleanasing of the cells for the queen to las in; (3) the collection of pollen, water and nectar for food; and (4) the building of storage coinbs and collection of nectar for future supplies of honcy.

The aim of the bec-keejuer is to keep his colo nies at rong. The crowded condition of the hive should be secured at the right time-i.e. at the honey flow. Honey is mado from the nectar of llowers. Spring and early summer are the timev when tho honey crop is gathered. Thore is a period every year, varying in oach district, when the supply of nectar is most a bundant. This time should ho ascertained by the bee-keeper, who will then stimulate his colonics beforehand.

Bees are thirsty insects, and at the end of February a shallow pan half-filled with washer stones should be placed at a distance of four or five yards from the hives. This should be partly filled with water to which table salt has heen added in the proportion of one teaspoon ful to a pint. The tops of the stones should be left dry for the bees to alight on.
BEECH. One of the chief uses of heech wood is for chairs. Most of the bent wood variety are of beech. and so are the windsor and other non-upholstered chairs. The framas of upholstered chairs and couches are often of heech, if they are not of birch; also turned table lega and many other turned articles. Beech may be stained to resentble maliog any or walnut. It is used for tool handlea and for mallets and planes; sometimes for wood-workers benches and dowel rods; alao for brushes, and rollers for wringing machines and mangles. Beech is a heavy wood with straight and close grain, light in colour, sometimes with a reddish tinge See Chair.

## Beef and How To Cook IT

Heipful Intormation atout the Joints and Tested Recipes for their Preparation
For general cooking methods sec Baking: Boiling; Braising; Roasting; also specific cuts as Brisket; Sirloin; Stenk, etc.

Grass-led, short-homed cattle provide the best beef on the English market Cow-beel is not so tender or well-flavoured, but is sold at a lower price Chilled beef is superior to and a little more expensive than the frozen ment imported from abroad It may require to be slowly thawed before being put in the oven, and is wholesome and tender if properly cooked

If raw boef is pale pink or purple the animal has not been in good condition; a clear red indicates health. If the fat is streaky, giving the beef a marbled appearance, the animal has been in prime condition. The fat should be without brown spots or streaks of blood. The flesh should feel firm and elastic. Then is no diangreenble odour from good meat. After keeping it at home for a day or so, washing with diluted vinegar will restore freshness Meat that is in prime condition docs not get watery on standing, nor lose much juice in the process of cooking

The Parts of Beel and Their Use;
The hind parts at a bullock are the most expensive. Sirloins and ribs are used for roasts: the rump gives the best steaks for broiling. The topside of the buttock is useful for ronsting or gives good stewing steake. The silverside or underside is usually salted and boiled, as is also the brisket, which is a cheap joint. The aitchbone (buttock) is cheap and used mostly for boiling Flank of beef pro vides good steaks for pies. The leg and shin are used for soup and also for potted meat. Cow heel makes a jelly as good as calves-foot jelly

Oxtail is stewed or made into soup Tripe is the ruminant stomach of the ox, and is easily digested The heart, liver and kidneys are moderately digestible. The sweetbreads of an ox require long and carcful cooking. The suet around the kidneys is specially good for the finest of cookery uses.

When a joint of meat is kept for a lew days it should be wiped and hung up in a cool, dry place to which llies have no access. The under cut of a sirloin may be takien off and used separately for beef olives or fillets of beef, thus giving an extra hot dish out of the joint

Boiled Beef. Choose a salted round, aitch bone, brisket, or silverside, and tie it into a shape convenient for carving Put it into a pot with just enough water to cover-cold water if the beef is very salt, otherwise warm Bring the water slowly to the boil, and then add two onions, several carrots (cut lengthwise into pieces). some sliced turnips, and soine herbs Let the beel simmer, but not actually boil Make some small suet dumplings and boil with the beof. Allow 25 min . for each lb the joint weighs and 25 min over. Serve the beef on a hot dish, pouring over it a cupful of the water in which it was boiled. Garnish with regetables and dumplings.

These are made with (; oz llour, 2 oz. suet. I small teaspoonful salt, \& teaspoonful bakingpowder, and a little water or milk. Firat the suet is chopped and mixed lightly with the llour, baking-powder, and salt; then all are bound together with the water, lineaded lightly and made up into soft balls of dough, which are cooked during the last 15 min . the meat is boiling. Serve at once, otherwise they turn heavy.

Braised Beef. A round of beef is the most suitable. Flour the meat lightly and brown in a saucepan in hot fat. Add a teacupful of hot stock, salt and pepper, a little mace or nutmeg. any sliced or chopped vegetables, 6 or 8 pepper corns, 2 cloves, and a little parsley. If no !resh celery is available, add a little celery
seed and a teaspoonful of dried herbs in a muslin bag. Cover and cook gently till the meat is tender, laying a piece of greased paper over it to kecp in the steam. A couple of Spanish onions, boiled for a few minutes and then quartered, may be arlded to the braise Place the incat on a liot dish, strain off the liquid, arrange the vegotables in four heaps round the dish. and pour some of the grapy round, serving the rest separately

Roast Beef Ribs of beef are often boned and rolled before roasting. Rounds and aitchbones can only be rossted successfully if very tender. Put in a very hot oven and reduce heat after first 10 minutes. Give 20 minutes to each pound, and 20 minutes over. The roast should be served on $\Omega$ hot dish with pieces of Yorkshire pudding, horse radish sauce, and gravy separately scrved.
Rolled Beed. Procure a large steak cut from the topside of beef, weighing about 2 lb ., and cut about if in. thick Wipe and llatten


> Beel. Quarters marked off to show bow they are cut tor market.

1. Hind-quarter. A. Leg. B. Topside. B!. Underside. C. Aitchbone. D. Hind-quarter. A. Leg. B. Topside. BI. Underside. C. Aitchbone
D. Thirk fank. E. Rump. F. Loin. G. Flank. Dotted lines D. Thirk fank. E. Ramp. F. Loin. G. Flank. Dotted lines show B Brigket. C. Middle oiece. D. Clod and Sticking. E. Sbin
slightly by beating with a rolling-pin or a cutlet-bat dipped in cold water. Remove the skin from $\frac{1}{2} \mathrm{lb}$. of raw pork sausages, mix the sausage meat with 2 oz . fresh white crumbs, 2 teasposnfuls chopped parsley, a dust of powdered herbs, a little salt and pepper, and one well-beaten egg. Spread this forcemeat evenly over the beef, but not within $\frac{1}{2}$ in of the edges.
Roll up the beef, bind in shape with tape, put in a baking-tin with 2 oz of beef dripping and a teacupful of water, and bake in a moderately hot oven for about if hours. Baste frequently, and if the dripping smokes, add more water. When cookerl, remove the tape, place the roll on a hot dish, and atmin rouni it about $\frac{1}{2}$ pint of hot tomato snuce If liked, a veal forceneat of crumbs, suet, and herbs can be used instead of the sausage filling.

Stewed Beef. Trim 2 or 3 lb of meat, tie neatly, and lay in an carthenware dish. Then boil If gills of vinegar together with 2 teaspoonfuls mixed of allspice, cloves, nnd mustard seed for 5 min. and pour over the beef. Leave in this marinade for 2 hours, and
lurn uccasionally Cut 4 oz bacon mon large cubes: melt 1 oz of beef dripping in $n$ sauce pan, and fry the cubes lightly When done, lay them on one side and put the beef into the hot fat, letting it brown well.
Lift the beef onit of the pan putting in itg place slices of onion Fry these, and add 4 oz of whole new carrots. Lay the heef on these vegetables, add 1 quart of stock, a small bunch of herbs. and a few spring onions Cover the pan and simmer contents for two or more hours, until the meat becomes tender Meanwhile melt 1 oz of bcel dripping in another pan adding and carefully browning 2 oz . of flour Colour and flavour will Iargely depend upon this Strain and stir in gralually the stock from the bcef, then boil, skim, and season this gravy
Beef à la mode This is a useful casserole dish Take 1 lb . of steak, and place in a pan to brown with a little butter, flour, and some small onions. Add a glass of olaret to a breakfastcupful of stock. Pour over the meat und add carrot, a little mixed herbs, pepper, salt, and the juice of half a lemon. Simmer slowly for two or three hours, adding boiling water if necessary. Scrve the meat in the casserole with the onions and carrots and a little chopped parsley. Cold Beef. Scraps of cold ment may be utilised to make beef cake. It can bo orna. mented by pressing into the thickly greased top and sides of the mould thinly cut rings of boiled macaroni or cooked peas rings of cooked carrot. etc.

Take a plain round mould and thickly grease it inside. Melt 1 oz. of butter or dripping in a saucepan, add 2 teaspoonfuls of choppor onion and fry a light brown Stir in $\$ 1 \mathrm{~b}$ finely minced cooked beef, 2 oz. fresh white crumbs, and 2 teaspoonfuls of chopped paisley Mix these with one whole egg and one cxtra yolk well beaten, and $\frac{1}{2}$ gill of stock. Season and mis carefully.

Press the mixture, : little at a time if the mould is decorated, into the greased mould. 'l'wist a piece of greased paper over the top and steam the cake for $\frac{1}{2}$ an hour, or till lirm in the centre. Remove the paper, slip the shape on to a hot dish, and strain over and round it a well-flavoured hot brown gravy

Beef Polantine. This may be sorved cither for breakfisst or as a supper dish. Cut $\$ \mathrm{lb}$. of cold roast beef into fine slireds. Have ready 1 gill of good brown gravy heated in a stewpan. add the meat to it, and allow to heat gently. Peel and thinly slice one Spanish onion and divide these slices into rings.
Dip each of these in slightly beaten white of egg or milk, then draw them through a little tlour and fry them in smoking hot fat until they are a golden brown tint. Keep these hot, and in the same fat fry three small firm tomatoes cut round in halves. Put the meat and well-seasoned and thickened gravy in the centre of a hot dish, arrange the tomatoes round and heap the fried onions on the top of the meat. This is sufficient for 3 persons.

Pickled Beel. To Irv-pickle remove any bones or unsuitable bits from about 5 or 6 ib
of thin flank or topside Rub well over with common salt and leave for $2 t$ hours Pound together in a mortar 1 it of common salt, $\frac{1}{2} \mathrm{lb}$. of brown sugar, $\frac{1}{2} \mathrm{oz}$. of saltpetre, and $\frac{1}{2}$ teaspoonful of black pepper to a tine powder Rub this mixture thoroughls into the beef, keeping it in an esrthenvare pan Turn and rub every day, or at least 3 times a week. Continue this process for 8 days, or until sufficiently salted.
BEEF GOULASH. A Hungarian stew Cut 1 $\frac{1}{2} \mathrm{lb}$. of boneless beef into 1 in . cubes, also 3 oz . of streaky bacon. Put these into a stewpan or casserole with 2 oz of chopped onion, and one small, fresh red chilli, or 2 dried cayennc pods. Add $\downarrow$ pint of good stock. cover the pan, and simmer contents for one hour. or until the meat is tender.
Mix 2 teaspoonfuls of fine ontmeal with 1 gill of cream, and stir into the stew until it boils. Allow it to cook gently for another 10 min . then season carefully and serve in the casserole or poured out on a hot dish. Small pickled gherkins and wholemeal bread should accompany this dish, which will be sullicient for five to six persons
BEEF JELLY. Prepared by cutting 4 lb . of good gravy beef into sinall pieces, laying them in a jar with a pint of cold water and a little salt. Cover tightly, stand in a pen three parts full of boiling water, and steu gently for cight hours. Then strain through a clean pat, and allow it to become cold; just before assimilate.
hair sieve, and remove every particle of fat the following day. A sheet or two of best leaf gelatine or a little isinglass can be used to stiffen the jelly.
BEEF NOISETTES. Select "good fillet of beef weighing $1 \frac{1}{2} \mathrm{lb}$. Trim off rough pieces and divide fillet into round slices not less than $t$ in thick. Melt $1 \frac{1}{2}$ oz of beef dripping or butter in a frying-pan, lay in the noisettes, and fry them quickly for 8 to 10 min ., taking care they are under rather than over-cooked. Arrange neatly in two rows on a bed of liot mashed potato or apinach. pressing the round pieces of beef down to hold in position. The next process is to strain mund them some hot brown gravy and lay on them a small pat of maitre d'hôtel butter.
To prepare this, work into 1 oz . of butter, I teaspoonful of finely-chopped parsley, 1 teaspoonful of lemon-juice. salt and cayenne to


Beel. Joints cut trom the fore-quarter, as shown marked of in the previous page. 1. Fore-rib. 2. Clod and sticking. 3. Shin. 4. Brisket. 5. Middle piece serving place a small piece of it on cach noisette.
BEEF STEAK PUDDING. Take 2 lb , of ateak, wash quickly, dry and cut into pieces about an inch square. Mix together 3 teaspoonfuls flour and a good seasoning of salt and pepper; dip each piece of steak in this mixture.

From lb . of suet pastry cut off about a third and put it on onc side; this is for the lid. Grease a pudding-basin, line it with the pastry, then pack in the pieces or rolls of steak. When the basin is full, pour in enough water or stock to come half-way up. Wet edges of pastry. put on lid, and press the edges together. Scald a pudding-cloth and tie securely over the pudding, taking care to make a pleat in the middle of the cloth to allow room for the crust to swell.

Put the basin in a pan of fast-boiling water and boil from 2 to 3 hours. Serve in the basin with a clean napkin pinned neatly round it. See Steak.

BEEF TEA. When properly prepared beef tea may provide some of the nutritive materials of beef, hut the common idea of its excellent food value is unfounded. It is always of less value than milk as food. The stimulating effect on the digestion and the bowels of the neat extractives which it contains is often valuable.

Beef tea must not be allowed to boil, or even become so hot that the albumen it contains


Beel Joints cat from the hind-guarter, as shown in the previons page side. 4. Lain. 5. Leq. 6. Topside. 7. Top-rump.

1. Flank. 2. Rump.
2. Silver8. Aitchbone
taste. When mixed, shape into a little Hat coagulates, as this renders it less easy to

Wash 1 lb . of lean beef and dry, cut in slices, and scrape these with a sharp knife. As each piece is scraped, lay it at once in a pint of cold water with teaspoonful of salt and let it atand for half an hour. Then put the nicat and water in an earthenware jar, tying a piece of thick paper over the top. Place the jar in a pan of boiling water on the fire and let the water simmer gently for $3 \frac{1}{2}$ hours, stirring occasionally. When cooked, strain out the meat, but do not use too fine a strainer, unless it is imperative that not a particle of solid matter is given. Season carefully with salt. If more convenient, the jar containing the beef tea can be put in a slow oven instead of in a pan of water. Serve with thin dry toast, unless the patient is restricted to a liquid diet
Uncooked beef tea may be ordered in cases of extreme exhaustion. Usually only one or two teaspoonfuls are given at a time, as it is very strong. It should be prepared only in small quantities, as it will not keep.
Wash and wipe 3 oz . of fresh topside of beef, trimming off fat. Scrape the meat finely, and as it is scraped lay in a shallow dish with three large tablespoonfuls of cold water and a saltspoonful of salt. Cover over and let it stand until the meat is almost white and the water deep red. Keep pressing the meat well. It will take an hour or mone to soak sufficiently. When ready, pour through a piece of fine muslin, squeezing out all the juice.
For beef essence cut 2 lb . lean meat into small pieces, sprinkle with one teaspoonful salt, put into a covered dish with one tablespoonful water, and liake in a moderately liot oven for five or six hours. Serve a teaspoonful of the juice at a time, hot or cold

BEEF TEA CUSTARD. A useful invalid dish. To make, beat one whole egg and one extra yolk lightly, but well together, without frothing. Heat $\ddagger$ pint of beef tea, and pour gradually on to the egg and season Strain the custard into well-buttered little moulds, twist a piece of huttered paper over the top of each, and steam slowly until firm. If cooked too fast they will be watery and full of holes. When sufficiently cooked, let them stand for a minute or two and then turn them out carefully.
BEEFWOOD. This wood, which is used by cabinet-makers, comes mainly from the various species of the Australian tree Casuarina. It is also obtained from the bully tree grown in Guiana. See Wood.

# Beehrve: Construction of a Modern Type 

## Comprehensive Instructions for the Craftsman Beekceper

For the Principles and Internal Arrangement of a W.B.C. Hive see the article Bee
Madern bechives are of two main types, the This allows the rool to s!ip over the upper porLangatroth and the IV.B.C. The former is an tion of the outer case, and so dispensea with a Ancrican invention dating from 1852, and an plinth, whilat effectually keeping out the wet. improved form is extensively used in Great The top of the roof is of $\frac{1}{2} \mathrm{in}$. wood, each piece Pritain. The W.B.C. is a hive planned in 1890 being 24 in by 12 in Where the parts meet at ly W. Broughton Carr, solely to inect the needs of Brit ish bee-keepers. Its internal arrangenent is shown in the illustration under liees and liee keeping on p. 82, and we give helow all necessary instructions for making a hive of this type.

The hive is slown in perspective in Fig. 1. The outer enso, including the roof, consists of the centre the ridge piece (of 3 in . by $\frac{7}{6}$ in. material) is cut on the underside to cover the joint as shown, so that no water can pussibly get in. This roof portion should casily fit over the other: let there be no tightness anywhere so long as the bees cannot enter from the outside.
Some amateurs may prefer to use the type of roof shown at Fig. 9. By making the front

three parts, and it is advisable to commence by lirst making the portion slown at lig. 2 .

The construction may be by nailing the case together; if this is done, fine oval brads should be used, and the work should he akew-nailed so as to prevent the joints opening when exposed to the weather. Or, the construction may be by the combing or curner-lock joint (Fig 3), and this would, of course, be glond nad nailed at the joints Thirdly, the worker could adopt the through. dovelailing method illustrated in Fig 4.

The front and back troards of Fig. 2 are 10$\}$ in. long, 8 in inde, and 1 in thich; the sides, 19 in by 8 b in. of in matorial The inside measurement, when fitted together, is it in from frout to rear and 18 in . across the front. A plinth $1 \frac{1}{}$ in wide diops in below the edgo of the cuse so ns to lit around the lloor hoard und carry off the wet. The two slidea, A (Fig 2), which enlarge or ieduce the entrance, are 10 in
 a rebated guide piece (B, Fig. 5), litted helow the porch $A$ is one of the slides.

The porch is $4 \frac{1}{2}$ in. wide, and a weather groove is worked along the edge (Fig. 6) to carry off the drip. This porch is supported at each end by two $\frac{1}{2}$ in brackets. The second portion of the outer casc is a "lift" $6 \frac{1}{2}$ in deep, the wood being the same thickness as the lower portion (Fig. 2). It is advisable to make this in duplicate. A sketch of this lift is given at Fig 7, and the inset, lettered $P$, shows an enlarged end sketch of the plintl. The lift may be removed to reduce the height of the hive for winter, and a second lift may be added in the summer when necessary.

The roof is very simply formed with a view to lightness, and is thoroughly rainproof Fig. 8 will make the main pinints in the construction quite plain. The front and back pieces are $\frac{t}{2}$ in. thick, 203 in. long, $2 \frac{1}{2}$ in deep at the ends, rising to $3 t$ in in the centre or ridge; the sides are of $\frac{7}{6} \mathrm{in}$. wood $20 \frac{1}{8} \mathrm{in}$. long and 2$\}$ in. deep. Along the lower edge of the side pieces a rebnte is cut $\frac{3}{8} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$. deep


Fig. 3


Beebive. Fig 1. W.B.C. hive which can be made by the amsteur wood worker. Fig. 2. Lower portion. Fiz. 3. Corner-lock joint Fir. 4. Through-dovetailed joint. Fig. 5. Details of slides. Fiz. 6. Weather rroveve in porch. Fig. 7. Dpper portion or lift. Fig. 8.
Wool of caso. Fig. 9. Alternative method of making a rool
and rear of the roof of the shape heie shown, the necessity of working out a V -shaped recess under the ridge piece is removed Suitable ventilation holes should be bored in the front and rear, and a small piece of tine wire gaure should be fitted behind the holcs to keep, out intruders.

The lloor hoard may be made separate from the legs and supported hy a distinct leg frame, or the thoor may be built in combination with the splayed legs (Figs 10 and 11). Beginning
with the fluor board, the boards forming it are $\frac{1}{\text { in thick, tongued and grooved where }}$ joined, and nailed on to the stout battens $2 \frac{1}{2}$ in. deep by $1 \frac{1}{2}$ in thick. Between the points at $A$ it measures 20 in ., nnd the width acmss is 19 in. The sloping alighting board projects $\bar{i}$ in. beyond the point $A$ The form of the entrance, as seen in sketch, explains itself. It is $15 \frac{1}{2} \mathrm{in}$. long hy $\frac{1}{2}$. high. liig 2. of courso, fits on to this flonr portion
The splayed legs ( $\pi$ single line plan diagranı of which is shown at lig 10 ) are likely to cause some little difficulty to the amateur builder; and the following suggentions will considerably help him. Take a joiner's adjusaable bevel and, with a protractor set the blade to 10: degrees, as shown at lig 12; then mark at thic shoulder lines, as shown at Figs. 13 and 14 . Cut the joint as shown, and it will be found that the portion abuve the shoulder line lits closely into the corner of the frame. whilst the shouldered portion gives rigidity to the whole structure The height fom the floor proper to the top of the fionring loards of the hive may be about 12 in.

## Details of Body and Frame

Tho budy box (Fig. 15) is $155^{8}$ in by 14$\}$ in. inside ineasurements. It holds ten standiand frames and a division buard (or dummy). along with tivo strips of thin wood in wide and 16 it in long. The front and back boards are fin thick. 15 g in . long by 8$\} \mathrm{in}$. wide : sido pieces, 17 io in long, 9 in wide and $\frac{8}{6}$ in. thick. Tho strip $0^{\circ}$ wood, I) ( $166_{3}^{3}$ in by 18 in by $t$ in. ), nails on the outside to enclose the frame ends as shown. Prior to nailing oll this strip, a piece of wood $S\left(\begin{array}{l}\text { a inn. by } \\ \text { 各 in } \\ \text { in }\end{array}\right.$ in position level with the top edge of the front and back boards, along which are nailed the tin angle-picces forming the metal runners. whereon the Irames (fitted with W B C ends) work. Fig 16 slinws one end of a standard frame: the purtion above $A$ lies on the recoss formed in the body box
The shallow frame box (Fig 18) is an exact counterpart of the budy box with two excoptions: first, the depth is reduced to 3 in . second, the front and back boards are only $15 \frac{1}{\mathrm{~s}}$ in long. The capracity of this box is ten shallow Irames 5 d in deep with ordinary onds, and two thin slips of wood. or eight similar frames fitted with W.B C ends.
The eke (Fig. 19) may be described as a slice 3 in deep from the lower side of the hody box (Fig 15) and. beyond stating that the four slips of wond shown on the upper edge are for leeping it in position when fised. the sketch explains itaclf Fig 17 is a slietch of the housing joint for constructing the frame, and due allowance must be made in


Beehive. Fir. 10. Ler frame with plan diagram. Fig. 11. Flooring and allighting board nailed 20 frame Fig. 12. Joiner's adjastable bevel, set to $105^{\circ}$ for marking of splayed legs. Firs 13 and 14 . Two views o legs showing shoulder joints. Fig. 15. Body box Fig. 18. Corver of standaru trame. Fig. 17. Bousing joint for trame. Fig. 18. Shallow irame bor. Fig. 19. The eke placed beneath the shallow frame box
the length of the front and rear pieces to fit this housing. The eke may bc used for giving space below the eumbs in winter and, having served this purpose, by reversing and setting it above the frames in early spring it helps in tucking in additional warm wrappings Finally, when set below the aliallow frame box (Fig. 18), it converts the latter into a fullsized brooll chamher for standand framea
Suitable timbers fur the making of the hive are ycllow pine and red deal, or a combination of the two woods. Where required, screws alone are usod, and these are previously dipped in paint, the overlaps and plintlss heing serewed in their positions from the inside of the cascs. Il here the wood overlaps, it should have two conts of white lead and oil previously. The outside of the hive is generally painied middle green, the inside being left unpainted. The illustrations aro laken from The British Beakcepers' Practical Notebook, Madgwick Houston \& Co

BEE PEST : How to Counteract. Also known by the name foul brond, this disease spreads so rapidly that, unloss precautions aro taken, a whole neighbourhnod may become affected, and tho chances of successfil beckeeping therein will he scriously inperilled if not utterly destroyed. Two forms of foul brond have long been recognized as existing in Europe, a viritent or strong-sinelling and an adourless form. A third type, sour brond, has usually been found associated with the strong-smelling type.

When stocks are found to be weak and are working languidly, with little desire to lly and swarining litile, foul brood may be suspected. If it is present, an examination of the combs will show celle containing dying or dead larvae, and others with their covers sunken or perfurated

Chilled bmod must not he mistaken, as it verv frequently is, for foul bruod. The dead larvae of chilised brood turn first grey, and afterwards become nearly black, whoreas in foul brood the larvae turn at first pale yellow and then brown, except in sour brool, when they turn from grey to ycllow.

When the disense is discovered in a wenk colony, the destruction of bees, combs, frames and quilts, together with a thorough disin. fection of the hive, is the best course. 'The spores ano then destroyed and the source of infection removed.
If an affected colony be still strong, the hees may be preserved by making an artificial swarm into a sliep or swarm hox. The hees should be confined in the skep or box. They should be kept confined in a cool place, such as a cellar, for 48 hours without fond, by which time all the honoy they may have taken with them will have been consumed, and the diseased lees will have died. After the outside has been well painted with oil paint the hive will again be ready for use.

At the end of the period of starvation the bees alinuld be lived into a movable comb hive in the same manner as a swarm. They are then fod for at least a week on syrup, to which as much naphthol beta as can be heaped on a threepenny piece has been added to every pound of white cane sugar used; the naphthol heta being dissolved in methylated spirit, sweet spirit of nitre, or whisky, and nilded to the syrup while warm but not hot.

In the case of mild attacks disinfection or fumigatimr may be resortcd to with success, formaldehyde being the chiof agent used.

These remedial measures are described in Leaflet No. 32, issued by the Ministry of Agriculture. Before attempting them it is advisable to consult an expert bee keeper wherever such help is available.

BEER. Beer is a fermented infusion of sugary substances with added bitters. At one time the sugary substance consisted of
sugar-derived from malted barley, and the
bitters tonk the form of hopa, but now sugar from other sources is used, one of these being by the action of sulphuric acid on starch, and calumba chiretta, quarsia, and other sub. stances are used to give the bitter flavour. Notwithatanding thesc changes the beer may be perfectly wholesome, though many beer drinkers prefer to have the old brew when they can get it.

Beer is a lood to a greater extent than other nicoholic liquor, mainly in virtue of the malt or sugar which it contains: but, as a general rule, it is taken as an agrecable form of bitter tonic to stimulate appetite and nid digestion: or it is taken to alake thirst. If taken with a meal it should be in modernte amount, as apart from the nature of a liquid, any large quantity taken during digestion dilutes the gastric juice and delays digestion.

During convalcscence from acute illness, and in many cases of consumption, a glass of beer or stout makes a useful and agreeable tonic. Stont is uften recommended to nursing mothers by their friends as a means of meeting the aulditional strain thrown upon them; but. its n genoral rule it is mucli more antisfactory to lenve alcoholic liquar alone. and rather to supplement the dict with extra milk. Stout and porter arc heers to which colouring minter has been added Formerly this was burnt malt, but now it may be carainel. molasses, or liquorice.

People who drink a lot of beer are apt to become stnut and gout and rheumatism many be other legacics of the liabit A beer-henrt is one which has tiruken down un der excessive strain, largely imposed upon it by the necessity of pumping through the blonil-vessels of the body streains of blond swollen by inordinate beer drinking over a long period. Again. the heavy drinker may produce permanent dilatation of his stomach, and chmonic giatrio catarrh may be a result of intemperate beer drinking.

One has always to be careful about the quality of the becr purveyed. A good beet should be clear, transparent, and reddishbrown in tint. and should not be soured. Beer is sometimes watered, and alum or sugar is added to produce a "head " ; the beer goes bad very readily with an increase in its acid content. Such beer may upset the stomach in any quantity. During hot weather many penple bring on sickncss and diarrhoca by the combination of lager beer and fruit of sone sort. There is always some common walt in heer, but in some samplen this is materially increascd, apparently with the object of creating thirst.
Beer becomics sour on standing in consequence of the growth in it of a minute fungus which converts the alcohol in the beer into acid. This acid is the one which is found in vinegar. If beer becomes dead-that is to say, only slightly sour-it can be restored by aulding a teaspoonful of carbonate of soda to each gallon of beer, mixing well, and allowing to settle. The beer will recover a good deal of its sparkle and llavour by this means, but will have lost sume of its potency.

If inarkedly sour the beer cannot be restorecl, but should be kept to make vinegar This is done by allowing the beer to stand in contact with the air until souring has progressed to the required stage. The liquid that results may be used as vinegar after having been clarified by filtering through several thicknesses of muslin or through cotton-wool. See Ginger Beer; Lager Beer; Spruce Beer.

BEE STING: How to Treat. The constitutional effects of a bee sting may be
severe, and are those of shock coldness of the body, faintness, etc The sting should he searched for and removed. The bost npplication is ammonia, butanlutions of bicarhnnate of soda, common salt, or permanganate of potash may be used. Where the sting is about the oye, mouth, or outer passage of the ear ammonia would not be used. For the shock the patient is kept warm and stimulanta given. If speedy relief is not obtained the doctor should he sent for. See Bite; Sting.
BEESWAX. Wax is not gathered by the worker bee, but is organically produced in her body from honey and pollon, by secretion bencath scalcs. When cleaning hives a box should be kept for the collection of all refuse and burr combs The scrapings from the lloor board during spring cleaning should be saved, for there is generally sufficient wax to make it worth the trouble of extraction Wax can be obtained from old broud combs and the cappings from extracting combs

The following methods for extracting the wax are recommended by the Ministry of Agriculture (Leaflet No. 378) : (1) The solar "ax extractor; (2) steam: (3) builing water: or (4) the heat of the oven.
The solnr wax extractor is really a miniature garden framc, with a double glazed and hinged light Inside, the frame is fitted with a metal tray which slopes down to a tin trough covered with wire gauze. The extractor is placed in a sunny position and the material to he treated is spread thinly over the bottom of the inetal tray The wax inelts and runs into the trough being strained of impuritics by means of the wire gauze covering.
he matcrial to be extracted by methods (2) and (3) must be stored until required in an airtight tin for protection against the ravages of the wax moth In the winter it can be melted over the kitchen fire by means of a Gerater wax extractor, an arrangement similar to a domestic steamer.
To extract wax by means of boiling water the material is tied in a bag made of porous fabric and stond on laths of wood placed acmas the hottom of a copper or saucepan, so that the bag does not tonch the bnttoin The bag whould be weighted with a stonc, and water poured in until it flows above the bag. The water should then be boiled very gently. The melted wax will percolate through the bag and float on the water, and when cold it can be lifted off in a solid cake.
The chief use of beeswax for domestic purpuses is for lloor and furniture polinhes.
A flonr polish is prepared by shredding yollow wax, 14 oz , and placing it overnight in spirit of turpentine, 32 oz . In the morning place the basin containing the above in a vessel of boiling water and stir until clear. Then renove the basin from the hot water and st ir the polish occasionally until it is cold. Many accidents have happened in preparing floor polish through contact of the turpentine vapour with tlame. By the above method no danger of fire need arise
White wax, which is employed for cosmetics. cold cream, and ointments, cunsista of beeswax hleached by exposure to sunlight. The beeswnx is melted and furmed into ribbons by pouring it upon rollera partly immersed in water. See Cold Cream; Cosmetic: Furniture Creain.

BEET. Of the orlinary garden beet. Beta vulgaris, there are several species, but the only two other than tho common kitchen-garden beet which are much cultivated are the spinach beet and the Chilian, the variegated form of which has extremely beautiful foliage and is much grown in Hower
gardens. There are both green-lcaved and red-leaved varieties, and there are whiteskinned as well as red-skinned roots.
Most of the beets are natives of Italy and other countrics of Southern Europe, and aro best if lifted from the ground and stored for winter use, instead of remaining in the soil.
There are two types of culinary root beet-the round and the long. The typical round beet is the turnip-rooted or Egyptian. The skin is dark red and the Hesh crimsun. but not so deep in colour ns some of the long beets It grows quickly, and consequently gardeners have come to use it for their early supplies storing only the long type. The Hinvour is excellent. Somewhat larger than the turnip-rooted, and yielding a heavier crop quite as oon, is the plohe, in which the roots wile quite as wide as the Egyptian, are deeper 'The liavour and colour are good.

Beet is usually offered for sale at shops in a cooked state The resson for this is that the skin of the edible beet is very tender, and easily cut, scratched, or pierced If such an accident happens in its raw state. the beet bleeds or loses its colouring matter, and, at the same time. its appearance and Hatvour. Hence the value of cooking the root as soon as possible after it has been lifterd

As a native of the seashores. heet пppreciates a light, sandy soil, but it is not fastidious, and will succeed in the heaviest clay, provided the soil is made friable. It is raised from sced and thrives in most parts of Great Britain Early sowing is not advisable for the long or parsnip-shaped beeta, because, apart from the risk from frost, there is the danger of the roots becoming large and coarse Nay is generally quite early enough, but in light. dry suils sowing may be practised about midApril The turnip-rooted and globe beets may be sown abnut a month earlier As a further safeguard against coarseness it is usual to sow beet on ground which was manured for a fihrous rooted crop the previous year. It may follow peas, beans and leeks.
The seed should be sown in drilla drawn 15 in . apart and about 2 in deep, rather less than more. It is well to sow a patch as a reserve. transplanting th the rows in showery weather as occasion may require. Then only hoeing and thinning will be needed until the crop is ready. Some like to sow the tumip or globe beet in July after early peas or potatoes, and useful roots are thereby necured. To store, fork beet lightly up in Octoher, taking care not to pierce the taps, draw them out by hand. romove the tops, and lay them head to tail and tail to head in sand, covering with straw, bracken or litter to keep out frost. It is not the case that cutting off the tops necessurily leads to loss of sap and colour. As long as the leaves arc ripe it does not matter whether they are cut off or twisted, if at least an inch of the stem of each leaf is left on the crown.
Spinach and Seakale Beets. Even the smallest of kitchen gardens is the better for a row or two of spinach beet, which grows to a height-not including the flower-stem-of two feet or more in rich soil The root is a parsnipcoloured tap. The seakale beet, which is the same plant as the silver beet, is


Beetle Trap with delicately balanced plates that yield with the weight of the insect and drop it into a central well
even more vigorous than the spinach beet, from which it is distinguished by having bmad, white midribs instead of somewhat narrow green ones. See Beetroot.
BEETCARRION BEETLE CThe beet-le which attacka the beet is Hat-hacked about half an incla in length, and of a blackishbrown colour, the wing-cascs ridged in their length The larva is a shiny black. Ilat oval whose natural food is carrion, but in the absence of this it attacks the leaves of beet
 and mangold. The de scription applies to Silpha opaca, but a near ally, Silpha atrata, of blacker hue. is equally destructive
The white eggs are laid in the ground in spring, and these soon hatching the larvae are ready to attack the tender seed. lings of the beet. When the leaves show signs of being eaten they should be examined carcfully, and the insects picked off and dest royed Stimulating chemical manures should be applied to give the plants a chance by rapid growth of outliving the injury Where manures of animal origin are used these should be well worked into the ground in autumn. so as not to attract the beetle in spring.
BEET FLY. The grubs of Pegomyia betac, n small two-winged Hy, known as the beet or mangold tyy, feed upon the leares of beet and mangold The white eggs are laid in batches on the underside of the leaf, and if these are lonkod for in spring and early summer they may be destroved by the pressure of finger and thumb. If allowed to hatch, the legleas grubs ent the lleshy parts of the leaves, thereby impair ing the liealth of the entire beet plant.

The application of arti ficial manure, by stimulat ing growth, may enable the plant to thrive, in spite of this set-back. If, however, some plants have had their leaves skelotonised, it is better to puli these up and destroy both plant and insecta

BEETLE DESTRUCTION trap consists of $\Omega$ well into A beetle diluted treacle is put, and sloping ends which make the well accessible. Attracted by the odour, the insects fall in and die. Phosphor paste spread on thin bread is a deadly lure. Store-room beetles of different kinds will be found on or in the food they attack.

In the case of furniture the problem is often difficult owing to the large size of the article attacked. If small, it may be suhjected to a high temperature in the oven; but if large, corrosive sublimate dissolved in methylated spirit should be forced into the minute wormholes with a fine syringe If it runs over the surface it will spoil the polish.

Furs or feathery attacked by beetles may be treated by the hot oven process, but great care must he talien that the temperature is not so high as to scorch or singe the articles. Naphthaline in the wardrobe will keepl the beetles away; but it may not kill those that have made their way thercin.

BEETROOT. The root of the beet is rich in sugar. It must be bniled and left to get cold, and is then peeled, sliced, and
 globe or turnip beet
the greengrocer, but if raw, wash before boiling. Do not touch the skin with a sharp instrument or the ront loscs its colour. Boil from one to two hours, according to age and size, adding a tablespoonful of salt. Press the skin with the fingers; if it begins to peel off the beet is rearly Drain well in a colander, and when cool remove the skin.

If to he served hot, peel at once on removing from water, slice and send to table cov. cred with a dressing composed of a teaspoonful each of Hour and mustard, and a piece of butter the size of a walnut, $\Omega$ teaspoonful of salad oil, and one tablespoonful of vinegar This dressing should bo mixed with a little gravy, milk or cream, and hoiled till it liecomes as thick as melted butter or white sance. See Reet.
Beetroot Pickle. Prepare a quart of malt vinegar for the pickle by boiling it with $\frac{1}{\mathrm{oz}}$. each of whole blach peppers and allspice and grated horacradish, anil then let it cool Cook 4 large bectroots, peel and slice them. place in bottles, and pour the vinegar over. It is important to take care that the bottlea ure securely covered.

BEGGAR-MY-NEIGHBOUR. A sinmple card game for two people in which the pack is shuffled, and the dealer deals out the whole pack one at a time to himself and his opponent. The non-dealer has the lead, and he and his opponent turn up cards altemately. When certain cards are turned up by a player his opponent pays him as forfeit a certain number of cards. One card is paid if a jack is turned up. two for a queen, three for a king, and four for an ace. The cards are turned face upalternately by the players until one of the fout forfeit carls appears, when payment begins.
If while turning up cards for paying a player reveals a jack, queen, hing, or ace, he ceases paying, and his opponent in turn begins to pay the number of cards required ay forfeit. When the whole packs of ench player are played, the hands held by each aro played out again, and the game is so continued until the cards are in the hands of one plaver.

BEGONIA : How to Grow. For foliage and bloom, the begonia ranks among the best of greenhouse plants. The summer leafing or tuherous hegonias are excellent for the cool greenhouse, or for bedding out during the warm months; the winter llowering or fibrousrooted sorts are valuahle under glass when the supply of blossom has becoine scarce
The culture of the tuberous sorts is not difficult. An ordinary 15 -inch box is big enough, with an inch of drainage material at the bottom and a layer of moss over it. The compost is one part ieaf-mould, one part loam and one peat with a dash of silver sand. Begonia seed is so tiny that a lot of it mny be lost if any lumps are left on the surface. The box or pan should be immersed as far as the edge in a tub of water in order to soak the soil. Any excess of moisture should be allowed to drain away, and the seed carefully sprinkled on the surface. All that is then necessary is a covering of the finest silver sand. Another method adopted by some growers is to lay on a fow flakes of clean moist moss instead.
Afterwards the box should be placed in $\Omega$ propagator or in an even temperature of $60^{\circ}$, and be covered with a sheet of glass and a piece of hrown paper in December or January. When the tiny seedlings show, they should be carefully shaded. In a month they will be ready for transplanting to other boxes. The seedlings should be kept thereafter in a moist atmosphere at as near $60^{\circ}$ as possible. If they are to be grown in pots the next shift should be into a 3 -inch pot If intended for bedding they can be kept in boxes.

## Growing Bexonias Out-of-Doors

Bedding plants should be carefully hardened. The beginning of May is usually the proper time to put the boxes in a cold frame. Begonias in heds should be well treated. The beds should be dug deeply and well raked over. It is advisable to add spent hotbed manure if available. The plants do best in semi-shade.

Many begonia lovers ignore seed and start with tubers purchased in winter or spring. In starting tubers into growth, lay them on a hed of fibre or in a box of leaf-mould in a moist position in an ordinary greenhouse temperature, where they can get at any rate halflight. All the little fibrous hairs should be carefully rubbed off

The winter flowering hegonias, of which Gloire de Lorratine and its forms are the principal sorts, are invaluable. Gloire de Lorraine is propagated by cuttings. The Howering period extends from October to February, and at its best the plant is a mass of beautiful hloom. After Howering it should be cut back and one or two plants put aside for young stock. New shoots appear after the pruning, and these, which should be removed


Begonis. Waxy white flowers of a single variety of Photo, Sutton \& Sons, Lid.
with a heel of the old wood, form the cuttings There are several winter varieties
The rex begonia is grown for its foliage. Its leaves are large and ear-shaped; they are coloured in a great variety of ways, including remarkable conihinations of silver greys. crimsons, and bronzes Propagation is effected by means of the leaves The best way is to cut half-way through the larger ribs and to pin the leaves down upon the top of a pot or pan containing candy loam and peat, just above the places where the incisions are made. In due course tiny plants will appear at the points of these incisions. Pron. Be-go'-ne-er.

BELCHING. Besides being common in certain types of indigestion. belching occurs in hysteria and ncurasthenia. The gas is not from fermenting food. but consists of air which has been gulped down. All that may be necessary in the way of treatment is to limit the
consumption of sweet or atarchy foods. In liysterical cascs h alf-teaspoonful doses of ammoniatcd tincture of valerian will generally suftice See suffice see Flo

BELGIAN HARE. This is a pupular breed of rabbits. It is long in body, has large black ticking. It attains a large size, can be easily reared, and is marketable at an early

## Bells: Electric \& OTHER HOUSEHOLD TYPES

## A General Guide to their Installation and Repair

Electric Batteries for Bell work are described under Battery and Dry Rattery ; Appliances using Electric Rells under Alarm; Rurglar Alarm; Fire Alarm, eic
Bicycle bells are usually nctuated by a lever $t$ and have a train of wheels and a rotnting hammer that sounds the bell mnny times with once moving the lever, as shown in Fig. 1 Useful types of doorbell are those that have a press knol, outside the door and a clockwork device within the bell itaclf, the whole mounted


Bell. Fir. 1. Bicycle bell, showing rotating hammer

Electric Bells consists of several distinct elements. These may be classed as follows: (a) The souree of the electricity to sound the bells. (b) The bells themselves. (c) The contacts or pushes. (d) Indicators to acquaint the person rung for with the whereabouts of the ringer (e) The connecting link hetween all these elements, viz., the wiring system. So far as the source of power is concerned, this is usually obtained fron a battery of dry cells or Leclanché bat. teries located in some convenient place, such as a dry cellar or the top of a cupboard.
It is a true economy to begin by installing adequate battery power. The average smalif house of eight rooins will need a battery of three or four Leclanché cells. A large ramhling building on three lloors with a subbasement may well need twice this number. Every yard of unnecessary wire in a circuit means so much current wasted, and any bad adjustments or faulty connexions will increase the resistance, and add to the demands upon the battery. The best place for a battery is somewhere near the centre of a systein, as all the leads or connexions are then shorter, and current consumption is less.
For indoor use the wire generally used is No. 18 or 20 copper, india-rubber double cotton covered, and paraffined. It is known as No. 18 (or 20) I.R., D.C.C. This wire is usually tinned, to facilitate soldering and guard against oxidation. When measuring up for wire remember to allow for the corners and for waste. When ordering wire it is usual to purchase it in several different colours to assist in identifying the various leads. Twin wire consists of two separate fully insulated wires, enclosed in an outer covering of cotton. In
this case one of the wires is usually identified by means of a coloured strand Flexible wires are used for hanging pushes.

A method of fixing wires ahove ceilings is shown in Fig. 4, insulated staples being used to fix the wires to the rafters. All joints in wires should be thoroughly well made, as upon the closeness of their metallic contact will depend the excellence or otherwise of the system. Fig. 5 shows two methods. After the wires have been soldered the joint is covered with insulating tape (Fig. 6). This should extend for at lnast one inch each way on to
 the covering itself. Connexions to puslies and bells arc generally mado by means of in binding screw or terminal nut, as in Fig. 6 Thi hest bells are mounterl on an iron frame indenendent of the wooden basc, and provided with a dustproof Bell. Fig. 2. Sectional view of door- cover. The bell actuated by a spring which is type nost frequently used is the trembling or vibrating bell illustrated in Fig. 3. It consists of an electro-magnet, A, fixed to an iron frame, B, provided with a soft iron vibrating armature, $\mathbf{C}$, one end of which is fitted with a hammer. The other end is lixed to the frame by a spring, $D$, an extension of which carries n platinum contact. Fixed to the iron frame but insulated


Bell. Fig. 3. Common type of electric bell. The lettering is expla ned in the text
from it a able platinum-pointed contact scre

When a press button is pushed curnen Hows from the battery, through the wires to one terminal of the bell, thence through the magnet coils, armature, contact screw and post to the other terminal and back to the battery The circuit is thus complete, but as the current fousthrough the marnet coils it energises the core. This attracts the armature, causing it to move and strike a blow on the gong while at the same time the contact spring moves away from the screw and thus breaks the circuit. The current ceases Howing, the spring returns the armature to its atarting point, when the contact screw again Bell. Figs. 4-6. Diagrams makes contact and illustrating details of work closes the circuit in wiring an electric system Owing to this continuous sequence of operations the bell continues to ring while the press is pushed The contact points should be clean, and the screw adjusted so that the armature is free to vibrate The armature should not touch the corc. Usually this is prevented by a projecting stud of non-magnetic material on the corc.

Continuous ringing bella are used in connexion with hurglar and fire alarms Their construction is similar to that of the vibrating bell, but with the addition of a catch on the armature, which engages with a lever to which
 Courtess of General Electric Co.. Lid
is fixed a spring This bell works na follows : First, the current llows ns in the trembling bell, but ar the armaturc moves it releases the lever, which falls against a second contact post. This closes the oircuit through another wire to a third terminal, and thence to the battery. The bell therefore continues to ring until the lever is lifted and the circuit is again broken by resetting the lever.
Relays are necessary on long circuits, and many forms of indicator are improved by their addition. The п pparatus comprises an electromagnet with armature nod contact screws. Its duty is to close a local circuit when actuated by a relatively weaker current Howing through the coils of ite magnet.

Bell pushes, pulls, and switches are made in various patterns and materials. Their purpose is the same. viz., to close

Bell Indicator with pendulum disk oderated
by an electro-magnet

push consist of two metal plates fixed to the base ; one Hat, the other shaped like a pig's until it is again altered, whereas a pull or a push has to be held to keep the circuit closed. With the aid of the forcgoing notes the amateur should have little difliculty in tackling the installation of a new system or the repair or alteration of an existing one. The only real trouble is in knowing where and how to place the connecting wires or runs. For this purjose reference should be made to the different wiring dingrams, Fig. 8 In dealing with an existing system, either for purposes of addition, or to trace a fault, it will be necersary to find out the runs of the different circuits. An ordinary vibrating liell may be em. can be tested by any single circuit impairment of swallowing and speech, thirat, ising it-attaching one end by a temporary wire to a battery and the other end to one terminal of the bell. A separate temporary wire connects the other bnttery terminal to the bell. Hence, the circuit being complete and closed, the bell should ring; if it does not, the fault will be somewhere in the circuit under test.

When dealing with a failure of the systems as a whole, suspect the battery or a biroken wire. If one or more bells ring feebly and
 some riot at all, then the battery is almost oertainly run down. When only one bell faily, and the others are up to standard perforinance, look for trouble on the affected circuit. It will probably be found in the push, the adjustment of the contact screws of the bell or indicator, or a broken wire. The latter is, however, compara. tively rare.

Bell Indicators. In an electric bell system the indicator tells from which room a call has been received and so dispenses

The contacts of a tail and sufficiently springy to lift itself clear of the flat or lower plate. The press button is held up by this spring.y contact An improvement is the morse-key type of push (see Fig. 7) The pear push, mostly emploved in hedrooms, consists of a pear-shaped handle suspended by twin flexible wires from a rosctte on the wall or ceiling.
Switches are sometimes used in bell work to break a circuit or transfer it from one place to another. A wwitch remains open or olosed
with separate bells. Indicator movements resolve themselves into two maill classesthose that drop a shutter or move a disk and have to be reset every time the bell rings and those that swing like a pendulum and do not require resetting.
A form of the pendulum variety is illustrated lelow It consists of an electro-magnet fixed at one end to a metal frnme An arm on the frame lightly supports a pendulum armature trom which is suspended a paper vane or disk. When the current flows through the magnet the armature is attrmeted and set swinging and will continue to awing lor some considerable time
These indicators are generally mounted in a polished hardwood case with a glazed front. through which the paper vanes can be seenThis type of indicator seldom gives trouble ; all that is needed to keep them in perfect order is to see that they are clean and that the wires and connexions are sound
BELLADONNA. Both the leaves and the root of the deadly nightshade, or bella donna, are employed in medicine, the active principle being atropine. The liniment of belladonna often gives good results in neural gia The symptoms of poisoning by belladonna, or deadly nightahade, are dryness of the mouth.


Wiring corelay local Circurt
inpairment of swallowing and speech, thirat, dilatation of the pupils, dry skin, and frequently a scarlet rash, delirium, and unconsciousness. The best antidote is warm strong ten administered immediately. See Atropine Poisoning.

BELLADONNA LILY. The popular name of belladonna lily is given to the Amaryllis. of which A. Belladonna bears rich leep pinli or asamon-coloured flowers. It needs deep rich soil and the shelter of a southern nspect to thrive in countics north of the Thames. The bulbs should be planted in June and the flowers appear, before the folinge, in


Belladonna Lily. Cluster of the large delicately coloured
fowers of the Amaryllis

Angust and September. The greenhouse or half-hardy apecies of the belladonna lily are known as Hippeastrum (q.v).

BELL CRANE. A mechanical device for transmitting motion from one direction to another at an angle to it, uamally a right angle. By suitable proportion of the arms a different stroke or pull is obtainable. The device is in extensive use on machinery, hut derives ita name from its application to domestic bells of the old spring operated type.


Belleek Ware. Basin of genuine tinted porcelain made in the North of Ireland

BELLEEK WARE. While similar lustreware is manufactured in Glasgow, Staffordshire and the United States, the true Irish porcelain from the factory at Belleek on Lough Erne is easily distinguished by its characteristic mark, stencilled or stamped in colour, of the name with a device of a round tower, greyhound, harp and shamrock leaves.

For a quarter of a century after 1857 the factory turned out its hest thin, eggshell type of parian ware, sometimes with an ivory glaze and a mother-of-pearl lustre. See China.

## Bellflower. See Campanula.

BELL GAUGE. Made of nickel-plated ateel, and shaped as shown in the illustration, this is used for measuring knitting needles and crochet hooks. The latter should pass through easily and never be forced. For sizes 1 to 5 use the holes, but for sizes 6 to 24 inclusive use the slits leading into the holes. the holes in these particular sizes being intended to release the pins when gauged. See
Bell Gauge for measuring knitting needles and crochet hooks Crochet: Knitting.
BELL - GLASS. A glass vessel, bell-shaped, with a knob at the top, this is made in various sizes, the mouth fitting into an earthenware saucer. Seeds sown in a pot and stood in the saucer under the glass will rapidly germinate and grow, owing to the close, moist atmosphere. Bell-glasses are also invaluable for foroing cuttings quickly to take root, or for growing seeds that need the protection of glass in their earlier stages. In the largest sizes-those which are used for the French system of intensive horticulture-the native word cloches is now so usually applied that it has become anglicised.

BELL METAL. The metallic alloy used in hell-casting is generally composed of 78 p.c. copper and 22 p.c. tin. The material is expensive, hut by ite use alone can a good tone be obtained. Bell metal is occasionally used for very bigh-class cooking utensils, such as stewpans and kettles.

BELLOWS. In their simplest form bellows are elementary types of air compressor, adapted for blowing fires. The same principle is frequently applicd to the bellows used for blow. ing the organ in a church or hall, to vocalise certain small toys, and to actuate part of the mechanism of a player piano. A concertina is another type of musical instrument embody ing bellows to act as artificial lungs. Many
cameras have bellows to exclude extraneous light rays from the lens and photographic plate (See Camera).

Bellows are designed for single action double action, or treble action, according to the number of stages through which the air is compressed. An example of the first is the domestic fireside bellows. Double-action bellows are largely used for small brazing and blacksmithing jobs: a usual form is operated hy foot power.

BELL'S PALSY. Paralysis of the muscles of the face is known as Bell's palsy and is usually confined to one side of the face. The cause may be exposure to cold, as when a person sits at the open window of a railway carriage, or a blow in the region of the ear. It may also be brought about by diphtheria, meningitis or car-troubles.
When due to cold, a mustard leaf should be applied behind the car and the patient protected from further cold. If there is much pain. 10 grains of aspirin may be given. Medical advice must be taken.
BENARES WARE. The decorated brassware produced by Hindu artisans at Benares includes trays and salvers. plates, tumblers, hookabs, gongs, and various forms of waterbottles and ewers Especially graceful are the melon-shaped lotas, used for religious purposes Cheap Benares ware has been produced for export, with shallow designs

## soft leather See Brass.

## THE BENCH: FOR CARPENTER AND MECHANIC

## Two Examples of a Necessary Feature of the Workshop

## See also Amateur Carpentry and the articles on Chisel. Hammer, Saw and other tools

The combined bench and cupboard shown is made of beech wood or other hard in Fig. 1 is within the capabilities of any material. The top fits into special slots, the anateur. Convenient sizes are 3 ft . long, oross rails being secured by long hardwood 1 ft .9 in . wide on top, and 2 ft 9 in . high. The wedges. Two vices are fitted, one for ordinary legs are 2 ft .7 in . long, made from $2 \mathrm{in} . \times 2 \mathrm{in}$. use at the left hand end of the bench, the deal, the oross-pieces of similar scantling other, or tail vice, works longways of the mortised and tenoned into the legs. The bench and acts as a cramp for wide work. back and ends are enclosed by 昌 in match- Square holes and the pegs provided to fit lining, nailed in place, while the top is made them enable work of widely varying widths from two pieces of 11 ins. $\times 2 \mathrm{in}$. deal glued to be held firmly. A tool-well prevents the and pinned together and screwed in place with tools getting in the way of the work, while a $3 \frac{1}{2} \mathrm{in}$. screws passing through the framework. drawer holds others not needed at the moment. The front is enclosed by two simple doors Convenient sizes for such a bench are : 6 ft . hung on 6 in . cross garnets and provided with a long, 2 ft . wide, 2 ft .6 in . high, legs 4 in . bolt. The floor is of match-lining; and the square, rails 3 in x 2 in ., top 3 in. thick. A

shelves and racks are cut from 6 in. $x$ 各 in. deal.

A fow small drawers at the bottom accommodate screws, nails and other small parts. A back board 4 in . wide and $\frac{5}{8}$ in. thick prevents the tools falling off at the back. A portable bench vice with a olamp fitting is very convenient ; it is fixed up in a few moments, and when not wanted is accommodated within the cupboard. The various toole are supported on racks or shelves or hang from hooks, as may be most convenient.
The regulation joiner's bench, as a general rule,

based on foreign requirements, such as jardinidres and ash-trays. The inside of a piece of lemon rind rubbed hard on the surface and washed off with bot water will clean the article ready for polishing with a soft, dry cloth. Ordinary metal polish should never be applied Good pieces, which should not he lacquered, may be cleaned with a mirture of sweet-oil and rottenstone, free from grit, rubbed in with a flannel, and finished off with
portable carpenter's bench of a useful type is cross braces and stout longitudinal members. shown in the picture of a workshop on page 13. The thick top may be bolted to the cross Such a bench may be purchased ready for use, members, the bolt heads being sunk below the or it is quite easily constructed.

Where a regular workshop is available it is frequently possible to build in a work bench. This is both economical and practical ; stiffness and rigidity are assured, and for metal work it is preferable to the portable benches. One important item is to see that the bench stands fair and square on the floor: it must be accurately levelled, which may be done by means of suitable packing beneath the legs.

The construction of a mechanic's bench is illustrated in Fig. 2. A convenient height is 34 in ., with a width of 30 in . and a length of 6 ft . The top is composed of oak or other hardwood 2 to 3 in. thick at the front, and 1 in . thick at the back.
 attention. The leas must be at least 3 in and in attention. The legs must be at least 3 in.
square and very well framed up with diagonal
end to its plate, and is raised or depressed by


Bench Stop. Loft, wooden stop to insert in mortiso. kight, fing metal atop controlied by screw

BENCE STOP. This is a hardwood or metal stop, fixed or adjustable, against which work is rested on the bench when planing, etc. In its simplest form it may be a wooden strip screwed to the bench top a short distance from one end, close to the front edge of the bench. Another kind of stop, made from a piece of hardwood about 4 in . long by 2 in . square, is mortised through the top of the bench about 2 in from the edge. The stop fits tightly in the mortise, and is knocked upwards or downwards with a mallet to adjust its height above the bench. A face iron may be made by heating and flattening the end of a piece of $2-\mathrm{in}$. iron, and cutting serrations in its edge with a saw file. (See illustration).

Adjustable metal stops ąre made in various patterns, and are easily fitted to the bench top. In one type the stop piece is binged at one turning a large screw-head in the plate. In
another type the stop rises and falls in a socket as the adjusting screw is turned.

## BENT IRON WORK: SOME OF ITS USES

## A Process that Can Be Used to Beautify the Home

## Seefurther the entries on Lacquer; Piercing; Wrought Iron and other related subjects

Bent iron work is used for numerous household articles, including giriles, screens, lamps, hobby by amateurs at home. Only a few stances and the skill consists brackets, photograph and picture frames, and mainly in producing graceful curves, symother purposes. It varies in character from metrical proportions, suitable designs and work done at a forge on red hot metal to that secure unions of parts. The iron can be which is easily done cold by bending with pliers bought in coils, or strips of it can be cut with or with the fingers.


the thickness of ordinary tin plate, and bends nearly as easily as the latter. Widths range from \& in. to $\frac{1}{1} \mathrm{in}$. In most articles there must be something in the form of a frame, or substantial element, to which the comparatively weak and slender ornamental work can be attached. The apparent endless variety is made up of a fow elementary forms ropeated continually. These are shown in Fig. 1. Besides these we get plain circles and ovala.

The strip of metal is cut with shears and then bent with pliers. Round-nose pliers are used for bending small curves, the unbent part being held with Hat-nose pliers or with the fingers. Pliers are used to hold the strip securely and to bend a little at a time. They are moved along as required, and the workman judges by his eye when the curve is correct. Heavy, flat pliers are used afterwards to assist in taking out kinks and improving the curve.

Parts in contact are generally held together by clips (Figs. 2 and 3). These are made from the ordinary strip and pinched tight with pliers. Sometimes joints are riveted and sometimes soldered. Riveting is only practicable when the parts can be laid on an anvil for hammering the riveta. Holes for rivets are generally punched. In thick metalthat is, more than about $\frac{1}{18}$ in.-drilling is the only way. In metal too thin to be countersunk the rivets used must be of the types shown in Fig. 4.

Fig. 5 shows a rivet in place before it has been closed by hammering, the type of rivet shown being the cup-head or snap-head. The tool shown in Fig. 6 is used, in the same way as a punch, for imparting a neat convexity to the tail of the rivet, after the preliminary work has been done with the hammer only. A block with a similar concavity should be placed beneath the head of the rivet to keep it from flattening on the anvil.

Small bolts are occasionally used instead of rivets. For soldering, the surfaces must be cleaned and flux applied. They can then be coated with solder and pinched together with hot tongs, or bound with wire and heated by a Hame, or pinched with pliers while the solder is running. Of all the above methods the clip is the most popular and the quickest.

## Use ol Twisted Strips

Fig. 7 shows how strip can be twisted, either for appearance or to make it equally stiff each way. The ends are held with pliers or, preferably, one end is held in a vice and the other twisted with pliers. Fig. 8 shows chain made from strip iron. Fig. 9 shows examples of sheet metal ornaments. These are often of copper and, strictly, they are classed as repousse rather than bent iron work.

Fig. 10 shows a wall bracket, the frame of which consists of stout iron rod. Fig. 11, made entirely of bent iron, is a stand made to suit a glass or china vase. Fig. 12 shows how the large areas of grilles and screens are filled in by a repetition of some simple pattern. Fig. 13 shows the same method applied to narrow borders.

For the floating flower bowl, shown in Fig. 14, a polished copper or brass bowl can be used, or one of brightly-coloured china. The combination of a tlame-colour bowl with the dull black iron is very effective for table ornament. Make the foundation ring, A (of a size to suit the bowl), from stout iron, to which is attached the ornamental ironwork. The stand is made in two units. as shown in Fig. 15, each composed of three parta ; these, when made up, are riveted to the foundation ring and form the four legs.

Making a Standard Lamp. A design for a Hoor lamp is shown in Fig. 16. First choose the lamp and make the top ring to suit it from by
 meter, and at the lower end fit a gas flange,

Dent Iron. Figu. 14-15. Stand for a copper or cinina bowl screwing it on to the tule. The flange has to be cut away to form three arms (Fig. 17) and to these the bottom legs of 14 by $\frac{3}{18} \mathrm{in}$. iron are riveted or brazed. The long and continuous outer members, $A$, of by sit in. iron, and then the pieces B (Figs. 16 and 18) are bent and riveted in position. The inner ends of the latter are turncd down into the bore of the upright pipe and secured by driving in a ${ }^{\text {In }} \mathrm{i}$ in. Whitworth nut filed to fit as in Fig. 18. This part is completed with a rosette and ball
head scrow. The remainder of the decorative soil Propagation is by seed sown under glass work is carried out in ordinary $\ddagger$ in strip iron, in March or outdoors a few weeks later; also shaped and clipped in place as shown in by division in autumn or apring.

The only other species of note is the wild bergamot, a somewhat taller plant with purplish flowers, also having aromatic leaves
The essential ofil of the same name is ubtained from a variety of orange taking it name from the town of Bergamot Its rind yields a very fragrant oil used in h:gh-class confectionery. ligueurs, and largely in perfumery liergamot is sold as an essence Pron. Ber ger-mot

BEST MAN. A relative or personal friend who accompanics the bridegroom to the churc!. or wherever the ceremony is to take place. Previously he has seen that the neccasary arrangements have been made and received instructions from the hridegroom as to what he wishes him to do. With the bridegroom he stands in position to receive the bride, and remains just behind the pair during the ceremony At the right inoment he hands the ring to the bridegroom and he accompanies the newly married pair to the vestry, where he usually signs the register.

If a reception follows the ceremony, the best man helps to attend to the comfort of the guests. The best man sees to the payment of the officinla who have assisted at the marriage service - the clergyman or regintrar, the organint and others that are necessary, and distributes gratuities See Marriage; Wedding

BEVEL GEAR. 'The use of bevel gears is for transmitting motion from one shaft to another when their centre lines are at an angle to one another. The teeth are cut radially and to an angle or bevel formed on the outer part of the face of the wheel, the angle and shape of the teeth being determined largely by the rela. tive diameters of the pair of wheels. Two equal size bevel gears that are used to transmit motion at ight angles are known as mitre wheels.

Farniliar applications are the gears on egg whisks, hand
bevel wheel and pinion on some makes of drills, butter churns and som
window control gear. See Gcar

BEVELLING. It is chiefly in woodwork that bevelling is found; it menns the production of surfaces which are neither at right angles nor parallel with each other. A box or tray with splayed or sloping sides and ends, or the hody of a barrow, are instances where joints are bevelled to obtain the required shape of the article. In other cases an exterior surface may lie bevelled in relation to other surfaces, e.g. the top edge of a plinth.

In furniture, edges ane frequently chamfered, whioh means planing off the angles so that a narrow Hat at the angle of $45^{\circ}$ is formed.
 the fragrant parden herb Parts meeting with a joint at $45^{\circ}$, such as the corners of picture frames, are a日id to be mitred A sloping joint uniting pieces in the same plane is, a acarfed or spliced joint. lll come under the hearling of hevelling.
As a general rule lines are
marked on the work to show the exact extent of the required bevel, and the cutting tools work to these lines. In other cases appliances are used for guiding the tools In sawing sinall pieces at an angle of $45^{\circ}$ a mitre box or a mitre block may be used to guide the saw. For planing the angles two types of shooting hoards are used These may be for $45^{\circ}$ only or adjustable to any angle. One kind is used for planing long edges (Fig.1), the other for short ends (Fig 2). In both the plane is used
 of making bevelled edges In carpentry
lying on its side. It is alid backwards and forwards with the right hand, while the work is held in position with the left.

A woodworker's bevel is used for marking lines (Fig. 3) and testing (Fig 4). The bevel is adjustable to any angle, and is tightened bo a screwdriver or by a wing-nut. Detinite angles are obtained from a protractor, or by drawing a full-size view of that portion of the work on paper. Fig. 5 shows a type of bevel used chietly by metal-workers. Besides this there are bevels in combination with protractors.
Beveren Rabbit. This rabbit is largely hred for its pelt; there are two varieties, one late blue, the other white. See Fur: Rabbit.
BEZIQUE : For Beginners. Bezique is a game of cards for two, three, or more players, and is played with two or more paclis, one for each player, shuffled together. The pucks do not contain the sixes, fives, fours, threes, or twos The cards, in order of importance, are ace, ten, king, queen, knave, nine, eight, seven. For the sake of simplicity the game for two players will be described.

Two ordinary packs, with the noted eards removed, are thoroughly sliufled together and cut by the two opponents, the player cutting the higher card having the right to deal. The denler deals out the cards, three to his opponent, three to himself, then two to his opponent, two to himself, and finally three to his opponent and three to himself. The 17th card is turncd up for trumps, the remainder of the paok, face downwards, lying between the two players. If the turn-up happens to be a seven the dealer scores 10 points.

The game is $1,000 \mathrm{up}$, and the points scored are for the following combinations held by the players, nnd declared by then, i.e. placed face upwards on the table. The table gives the names of the declarations
Bezique (qucen of apades and knave of Pointe monde or aucen of clube and knnve of heart according to trumpa)
Double hezique (both queens and both knaves).. 500 Sepuence (nce, ten, king, queen, knave of (rumps)
Common marringe (king and queen of any suit
save trumps)
Royal marrlage (king and queen oi trumps)
4 Aces
Queens
Knaves
Seven of Irump (turned up)
Playing seven of trumps
Exchanging seven of trumps for trume car
Ninning of last tric
20

Earl ace und ten in tricks of scoring phayer 10
the play is as follows: Each player looks at his hand, and the dealer leads a carl which

He thinks ne is least likely to want for one of the combinations given in the table. His opponent need not take any trick, though if a ten or an a0e is played he generally tries to do so, s:nce such cards count towards his score at the end of the game. He may also wish to take a trick - because he wishes to deolare one of the com. 'binations enumerated. He need not follow suit, and may take a trick by playing a higher card of the same suit or by trumping.

Whiohever player takes the trick turns over the two cards, and then either declares any combination he may wish to do, or takes another card from the top of the paok His opponent takes the next card, so that each player makes up his cards again to eight. One of the drawn cards may provide a card of a required combination, but a player cannot declare until he has won another trick. He must, too, declare anything before taking another card.

The trump card may be an important one, e.g. the ace or ten, and a player may exchange it with the seven of trumps, if he holds that card, on winning a trick. Playing either seven of trumps in this way, or playing it on a trick, except when playing the last eight cards, entitles the player to acore 10

When to Declare Bezique
fiach declaration, as made, must be laid down face upwards on the table. Bezique is declared by placing the proper queen and knave on the table. The berique queen and knave must be of opposite colour and neither may belong to the trump suit; i.e. bezique must either be queen of spades and knave of diamonds or queen of clubs and knave of hearts. Double bezique may be declared either by placing both queens and both knaves on the table, or by first declaring bezique and then afterwards adding the other two cards. But all four must be on the table at the same time to obtain the double bezique score Should the bezique be declared and the cards afterwards played, the player may afterwards hold the second queen and knave, but he can only declare bezique with them and not double bezique. The same rule applies to all combin. ations, i.e. all the cards of that combination must be on the table at time of declaration.

Sequence consists of ace, ten, king, queen, end knave of trumps. The king and queen may be declared first (but not afterwards) as a royal marriage, and the other three cards added when convenient. In some forms of the game a royal courtship is allowed, scoring 20 points. This consists of the knave and queen of trumps.

## Use of Cards a Second Time

Cards once declared in a combination cannot be used again for a similar combination, a for a royal marriage. Such cards, however. may be used a second time in different combinations, e.g. the ace in sequence may be used to form one of four aces, the queen in bezique may be used with three other queens to give four queens, and so on.

The play goes on as described until the stock between the players is finished, and each player is left with eight cards. Though he may, by his very last cand, complete a combination, he cannot now declare it. The last trick befure the stock is finished counts 10 points to the winner, and in playing the last eight cards players must follow suit, if possible. If not, they are at liberty to trump. When the final card is played each player goes through the tricks he has won and counts the eces end tens he has in them, these being added to his score.

The following are a fow hints on playing. first of all it will be found by a player that he often holds parts of one or more combinations. It will not be always possible to keep all the cards, and one or more cards of a wanted sombination will have to be played on tricks.

In such a case it is better to keep four kings and four queens than four aces. The two former sets can always be used for marriages and so increase the score.

It is not always advisable to declare or play valuable cards as early as possible. To play one of two kings of trumps before any declaration tells your opponent that you have both kings, and he will not trouble about getting sequence.

When the number of cards in the stock is becoming low, it is advisable to take as many tricks as possible and to declare everything at once, and not separately. That is, if you have sequence, declare it as a whole and lose the royal marriage score.

In three-handed bezique, played with three packs of cards, triple bezique may be scored, counting 1,500 points, and the game is often fixed at 2,000 up. With four-handed berique, players may either play for themselves or act as partners, as at whist. In the latter case each player may declare when lie or his partner has won a trick

BIB. A baby's bib oan ue made trom a double equare of bath towelling bound with white tape, cutting a semicircle from the square to fit the baby's neck and attaching tie-on tapes. Bibs are also made of silk over a pad of cotton-wool quilted and lace-edged.
BICARBONATE OF SODA. In con. junction with oream of tartar, bicarbonate of soda is used in making baking-powder. It is also frequently employed in the making of scones, etc., in the proportion of about teaspoonful to a teaspoonful of cream of tartar and 1 lb . of flour. For soda ciake. it is used without the cream of tartar. If too much soda is used in a cake it will flavour it disagreeably and give it a yellow colour.
It is also valuable as a medicine, being given for indigestion in doses of ten to twenty grains, dissolved in water. It is also taken in the form of compressed tablets, known as soda mints, containing ginger and peppermint. Moistened with water and applied to the part, bicarbonate of soda relieves the pain from insect stings. See Baking Powder: Soda Cake.

## The Bicycle and its Mechanism

## Care and Adjustment to Secure Good Ranning Order

## The articles on Balt Bearing; Brake; Chain; Coaster Hub: Three Speed Gear; TIre, and other

Dealing tirst with the frame of the bicycle, the two parts requiring attention are the ball races in the steering head and the cup cones of the bottom bracket. To keep out any wet, the cones A (Fig. 1) are a press fit into their housings. These cones may be driven out from the inside and replaced with new. The cone B at the crown of the front forks is only a light press fit, so can be easily replaced. Ball races must not contain a full ring of balls; there must always be one short. The object is to allow freedom of movement for the balls.

When the head is complete, as shown at Fig. 1, tighten down the lock ring C just sufficient to stop all luoseness, and no more. After seeing that the handle-bars are the right height and square with the front wheel, tighten the nut D .

With the bottom bracket (Fig. 2) the inner cones, $A$, are in most cases in one piece


Bicyole. Figa. 1-6. Diagrams illumpatiox some of the more important parts of the meabenilum
with the spindle, B , that carries the cranks. The outer races, C. are carried in the bottom bracket shell. In assembling, set the balls in the outer races with vaseline, and first screw the ball race on the chain sprocket side into its original position. This assures correct alinement of the chain over the sprockets. Next scrow in the other outer ball race, finally locking by the means provided. When fitting the cranks on to the apindle, take partioular note to fit the head of the cotter pins head to tail, i.e. if the head of the sprocket cotter is on top; the head of the other one must be underneath. If this is not observed the cranks will not be in line. When fitting new pedals it will be found that they are screwed into the crank, a left-hand thread being used for the sprocket-crank and a right-hand thread for the other.
The hubs of the wheels follow two distinct types. In one the adjustment is carried out by the cone, $A$, on the spindle (Fig. 3); in the other the outer race, $B$, is used as the means for adjustment (Fig. 4).
Where adjustment of the wheet bearing: is by the former means (Fig. 3), it is advisa.lle to leave the bearing very slightly slack: the thrust transmitted to the cones by the nuts that hold the wheel in place between the forks will take up the slack that was left.
Should the rims of the wheels be out of truth, remove the tire and tapes that cover the ends of the spokes. Then mount the wheel between the forks, turning the bicycle upside down so that it is supported on the handlebars and the seat, and give it a vigorous spin Now hold a piece of clialk to the edge, allowing it to approach the spinning rim until it just catches the high places. Stop the wheel, and with the nipple-key tighten all the spokes on the opposite side to the chalk marks, and slightly let down all the spoken on the same side as the chalk marks. Then wipe off all marks, and repeat the procoss until the rim runs true. When finished, the tone of all spokes should be nearly the same; but if there is a considerable difference, work at it until a fairly uniform note is achieved. After any adjustmont to the spokes, file down any ends that may be protruding through the nipples.

If the machine is fitted with a free wheel it will probably be one of the two types shown in Figs. 5 and 6. To remove the free wheel from the hab of the wheel, first undo the lock-ring. Since this will have a left-hand thread, it must
be turned in a clockwise direction. Next, by means of the holes that will be found on the face of the free wheel, slack this off with a punch and a light hammer. In this case turn it in an anti-clockwise direction, as it has a righthand thread. In most patterns a repair of the mechanism is impracticable.

Of the saddle there is little to be said, except thet an occasional dressing applied on the under side with a leather preservative will help to keep it in good condition.

When adjusting the chain remember that there is sure to be a tight place during the complete travel of the chain's length round the sprockets ; . therefore, find this tight place and adjust accordingly, not too tight. Also note that the wheel is central between the bottom forks, otherwise the machine will not track properly, neither will the chain be in true alinement Do not forget that, where fitted, the back brake, if of the bottom stay pattern, will also need adjustment.
BICYCKE SEISD: How to Make. A portable shed for two cycles, framed up in sections, is shown in Fig. 1. The front, back, ends, and roof are made up in separate parts, and are fixed together with bolts and nuts.

The framing should not be less than 2 in . square. That in the back (Fig. 2) consists of two end uprighte, $A$, bottom rail, $B$, and top rail, C, which are half-lapped and screwed cogether. There is an inner upright. D, which is notched into the top

grooved and tongued match boards, fixed with the joints running from top to bottom. The boards on the ends should overhang ? in. at the back edge to cover the edge of the boards on the back. The front and back seotions fit between the end sections, to which they are fixed with bolta and nuta.

The roof should be of 1 in . matoh board, with the joints running from back to front, and overhanging 3 in . all round. The boards are held together with battens fixed across the ends on the under side. The roof is screwed on. A pair of doors are made from 1 in matchboard battenel together, as at Fig. 3, and hung with hinges. The left-hand door is lit ted with bolts at the top and bottom, and the righthand one with a lock, while a fillet is fixed on this door, to cover the joint, as at Fig. 5. The bottom of the slied is covered with 1 in . boards, resting on the bottom raik of framing. When complete give three coats of oil paint.

BISNNLAL. Most flower-garden biennials are distinguished by a single main stem, whioh branches freely above the root. True biennials start from seed one year, flower and seed the next, and then die. Most biennials seed freely and germinate surely, because at the season when they are sown, mid-May to mid-June, he ground is warm.
The following are the most useful hardy biennials. Some are not true biennials, but are best treated as such: Brompton stock, Canterbury bell, chimney bell-flower, foxglove, Iceland poppy, Indian pink, sweet rocket, sweet-william, wallHower, forget-me-not and honesty. See Annuals.
Biffins. These dried apples are similar to Normandy pippins (q.v.). See Dried Fruit
BIG BUD. The pest known as big bud is caused by the black currant mite. The plant which suffers most is the black currant.

In the blaok currant the developing buds are attacked and swell until they are almost globular in shape, and are about twioe the size of the normal buds. As a rule the buds dry up and die in early summer. The natural result of this loss of buds is a progressive decrease in the crop, whioh may ultimately ail altogether.
The disease is dealt with in Leatlet No. 1 of the Ministry of Agriculture. Badly affected rail. The ends and back are covered with $\frac{1}{8}$ in. bearings at each end of the connecting-rod,
work is strength ened and kept rigid by the stays, E, whichare fitted and nailed in position. The ends (Fig. 3) each consist of a back uprigbth $F$, front upright, $G$, bottom reil, H , and top rail, J, which are half-lapped and gerewed to gether. The stays, $\mathbf{K}$, are simply fitted and nailed in position.

The front framework consists of two end uprights, $L$, bot tom rail, M , and top rail, N, which are half-lapped and screwed to. gether. The top rail should be 4 in . deep, or it may sag when the roof is fixed. The bottom rail should be framed into the uprights so that the face of uprights projects 1 in . beyond face of


Bicyele Shed. Fis. 1. Simple shed for maling which instruction aro stiver in tho reat. giviag worlding details and dimensions
By arrangement with Evans Bros., L.d.. London bushes should be grubbed up and burnt. In gardens, attacked buds should be destroyed as soon as they can be detected, so as to kill the mites be. fore the period of migration, which is from March to May. The best treatment is to use lime-sulphur on the bushesfrom early March to mid-May. Herc is the mixture:
Slake 1 lb . Ni quicklime; add 1 Ib. or flowers or sulphur and gand stir
Boll the mixture or ten minutes, stiring all the time: allow it to cool and the sediment to sot. le, then pour the lquid into a bottle, and cork it well. For use, mix 1 pint with 12 gall. of water. SeeBlaok Currant.
BIG-FND. The big-end in an internal mbustion engine is the larger of the two
the smull-end or gudgeon-pin bearing being the one on which the piston is mounted. The bigend in its most common form is of the split type, and the bottom half, or cap, is bolted to the upper half, which is machined integral with the connecting-rod, by two or more bolts.

The illustration shows a bearing of common type. $A$ is the connecting-rod with big-end housing drilled and countersunk at $B$ to receive the bolts, C, that hold the cap, D , in pusition, alar, oil ways. These bolts are secured by a castellated nut and a split pin The cap $D$. is drilled cen. trally at the bottom. and fitted with a scoop for picking up oil to lubricate the bearing as it passes over the oil sump located in the crank case.
Between the cap and the upper half of the housing are placed two packing pieces E, known as shimms. 'These are


Big-End bearing ol type ased for intarnal combastion engines formed of a number of very thin sheets of brass, and are provided so that wear in the bearing may be taken up. The housing, F, called the brasses, is in two pieces and of phosphor-bronze, having a shoulder at each end to locate it in the main housing, and is machined rough on the inside and recessed, as shown, to receive the white metal lining. The white metal, G, is cast in, turned nearly the correct diameter, and finally scraped a true fit to the crank pin.

Big-end bearings un motor-cycle engines are solid and not split. as in large engine practice. They are constructed with a phosphor-bronze bush, or with roller or ball bearings, roller bearings being most favoured. The usual construction of a motor-cycle crankshaft allows of the big-end being slipped off the crank-pin on parting the two ty-wheels that go to form the crankshaft.

Repairs to Split Bearing. To get at the big-end on the majority of engines fitted with
 the split type bearing, it is only necessary to remove the oil sump, thereby exposing all the connecting-rod big-ends to view. Dismantle the bearing requiring attention. and withdraw the conneoting-rod with piston down past thecrankshaft. Thiscan bedoneun most modern engines ; otherwise it will be necessary to take off the cylinders and withdraw it from the top.
To take up wear in a split type bearing proceed as follows: Thoroughly cleanse off all oil and dirt. Next remove one thickness only off each of the shimms; then very thinly coat the crankshaft with a mixture of thin oil and blue mineral or red lead. Replace the housing en suite on the crankshaft and bolt up tight, giving each bolt a half-turn alternately to ensure keeping the pressure on each equal. The connecting. rod should now be given one complete turn (not more), then Bis Bud. Its eneot on a caro black carrant
carefully dismount to avoid disturbing the marks that the blue coating has made on the
nigh places on the white netal housing These high places should now be very carefully acraped off with a proper scraper. Having done this, clean and remount the bearing. following exactly the same procedure, and continue until there is practically an even film left all over the faces of the white metal Always bear in mind that any white metal removed from the unmarked surface ineans that an equal amount has to be scraped off the ontire face to correct the error.

On finally cleaning and assembling remember that the connecting-rod must on no account be an easy fit, neither must it be too tight ; it held horizontally with piston and gudgeon-pin in position, it should have a tendency to fall a little way only This test can only be applied when the crankshaft is removed from the engine. See Bcaring : Motor Car Motor cycle : Piston.

BIGNONIA. With brilliant Howers of varying colours the bignonia flourishes in the greenhouse, and is a good climber for roof. pillar, wall or trellis Propagation is effected by cuttings in the autumn, and inserting them in sand under a bell-glass or a frame or in a propagator. Loam and half peat, with sand, form a suitable compost. They are better planted out in pots Magnifica, crimson, and Tweediana, yellow, are suitable for the greenhouse. Capreolata, orange-red, may be grown aqainst $n$ sunny wall out of doors. Pron |lig.no'ne-a.

BILBERRY. Growing wild in woods and moorlands, this fruit is also known as the blaeberry in Scotland and the blueberry in America, and is much used for making jam and tarts by reason of ite distinctive flavour.
Bilberries should be washed and picked over before cooking, and are then steamed in a jar placed in boiling water, allowing about 2 oz sugar and 2 tablespoonfuls water to zach lb. of fruit. With a short crust the berries make a delicious tart. For jam-making the fruit is preserved as in recipes for black currant (q.v.). This is essentially a home-made jam, and is not often to beobtained in the shops, the reason being that the demand far exceeds the supplies available. The bilberry leaves a stain on table linen and light-ooloured garments which is hard to remove unless treated immediately with cold water If the stain has dried, it is best to stretch the material across a basin, pour hot water over the affected parts and afterwards apply fresh lemon juice.
BLLIOUSNESS. Eating ton much rich indigestible food often results in a bilious headache, especially with those who suffer from indigestion. In normal conditions poisonous substances formed during digestion are rendered harmless by the liver before they reach the general blood stream, but in in digestion these substances may overwhelm the protective resources of the liver, and accordingly we have symptoms of poisoning in the shape of malaise, physical and mental, and sometimes pronounced headache, with or without vomiting. The latter is beneficial, as it rids the stomach of much of the disturbing material.
Bismuth salicylate in 10 grain doses three times a day or 10 grains each of bismuth carbonate and sodium bicarbonate will be useful. Two grains of calomel at bedtime and 2 drams of Epsom salts in half a glass of water on an empty stomach in the inorning will assist in clearing the liver and intestines. Very little and simple food should be taken.
A sick headache is a different thing, though people who are subject to it may precipitate an attack through indiscretion in diet, it may follow overwork or worry or other cause. In this form eye trouble is not uncommon. Some people who require glasses have periodical headaches; a visit to an oculist obviates distress and the taking of a lot of medicine.

Bilious attacks in children are, as a rule. simply bnuts of acute dyspepsia due to overeating or the eating of too rich or not quite fresh foods. The only treatment needed is a teaspoonful orso of castor oil and a starvation diet fos twelve hours.
Sometimes what may be considered to be mild bilious attacks. occurring at intervals of $n$ few months, with vomiting and more or less severe abdominal pain lasting for a day or two. ma, be mild, recurrent appendicitis.

The greatest care should be taken here in preacribing purgatives, and if there is the slighteat abdominal lenderness (particularly over the lower right abdominal area), the physician should be sent for.
In some children there is an inherited incapacity of the liver which gives rise to repeated attacks of biliousness on the slightest occasion. These begin about the age of three or four years. A railway journey, a visit to the seaside, fatigue, a fit of anger or grief. paddling, or expusure to cold wind may, for example, be enough to bring on an attack of biliousness with vomiting.
Treatment consists in putting the patient to bed in a quiet, darkened room and giving no food whatever. A glass of hot water or ice sucked at intervals relieves the thirst Hot fomentations or a hot bag will ease the pain. As soon as the vomiting ceases, give the child two to four grains of grey powder, followed by a small dose of Carlsbad salts after six or eight hours. As soon as the aperient has acted, give some light nourish ment, such as milk and sodawater, iced whey and jellies. Next day plain, ordinary diet may usually be resumed. Sodium bicarbonate, in 5 gr . doses, in milk before breakfast might be given to the patient for some days, and doses of Epsom or Carisbad salts every three or four days. See Appendicitis: Diet; Indigestion.
BILL: Tradesman's Account. An account contains a list of the items purchased, with the price opposite each, and the total. This bill should be checked at once. If any mistake is discovered, the liability should be at once repudiated in writing, a copy of the letter being kept. An example of such a letter is the following

## 2 January, 1931.

Dear Sir,-With reference to your account delivered this morning, I want to call your attention to two items, one of Dec. 2 and the other Dec. 15. I ordered the joints on that day myself at your shop, and paid cash across the counter. Please correct mistake in your books.

## Yours truly,

Annie James."
It is important to write at once. If nothing is done till the tradesman renders his statement to account rendered overwhelming evidence will be required in a court of law to prove the money not owing.

Where sums of money are paid at intervals on account, the tradesman can appropriate the payment to any of the items owing. The householder, on the other hand, can also appropriate it to any he likes, and he has the first choice. If neither party appropriates the money to a specific item, the payment is by law considered to be appropriated to the oldest of the itenis. This is important when considering the question of old accounts, which are irrecoverable after six years, unless something is paid on account, or some acknowledgement of indebtedness is made within six years before the action is begun.

It is not the case that if an incorrect bill is sent in by a tradesman, the debtor need not pay it. No one, except a solicitor, is ever bound to send a hill in at all, unless he expressly agreed to do so. If the bill is not correct, send or take the amount really due, and if the tradeaman refuses to accept it, pay it into court with a plea of tender before action when sued. If it is the correct amount he will have to pay ull the legal costs. See Accounts.
BLLLBERGIA. This plant is sometimes grown in greenhouses in England. It possesses thick and fleshy leaves on a short stem, and ${ }^{\prime}$ bears large heads of hlossoms in late autumn and winter.

Equal parts of loam and peat, with a little decayed manure and a sprinkling of sand, suit them. Suckers form at the base of mature plants, and these can be used for purposes of propagation. The best species are B. moreli. hlue and rose ; B. thyrsoidea, scarlet : and B. vittata, green. red, and violet. Pron Bil-berjy-er.
BILLHOOK. In its various forms the billhook is a useful tool for wood-chopping, sharpening the ends of stakes, and cutting down busbes or brushwood. The shorthandled handbills, however, are the most serviceable for chopping firewood.

When cutting
 sooll whill with chopping blade. a blow. The long-handled billhook is used for hedge cutting, or in places otherwise out of reach. A billhook needs a keen, sharp edge. Most workers will find it best io hold the edge of the bill away from the body. The object of the hook part is to facilitate cut. ting growing timber.

BILLIARD BALLS AND CUES. The standard size for billiard batls is between $2\}_{6} \mathrm{in}$. and 2 s \% in., and they must be of equal size and weight. Ivory balls are used in British official championships, both amateur and professional, and are generally employed in first-class play. When bnying a set of ivory balls, a fair price should be paid to get a well-seasoned set made of the right kind of ivory, and they should be bought ${ }_{2}^{1}(\mathrm{in}$. full, thus allowing for adjustment.

A new set of ivory balls ought to be kept in the billiard roon for a week or two to get accustomed to the temperature before they are taken into play, and at first they should be just tapped lightly while playing a series of gentle strokes, a process which hardens the texture of the surface of the balls; it is well worth while to humour a set of new ivory balls for a month in this way before playing an ordinary game with them. Any chalk on the balls should be removed with a cloth.

They should not be handled any more than can be helped, and in particular the ivory ball should not be held in the hand while waiting to play. On a damp day especially the balls are all the better for an occasional rub while play is in progress.

Professionals know that it spoils ivory balls to leave them in the pockets when play is finished, and are careful to place their set in a
proper box lined with soft material. (See Fig. 4). Nor would they leave ivory balls on a window-sill exposed to cold and draughts, or on a mantelpiece when the heat of a fire would ruin thein at once. This explains why a professional will have a good set of ivory balls in use for years.
Composition halls, which are not affected by changes of temperature, are cheaper and more lasting than ivory. They are much in favour where economy is the deciding factor, although they are not ao pleasant to play with and do not throw quite the same angle as ivory. Their absolute truth is a strong point in their favour, their durability is another, and so is the fact that all sets of one make are alike, whernas ivory may differ very considerably. For snooker and other pool games requiring a large number of balls the low cost of composition is an inprortant consideration.

Comprosition balls, however, need much more cleaning, as chalk marks and dirt of all kinds stick to them inore easily. They should be washed in warm water, ruhbed thoroughly clean and dry and then given as inuch polish as they will take from a perfectly dry cloth

## Size and Weisht of Cues

Billiard curs of any weight or size are permitted by the rules of the game. In practice, weights vary from 14 to 18 oz , but size as regards the length of stock cues does not vary so much as it inight. Many faults might be remedied if cues suitable for very short or very tall penple were more readily obtainable. Cues under 15 oz . are seldom used, but the championship has been won by a player using an 18 oz . cue. Generally from 15 to $16 \frac{1}{2} \mathrm{oz}$ will cover every reguirement, and it is preferable to have a cue heavy rather than light. When it comes to judging a billiard cuc, appearances are even more deceptive than usual. No matter how high the polish may be, anything whippy should be rejected at once, and wood twistcd in the grain, especially towards the point of the cue
where it slides over the bridge-hand, is another thing to guard agninst.

When play is over, the cue should he replaced in its casc, as no cue will keep straight if it is left leaning against a wall. If the cue feels sticky as it slides over the bridge-hand, it should be rubhed briskly with a dry cloth or a sheet of paper, but not sandpaper. The use of anndpaper to remove temporary stickiness wears the wood away unevenly in a very short time, and renders the cue useless for real billiards. Sandpaper may be used with advantage on the leather tip of the cue. Constant play makes the tip hand and shiny, and if it is lightly rulbed against the grain of the leather with a piece of coarse glasspaper, or even a wood file, a constant source of miss-cues will be removed.

## How to Tip a Billiard Cue

When tipping a cue, the firat thing necessary is a flat true surface on which to lay the new tip. Useful little machines are sold which do this troublesome job very neatly, hut if it has to be done by hand it must he completed well and truly. Select a tip as nearly as possible a perfect fit, soak the adheaive wafer in hot water, adjust the tip firmly and accurately, and leave it to dry thoroughly. If proper care is taken, especially as regards selecting a tip which fits, there should be small need for trimming and filing. But if this has to be done, never allow the woodwork of the cue itself to be touched by file or aandpaper. The tip must be made to fit the cue, not the cue sandpapered to fit the tip. The tip of a cue should be large rather than small

Besides the ordinary cue, there are the long. rest and the half-butt, which should be kept straight and well tipped. It is hettor to lay them on the lloor under the tahle than to try to prop then up in a rack.

Cement for fastening the tips of billiard cues is mude by soaking 1 oz . of isinglass in 2 oz . of water, and adding 1 oz . of glacial acetic acid, warming together until dissolved.

## The Billiard Room and its Accessories

## General Information on Lighting, Beating and Equipment

The main requisites of the game are considered in the preceding article, Billiard Balls and Cues, and in that on Billiard Table, while the construction of some of the lesser accessories is dealt with here

The ideal billiard room is built on a ground floor with brick or concrcte supports for the lega of the table and should he a substuntial and well-lighted structure. A skylight for play during the day is the only perfect natural light, as a side-light which throws shadows as the balls lie on the table is most disconcerting. Ventilation is also helped by the skylight, parts of which should open to let out amoke and allow fresh air to enter; but an open skylight should always be watcherl in case of rain.

Electric light is the best artificial illuminant, but gas mantles are quite good, though the wasteful naked flame should be avoided Whatever light is used, the shades should be adjusted so that the full glare of the light cannot catch the eye of a player as he shapes at his stroke. A well-arranged room in a private house is illustrated in Fig. 1.

The heating of the room requires careful attention, as hoth balls and tuble are very sensitive to changes of temperature, and the game is not pleasant to the players if the weather is cold and the heating insufficient. Onc of the many systems of heating by pipes or radiators is far hetter than an open fire, which should be avoided on account of the glare, the dust, and the impossihility of maintaining an equable temperature.

The space required for a full-sized table is rather more than 21 ft . by about 16 ft ., which must be clear space after allowance has been made for settees. A little less is possible, but the measurements given sllow a margin of comfort. The flow covering ahould be of woven
material where the fcet of the players tread on it. The marking board (Fig. 2) and cue-racks must be well niade and kept in good order. Nothing is more annoying than a marking board which sticks, or cue-racks fitted with cheap clips which disfigure the cues with handlike marks.

But for every fortunate possessor of an ideal billiard room there are many who cannot
 allowed to sulfer.
get a bsolutely the best of everything. The most usual shortcoming is lack of ground-floor accommodation, which generally means that a


Billiard Raom. Fig. 2. Standard pattern marking board, with scorers sliding on brass strips
top light is impossible. When this is the case the upstairs room selected for the table must. be strong and well built, for a hilliard table is a heavy piece of furniture, and if it begins to settle down unevenly it is at once out of truth and useless

Those who have to fit a table of lcss than standard size into an ordinary house will be well advised to make sure they have room enoughto play properly. A sinall table in a room too small for it is notworth having, and the saine may be said of sinall tables which are set up without due regard to levelling. In in ordinary house, especially if fitted in an upstairs room, these small tables take time to settle down, and often re-


Billiard Room Fig. 3. Cue rack. Fig. 4. Padded box for billiard bal's. Fig. 5 . Sectional view of a cramp for a billiard cue quire read. justing more than once before they can be depended upon. For the rest, everything which applies to the ideal room for a full-sized tuble is applicable to the small table; but when it comes to making the best of what must necessarily fall a good real short of the ideal, the light is the last thing which should be

A badly lighted table, be it large or small, is an ahomination, and there is no reason why the small table should suffer in this respect. Generally a top light is out of the question, so that it is all the nore important to arrange for the best of artiticial light, as all play will be dependent upon it, so far as seeing the balls well is concerned.
There are various styles of cue-racks and stands. The wall rack is simple to construct and quite efficient. It is conveniently made in two lengths, the one fitted with the slotted ledge (Fig. 3, A) above a rail, which is fitted with equally spacerd spring clips and secured to the wall by braseplates and screwing. The rail can be of $\boldsymbol{s}^{3}$ in. thickness and 4 in . or so wide, with the ends and under edges plain or moulded ovolo as preferred. The spring clips are purchasable from a
good-class ironmonger in dozens, and merely require screwing into equally spaced positions. The shaped ledge above is screwed and glued on, and the clips are fixed on the centre line of each recess so that the cue lies evenly within it. Width of this ledge can be about 2 in . and its shaping a repeat such as Fig. 3 C .
The revolving cue-stand is specially suitable for some rooms, but as it is not likely that a player would undertake its construction we do not give details. These stands can often be obtained second-hand at low prices.
The amateur craftsman might, however, exercise his skill in the making of $n$ box to take three balls, as illustrated at Fig. 4. Finished dimensions can be $8 \frac{1}{4} \mathrm{in}$. long, $3 \frac{1}{2} \mathrm{in}$. deep and $2 \frac{3}{i n}$. high. The lower box portion can be $1 \frac{1}{2} \mathrm{in}$. high. and the workmanship is usually of the best. Sides, back. and front are carefully
dovetailed together of $\frac{1}{2} \mathrm{in}$. or $\frac{\mathrm{l}}{\mathrm{h}} \mathrm{in}$. mahoganv. and a $\frac{1}{3}$ in. hottom rehated in. The lid is dovetailed together in similar fashion. and the top rebated in. A separate partitioned hox is inset, made from ${ }^{36}$ in thickness. mitred together, and finished to pmoject with bevelled edge about a full $\frac{1}{4}$ in above the box.

A cue cramp (Fig. 5) is an essential accessory of every hilliard room. In action the cue top is passed through the centre of cramp, and the cemented tip compresed into position by forcing down the stop upon it and securing it in position by pulling down the cramping ring over the cuts in the splaved end. In addition there is a hole to take a small length of file with which any unevenness of tip or adhesive is corrected The file is holed at one end, and a length of brass chain secures it to the stop above

# Billiards: How the Game is Played <br> <br> The Strokes Explained and Mustrated 

 <br> <br> The Strokes Explained and Mustrated}

This work contains also articles on Pool, Pyramids and Snooker Pool

English billiards is played on a table ineasuring 12 ft . by 6 ft . The spot is $12 \frac{3}{4} \mathrm{in}$. from the top cushion, the middle spot is half-way across the table in line with the centres of the middle pockets, and the pyramid spot is equi distant between the iniddle or centre spot and top cushion. The table has six pockets. one at each corner and two in the middle of the longer sides. Those at the spot end are known as the top pockets; those at the balk end as the bottom pockets.
The game is usually played by two or four players. l'oints are scored as follows: two for a cannon, i.e. when the playing ball strikes the other two balls two for going into a pocket after hitting the white; and two for potting the white, i.e. driving it into a pocket.


Billiards. Fig. 1. Fullsized table, showing the lines and spota Three is the score for going in off the red or for potting the red. A miss counts one to the non-striker three if the hall is sent into a pocket or off the table without striking a ball This rules should be consulted for other examples of scoring. Wach player or pair o players has his own ball, these being the two white ones, one being distinguished by a spot. Various ways of deciding who whal start first are in vogue. Beginning the game is known as hreaking the balla
A player can continue playing as long as he scores from every stroke, but ns soon as he misses, his opponent takes his place. The total score made by a player without losing his turn is known as a break. If the cue-ball, when at rest, touches either of the other halls, the balls must be spotted and the striker continues his break. Fouls and their penal ties are matters concerning which the rules should always be consulted.

## Importance of a Correct Stance

A correct stance is of primary importance in billiard playing, but is difficult to define with exactitude, because players of varying height and physique have to play on a table which measures, from the floor to the cushion rail, from 2 ft .9 in . to 2 ft . $10 \frac{1}{2} \mathrm{in}$. The safest guide to a reliable stance is to remember that absolute steadiness is the ideal in view. A cueman when standing as he should to make his stroke is, above all things, firm and steady. Only his cue-arm, lissom and ready to propel his cue should be flexible and ready for the utmost nicety of movement.

As $a$ general rule it will be found that by advancing the left leg and slightly bending the left knee, while the right leg is kept firm and straight, the foundation of a correct stance is assured. The upper part of the body should be bent forwards, the left arm thrown well out and the left hand arched to form a bridge over which the cue slides. The cue butt should he held without force or effort, always learing in mind that the cue is
 to be swung at the hall, not pushed or thrust with a movement having continuous and appreciahle power behind it

To gain impetus for the swing, the cue must be drawn hack-it is sometimes helpful to draw the cue back very slowly indeedbut when the swing forward is marle it should be kept ns llat as is consistent with frecdom, and must be continued until the cue goes clean through the hall in the line of the strake. "Iet the cue do the work," is continually dinned into the cars of pupils by professional teachers of billiards, and is such excellent advice that no progress can be hoped for if it is ignored.

Face the balls when sighting a stroke, and always endeavour to have the cuetip on a line taken from fairly between the eyes when the ball is struck by swinging the cue at it. Never forget the swing-it is all important. In actual hall striking, the first thing to do is to learn to hit the cue-ball truly in its atrikable centre. This is by no incans an easy thing to lo with consistent accuracy, but it must be done, and the best way to master it is by utilising the fami liar one-ball stroke, played by placing the cue-ball on the
 centre-spot of the talk-line and playing it straight over the line of spots.
If struck truly in its centre the ball should rebound straight to its starting point. Mostly, however, it will show a tendency to return to the right, which proves that right-hand side is being imparted unintentionally, a fault which must be rectified. To eliminate any tendency to strike the ball above or below its centre, it is a gooll plan to practise this stroke with the spot-ball, adjusting the spot for each stroke exactly where the cue-tip should
this as merely a preliminary stepto wards higher ilights in the game. Plain ball striking is the backbone of all billiard playing, and no man can make a break of any size unless
impinge on the ball. This one-ball practice is admittedly tiresome, but it ranst be per severed with if real billiards is to be plaved.

The half-ball stroke with the resultant natural angle is the next step, and it is a very big one, towards aptitude at the game. The half-ball stroke is made by directing the centre of the cue-ball towards the extreme edge of the object-ball. It inust be played without the least side on the cue-ball, without strength enough to force the stroke, and with free cueing to impart life and brisk forward rotation to the cue-ball. There are four set positions usually demonstrated as showing the half-ball stroke and the natural angle, but in a strictly scientific sense the angles thus shown differ appreciably. In practical play. however, it is indisputable that the hazards can be scored as described from the following positions

Place the red ball on the centre-spot and the cue-ball $7 \frac{1}{2} \mathrm{in}$. from the centre-spot on the balk line (Fig. 5). Place the red ball on the pyramid spot and the cue-hall rather less than an inch inside either of the spots at the ends of the balk-line (Fig. 6). Place the red hall on the billiard spot and the cue-ball in ine with the shoulder of the middle pocket (lig. 7). Place the red ball on the hilliard spot and the cue-ball in the centre of one of the top pocket openings or on a line a shade nearer the top cushion (Fig. 8). If the halls are placed as directed above, and a half ball stroke played as shown in the dingrams (see p. 99), the losing hazard will always result, and if the strength is correct the red ball will travel as indicated by the dotted line in the diagram and stop in excellent position.

## Hall-Ball Shots the Key Strokes

These four strokes, for open billiards, may be called the key-strokes of the game. Any player who can handle them really well, especially Fig. 5, is well on the way towards cuemanship of no mean order. But unless they are mastered as well as opportunity permits, the making of diflicult strokes at uncertain intervals, or even the making of them fairly frequently, will be of very little use. The plaver who has a sound working knowledge of the half-ball stroke knows what he is doing when he tackles any other st roke on the table. He has a reliable standard of comparison to work by, knowing as he does that a half-ball contact will produce a given result; he can calculate what a contact thicker or finer than half-ball will give him as regards variations from the natural angle.

All this is done, it should he noted, without atriking the cue-ball anywhere except in its centre, and it is altogether wrong to regard


Billiards. Figs. 2 and 3. Two views of a good bridge, Grm, but not rigid, as made by Tom Newman Pliotos. Wriulitson
he has reasonable command of it. It is an left-hand side, the clicek action is at once bination of side and screw are to be avoided if all too common fallacy to imagine that screw apparent With running side the cannon is nnd side arc the things that really matter, scorable, but there is indeed a difference if the stroke is attemp:ed with check side, which illustrates yet another important attribute of side. This is the effect it has after a side-laden ball inipinges on a cushion. At normal pace, if a ball has no side on it, the angles of incidence and retlection are equal when it strikes a cushion and rebounds from it, but running side makes the angle off the cuslion more nbtuse, wider, ns it is called, while check side makes the angle more acute.
Screw may be defined as latent brekward spin. It may bring the cue-ball back as much as 6 ft . or more after full contact with an object ball lying a foot Photo. Wrighteson and that the beautiful simplicity of plain ball or so away. When striking is a mere rudimentary commonulace of no interest.

There are, of course, very many strokes which lie beyond the power of plain ball striking; then, and not till then, does the employment of side, top or screw become neceasary and justifiable. Side is imparted by striking the cue-ball to the right or left of its centre, as the case may be, and is not so much a matter of striking the ball as far aq possible to the right or left, as it is a question of nent and crisp cueing. When putting side on a ball the best results are obtained by keeping the cue-tip on a line struck fairly across the centre of the ball. It is a inistake to put top or hottom on the hall when im. parting side, unless it is done purpozely to combine side with either of these things.

The action of pure side is to take the ball away in the divection of the side imparted, excepting when a ball is moving rather slowly against the nap of the cloth, when the action of side is reversed. Side has a certain amount of effect on the course of a ball before another ball or cushion is struck, but the effect is much more apparent and decided after contact with a ball or cushion, cspecially if force is ueed when a ball is played at and the ball to ball contact is thick. In billiard parlance, mention is often maile of running side, check side, and pucket side. These definitions are apt to confuse the beginner unless clearly explained.

Place the red ball on the billiard spot. the cue-ball on the centre spot of the halk-line and the second-object ball near the left balk pocket (Fig. 9). If a smart half-ball is played on the right of the red with plenty of righthand side on the cue-ball, it will be scen at once how this side helps the run of the ball off the cushions. If the same stroke is tricd with


Billiards : the key strokes Billiards : the key strokes. Fig. 5. Standard half ball shot : cue ball on balk line, object ball on middle spot. Fig. 6. Stanjard balf ball shot ; cue ball on balk line, object ball on pyramid spot. Fig. 7. Standard half ball shot : cue ball in centre of top pocket apening, object ball on billiard spot. Fig. 8. Stanjard hall ball shot : cue ball at shoulder of middle pocket, object ball on billiard spot. ball cannon : cue ball on centre of balk line, object balls on billiard spot near left balk pocket
nbuve its centre is concerned, top helps to casily damaged than is commonly supposed impart life to certain strokes. It is, however, Slate, cloth, rubhcr, wood and a little inetal as well to avoid the use of top whenever are the raw materinls which enter into the possible, as it panders to inaccurate cueing.

Top may be used in conjunction with side. so may screw, and only experiment is of much use in demonstrating the multitude of effects thus to be ohtained. But it cannot be ton of ten repeated that plain ball billinrds comes first, and that intricacies such as the com-


Fig. 8


Fig. making of a billiard table. The nature of these suhstances differs widely, and to fashion and adjust them into a perfect and harmonious whole is no mean feat of craftsmanship. The cloth and cushions are the most sensitive parts. Damp and cold will ruin the beat cushions, so will the player who never uses the rest, but
possible. When employing side or screw it is advisa ble, as a general rule, to use as inuch of either as the cue-power of the individual can impart, obtaining any desired result by varying the strength of stroke and the ball-to-ball contact
1.)rag means striking a ball low with the intention of preventing it from running untruly when it is desired to play a long shot at slowish strength. The cueing is more free than is used for the screw stroke pure and simple, and the stroke, although difficult, is worth practising, especially if the table and balls are short of absolute perfection, as drag helps to minimise such defects. Stun is produced by hold. ing the cue heavily when playing rather full on the object ball; the cue-ball is struck rather helow its centre and can be made to stop dead, when the atmke is known as a stab shot, or it can be made to travel slowly to make a cannon or pocket, usually a cannon. The stun atroke is very useful when it is desired to send the first object-ball a long way and barely move the second object-ball, many pretty gathering cannons being made in this way.
Break-building can be summed up as the art of playing one casy stroke in suc! it manner that another easy one is left : in its highest forms, notably in top-of-the table billiards, it depends upon a sense of touch and insight into the possibilities of the game which amount to a gift. In the ordinary way, however, much can be done if thought is taken before a stroke is made, thought directed towards computing where the balls will be when they stop, usually the last thing the novice troubles about !

Ivory balls of standard size and equal weight are presumed to be in use when playing the strokes mentioned in this article. If composition balls are used, it will be found that the positions will be apt to vary alightly.

BILLIARD TABLE : Its Care. Because of its bulk and size, a billiard table is apt to be regarded as a fixture which cannot very well come to any harm if left alone, or as something atrong enough to stand any treatment short of wilful and malicious damage The truth is that such a table requires constant attention to keep it in good playing condition. and, although far fomm fragile, is inuch more
insists on clambering on the table to reach a shot he cannot get at in the ordinary way.

The table should be brushed frequently, always with the nap of the cloth, and the brushing should be so thorough that the fibres of the brush dig well into the nap and fetch out the chalk and dust ; a perfunctory brushing is very little use. If a cloth is brushed in this manner it does not want ironing half so often as is supposed, especially if $\bar{u}$ duster is wrapped round the brush and the table gone over again after the brushing is completed.

When ironing a billiard table the iron should be hot enough to imon linen, but it is too hot if it leaves the least trace of singeing on are old piece of white rag with which the face of the iron should be cleaned before it is allowed to touch the cloth. The iron should be grasped firmly and run quickly up the centre of the table in a straight line with the nap of the cloth, and the operation completed by taking in successive swathes of cloth until the whole is covered, care being taken not to press the iron needlessly against the cushions, e8jecially when ironing near the pocket openings. Above all, do not iron against the nap of the cloth; one such application of a renlly hot iron spoils the cloth entirely.

When a new cloth has been on for a little time it needs stretching and readjustingalways a job for an expert. This operation throws the original balk-line and spots out of


Bllliard Table, Miniature table, the top of which can be replaced by leaves, thus making a diuing table Pholo. Thurston
place, and they have to be changed accordingly. Banging a ball on a spot is bad for both the ball and the cloth, and slould be sternly discouraged
BILL OF SALE. A bill of sale is a document whereby personal goods are tiane ferred or else mortgaged, and is commonly used by people who wish to horrow monev on their furniture. A mortgage bill of rale must be in a particular form and registered.
The creditor can only seize the goods for one (or more) of the following canses: (l.) default in payment of principal or interest : (2) bankruptcy of the debtor; (3) if thic debtor fraudulently removes the goorls; (4) fails to produce his last receipt for rent ; or (5) suffers an execution to be levied on the goods

A mortgage bill of sale cannot be giren for less than f30. It can only be given by the true owner of the chattels

BINDING: How to Apply. Seam edges are sometimes finished with a special tape binding to neaten, and edges of garments are hound with braid, self-material, or a contrasting coloured fabric, as a decorative trimming. In other cases two edgen or ends are bound together to secure them, e.g. the $t$ wo ends of a wire sewn to the outer edge of a lampshade, etc., and set to a certain shape. Here the binding is done by lapping the ends of the wire a few inches, then tivisting a strip, of muslin round and round until both ends are hidden (Fig. 1), fastening off with a few stitches. Another method is to fold a long strip lengthwise, and to slip the wire up into the fold, then to sew along within the edges
To bind seams, place the binding along the raw edge of the seam, so that half its width lies
over the material and half extends beyond the rair edge; then hem or run the lapped edge of the binding down, after whioh turn the


Binding. Diagrams showing how braid of other material should be applied for binding purpnges
remaining or unattached edge over to the other side of the seam turning, and hem down (Fig. 2) so that the turning is sandwiched between. In using braid, sewing-silk of the same colour as the braid should be employed, and the running or hemming stitches should not be made tightly enough to indent the braid If the loraid is to be taken round a corner, it should be set in a mitre (Fig. 3), or if along a curve, the ting cotton thread gencrally woven into each edge of thic braid ahould be pulled up to make the requisite shape.

If a very narrow binding is required, nnother method is followed. The braid is set over the right side of garment, so that none of it extends beyond the edge, but so that the outer edge of braid comes level witl. garment edge, after which it is stitched on within these onter edges (Fig 4). The remaining or unattached edge of braid is then turncd over to the wrong side of garment and hemmed.

If the edge of a dress, elc., is to be bound with strips of self or contrasting coloured matcrial, the strijs inust be cut off on the cross, and joined to the required length. The joins inust come on the straight of the grain, so that the ends of the strips will be necessarily slantwise and the joins corresponding. To do the hinding, follow the second method explained for braid binding, and illustrated in Fig. 4, though in this case, if any curve is to be bound, the strip, being out on the oross, can be st retched to the deaired sliape, and need not be drawn up. In binding, carefully note that no part of the garment edge which comes on the cross is stretched in the process. After binding press well. Sec Bookbinding.
BINDING COURSE. In brickivork this is the name given to a row of bricks set acroas an inner and an outer course to bind them together. See Architecture ; Bond; Brick; Building.
BINDWEED. 'Two plants bear the name of bindweed or bearbind, Calystegia sepium and Convolvulus arvensis, and both are very pretty, hut if once they get out of hand they become weeds of the woist type. The safest means of extirpation is to dig them up by the roots, which usually extend for a considerable distance horizontally undergiound.

BIRCR. The silver birch, Betula alba, so called be cause of its shiny white bark, is a most graceful and ornamental tree that flourishes best in light soil. It is a beautiful lawn tree. Planting may be done from Nov. to March inclusive. The birch is raised from seed which is sown as soon as it is ripe or in spring.


BIRCH: In Furniture Making. The wood of the birch is one of the cheaper hardwoods, used for much the sainc purposes as beech. It is a light brown in colour, closegrained, sometimes with a figure similar to maliogany, and is uften stained to resemble that wood. Birch is easy to work, and has a smooth surface with a rather lustrous appearance. It is used for bedroom furnituro and frames of chairs and couches, turned articles, lirush heads, casks and tubs, handrails, and dowel rod Plywood is often made of layers of biroh, and in this form it is-used for chair seats, vehicle hodies, as well as for panels for various purposes.
Birch dowel rod is sold at most hardware and general stores, and by timber dealers, in lengths of 3 ft . and upwards. Diametera are from ${ }^{3} 0$ in to $\frac{7}{4}$ in., the most useful size being about $\frac{1}{2}$ in. Cabinet-matiers use it for dowelling the frames of chairs and other articles, as an alternative to making mortise and tenon joints. For this purpose it is used in short pieces, thesc usually not exceeding 3 in. or 4 in . long. See Wood

BIRCE TAR. Tarry oil obtained from a birch, the Betula alba, and known as birch tar, is used as an application in skin diseases associated with itching, e.g. chilblains, cczenia, or psoriasis. It should not he used if the skin is acutely inflamed and moist. A useful combination is birch tar, 1 dram; zine oxide. $2 \frac{1}{2}$ drams: vaseline, 5 drams. See Chilblain

BIRD BATE. Onc of these shallow stonc basins may be put in an open space in the garden to provide water for hirds Some

are fashioned like miniature fish-ponds, ahout 2-:3 ft. across and $2-: 3$ in deep, but $n$ more useful kind stands on a pedestal, and the hirds are thus protected from cats. One of these makes an effective centre for a small lawn. It is cheaper and lese difficult to erect than a sundial, as it only needs to be kept full of fresh water. If the basin is a large one, it may have a rnised stone in the centie as an additional perching ground for the bircls.
BIRD CAGE. The designs and types of birdcages are imnumerable, but they all naturally divide themselves into two types, viz all-wire cages, with which must be grouped cnges of light wood framing and open wirework all round, and hox cages.

The danger of the all wire cuge lies chielly in the fact that cold wind or draught can pass through
it. and if this cage is placed in $n$ window it becomes a death-trap for even the most hardy species of birds. This danger ean be eliminated by placing the cage against a wall, and in such a position that no current of air can pass through it from end to end. If it must stand in $\pi$ window, then the only sale procedure is to surround it on three sides with clear glase The screen must be the full height of the cage, and be placed hetween the cage and the window. Thus an all-wire cage can be made n safe habitation for all specics of birds.

The hest cage is of the box type. Every cage, whether its materials be of wood or metal, should be fitted with a inetal draw tray for cleaning convenience, and the fond receptacles ought to be so placed as to be easy of access both to the hirds and their owner.

As to the size of the cage, it must be sufficient to allow the occupant to move about and perch without fraying or otherwise damaging its plumage. It must he large enough for the hird to turn about without bending its tail feathers, and the perches so placed that its head does not rub agninst the top of the cage or its tail come in contact with the floor of the cage. A small active, vivacious bird no larger than a wren often needs a larger cage than one four tinea its size. It is an indisputable fact that to put such a bird in a cage in which it ean


Bird Cage London breeding cage containing a separate compartment and rest for the birds on right Courlesy of J. J. 7 liomas $\mathbb{\&}$ Co., Lid.
merely hop and not mose about freely is to rob it of any chance of a long or happy and contented life. Many species of birds become corpulent and fall into ill-health if they cannot take some wing exercise.

For canary fanciers both type and size of cage are regulated by the governing bodly of each variety. For other apecies the cages are invariably of the box-type, and the novice exhibitor had better leave himself in the handw of the cage-maker.

Of parrot cages there are threc types-round. square, and rectangular. The rectangular is too large for the average romm, and of the two former the square is the better, as a cage of 2 ft . sq. contains more space than one of 2 ft . diameter.

Cages should have a spring and autumn clean, when they need to be scalded with some insecticide solution, dried, distempered inside, and the exterior re-stained. See Aviary; Canary ; Parrot.

BIRD CRERRY. This is a name sometimes given to ornamental flowering cherries. The botanical name of the tree is Prunus padus. A native of Britain as well as of Manchuria, it is a hardy, May-flowering tree, often attaining a height of forty to fift! feet. The flowers take the form of pendulous racemes six inches in length, and are white or pink.

## BIRDLIME.

 Made in Japan from the bark of the holly, birillime is the chief ingredient in fly-papers and fly-strings, and is also used for spreading on boards to traj mice and rats. Artificial birdlime for the same purposer is inade by melt. ing together boilet! linseed oil, 6 oz.; gum thus, 1 oz. ; and castor oil, 2 oz. This is npplied. while still warm, by means of $n$The bird cherry thrives in ordinary loam, 2 in long by $\frac{1}{2} \mathrm{in}$. diameter, having slots 1 in and is best gown as a specimen tree on a lawn, long to receive the sails, and bored 1 in. into or grouped in park or woodland. It is rather the stock. This method of fixing the sails allows too vigorous a subject for the ordinary garden. of their being easily set on the angle to catch stiff brush. See $1 \cdot 1 y$-paper.

BIRD LOUSE. Bird lice are unrelated to the true lice, ind are more of the nature of scavengers, feeding upon scurf, skin secretions, hair and feathers. They are amall, flat, wingless insects of the order Platyptera, and have makean armed with shorp They affect domestic poultry and pigeons chiefly. The egge are attached securely to the hairs or feathers Where they causc annoyance to pets, finely powdered sulphur or insect powder should be blown into the pluminge.

BIRD SCARER. The scarer shown in Fig. 1 is driven by a windmill, which revolves a rod, and causes Lwo metal plates to clap together. The post and arm, Fig. 2, are $1 \frac{1}{2}$ in. square, half. Inpped and screwed together, the post being pointed for fixing in the ground The windmill is attached to a hardwood rod, Fig. 3, which is $13 \frac{1}{2}$ in. long over all by $d$ in. diameter, working through $n$ hole in the post bored in the position ahown at Fig. 2. The stock of the windmill. Fig. 4, is 3 in . in dinmeter by $1 \frac{1}{2} \mathrm{in}$. thick, with a $\frac{1}{2} \mathrm{in}$ hole in the centre to fit the irod.

The six sails, Fig. 5, are 6 in . long by 3 in . wide at the ends, tapering to $\frac{1}{2}$ in., by about $\frac{1}{3}$ in. thick. They are fitted to dowels, Fig. 6 .


Bird Cherry. Sprays of banging blooms of the ornamental flowering cherry the wind from whichever direction it may happen to be blowing.
'Two round fixing blocks, Fig. 7, are required to adjust the rod to its correct working bearing in the poat. The blocks arc $1 \frac{1}{2}$ in. in diameter by 1 in . thick, having $\frac{1}{2}$ in holes in the centre to fit the rod, while a small loole bored from the circumference to the centre admits of $a$ small pin being driven through and into the rod when the blocks are finally adjusted. The metal plates are 4 in. by 2 in. by about $\frac{1}{16}$ in. thick. The plate on the arm is attached with two wire staples, while that on the rod is fixed by making a save cut in the rod and driving two small screws, as illustrated in the diagram, Fig. 8. See Scarecrow.
BIRD SEED. The principal seeds used as food for cage birds are canary, flax. hemp,
millet and raje. The first named is the flattenerl yellow sced of canary grass; flax or linscerl is also compressed, but smaller and hrown in colour, and produced by the common flax Millet is the round, hard seed of Sorghum vulgare, the guinea corn ; hemp, the large. roundish grey seed of Cannabis antiva; and rape is the dark shot-like seed of $\pi$ variety of the turnip. To these miny be added the seed spikes of the plantain obtainable from any plot of waste ground; and for the larger birds tares, Indian corn, and the seeds of sunllower. Seedheads of thistles are appreciated by some finches, who pick the scedsfrom the thistle heads with avidity. See Aviary; Canary; Parint.

BIRDS' EGGS. In making a collection of birds' eggs the first thing to do is to acquire some practice in the handling and preparation of the specimens, in order to avoid spoiling them and thus taking eggs wastefully.

The easiest and simplest way to blow an egg is to make a hole in each end with a pin and then blow out the contents with one's mouth This metlod may be tried on the common egga till one is sure of holding the egg so judiciously as to cscape breatiage. A drill and blowpipe should then be got from a dealer in natural history requisites, and some egga blown by the proper method of making a neat round hole in the centre of one side, and expelling the contents through this alone. In both methorls a pin should be inserted to break up the yolk before the blowing process is begun. If an egg is hard-set, the embryo bird should be snipped to pieces with a pair of fine scissors, and the bits withdrawn with a pair of fine-pointed forceps, but the taking of such eggs should be avoided wherever possible.

When cleared, the eggs should be thoroughly washed out with water injected by means of $a$ fountain-pen filler or similar instrument; carc should he taken to a void wetting the egg more than can be helped After washing out, the hole or holes in the egg should be closed by gunmming a tiny disk of paper over the opening; the egg is now ready for the cabinet, and should on no account be varnished. Neither should the eggs be gummed on a card or strung on strings, as is sometimes done. The eggs of some water-hirds have a chalky coating, and this should not be scraped off

For keeping eggs till one has a cabinet ready, chip lill-hoxes bedded with any soft matcrial
will do; each egg should be marked with a number with a fine pen and marking ink, and the numbers should be entored in a notebook with the name and any other particulars opposite. For exhibition in a proper cabinet, the best bedding is black cotton-wool ; the name labels can be gummed on to the edges of the partitions. Jucks' eggs should the bedded on a little of the down with which the bird lines the nest, since this down differs according to the species of duck, and is a considerable help to identilication.

## Identification of Birds' Egrs

Practice in the blowing of large eggo like these should be obtained with the eggs of ordinary ducks and of fowls. In the case of large eggs it is often only convenient to exhibit one, and indeed to take only one egg from a nest is a good rule in the case of most birds. It is the taking of the whole set, and the accumulation of numerous sets of the same species, regardless of its scarcity, that has brought egg. collecting into disrepute.
In order to be sure of the name of an egg one must not take it till one has seen the birds, or one of the birds, to which the nest belongs. As often as not an egg cannot be identified apart from its producer by a beginner, and even the expert may be unable to distinguish between the eggs of some species. This is most often the case when the birds are nearly related; thus, the eggs of the various tits are often very hard to distinguish.

Sometimes the egge of quite different hirds may be alike, as in the case of the sedge-warbler-and the yellow wagtail. In this case, however, the nest is some help, for that of the sedge-warbler is constiucted in the bushes, while the yellow wagtail's is a rough affair built on the ground among the grass.

## Birds' EgGS: A Cabinet for Collectors

How to Make a Compact Set of Airtight Drawers The woodworking enthusiast who is also a naturalist will readily adapt this design to other collections,
such os Buttertics. Information about similar hobbies will te tound under rlowers; Shells, etc.

The cabinet shown in the diagrams in this and the next page measures 3 ft . $0 \frac{1}{2}$ in. wide ly 1 ft . $6 \frac{1}{2} \mathrm{in}$. deep over the carcass. The total height is 3 ft . 2 in . There are 30 drawers. The cabinet is adaptable, with little alteration, to the needs of the collector of butterflies or other natural history objects.
The cabinet is of solid mahogany through out, with veneered door panels and end panels. For the drawers, which call for most careful and exact workmanship, a perfectly sound and well-seasoned hardwood is cssential. The cabinet has no ornamental features. The top is moulded and the ends (like the doors) are panelled. In Figs. 1 and 2 are shown respectively the front and end elevation; whilst Fig. 3 shows a front view with the doors removed.
The carcass consists of two $Z_{6}$ in. framed ends (for section see Fig. 7, A), to which the carcass top and bottom are dovetailed (Fig. 4). The ends are rebated to take the framed back. The $\frac{z}{z}$ in. central gable is fixed by grooving to the top and bottom. Half-way up are the stiffening shelves (solid shelves, not merely rails), $\frac{8}{8}$. or $\frac{1}{2} \mathrm{in}$. thich, grooved to the middle and end gables. In each case the grooves will be stopped hack a little from the front to mask the joints.
The top is shown in Figs. 5 and 6. It is 19 in . deep, made up of a solid $\frac{1}{2}$ in. top and a moulded and mitred $\frac{\xi}{} \mathrm{in}$. by 2 in . slip below.

The base in dovetailed together, and faced up with $\downarrow$ in. lengths. Stout angle blocks are glued and screwed on to take circular toes $3_{\frac{1}{2}} \mathrm{in}$. in diameter by $\frac{7}{8}$ in. thick, which are screwed on from below. The base mould is shown in Fig. 5.

The doors are framed up of $2 \frac{6}{8} \mathrm{in}$. by $\frac{z}{8} \mathrm{in}$. atiles and rails, sections being shown at Figs. 5

The thrush's nest in very characteristic with its plain hard lining of mud-plaster: but though the bright bluc eggs, with their fow and distinct black spots, s.o very different from those laid by any other bird which nests here, they are not always true to type, and in rare cases may lie marked with brown instend of black, or even be plain blue altogether.
The thrush and robin are the two birds most likely to be found breeding early in the year, but, generally spreaking, it is not of much use to look for eggs till March, and the great months for eggs are April, May, and June. After that, although many birds breed a second or even a thind time in the year, the supply of eggs rapidly falls off.

Before setting out to search for cggs one should find out which birds are protected by law, and the particular regulations applying in the locality.

It is a mistake to think that one will always find the nests in the most out-of-the-way places: birds often nest in a frequented spot, and in a wood, for instance, the nests are more likely to be found along the pathways than right in the depths of the thicket. Birds which build in holes are often careless of observation, and less inclined to secrecy than thoso which build among the boughs. and twigs.

Birds which build high up are also less secretive than those which build low down, and the hardest of all nests to find are those of birds which nest on the ground.

In searching for nests which require climbing to reach them, it is always best for two people to go together. Assistance may be required, and someone will thus be at hand in case of an accident. The eggs of many cliff-building sea birds, indeed, are not to be got by any ordinary amateur, and must be obtained from men who make it their special business to collect then.
tillets are fixed to both faces of the central gable as well as to the ends, and all are stopped back about 14 in . to correspond with the drawer grooves.
The back is framed in the manner indicated nt Fig. \& The necessary brass fittings consist of two pairs of strong brass butts, two flush bolts for left-hand door, lock, and two drop, handles.

The drawers are so constructed as to be virtually airtight. Everything depends first, on accuracy in setting out, and secondly, on exactness in construction. The drawers are 17 in wide, 16 in. from front to back (not including knobs), and 2 in . deep outside. A part side view is given in Fig. 8, sections in Figs. 9 and 10, a part top view in Fig. 11, and details of the disinfectant reservoir in Fig. 12. Tho drawer in reality is a box with a framed lift-up glass top. There is no space between the drawers. There is a scratched bead, which will be seen in the sections. Figs. 8 and 9 . The drawers, by means of their side grooves, run on the iillets already described, and the lift-up glass tops are hilden by the fronts when the drawers are shut. The details and sections here given are drawn half size.
The drawer fronts (Fig. 9) are 17 in. long, 2 in. deep, and $\frac{5}{8}$ in. thick. On the top, at A, a tiny V-groove is run, and at $B$ there is a Hat lead. looth of these features heing simply finishing touches. If Fig. 8 is examined in conjunction with Fig. 9 it will be observed that the lift-up top comes flush with the top of the drawer front.

## How the Cabinet is Kept Airtight

The inside of the front is rebated to receive the top, a rounded fillet, $C$, being carefully worked right along to engage with a corresponding groove, $\mathbf{E}$, run in the top frame. These rounded fillets keep the top practically airtight when on, and must be neatly initred at the corners. About $\frac{1}{i n}$. from the lower end a groove is run to take the $\frac{3}{3}$ in. bottom of drawer. The fronts are dovetailed to the sides as in Fig. 8. The drawer sides are shown here as if $\frac{8}{8}$ in. thick, but in the actual cabinet under consideration they are only 8 in. They are slightly narrower in widtl/ than the fronts, as the top comes right down upon them Fig. 10 shows a scction through the sides. The top edge is finished with a rounded bead gables, so that access to the drawers is easy. The rails are shouldered and tenoned as indicated by dotted lines at Fig. 4. The astragal is shown at $A$ and B, Fig. 5. Note should be taken of the section at $A$, and also of the detail at B, which indicates the stopped bead at the ends. The ends of the cabinet are framed and panelled to appear like the doors. As, however, the inside faces have to lse fitted with narrow fillets on which the drawers run, the panels arc flush with the stiles and rails at the back, as Fig. 7, A

At Fig. 7 is also shown a sketch of the lillets. A reference to Figs. 8 and 10 will show that grooves are run in the drawer sides to engage on the fillets, and as the comfort of using such a cabinet depends largaly on the easy running of the drawers, there must be absolute accuracy in the fixing of these fillets.

Their positions should be accurately marked, and, for preference, shallow grooves should be run in the gables to receive them. In the case of the present cabinet the drawer grooves are ${ }_{10}^{3} \mathrm{in}$. by $\mathrm{i}^{3} \mathrm{in}$., and thus the tillets will project $\mathrm{in}^{3} \mathrm{in}$. by ${ }^{3} \mathrm{i}$ in. to engage with the grooves. If hedded in the gables they may be cut ift in. Wide by $\mathrm{I}^{3}$ in. deep Of course,
 elevations and sectional and other details of construction
exactly similar to that on the front; in this case, however, it is easier to work as there is no rehate.
The groove by means of which the drawer alides is shown at $F$ in the section, Fig. 10. The groove, which may he $\frac{3}{} \mathrm{i} \mathrm{in}$. wide by $\mathrm{i}_{6} \mathrm{in}$. decp, runs to the back of the drawer. hat is
stopped $\frac{8}{8}$ in from the front The greatest care must be taken to sct out these grooves accurately, and to cut thom clean and sharp. The slightest error will cause the drawer to stick, and if force is required to open or close it the gable fillets will soon wear. Like the front, the sides will be grooved in order lo take the drawer botton
Two thumb. slots (shown in Fig. 8) are worked to the top edge of each side, so that pressure with the linger may be exercised on the lift-up lid to remove it. A section is shown. The back is shown in rection in Fig. 9. It also may be ? ${ }^{3}$ in thick, with rounded fillet, C. It is dovetailed to the sides as in. dicated in Fig. 8. The bottom mny be $3^{3}$ in thick, of sound wood. It is slid from the back into the gronves cut in sides and front to receive it. To the back it is firmly bradded to prevent its working loose

In Fig. 3 the two middle drawers are shown slightly deeper than the others. The nctual drawers are no decper, but the front is taken down half an inch to hide the edge of the stiffening shelf, which is set back ahout $\ddagger \mathrm{in}$. from the front edge of the gable-ends and centre parti-
 tion.

All draw. ery, with their lids, should lve numbered, so that each may be kept in its phoper place. Preferably, tohc numbers of
Fig. 12. Details of she disinfectant the draivers sich is placed in the front should be
side of drawer
stamped on drawer front and on the the top edge of drawer fro
under front edge of lid frame.
The lift-up top is a frame which fits closely on the drawer. It is shown (in section) separately in Fig. 9 and in position in Fig. 10. It engages in thirec distinct ways: first, the front edge of frame fits into the rebate cut in the drawer front; secondly, the groove, E, fits on the rounded lillet, $C$; and thirdly, the projecting bead, $D$, fits exactly within the four sides of the drawer
The frame sides are only $\frac{1}{2} \mathrm{in}$. wide by $\frac{3}{3}$ in thick. Thus the wood used inust be in perfect condition. The inner top cdge is slightly chamfered, and the lower edge is run with a U-shaped groove, E, to fit the rounded fillet, C, formed on the draver sides, front and back. A rebate is cut to receive a pane of medium heavy sheet glass, and the frame is mitred at the corners and keyed as shown in the inset sketch at Fig. 11. (The mitre key is also shown in Fig. 8.) The glass, which must fit closely, is held by a fine bead, $D$, which projects as shown to fit inside the drawer. This bead must be securely glued in.
BIRTH. The birth of every child, whether horn alive or still-horn, in ust he registered at the local registry within 42 days in England and 21 days in Scotland. A child must be
registered loy the father (i) the child is legiti mate) or the mother: failing them by the occupier of the house where the child is born, or by any person present at the birth. The father may register an illegitimate child and give it his own name. The cost of a birth certificate is 2 s lid In the case of a foundling information must lie given to the registrar. The name may be altered with. in 12 months (Scotland, 6 monthis) of the registration. birth.

BIRTHDAY. Most people think that a person born onthe 3oth of June, 1900, would come of age on the 30 th of June, 192l. The person in question comes of age on the $29 t h$ of June, 1921 , because that is the day on which he returlly completes 21 years. And as the law takes no notice, as a rule, of fractions of a day, it does not matter at what hour on the 30th of June, 1900, he was born. He is 21 and of full age at the very tirst moment of the 29th of June, 1921.

BIRTHMARK. Angiomata, naevi, or port wine marks are masses of dilated blood-vessels slightly raised on the skin, scalp, lips, etc. Moles may be flat, but are usially somewhat raised above the skin. Common sites are at the side of the nose or on the check on the line between the angle of the mouth and the opening of the ear.
The treatment is best left to $a$ doctor, as some of the conditions require excision, liquid air, or electrolysis, whilc others are treated by radium and carbonic acid snow. It is never safe to irritate moles by the use of caustics or otherwise.
BISCUIT : How to Make at Home. All flat bread that is baked until it is crisp may be called biscuit, but as a rule the word is uscd for the two principal sorts, referred to as soft and hard biscuits. The soft variety is easier to make at home. To ensure crispness the dough should be thin. It is difficult to keep it of equal thickness, so have two strips made of hardwood that does not readily warp-say, mahogan $y$-and when the rolling of the sheet of dough is nearly finished, the two strips of wood are placed one on cach side of the sheet, and near enough toget her 10 support the ends of the rolling-pin. The pieces of wood are made of a thickness the biscuits are intended to bealout $\frac{1}{\frac{1}{8}}$ in. The whole shect is then easily liept of one thickness, and the biscuits are not so readily burned.

Rich biscuits need no rerating ngents; they are made short with butter or other fat, and bound together with eggs. Those with less shortening, and made into dough with milk, have usually chemical aerating agents inixed with the flour, or self-raising flour may be used. Biscuits should be baked on a shelf near the top of the oven, so that they may colour.

A rolling-pin about $1 \frac{2}{2} \mathrm{in}$. in diameter, 16 in. long, and the same thickness throughout, is better than the ordinary kitchen moller with handles. A variety of cutters can be made from oval and oblong inustard and other tins; sll that is necessary is to pierce a hole in the bottoin to let in nir. A soft broad brush
should be kept for washing over with n glaze of egg added to twice its volume of inilk A fork serves for pricking, or a little docker. with the spikes equidistant.

Wholemeal Biscuits. Into lf lb. medium fine wholemeal mix $\frac{1}{f}$ oz. bicarbonatc of sods and $\frac{1}{2}$ oz. cream of tartar. Rub into this 4 oz. good margarine, or half margarine and half butter. The meal is then placed in a basin, and at once mixed into dough with about $\frac{1}{2}$ pint milk, in which 4 oz. sugar has been dissolved. The dough should bo stiff and yet easy to handle. Turn on to $n$ board dusted with meal, and roll out in sheets $f$ in. thick. Usc only a small piece of dough each time The baking-sheets require no grease, nor do the biscuits need pricking They bake in a hot oven in ahou 12 min . and if cooked should feel hard when pressed.
l3y using half the amount of flour, 3 lb . medium oatment, and more milk, oatmeal biscuits could he inade from the asme recipe.
Short Biscuits. Sift $\frac{1}{2} \mathrm{lb}$. flour-all ordinary llour or half ground rice or cornflourand rub into it 4 oz . butter or margarine. Mix in 2 oz. white sugar, turn out the whole on a floured board, and mould to a paste. When well worked together so that it does not crumble roll out thinly and cut into fancy shapes Put a piece of almond, angelica, cherry or candied peel on the top, and bake in a slow oven until lightly brownerl. Do not attempt to remove from tin until cold
BISCUIT WARE. The term denotes pottery which has been fired without or before being glazed. It includes unglazed ston ewarc. black Egyptian, terra-cottr, and Wedgwood jasper. China collectors prize certain fainous and beautiful biscuit groups made at Sóvres, as well as those modelled in the Derby factory, capecially between 1790 and 1810 .

These figures, which have the feel of new clay tohacco-pipes, sometimes with a slight translucent glaze, include groups suggested by Angelica Kauffann's drawings, rustic figures and scenes, Derby medallion portraits of British generals and admirals, besides small mound or oval plaques of Bristol make. After the best period the secret of making biscuit ware was lost, and a long interval intervened before Parian ware took its place.

Pieces ought to be dusted with clean cloths. and washed in clean water, otherwise the unglazed surface may become ameared or discoloured. See China

BISMUTH. The various compounds of bismuth have an antiseptic, astringent, and sedative action. Those most commonly used in medicine are bismuth oxide, bismuth carbonate, bismuth subnitratc, bismuth salicylate. the duse of each being $5-20$ grains; the liquor of bismuth, dose 1 dram; and the compound bismuth lozenges All these are used in irritable and inflamed states of the stomach and howels, and relicue the pain, vomiting, and diarrhoea.

Bismuth carbonate is perhaps the best of the preparations, as it relieves acidity. For indigestion, a useful combination is bismuth carbonate, grains 10 ; magnesium carbonate, grains 20 ; and bicarbonate of sorla, grains 20. 'I'his can be taken in milk or in sods-water, three times a day, half an hour after meals.

BISQUE SOUP. A shredded onion and a piece of cucumber are fried in a tablespoonful of butter and added to a quart of fish stock, the whole being seasoned with salt and pepper and cooked until the vegetables are tender. Then the yolks of two eggs arc heaten into $\$$ pint cream and added. 'The soup should not be allowed to boil, but stirred thoroughly until it thickens, when it is ready to serve Ilavoured with anchovy sauce. See Soup.

BIT : For Driving. A bit is the mouthpiece of $n$ bridle carried by the horse in its mouth so that the driver may cause it to oley his will.

It is usually of metal, and both the cheek atraps and the reins are attached to it. A curb bit has a curb chnin instead of a bar, and zives the driver a atrong leverage by enabling him to compress the horse's mouth. A snaffle hit is joined in the centre, and is usually provided with check pieces so that the reins may not go into the horse's mouth. See Driving: Harness; Reins.
BIT : For Wood and Metal. Small steel cutting tools or bits are used for horing wond or metal; they are rotated by means of the brace or stock, into which their squame tapered ends are fitted Of many patterns designed to suit all kinds of boring work the most useful are the following :
Auger bits, Fig. I, for deep horing, are made with a long shank, a twist, and a head. The latter has two spurs uhich dcfine the size of the hole, two cutters which remove the wood and place it so that the trist draws it up, and a screw which draws the bit into the wood. Sizes range from if to 1 it in .


Bit. Figs. 1-8. Bits of patterns in common use. Figs. 9 and 10 . Expansion bit and extra

Centre bits, Fig. 2, for shallow boring are made with a central prong, a apur, nad a cutter which acts as a lifter or lip to carry off the shaving. They are mado from $\ddagger$ in. to $1 \frac{1}{2} \mathrm{in}$. in diameter.
Countersink bitw are employed for boring conical depressions to allow screw-heads to he turned in flush. 'There are three kinds in ordinary une. The tlat bit, Fig. 3, hnving two inclined erges ground to opposito anglea, is mainly used for iron and for enlarging the holes ill hinges, etc. The rosehead bit, Fig. 4, is for brass, but is useful for hardwood: it has a conical head with edges which may be sharpened on astone. The snail-head, Fig. $\overline{\text { on}}$, for soft woods, is conical, with one side cutter.
Nose hits, Fig. 6, are for end grain ; they are hollow in the shank, with a cent reing projec tion at the point, and range from in. to $\frac{1}{2}$ in. in diameter. Shell hits are similar in shape, hut have a plain rounded end. They are bandy for cruss-grain boring where deep holes are required. Spoon hita, also similar in form, have a pointed end.
Twist or gimlet bits, Fig. 7, are for hardwoods : they have a gimlet point and are out on the curved sides of the shank. They are difficult to sharpen. Sizes range from质 in to in .
Turnscrew or screwdriver bita, Fig. 8, are used in thuse cases where a large number of screws have to be driven

Expansive or expanding bits are intended for horing shallow holes up to ahout 3 in . in diameter. They have a fixed screw-head and an adjustable spur and cutter. In Figs. 9 and 10 are shown Clarke's patent expansion bit and the extra routing cutter for obtaining large diameters.
A type of hit having practically no centre point is Forstner's auger bit, a splendid tool for horing away the groundwork for carved panels, etc Bits should be kept cither in a wooden atand, with the shanks fitting in $a$ tapered hole, or in a canvas or baize roll. Soldering bits are described under the lieading soldering. See Brace; Drill; Soldering.

BITE: Of an Animal, A lite is likely to produce a poisoned wound, or, at any rate, should always be treated as such. Blceding should be encouraged for a short time, imless it is too free, and the wound should be washed out with an antiseptic lotion, such as saturated solution of boracic acid, carbolic acid lotion (1 in ( 0 ), or a solution of permanganate of potash. If the bite is a severe one, ra by a hoise, the treatment will have to include that for shockwarmth and stimulants, hot coffee, spirits in water, or a teuspoonful of sal volatile in water.
In the case of a dog bite a ligature should be fastened on the limh (if the bite occurs on one), and this is done by tying a handkerchief round the limb, passing a piece of stick through it, and twisting the ligature tight. This can be left on for half an hour if necessary. Inmmediately the ligature is applied, or at once in hites on other parts, the wound should be sucked. There is no risk in doing this if the lips and mouth are free from abrasions. The mouth should be rinsed out with water or apirits after the operation is completed. A piece of boracic lint or a clean rag wrung out of horacic or carbolic solution is then applied. The doctor will have been sent for, of course, and may decide on further measures. The anxiety in dog bite is whether or not the animal is suffering from hydro. phobia, though, of course, one may be bitten by other animals or even by human beings suffering from hydrophobin. Therefore the dog should not be destroyed until suflicient observation of its condition can be made.
In Great Britain the only snake whose bite need be considered is the adder or viper, and the bite is rarely dangerous except in the case of children and debilitated persons.

Where insect bites or stings have occurred the sting or atings should be searched for and treatment applied as given under Bee Sting. See Adder Bito: Bee Sting; Frost-bite : Hydrophobia; Sting.

BITTER ALMOND. The skins are rough and indigestible, so they should always be removed by blanching. Bitter almonda contain a substance called amygdalin, one clement of which is prussic acid. Therefore, though useful for pounding with sweet almonds, or as a flavouring, they should be used in moderation. See Almond

## Bitter Apple. See Colocynth.

BITTER PIT. The name is given to a disease of ripening apples, npparently not caused directly by fungus or insects, but physinlogical and due to some weakness in the tree. It is so named from depressions in the skin of the fruit, which correspond with brown spots in the underlying flesh. The tissues of the apple are stored with starch, which during the ripening process is changed into sugar. In fruit suffering from bitter pit it is found that the starch of the brown spots remains unchanged and bitter to the taste, whilst the surrounding white flesh has become sugary. At present no cure is indicated, but the trouble is less likely to occur if the trees are lightly pruned and planted in well cultivated and adequately drained land See Apple.

BITTERS. Various kinds of bitters, including Angostura, Khoosh, orange, and peach, are made by cordial compounders, and taken with sherry, gin, etc., as an appetiser. Bitters can also be made at home. One recipe requires a bottle of orange wine, a quartern of proof apirit, and 2 oz . of bitter orange peel. The latter should be steeped in the spirits for a weck or 10 days, and then run off. The spirits are then mixed with the wine, and the litters are niade.
BLACK : The Dye. There is not one black, but many, and lyers of fabrics are able to offer several shades of black, more or less blue, full or reddish. Comparison of blacks should be made not merely by looking downwards at the samples but by holding the patterns up to the light at eye-level, when the difference of tone is much more apparent. Blacks of the same shade look different when they are dyed upon a shiny or a matt surface.
There should be no difficulty in olstaining permanent blacks. auch as will not turn rusty in wear. On cottons the fastest black is an aniline dye.
Linen dyes back with difficulty, but silks, natural and artificial, are satisfactory. Professional garment dyers have the neans of making a better job than can be turned out at home, but facled blacks can be improved by re-dyeing with home dyes.
BLACK-AND-TAN. This neat-looking, short-coated terrier, also known as the Manohester ierrier, is a good house-dog. Quiet and alert, he is always ready for a romp with the oliildren. He is, moreover, a good ratter.
The head is long and wedgo-shaped, with tapering jaws, small bright eyes and n black nose. Jet-black is the predominant colour, picked out sharply here and there with rich tan. The muzzle, lower jaw and throat, a spot on each cheek and over each eye should le tan; so should the front legs below the knees, but the hind legs should have tan on their inner side only. The same colour marks the under side of the tail, the vent, and there is a touch of it on each side of the chest.


Black-and-tan Torries. Specimen of the mlniature variety of this short-coated breed of dog

The weight varies from 10 lb . to 20 Jb ., but there is also a toy race which does not oxceed 7 lb . Sce Dog; Terrier.

Black Beetle. This is an incorrect nume commonly applied to the cockroach, whioh is not a beetle. See Cockronch.

BLACKBERRY. The cultivated varieties of blackberry are rarely superior to the best of the wild brambles in Havour, but they produce much larger fruit, ripening in September and Octoler. The parsley-leaved blackberry is one of the best for gardena The best of the newer ones are Edward

Langley, Pollards, Best of All, and Himalayan Giant. All Hourish in ordinary soil that has been dug and manured. The latest novelty is a white blackberry which was found growing wild in Bedfordshire and is available for cultivation in garclens.
Blackberries are readily propagated by pegging down the tops of canes, or roots arc thrown out freely, and when they are abundant the tips can be cut away and the parent liberated. They succeed on arches, trellises and frameworks of stout stakes.

The principal difficulty is to get the plants established, and severc pruning is required. It should begin with the planting, and consists in cutting whatever canes the plants may be carrying close to the ground. The canes will bear a large number of strong laterals if they are stopped when they have grown to about half their normal height, say, 3 ft . The laterals may be pinched at the foot. This treatment dwarfs the plants, which may be convenient in some gardens, and as a rule it gives very good crops of fruit. After the first year pruning is done as soon as the fruits are gathered by cutting out the old canes. See Apple; llottling.

## BLACKBERRY AND APPLE JELLY.

 Stalk and examine 4 lb . ripe blackberries and turn them into the preserving pan with $1 \frac{1}{2} \mathrm{l}$. of apples, washed had cut in slices, but not peelei and cored.Then pour into the pan $\&$ pint water and the juice of one lemon. Boil until the apples are soft, then strain off the juice through a jelly bag. Rinse out the pan, mersure the juice back into it , and add 1 lb . white sugar to every pint of juice. 13oil it steadily until it will jelly firmly when tested on a plate. Pour the liquid into dry, warmed jars and tie them down at once. Should the blackberries be poor and what is termed bullety, use double the amount of apples and only $\bar{f} \mathrm{l}$. sugar to each pint of juice. See Apple.

BLACKBERRY AND APPLE PLE. For overy pound of blackberries used to make this covered tart take $\frac{1}{2}$ lh. apples, 3 tablespoonfuls sugar, and a breakfastcupful water. Fill a pie-dish with the fruit and sugar in liayers. taking care that the fruit is on the top. An inverted egg-cup should be stood in the centre. Then pour in the water and cover the dish with a short crust. Bake the pie in a moderate oven for about $\frac{s}{}$ hour. One lb. blackberries will be enough for 4-6 persons.

## BLACKBERRY CREAM. Put 1 lb . of

 blackberries in a saucepan with \& lh. sugar, the thinly peeled rind of a lemon, and 2 or 3 apples peeled and sliced. Stew slowly until the fruit is soft, stirring frequently; then rub the mixture through a hair sieve. Dissolve I oz. gelatine in 2 tablespoonfuls of water, and strain it into the juice. When the latter is lukewarm, stir in $\frac{1}{2}$ pint of whipped cream, and pour it into a wet mould. When the mixture has heen allowed to set in a cool place, it can be served with jelly.BLACEBERRY JAM. Aithough it is often made without apple, even a little of the latter is an improvenient to blackberry jam. Peel, core and slice $1 \frac{1}{2} \mathrm{lb}$. of apples, and put then in the preserving-pan with a gill of water and 4 lb . of white sugar. Stew the apples until soft, stirring frequently with a wooden spoon, and adding more water if necessary.

When soft, add 4 lb . of stalked blackberries, and boil steadily until some of the jams sets when tested. Remove scum during the boiling. Turn out jam when finished into dry, heated jars, and tie them down at once. See Apple; Janı.

BLACK CAP PUDDING. One beaten-up egg to $\frac{1}{l b}$. of tlour and a pinch of salt is the proportion for the batter, half a pint of milk being added to bring it to the right consistency.

The batter is heated and stirred. A mould liaving been thickly grcased, 1 oz. of cleaned currants are sprinkled into it, then the batter is poured in and the mould covered with greased paper and allowed to steam for an hour and a half. See Batter.

BLACKCOCK. This game bird, in season from the middle of August to the end of November, is usually roasted and is excellent

BLACK CURRANT GIN. Made from 1 quart of black currants, $1 \frac{1}{2} \mathrm{lb}$. of Deinerara sugar, and $1 \frac{1}{2}$ quarts of gin All that is necessary is to put these ing!edients into it stone jar and shake them occasionally. This drink improves with keeping.

BLACK CURRANT JAM. I little less than a pound of sugar is sufficient for 1 lb . of black currants: it should be added to the fruit in the preserving.
 llowed the whole some time. T sugar and fruit are brought slowly to the boil, being thoroughly stirred so that they do not stick to the pan. Aliout 35 minutes' boiling should lie sufticient, but the only. safo test is to place a little in a saucer and stand it at an open window to see whether and economical. The female bird is known it will jelly when cold. The covering of the as grey hen. They should bo hung and kept jam should be done whilst it is quite hot for a fow lays after shooting. After plucking See Jam. and cleaning the bird, wipe it inside and out with a damp cloth; washing spoils the flavour: It should be trussed as a chicken. Roast for about an hour in a moderate oven, basting it irequently. Dish on a slice of buttered toast with brearl sauce, gravy and fried breadcrumilos served separately. See Game.

BLACK CURRAN'T. Of all currants the black are the richest in Havour. They have none of the extreme acidity of the red, but have a rich almost vinous taste. The plants thrive best in heavy, retentive soil, and are most healthy and productive when throwing up an abundance of suctiors from the base. Whatever the soil, large pieces of young wood may be selected for cuttings, and planted for most of their depth, 5 to 6 ft . apart, in autumn, with all their buds left on. They should become protitable in their third year and be at their best in the seventh year from the insertion of the cutting.

The rooted cutting is shortened to about 9 in. at the end of the next season's growth in order to increase the number of main branches. No summer pruning is needed, and the winter proning merely consists in cutting out parts of the old branches in order to make room for young ones. The young wood that is produced from the plant in one season bears fruit the next.

Currant Diseases. One of the most serious is that termed nettlehead, or reversion. The bushes may revert bv degrees. The leaves become elongated and narrow, assuming the nettlehead form; there is change in the Howers, and fruit production almost entirely ceases. May and June are the best montlis to detect the diseass, which can only be done by carefully inspecting the bushes.
Methods are recommended for dealing with reversion in Leaflet No. 377 of the Ministry of Agriculture. The plantation should be oxamined systematically, if possible twice a year, at blossoming time and again in May or June. Reverted loushes should be marked, and after the crop has been gathered they should be grubbed up and burnt. Care should be taken to propagate only from sound stock. Since the disease is conveyed by the big bud mite, keeping down this pest will reduce the incidence of the reversion disease. The surest mothod of detecting reversion is to count the reins running from each side of the midrib in the terminal lole of the leaf; if there are fower than five veins, reversion may be suspected. See Big Bud; Bottling; Mag. pie Moth; Red Currant ; White Currant.

BLACK CURRANT JELLY. Simmer the currants in an earthenware jar placed in hoiling water until all juice is extracted and then strain through muslin. With a pound of sugar to each pint, the juicc is boiled until it sets firmly when dropped on a plate. It is then poured into jare and covered at once.

Black Currant Mite. This is the name of the insect which causes the disease known as Big Bud (q.v.).

BLACK CURRANT PUDDING. The ingredients are: $\frac{1}{2} \mathrm{lb}$. of Hour, 5 oz of suet, $1 \frac{1}{\mathrm{lb}} \mathrm{lb}$. of black currants and 2 tablespoonfuls of brown sugar. The suet is chopped and mixed with the Hour, which is then made with water into a soft but not sticky paste. A quarter of the suet crust should be now cut off and put aside for the top of the pudding, the remainder being rolled out about $\pm$ in. thick on a tloured hoard. Line a greased pudding basin with this pastry, then put in the currants, with the sugar and about a gill and a half of water. The small piece of pastry for the top is rolled out and pressed on to the hasin (a little water leing used to make the two edges adhere) and then covered with gicased paper. A floured pudding cloth is tied over top of basin and the pudding boiled in fastboiling water for about $2 \frac{1}{2}$ hours. It should he served with cream. This will be sufficient for 4-ij persons.

BLACK DOLPHIN. Collier, black Hy and hack dolphin are names applied by gardeneıs to the aphis that settles on the terminal shoot of broad beans. Similar in form and halits to the aphis that troubles the rose-grower, the black dolphin is rendered distinct by its sooty hue, delicate pale legs and antennae, and a long tine beak which is thrust into the cuticle of the plant whose juices are sucked through it. It exists through the winter in the egg-stage on some perennial weed such as dock. The eggs hatch in April, and the wingless young colliers settle upon the new vegetation. These are nearly all females, which produce living young, and the multiplication of these pests goes on indelinitely.

Is suon as the pest appears the tops of all affected bean plants should be nipped off, dropped into a tin and emptied on the kitchen fire. Where this course is not possible owing to their having been allowed to spread, the plants should be syringed with an insecticide or with strong soap-suds free from soda, washing oft the soap with clean water within twelve hours. Broad beans which are sown in November suffer much less danage from this pest than spring-sown piants.

BLACK DRAUGHT. This name is given to a strong aperient containing Epsom salts, liquorice, spirit of sal volatile, and senna The usual dose is $1 \frac{1}{2}$ oz. taken early in the morning. The previous evening a blue pill (o grains) is taken, the combination being a common remedy for such ailments as congestion of the liver or biliousness.

BLACK EYE. This is an eflusion of blood under the loose skin over and around the lids It is due to a blow As the tissues beneath the skin in this region are very lax, considerable subcutaneous bleeding takes place, and this accounts for the discoloration, which at first is dark purple and then passes through brown and green to yellow. Apply cold compresses made of folded flannel or lint, sulhcient to cover the area, wrung out of iced water, and applied as continuously as possiblc for a few hours An older remedy is the application of a piece of raw beef

When swelling has subsided the removal of the discoloration can be hastened by conpresses soaked in spirit lotion, metliylated spirit, one teaspounful, water up to two tablespoonfuls, and covered over by gutta-percha tissue, the whole being held in position by a bandage. Several times a day a little vaseline should be smeared over the evelids, which are then gently massaged. See Eyc.

BLACKHEAD: How to Cure. Black. head or comedo is a little white or yellowish elevation of the skin with a black centre and is often associated with common acne, which is a chronic skin disease characterised by pimples, blotches, blackheads, and a greasy skin on the chin, forehead. shoulders, and hack It is commonest in young people at the change from childhood to adult life. The hard pimples with little black dots in their centre are the tiny skin glands which have become choked with secretion which has undergone degeneration Later these little red mounds become pustular and discharge. New crops of pimples and blackhends succeed each other, the affec tion often persisting for years.
The parts affected should be washed thoroughly night and morning with soap and warm water. After this, mop the parts for five minutes with water as hot as can be borne Then press out with the finger-nail, guarded by a thin silk handkerchief, or with a comedoextractor (which any chemist can supply), as many of the blackheats as possible. At bed time apply the following lotion with a little cotton-wool, and allow it to remain on all night

## Precipitated sulphimr

${ }_{2}^{1}+$ part
Rose water
${ }_{2}^{2+1}$ parts
The diet should be of the phanest, with plenty of green vegetables, and fatty foods inust be a voided, as well as pastry and sweets. A tablespoonful of the following inixture may be taken in a little water three times a day, about an hour after meals

Bismuth oxycarbonate
Sodiull bicarbonate
Mucllage of tragacanth
2 drams
Peppermint whter $\quad \therefore \quad \begin{aligned} & 2 \text { drall11s } \\ & 1 \text { ounce }\end{aligned}$
Whine) 0 ounces
Where the pimples tend to become full of matter, $\ddagger$ grain doses of sulphide of calcium taken four times a day often have a drying-up effect on the spots.
For the anaemia and constipation so fre quently noted in acne the following prescription is recommended


Take a tablespoonful of the above prescrip tion in a wineglassful of water, at least half an hour before taking breakfast.

BLACKING. For preserving and polishing Mack leather hoots, various dressings mostly depend upon the use in their manufacture of a form of charcual made from bones, known as
ivory lilack or bone black. The lirst recipe makes a liquid blacking.
Mix 8 oz . of ivorv hlark with 1 oz, of sperm oil 80 that $\pi$ smooth paste resulta, then add 6 oz. treacle Sinired with an equat glamtity ol gordirall 1 negnt weight) sulphuric acid Eflervescence and licat reanlit weight) sulphuric acid Eftervescrnce and licat. result, vinegar, and tottle the blacklag whilst. stial warm.
For use on calf leather boots, the recipe of a polish which is waterproof is:
Carnauba wax, 10 oz.; becawax, 3 oz . stearin, Ioz: flaredded and meltell tore lier in A Am sunce man of turnentine, 45 oz . : witlo wh'ch aniline hlach op oz, and ivory black, ${ }^{2}$ o\%, have licen proviously nixed. The paste should then be made smooth biv nubbing in a mortar.
If the paste is required for brown leathet boots, phosphine and bismarck brown, 2 dr . of each, are added in place of the aniline black and ivory black.

Hont varnish is made as follows, and applied with a small sponge :
Dissolve 20 dr . Wue-black aniline dye and 31 dr bismarek brown aniline dye in $n$ galloll gpirit to form the " mother-liquid dye." Then nilx ${ }^{2}$ pt. of this with 1 gall. apirit, and camphor, 11 oz, Venice turnentine, 16 oz., shellac, 36 oz: Hnally adding 2 nt
lienzine with which has been mixed 3 oz castor oil lienzine with' which has been mixed 3 oz . castor oil ind If oz. linsced oil.

## See lioot.

BLACK JAPAN. A compound of asphalt, boiled oil, and turpentine is used תa a varmish for motals under the nanic of black dapan. l3runswick hack is a similar article: when imparting a dull surface it goes by the name of Berlin black.
BLACK ROT. Nearly all the cultivated plants lelonging to the cabbage family are liable to be attacked by this disease. In l3ritain it is most frequent in kale, cabbage, and caulithower A characteristio feature is the ap pearance of dark or blackened veins in the foliage, which turns pale or yellow, the veins sometimes standing out so clearly as to ap. pear like a black network. When the affected leaves and atalks are cut across, the veins or vascular bundles appear as darli points, and when the stem is thus examined a characteristic black ring of wond is present.

When young plants are thus attacked they may survive for some considerahle time, but remain stunted and unhealthy. In the case of cabbage and canliflower, no hicad is formed, and in turnips and radishes the root fails to develop properly. In severe cases all the leaves may fall off and the plant remain merely as a long stem with a few deformed leaves at the apex ; in other cases a head which is apparently sound is found to be discased inside. Plants are attacked at all ages. Infection usually takes place through the parts above ground and generally by way of the leaves. Slugs and caterpillars are carriers of the disease.

Another source of infection is contaminated seed, which may produce infected seedlings. Contaminated manure or soil in which diseased cabbages have been grown is a source of danger. A small amount of infected soil may ruin the bed, and if there is any doubt such aoil should either be rejected or sterilised. Diseased plants should always be burned. They should never be buried, thrown on the manure heap, or given to pigs, chickens or other animals. Where the disease has existed no cabbages should be grown on the land for five years.


Black Rot. Its effect on a cabbage stalk, bere shown in

Leallet ?()0 issued by tho Ministry of Agriculture deals with this disease, and gives informa tion aliout inethods of disinfecting the soil.

BLACK SCAB. This is the name of two discases, one affecting apples and pears, the other potatoes. The first shows itself in the form of black specks and spots. which spread into large discoloured patches. The fruit, leaves, and twigs may all he alfected In bad cases the fruit cracks. In drier years it is rarely so severe as in wet ones. The best treatment is, in winter, to prume out all diseased and unhealthy-lonking slonts, and to spray with Bordeaux mixture (q.v.) or lime sulphur. just before the Hower-buds opien and again as soon as the petats have fillen.

In potatoes black scab (wart disease) appears to be a disease of the tuber only The first sign is a series of waits in the eyes which develop into black crinkled masses The affected tuber rots, and a clark tluid of offensive odour oozes out. The disease may not affect potatoes in store during the winter, but inay show itself at the eves when the sprouts begin to push Every tuber affected and the huulms should be burnt. No seed from the affected stock should be planted even if part of the crop appears to be clean

It is perfectly easy to prevent potatoes being damaged by this disease by planting on! y varieties which are immune to its attacks e.g. Witch Hill, Arran Comrade, Abundance. Great Scot, Majestic, and The Bishop, See Apple: Pear: Potato.

BLADDER PLUM. The malformation and distortion of the young fruit of the plumtree, known as bladder jlum, is caused by a minutefungus. Ascomyces pruni, which is perennial in the tree affected and in spring sprearls into the fissues of the new shoots. The plums attacked are distinguished by their larger size, pointed ends, hollowness, and the skin having a bloom upon it due to the threads of the fungus bursting through: they soon turn yellow and shrivel. It has been suggessed that the twigs bearing these bladder plums should be cut well back and destroyed; but it is probable that the fungus runs through most of the tree. See Plum

BLANCHING. . Calf's head, calf's fuot, sherp's and lainb's trotters, veal and lamb sweet bread and brains are all blanched before cooking. They are first placed under a tap of running water in order to rid them of blood. and then put in a pan of cold water and brought slowly to the boil. They are allowed to boil for from 15 to 20 min ., with the exception of veal sweetbrend and brains, which should only be allowerl to hoil for 10 min . and lamb's sweetbread, which must not be allowed to boil at all. The water is then drawn off and the meat cooled before cooking.

Celery, artichokes, endives, turnips and small onions which have been kept for some time may be hlanched before cooking. Thes are Acalded, and then cooled by steeping in cold water until just warm. when they should be placerl on a sieve ready for use. See Almond; Calf's Head, etc.

BLANCMANGE. Blend two heaped tablespoonfuls of cornllour with a little cold milk, till it is like sinooth, thick cream. Boil the rest of a pint of milk, with $\Omega$ piece of
lemon rind to flavour, and add about two for blankets for babics' cots, and there are also tablespoonfuls of sugar, stirring-till the sugar camel-hair blankets in colours and satin is quite dissolved. Remore the lemon and bound to be obtained in all sizes. Jacquard pour the hot, sweetened milk over the corn- dyed blankets are not so practical. where flour paste, stirring all the time, as in making colour is liked, as those plainly dyed. starch. Put the mixture back in the pan and boil gently for five minutes, still stirring blankets, thanks to the sulphur fumes with


Blancmange. 8 weot cornfour blancmange favoured with oranges and coloured with cochineal
continuously. Then pour into a wetted nould and allow to stand in a cold place for several hours before turning out.
If a few drops of cochineal are stirred in before taking it off the fire, the blancmange will be pink. A little vanilla essence or almond flavouring may be used instead of the lemon. A large tablespoonful of grated chocolate may be added to the above recipe when blending the corntlour and milk, and the blancmange served with whippod cream.
When in season, stewed raspberries yield sufficient juice to make a delicious blanemange. Cook this as for ordinary blancmange, using the syrup of the raspberries as liquid, and serve with whole raspberries.
A more elaborate blancmange is made by pouring the cornflour mixture over several layers of fruit placed in the bottom of a mould. Glacé cherries, bananas, and tinned pineapple will make a good foundation. When the mould is half full, add another thick layer of mixed fruit and fill to the top with blancmange. The first layer must be nearly cold before the second is added.
BLANBET. Roughly divided into four types, blankets are of (1) a loose cellular weave, (2) Witney, (3) cloth, and (t) Scotch diagonal twill. The first of these are expensive, loosely woven to admit free passage of air, very light, but of the finest wool to ensure warmth: made in colours and satin bound.
The hairy pile of the Witney blanket is scratched or teased out of the body of the article, and the fabric is weakened to that extent. The better qualities are made with long wool, and the loss can be afforded, but the lowest qualities are less satisfactory, because there is too little foundation left, and the pile comes away in wear and washing. Witney blankets are warm when new, but become in effect cloth blankets when their pile has been lost. Cloth blankets are made of shorter wool and their surface is slightly raised, but not by wire brushes, and their wear is dependent upon quality. There are both all-wool and union blankets, and the best qualities of union (i.c. wool and cotton) are to be preferred to the cheapest all-wool varieties. Scotch blankets are made of strong wool, and wear well.

Blankets are sold per pair, of dimensions which should be stated in inches, and calculated to fit respectively single or double beds. It is advisable to see that a good overlap of half a yard per side is left.
In any blankets it is essentially desirable to have a maximum of warmth to a minimun of weight. The fine wools are warm without being heavy, but are much more expensive than the hairy wools. The finest wools are used
mild soap should be A good fiake soap of guarantced suitability in washing woollens may be used and dissolved before use. The quantity should be sufficient to produce a quick lather to be poured in and the blankets left to steep bofore beginning to dolly them or to plunge by hand. Blankets must never be rubbed in washing. When a large part of the dirt has been removed, the blankets should be given a second wash. The water should be wrung out either by hand or by mangle, and the blankets should have two washings in lukewarm water to remove all vestiges of soap.
A yellow tinge may be corrected by adding a little bluc to the washing water. They can lie whitened a little by prolonged exposure to sunlight, which is also the best way to dry them. In washing blankets the aim is not merely to cleanse, but if possible to improve them by turning them out in fresh, light, spongy condition, and the method of drying is all-important. The housewife has to use lines or stretch the blanket on the grass, and in either event it is advisable to turn the article about frequently. A sunny day with good wind should be chosen.
Old blankets are useful for ironing-table pads, or, cut to shape and blanket-stitched, for table underlays to prevent the spoiling of polished table tops by hot dishes. Odd pieces of blanket afford good scouring cloths for washing floors and similar work. See Bedding.
Blanket Cloth. A heavy woollen fabric used chiefly for colourerl and white sports coats.
BLANQUETTE. A form of veal stew, for which the ingredients are 2 lb . breast of veal, 2 onions, 2 cloves, 2 carrots, a bunch of herbs, salt, pepper, 1 oz. Hour, 1 egg, and 1 tablespoonful chopped parsley. The meat must first be freed from skin, fat and gristle and cut into small pieces $t$ in. thick. These are put into a saucepan and as much warm stock or water poured over them as will cover them, generally about a pint, then brought to the boil and skimmed The onions are peeled and a clove put in each; the carrots are scraped and cut up, and the herbs tied up. All are then put into the pan, seasoned, covered, and allowed to simmer gently for one hour.
Take out pieces of meat and strain gravy. Mix flour with a little cold water, stir into gravy and bring to the boil, stirring all the time. Simmer for five minutes, then cool slightly and add the yolk of an egg well beaten. Put pieces of veal into a small pan, strain gravy over and heat tlirough ; on no account let it boil. Pour out on a dish, and garnish with parsley, and the blanquette is ready for the table.
BLAUD'S PILL. A favourite preparation of iron, Blaud's pill is chiefly used in anaemia,
especially in those types where there is a great deficiency of haemoglobin, the red colouring matter in the blood. Each five-grain pill contains one grain of carbonate of iron, the dose being one to three pills. To be of use the pills must be freshly made.
BLAZER. An unlined jacket resembling a cardigan with three pockets, but with collar of the step variety, a blazer may be used lor ordinary sports wear by boys or girls. Blazers for schools, colleges, and universities have their special colours, as also have those of many clubs.

BLEACEING. The articles calling for treatment are mainly white cottons and linens. sometimes woollens and, less frequently, silk. Cottons and linens are best bought lully bleached. Unbleached cottons and linens are dingy in colour, as the raw material carries with it impurities of a waxy or gummy nature. These discolorations disappear gradually in wear and washing and the article assumes a whiter appearance; the whitening process is assisted by drying the washing in the open air, and preferably in a good brceze. Country and sea air are better than town air for the purpose of this natural bleaching.
It is wrong to boil linens in washing soda, although cottons may be treated in that way to whiten. Soda disintegrates the linen fibre and causes it to come away as short Huff. A good mild soap should be used in washing linen and well rinsed out. If linen is ironed with soap still left in it, or if linen after washing is stored above a hot cylinder, a yellow tinge is caused which may call for bleaching. This colour can generally be removed by careful re-washing with repeated rinsings, followed by open-air bleaching. The article should be apread on the grass and periodically moistened. The continual wetting and drying has much to do with the removal of the colour.

## How Cotton Fabrics are Bleached

When cotton is bleached by professional bleachers from its natural colour to a full white it is boiled in clear lime water and washed ; treated with weak acid and washed ; boiled with caustic soda and washed; steeper from 2 to 4 hours in clear solution of chloride of lime ; hoiled for 12 hours and washed; left in weak acid again for 3 or 4 hours and washed ; finally it is rinsed and blued. To attempt the process at home without the necessary plant would lead to damage to the fabric. If chloride of lime, i.e. bleaching powder, is used at all the solution should be made three days in advance and the mixture should be stirred up or shaken in a large jar repeatedly at intervals. Only the clear liquor must be taken and about 1 lb . of the powder should be used to a gallon of water. The cottons should be fully washed and rinsed before they are put to steep in the bleaching fluid. The action of the bleaching powder is hastened if the cottons are previously rinsed in water acidulated very slightly with s:Ilphuric acid. When taken out it is important o rinse them well in water to which washing soda has been added. They must be well rinsed again and then dried.

Bleaching powder should not be used on woollens. It dissolves wool if left for a sufficient time, and in any case makes it harsh. Necessity to bleach woollens chiefly arises when repeated or careless washings have turned what should be white flannel or white knitted goods to a vellow tone. To whiten these a solution of 1 lb . soap and 3 lb . amınonia to 5 gal. water may be used. The action is slow, and the articles may have to be left some days.

A more expensive method of bleaching is applicable to cottons, linens, woollens, and silks. It involves the use of peroxide of hydrogen. A solution should be made in an earthenware vessel of one part of commercial peroxide of hydrogen to ten parts of water
and a fer drops of ammonia, sufficient to water a faint smell This provides an effective
matie the mixture slightly alknline. The bleach which, in addition to its remarkable articles should be put to steep wholly under whitening properties, does not injure the lace water, or stained portions will result The Another simple way of bleaching lace which vessel should be covered against light, which has becone discoloured is to press it gently interferes with the result After half an hour with a warm imn and then set in a clean linen or so, when the articles have been thoroughly bag. The latter is left to soak in olive oil for penetrated, they should be squeezed semi- a whole day and night, and afterwards boiled dry and hung in a draught to dry. The in a lathery mixture of soap and water. When heaching takes place while the articles are the boiling has continued for $\frac{1}{4}$ hour or 20 min ., drying and only if the atmosphere is cool enough. The operation cannot be done if the ail is warmer than $68^{\circ} \mathrm{F}$., and the peroxide must be new. A good white can be obtained with peroxide without danger to delicate goods, but pains must be taken to wash it out afterwards
lace needs to be treated with special care during the bleaching process. For this use a rery weak solution of chloride of lime and
water, just sufficient of the former to give the
tor


Bleeding. 1. Place for compressing common carotid artery. 2. Pressura to arrest bleeding from subclavian artery. 3. Pressure applied to subclavian artery by means of key handle. 4. Compresslng occipital artery behind ear. 5. Facial artery pressed akainst lower border of jaw. 6. Pressure applied to superficial temgoralartery. 7. Forced ferion of elbow joint to arrest bleeding from arm. 8. Preasure on brachial artery. 8. Bleeding from sole arrested by pressure on posterior tibial artery. 10. Comprassing temoral artery
as a bleach for clothes, a tablespoonful of the powder is added to a copperful of clothes

It is useful also for removing mildew stains from linen For bleaching engravings. a tablespoonful of the clear liquid is mixed with a pint of water and the engraving soaked in the liquid. It is necessary afterwards to remove all traces of the bleaching liquid by soaking the engraving in several changes of clean water, as any trace of chlorine left in the prper would in time cause deterioration

BLEACHING SOAP. The chemical generally employod in these is perborate of sodium, a salt which releases oxygen on contact with water. Oxygen plays an important part in open-air bleaching, and when the bleaching sonps are used, the wash-tub does work that is ordinarily done during open-air drying. Bleaching soaps present one neans of increasing the whiteness of articles which cannnt be exposed for long.

BLECHNUM. This is a family of vigorous hardy and greenhouse ferns. B. brasiliensc and B. glandulosum are grown under glass in a compost of peat, loam and sand, and need abundant supplies of water from spring till autumn, but do with less during the cold months Blechnum spicant, the hard fern, grows wild in Britain; it is dwarf and evergreen. There are many varieties of this fern. Pron. Blek'num.

BLEEDING. Haemorrhage, or hleeding, may be exterial, as from a wound, or it may bo internal. It may occur from arteries, veins, or capillaries, the small vessels which unite arteries to veins Bloorl from the arteries is bright red, and comes in spurts, the direction of these heing away from the heart. Blood from the veins is of a dusky red or a purple hue, and flows in a steady stream. Blood from the capillary vessels is redder than venous blood, and it onzes out of the surface of the wound. Of the three forms heeding from an artery is the most serious. Vein blceding can nearly always he stopped by pressure. Bleoding from capillarics is slight.

Hacmorrhage in certain parts of the hody is given specific names. Cerebral haemorrhage (one of the causes of apoplexy) occurs from an artery in the brain; haenoptysis from the lungs; hacmatemesis, the stomach; haema. turia, in the kidneys or urinary passages : epistaxis, from the nose.
In wounds of the hand, arm, foot, log. or other parta, the simplest plan to stop hleeding is to press the fingers on the wound; or, if that is unavailing, then to apply pressure to the main artery. In bleeding of the forcarm, one method of putting pressutio on the hrachial artery is to place a pad in the hollow of the elhow and bend the arm. Bleeding from the leg may be controlled by placing a pad in the hollow of the knee and bending the leg.

In the case of the thigh. the femoral artery is compressed agninst the bone in the middle of the groin. When the bleeding is from tho neck, pressure is applied to the carotid artery, a little helow and on the outer side of Adam's apple. In bleeding from the nose a cold cloth on the naje of the neck and another on the forehead are often effectual.

Another method of stoppling bleeding is by the application of an improvised tourniquet. See Tourniquet.
In capillary hleeding over a large surface one may employ styptics such hs tamnin, perchloride of iron, gallic acid, turpentine, or alum; but very hot and very cold water often prove effectual. In internal bleeding, indicated by excesaive pallor and a thready pulse, send for the doctor and meanwhile keep the patient perfectly still.
BLEEDING HEART. Dicentra or dielytra, popularly termed Bleeding Heart, is a herhaceous perennial, hard! except in the-most
expused situations, and makes a bush nanr!y
3 ft . high. The pink flowers are borne on long arching stems, and are nearly an inch across, heart shaped, and particularly gracefal in effect.

Propagation is by division when dormant It is frequently giown in pots and forced in the greenhouse. It is almost inpossible to give the plants ton much water while they are in full growth. After flowering the plants can be divided, watered for a fow weeks, and then allowed to rest until the autumn.


Bleedlag Heart. Foliage and arching aprays of drooping pint flowers
BLENDING. Indian or Ceylon teas are frequently blended with Chins tea, the strong. coarse flavour of the Indian product being mellowed by the subtler and more delicate flavour of the China tea.

The housewife can make her own blends of tea, coffee, or butter and margarine with perfect success and much saving of monev.
No fixed rules as regarde proportions can be laid down, hut the following would make a goorl blended tea : take 1 lb . coarse Indian tea,
 broken Pekoe. These amounts of the dry teas should be poured on to a paper or tray and then mixed with a spoon, mixing thoroughly but gently.

A good after-dinner coffee would be obtained from equal parts of Mocha and Mysore coffec ; Costa Rica and plantation coffee, in equal proportions, make a good breakfast coffee. Chicory adds body and colour to the infusion. and effects a considerable saving if the Havour is not objected to. A good proportion would be one part of ground chicory to three parts of the ground coffee

Butter and margarine can be hlended in the home, but such a mixture is not so good for children as genuine butter. The mixing may be done on a pastry board, the butter and margarine being worked together with the aid of wooden butter pats, or they may be melted together in a basin and then thoroughly stirred whilst cooling. See Adulteration; Coffee; Tea; Tobacco, etc.

BLENHEIM ORANGE. One of the bestknoun varieties of apple, useful alike for dessert or culinary purposes, is the Blenheim Orange. When grown as a standard tree on the crib stock it takes many years to reach a profitable fruit-bearing atage. The Blenheim Orange has a deep yellow akin, atreaked and tinged with red, is of fine flavour, crisp and juicy, and is in season from November to February It is probably second only in flavour, when fully ripe, to Cox's Orange Pippin. See Apple.
BLIGHT. The term is used loosely to indicate that plants have been attacked by some insect or fungus pest ; but it is now usual to indicate more preciscly the nature of the attack. Among less intelligent persons one may still hear a murky condition of the atmosphere ieferred to as a blight; but it
has no connexion whatever with the troubles nffecting the crops, as the ancients believed See American Blight; Apple; Green Fly, etc
BLIND : Their Training. Each local authority is ohliged by law to provide suitable education for the blind children in its area from the age of five years. The parents should get into touch with that borly in good time, so that the child is able to begin his schooling as snon as the age of five is reached.
The aim of the parents and others associated with the child should be to make him as normal as possible. They should seek to cultivate habits of self. reliance and independence in the child, who must not he waited upon but be taught to dress and feed himself, and to move about freely. Mannerisms such as swaying the body, shaking the fingers. poking the eyes, and twisting the heard must be firmly corrected. Blindness ought never to be discussed in front of him, and tactless visitors should be restrained from talking of him, and sentimentalising over him in his presence.
When a jerson loses his sight in middle life, his friends should seek the rssistance of the county education authority, for it is the duty of that body to see that blind persons receive such occupational training as will fit them to earn their own living. During training a maintenance grant can be obtained. Do what is possible to

## Blinds: Their Fitting and Repair

## How to Fix and Adjust Window Blinds

## Special forms of blinds are described under Sun Blind and Venctian Blind, and various <br> other ways of treating windows under Casement; Curtuin, ctc

Blinds have gone out of fashion owing to the use of practical long and casement curtains; and also of pelmets or valances to finish the window scheme. Owing to these the lace erlging of sitting room or trimmed blinds is no longer required, and in town houses obscures the daylight when the blinds are only partially drawn up to show this decoration at the top of the window. For kitchen and back premises dark green blinds are best as they only require dusting and can be kept clean if aponged or wiped with a dainp clath. Even here oiled silk or American cloth is being used for casement curtains.
The stiff linen blind excludes air as well as light. Another substitute is the latticed out. side shutter, which with the casements thrown open gives a sufficiently darkened room for sleep with a regulated supply of air.
Where holland or linen blinds are washed at home, the best plan is to unstitch the hems before putting them in the water. Then, if the material stretches, it may be cut to fit the roller and sewn up again, with little or no trouble, while, if it shrinks, the roller may be cut to fit the blind.
Fitting and Repair. Apart from Venetinn blinds, almost all blinds in use are mounted ujon rollers, upon which the material forming the blind is wound. The first thing to see sbout is that this moller is horizontal ; if it is not, the blind will not mill up Hat, but will crecp over to one side. A spirit level can be applied to the roller, if in place, as a test, and any necessary adjustiment made accordingly. When putting up a new blind a string can be stretched tightly between two thin nails driven into the framework of the window, the string occupying the place where the roller is to be fitted. This string should be tested with the spirit level and adjusted until it is hori-
banish self-commiseration from the patient. Keep his mind alert and in constant touch with former interests.

If blindness comes on in advanced nge, the same principle of keeping alive in the patient's life as many interests as possible should be followerl. His friends should get in touch with the nearcst Home Teaching Society, which will send a visitor to teach braille. A blind person unable to follow his employment can obtain an old age pension at 50 . See Braille; Pension.

BLIND HOOKEY. A caid game for two or more players, to which the name of blind hookey is given, is beat played by four or five, and they cut for deal, the lowest dealing The cards are shuffled by any or all of the players, and by the dealer, who is the banker, last The banker then presents the cards in turn to cach player to cut a num her of cands from the top of the pack. The cards so cut must not be less than four, and when cut remain face down.

Each player lays a stalic on his cards, and when all stakes liave been made the cards are turned up so that the bottorn card of each pack is shown. If the banker's card is higher than that of any particular pack, he takes all the money on that pack. If lower, he pays over to the player a stake equal to the amount on the pack. If the two carda arc equal in value, the banker takes the inoney staked. The banker keeps the bank, though the players may deal in turn, until there comes a hand when he pays all round. In that case the next player takes the bank. Any player can stake any amount within the agreed limit on any other packet but the banker's, and onlookers may stake on any pracket as well.
zontal. It then acts as the centre line for the roller, and the fittings are screwed in place so that the bearing holes or centres will register with this line. The simplest arrangement of mechanism consists of two metal supports providing bearings for a plain wooden roller, with suitable pins in the ends to act as an axle. At one side of the roller is a $V$-shaped pulley wheel around which passes a stout string or cord, joined at the ends to make it continuous, tension being brought upon this cord by an adjustable whee mounter in a netal framework known as a blind rack. Some of these racks have a ratchet arrangement; others a screwed rod and milled nut for adjustinent. Racks of all patterns are fixed to the window frame by means of screws.

Points to watch are that the blind roller can revolve truly and freely; that the cord is sufficiently thick to grip; the pulley, and that the small wheel on the blind rack rotates easily. The fault with this type of blind is that the cord soon stretches and needs more or less constant attention if the blind is to function properly.

In blinds of the semi-automatic type (Figs, 1 and 2) a ratchet arrangement is provided, so that when a single cord is pulled the blind can be raised or lowered, and stops wherever desired. A lever pawl is so arranged that when the blind cord is pulled, the lever is moved and lifta the pawl clear of the ratchet on the end of the blind roller, the blind being lowered by keeping a slight tension on the cord. On releasing this tension the weight of the lever causes it to fall back and engage the ratchet, thereby holding the blind in place.

The renewal of the blind cord is done by winding the blind up to the top and removing the old cord and threading a new one through the hole in the lever. turning it once or twice
round the spool and then through a hole in way to make sure the blind will hang properly the roller end provided for the purpose is to place the end of it over the roller, letting (Fig. 1). A knot is then tied in the cord, and the blind hang down in its proper place, and this prevents it from pulling out of the hole. Takc care to wind the cord the right way round the spool, noting that the cord winds up or around the spool when the blind descends, or vice versa.


The brackets are gonerally niade to screw on to the front of the window framing. Other patterns are available that can be screwed to the top of the window frame, from which they hang downwards To facilitate the lowering of the blind a lath of wood is generally inserted into a hem in the lower part of the blind, and various tassels and pulls are often fitted to this lath by means of a metal fitting known as a knotholder. To secure the biind cord, a frequent practice is to fix a metal cord-holder to the window frame.
Automatic or spring blinds are made with a hollow roller, into which is fitted a coiled spring. One end has an automatic ratchet action; the spindle is square in shape at one end, and fixes into a square bole in the bracket to prevent this end of the spindle from rotating. The opposite end is a plain peg, and rotatea in the bracket as usual. With these blinds no cords or controls are necessary. The blind is merely pulled down as far as needed. To raise it, the blind is first pulled down slightly to release the automntic eatches, then it is released or moved up quickly, thus allowing the spring to wind up the roller very quickly, centrifugal force sufficing to keep the ratchets out of engagement (Fig. 3).

## Spring Blind and its Fitting

A nother form of spring blind (Fig 4) has a hollow roller, in which a spring is located at one end of the roller, also a ratchet with a spring pressed lever pawl. When the blind is pulled down by a centro cord attached to it, the spring is wound up. The blind is, however. held in place by the lever paivl. When the release cord is pulled, the lever pawt is raised, and the spring winds up the blind; it is checked at any fosition by releasing the cord. This type is good for general domestic use.
To tit spring blinds proceed as before de scribed, but when putting the roller in place finally have the blind lully wound up on the roller and twist the roller a turn or two to bring a little tension on the spring. If such a blind fails to act, examine the automatic ratchets, which are on the square spindle end of the roller. See that they can work quite loosely and freely. If they are choked up with dirt and dust, clear this away. If the blind works but does not go up to the top, the spring is probably slack, and is remedied by lifting the plain end of the roller out of its bracket and winding it up a little tighter.

The blind itself must be correctly fastened to the roller, or it will always give trouble. One
then to secure it with a few tin-tacks to the roller, avoiding all creases Afterwards carefully take down the roller and fold over the end of the blind, thus giving a double thickness of material through which to nail. Some

BLOATER PASTE. For n savoury paste, grilled bloaters have morc flavour than those cooked in water. Cook one dozen large hloaters about 10 min or till the slin and hones come away ensily. When free from these, pound the flesh finely with about half its weight in butter.

Rub with a wooden spoon through a fine wirc sieve : season with cayenne and powdered mace to taste, and press it into small dry pots, lenving a space of $f \mathrm{in}$. on the top of each. To make air-tight, pour in melted mutton fat, and leave till they are aet hard. Mutton fat hicing harder than bref is less likely to crack across or melt.

BLOATER TOAST. Take two grilled hloaters, bone, akin, then chop the llesh into small pieces. Prepare six pieces, of huttered tonst and kecp hot. Melt 1 oz. butter in a sancepan and add to it the fish, a teaspoonful chopped parsley, cayenne pepper and seasoning to taste. Bent up an egg and, when the lish. etc., is hot, pour it in, and stir the whole near, but not over, the fire until it thickens. Pile lise mixture on to the hot buttered toast. If desired a little checse could now he grated over the tish, which should be put for a few minutes in $n$ hot oven. The roes, if any, might be grilled and served as a garnish.

BLOODROUND. Formerly used in the tracking of fugitives, this dog, in apite of his bulk and manifest strength, is gentle and obedient. He is an affectionate companion, and, in aldition, is a trusty custodian of any premises or property.

A solemn-looking dog, standing a little over 2 ft. and weighing about 100 II ., he varies in colour from black-and-tan to red-and-tan or tawny, with perhaps a little white on the broad cheat, the feet and tip of tail. The narrow head is long in proportion to the length of body, with folds of loose skin, especially over the forehead. The eyes are deeply set, and the long, thin cars hang straight down in soft folds The forelegs are straight and largeboned, the feet large and strong. The long, tapering tail is curried high with a moderate curve. See Dog.


Bloodbound. Specimen of the breed of dar once used for tracking fugitives

BLOOD POISONING. Three distinct conditions are comprised under the name of blood poisoning. When the blood nhsorbs only the poison produced by disense germs, the resulting condition is termed sapraenia: if the germs ns well as the poison are circulating in the blood, septicaenin results. In pyaemia the germs are carried by the hlood to various parts of the hody and cause multiple abscesses to break out.

The chief symptoms of mild sapraemin are hendache and fever; in septicaeniia there are shivering, pains in hack and limbs, hot and cold sweats, and high fever. Septicaemia is
usually due to the introduction of pus-producing organisms through a puncture, e.g. a pricked finger.

When shivering and fever follow the slightes! wound, no time should be lost in sending for professional aid, ay both septicaemia and pyaemia may require surgical treatment.
BLOODSTAINS. To remove hloodstains from silk or wool, these should be washed with water and rubbed with soap liniment. For cotton and linen goods use solution of chlorinated lime (bleaching powder), and wash out the solution with clean water. Where the stain is old-standing it is sometimes necessary to employ pepsin

Blossom Wilt. As this pest attacks apples, particularly certain varieties, it is generally known as apple blossom wilt (q. V ).

BLOTCH. This may consist of pimples, discoloured areas of the skin, or small groups of pustules, and may occur in connexion with skin diseases or eruptions. A blotchy face is not uncommon in constipation. A laxative should be taken, as cascara tablets or sulphur at night, or Epsom or Carlsbad salta first thing in the morning. Sugar, sugary foods and pastries should be left out of the diet, though fats need not be reduced. It is probable that in most cases more open-air exercise is needed In washing, too coarse a soap must not be used, and if the water is hard add a little borax.

The following ointment will be found useful:

Oxide of zinc powder
Precipitated sulphur
Salicylic acid
Concentrated cainplior witer

## nolin

## See Blackhead; Pimple.

BLOTTER. To make the simplest kind fold and stitch about six sheets of strong blotting paper, the size of an exercise book or larger, into a cover of stout coloured paper. This may be quickly ornamented by stencilling (q.v.). Alternatively, make a cover of two sheets of cardboard, fastened together by a strip of linen, glued securely down one side of each. To this linen stitch the blotting paper, and the book is ready to slip into a loose cover.

For an embroidered blotter cover, take 3 yard of silk, linen or other plain material, with the same quantity of lining silk, $1 \frac{1}{4}$ yards narrow galon and a piece of cardboard, is by $11 \frac{1}{2}$ in.
Cut an oblong in the covering material and also in the lining measuring 19 by $12 \frac{1}{2}$ in. Fold the material in half, across, and in the middle of one half draw or transfer the pattern selected for embroidery or appliqué work. Decoration must be done before the blotter is made up.

Half an inch has been allowed for turnings and the cover and lining must be seamerl along three sides; the cardhoard is then slipped in, the fourth seam closed and the inside of the blotter is finished off all round with galon. The blotting paper is attached by means of a tinsel cord to which a tassel may be added.

Blotters may be covered with brocade or shof taffeta edged with tinsel gaton and finished with a heavy silk and beaded tassel, arranged to hang over the edge of the writing table.

A leather cover can be made with no other tool than an embroidery needle. An oblong piece of dark sheepskin is needed, large enough for the back and front cover to be in one piece. One inch extra should he left all round for turnings and an inch for the fold at the back. A pattern should then be designed in the centre of the front, and outlined in coloured fine cord stitched down or couched, with sewing silk all round its edges and across it, as desired. The rest of the design can be filled in with coloured beads.
Two pieces of stiff card board are then needed, as mounts for the back and front. Cover them
with soft interlining (domette is the best) and lay in place on the leather. Turn an inch of the leather down over the mount and fasten it securely by means of long stitches from top to bottom and from side to side. Cover these stitches with interlining, and then slipstitch in a silk lining of a colour to match the design. Such a blotter is suitable for dining-room or study. Colours should be in harmony with the decorative scheme of the room.
A hlotting pad is simple to make. Across each corner of a large piece of very stiff cardboard fasten a strip, of American leather or suede, about $2 \frac{1}{2}-3 \mathrm{in}$. wide, glueing the ends round underneath the board. Several thicknesses of blotting paper the same size as the cardmard can then be secured on it, by slipping each corner under one of the triangles so formed. Blotting paper can be obtained in nearly all colours to match covers or corners.

Blotters can also be obtained mide in the form of a semicircle of wood, with a handle fastened into a thin piece of wood which fits, and is screwed down, on to the flat side. The blotting paper is placed on the curved part, the ends being slipped under the handle to keep it secure See Leather Work: Writing Table.

BLOTTING PAPER. Besides its obvious use, blotting paper is effective in removing grease from clothing. Heat an iron, lay a pad of blotting paper over the grease-spot, and pass the iron over it, allowing sufficient time for the heat to penetrate. When the blotting paper is removed it will be found to have absorbed the grease.

A filter for water can be improvised with a piece of clean white blotting paper cut in a circle, according to the size of the vessel into which the water is to be filtered, and foliled into three, to make funnel-shaped, and inserted into the bottle or jug. For pressing and keeping flowers blotting paper is used owing to its absorbent quality.

BLOUSE. What may be termed the two classical styles of blouse are seldom quite out of fashion in some form. The first of these is the tailored shirt hlouse to the waist, and the second the Russian overblouse or tunic, belted, fastening down the side-front and pouched at the back.

Most fashion journals illustrate styles of blouses that arc in vogue, and it is quite easy for the home worker to select a pattern and adapt it to her own requirements.

BLOW-FLY. This is a large, stout bodied, two-winged tly of a steel blue colour, whose presence indonrs is made known usually by a loud buzzing noise.
The blow-Hy or bluebottle lays its 500 to 1,000 white eggs in batches on such joints of meat as it can reach, cooked or raw. These egge hatch in the course of a few hours, and white, legless maggots or gentles issue from them. In spite of the absence of jaws or any cutting apparatus, these apparently helpless creatures are able to break down the firm muscular material of the meat and use it for
 fully rrown fy. Above, highly mar

Blow-fly. Left : top, errs ; bottom, nifled head of a bluebottle, showing its relatively large ejes
their own sustenance. This they nccomplish by pouring out a fluid from the month which rapidly dissolves the firm flesh and reduces it to a condition in which the gentles can absorb it. A few days of continuous feeding bring the maggot to its full size, and it changes into the pupal form within the larval skin, which hardens and turns dark red Ahout a week later the pupa skin aplita to release the perfect hlow-fly.
Blow-Hies are not bred in ordinary dwellings ; they come in from without. Great care should le taken, therefore, to prevent their access to any flesh foods. The larder window must be kept open for ventilation, but it should be covered sccurely by a sheet of wire gauze. Should the female fly have deposited batches of eggs, these should be at once cut out and the joint washed with a solution of boracic acid
Besides the bluehottle described, there is nother blow-fly of similar habits. It lacks the blue hut owing delicate clothed, it chequered with and the fore-
 tint and instead is black, to the disposition of the hairs with which it is appears to be hlack and grey, body appears to e striper.

BLOW LAMP Plumbers, gas litters and elec. triciana use the hlow lamp to cut and make up connexions, painters

to blister old paint so that it may be easily scraped olf. The instrument con sists of $n$ strong body of sheet-stee or brass. A, capable of holding from a quarter of a pint, in the small sizes, to two pints or more in the larger ones, of petrol, para. Blow Lamp in use for removing old paint. Aboved diagram
showing how the appliance acts petrol para flin, or kerosene. The apirit is forced through
a nozzle in a vary line annular jet into a special Bunsen type burner, B, either by means of compressed air or by warming the hody of the lamp. As the spirit passes through the hurner it is more or less completely vaporised hy heat from the walls of the hurner, which hecome very hot, and at the same time draws air in with it The result is a very hot, strong llame. The diagram shows a form for hurning paraffin oil, in which an air pump, $C$, is used. There is a groove, G, running round the base of the burner, in which a little methyla ted spirit is placed and lighted when starting the lamp, to give n pre liminary heating. 1) is the filling cap, E a relief valve to reduce pressure when needed, and l , the handle.

A few strokes of the small air pump, forming part of the lamp develop the necessury pressure to force out the jet of oil, and, once started, the heat of the
burning flame is usually sufficient to keep the lamp going, though a stroke or two of the pump may be given when necded.

BLOW PDPE. The many forms of the blow pipe in use, from the simple bent tube to elaborate appliances, are divisible into two classes: those blown by the mouth, and those operated by mechanical ineans, which inay be merely a special form of bellows. The object in all cases is the same, namely, to supply an cextra amount of oxygen, either as oxygen or as air, to a Hame or jet of burning liquid or gaseous fuel, or a mass of solid fuel, to increase the intensity of its heat.

The simplest form is shown in Fig. 1, and consists of a piece of metal tube bent and tapering to a point; air is blown through this from the wide end by the mouth. Fig. : shows a mouth blow pipe with a connexion at $A$ to a source of gas, and Fig. 3 shows an injector blow pipe to be blown by bellows.

In using the common blow pipe, some skill and practice are needed to maintain a steady stream of air from the month. The hlast is to be kept up by utilising the muscles of the checks, breathing being carried on through the nostrils alone

The introduction of the jet of air from the blow pipe into the body of the flame, as shown in Fig. 4, gives rise to a double combustion. The outside of the large, shaded, hollow cone is burning with the aid of the external air; the inside with the aid of the forced jet of air from the blow pipe. In consequence, the sharded cone part acquires a very high temperature, more than sufficient to soften a bar of iron, or an iron tube to bend it, to solder any common article, or to weld two pieces of iron together. See Bunsen Burner.

BLUE: The Colour. For laundry use, blue consists of indigo, prussian blue, or ultramarine, in solid or liquid form. It is used in the rinsing water for white clothes, to neutralise any yellow tint after washing. It is also, for the same reason, used to rinse white hair. The solid blue sold in various shaper and in small bags consists of a mixture of 10 parts of ultramarine, 10 parts of hicar bonate of soda, 3 parts of liquid glucose. These ingredients are ground together in a mill until a stiff paste results. From this various shaped oubes or cylinders are cut, which are afterwards dried. On account of the presence of bicarbonate of soda the blue is a remedy in cases of wasp sting. For this purpose the blue bag is moistened and dabbed on the stung part.
Liquid blue, which is often preferred to solid blue for laundry purposes, is made by mixing prussian blue, 4 oz , and tartaric acid, $\frac{1}{2} \mathrm{oz}$, with one gallon of hot water, and atirring occasionally with a wooden stirrer for twelve hours. Then strain through a woollen oloth. Another method is to dissolve 1 p.c. of aniline blue in water, the advantage of this variety being the absence of acid. See Colour.

BLUEBELL. The wild hyacinth that flowers in the woods in spring is popularly knowh as the hluebell. It improves with cultivation if grown in cool shady places with a moist soil. The bulbs are best planted deeply ( 6 in deep is not too muoh), and when suited will send up an abundance of deep blue spikes year after year. There are many varieties, some bearing pale blue, some white, flowers. See Harebell; Hyacinth; Scilla.
Bluebottle. See Blow'fly.
Fig. 1

BLUE FLY. This name is given to one of the many aphides pests which infest gardens jects growing under glass. The best treatment is by nicotine fumigation, assisted by sprayings of soft soap and paraffin emulsion. See Rose.

## Blue Gum. See Eucalyptus.

BLUE MOULD. Starting from minute spores, this appears as a smail white speck, which spreads gradually over the surface of
 the food until a large area is covered, the older parts of the growth being blue or greenish-blue in colour. face. Jams, preserves, mould may grow: In the the typical appearance and Havour of the cheese. of blue mould where it is destructive, food should be kept covered and in a dry place, and food tins should have well-fitting lids. Oiled

Blow Pipe. Figs 1-4.
Bow Pipe. Figs 1-4.
Forms oi pipe employed
lor different purposes
paper should be put on jam while still hot from boiling to keep out the air; or a little melted paraffin wax poured on to the surface of the jam as soon as it has set. See Cheese.

## BLUE OINTMENT.

 colour, this ointment is prepared by ruhbing together metallic mercury and benzoated lard. A small proportion of suet is added to stiffen the ointment. It is employed in skin diseases, chronio inflammations, and enlargements of the glands, also for killing parasites. It is better to use it in a diluted form (one part of the strong ointment with two parts of larrl) to a void the risk of sulivation.BLUE PILL. An oldestablished remedy for liver complaints is the blue pill, followed next morning by a black draught (q.v.) or saline. It is a hlue mass, consisting of metallic mercury rubbed for a dong time with confection of roses and powdered liquorice root. The dose is from four to eight grains.
BLUE PRINTT. A kind of photograph of bright blue colour, known as a blue print, is made by printing from a negative on to a special paper which may be bought as ferroprussiate or cyanotype.
To make a print, a sheet is laid with the yellowish coated side in contact with the negative in a printing frame and exposure made to bright daylight until, on opening one half of the frame, it is seen that a when finished; and the shadow parts should square feet.
have a semi-metallic, choked-up appearance.
When it is judged that exposure has been sufficient, the print is simply soaked in clean water, when it quickly becomes of bright blue colour, showing all details. It is washed for a few minutes in water and left to dry by hanging up at a little distance from a fire.

It is really a plant which grows best on a moist surhread, flour, condensed milk, fruit and cheese are a mongst the articles on which the produotion of certain cheeses, such as Gorgonzola, hlue mould helps to produce

To prevent the occurrence

Named from its greyish-blue picture is visible. The picture must diagram. Matchboard and weatherhoard are appear much darker than it is required to be sold by the square, that is, 100 nominal

Blue print paper is very largely uscd for making copies of engineers' plans or drawings, etc. When exposed to light behind an original of this kind it will yield an excellent copy in white lines on a blue ground. See Dark Rooin; Developing.
BLUE STONE. Sulphate of copper crys. tals is so named. It is most popularly known as an application for exuberant granulations, or proud Hesh, and it stimulates the healing of sluggish soncs. The crystals may he rubbed on or used as a solution in water. Copper sulphate is a speedy emetic in narcotio and phosphorus poisoning, in a dose of 5 to 10 grains, but the doctor should administer it. It is recommended for styes as a one p.c. solution, applied every half-hour after the affected eyelashes have leen pulled out.

Chronic poisoning produces a green line along the guins. In poisonous doses it acts as an irritant. After the use of an emetic, white of egg and milk should be given, and followed up by drinks of harley water and thin arrowroot. Fomentations may be applied to the abdomen to relieve pain. See Poisoning.

BOARD : Varieties and Uses. A board as generally understood means a plank or piece of wood relatively long in proportion to its breadth and thickness. In the timber trade a hoard is reckoned as 1 in thick, and most hardwoods, whitewood, walnuts, etc., are sold by hoard measure, at per foot super. If the material measured 2 in . thick, then the price at lid. per foot super would be 1s., because there are two layers, as it were, each worth 6d.

For general indoor use, and many outdoor johs as well, the ordinary wood, known as yellow or red deals, answers very well. Such deal is sold in planks, that is, 11 by 3 in.; deals, that is, 9 by 3 in. ; hattens, that is, 7 by $2 \frac{1}{2} \mathrm{in}$. From pieces of timber of these


Square Edge Board


Sawn Weatherboard


Motched Weatherboard Board. Sections of standard prepared board used in building basic sizes all smaller sizes of timber are cut.
The term prepared boards means that the edges and one flat surface have been machined or planed amooth by machinery A rough hoard is one that has heen left by the saw. Shelving boards are cut 9 in., 10 in., or 11 in wide, and 3 in., 1 in . or $1 \frac{\mathrm{f}}{\mathrm{in} \text {. thick. They }}$ arc planed on face and two edges, and sold by the lineal foot or per foot Matchhoard is made in several thicknesses and widths ; it is planed on one side, and machined on each edge. The sections illustrated are the ones inost generally used. Weatherboarding is inade in two general forms-the ordinary tapered or feather-edge board, and the rebated, which presents a Hat surface on the interior and the familiar appearance on the extetior. A matchedweatherhoard is also made; this is tongued and grooved and staned, as shown in the

For the average indoor use ordinary squareedge planed boards can be purchased from stock at most timber yards in 3 in., 4 in., 5 in., 6 in., 7 in. or 9 in. uilths and $\frac{1}{2}$ in., $\frac{3}{3}$ in., 1 in ., and 1 fin . thick. Flooring is usually stocked in $\frac{3}{} \mathrm{in} ., 1 \mathrm{in}$. and 1 f in . thicknesses, 1 in being that most genelally in request.

Matchbord is made in $\frac{1}{2}$ in in., $\frac{1 n}{}$., and 1 in . thicknesses, and 4$\} \mathrm{in}$.. 5 in . and $i \mathrm{i}$ in widths. The quoted thichnerses of boards are nlways nominal, being derived from the deal or plank from which the material is cut. Thus a $\frac{!}{2}$ in board will only measure a full $a_{\text {a }}$ in. actual thickners. and a loard nominally 6 in wide will only hold up to an actual 5\% or pessibly 5 in if planed on both edzes

When using boards for shelving it is important the see that the thickness is adequate for the space to be spanned by the board. In ganeral a 9 in . by z in. hoard will only span 2 ft. without sagging, under normal loading. See Amateur Carpentry; Floor: Vatchhonrd. etc
BOARDING HOUSE. In towns or at the seaside hoarding houses resemble private hotels, and differ from furnished apartments in the fact that the guests take their meals in the same room and sliare a general sitting. room, in which a piano and comfortable chairs and couches are usually provided. In large cities hoarding houses seldom provide more than two meals a day, breakfast and dinner. except on Sunday when all neals are provided. The terms for room and mouls are inclusive. At seaside hoarding houses lunch and afternoon tea are usually pmoided at an inclusive charge City boarding houses charge much the same all the vear round, hut the boarding. houses at watering places, which have no
winter reason, increase their tariff during the on fiat pieces or chocks secured to the deck with summer reason. This culminates in August, which is, as a rule, the most oxpensive month in which to seek holiday accommodation

A bonrding house keeper, as distinct from a loriging house keeper, has no right to detain a boarder's lugazge for an unpaid bill. (In the other hand, she is uot linhle for thie safety of the hoarder's luggage or belongings, unless she is guilty of negligence. In a case where a servant was takien on who was a convieted thief, the lonarding house keeper was held guilty of neglivence, because she rngaged thie servant without any inquiry, and under such circumstances that she inight have known the sort of servant she was engaging. So that, when the servant stole from the boarders, the hoarding house keeper was held liable. See Holiday; Lorlgings.

BOARD WAGES. A servant who is ell gaged in the usual way, that is, at a wage with the mistress to provide food and drink cannot be compilled to accept board wages hut if the mistress does not provide the food and drink the servant is entitled us provide them herself and can claim the coat from the mistress. In England, if a mistress dismises a scrvant with a month's wasey in !icu of notice, she only pays ordinary and not board wages. In Scotland she must pay month's board wages, to compensate the servant for the board she could have had during the month. See Servant.

## Boat: The Making of a Model

## Fascinating Work for the Amateur

The reader should consult nlso the articles on Aeroplane: Engine and other Madels; also Soldering; Woodworking. A companion article is the one on Yacht
The making of a good working model boat with Indian ink, and coloured with water is a fascinating occupation for the amateur In this article full instructions are given for making (a) a model cross-channel steamer of modern type, and (b) a fast electrically propelled model apeed hoat.
In the construction of the ateamer (Figs I to 5) commence by making the hull from a solid block of sound pine or deal, free from knots. This hlock when finished must measure 24 in . long, 3 in . wide, and 3 in . deep. If a larger hoat is required the drawings can be enlarged in proportion

The hull can be shaped as follows Plane the wood block smonth and Hat on all four sides, and draw a centre line along the top and hottom faces. Square of the three section lines, A, B, C (Fig 2). on all sides of the block. Mark on the upper and lower faces of the hlock the deck !inc, and on the sides of the hlock mark the slieer line or profile. Now saw away the surplus wood nearly to these lines thus producing a boat-shaped block.
To ensure getting the hull the correct shape, cut three cardhoard moulds. shaperd as shown in Figs. 3-5 Apply these from time to time to their corresponding section lines while the work of shaping goes on. This is best done with the aid of chisels and gouges, warking from the middle towards the ends until all three moulds fit properly, their upper edges flush with the upper part of the block. Mark of the sheer-line and cut this to shape. Then hollow out with gouges and chisels the interior of the hull, taking care not to run the toola through to the outside. Cut a deck from a piece of yellow pine ${ }_{32}^{3}$ in. thick, and fix it temporarily with a couple of fine brads.
To complete the hull, cut $n$ recess $\ddagger$ in. wide into the bottom of the hull on the outside and fill it with lead. Then cut a way the middle part of the deck so that the whole of the superatructure can be lifted off to get at the machinery. The superstructure and bridge are made from $\frac{3}{32}$ in. pine or cigar-box woud. The captain's cabin is cut from mahogany, and the windows and doors drawn on it
colour paints. The railinga are made fron model stanchions and lloral linding wire secured with solder.
The funnels are made of tin-plate, the stays being floral hinding wire soldered in place as shoun. The top af the funnel is beaded over. and $a$ wire ring soldered beneath it. The two hatch covers and the skylights are out from mahog. any. A cigar-box oftersuseful material for this kind of work.

The lifehoats are carved from solid yellow pine blocks, fitted with seatr.and nountel


Boat. Fig. 1. Madel cross-channel steamer which can be made by the amateur. Fig. 2. Sheer plan and deck plan. Figa 3-5. Drawinga giving form of hull at the three critical points indicated on plang above
spray hood ends is $5 \frac{1}{2} \mathrm{in}$., tapering off to 4 in at the stern.
The amateur who does not care to tackle the job of making auch a hull can procure one from Whitneys, 129 City Road, London, E.C., who supply the power plant here illustrated and described. The hulls are made 24,30 and 36 inches long, and aso in the metre size. We will assume that the 24 -in hull has been made or purchased. A permanent-magnet motor to suit this size will run from $n$ dry battery (Ever Ready No 12i), or a special low-built light-weight accumulator may be purchased. This, while costing three times as much as the dry battery, has the advantage that it can be re-charged quite cheaply. Fig. 7 shows the motor with propeller shaft, atern tube and three-bladed propeller.

The motor shaft has a projecting pin which engages with the forked end of the propeller shaft and so acta as a driver. The motor frame is already set at an angle, so that when it is screwed down by its lugs to a wouden base made to fit the floor of the hull, the shait will be inclined approximately at the correct angle to line up with the propeller shaft. The stem tube, through which the latter protrudes, must be soldered into a hole carefully made in the hull The propeller shaft is supported further by a simple bracket made from a strip of brass bent up and soldered to the $l$ all The inner end of the stern tube is providsd with a atuffing gland to exolude water. The tube may rest on a block fixed to the wooden base, and may be secured by a brass or rinc strap passing over the tube and acrewed to the base. A clip for the dry battery or accumulator should be fixed at the stern
A wooden dashboard may be litted just under the mouth of the hood, and a simple switch on this will start or stop the machinery. The rudder is made from sheet zinc or brass, and soldered to a brass post. The past passes up through a brass tuhe soldered to the hull and protruding through the deck. The rudder is held in place, when set, by a lock nut Fig. 8 shows a larger motor for a


Boat. Model Electric Speed-hoat. Fig. 6. Bull, which ts made ol zinc. Fig. 7. Accumulator. Fir. 8. Motor with propeller shaft, stern tube and three-bladed propeller. Fig. 9. Larger power plant suitable for 36 ln . hall pricked holes using the pins as the key to the design. the middle of a hem. hardwood. Brush.
is drawn in pencil upon cardboard and pointa are inked and then pricked to show where the gimp must be made. A tracing of this draft is made on parchment, and this is fastened down upon the lace-making pillow Solid-headed pins are then inserted at the

The bobbins from whence the name comes are wood or bone, and carry the thread Two threads are tied together, and they, with their bobbins, hang upon the pin. The lacemaker deftly throws one bobbin over another.

BOCCONIA. The plume foppy or bocconia is a tine herbaceour perennial plant, growing 6 to 8 ft . high, with glaucous leaves and long plumes of buff-coloured Howers. It loves a deep, moist, subatantial soil, and thrives in well-tilled clay. It is effective if a small clump of it is grown in an isolated position as a form of lawn decoration. Propagation is by division in autumn or sprinu under glass, and by pieces ol root laid in shallow boxes of gritty soil in a frame in spring. Pron. Bok-coney-er.
BODKIN. A thick needle with a blunt end and a wide eye for threading elastic or ribbons through slots or lace, etc. A good substitute is an ordinary safety-pin, which also has the advantage of not becoming unthreaded in

BODY BRUSH. In best makes Iristle only is used, the knots are wire-drawn, and the backs screwed on as with good clothes brushes. The handles, which are lengthy for convenience and atraight or bent to suit various tastes, are usually made of beech or similar

Cheap fibre mixing brushes, which are harsh, or pure bristle of white and grey. can be had of any required stiffness. They should not be left lying on their backs in a sodden condition when not in use, hut hung or propped up to drain and dry. Occasional rinsing in hot water to which a little am monia or antiseptio preparation has been added will tend to keep them wholesome. See

BOETTGER WARE. Genuine pieces of the jasper-like stoneware in dark red, which was produced by the inventor of Dresden china early in the 18th century, are rare. They may bear imitations of Chinese marks, or the famous crossed-swords device, or be unmarked. Unglazed red ware of German make has been faked up and passed off as Boettger. The various styles include half-busts or figures with the drapery beautifully polished in a lathe, sprigged teapots, beakers and candelabra, hesides vases with lacquered or enamelled designs. All these form effective ormaments for the living-room, but do not mix well with $30-\mathrm{in}$. hull. Two 4 -volt accumulators in more delicate work, such as Chinese Horal parallel are needed for this set. The motor is mounted parallel with the floor of the hull, and is connected to the inclined propeller shaft by a flexible spring coupling.
Bobbinet. Machine-made plain net made with extra stout cotton and suitable for window curtains See Lace.

BOBBIN LACE. Lace hand-made, not with the needle, nor by knitting nor embroidery, but by twisting and plaiting threads into a pattern, is known as bobbin lace. Other names for the same kinds are pillow ace and bone lace (now obsolete). A design
pieces or old decorated white china.
BOG: In Gardening. An artificial bog is a piece of moist ground, natural or prepared, in which may be grown water-loving plants which do not actually require a pond or stream. These hogs are usually made of concrete or Portland cement basins, about 1 ft . in depth, and filled with peat and loam. The bog is kept wet by means of a drip from natural or artificial sources

Most of the ferns make good bog plants, and other popular specimens are the sundew or drosera, hardy lady's slippers, side-saddle

Howers or sarracenias, butterwort or pinguicula, marah marigolds, and Japanese primroses. See Water Garden.

BOG BEAN. This interesting aquatic plant is sometimes found by the edges of streams and pools It is called Menyanthes


Bog Bean, a plant for the water garden trifoliatn, and is also known as the luck bean. It is herbaceous and Howers in early suinmer, the Howers being bell-shaped, white inside, and strenked with red outside. The llowers are horne on stems which float on the surface of the water.
The bog hean is eusily propagated by taking short lengths of the stems and jegging them down with carnation pegs to the moist ground or bot- tom of the water, until they throw out roots. See Water Garden.
BOG OAK. This is the name given to oak found buried in peat boge which centuries of immersion have turned to a deep black colour. It has applications in cubinet-inaling. In various parts of Ireland where deposits of thag oak are found a considerable industry exiats in carving and fashioning this material into curios for souvenirs
BOIL : How to Treat. A boil is caused by a germ finding its way into the skin either into a hair follicle or elsewhere, there setting up inflammation. A cause may be any temporary falling off in the patient's health, but the general health may be apparently good. Over-eating, especially of rich foods, is a cause of boils. The patient should keep for a few days to a light diet and avoid aicoliol. Boiled Spanish onions are beneficial. The hoil should be sponged several times a day with a solution of one part carbolic acid to 20 parta water. If it is about the nostrils or in the ear, medical treatment is neccasary, and a pliysician should be consulted.

Impaired nutrition through under-feeding may cause boils in young children. The diet should be carefully looked to in such cases Chenical fond will be a good tonic. The skin all round the affected area should be wushed every day with saturated boracic acid solution, and the following ointment is then applied: buracic acid powder, one dram; vaseline, one ounce.

More sunlight and more hours spent out of doors will alao help greatly to build up the general health, and if a change of air is possible it may be, the best thing. See Gumboil.

BOILER: For Hot Water Supply. The development and successful use of any hot water boiler depends upon an appreciation of the fact that water rises when it gets hot. It is easy to see, therefore, that in an enclored boiler the water will tend to. rise as it gets hot. If a regular supply of cold water be introduced through a pipe at the bottom, and another pipe be taken from the top of the builer, the hot water will rise up this pipe, and the heated water can be stored up in a tank at any convenient spot in the house above the level of the boiler. The storage tank is connected by a second pipe to the bottom of the boiler. The pipe that the hot water goes up is known as the How pipe, the other as the return pipe, and both should be $1 f$ in. diameter.
A boiler of this type (Fig. 1) is generally placed at the back of the kitchener, as indicated in Fig. 2. The direct heat of the kitolien fire is about three times the value of
the Hue heat at the sides and back of the ment, provided they are not nearer than 18 in boiler, so that the most efficient boilers are to any woodwork and that any requirements those nearest th the direct heat of the fire.
Many of the troubles of
boilers are caused by the fact that they are neglected on the assumption that as they contain water they are automatically cleaned. The water, however, must be regularly drained off, the stove itself taken apart sufficiently to give access to the boiler, and the manhole or clearing plug located and unscrewed. When the manhole is opened and the water remaining in the system escapes, a can should be placed to catch as much of the water as possible, and


Boller. Fir. 1. Type largely used in kitcheners, and shown in position in Fig. 2 (above) by dotted lines are complied with The boiler should stand on a good solid bed of concrete (q.v.) or other fireproof material. The outlet tlue is generally made of cast or wrought iron in the form of a stove pipe. The water supply and the flow and return pipes should be of iron, except in certain districts where the water is very soft, in which case copper or lead pipes will have to be used.

An anthracite boiler is illustrated on page 20, fixed alongaide a cooking range. Both this boiler and the one shown in Fig. 3 will burn antliracite, broken coke, or coal, and consume all combustible household rubbish The boiler shown in Fig. 4 is intended to supply hot water for the bath. It is generally possible also to heat an old sack or one or two small radiatora with a boiler of two used to this kind, but a different type is required for soak up the re. a proper central heating system. mainder. After In addition to those illustrated the boiler has there are many other excellent makes been emptied. Boilery of this kind are fitted the scale or with a hot plate on which lur is removed by scraping it out with a metal chisel or a piece of hoop iron.

When a boiler is heavily coated with fur the coating acts as a screen or insulator between the water and the heat from the fire It also prevents the water from coming in contact with the metal of the boiler. Contact is necessary to prevent the iron from burning away, and this is most likely to happen where the deposit is thickest and the hent is greatest, just at the crown of the arch forming the Hue beneath the boiler After acrupulously cleaning the boiler, wash it out thoroughly and replace the manhole covers, well bedding them down with red lead, putty, and a piece of stout string coiled around and pressed down into the bed before replacing the cover, which must be serewed up tightly.

Independent Boilers. The home installation of a new hot water system is most conveniently carried out by the amateur if the independent type is chosen. These, being selfcontained, can be placed in any part of the building on the ground floor, or in the hnse-


Boiler. Fig. 3. Independent boiler which produces a constant aupply
of hot water. Fig. 4. Boiler which will supply bot bath water and may also be connected with two amall radiators or a towel rail smith if Wellstood. Lid.; and Nutional lladtator Company. Lid


Boiler. Fig. 6. Sectional dlagram of a dome-top boiler. A, water inlet : B, grate level below which is a water way, C ; $D$, mud bole ; $E$, hot water
outlet : $F$, fire door: $G$ feed door
cookery, a slow process which ensures the retention of the natural juices, is often pre ferred for such fonds.
The second object of boiling is to impart Gavour and nutriment to the liquid, e.g meat and bone soups and broths. To accomplish this result, the materials are placed in cold liquid, and allowed to soak for a time before heat is applied slowly till boiling point is reached. Boiling is continued till the ingredi ents have yielded their nourishment.

Boiling is employed thirdly to give part of the nutriment and llavour th the liquid, and partly to retain it in the meat, etc., e.g stewed chicken, Irish stew. This effect is produced by placing the food in cold water, and quickly heating it to boiling point, keeping it at that temperature for about five minutes and then lowering the heat to simmering point.

Boiling for the entire time of cooking s required for bone and meat soups; all green and most other vegetables; all boiled pud dings, all starchy foods, e.g. Hour in sauces and for rice, macaroni, etc.

It should be noted that once the surface al liquid bubbles briskly, no amount of fuel will make it uny hotter. The on! y result of furious boiling is that fuel and food are wasted.

Water in which meat, vegetables, nce. macaroni, etc, have been boiled should the used for stocks, soups, and sauces See Beel Chicken; Cooskery: Pudding etc

## Bokhara Rug. See Rug

BOLECTION MOULDING. In build ing work bolection moulding finds a place largely in the panels of doors. Such mould ings rise above the face of the framing and are rebated over the edges, forming a narrow projecting ledge between frame and curved part of the mould ing See Moulding.

BOLERO. A very short jacket with open fronts, the lower edge terminating some inches above the waist it periodically returns to every day fashion, and is employed for Spanish or gipsy fancy dress being worn over a white blouse.

BOLSTER. Usually round in shape, it may be stuffed with feathers or with white horsehair. A variety for use with the large, square pillow is the wedge bolster This is about 20 in from hack to front. deep at the back, the height about 5 in . and sloping to the front. weight about 5 in. and is as thin as possible.

Upholstered like a mattress, a bolster should have a permanent under-cover, and a cover which is changed regularly in the same way as a pillow-slip. See Cushion; Pillow

BOLT. For doors, cupboards, and similar purposes, bolts are made in hundreds of different sizes und styles They have one object in common-to secure a movable part to some other part usually immovable Essen tial considerations are security, efficiency, and neat a ppearance.

A few of the more useful types of bolt are illustrated, their principal uses being as follows

Common japanned tower bolts (Fig 3) are made in several sizes, from 4 in . to 12 in long, and are used for outhouse doors and general purposes. They frequently shoot into a plain hole drilled in the doorpost.

Brass barrel bolts (Fig. 4) are made in sizes from 2 in. to 24 in. long for internal work, and are screwed flat on the door. Flush bolts (Fig. 6) are generally made in brass, with a sunk slide, in many sizes and
widths, trom 3 in long by $\frac{1}{d}$ in. witle to $\because 4 \mathrm{in}$. long by 1$\}$ in wide. They are fixell to the enge of a door, and embedded by cutting a recess, and are frequently used on the one side of a double door.
work. high tensile steel

Engineers' bright bolts are machined all over, and hold up very closely to size. Made with bexagonal head from superior grader of mild steel. they would always be used on machinery or any jol, where strength is a consideration

Coach bolts, which are much used for bungalow work and poultry houses, have a rounded head and square portion on the shank immediately beneath the head to prevent the bolt turning round

Eye bolts are so named because the head is formed as an eye or ring. Generally
Bolk. Figa. 1-8. Verious patterns of doorobolts in common asa soe text


Fig. 5


Fig 6

Blind bolts (Fig. 1) are made straight or screwed Whitworth and made in the black necked, and cxtensively used on cabinet work, for doors of small cupboards, etc. They screw flat on to the door, and may shoot into a hole, through a brass plate, or into a socket.

Monkey-tail bolts (Fig. 5) are largely used for warehouse and garage doors. They are
 in length. Padlock bolts (Fig. 2) are sometimes used on the outside of storehouse or shed doors, the bolt being locked to a staple with a padlock. Such bolts are usually gal. vanized to resist rusting.

Bolts seldom give trouble, the only things likely to affect them being the shrinkage or warping of the door, or the wear of the hinges, allowing the door to settle. This generally necessitates the removal of the staple or socket, plugging the old holes, and rescrewing.

Bolts fitted with stamped metal sockets sometimes work stiffly. They are generally corrected by holding a heavy hammer beneath the barrel and striking a few sharp blows with a light hammer on the upper part of the barrel or socket. This stretches the metal somewhat and makes more room for the bolt. The bolt should be shot into the socket while doing this, as it then presses on the tight spot; the jarring due to the hammer blows is transmitted to these tight spots, and they are thus stretched. See Latch; Lock, etc

BOLT AND NUT : Elow to Use. In the general meaning of the word a bolt consists of a circular rod of metal having a solid head formed on one end, and screwed or threaded at the other end to receive the nut. The pieces to be held, or bolted together, are thus clamped between the head of the bolt and the nut.

Bolts are made in a wide variety of forms, sizer, and shapes, adapted to various purposes. The forms of the screw thread and its pitch, or number of turns to the inch of length, vary according to certain standards.

The ordinary black ironmonger's bolt with hexagonal head is used in all houses. The hole for it to pass through must be slightly larger in diameter than the nominal diameter of the bolt, as it is not machined to exact size.

British standard finethreaded bolts, known as B.S.F. bright bolts, are extensively employed on automobile and aircraft

is known purchased as a screw or set screw.

BOMBAY DUCE. A tish obtained in Indian waters, and exported fron Bombay either in a dried and salted condition or in tins. Bombay ducks are usually crisped in a brisk oven for a few minutes, and served with curries. To powder these dried fish, crisp in the oven without burning, pound finely, and put through a strainer. See Curry.
Bonbon. This word is. used for certain large sweetmeats. See Cracker: siveets.

BOND: In Brickwork. Bond is the name given to any arrangement of bricks so that the vertical joints in one row or course do not come exactly over or under a vertical joint in the next course. To ensure a
satisfactory bond, the bricks must be uniturmly arrangerl, have as few hats or partial bricks as possible, and the vertical joints or perpends in every other course must be above cach ot her.

Several kinds of bond are in general use. the principal of these being known as English, Flemish, garden-wall, and herring-bone The ordinary dwelling-house is usually built with English or Flemish bond. The names apply to certain recognized ways of arranging the bricks in the one brick or 9 in . thick wall, and the one and half brick or $13 \frac{1}{\mathrm{~s}} \mathrm{in}$. thick wall See Bricklaying.

BONE. Grouped together as the skeleton, the bones of the human body form the framework upon which all the tissues depend. Bones are composed of chalky substance (carbonate and phosphate of lime) together with fibrous tissue In youth the fibrous tissue preponderates and the bones are elastic to a large extent, whereas in old age mineral salts make up the bulk of the bones. Children's bones, therefore, tend to bend and yield under pressure, whereas the chalky bones of old ago are brittle and break easily.

Inflammation may occur in the periosteum (the tough membrane that covers the bone), the bone, the bone marrow, or in all threc. It may follow an open wound or be due to microbes brought by the blood, nore especially after an injury Hence superficial bones, like the shin or bone in the neigh bourhood of joints, are specially liable. The inflammation may be acute or chronic. If the bone is denuded of periosteum the portion laid bare is likely. to die.

Children who are run down, or who have some source of infection about them, such as a sore throat, are occasionally liable, after a slight injury perhaps, to a virulent and dangerous infection of the bone marrow of a long bone. The child looks very ill, highly fevered, perhaps somewhat delirious, and screams if some part of the bone, say. the lower end of a femur, is touched.

The importance of remembering this condition is that it is sometimes mistaken for acute rheumatism, and valuable time is lost. Dragging at the arms of small children is a cause of inflammation at the growing ends of the bones. The treatment of these conditions is surgical. See Arm; Fracture: Leg, etc.

BONE BLACK. A form of charcoal, prepared by heating bones at a high temperature in iron vessels front which air has been excluded. It is employed for bleaching sugar and also in the manufacture of blacking. The best kind, ivory-black, is made from waste ivory. In this variety the charcoal is in a very fine state of division.

BONE MIEAL. This contains about 45 p.c. of calcium phosphate with about 5 p.c. of nitrogen. It is a useful fertiliser to apply to plants which are coming into full growth in the ordinary heated or intermediary house. It is a valuable atimulant, and is practically inororous.

Bone meal is largely used, on account of the phosphates it contains, to promote growth in young chickens. It is often confused with green cut bone, from which it differs materially, the latter possessing a high nutritive value, and bone meal little, if any. See Chicken : Fertiliser : Poultry.

BONES : Use in Cooling. Clean, fresh bones contain a large amount of gelatinous matter, but this can only be extracted by quick and long boiling. It is quite easy to know when bones have yielded all nutritive and gelatinous elements, as they have then a spongy, perforated appearance and are of no further use.

Bone stock is a foundation for various soups. Poultry and game bones, which nust not be the least high, and ham and bacon bones are especially valuable as flavourers. To make stock, wash 2 lb . of bones, removing the fat and marrow. Saw or chop into ahort
pieces, and put in a saucepan with 2 quarts of cold water and a teaspoonful of salt.

Heat slowly until they boil, and remove any scum. Add 2 oz . each of clenned and scraped carrot and onion cut in quarters. Do not peel the onion, as the skin will add colour and flavour. Boil the whole stendily for 4 hours, strain into a basin and leave until cold. The hard white fat that forms on the top may be saved for dripping, for use with vegetables, etc.

For devilled bones select those with sufficient meat to afford a meal. Sirloin of beef bones or those from a roast saddle, or blade-bone from a shoulder of mutton are best. Mix together 2 teaspoonfuls of French and one of English made mustard, a tenspoonful of chopped chutney, $\frac{1}{2}$ teaspoonful of strained femon juice, with salt and cayenne to taste. Work all these into 1 oz . of butter. Spread and work this mixture well over and into the meat on the bones, and dust with a few browned crumbs. Place on a baking tin in a sharp oven until thoroughly hot, or they may be broiled Serve at once with any of the melted mixture poured over them, and garnish with tufts of prepared and seasoned cress.

Marrow bones contain nutriment and make a savoury or lunch dish. Select large, fresh bones and have them sawn through if more than 3-4 in. long. Cover the end of each bone with a little stiff paste made of flour and water only, to prevent the escape and wasting of the marrow during cooking. Tie each in a cloth and boil from $1 \frac{1}{2}$ to 2 hours. Take out of the pan, remove cloths and paste, pin a clean napkin round each bone or half bone and send to table upright on a hot dish, with dry, orisp toast in a toast-rack. A long marrow spoon is used to extract the marrow.

BONING: Joints and Peultry. Some joints of beef, mutton and veal, e.g. breast of mutton, brisket and aitchbone of beef, and shoulder of veal, and also, on occasions, fowls, ducks and other birds, are boned before they are cooked, to lessen carving difficulty.

If a boning knife is not available, a sharppointed kitchen knife may be used, and should be slipped with a olean cut to the bone. Do not include in the joint any pieces of gristle, etc. that might be left on the bone.

The secret of successful boning is to cut the meat as little as possible. In some cases, e.g. a shoulder of vea!, the hole left by the bone can be filled with forcement. Such meats ay pig's heard and calf's head, and also sometimes breast of mutton, etc., are boiled whole until the bones readily lerve the meat.

Fowls, turkeys and ducks may be boned and their original shapes retained, if so desired. To bone and shape a turkey, take one that is plucked and (Irawn, cut off the neck and loosen the skin from round it, pushing it well back. When the wishbone is exposed, detach it carefully from wings and breast bone. Divide the joints of the wings and clear them. The breastbone has next to be freed; detach the most prominent part carefully.

Roll back the ment over the part unboned, keeping the knife close against the bones. Detach the legs at the joints, and, after a little further work, the entire skeleton will come away. Then wash and dry the turkey. To bone the legs, the knife is worked gently round the bone, the thigh bone being removed whole. Continue until about half the drumstick is exposed, and then saw it off, leaving a little bit of the bone in to help to give the prepared turkey a more natural appearance. The small end bones of the wings are also left. For a galantine the end bones of the wings and legs are removed.

Turn back the meat the right way out. Fill the legs and wings with forcemeat, pressed tightly in until they resume their former shape. The trunk may be stuffed with forcemeat, or filled with a cooked ox-tongue, the bend of it
lying where the prominent part of the breast- Hesh of the wings and legs, and trim off the bone should be. The spaces left are stuffed rough edges of the neck.
with ns much forcemeat as the turkey will hold. Work the turkey with the fingers until it has nearly regained its shape, tie securely in a buttered cloth, and it is ready for boiling.

A fowl boned in a similar way could be stuffed with sausage meat, the spaces being filled with mushroom, bacon, or other stuffing. Ducks are stuffed with sage and onion. To bone a bird that has already been cleaned, slit it down the back, and work round it from there. The back can afterwards be drawn together.

Our illustrations show how a chicken can be boned. In Fig. 1 it is represented as ready dressed, but an untrussed bird is dealt with in precisely the same manner. When trussed, remove the skewers and strings, reserving the liver, gizzard, extreme ends of the wings, and the feet up to the first joint.
To bone the chicken (Fig. 2), it should be held uip on end supported by the left hand


Arrange the flesh evenly over the surface of the chicken. Spread carefully 1 lb . of sausage ment flavoured with $\& \mathrm{lb}$. of chopped mush. rooms, 3 oz . of bacon, cut in fingers, and a hard-boiled egg, sliced. Arrange it as shown (Fig. 5) and roll it up neat'y, but do not sew the edges together. Tie it in a oloth like $a$ roly-poly pudding, and it is ready for cooking.

The finished dish is shown in Fig. 6. Remove the cloth, rinse it out in hot water, and tie the chicken up in it, tightly shaping it. The bird should then be pressed between two dishes and allowed to cool. See Beef; Breast ; Chicken; Fillet: Garnish; Stuffing.

BONNET: Of Motor Car. The bonnet's seating, both on the dash and the radiator, is threaded through noles with a strip of some soft material. Should this be hard, which is more than likely, through the ingress of oil and dirt, replace with new.
A frequent cause of noise is due to the bonnet butting up against the seatings, thus giving the impression that it is too long. This is seldom the case, the fault usually being in the radiator, the holding bolts of whioh have become loose, allowing the radiator to vibrate. These should be tightened.

Where a top centre hinge is employed see that it is firmly secured at each end. Finally, a little very thin oil worked into the hinges will oure a lot of puzzling noises; the same applying to bonnet fsstenings. Sec Motor Car.


Cornmence by turning the skin of the neek back over the brenst and back until the shoulder bones of the wings are laid bare. Divide each joint as in the photograph and scrape the bones of the wings quite olean, removing the wing bones from the carcase.

The flesh of the body must now be removed carefully and cleanly with the boning knife down towards the thighs, and must be scraped off the breast bone without breaking the skin (Fig. 3). Divide the thigh joint as shown, scrape the bones quite clean, breaking them at the joints, and remove them also.

Now proceed. \&s shown in Fig. 4, to remove the Hesh entirely from the carcass. Cut off the "parson's nose," turn inwards the
 Boning a Fowl. 1. The bird ready dressed for boning. 2. Skin of neck
turned back to lay the shoulder bones bare. 3. Dividing the thigh joints. turned back to lay the shoulder bones 5. Flesh spread over with stuffing of hard-boiled eggs, bacon, sausage-meat and mushrooms, before being rolled up for cooking. 6. The fnished dish as garnished for serving

## Bookbinding for the Amateur

## How to Repair and Rebind One's Books

The article on this subject is one of a group that describes hobbles which can be taken up with advantage hy the amateup. Sec Leather Work

Simple bookbindiny may be done at home with a few tools and applianccs, and the liandy man can iniprovise or make for himself many of those required. The tools needed nre as follows:

| laying | 1 mewing frame and keya |
| :---: | :---: |
| 1 pair backlog hoards | 1 backing hamm |
| 1 pair cutting boards | naring knile |
| 1 pair presalng boards | 1 bone folder |
| 1 pair pressing tlns | 1 knocking down fron |

To these may be added others likely to he in the amateur's tool box, i.e. a small tenon saw, a aquare, and a glue pot. A paste-pot will be needed also. The bookbinder uses a small "tub" for this purpose (Fig. 8), a rectangular wooden hox having fixed across it at one end a wooden strip on which to rub out surplus paste from the brush. Glue and paste brushes should be the proper ones made for the purpose. They can be obtained, together with other requirements of the amateur hookbinder, from the firms which specialise in these goods

Since the cutting of book edges presents some difficulty to the amateur, and is done by machinery in a fraction of the time taken by the old-fashioned method, it is suggested that the local bookbinder be asked to trim the edges of any hooks which require this treatment. If this course is adopted the annateur will not need the tool called a plough, which is used, in conjunction with the laying press (Fig. 8), to cut book edges by hand.

We will commence with a oloth bound book which has come out of its cover, and is otherwise in fairly good order. Dealing first with the cover, remove any loose portions of the end papers and any hard glue adhering to the back. If the cornera have been "teleacoped ' they can be carefully hammered out flat. The back of the case may be repaired with pieces of binding cloth of the same sort and colour as the original. Should the back be damaged beyond repair, a new back may be made from a strip of cloth. The new back must be cut wide enough to allow an overlap on each side, which is glued and pressed between the edge of the old cover and the board.

The edge of the old cover fabric must be rubbed down with a bone folder to make a close joint, and the case can then be put aside in a press, or under a weightcd board, to dry. An old oopying press, often to be picked up cheaply, would be very useful to the worker.

A new case is ensily made, the old one serving as a gauge for size. If the old boarda are


Bookblading. Fir. 8. Laying press, showing ploarb for cutidin book edres; (above), paste tub
usable, the measurements of the case should be observed before stripping, and a piece of binder's cloth cut to the size, allowing an overlap all round for turning in. If new boards are necessary, strawboard of the appropriate thickness should be obtained and carefully cut to size with a sharp knife and a metal straight-edge. A piece of stiff paper is glued to the back, leaving a space between the hoards and paper strip. Fig. 2 will make this clear.
The cloth is glued out and left for a minute, when the left-hand board, $A$, is placed on it, leaving the correct margin for turn-in. The manilla strip, $B$, is then placed on the cloth, and finally the right-hand board, C. The positions might be marked on the cloth by pencil lines before glueing. Turn in the edges, rubbing the cloth down with the folder. It will be noted that the point of the board comes a little within the diagonal edge of the cloth, just leaving a little cloth to form a fold when the edges are turned over the board.


Bookbinding. Fig. 1. New end papers, A and B. Gpped on to the frat section. Fig. 2. Making a new Backing board. Fig. © Cuting board. Fir. $\boldsymbol{\theta}$. Book alter backing Fig. 7 . Bow book ts rounded

The cover is then turned right side up and the whole surface rubbed down well with the folder. If the glue is hot and in proper condition there will be a smooth surface and no bubbles.
The book itself must now be dealt with New end papers will be needed, and perhaps the atrip of mull which held the back to the covers has come away. The mull may be pulled off and replaced by another atrip, but if the sections are loose or some of the stitches are broken, this must be attended to first. The sections of a book are sewn through the fold from the centre, each section being also caught to the next. Ordinary hooks are machine sewn, the better-class work being sewn to tnpes or cords. The methods adopted for hand-sewing books are shown in Figs. at and 10. The latter explains the process of sewing on tapes.

Make new end papers by cutting a sheet of stout white paper twice the size of the book page and folding it in the middle (Fig. 1, A, B). This is pasted at the fold and tipped on to the first section of the book. The end papers for the final section are made and fixed in a similar way. Any torn leaves in the book may be mended with paper resembling that of the original. The old end leaves will furnish paper for patching or mending, and gummed transparent mending paper may be utilised. Loose plates should be tipped with paste and carefully replaced.


Book binding. Fig. 9. Sewing press, slowing the
method of sewing on cords. Path of needie indicsted on cords. Path
by dotted line
After any loose sections have been dealt with, and new end papers attached, the back should be glued up. Place the book in the press between boards, and work thin glue well into the back. When the glue is dry, but not hard, the book may be rounded Fig. 7 shows how this is done. Place the book Hat on the bench, front edge towards you. With the four fingers of the left hand stretched across the side and the thumb pressed into the front edge, pull the thumb and fingers towards each other, at the same time hammering the back of the book towards you. Turn the hook over and repeat the hammering. This will force the sections forward on each side, and the book will now be perfectly flat with a round back, instead of being wedge-shaped with a flat back as when first sewn (Fig. 11). The threade used for sewing do not now fall exactly over one another, and the increased thickness or sewing swell is thus reduced (Fig. 10). (These illustrations show a book which has been sewn on cords. In good class work the ends of the cords are laced through holes in the boards of the cover. The cloth or leather cover is then made on the book itself.)

Place the book between backing boards in the laying press back outwards. The top of the backing boards should be ahout the same diatance away from the back edge of the book as the thickness of the cover boards (Fig. 3). Sorew up tightly and hammer outwards ! rom the centre to form a groove into which the oover boards will fit. Care inust be taken to kecp the round true, as near as possible the third of a circle (Fig. 6).

If the back of the book was in fairly good onder it will not have been neccssary to re-sew
soctions or to round and back the book. Glue and bring the cover over on to the book with up the back and line it with stout paper, the lcft hand, watching meanwhile to see rubbing down the lining after a while with a that the margins are even and equal to those


Bookbinding. Fir. 10. Sewing on tapes ; path of needle shown by dotted line. Fig. 11 . Book sown on cords, showing catch stitch betwoen sections: Loft, after sewing; right. baok ronnded. Fig. 18. Wethod of overcasting singio loaves
folder. When dry, glue up again and place on of the front cover. The book must be placed the back a strip of mull about $1 \frac{1}{2} \mathrm{in}$. wider botween pressing boards and left overnight than the back, leaving unglued the overlapping portion, which is pasted down to the covers when casing in the book. The book is then placed aside to dry.

To insert the book into its cover, the front end paper, together with the overlapping portion of the strip of mull, should be evenly coated with thick paste and the book laid carefully on to the cover, seeing that the "squares" (margins) are equal on head, tail and fore-edge. Next paste the other eug. (back) end leaf, which will now be uppermost, the illustration of a sewing frame (Fig. 9) a and leave it for a minute. Then hold the section is shown boing sewn to cords, a method book with the right hand between its leaves, adopted for better-class work.

## BOOKCASES AND BOOKSHELVES

## Fittings to Make or Buy for House or Flat

Here is shown how accommodation for the books of the household can be provided at small cost. For information on the Carpentry details involved see Cabinet Making; Jolnt: Mortise: Tenon; Wood, etc.

The shape and size of a bookcase nust vary painted to suit the woodwork of the room or according to the space available for its accommodation. Those most usual in houses of moderate dimensions are made to fit the recesses on each side of a fireplace, or to reat against a wall. They should havo the advan. tage of light, without the disadvantages of st rong sunlight or appreciable heat from coal or gas fire or hot-water pipes. The golden rule is to make the bookcase for the books. Any ornament should be of the simplest kind, and the shelves should be movable, so that the books can be placed upon thent according to their size.
Sectional bookcases on the unit system are useful in this respect, and possess the adven. tage of being easily moved and added to. On the other hand, their appearance is not so deonrative for a drawing-room or in associstion with period furniture as shelves well placed in niches or recesses, or bookcases of the Chippendale style (q.v.). Space saving is so necessary in many homes that bookshelves are often added to built-in corner seats, above the padded backs; or low book. cases form separate and yet composite parts of a divan sofa, made in threo seotions, with upholstered centre and the two-shelved book. cases at either end,


Bookcase. Fig. 1 (above). Bookcase
cabinot made to fit in recess. Fig. 2 (risbt). Front elevation, section and pian
made in oak, walnut or mahogany.
The total height of the bookcase shown in Fig. 1 is 4 ft .3 in ., the width 2 ft .10 in ., sud the depth $10 \frac{1}{\mathrm{i}} \mathrm{in}$. The bookcase portion has three spaces, and will hold from fio to 70 volumes of crown 8vo or deiny 8 vo size. Fur living-room bookcase oak will look best, or American whitewood will serve if it is tained to the colour of one of the hardwoods.
The cnds, Fig. 2 (A), niay finish $z$ in. thick. The


- Manc
upper part is cut back with a sinuple shaping, and the lower parts may be shaped as indicated if the cabinet is not to stand in a recess. Both ends aro dovetail-grooved to take the cupboard top and bottons, the gronves being stopped about fin. from the front odge in order that the joint will be hidden. The back edges may bre rohated for the upper and luwer backs

The cupboard bottonı ( $B$ ) and top ( $C$ ). likic the ends, should finish $\frac{7}{} \mathrm{in}$. thick. They are dovetail-housed to the ends, and the front edges will be cut back to correspond with the stopped grooves. At front the edges are Hush with those of the ends. The back (D) is indicated as three-ply, but may be matched or framed according to the use to which the cupboard portion is to be put. The shaped rail (E) below the cupboard bottoni

|  | Long In. | Whide In. | $\begin{gathered} \text { Thick } \\ \text { inl. } \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| 2 enila (A) | 51 | 11 |  |
| Cuphoard hottom (1i) | 33 | 10 |  |
|  | 33 | 101 |  |
| Rack (threr-ply--I)) | 30 33 | 33 2 | \% |
| Top shelf (F) | 33 | 51 |  |
| Upper back (Jolnted- (1) | 33 | 1.5 |  |
| Pllaster allp (H) | 103 | 11 |  |
| 2 back sllpa (J) | 16 | 11 |  |
| 4 door atilos (M) .. | 28 | 2 |  |
| 4 door ralla ( N ) .. | 164 | 2 | ? |
| Astragal (0) 2 insilc alicivea (i) |  |  |  |
| $2 \text { shelf brackets ( } R \text { ) }$ | 5 | 2 |  |
| Panel mould (If used-s) | 72 | 1 |  |

stands back about so in. It may be dowelled on, or giued with angle blocks behind.

The upper shelf ( $F$ ) is shaped as shown in the plan, and is plain housed to the ends. If the upper back ( $G$ ) is made in two parts the shelf may be cut $\frac{1}{2} \mathrm{in}$. wider than shown, in order that it may go right to the back. The small brackets ( $R$ ) stand in $\%$ in., and are fixed with small glued blocks.
(In the section the upper back ( $G$ ) is shown in one pieco. If preferred, it may be in two parts, the upper portion being dowelled to the shelf ( $F$ ). If in one piece, or if jointed (the joint ooniing behind the shelf), $\frac{1}{f}$ in. wood may be used. In this case, H is a $\frac{1}{\mathrm{t}} \mathrm{in}$. pilaster, planted ont, and JJ are two moulded slips, $1 \frac{\mathrm{in}}{} \mathrm{i}$ wide by $t \mathrm{in}$. thick, planted on to form a kind of plinth. If it is preferred to have the upper back divided, the wide portion between the shelves might be (a)
 franted up with a long mirror, or (b) framed to form two panels as in. dicated, or (c) it might be a solid board with a small mould ( S ) pinned on to form panels. The ends, which are $5 \frac{1}{2} \mathrm{in}$. wide at the top, are rounded off to tho section shown.
The doors (M) and N) should not be made till the carcase is otherwise com. plete. They are framed up of stiles and rails 2 in . by $\frac{7}{8} \mathrm{in}$. and are shown without a mould. The astragal (0) should be quite plain if the doors are made to the section shown. Insideshelves ( P ) are ${ }_{3}$ in. thick, and may be hung on fillets or on studs.

In the cutting list given un page 119 the lengths and widths allow for joints and paring, but all thicknesses are net. If the upper back $(G)$ is cut in two pieces, the lower one will be 10 in . wide and the upper one $2 \frac{1}{2} \mathrm{in}$.

Making a Set of Bookshelves. A set of book shelves which are suitable lor a narrow recens at the side of a fireplace, or the return corner of a room at the window end, is shown in Fig. 3. The addition of a small cupboard helow adds to its usefulness. Additional wide shelves may replace this, if desirod If other furniture has to be matched, oak or other hardwood may be used, but for ordinary purposes American whitewood will do.

The cutting list is as follows, lengths given allowing for joints, but all thicknesses are net.


Buck (matched) about 15 ft . super.
The sizes given on the scale drawings in Fig. 4 are necessarily suggestive. A carcase width of 2 ft .6 in . is useful for the narrow recess, but this could be slightly increased or reduced to suit requirements.
The uprights (about 6 ft . 2 in . long) are $s$ in. in width. Dut widened by glue-jointing to

the amsteus wood worter ? in. thick, with or without a mould. The shaping, also of canary woorl. if in. thick. inside clupboard shelf, fixed or adjustable, is screwed in position from top of cornice boart will act as a door-stop.

When shelves have to be fitted into a recess, and no screws or nails may be driven into the wall, a good plan is to provide two uprights of Hat board as wide as the shelves, onc for each side, or alternatively two narrow uprights, about 3 in . by 1 in ., for 9 in . wide shelves, for each end. If the shelves are not to be adjustable for distance apart, it only remains to cut grooves in the uprights at the desired levels. An alternative method, avoiding the need of wedging between the wall and the upright, is to cut two or more shelves so that they have projecting ends that pass through slots cut in the uprights for that purpose. These are then secured with wedges driven through alots in the projecting ends of the shelves.

Assemble thc parts as follows: Glue to the grooyes which are cut in the ends, and fix in the three shelves: glue, nail, and screw the cornice board, and allow the glue to harden ; cut the shaped piece, and glue and sorew it to the cornice board. If the screws be put in from the topof the cornice, the method of fixing in the shaping will be concealed from view. Three coats of suitably coloured enamel will make a good finish

Ends, ehelves and cornice board are of canary wood, 7 in. thick; they sliould be kept as thick as pussible but planed out of winding. The

11 in. for the lower part. The added portions are shaped at the top, and at the extrene top of the uprights a little piece is glued on to give a break. The uprights should be dove-tail-housed to the top, shown 9 in . wide.

The cupboard bottom and top and the top shelf should be dovetail-housed to the uprighte,

the hollsing being stopped in each case to mask the joint. The other shelves may be housed, or fitted on fillets or secured in position with bookcase pins. The shaped rails below the bookcase top and the cupboard bottom may be glued on with angle blocks behind. The
dours are framed of material 2 in . wide by

Fig. 5 shows a hanging bookshelf. The shaped part of the ends shown in the elevation is cut out with a bow saw and carefully cleaned up to a smooth finish. The ends are then marked out, and the dovetail grooves cut so as to receive the ends of the shelves, which are cut as at C (Fig. 6).
The front and ends of the cornice board should have their edges moulded, as shown at A or 13. The moulding at $\mathbf{A}$ is worked with a moulding plane, but those who do not possess a suitable tool could easily cut the moulding shown at $B$, which would be alnost as effective. The shape cut at $B$ would be worked as follows: Mark the work as deeply as possible with a cutting gauge, and plane roughly to aliape with a jack plane ; then work away the square or fillet with a tenon saw and chisel, pare up, and glasspaper to a finish. It will greatly facilitate the working of the moulding if the glasspaper is wrapped round a small piece of wood about 21 in . long by 1 in . by 1 in .: there will then be little or no tendency to ruh he flat or chamfered portion of the moulding out of shape.
with 3 screws, 11 in . long by 10 or 8 gauge. The cornice board is fastened to the ends with 4 screws 2 in. by 10 gauge and 4 oval nails. 2 in . long. To fix the bookshelf to the wall, 3 brass ear plates are required; ¿2 ear plates are fastened to the cornice board and I to the centre of the bottom shelf.
Movable Shelves and Portable Shelving. When a large number of books is to be provided for, and perhaps the whole side of a room will be taken up with the shelving, the system described below is suitable. The sides and any intermediate uprights are I\} in. by 8 in . or 9 in . boards, and the shelves are 1 in . thick. Oak is very suitable for the purpose. A pair of uprights are connected by a base at the bottom and a comice at the top, these being of the length selected for the shelves.


Bookaase built ap on the unit system from bozes with and withont doors, made by Venesta, Ltd.


Bookcase. Sef of shelves, so constructed that each shelf can be adjustej to the height of the volumes it is intended to bear Courtesy of Counsril Life, Lid Angle bracketa and screws are used to fasten he pasted inside the cover of a book to mark them to the uprights. Slotted brackets can be its ownership, a book plate may be specially obtained which permit the removal of the base designed and an elaborate production blazoned or cornice by just slacking off the screws, with cont of arms or some fanciful design, or a which need not be entirely unacreverl. Two simple form with the owner's name. The grooves are ploughed in each upright to take earlieat existing examples date from the narrow metal strips (Fig. 7) picrced with rect- early l6th century, and these, as well as angular holes about an inch apart. The atrip fine sjecimens of workmanship of the 17th lies in the groove flush with the face of the wood, and is secured by screws. and 18th centuries, are collected by some peoplc as a hohby.
The shelves are supported on steel studs which fit into the holes in the strip. The strips are sold in lengths of 6 ft., but can be had in special lengthe at a little extra cost. Iron brackets from 2 in . to 6 in. wide are also made for use with the bookcase strip (Fig. 9). In making up shelving on this system it is imperative that the strips on each of the uprights shonld be the same height from the floor line. Intermediatc "prights willb


Book Rest. Fir. 1. Tilted book rest suitable for a stody table or writinn-desk. Fig. 2. Front aspect. Fin. 3. End of book rest inlaid with black and white check pattern the squares indicated represent each hati inch

## BOOK REST : How to Make. A book rest

 or book rack differs essentially froin a bookease or bookshelf in that it is mainly used for holding books which are constantly in use. It is gencrally designed so that the books are tilted at a convenient anglo for quick selection.The book rack shown in Fig. I, which is made with two ends, a back and n botton, could be carried out in oak, in which case the


Book Table in polished oak. It has sheives on every side and is admirable for the lounge. See below
ends may be inlaid with a black and white patten, as shown at Figs. I and 3. If this plan is adopted, the rack should be fumed fairly dark and waxed, and the inlay could be elony and holly. Mahogany and walnut are alan anitable woods.

The ends, which are $\mathrm{f}_{\mathrm{l}}^{2} \mathrm{in}$. wide by ( i in. high, are cut from $\frac{1}{2}$. material with the grain running from top to hottom. The shape may easily he transferred from Fig. 4, if the squares indicated in the illustration represent each it in. The back and bottom alould he 1 ft . $\overline{5}\} \mathrm{in}$. long, the foriner being 6 in . wide, and the latter 4 in ., while a thickneas of $\frac{1}{} \mathrm{in}$. will be found sufficient. The back and hottom are simply housed $f$ in. into the ends in the positions indicated at Fig. 4. The joints are cut to fit fairly tight, and are glued.

BOOK TABLE. This space-saving piece of furniture takes the place of $n$ revolving hookcase. having shelves on every side to accommodate looks and periodicals in use, and is also a convenient occasional table. It has the advantage of being solidly made and perfectly atcady for a reading lamp or tray of glasses, etc. See illustration above.

## Boots: Useful Hints on Choosing

## How to Recognize Good Footwear and to Preserve it in Use

Related articles are those on Boot Polish; Boot Repairing; and Leather. Sec also Brown Boots
When buying a pair of boots, to the casual the vamp or golosh, the perfect insertion and eve the chenper boot, nicely treed up, well stnetched to take out all creases, and then care. fully polished, will not present much difference from one at perhaps double the price ; but close inspection will reveal the greater smoothness or velvety feel of the grain if of a high grade hox-calf, which will lo found to give greater satisfaction in wear, and to retain its appearance longer than the cheaper bont made from a lover quality coarser skin, or perhaps from box-hide, which can usually be recognized by the absence of grain marking, and the harsher surface when the hand is passed over it making it more liable to crack in wear. The higher giade box-calf has distinot grain markings and is beautifully supple.

The tinish of the boot should also he regarded, the neatness of the closing of the uppers, the exact regularity of the atitching to
alinement of the eyelets, and, alove all, the quality of the leather of which the tongue is made and the wry it is attached to the inside of the opening. A cheap bont often reveala itself in the tonguc, being of very poor, rongh stuff carelessly fastened into the inside of the front.

The lining of the linot sliould be examinel. and, whether of linen or leather, this should fit without wrinkles. Then the fingers should be passed down towards the toe. If there is a crease in the toe, where the lining has been hadly lastod, and this is quite a common fault in a cheaj, boot or shoe, it will cause constant trouble in wear from the first day. The lnoseness of the lining will form a hard ridge, which will rub) hlisters across the toes. At the heel, the fit of the stiffener inside shoull be noted. If on passing the fingers downward the
adge of the stifiener is plainly to be felt, then it can usually be anticipated that the friction of the wearer's heel will rub a hole in the back lining very quickly, and a blistered heel will probably result

If all these points are satisfactory and the boot fits closely to the foo: when the wearer stands up and puta his weight upon it, without painful compression of the big.toe joint or cramping of the toes, then, whet her the bonts ara chrap or expensive, it may rafely lie assumed that comfortable wear will result, and as much durability as tho purchaser has a right to expect.

In buying patent leather shocs it is well to choose the best, although even the best patentcolt or patent-calf cannot be relied upon to wear without cracking in spite of many attempts to produce a patent leather that will not crack; but cheap patent, which is often not leather at all, but Amcrican cloth, is certain to become cracked in wear and quickly to lose its smart appearance. It is all the more important, therefore, to see that the finish of the inside of the shoe is all that it ought to tro.

Owing to the hard cnamil surface patent shoes will not stretch in the least degree. They are also nirtight. When the foot becomes warm and siwollen there is no possibility of the shoe stretching, and thus the liot foot, prevented from swalling, becomes cramped and still hotter through lack of ventilation which ordinary leather afords

A glacé kid boot is sometimes made with a patent leather cap, and to preserve the surface of the patent this cap is rendered unbrakable with a toe-puff or case of hard leather, atifiened canvas, or compressed libre inside This looks amart at lirst, but in wear the Hexible glacé has a tendency to crease in the same place every time the foot is bent, exactly where the atiff toe-cap finishea, and very quickly an unsightly crack develops.

## Leather which is Waterprool

In regard to the soles, it is difficult to tell the quality of leather used, as the leather is scraped, and what is called fake applied to it, cither black or brown. This applies to vegetable tanned leather. Chrome tanned sole leather can be diatinguished as it is aluays left in its natural green colour. This leather is absolutely waterproof, and in the best tannages is far more durable in wear than even the best quality oakhark-tanned. While clirome is watertight, it is also airtight, and is not recommended if the wearer has hot feet.

It will be found the truest economy to have two or three pairs of boots in use at the same time. After being worn for a day, the boots should be placed on a pair of trees. If wet, they should not, in any circumstances, be placed "ear a fire, hut should be laid on their sides in a dry place, and not with the sole to the floor, so that the wet sole can dry in the air. When boots have been thoroughly soaked, an cxcellent plan for drying them before putting on the trees is to fill them with sawdust that has been well dried. This absorbs any moisture that may have soaked through ; and if the sawdust is tightly packed, it swells as it absorbs the moisture and keeps the uppers nicely stretched as they dry. When the boots aro dry the sawduat can be shaken out, and after being dried in the oven, this can be kept for further use.

The boota should then be placed on the trees and well polished. The uppers of wax-calf or kip should be treated with dubbin in wet weather, and chrome uppers can be treated with a dresaing of glycerine. This will help to reast the damp, or if it is not applied until after the wet boots have been dricd, will keep them supple. Before being polished, either with wax polish or other suitable blacking, according to the character of the upper leather, the surface grease ahould be carefully wiped off
or a good shine will not be obtained. Wet soles will be lound to dry hard and present a shrivelled appearance. An applicntion of glycerine well rubbed in will not only restore the nature of the leather, but will render the soles more watertight when again worn, and prolong their life.

A hot water pipe has ruined more good boots than the wearers have ever dreamed of, the subsequent rapid deterioration of the boot being attributed to poor quality leather or faulty workmanahip. Leather scorches and perishes if aubjected to heat. The damage is not noticed at the time; but when the boots aro again worn, the perished brittle leather cracks and crumbles away.

## How to Determine the Fit

The fit of the broot is determined across the joint over the crown and the arch of the inatep and the heel. From the joint backward the bont should fit snugly like a well-fitting glove. but there must be plenty of room for the toes, There must be no looseness in the heel, but this will be kept quite snug by the fit of the joint. There can be no greater mistake than to have the thes fitted. The icleal is close heel, well-fitting joint and instep, and leave the toes plenty of room to look after themselves. In walking the weight of the body is put on to the foot, and is transferred to the toes as the heel leaves the ground. If there is no room for the thes to apread naturally under this transference of weight, the result is cramp, discomfort, and pain, with eventual corns and foot trouble generally.
Leather improves with keoping, and it is a good plan to buy boots several months beforo they are uom. They should be atored in a dry cupboard and occasionally cleaned. A little vaseline round the edges of the soles from time to time will add to the durability. A varnish dreasing which produces a shine without rubbing or brushing is injurious to the leather. Polish cannot penetrate when applied over such a varnish, and polish, which helps to preserve the leather, cannot do so unless it penetrates it. When shoes are varnished it makes them impervinus to the perspiration of the foot, which is absorbod into the leather itself and gradually rots it.

Chrome upper boots or shoes (box-calf, willow-calf, dull chrome, glacé kid) should never be cleaned when damp. The best makes of polish only should be used. Vegetable tanned upicra, wax calf, waxed kip or split, such as farm boots, etc., inay be kept soft by rubbing in nightly dubbin, neat'sfoot oil, or tallow.

BOOT BRUSE. Owing to the improvementa effected in leather polishing prepara. tions the old method of boot.cleaning has in inany liomes completely disappeared; but for preparatory cleaning from dust or mud the boot or shoe brush is still a necessity. Pure bristle is the cheapest outlay. If fibre is used in a mixture it will soon break, and horse-hair will not last so long in hard wear. The butt or ront end of the bristle supplies what is needed for the reliable hard bruah, and the bright, needlo-like stiffness of these knots should be looked for. They can alan be obtained with a row of knots set in the end of the atock to brush out the welts. For blacking with oil or water blacking, or applying polish, a softer quality is required.

The polishing brush should be of merlium stiffness wherc


Bootes knitted according to the directions given in this article
blacking is used, and a softer one will give the right finish after applying polish. Ses Blacking : Boot: Boot Rack: Brown Boots; Brush.

BOOT BRUSE BOR. For those who use both black and brown boota the box shown in lig. 1 will prove serviceable. The sizes given are approximate for an average size brush and pad, and the usual small tins of polish.

The partitions provide for brusheg in the centre, and black or brown polish and pard on cither side. The sides can be housed and nailetl and the holes atopped; or, in a rougher faahion, the parts can be nailed toget her.


Boot Brash Box. Fig. 1 (above). Box holding cleaning apparatoi lor both black and brown boots. Pig. 2 (below). Detaila showing how the boz, with ite partitiong, is made

The partitions can be of $t$-in. thickness, baing plain-grooved into position, as indicated at Fig. 2. These parts should be secured in position with just a touch of glue. The gronves ars aquared and the sid?a cut with the tenon saw, the core being removed with a $\downarrow$-in. chisel.

The bottom is best cut $\frac{1}{\frac{1}{2}} \mathrm{in}$. Inngef and wider than the sides of the box, so that the edges, when the bottom is screwed on, can project $t \mathrm{in}$. on all sides, to be nestly rounded off for finish. A brass handle is screwed on for lifting purposes. This side of the bnx can be $t$ in. or $\frac{7}{m}$. in thickness, using a 4 in . handle and $1 f$ in. screwa, entered well home. U-shaped openings in the sideq of partitions fronting the amall wells will facilitate the removal of the paste boxes.
BOOTEES: How to Rnit. In choosing wool for a baby's bontoes be sure it $\mathrm{i}_{4}$ of good quality, well shrunk, and soft in texture. They will often be in the wash, si) cheap wool is a mistake, and they miust not be inade too small, or they will stop, circulation instead of rasist. ing, it. In using wool or ribbon tiea, be sure they are not pulled too tight.

The following pattern is simple in plain knitting, and two needles only are use. 1 till just at the finish. The materials required are 1 oz. of well-shrunk 4 -ply fingering in white, pink, or blue, three knitting-needles, No. II). and 1 yd. of narrow ribboa. The ribbing may becontinued
nenrer the ankle by working an additional 8 rows with 30 rows plain linitting.

Cast on 40 stitches. Rib knit 2, purl 2 for 16 rows : then work 38 mws in plain knitting. For the next row-the 55th-linit 2 . wool forwaril. knit 2 togetherto
makc a row mance a row
of holes, and repert this till the end of the row. Knit 2 rows in plain knitting. Then begin the instep of the foot as follows: Knit 14. then knit backwards and lorwards on the next 12 stitches. for 34 rows Break off the wool (fastening the end firmly) and leave these stitches on a needle or safety-pin.

Begin again with the 14 stitches on the left of the ankle, picking up the 17 stitches along the side of the instep piece just finished, and 6 of the stitches left on the safetypin. Take another needle and knit on the other 6 stitches across the toe, the 17 stitches on the wher side of the instej, and the 14 stitches at the ankle. Knit backwards and forwards, using the three ncedles for 14 rows, without shaping. Then work 6 rows, decreasing once at the beginning and end of each nedde. Cast off.

Sew up the seam neatly, threading the ribbon through the holes at the ankle. See Bahy.

BOOT LACE. East India kip provides the leather for laces used with heavy brots. Mohair laces are usually a mixture of wool and cotton. The leather huckle lace worn with golf and other sporting shucs consists of a thin strap of leather inserted through the eyelets of the shoe, and fastened by means of a nickel. or other metal buckle inatead of being tied.
BOOTPOLISH. Wax polishes arc coloured with aniline dyes, black or brown as required. The surface obtained on the hoot must not be sticky, hence a very hard wax, known as carnaubia wax, is employed.
The wax is boiled with borax or sodla to form an emulsion, and this is mixed with a hot

## Boot Repairing in the Home

## Essential Processes Simply Described

Readers may usefully turn to the preceding article on Boot, in which hints are given on the
selection and carc of footwear. See also Clog
Most hoots and shoes in ordinary wear to hammer, with one head; a couple of shoedny are either welted, where the outer sole is maker's knives, one ground right down to a stitched through the edge to a welt sewn round small triangular hlade, which will be found the the edge of the upper, or machine-sewn, where the outer sole is sewn through to the inside of the boot by stitches going right through the sole substance. The outer soles may also be attached by riveting, hy thin wire screws or, less fiequently nowadays, by wooden pegs. Of these, all may be repaired by riveting on a new sole, although in the case of welted hoots it is preferable that it should be stitched on. With machine-sewn boots, a sewn sole makes a better repair, but it is quite adaptable for riveted repairs, as described in this article, the only method practicable for the average home worker.
The essential tools are a shoemaker's
solution of soap coloured with nigrosin (an
aniline black). Boort dressings in liguid form. used for ladies kid shoes, contain shellac, which has been dissolved in borax or soda solution. If soap is added a dull finish is given in place of the glose of the plain shellac dressing. See Blacking: Boot.
BOOT RACK. A folding rack is shown in Fig 1. It is made with a back and two folding frames, and in the size shown is capable of holding eight pairs of ladies' or six pairs of gentlemen's hoots. If a larger rack is desired the length of the rail inay be extended or height of rack inercased. To make it, 4 ft .6 in . of
 8 ft 1 in . of 3 in . round material nust be arranged for. The 3 in . material is cut into two 2 ft .3 in . lengths. the 11 in . into thrce 2 ft .2 in ., and four 1 ft ., and the $\boldsymbol{z}^{2}$ in. into four 2 ft . $\frac{1}{\mathrm{in}}$. lengths.

Boot Rack. Fig. 1. Dgeful rack made to fold againgt the wall when not in use. Fizs. 2-8. Diagrams showing details of construction By arrangement with Exans Bros., London

For the back take the two 2 ft . 3 in. lengths of 3 in . material for the sides, and the thrce 2 ft .2 in . lengths of $1!\frac{\mathrm{in} \text {. for the rails. }}{2}$ Dovetail the two front rails into the front edges of the sides, and the back rail into the back edges, in the positions at Fig. .2. The ends of the sides are shaped as at Fig. 3, and hanging holes are bored.
The two folding frames are exactly similar. For each take two of the 1 ft . by $1 \frac{1}{2} \mathrm{in}$. pieces for the sides, and two of the round pieces for the rails. The frames are made to the dimensions shown at Fig. 4 by shouldering down the ends of the rails to $\frac{1}{2} \mathrm{in}$. diameter, for a lengtlı of 3 in., and boring holes in the sides into which the shouldered portions of the rails may fit.

The frames are fitted to the hack with rivets or round head screws, as at Figs. 3 and 6. The frames when extended rest on the cilges of the front rails of the back, as at Fig. 3. A coat of stain or varnish will be necessary as a finish.
most handy for cutting off the worn sole of a
welted or sewn hoot; a shocmaker's rasp, rounded on one side and with a Hat file surface on the other; a straight awl, sandpaper (No. 1 $\frac{1}{2}$ ), a glazing iron, the most convenient shape to use being the combination iron. Ilso shoemaker's ink, heelhall, and the indispensable rivet. The rivets will he of the length most suited to the joh in hand, and should he preferahly brass, except in cases where a double row of rivets is fixed to take wear, when iron should be used.

An iron foot or last is necessary. This can either be attached to a shaft in an iron socket fixcd to a bench, or, where repairing is only
an occesional job, an iron foot fixed in a wooden stick or "leg" resting on the lloor may ber used. Several sizes of iron feet will be required for men's, women's, and children's hoots, and these will be interchangcable in the same wonden leg.
leather can ho purchased ready shaped up in soles and top-pieces, or it can be hought by the piece. Siclect a piece with cren, smooth grain and equal substance. The flesh side should not be loose, but should be firm and hard. If a pattern ot the sole to le replaced is taken in paber (Fig. 1), this can casily lre applied to the piece of leather chosen and waste avoided.
The pattern is made by placing a piece of newspaper flat on the sole of one of the bonis with the edge across the waist where the graft is to lic, and passing the tile side of the rasp, downwards round the edge of the sole, leaving the exact shape of the sole filed out In cutting the soles from the picce of leather, take eare to turn the pattern over when cutting the second sole. Temper the leather by atcep. ing it in a pan of cold water for 5 or 10 nim. Then take it out, bending and twisting it in the fingers until the superlluous surface moisture is absorhed and the lenther is mellow.
When the leather is fairly dry but still moist and plastic, place it grain downwards on the lap-iron-an old flat-iron minus the handleheld on the knees, and strike it firmly and evenly with the Hat head of the hainmer, commencing in the middle and working out to the ciges. The strokes should not be tor vigorous or the fibres will be crushed. This hammering makes the leather tougher and closes up the pores, making it more waterproof and more durable in wear.
Now take the hoot to he repaired, and, after damping the bottom and placing on the foot, take off the old sole. The little pointed knife is inserted in the joint at about the spot where the new sole will join the old, and the stitches cut through to the corresponding point on the other sidc. In Fig. 2 a machine-scwn boot is shown, and the same method will apply to ripping a welted boot. If the old hoot has a nailed sole, the toe should be prized up by inserting a screwdriver or blunt old chisel and the toe end of the sole seized in the nippers and levered hack, the middle sole heing held down firmly with the other hand meanwhile. The old sole should be cut off actuss the joint with a slanting cut, leaving a longer length of waistline on the old sole on the inside than on the out (Fig. 3).

## Repairins the Midde Sole

Before procecding further the middle sole should he made good. If the hoot is wom so hadly that pait of the middle sole has heen worn through, a thin patch should be placed over the worn spot with a couple of short rivets tapped in to keep it in place. Boots should never be allowed to wear through the middle sole hefore heing repaired. It may he found that in ripping a riveted sole the middle sole has been pulled away from the inner sole. This should be knocked down and half a do\%en rivets put in These should be just long enough to penetrate the inner sole and hurr over on the iron foot, but not long enough to turn over appreciably. They should be hammered well home.
Having made all secure, take the new sole and, placing it in prosition on the atripped hottom, with the back of the knife mark $n$ line ncross the old waist where the groove or skived hollow for the end of the new sole is to start. (Fig. 4). Skive out on the old waist from this line, tapering towards the joint cut (Fig. 5). Now skive off on the flesh side of the waist end of the new sole, tapering towards the joint, but not too finely or suflicient substance will not be left to hold the waist rivets securely (Fig. 6). Place the new sole in position and, holding firmly, make a row of holes from side


Boot Repairing. Figs. 1-9. Illustrations of the various stages of soleing and heeling a pair of boots. the correct method of dolng which is described in the accompanging article
to get worn through, is a worn-over heel destroys the shape and appearance of the boot, in aldition to putting in undue strain upon the boot upper at the heel But if the second lift is worr, then a cut should be made acruss the heel, so that the worn part can be prized off and a new half-lift nailed on (Fige. 8 and! !).
Trim off and, after taking out any protruding mails or hammering down, rivet on the top piece. To mecure this. 3 in . rivets should he used, and then a double row of shorter rirets to take the tread (Fig. 10).

Sole and heel are now ready to he finished off. The first process, supposing the edges to have been closely trimmed up with the knife, is rasping. This is effecterl with the round side of the rasp, and gives the edge a slightly hollowed shape (Fig. 11), which is accentuated with the round edge of the huffing knife (Fig. 12).

The heads of the rivets on the sole should be rubbed over with the llat side of the rasp. If it is desired to finish the joint in a workmanlike manner, the upstanding edge of the new sole can be skived olf with the knife, the surface at the joint rasped, and then the whole surface of the aole 8an be buffed and linished off with sand paper.

The edges of the sole are now finished off with sandpaper and inked. When this is dry we proceed to the operation of setting the edge or polishing. For this the combination iron will be found most convenient. Fig. 13 shows this tool with its difierent fnces, A, B, C. First the inked edge, having been allowed to dry, is ironed, and then a thin coating of heelball is applied, and the iron, warmed up but not made too hot, distributes the heelliall evenly over the surface. Firn, even pressure with a quick motion will produce a amooth, shiny surface, and then, to finish off, the superfuous heelball is taken off, and a final polish applied with a piece of cloth, which is folded acrors the thumb. Figs. 14 and 15 illuatrate the method of holding the iron, and show the differentedges that are emploved for sole and heel.

BOOT SCRAPER. A bout scraper saves dirt and mud being hrought into the house, and one aimilar to that shown in Fig. 1 can easily be made. The soraper is constructed
to side near the joint, but not ton near. The first rivet is knocked in on the side (Fig. 7), and the row of rivets in now finished across the waist.

After nailing the waist, press the fingers across sole, hammer from waist to toe, and, holding down firmly, drive in a rivet in the centre of the fore part quite near the toe. The new sole should now be lying snug on the middle sole, and the edges of the sole should the pared close, care being taken not to cut the edge of the middle sole.

A line is now drawn about ${ }^{3}$ in. from the outer edge all round the sole. This can be done with the thumhnail, using the first finger as a guide on the edge of the sole. Now with the awl make the holes for the riveta at equal distances all round, not too far apart, taking care to hold the awl perfectly upright.

When some degree of expertness is attained in driving the rivets, the bole-pricking may be dispensed with, the rivet being pressed into the leather (which should be still sufficiently moist and plastic to enable this to be done) with the left hand, as if placing in the hole made by the awl, and then one smart tap should drive it home. After the whole row has been completed, the edge of the sole should be well hammered all round in order to drive the rivets liome

Before finishing the edge, the heel may he taken in hand. The corner of the top piece should be prized up and seized with the nippers, and the top piece pulled off, the boot being held firmly on the foot with the left band. The second lift should never he allowed


Boot Repairing. Figs. 10-15. Concluding stages In soleing and heeling a pair of boots, showing how the heels and soles should be fnished of with a rasp and sandpaper and Anally burnished
with a wooden framework consisting of two sides and a bottom bar, and is fitted with a scraping iron at the top.


Theside lours of the framework are 103in. long by 2 in . wide by 1 in. thick, and slots $\frac{1}{10}$ in. wide are cut $\frac{1}{2}$ in. in from the top ends. The loottom har is 12 in .
long by 2 in wide by 1 in . thick. Notches 1 in wide by $f$ in deepare cut in the upper face of the bottom bar to receive the bottom ends of the side hars.


Boot Scraper. Firs. 1 and 2. Simple
scraper and method of fixing jit
The scraping iron slould be 12 in . long by 2 in. wide by $\mathrm{I}^{3}$ in thick: the top corners are rounded, and ${ }^{3} \sigma$ in. holes are bored wt the ends. The ion fits into the slots at the top onds of the side hars, and is fixed with rus $^{\prime}$ in. rivets, which pass through the hars and iron.

Before fixing, at least three conts of good oil paint should be applicd. A hole must be prepared in the ground to receive the framework, the scraper being fixed at the height suggested in Fig. 2. The earth around the Iramework should le well stamped down.

BOOT TREE. There are various patterns of boot trees, and to use them to the best advantage they should conform as nearly as possible to the shape of the boot worn. It would not do, for instance, to put a round-toed tree into a pointed-toed boot, as it would be alnost certain to stretch the toe out of shape. A boot that is treed-up immediately after wearing and left until again required will retain its original shape. See Boot.

BORACIC ACID. One of the inost useful of the mild antireptics is horacic or loric acid. For soothing irritated or painful cyes, one part of boracic acid to forty parts of water is a widely used lotion. Nixed with equal parts of powderd zinc oxide, it is a good dusting powder. For excessive perspiration of the icet, a powder containing one part of boric acid, two of starch, and tiro of zinc oxide, dusted into the socks, gives excellent results. In saturated sohution boracic acill forms a non-irritating, antiseptic Intion excellent for cleansing sorcs.

BORAGE. The flowers and also the aromatic leaver of lorage are ured for flavouring such bever. ages as claret. culp or negus: the leaves and young tops inny be einployed in salads. The flowers are hlue, the leaves oblong and clothed with white hairs, the stems about 2 ft. high, hollow and rough. The plant is lest grown as an annual, sced being sown out

of doors in spring. A foot apart is a suitable distance for the plants, which like a rather dry and stony soil. See Claret Cup: Negus. Pron. Büridge.
BORAX. The white powder known as lorax occurs naturally in Califormia, and has the chemical name of biborate of soda it is much used as a mild antiseptic and as a water softencr. Dissolved in glycerin (1 oz. of purified borax in (6 oz. of glycerin), it is known as glycerin of horax, and is used for thrush and in other forms of sore noouth. Good results have followed the adininistration of horax in cpilepsy.

As a gargle for sore throat the proportion to use is 1 oz . of borax dissolved in a pint of water. As an eycwash 8 grains of borax in 1 oz . of water is the proper strength to employ. Borax ointment, made by mixing 1 oz . of borax with 8 oz of spermaceti ointment, is an exccllent application for chilblains or cracked nipples. For softening water a teaspoonful of borax is added to a civerful of water. the advantage of borax over soda being that horax docs not affect even the most sensitive skin. Borax is no longer used as a food preservative.
BORDEAUX. The wines of Bordeaux contain the least amount of sugar, alcohol, and acid of any, and are not fortified with any spirit. They arc generally divided into four classes, which differ in toste, colour, bouquet, durability, and price. In the first class are
what are known as the Chatenu wines, such ns Châtcau Lafitc, Château Latour, Clîatcau Margaux, and Château Haut Brion
The second class comprises wines such as Rauzan. Beaunc, Mouton, Leoville, La Rose, Pichon, and Longueville. In the third class are wines such as Château d'lssan Poujets, Cantenac and Giscours, In the fourth clase are the clarets. St. Julien, Pauillac, and St Fstephe. See Claret: Grape; Sauterne, etc

BORDEAUX MIXTURE. The most effectire spray for apples and pears is Bordeaux. mixture, and it can he relied on to prevent scab. The Ministry of Agriculture Leallet No. 131 describes its preparation and use in orchards. The best formula is: copper auphatc. 4 lb . : lest quicklime (in lump formi), $4 \mathrm{II}^{2}$. and water, 50 gal. The copper sulphate should be dissolved in a small wooden vessel at the rate of 1 gal . of water per lb . of sulphate. On no account should iron or tin vessels be employed.
The lime slould be slaked to a tine paste with a little water in another vessel, and water added gradually to make a milk, and finally diluted in a large harrel to the requisite amount ( 46 gal .). The 4 gal . of copper aulphate may now be poured slowly into the diluted milk of lime, and the mixture stirred thoroughly during the process. The two solutions may be kept separately for a long time, but after mixing the solution should be used at all events within $2 \&$ hours. See tpple: Pcar.

## Borders: Their Effective Garden Use <br> Choice and Arrangement of Flowers and Plants

In this work the reader will find entries on the various planis and flowers mentioned in

I garden border is, strictly, an cxpanse of soil devoted to the cultum of flowers, fruit or vegctables, which has the shiclter or protection of a wall or fence along one side. Modern usage, however, gives the name to any cxtended Hower bed, e.g. one by the side of a lawn or in front of a shrubbery.

Borders are described as herbaceous, mixed, spring or autumn fowering, according to the nature of their contents. Thi best are those which rely chietly upon perennial subjects for their seasonal beauty. Beautiful herbaceous borders are practicable in almost every garden, provided the site is open and unshaded, and the soil good and of sufficient depth to permit of $n$ leed of friable mould 18 in . to 2 ft . deep. A short, wide border is better than a long and narrow one, as the narrower the border, the more difficult it is to arrange the plants in bold groups. In very narrow borders plants have to be restricted to the small kinds.
In a 6 ft. horder most of the large kinds would have to be left out or used in units, but with n support at the back for climbers or creepers, satisfactory groups of the smaller plants could be formed.

The great majority of hardy herbaceous plants flourish in ordinary well-cultivated soil. Heavy soil needs rough digging and full explosure to weather some weeks before the time comes for planting, which is best done in early autumn or February-March. Let no effort lo spared to get a dcep bed of friahle soil. Decp and thorough hoeing is essential during the growing season. If the border is being made beside a path, the front area should bo levelled and rolled to $n$ width of not less than 2 ft . and turf laid, a strip of well-kept sward forming an admirahle foil for flowers.
In dealing with a single-faced border, one backing a wall, hedge, etc., the planter will work from back to front: but in dealing with a double-fronted horder, he will work from centre to front on two aspects.

If there is no wall, fence, hedge, ctc., shrulis or small trees should be included to provide a
permanent background. This should not be attempied in a horder less than 12 ft . wide bit, insteal. some of the taller, coarser herhaccous pereınials-golden rods, sunflowers, and inulleins, for example, might be used
Thic following is a short sclection of the principal horder plants

Taidi liants for back areas

| Campunula | Golden rod |
| :--- | :--- |
| (pyramidalis) | Hollyhock |
| Delphinlum | Mollein |
| Rellenlun | Concllower |
| Foxglovo | Suntlower |


| Memum plants for Midmle 1 reas |  |
| :---: | :---: |
| Erigeran | Michaclmas dasy |
| Day lily | (small kinds) |
| Gypsophila | Monkshood |
| (paniculata) | Phlox |
| Helcnlinn (Crimson IBeau(y) | Red-hot poker Sca holly |
| 1 ily. | Spiraca | Lupin

Dwarf Plants for fuont areas

Campanula
Campion
Carnation
Columbine
Corcopsis
Geum
Inula
Monturetia
It has to the remembered that not only must there be liberal spacing between the various groupa, but also between the components of each group.
Rose pillars may lee introduced with good effect. As a rule the best line for them is just hehind the centre, and they nced not he nearer than 12 ft . apart.
In the double-fronted border, the centre will be occupied by hollyhocks, eremuruses, Iarger Nichaelmas daisies, willow herbs, mulleins, delphiniums, golden rods, and other tall or bulky plants, not forgetting the rose pillars. In the half-centre spaces will go phloxes, monkshoods, heleniums, coneflowers, spiraeas, peonies, etc.; while in the front will come day lilies, Japanesc anemones, antirrhinums, columbines, Canterbury bells, coreopsis, geums, pentstemons, cinquefoils,
achilleas, leopard's banes, cvening primroses, heucheras, pyrethrums, and globe flowers The following is a selection of plants suitable for borders only 4 or 5 ft . wide They may be set singly if the border is a short as vell as a narrow one, or grouped in threes if it is of fair length :

Aclillea
Antirrlinum
(intermedlate)
Aubrietin
Campanul:
(persecifolia)
Carnation
Chiristmas rose
Cinquefoil
Columbine
Corenpsis
Crancs bill
Day lily
Evening primrose
ronm thower
Gailardia Grs. Bradshaw)
Goat's licard
Golden drop
Hencliera (xanguinen)
Incarviltea
lnula (olandilobr)
Iris
Jacob's Indder japances ancimone Jerusalem Crioss
Lenpard's bane
(Doronicum)
I.ungwort

Mcadow rue
Montbretia
Pentatemon
Peony
Peruvian lily
Phlox
Plantain lily
Pyrethrum,
scabrous (Scalinosa Caucusica)
Sea lavender
Scdum (spectabile) Stokesia
Tondtlis
Vemnica (longifolia) Wallthower

It should be an aim with the flower gardencr so to dispose his plants that each area of the horder has bloom throughout the season; and to aid him to accomplish this, the most important plants are given in three groups

Early flowfring Haruy planty

| Columbine | Pcony |
| :--- | :--- |
| Gcum1 | Pink |
| lris (some) | Pyrethrum |
| l.copard's banc | Thrift |

Mid-Skason hardy plants
Achiliea Hollyhock
Inchura
Campanula (inost)
Campion
Canterbury licll
Capo hyarinth
Carnation
Carnation
Day lily
Delphinium
Evening primrose
Foxglove
Goat's rue

| lria |
| :--- |
| Lily |

Lonsestrife
Lunin
Monkilond
Montbretia
Moon and ox eve daisp
Mullecin
Phlox
Phlox
Poppy
St. 13rino's lily
Spiraca
late hlooming hardy plasts
Conetlower
Golden rod
Japasese
aneinane
Michaelmals dnisy

## Pentstemon

Red-hot poker
Sedum (apretabile)
Sueeze weed
Suntlower


Border Terrier. Prize-winning specimen of this popular breed of dor

To let plants alone year after year is to invite gradual degeneration, and it is an accepted iden that the most rigorous perennials should be divided every two or three years Some take several years to re-establish them selves after being transplanted. Among them arc peonies, perennial poppics, Christmas roses, lupins and others with long, tap-like roots. When such plants are overcrowded it is quite possible carefully to lift portions of growth without disturbing the main roots
Most hardy plants like sunshine, but a fell will succeed in the shade, and some of these are giren in the table lelow:

## Ancrican cowslip

 AnemoncAsphodel (Aspliortelus ramosins)
Auriculn (Appine) Bar rentivort
Bergamot
Bleeding licart Campion
Christmnas ros
Christmens ros
Columbline Columbine
jog's tooth violet
False hellebore Fonill flaver Fonglove Fumitory Gilolve Hower Gmpe hy acinth Honest $\mathbf{y}$ Lady's smor'k

Ieopard's linne Lily
Lily of the valley
Mcadow ruc
Meatow raf roll
Monkey llore
Parcisginkite
Periwinkic
Polyanthus
Priminthes
$\stackrel{\text { Priminese }}{ }{ }_{\text {St. Johins wor }}$
St. Johns
Sa ifrage
Scduni (ppretabile)
Snake's liead
Snowidrol
Snortink
Solomoris seal
Spiraca
Winter aconite
Wood hyacinth wood lily W゚oodrulf


Border. Herbaceous border in a large garden at Hindhead. Surrey. The clipped bolly bushes make an effective background for the sequence of flowers, those shown being the blossoming of dune

BORDER TERRIER. This is a very interesting breed of terrier and its degree of popularity has cone into line during this last oight or ten vears According to the Eiarl of Lonsdale these terriers have been kept in the licnnela at Lowther Castle for over a century the Border Terrier should weigh nhout sixteen pounds and its colour is either red wheaten, blue and tan or grizzle but the first named colour is certainly the most popular and it is one thint is \&enerally accepted Tho cont should be harsh in texture and close fitting A compact body and straight limbs, with catlike feet are esaentials, whilst the head should be broad in skull, strong in nuzzle and jaws levol, with V-shaped ears The tail should be oarried gaily but never docked. See Dog.

Borecole. This is the name of the rege table more usually called curly kale (q.v.).

BORING: And Boring Tools. Boing is any process for making a hole in wood, metal, or other material, and, strictly speaking, it is a nuachine process Apart from the recognized drilling operations, the tools mostly used for boring include single hand tools, such as the bradaivl and gimlet, doublehand tools such as the brace and bit, and the regulation wood-boring machine. This last consiats of a wooden or metal base, with an angularly adjustable upright member carrying a spindle, rotatahle lig means of bevel gears nnd two crank han dles. The tool is usuallyan anger bit and fed intothe work by means of a rack and pinion, actuaterl anto. matically or by hand.

Bradawls are used to make holes for nails and screws. The brace and


Boring. Vertical boring machine for large timber
 bit arc ensploved to makie holcs from a small size up in it in. or 2 in . diameter in wool.

Holes are bored in brickwork or stone by menna of a atcel chisel or har shaped with four Hutes, thus forming an X-shaped cutter. Sometimes a jumper or tubular cutter is used. Either is pressed agninst the brickwork, given a hlow with a hammer, rotated a quarter turn, and given another blow, and so on until the tool is driven in to the required depth. Chiun und glass are lored with a special drill stock.

When the lathe is used, if the object to be bored can be mounted on a faceplate or held in a chuck, it is customary to hore the hole with a hand tool, or preferably a tool held in the tool post of the slide rest. If the nature of the jol, prohibits this trentment, it is customary to holt the work to the saddle of the lathe, adjusting it by means of packing hlocks until it is axial with the lathe centre. A roung hole having heen previously cast or drilled through the work, a loring bar is inserted through the hole and mounted het ween centres in the lathe.

A cutter is adjusted to the correct diamoter and secured with a wedge or otherwise to a transverse slot in the horing bar. The latter is set in motion, and the work fed up to the tool, which thus bores the hole. A rough cut is usually taken first, followed by a smooth or finishing cut. Other methods of horing include the use of the oxy-acetylenc blow pipe. See Bit; Blow Pipe; Brace; Bradawl; Drill; Gimlet.

BORZOI. This dog is a Russian wolfiound of great size, graceful form and majestic appearance. He is a first-rate house dig.


Borzol. Champion of the Russian breed of large white wolfhound. It is one of the tallest dogs
perfectly companionable, and of affectionate disposition. The colour is white, variously marked with yellow, fawn, brindle, bluc, or black, or the coat may be without narkings.

The long, slender head is triangular in shape, with dark eyes, and small thin ears set far back. The long cont may be either flat, curly, or wavy, but it must not be at all woolly; on the neek it should form a profuse curly frill. The long tail, carried low, ahould be well feathered. See Dog.

BOSTON : A Good Card Game. For this there are four plavers, the cards rank ns at whist, are cut for deal and choice of sonts The cards are shuffled only once throughout the game, and the player to the right of the dealer cutis. leaving at least five cards in each packet. The player opposite the dealer cuts the pack, and the top card is turned up for trumps. This suit is callerl first preference and the suit of the same colour second preference. The remaining two suits are plain suits

The object of the game is to win a nominated number of tricks. Beginning with the cldest hand, cach player in turn bids that he will win a certain number of tricks, naming his own trimps, or to lose a certain number of tricks without trumps. The player whose hid is accepted plays against the other three

The bids rank as follows: Boston, to win 5 tricks; to win 6 tricks; to win 7 tricks little misery, to lose 12 tricks ufter discarling a caird which is not shown; to win 8 tricks to win 9 trioks; grand misery, to lose every trick; to win 10 tricks; to win 11 tricks little misery with the cards exposed, also called little spread; to win 12 tricks; grand misery or big spread with all the cards exposed; grand slam, to win evory trick.

Players ano provided with white and red counters, the latter heing worth five white. One red is placed by cach player in a pool, and when there are more than 2.5 reds in a pool the surplus is set aside, only 25 being allowed to be seen on each deal. No bid of less than 7 tricks wins a puol unless the adversaries insist on playing the hand out. If a player wins the nominated tricks he is paid by the others and takes the ponl for 7 tricks or over If the loss be donble the pool he pays his opponents. One red counter must be placed in the pool for a misdeal and four for $\boldsymbol{n}$ revoke. Playens are only paid the number of tricks they have originally bid, though they may win more.

A bid must be made with named trumps. The next player may say "I keop," meaning that he bids the same number of tricks in nne of the preference suits A plaver calling higher says "I keep over vour." If all pass,
the deal is void, each player sorts his cards in sequence ind they arc packed and cut for a freshl deal. Whichever player wins the bid oldest hand always leads. When littlo miserie are played, each player diacarda a card which he does not show. Spreads must be laid down beforo any card is led.

The actual paying for winning $n$ bid varies, but is gencrally as follows: 10 for 5 tricks 13 for $6 ; 20$ for $7 ; 25$ for 8 ; 35 for 9 ; 45 for 10; 65 for 11 ; 105 for $12 ; 170$ for 13 ; 20 from each player for little inisery; 40 for big misery ; 80 for little sprend; $\mathbf{1 6 0}$ for big spread, with corresponding penalties for losing
BOTTLE. The average household does not make as much usc of carcfully washed old bottles as it might do. The ordinary graduated medicine bottle, for exsmple, malies an excellent liquid measurer. Most of them are divided off into teaspoonfuls or tablespononfuls. Besides the advantage of quickness in measuring n number of tablesponnfuls of liquid the hottle is more nccurate, as tablespons vary in size considerably.
Bottles are in constant request in photo graphic work. Different slapes or different sized bottles should be used for developing, fixing, and other solutions, so that they can be handled and used in the dark ronm. wiere the light is not alwinys sufficiently clear to read the labels
simple way to remove $a$ cork that has fallen into a bottle is to make a loop of string, or preferably wire, and insert it into the neck of the bottle. whake until the Turn upside down and that the loop of string or wiro catches it, when it can be forcibly withdrawn. For a cork that has broken off in the neck of a buttle insert the blades of two penknives on opposite sides of the cork, and pull the handles slightly towards one another and slowly twist and pull. This will generally remove the cork.
The stoppers of glass bottles are sometimes difficult to remove. One method is as follows Place a little olive oil between the stopper and the mouth of the bottle, stand the latter in a pan of cold water, and hent the water alowly. Tako the bottle out and allow to conl In the cooling process some of the oil will he drawn in between the stopper and the bottle neck and loosen it. Often a tight stopper may he removed by wrapping the neck of the bottle in cloths dipped in hot water. This allows the neok to expand sufficiently to force the stopper out. It is advisable in the case of hottles which are constantly in use to tic the cork or stopper to the neok of the hottle.
Wrarm water and soap first, then a thorough insing with cold writer, will olcan most hottles ; and if they are wanted to dry quickly little methylated spirit should be sluiced
round inside the bottlea and the latter stomi upside town to drain. Small botiles may be cleaned with a solution of egg-shells in time juice. Discolorations can be removed by putting into the bottle a raw potato (cut into pieces) with a teaspoonful of ralt and twice that amount of water. Shake well and when the bottle is clean rinsc with cold wate Alternatively, rinse with strong canstic aoda Salt and vinegar is an old-fashioned way of cleaning bottles which is effective. A bottle which has contained petrol should be washed out with thin, warm milk of lime

Bottles sent by post should be wrapped in corrugated cardhnard, as a protection against brenkage. It is advisable to label all bottles containing liquids, for it is not always possible to tell what a bottle contains by the appear ance or smell of the contents. See Baby Cork; Feeding Bottle: Hot Water Bottle

BOTTLE WAX. Ordinary sealing-wax has $\Omega$ basis of shellac, which readily melts at a Hame, and quickly sets when the heat is with drawn. For hottle was resin is used insteal of ahellac, tho properties of which it resembles A preparation made with resin answers well as a sealing for bottles and parccls, and is cheaper. Bottle wax is used for wine bottless and to keep nirtight jars or bnttles of pickles


Bottle. Simple metbod of extracting a cork which has sallen into a bottle
The following table gives repre sentative recipes :


The gencral process of preparation is to melt the resin and tallow in an iron pan over a gas flame, taking care that the mixture does not catch fire. When this is done rub down separately the colouring matter and other powders ordered with the resin oil or cotton sced oil. This should then be stirred into the melted resin. When the mixing is completed the wax should be poured on to a warm plate which has licen slightly greased, and rolled intn thick sticks by means of a warm roller

## The Bottling of Fruit

## How to Secure Successful Results

## The articles on the various firuits suitable for botling, c.g. Apricot; Loganberry; Plum, etc., may be consulted for further information

Fruit may te preserved for an almost inletinite time if it is properly bottled. This object is attained by placing the fruit to be preserved in a suitable jar and then raising the temperature sufficiently to destroy or render inactive any germs present on the fruit. The jar is then sealed, so as to prevent germs from entering from the outside. This is termed pasteurisation.

Screw-top glass jars are the best, though those supplied with a metal spring are quite satisfactory. Before use the bottles should be carefully tested for possible flaws, as the seat ing for the rubber bands is apt to be imperfect

When small quantities of fruit are to be bottled, a large silucepan or fish kettle for heating water will suffice for a steriliser, provided it is deep enough. For fairly large quantities, a pan holding one or two dozen bottles is necessary. Care in the choice and renewal of ruliber rings is essential.

Fruit for bottling should be of good quality and not over-ripe, or fermentation may take place. It should be graded, wined and prepared, e.g. currants stalked, plums stoned, pea's cored and halved, otc.

Pack it tightly in the bottles without bruising $i t$, and fill them with cold water to
orertlowing Place on the rubber ring, cap, and screw-band or clip; screw up and then release slightly to allow air to cscape during pasteurisation. Clips or springy allow the air to oscape automatically. Place the bottles in the pan in which they are to be pasteurised; the cold water in the pan must just be within an inch of the tops of the bottles. Different fruits require different treatments, but for most the following method will be found satisfactory
With Thermometer.-Bring 10 the required heat slowly nt the rate of npiroximately $2^{\circ}$ Fuhrenhct per minute. A temperature of $155^{\circ}$ to $180^{\circ}$ is cecssary.
Without 'Thermometer.-Bring the water very slowly to simmering. or until the hand cannot le hold on the pan itd When this point is reached ift up a bottle ior exanination If the frult is atill on ns to bing to move ahout when bot 80 twisted it is ready to come out.
Should the water in the pan become too low through boiling, more should be added, but it must be of the same temperature as that in the pan. When ready the bottles should be renoved, the covers at once securely fastened down, and the bottles allowed to cool alowly. Hot bottles must be placed on a cloth wrung out in hot water to prevent cracking. When quite cold, remove the screw or clip and test the efficiency of the scal by lifting the hottle by the cover

## The Dry Method of Bottlins

The dry method of bottling, which is more particularly suited for plums and gooseberries, is very simple. l'ack the fruit tightly in the bottles, and place in a slow oven on a piece of wood, cardboard or asbestos, or the hottles crack at once, until the fruit shrinks slightly; it is then ready to come out. Have hoiling water ready, remove one hottle, fill up with the hoiling water, and fasten securely before taking another bottle from the oven. See that the lids and fittings are warm before heing placed on the bottles.

Though glass jars with a special device for sealing are to be preferred, if they cannot be obtained, ordinary wide-necked bottles or jars may be used, and sealed. The necks of the bottles should not be larger than is necessary for the insertion of the fruit. Sealed hottles should be examined from time to time, in case fermentation or mould growth occurs in any of them. If this bappens the contents should be consumed without delay. Ordinary bottles or jars should not be packed so full of fruit as special bottles, on account of the senling necessary to render them airtight: otherwise pasteurisation should follow the lines of bottling in apecial bottles.

Two layers of parchment paper may be pasted separately one over the other and tied with fine string, provided that the bottles are afterwards kiept in a cool, dry place.
Corlse may be Corlis may be used instead, scalding them well first, and then sealing the tops with bottle-wax. The use of syrup is, not
essential, pure water being equally suitable and rather more transparent. This bottling being done without sugar, when the fruit is nceded for use pour juice into a pan and add sugar to malic a syrup l3ring this to boil, then add fruit and cook over top of stove very slowly for $n$ few minutes only
Ripe tomatoes can lie bottled in this way and are useful for soups, etc. in winter

BOTULISM. The form of food poisoning known as hotulism is due to the presence of a microbe in fruit or vegetahles which have heen canned or hottled; nearly all the outbreaks have occurred where the preserving was done at home. The symptoms are vomiting and diarrhoca, with abdominal pains, cramp, and paralysis or weakness of the legs, and perhaps difficulty in speaking. Deatlo may result.

The danger of poisoning is removed by cooking the food hefore usc ; warming is not suflicient. See Fond Poisoning

BOTTOM HEAT. The term is applied in gardening to the process of raising the temperature of the soil in which plante are being grown in a heated greenliouse. It is usually obtained by running a row of hot water pipes underncath the borders, but occasionally, as with mushroom beds, the desired effect is obtained by the ferment of manure
lBottom heat is chiefly used to hasten the growth of scedlings and cuttings for planting out purposes and for forcing early vegetables.
lbottom heat should be used very sparingly when forcing half-hardy subjects for hedding out, otherwise the young plants will grow up very tall and weedy. Soil temperature can always le taken by means of thermometers manufactured for the purpose. See Gardening ; Greenhouse.

BOUGAINVILLEA. This is a greenhouse climbing plant, a native of $\mathbb{S}$. America. As it loses its leaves in winter, it is valuable because it does not interfere with the admission of sunlight into the house for the benefit of other subjects. Its rose-coloured flowers are borne in bracts from spring till summer. The ordinary potting soil suits it admirably. It thrives in a temperature which may vary from $55^{\circ}$ to $70^{\circ}$, according to the season. The shoots should be hand pruned in spring.

BOUILLON. To make this clear broth, wash and dry 2 4 . lean heef and cut it into sinall pieces. Chop any bones, and soak bones and meat in 2 quarts cold water for half an hour, add a teaspoonful salt and bring the broth slowly to boiling point.

Then skim it and add to it a carrot, an onion, and a turnip, prepared and cut in quarters, a small bunch of herbs, parsley and a bay leaf. 2 cloves, 4 allspice, is peppercorns, and 2 chopped sticks of celery. Simmer (do not actually boil, or it will he cloudy) for 3 hours, removing any scum. Strain through n fine clean cloth into a basin and leave until cold. Remove all grease, re-heat and carefully season before serving in small soup cups, a tiny dust of chopped parsley being added to each cup. Sufficient for about 12 persons.

BOUQUET : Of Flowers. The florist's elaborate houquet is usually presented on ceremonious occasions, at public functions, and also at werldings, though at the latter the sheaf of long-stemmed flowers or the round closely packed quaintness of the Victorian nosegay is often seen.

For the sheaf, long-stalked lilies of any kind, gladioli, tulips, carnations, or a inixture


Bougainvillea. The delicately tinted Bougainviliea. The delicately tinted popular greenhouse climber
such as delphiniuns and pale pink roses can be used. The flowers are arranged in the same way as in a florist's bunch of fine daffodils, but a layer of moss or fern is placed between each graduated row of stalks, and tied in with them, to form a packing which prevents the flowers from shifting, and the whole is completed by ribbons.

The Victorian bouquet is a round massing together of small blossoms, and the inore compact and conventional it is the better. A delightful example is conmosed of pinli moss roses in the centre with circles of forget-me-nots, white pinks, mauve and purple violas, magenta stocks and mignonette. widening out to the desired size. The whole should be encased in the lace paper holder of the period and tied up with harrow ribbons to match the Howers.

The etiquette of bouquets is simple. For the débutante, on presentation, or other lady attending a court, the bouquet is not includer in dress regulations, but may be carried il wished. and is usnally a costly affair, chosen at a court llorist's to match the dress. The wedding bouquets for bride ancl bridesmaids are the gift of the bridegroom. At the beginning of the service the bricle hands her bouquet to the chief bridesmaid to hold It is permisaible for a widow-bride to carry a bouquet of coloured flowers. See Bride; Flowers.

BOUQUET GARNI,
This is more delicate in llavour than the packet of mixed dricil herbs. and is used for sauces and stews. It is made of a few sprigs of parslev, a bay leaf and a sprig of thyme tied up together.

BOUVARDIA. There are pink, scarlet. double pink and double white varieties of Bouvardia, which is a greenhousc slirub bearing fragrant flowers in winter. It is dwarf and bushy, and grows well in a compost of three parts lonin, one part leaf-mould, and some sand. l'ots of 5 in . or fi in . diameter will suit it. The plant should be atood in a shady place in the garden, or in a frame during thin summer, and brought into a wann house in September.

After flowering, the young growths should be cut back to the old wood. New shonots will ripen during the summer. and producc flowers the following winter. Propagation is effected by young shoots inserted in pots in spring.
BOW. The bow is the nacans wherely the strings of $\Omega$ member of the violin family are


Inrade to vibrate. It consists of a shender stick of $s$ narke. woodor 13razilian lance-wood. cut straight. following the grain, subjected to heat and then slightly bent.
Strands of white horsehair are carried ftom the toll of the bow to thenut, the latter
being fitted with a screw; it is tightened for playing, and relaxed after use in order to preserve the resilience of the wood

It is a characternstic of horse-hair to possess certain tooth-like roughnesses, which, aided by resin rubbed on to it, catch the string of the instrument, and cause it to vibrate and thus sound In course of time the hair wears away to smoothess, and the bow must then be res haired. Holding the how in his right hand, with the thumb upon the nut, the player drava it across the atring at a right angle, bet with the stick slightly inclined towards the left hand and ahout midway hetween the bridge and the finger-hoard. The wrist must be kept loose and supple. and the movement of the forearms should be fiee, but without any unnecessiry motion of the elbow. By variation of pressure, and by differences of movement in the bow, the player is able to secure all gradations of tone, as well as any desired species of phrasing

## BOWDEN CONTROL

 The Rowden wire control for cycles and other machines of the same kind consists primarily of two members. The cuble, or inner member, is composed of tine wire strands twisted together. The outer member, or sleeve, is formed of square-section non-rusting wire wound close up like a tension spring, and covered on the outside with a flexible waterproof material, as shown at $A$ (Fig. 1). The working principle of this form of control is as follows: The inner member is fastened at one end to the part to be controlled, and its other end anchored to the control lever ( 13 and F, Fig. 1), which shows the mechanism controlling a carburetter. There are numerous forms of control levers, all of which work on the same principle

Bowden Control. Fig. 1. Separate parts of the mechanism controlling a carburetter (see text). Fir. 2.
Diagrams illugtrating methods of making temporary repairs. Fig. 3. Permanent repair: correct methad
Bowden Control. Fig. 1. Separate parts of the mechanism controlling a carburetter (see text). Fif. 2.
Diagrams illugtrating methods of making temporary repairs. Fig. 3. Permanent repair : correct methad of senuring a Bowden wire into the nipple

Particulars of the brake control mechanism are given in the article on bmkes (q.v.).
An advantago of the Bowrien contml lies in its adaptability for all classes of contro where awkuard turns have to be overcome. To ensure ensy working never assemble tho control without first coating the wire with a mixture of thin oil and fine graphite. The best method to secure the wire to the control is, where possible, bo the use of the nipple supplied by the nakers. If this is not practicable, double the wire over and bind with thin copper wire, not forgetting first to solder the wire where you have to cut it, should it be too long. The control lever must be right home against the outer casing. It should not be forgotten that the lever to be operated is at rest. i.e that the length of naked wire show. ing at the end attached to the lever to be operated must be equal to the distance travelled bi the lever during its full movement ( $F$, Fig. 1).

So that the position of the lever may be set to a given position when at reat, a form of adjustable atop is provided as shown in $\mathbf{C}$ (Fig. 1). By such a stop the position of the outer member nlay be brought closer or withdrawn further from the operated lever, the result of so doing being either to lengthen or shorten the radius of movement. This adjustable stop con-
sists of a sleeve ( $a$ ), cuppicd at the end to receive the outer casing and screwed the whole of its length, so that it may hic positioned where required in the stop (b), and locked by means of the nut (c).
A tension spring is attached to the lever to be operated, so that it is pulled back to it.s original position when the control lever is released, or returned to rest, as the case may be, according to whether it is of the friction
design, B (Fig. 1), that stops where placed, as used for thmttle contmls, etc., or of the free design, D (Fig 1), as used for cycle brakes and exhaust controls. In onc tivic of Bowden control the spring is placed over the cable at the controlled lever end, and the whole enclosed in two tubes, the outer one heing stationary with the outer member, and the inner one travelling with the wire ( E, Fig 1). Fig. 2 shows various methods that may he emploved as temporary only, by which it is possible to get he:ue if a heratage should occur on the road. Fig. 3 shows the correct method of seouring the Bowden wire into the nipple. See Bicycle.


Bowl. Implements used in beating out an ornamental metal bowl. See tex!
BOWL : How to Make. In silver, copper, hinnze, lirass or Benares metal, howls hold plants or Howers. In papier inâché or pottery they are useful for bulhs, cut llowers or fruit, and are charming for this purpose in coloured stone ware. Glass and lustre howls also have a decorative value.
The making and omamenting of a bowl of simple form in one of the ductile metals, such as copper, hrass. or silver, can le accomplished at home with the aid of an anvil-block and a few tools. These comprise a hall pene hammer, a round-faced hardwood mallet (Fig. 1), a few ormamental punches, a pair of tinnian's snips, pliers, and file.
The anvil-block can be marle from an odd length of hardwood about $t \mathrm{in}$. hy 4 in . wide by $\mathrm{i}_{\mathrm{in}}$. deep. Set it with the end grain upwards, aind fasten it to a basehoarrl with a piece of felt on the underside, as in Fig. 2, if the work has to be done on a table. It is preferable to hold the anvil-hlock in a vice. The best material to begin on is sheet copper ahout No. 20 gauge.

Cut a disk of copper of ahout $(6 \mathrm{in}$. diameter and file the edges clean and smooth. Then draw circles from the centre of the disk, spacing the lines $\frac{1}{2}$ in apart. Holding the disk in the left hand, press it flat on to the anvil-block. so that the centre of the disk may he over the hollow in the block, and strike a lilow near the centre with the round-faced mallet. This will cause an indentation or stretching of the copper, and it is lyy a series of light, rapid blows, producing numerous indentations, that the howl is ultimately shaped. If the hammering, commenced in the centre, is carried
steadily round and round the howl, using the lines as a guide, until the rim is reached, then working back to the centre, the metal will speedily assume a howl-like form, as indicated in Fig 3 The next step is to beat out ns mans of the hammer-marlis as possible, obliterating them by light blows, and using a curved faced block or the curved corner of the block shown in Fig 2 .
Repeated hammering hardens the copper, and when this is observed the metal must be annealed, which renders it quite soft. The cdges of the disk may exhibit a tendency to cockle or pucker, but this will be of no great consequence when the design exhibits a scalloped edge, as shown in lig. 4. This is formed by hammering the edge in a hollow-shaped part of the anvil, as in Fig. 5, working scallops on opposite sides of the bowl instend of progressing round the rim. The ornamentation, consisting of a conventional Horal garland, is formed with the aid of a steel punch with a leaf-shaped end, held between tho thumb and forefinger of the left hand, while the bowl is supported between the third and fourth fingers, as in Fig. 6.

A circular block shaped as in Fig. 7, seen in section in 7A, will facilitate the llattening of the base. The use of the hlock is shown in Fig. 8, where the hammer is seen beating the basc to a Hat surface and forming the stilfening rim in the bottom. A tinal touch up with the hammer, giving a light blow or two here and therc, will produce the finished bowl (Fig. !), whioh then only requires scouring with silver arnd and water and a good rubbing with netal polish. Sce Batik; Bent Iron Work; Bull): China; Finger Bowl; Salad Bowl

BOW LEGS. Ricliets in chilliren are usually the cause of handy or bow legs. The legs should be loosely bandaged from the ankle to the crutch with a wide, soft Hannel bandage. Then splints 4 in . wide, carefully padded with cotton-wool, should be bandaged along the outside of the thigh and leg. The splints should extend well up aloove the hip joint, and some 3 or 4 in . beyond the solc of the foot, and should le worn during the day for a inonth or so.

BOWLS : How to Play. The full-sized howling green is 42 yd square with six rinks and a ditch about 6 in. wide all round, hut the game may bc played on a sinaller space and is in vogue oll many private lawns as well as on club greens throughout Great Britain. In the north some of the greensarecrowned


Bow!s. 1. Correct way of holding the bowl or wood 2 and 3 . Two wronk ways of holding sition; they must not exceed $16 \frac{1}{2} \mathrm{in}$. in circumference and $3 \frac{1}{2} \mathrm{lh}$. in weight, and are made with a bias, one side being weighted in such a way that the course of the howl tends to run in a curve The extent of the bias varies, hut, strictly speaking, the bowl should draw at least 6 ft in a distance of 30 yards

Any number of players up to four may oppose each other in a separate game, and on a full-sized green alnost any number in reason can get a game. If thereare only two players, or two on each side, each player uses four howls; in a three-a side game each player has threc bowls, and in a rink, or four-a-side, each has two howls. In all cases the points (or ends) are 21 up.

In an ordinnry game one of the leaders places the mat within a yard or two of the houndary. He then places on the mat one foot, which he ought not to lift. He rolls the jack in any direc tion which scems con venient about the order in which each playere rule and direct the aims of the other bowlers.
is an earthenware ball which should not exceed $2 \frac{1}{2}$ in in diameter nor more than 10 oz . in weight; it serves as the tee and must be at least $2 j$ yd. away from the mat on which the player stands. The bowls are of lignum vitae or other hardwood, or in some cases of compobut the last to howl are the two skips, as the captains are called. If the players are expert nearly all the bowls will be lying close to the jack some time before the turn of the skips cones. Till then they remain behind the jack

When all the shots have been delivered the plavers examine the positions of the bowls nearest to the jack, and 8 times out of 10 there is no difficulty in linding the bowl which is nearest, and wins the end for its side. If there is any doulst, accurate incasure ments are made. When the point has been settled the leader of the side which has won the end takes the mat and rolls the jack to some ot her part of the green. to slope from the centre to the ditch, but in and the game then procceds as lofore the south they are generally level.

All that is reguired for the gane is a jack and a few sets of lowls, together with an india rubber mat alout 22 in . hy 14 in . The jack


Bowls. Correct attitude Immediately after delivery of the ball, one foot being still on the mat Couriesu of Jurrold di Sons. I.td

BOW SAW. A bow or frame saw is used for cutting out various curved sha pes in wool. It consigts of a central bar with two end menibers, the holins of which are Irawn inwards by a cord tensioned by twisting the lever or tourniquet.
The opposite ends have handles movable in the holes drilled to receive them. The saw blade is long and narrow, pierced at eath end to receive a pin. Slots are cut in the metal ends of the handles and the saw is retained in position hy slipping it into the slots and insert ing the pins. The hlade should le tensioned hy twisting the cord. The saw is generally used with a vertical up-and-down movement, the teeth cutting on the down stroke.
Good quality bow saw frames are made in beech or similar hardwond. The length of the blade depends on the size of frame, 12 in . leing suitahle for amateur use. The width of the blade should be governed by the work to he done. For delicate work use the narrowest blade, and with fine teeth; for laige work


Bow Ware. Chimney piece ornamen characteristic of this porcelaid
use a wider blade with coarse teeth Threc different widths of blade will be ample as a selection for amateur work The work should be lield in the vice and hoth hands used on the bow saw, the sawing being done in a horizontal position when possible See Saw.

BOW WARE. A soft parte procelain made at kow and Chelsea in the 18th cen tury Old Bow is generally chalky white and coarse and heavy for its size, although some is of eggshell thinness It has a glassy lead-glaze, which with aqe has lecome iridesecnt and discoloured, often with brown patches anll stains.
The figures, usually de aigned for chimney-pieces, were more highly coloured than Chelsea. and often have square holes at the back for the metal stems of candlcnozzles Bow never imitated Sèvres vases or Dresden groups, but was successful with partridge, hnwtliorn, and dragon services in the Chinese taste, as well as with blue-painted "are, white with modelled reliefs, openwork baskets, sprigged tea. sets and landscape mugs It was mostly unmarked.
The common use of the anchor-and-crescent device in some styles often causcs true llow to be lablelled Chelsea or Worcester: The marks are easily forged, and inexperienced collectors should beware of the Bow imitations with copicd marks cleverly turned out in Paris and else where. See China
Bow Window. So called on account of its shape, this tyje of window is commonly termed a bay window. See Bay Window.
BOX : The Tree. The common apecies is a compact evergreen shrub with a characteristic pungent smell, thriving in most soils. It is a pronounced surface rooter, and is perfectly hardy. It grows up to 10 or 12 ft . in height, lout is of very slow growth.
Box is ensily increased by cuttings in frames in late summer. The lower hranches may be laycred into the soil in autumn, when suckers may also le drawn off and planted. The plant used for edging is a form of common box which is propagated by means of small rooted picces in May. Box is one of the chief suhjects used in tho practice of topiary work, which is the art of clipping trees and shrubs into fantastic forms of bircls, beasta, ships, etc. The timber of the full-grown treo is used for small tu:nery articles such as peg tops. See Wood.
BOX : How to Make. In making the simple hox shown in Fig. I the two end pieces should first be cut. These should preferably


Bow Saw. How the saw should be held with both bands to ensure a steady cot

be thicker than the sides, and in any cass stout enough to give a good hold to the nails. Then cut the two side picces and, standing the ends upright with one side piece spanning them, nail the side to the cnds, as in Fig. 1. Then add the remaining side and the hottom, nailing with thin wire or French nails.

If a stronger box is wanted, or the ends are in several pieces, fit upright battens as in Fig 2. It is customary when making this class of box to clench the nails, that is, drive them through the thinner wood into the hattens and then knock over the projecting ends. A goorl method is to hold a spare hammor ngoinst. the head of the nail while using another to clench the point

A quick and effective way to strengthen an old box is shown in Fig. 3, where comer pieces of square wood are nailed to the inside corners. Incidentally, this enables the lid to be screwed on if desired, as the corner pieces are stout onough to hold a screw. See Kínife Box; Trunk: Windour Box, etc.

BOX CALF. Box calf is largely used in the manufacture of handloggs and of boot and shose uppers, the letter grades being made from first selection calf-skins. For the cheajer clans of upper leathers, hox-calf is imitated under the names of box kip, this being made from the East Indian small cow-hide and finished with a box pattern; or from aplit hislea, in which case the leather is known as hox sides. When chrome tanned calf is dyed brown instead of hlack it is called willow calf, and is fre quently finished with the characteristic pattern of box calf.

All hox calf is tanned by the chrome process, the skin being converted into leather by the action of chrome compounds, so that it is quite distinct from leather tanned with inaterials like oak bark. When first tanned the leather is of a blue colour; during later stages of manufacture it is dyed and tinished. recpiving the characteristic grain of box calf.

Genuine box calf is one of the best of all upper lenthers. It wears sell, gives to the foot, and if properly lasted the shape of the boot does not spread or become unsightly after continued wear. Even under the influence of excessive perspiration a box calf upper is durable. lt should not crack after long wear, and if it does it is a sign of faulty tanning.

As with other types, the life of a box calf upper largely depends upon its preservation. Cleaning and polishing with a good reliable polish is all that is required; but the polish must he of sound quality. See Boot ; Leather.

BOXING GLOVES. In buying these gloves it is necessary to ree that they fit the hands comfortably, for if they are too loose or too tight a great deal of discomfort is certain to follow. Many hoxers pay little attention to their gloves, but they ought to lee kept absolutely clenn, free from grit and grease. When they are new they want no attention except to work the fingers frequently about in them, in order to make them pliable.

If, as may easily happen even in the mildest
form of boxing, sprinkling of hilnod should get upon the gloves, they should bevery carefully cleaned with a little linseed oil, for if the hood is allowed to cake it will make a hard spot which may damage an op ponent's face. On no account should the gloves be damped with water. If they have to be putaway for any length of time they should be thoroughly but
sparingly oiled, for leather always has n tendency to jerish and harden when it is not in use. The gloves should not he placed in a damproom, nor in one which is too liot.

BOX IRON. The old-fashioned kind was litted with a plug, made red-hot in the kitchen firc and then plunged into the metal case. This was superseded by electric or gas irons. with which a continuous hert can be obtained. These are con. venient, but unless a special plug or burner has heen provided, they cannot be used when the fittings are needed for lighting purposes. See Flat Iron; Ironing.
BOX MATTRESS. A variety of the spring mattress, this is one in which the springs are enclosed in n horsehair or rugging stuffed mattress made on a strong wooden frame and fixed to the bedstead. It


Boz Iron. Showing block of metal which is heated in the fre
linen and underclothing. It is useful in the nursery for toys, appropriately loosecovered in coarse linen on to which toy designs are appliqucid. Pine, if availablc, is suitable for use in constructing the box portion, the liead scroll being of birch, beech, American whitewood or other liardrood

If to be linished ns a plain hox without scroll heacl, the construction of the ottoman is of the simplest. I serviccable size will be 3 ft . 6 in . long by Ift. 6 in . vide, and 1 ft .3 in deep. Floor boards 1 in . ilicli and tongued are suitable, and are best dovetailed. A strong box, however, is made without the trouble of dovetailing by nailing or screwinf a 3 in liy 1 in clamp inside each of the longer sides, setting it back to the thickness of the short sides or ends, so that these can be nailed flush into tho rehatc thus lormed, and a hottom nailed up to this Castors should then be fitted, and this will complete the making of the hase portion of the ottoman

The lid may be of plain clamped boards of similar thickness and hinged to position, re membering to malio the clamps sufficiently short to allow the lid to shut easily. The lit can be minde as a tray, and is stayed from opening too far back by means of a couple of wide tapes nailed to the inside of the lid and the box side. The interior of the box can then be lined with sateen or ang other material that is suitable for the purpose
In upholstering the sides and onds, these can be padded to curre nicely with cotton-woil and covercd with cretonne or damask, carrying the material over the edges and into the inside of the box, where the edges are doubled and tacked gives the bed a neat, upholstered effect. but down. Thecovering is edged along the line of an overlay has to he used as well. See tho box bottom outside with variegatod cord Beilding; Divan; Mattress.

BOX OTTOMAN. This piece of fumiture is a combination of the long seat or couch, or gimp. tacked as before
The lid of the box can be casily covered with an evenly diatributed layer of brown wool hetween two layers of wadding, the edges of the canvas being tacked to the box edge, and the final covering stretched tauly over this and tacked with gimp, cord or ball fringe edring.
In conotructing the box for an ottoman such ac that pictured in Figs. I to 4, a length of 5 ft . 105 ft . 6 in . should he allowed, includin. space for a head scroll. The height of the seat framing may finish 1 ft .4 in . to 1 ft .5 in . In this way the rails of lid or seat framing are 3 in. wide, the box sides 12 in vide, and bottom 1 in.. an additional 1 in. or so being allowed for cators. Naterial 1 in. thicli should be used for sides and lid throughout, this latter being preferahly of birch, and the parts dovetailed together, and the bottom sciewed well home with 2 in. screws. In making the lid $n 3 \frac{1}{2} \mathrm{in}$. hy 1 in stretcher is being formed by enclosing the lower part of the article. The scat is made in the form of I hox ottoman may be made from a large box with $\Omega$ hinged lid. The top is upholstered to make a comfortable seat, and the sides are covered in the same material
In addition to its value as a couch or bed, the hox ottoman is serviceable for holding surplus things that crowd a room, hedclothes for an emergency bed, or even some of the houschold


Box Ottoman. Figs. 1-4. Diagrams showing how to inark out and make a box ottoman with a scrolled bead end
cut into and screverl to the bottom part in the centre, as indicated at Fig. 1. Stout brass hutt hinges should he used.

There are various shapes for the seroll portion of the ottoman, such as drum, scroll, holster. roll, pillow. etc For this poition of the work deal is often unantisfactory, on account of its tendency to split when a considerahle number of upholatering tacks are driven in, and it is better to use birch or hecch 1 in. thick. A plain scroll may rise 6 in. to 7 in . only, or with any taller type of shaping. 12 in will he a serviceahle allowance. À choice of shaples is offered at Fig. 2, and these will suggest a variation in the finishing.

The elevation vicwnt Fig $3(\mathrm{~B})$ is of a verage size, and is set out in 2 in . syunres. When cut to shape the two scrolls will be fixed in fosition to the box framing with four hardwood dowels each, the four stufling rails upon which the upholstery is built having previously been fitted between. The numher of these stuffing rails, which can be 2 in. hy $l$ in.,

may vary according to the upholstery deaign to be carried out. A stretcher rail of the same height as the lifting lid is fitted, as Fig. 3 (A). The scroll can be stiffened by means of two pieces of 3 in by 1 in . "ood screwed to the insicle of head prition of box, as at Fig. 4 (C), these heing sufficiently long to project and form stays for screwing to the inside of front and back scrolls. A plan of the underside of hox lid is seen at Fig. $t(B)$. This shows the stretcher rail dovetailerl in.

For comfort it is preforable to linish with a spring seat. For this about 3 dozen strong 4 in . springs will be required, and these should be tiel down to about two-thirds of their height when put in and covered with hesaian. Every attention must be paid to the even spread of the stuffing, arching it well in the centre and diminishing it towards the edges, so that they are regular and devoid of lumpiness. Unless this is done very carefully and methodically, the ottomian will never make a comfortable seat. A covering of calico over the second stuffing, especially where hair is used, is recommended previous to receiving the linal covering. An improved effect is obtainable by buttoning the seat; a plan of this is shown Het Fig. 4 (A). The head stufting would then be buttoned to agree See Divan: Upholstery.
BOX PLEAT. The material is folded alternately towards the loft and right to give
large flat pleats, which muat be all of the same size. If the pleating is to be all round, the material required is twice or three times the


Box Pleat. How the pleat in the material is tacked down ready for pressing : left, front ; right, back
length necderl for a plain skirt, according to depth of pleat desired They retain their shape botter when lecply folded.
fix the folds with pins as they are made, measuring accurately to get each box-pleat exactly the same size. When all the fo!ds are pinnerl in position tack them firmly with a needle and cotton. noticing that the three erlges, pleat and material, are even. Finisl! the pleating at the top by sewing it into a double band of material or binding. Box pleats only set well when firmly pressed.
For louble box-pleating two folls are placed to the left and two to the right to separate each box-pleat. See Pleating.
BOX THORN. Lycium chinense, or the bna thorn or tea tree, is a vigomus leaf-losing

shurb heacing small purple flowers which acc followed by red fruits in autumn. It grows quickly and densely and makes a useful sereen, especially in seaside gardens. It Hourishes in ordinary soil in a sunny position and is increased by seeds sown in spring.
BRACE : For Drilling Holes. The carpentor's brace consists of a cranked metal bar, one end provided with vided with
meanstohold the drilling implement or bit; the other end hasa circular wooden kinnb or heal. In the iniddle of the crank is a wooden handle frec to rotate.
'rouse such a hrace, a bit is inserted in the holder. which is known as a chuck. The left hand grasps the head, the right hand grasps the grip on the crank. The brace is held upright with the point of the bit exactly on
the centie of the spot marked on the wond where the holo has to be drilled (Figs. 1-3).
The left hand is prossed firmly downwards, while the right hand is employed in rotating the braco and bit. The chuck is composed of a hexagonal exterior member that turns on a screw thread cut in the brace, this in turn contracting two or three jaws which grasp the bit or drill. Some chucks are only adapted for grasping brace shank bits, while others will do this and will also grasp ordinary circular slask drills. This kind is to be preferred for all-round use. Better quality braces are made with a ball-bearing head. which is a great advantage. The ratchet brace has a ratchet movement which can be thrown into or out of action by moving a slecve on the orank. This device onables holes to he drilled in awk ward corncra or near to a wall, where it would be impossible to rotate a plain hrace.

Amongst the usos of the brace, apart from drilling holes, is that of driving screws. This is accomplished very quickly by aubstituting n acrewdriver bit. The enlarging of holes in metal or wood is done with a rimer bit The conc-shaped recess to accommodate a screw head is formed by the braco, using a counter sink bit. Rounding the ends of dowel pins is accomplished by using a dowel shaver bit and a dowel rounder bit. Shallow circular receases or sinkinge for a nameplate are formed with a brace and a Forstner auger bit.
The engincer's brace, Fig. 4, is a ratchetdriven tool for drilling holes. It is simple and effective. hut is only employed where a hand drill would not he large or powerful enough, and when the work cannot he conveniently taken to a regular drilling machine.

A rim brace is Inrgely used for removing and replacing the nuts on most types of detachahle wheels on motor cars. They are made in two forms, the plain hrace, and an improved form with ratchec. Separate sockets are obtainable to fit these hraces, and thus various size nuts can be dealt with from in in. to $\frac{7}{W} \mathrm{in}$. across flats. See Bit; Boring; Drill.

BRACELET. In the wide, old-fashioned varieties, which return to favour when hracelets are the vogue, one part likely to go wrong is the joint, through opening the brace let too wide, straining the hinge and ultimately tearing it from its seating; this is prevented by attaching a safety chain just long enough to enable the bracelet to push over the hand.
Sometimes the small pin in the hinge will work looac und drop out. Another can be made by taking an ordinary stout brass pin and, with a pair of pliers, pushing it well into the joint until it is a tight fit, giving it a tap with the pliers to drive it home, Fig. 1. With a small file, nick the pin where it projects, break it off, and finish hy filing it flat, Fig. 2 . Should the clasp become weak, it can be insNhouk the clasp become weak, it can be in

proved by inserting the point of a pocket knife hetween the spring and raising, Fig. 3. Where the front is set with jewels it slould be cxamined periorlically. Should one be loosc.
it is best to let tho jeweller examine it, as a part of the setting may have worn away; but with a fairly new bracelet the edges of the setting miny be rubbed down on the stone with the back edge of a pocliet-knile, or, if claw set, the points pressed on to the stone with the blade.
Pins in the joints of a flexible bracclet sometimes fall out. I new one can be made with a hrass pin, as described in stiff bracelets. Expanders depend on the strength of small coiled springs inscrted in each link for their expansion They ought not to be opened and shut more often than is necessary, or the springs will weaken. If this happens, it is best to return it to the jeweller for respringing. An occasional wash in hot water, with soap and a few drops of olive oil. will keep the springs easy and smooth running.

The gold slave hangle is hollow and is usually sold in 9 ct and 15 ct gold. The calibre is a circle closely set all round with small stones, which are held in position by rubbing over the outside edges of the hoop The greatest care lias to be taken of these, hecause if they are twisted it is almost certain that a stone vill Hy out, or at least be lonsened. If one stone should be lost, the bracelet should be taken to the jeweller and a now stonc inscrted, otherwise they will all work out.

Ivory and tortoiseshell hracelets are inlaid with gold wire or elephant hair. The gold inlay is apringy, and a jar may dislodge it. Should this occur, brush a little Canada halsmm or seccotinc into the groove, press the wire down, and bind tightly with thin string and leave for 24 hours. As heat renders tortoiseshell soft and pliable, it should never be put into hot water. Should thic surface become dull with wear, it can be improved by polishing with jeircller's rouge and a soft rag, ifterivards washing out with lukewarm water and sonp.

BRACING. This term is applied generally to all such work as the strutting of a rafter to prevent ita sagging, the fitting of a diagonal brace to a timber framework, or an angular strut or brace to aupport the back of a chair. The principle is that of stiffening $\pi$ structure by means of $n$ supporting braco generally placed diagonally between the parts to be strengt hened, thus tranamitting the weight froin the overhanging, or weak part, to the wall, foundation, or strong parts.

The principle is shown in the ledged and braced door illustrated. The ledges, A, cannot entirely prevent the planks which form the door from sagging, but the two braces, $B$, act as brackets or supports, and also help to prevent warping. Other examples will be found in the articies on Shed and Workshopl.

BRACKEN. Although quite wild, this common fern (Pteris aquilina) has certain donnestic or semi-domestic usea. The fronds are largely used for hedding cattle. They are also used to a slight extent for thatching houses and stacks. The stem of the bracken contains starch and has been used as a food.

Except in the wild garden hracken is of no horticultural interest, and, unless the wild garden is a large one, should not he introduced, as it spreads with great rapidity when once it has taken root, and it is somewhat difficult to get rid of it successfully.

BRACKET. Is ordinarily understood, bracket is an L-shaped metal support for a shelf, although there are other types, such as the bracket of a lamp, or a gas bracket, or electric fitting.


The iron hracket (Fig. 1) is intended for the repair of chairs or other furniture : these are usually $\geq \mathrm{in}$ or 3 in . long and $\frac{1}{2} \mathrm{in}$. wide. The strong light shelf bracket shown in Fig. 2 is known as the London pattern; it is made from pressed steel, and is finished in hlack japan. Usual stock sizes aro 3 by 4 in . to 12 by 14 in . Inother type similarly made, but with the additional stiffness given ly the curved brace or atrut, is shown in Fig. 3. They are handy for the rapid erection of shelves, a convenient nethod being to screw the brackets to upright battens of wool securely nttached to the wall and reaching to the floor

Shelf brackets intended to support plate glass or narlile shelves ate generally made in cast brass, cither polished and lacquered or nickel plated (Fig. 4). The littlo upturned nib or lip at the outer end cnsures the glass shelf from accidental movement. Such hrackets ane made in many sizes and shapes, also adajted for use on hars and posis for shop-window fittings.

Partition brackets (Fig. 万) are atont iron castings supporting a wooden or other partition, and canoften be tumed to good purpose by the aniateur. Stock sizes range from 12 in . wide by 24 in . ligh to 14 in . Wide by 48 in . long.

Bucket brackets (Fig. (i) are made in strong galvanised iron, and should be securely holted to the wall to sustain the weight of a large tire bucket. Gutter brackets of two types are illustrated in Figs. 7 and 8, one to drive into $a$ wall, and the other to screw on to woodwork. The householder should inspect the gutters and brackets occasionally, to be sure they have not sustained damage. If hroken they should be replaced as soon as possible, as a damp wall is the result of neglected rain water gutters and their supporting brackets. There


Brads of various sizes in common use. Top, floor brad;
centre, carpenter's oval wire brad: bottom, left, shoomaker's brad : ripht, joiner's brad
are numerous types of wooden bracket. Plain or ornamental wall brackots arc everyday requirements in the home: thoy can be quickly made from add materina and coloured or decorated to suit any stylo of furnishing. This kind of bracket is effectively carried nut in fretwork (q.v.).
The strong bracket shown in Fig 9 is useful for supporting heavy weights, and the sizes given may be modified to suit requirenents The parts ns shown in Figs 10-12 consist of a plain top, cut from commercial 11 in. by 1 in dcal, planed up on the face and edges, and finished off with hevelled corners. The hack is of heavier stuff. $1 \frac{1}{4} \mathrm{in}$. thick, and has notches cut out at 3 in . centres from ench end, 2 in deep at the front and $2 \frac{1}{2} \mathrm{in}$. deep at the back, and $\frac{l_{1}}{}$ in. wide.
The brackets are shaped as shown and can be sawn out with a handsaw, planed up on the top and front edges and cleaned up to shape at the back with a chisel. The half dovetail projection must be cut to fit tightly into the notches cut in the hackboard, its purpose heing to prevent the hracket drawing forwards and to relieve the screws of some of the work. To assemble the bracket put the back in the vice. then gluc the edge of the bracket and the notch in the hack, and sorew the bracket firmly in place with $2 \frac{1}{2}$ in. No. 10 countersunk screws inserted through clearing holes drilled in the back. Then glue and screw on the top, using four screws at the back and three into each bracket. Drill holes through the back and screw the whole to wooden plugs cemented into a brick wall, or to the studding on a plaster wall, or employ Rawluge. See Bent Iron.

BRAD. Generally this name refers to an oval section wire nail with a narrow oval head. They are preferahle to the ordinary wire nail for much internal household work. Convenient sizea are $\frac{3}{3}$., 1 in ., $1 \frac{1}{2} \mathrm{in}$., and 2 in .

Tyjucs of nails known as brads are illustrated in their actual size, and their purpose is apparent from their names.
BRADAWL. A small hand tool not unlike a screwdriver in aplearance, the bradawl is used for making holes in wood preparatory to inserting a nail or screw. The secret of success in performing this operation lies in cutting across the fihres. Conmence by pressing the hradawl firmly into the wood, cutting ncross the grain and as deeply ns possible; then twist the bradaul a little, thus enlarging the holc, and again force it down, cutting across the grain, and repeat the operation until tho hole is deep enough. If the hradnal is pushed in with the hade set the way

Bracket. Figs. 9 12. Strong wooden bracket. Ior supporting heavy


of the grain it will act as n wedge and
split the wood. aplit the wood.
Irndawla are made in 12 sizes, from a $^{3} \mathrm{z}$ in wide to in wide. Three sizes will neect most requirements ; and it will be found convenient to buy them ready handled.
BRAD - PUNCH. A small steel punch, known as a brad-punch, is used for driving the head of a nail below the surface. These are made in four sizes, with cupped or hollow ends.
BRAG. In this card game, a variation of policr ( $q . \nabla$. ), there are three special cards, the ace of diamonds, jack of clubs, and nine of diamonds, which may be called any card by the plaver bolding them. Thus, a player niny hold in his hand the ace of diamonds, king of chabs, queen of clubs, jack of clubs and ten of clubs. In that case he can call the ace of diamonds the ace of clubs to make a royal flush The three cards are known as braggera. In brag, however, any natural hand beats any similar hand made with a bragger. Thus a pair of aces beats one ace and n bragger : or three kinga beat a king and two braggers If two hands with braggers in each tie, the cards rank in the order ace of diamonds, jack of clubs, and nine of diamonds.

BRABMA. Massive size and heaviness of feathering arc the chief points in the appearance of the Brahma fowl, which formerly had a reputation for being a good lager and table hird, but is now kept almost exclusively for exhibition purposes. There are two varieties, light and dark See Poultry.

BRADD. Composed of plaited threads, nmong the more familinr types are bootlaces, costume braids, Prussian bindings, cords and gimps used in upholstery, tinsel galons, and fency artificial silk braids.

Cost ume braids, formerly made from worsted or mohair, are now composed of artificial silk. Russian braid, having a groove running down the centre, is easily stitched to ot her material

To hraid is to bind edges of revers, cuffs, etc., or to stitch a fine make of braid over a design already marked on the dress or costume, outlining the design completely and forming an effective trimming. This is usually done by machine, but may also be stitched by hand.


Braid. Method of applying Russian brald to a piece of material marked ont with a pattern

To do the actual braiding, place the braid on the garment-on the ink lines if a tranafer has been ironed off-and sew it down with small running stitches along the groove that runs down the centre, as ahown in the illustration. When the design is complete, the material should be pressed from the wrong side. The end of the braid can be made neat by sewing it to the eye-end of a large darning needle, and pulling the latter through the material to the
wrong side Braids to be used lor trimming purposes can be hought in widths varying fromi $f$ in to 9 in , and even 12 in See Binding.
BRAILLE. The system of embossed realing and writing moat widely used by the blind bears the nanie of its inventor. Brailic has no resemblance to ordinary print. The letters are inade up of a combination of dota, the largest number being six, arranged in three pairs. Space is saved by the use of contractions and ablireviations: but, even so, books in braille arc very hulky Nuch general literature is now in braillo type in Great Britain, in addition to several monthly magazines and two weekly newspapers. There is also a free National Lending Lihrary at $35, \mathrm{Gt}$. Smith St., Westıninster, London, S. W.. from which hooks are postel to all parts of the United Kingdom. Full details of the Rraille system can be obtained by application to the National Institute for the Blind, 294, Great I'ortland Street, London, W. See Blind.


Braille. Alphabet and contractions which ars em-
bossed on paper to enable the blind to read by tonch
BRAIN. The brain is the predominant part of the nervous system, and, like all nerve cent res, which originate nerve force as opposed to nerves, which merely conduct it, its activitics depend upon nerve cells, of which it contains millions. These are spread out in layers on its surface, and to increase the aren the surface is thmown into folds or convolutions The cells vary in size and shape, and have different functions. The brain is the organ of conscionsness and voluntary movements, and definite areas are mapled out for originating move ments of the hand, the arm, the face, etc., and for vision, hearing, smell.
Movements on one aide of the lody originate on the other side of the brain, and in righthanded people the centre for speech is on the left side of the brain. There are other minases of cells at the base of the hrain, and in the bull, or medulla, where the brain becomes continuous with the apinal cord. In the latter are the centres for the functions which carry on the life of the body, heart control, breathing, swallowing, control of the hlood vessels, and so on; hence injuries at the top of the spine are likely to be immediately fatal. The lesser brain, lying behind and hrlow the main mass. is mainly concerned with the maintenance of balance.
Injuries and Diseases. Bran abscess is a serious complaint, requiring immediate surgical treatment. The cause may have been originally a blow on the head or an unclean acalp wound, from which the inflammation bas extended inwards. A common cause is suppuration in the ear. The symptoms are dis. turbances of vision, recurring scvere hendaches. giddinces, and vomiting.
I person who has received a head injury of any severity will suffer froni concussion or stunning, with inore or leas unconsciousness If this deepens and the patient becomes comatose, breathing in a laboured, stertorous fashion, with Happing cheeks, and a slow, full pulse, which becomes feeble and irregular, it is probable that he is suffering from compression. In compression the hody is paralysed, but if the damage alfects one side
of the brain, there may be, to hegin with, loss of movement on the opposite side of the body. For treatment until thic doctor's a rrival, heep the patient lying in a quiet room with his head low Apily cold cloths to the head The condition may last for a long time
Concussion is the name used to describe the conditions resulting from n blow on the skull, with a sudden shaking of the lorain, which may or may not be accompanied by gross damage to the brain. The concussion may result in nothing more than a slight headache, dizziness, and mental "fogginess," lasting for but a moment or two; but in a well-marked, severe case there is loss of consciousness. For treatment pending the artival of the doctor, the patient should be put to bed, and no effort made to arouse him. Hot "nter bottles should bo put to the feet and legs, and cold cloths on the forehead. As a rule, recovery from concussion is complete.

## Cause of Soltening of the Brain

Should an embolus or clot bluck up a brain artery, and so cut off the blood supply, softening of the hrain may take place, the part afiected dies, and becomes liquefierl. Brain tumours may be cancerous, tuherculous, syphilitic, or sarconatous, etc. Disturbances of vision are common, and there is severe headache with vertigo and vomiting. There is likcly to be mental disturbance also. The treatment depends on the diagnosis.

Lethargic encephalitis, nlso known as aleepy sickness, is an inflammation of the grey matter at the base of the brain mainly, and is due to a microbe. The disease gets its name from the fact that most of the patients become drowsy. The eyes usually squint, and various nervous disorilers, one of then resembling St. Vitus' dance, may be left when the drowsinces disappears. The symptoms are sometimes very slight, perhaps a tendency to fall asleep during the day, and some reatlessness at night, with forgctfilness of the little things of evcryday life ; and the real nature of the condition might be overlooked, with detriment to the future health.
BRAIN FAG. Like all other working tissues, that of the brain may be tired by overwork. There is a diffierence in the amount of work which different individuals enn do comfortably, but the natural capacity of any person may be reduced by a poor supply of hlood to the brain or by the blood being of poor quality, as in anaemic states, or being loaded with toxins from the alimentary canal, when the contents of the last named are not moving along sufficiently frst.

A generous supply of blond is not only necessary for the provision of food and oxygen, but to cariy off the waste products formed by the working cells. Organs which are acting receive more blond for the purpose, and after a full meal, when the stomach is getting its supply, the brain gets less, and this accounts for the somnolence and dullness of the mental faculties at such a time.

Brain fag comer quickly in the neurasthenic, and may be due to inherent weakness in the brain tisaue; but a similar condition may be caused by overwork, especially when associated with worry, though worrying may also be a symptom of brain fag. Other symptoms are loss of power of attention, impaired memory, irritability, loss of pleasure in work and recreation, bodily weakness, perhaps digestive tmublo, and a large variety of sy mptoms.
If the condition in well developed the patient must rest. For prevention we should aim at beeping ourselves physically fit by open-air exercise and other menns. The idea that the best rest is a change of occupation is cssentially a sound one, but should not be stressed. A sufficiency of sleep is nll-important.

BRAINS : Recipes for Cooking. Calves' and sheep's brains are used in cookery, being sometimes bought separately, but usually sold with the head

Having blanched the brains by washing in salted water until all discoloration is removed, soak them in cold water, then remove skin, wrap them in a piece of muslin, and put into a saucepan with a little onion, a teasponfful of lemon juice or vinegar, a pinch of salt, a sprinkling of pepper and just enough cold water to cover them. Bring io the boil and then remove the brains and put into cold water until needed One set of calf's or two of sheep's brains will serve 4-5 persons

To fry, slice when hlanched, and coat the slices with warm butter; then dip into wellbeaten egg, cover with hreadcrumbs, and fry. Alternatively, dip the slices into a rich frying hatter (q.v.) and fry till a golden brown. Fried either way, the brains may be served with a hot piquant sauce, or garnished with slices of lemon.

Fried brain cakes or halle are useful for garnishing a calf's or sheep's head. To make them, chop the blanched brains up with the yolk of a hard-hoiled egg, a tablespoonful of white snuce or cream, a little nutmeg, a little grated lemon pecl, a pinch of herbs, and some seasoning. Add enough hreadcrumls to bring it to not too stiff a consistency, and when cool form into little Hat cakes the size of a penny, or into balls. Dip them in llour, then in egg, cover with breadcrumbs and fry a golden ljrown
For brains served on toast chop one set of calf's brains or two of sheep's rather coarsely, removing any stringy pieces. Whisk one egg until it is slightly frothy, add to it two tablespoonfuls of milk, and stir in the chopped hrains, seasoning the mixture carefully. Heat 1 oz butter in a pan, pour in the egg and brain mixture, and stir hriskly with a wooden spoon over $\Omega$ very gentle heat until it becomes thick and creamy. Heap on pieces of hot buttered toast, and sprinkle with chopped parsley.
Scalloped hrains make another appelising dish, prepared by cutting up a set of calf's or two of sheep's brains into amall pieces, and placing them in a little less than $\frac{d}{}$ pint of white sauce to which a tablespononful of cream and a few chopped mushrooms have been added Season the whole, and put the mixture into $\overline{5}$ or ${ }^{6}$ greased scallop shells, sprinkling each with breadcrumbs Place a small lump of butter on top of each, and brown in a quick oven. See Calf's Head; Forcemeat ; Sheep's Head

Brain Sauce, To serve with calf's hend boil and chop a set of calf's hrains, then add them to a thick melted butter or parsley sauce, well scasoned.

BRAISING. The process of braising can be carried out with success in caeserale or sancepan, braising pans being costly utensils Coals on the top are omitted, and the pan placed in the oven, in order that it may be surrounded by a gentle. even temperaturc. Braising, an economical method of cooking. develops a specially rich flavour, owing to the bed of mixed vegetables in the pin on which the food it placed. Mirepoix is the correct terin for this vegetable mixture. Like stewing, this method of cooking is particularly ndapted to meat or birds that, if cooked in other ways, would he tough, dry, and Havourless. No nutriment is lost from it, as the liquid reduces slightly and forms a rich gravy containing the nutrilive and thavouring juices that may have been extracted from the food. In some cases it is advisable, if the food is very delicate, to place n piece of buttered paper between its surface and the lid to prevent scorching and drying. See Beef; Casserole.


## Brakes: On Bicycles and Motor Vehicles

## Their Mecisanism, Fitting and Adjustment

## The arricles Bicyle: Motor Car ; and Motor Cjcie should also be consulred Sec further Con~rar. Hub

The brakes generally used on bicyoles comprise (a) the front wheel rim brake (Fig 2); (b) back wheel brako fitted on the back stays (Fig 1); (c) back wheel brake fitted on the sprocket bracket (Fig. 3) ; (d) coaster hub brake. Rint brakes are operated through a system of rods and levers, or by means of Bowden cahle control. The latter system is shown in Figs. 1 and 2.
A rear brake of the type shown in Fig. 1 consists of an inverted U-shaped piece, A, fixed in position over the tire and held in place nt the top, or fulcrum, by the Bowden wire, 13 , the ends, or legs, being held down out of action by two tension springs, $C$, attacherl to clips, D, that are secured round the forks or back stays of the machine The brake pad bracketa, E, are formed with grooves to receive the pads, $F$, generally made of fibre. The adjustment of the brake pads to the rim of the wheel is secured by the milled nut, G, and locked by the nut H
The action of the bralic is as follows: By means of the Bowden control the U-piece is pulled up, thereby bringing the pads into con-
tart with the rim.
The springs, C, return the brake to rest on releasing the Bowden lover. The distance, or clearance, between the rim and the pads is determined by the cable adjustment, J, provided with the of the usual type of clips, retains the pin, $C$ Bowden control. in a true line with the wheel, and also carries the studs, $D$, that keep the irms $A$ and $B$ up to their work
Vith the back wheel pattern irms $A$ and $B$ up to their work
With the back wheel pattern $\cdots$ the studs, $D$, are dispensed with, becanse the arms, A and
$B$, are kent up to their work hy B, are kept up to their work hy the direction of rotation of the wheel.
Fig. 3 shows a back wheel brakc made for attachment to the sprocket made for attachinent to the sprocket
hracket, with operating control rods. To tit this pattern proceed th follows: Unscrew the nut, $A$, nind remove the rod, $B$, from the draw-bolt, C. Fit clip D on the down tube so as to

Fig. 1
When in action this type of brake takes its support from the down stays. The direction of rotation of the wheel tends to keep the brakc tight When fitted to a front wheel and controlled by cable, the top, or fulcrum, of the ( U is held in position by enclosing the cable in tubes. one sliding over the other, the inner tube, A (Fig. 2), being fixed to the tension rod, 13. and the outer tube, C , secured to the clip, 1). that holds the outer inember of the cable This is necessitated by the action of the wheel, which tends to tear the brake from the forks The ends of the U-piece are fitted with pins which pass through holes in the clips, F , that are scoured on the forlis of the machine. The U-piece, G, acts in this case as the spring to withdraw the brake out of action and works as follows. The legs of the U-piece are sprung outwards, and the pressure is thus transmittex to the pins, $H$, causing them to slide to rest through the holes in the stationary clips, IF. Beyond seeing that the parls are not loose in the brackets, and also that they are not allowed to wear ton low, there is nothing requiring attention.

Brakes of the caliper-action pattern are used where it is desirahle tor have the pads acting on the side of the rim instead of underneath, as in Fig 4. Two arms, $A$ and $B$, are hinged at the top by tho $\mathrm{pin}, \mathrm{C}$, and the brake parls attached to these arms engage the sides of the rim through the medium of the Bowden wire, drawing the extension arms of $A$ and $B$ together A stalionary ${ }^{1}$-piece, which is secured to the forks of the machine by means in lin tio cios,

bring tube, E , in line with the liead Fit fork clips, $F$, on thi forks, but do not tighten. Then fit clip $G$ on down tube, leaving the screws, H and J, lonse Spring thic stirrup, K, over the wheel, and place the pega. $Q$ into the fork clips, F. The next operation is to adjust the screv, J, so as to leave the siving arm, M, a working fit. and tighten lock nut.
Tighten up screw, $H$, and carefully note that stirrup, K, lies parallel with the tubes, R, then tighten up lock nut. Now shorten tho rod, $B_{\text {, if }}$ if necessary, and pass it through drawholt, $\mathbf{C}$, till there is sufficient tension on spring. L. to force back the swing arm, M ; then tighten nut. A Adjust the pad holders, N, up to within $\frac{1}{8}$ in of the rim by means of thic milled nut, $\mathbf{O}$, then lock hexagon nut, 3 ', finally fitting the fork clips, F, in position. The stirrup, $K$ when at rest must not butt up against the fork clips. A stop is provided on the hand lever by which the position of $K$ should be set as shown.

Coaster hub brakes arc sometimes employed in conjunction with a two and threespecd gear. Generally speaking, the conster hub brake is designed on the internal expanding principle, employing either an expranding bronze ring or an expanding slecve, the braking power being applied in each design by back-pedalling.

Motor Cycles and Motor Cars. The various types of brake used on motor vehicles may le olassified under the following heads. Internal expanding, as shown in the diagram, Fig. 5. External contracting band brake, Fig. 7 ; and the front wheel brake, Fig. 8. In Fig. 11 is given a dingram of an interconnected fourbrake s.psten. Its particular feature is that pedal and hand lever actuate all four sets of brake shoes.
In the motor cycle class there arc the band brake, Fig. 9, the belt rim brake, Fig. 10 and alaso various forms of internal expanding brakes, designed in nearly all cases to give inaximum braking power in a forward direction, i.e. the expanding band is operated from one end only, its other end butting against a stop. In most censes this type of brake is fitted either on the gear box or incorporated with the belt pulley.

Figs 5 and 6 show the action of the Perrott-Bendix two-shoe internal expanding hrake. This is adapted to give a complete servo action

both forwards and backwards. Fig. 5 slows the two shoes with their operating mechanism, while Fig. © shows the operating mechanism in several positions. The shoes are connected to one another at their lower end by the short link $e$, and their upper ends are expanded so as to engage the inside of the drum by a floating lever, $f$, carrving two small rollers, $y$, one for each brakic shoe. The lever, $f$, is adjusted angularly by connecting its lower end to a short arm; $h$, fixed to the brake operating spindle. the outer end of which carries the usual operating lever, $k$ :. Each of the brake sloos is free to move within narrow limits determined by holes at their ends through which prass, with a certain amount of freedom, pins $l^{1} l^{2}$ fixed to the back or anchorage plate. A spring, $m$, contracts the brake shoes and keeps their ends in engagement with the rollers, $y$, in the usual manner.
The brake shoes are shown in their disengaged position at A in Fig. 6 , the ends of the slots in the shoes then being forced against the fixed pins $l^{1}$ and $l^{2}$ by the spring, $m$. When the lever, $k$, is rotated to apply the bralies (B, Fig. 6), it imparts an angular movement to the floating lever, $f$, and the shoes are therely forced apart until they engage the inside of the rotating drum. Both shoes are caltied round in an anti-clockwise direction, their rotation being resisted solely by the pin, Il. The motation of the brake drum thus drags round both shocs and increases the force with which they engage.
When the drum is rotating in a clockwise direction, as shown at C in Fig. li. the opernting lever, $k$, is moved as before and turns the Hoating lever $f$. The two shoes are, however, then Iragged round by the drum in a clock. wise direction, their rotation heing prevented by the fixed pin $l^{\prime 2}$, the pin $l^{\prime}$ being then out
obtained from both shocs as before. Friction washiers, $n$, carried on fixed pins prevent play of the brake shoes when they are disengaged.

Fig. 7 is the extermat contracting hand bralie, which usually operates on the same drum used by the internal hrake. The design of this type is very simple, and in its hest form is arranged as shown at A. The fenturc with this design lies with the controlling of both ends of the band: by so doing the braking power is ncarly as effective with either direction of wheel rotation. At B is shown a hrake band controlled at one end only. With this design the grip is very powerful in the anme direction as that takeil by the lever, applying the brake, hecause the brake drum is trying to wrap the band more tightly against itself. But if the action is reversed it will be seen that the direction of the hrake drum through its frictional contact with the band is doing all it can to nullify the power exerted by the lever, whereas in the design $A$, the resistances nre hetter balanced.

## Principle of Front Wheel Brakes

Fig. 8 shows a front wheel brake. The control rods nust be designed so that the brake may be applied irrespective of the posi tion of the whecls: this is carried out by means of a universal joint, D, positioned on the control rind so as to be over the dead centre of thi steering head.
With this class of hrake it is alsolutely imperative for the point of contact of the tire with the ground to coincide with the point touched by the imaginary lines, $\boldsymbol{E}, \boldsymbol{r}^{\prime}$. drawn down through the centre of the steering head and wheel. In the tigure A is a hall joint allowing univeral movement during spring dellection: 13 is a roll which is a sliding fit in $C$, the operating tube; $\mathrm{E}, \mathrm{F}$, lines meeting at the tire contact point with ginund. Firont wheel brakes are without exception of internal expanding design.



Brake: for motor vehicles. Fig. 5. Operating mechanism for Perrot-Bendix two-shoe gervo brake. Fig. 6, A, B, C. D. Mechanism shown in several positiong.
Fig. 7, A, B. External contracting band brakes. Fig. 8. Fiting of a front wneel brake. Fig. 8. Common type of motor cycle band brake. Fig 10 Principle Fig. 7, A, B. External contracting band brakes. Fig. 8. Fitting of a front wneel brake. Fig. 8. Common tyne of motor cycle band brake. Fig. 10. Principle
of a belt-rim brake. Fig. 11. Interconnected four brake system in which pedal and band lever both actuate a cross shaft connected to all four sets of shoas

An interconnected four brake spatem shown diagrammatically in Fig. 11. The brakes on all four wheels are connected to a cross shaft with twu ur three bearings. In the latter case one bearing is a slack fit, and comes into use only if the shaft or one of the other two bearings should fail. Some systems eniploy two cross shnfte, thus increasing the safety margin. To lessen the effort required of the driver in operating the brakes, various types of servo neechanism are employed. In the mechanical tvpe a clutch or brake is dragged round by the tranamission, and thus caused to apply the brakes. In another type the suction of the engine is utilised to create a vacuum in a brake oylinder. In some hrake systems the braking effort is transmitted by hydraulic pressure.

Fig. 9 shows the common type band brake employed on motor cycles, which operates on a drum, $a$, mounted on the hub of the back wheel. The brake band, $c$, is secured hy one end to the bottom, or chain stay, and the other end secured to a lever, $d$, this lever being usually controlled by a pedal, but may, if desired, be operated by the Bowden mechanism. This type is sometimes fitted to the front wheel, or to the gear-hox. In this position the internal expanding is also employed Fig. 10 shows the niethod employed with the belt rim pattern, and needs little description beyond stating that it is usually operated through a pedal. But when fitted to a front wheel it is operated through a lever on the handle-bars. A similar type is minde operating on the under side of rim as marked at $X$.

Unless brakes receive periodical attention, sooner or later they are bound to seize up, the causc of this in nearly every instance being the ingress of water which is liable to get in through lack of oil on the various moving paits. Always keep the binkic parts well lubricated, by frequent use of oil or grease. In conclusion, it should be noted that the proper functioning of brakes depends far more than is realized on the care of the operating rods or cables. Any stiffness of the joints or had adjustment, which would cause unequal braking where a compensating device is not litted, will all help towards causing brake troulile which may have serious consequences.

BRAMIEY'S SEEDLING. This is a very line cooking apple. The fruit is very large, Hat, with a vivid green skin, clianging to red on the sunny side, and the flesh is firm, crisp, acid and juicy. Some people eat this apple raw in order to cleanse the palate, but Bramloy's seedling is essentially the fruit for tart, pie, or dumpling. It is best as a standard on a rather heavy clay soil. The fruit is ready to pick firat of all in November, but with careful storage will keep till May or June. See Apple.
BRAN. The outer husk of the wheat grain, bran can be bought at little cost from any cornchandler. It is used as a feeding stuff for hoises and cattle, is onc of the staple foods for rabbits, and is mixed with the meal in the fowl's warin minsh.
It is often employed for packing, and is especially suitable for glass and china or other fragile material. A bag lightly packed with bran and warined in the oven for a few minutes retains its heat, and is a substitute for a hotwater hottle.
Bright-coloured materials. cretonne, chintz, ahantung. etc., will not fade if washed in a bran hath. To make one, about $\frac{1}{2}$ pint of hran is required for every 2 quarts of water. Sew the bran into a bag of fine muslin, leaving plenty of room for it to swell, and put it, with the water, into an enamel-lined or aluminium saucepan. Bring to the boil. and stew for about is hour. Then pour off the water, fill again with cold, and stew once more for a shorter time.

Is the bran softens the water, soup is un-
mnterial is put into the first bran water. It should not be rubbed, but squeezed lictween the lingers, and put, when clean, into the basin containing the second brew. Rinse it final!y in tepid water. No white ot delicately coloured material should be washed in this waly, as the water is tinted. The brancan afterwards be used instead of tea-leaves for keeping down the dust when the carpet is being swept. See Packing ; Poultry ; Rablit.
BRANDY. This spirit is best drank with plain water rather than with sorla or any sparkling mineral. Hot brandy and water is an excellent "night cap" The linest liqueur brandies are drunk neat at the end of dinner after black coffee, being served in a large glass, convex towards the lip, and not filled to the top. Fifty years old is a sufficient age for a good liqueur brandy.
Medicinally brandy is uned as a restorative in cases of temporary faintness, and a further use for it is found in the later stages of acute febrile disenses when the patient's ןowers are waning, e.g. in jneumonia, enteric fever, influenza, ctc. Then a tablespoonful may be given every hour or two, in milk, and as much as A pint or more may be taken in the 24 hours. As a quick stimulant in an emergency, a teaspoonful of brandly in one or two tablespoonfula of champagne is very elfective. See Alcohol; Cherry Brandy, etc.
BRANDY BUTTERR. This thick sance miny be served with plum pudding. Beat up 4 oz butter to a cream, then add castor sugar until it is stiff and rocky, a few drops of vanilln, and a little tiqueur brandy. Pile up in a glass dish. It is best made a few hours before it is wanted, and left in $n$ very cool place until served.
BRANDY SAUCE. To make a sauce, which is often served with pudding, melt 3 oz . of loaf sugar in alrout $\frac{1}{2}$ pint of water, and hoil until symupy. Add to this about a dessertspoonful of cornflour mixed into a creamy paste with "ater, and atir until it boils. Add about half a wineglassful of brandy before serving.
BRANDY SNAP. To make these biscuits take 6 oz each of Hour, butter, sugar and cane syrup, to which should be added $\ddagger$ oz. ginger and a few drops lemon juice. Melt the butter, syrup and augar together in a pan, and then stir in the sifted flour, the ginger, and the emon. Pour the mixture into small romnds on a greased baking-tin and bake about 10 min . in a moderate oven. Roll them up when just cool enough to handle.
BRAN TUB. A tub full of bran, in which are concealed a selection of amall toys, brightlycoloured bags of sweets, oranges, apples, or any other gifts is an old-fashioned but still popular amusement at children's partics and nt garden fêtes. If the tul) is a deep one, a thick layer of bran is put at the hottom before any toys are introduced, so as to bring them within the reach of small arms. The tub is then filled with alternate layers of bran and toys, bran being on top when it is full. The childien plunge a hand into the tubl and pull out the gift they touch first. See Children's Party.
BRASS. One of the most useful of metals, brass is olstainable in rods, sheet, or tube. It is easily turned, filed, or soldered, takes a high polish, and can be coloured without difficulty.

Brass wire is sold in coils, from very fine to quite stout rods. Round stuff can be bought in drawn rods, with a clean and bright aurface. Cast rods are rough and of little use to the amateur. Strip brass is the most convenient form in which to buy flat material up to $\because$ or 3 in. in width and 1 in. in thickness, lown to ${ }_{1}^{1} 6 \mathrm{in}$. wide by $3^{\frac{1}{2}} \mathrm{in}$. or less in thickness. Tubes are solid drawn and sold according to their outside diameter, and are stronger than the hrazed tube commonly employed for gas-fittings. Brass-cased tube is nade of iron covered on
the outside with a thin layer of brass, and generally used in cheap liedstends and for curtain rods and poles Circular brass blanks from 1 in. to 4 in . diameter and $\frac{1}{8}$ to $\frac{1}{4} \mathrm{in}$. thiok, as well as screwed brass rod, and brass gears of all kinds, aro valuable aids to the home-worker

Brass castings are extensively employed. Soft sheet brass, which can lse readily hammeren, is used for repoussé work, and can be cut with n fret-saw. Many stock patterns of pierced brass are ohtainable. As lirass does not rist, it should be employed for screws and hinges in damp places. Fur electrical work it is extensively used being a good conductor

How to Lacquer Brass. The cleaning of brasy is an everyday task in nost homes, much of which could be asoided by lacquering, especially with such artic!es ns door handles, fenders, and the like. The brass is first thoroughly cleaned and a mixture of paraffin and whiting is applied as a paste. Very dirty brass can he cleaned with a dilute mirture of nitric acid and water or sulphuric acid and water.

IVhen mixing the sulphuric acid it must alwaye be poured slowly into the uater: the ualer must never be poured on to the ncid or an accident may result.
Boiling in strong soda-wator also cleans ordinary brass-work. The work to be lacquered must he polished brightly, frosted or otherwise finished; it is then dipped into a hot bath of dilute soda water, rinsed in cold water and dried off in hot dry sawdust. This is to remove all grease. The work should not be touched with bare hands, but a piece of clean tisaue paper aloould be used.

The next step is to beat the work evenly but slightly, and a film of moisture will form on the brass. Directly this disnppears the lacquer is applied with a clean camel-hair brush in one even cont. The work must not be touched twice with the brush or it will be spuiled. The article is then turned about over the heat from a gas burner until it is dry, and set aside to harden off. Lacquer is ohtainable in crystal or colourless; pale gold, which imparts a slight colour; or deep gold, as usually applied to domestic articles If the crystal lacquer is used it will be absolutely invisible to the eye. Under normal conditions laçuer stands for a yenr or no:c without any other attention than that of an occasional dusting. See Ash Tray; Brazing.

BRASS COLLECTING. Examiples of old brass work, which arc within ordinary reach, belong to the last three centuries. They include caldrons and skillets, snuffers and candlesticks, mortars and door-stojes, trivets and chestnut ronsters, tinder-boxes and ember tongs, andirons and fire brasses, ladles and funiture handles, warming-pans and foot warmers, lantern clocks, trinket boxes, and table hells. Such ohjects enhance, when used with decorative discretion, $t$ he effect of lounges and halls furnished in oak or mahogany, with leather upholatery or deep-linted tapestries, and self-coloured wails.

Much continental hammered brassware. collectively called dinanderic, has for centuries been made round about Dinant in Belgium. It includes coffers, platters, and Dutch tobacco-boxes with liblical scenes based on old wood-cuts. The modern work is often poor in material and exccution, but good examples are to be had.

Oriental brass is best associated with eastern carpets and related colour schemes. The domestic brassware of the Hindu kitchen. whose unurnamented surfaces are burnished daily, generally preaent delightful forms; such are water-bottles or lotns, both large and small, wide-mouthed milk howls and sliallow ricedishes. Images of Buddha or of Indian deitics, if not placed in trivial surroundings, may be
displayed with one or two pieces of solid hammered IBenares ware.
A good deal of modern English hrass, including some which is spun or stamped by inachinery, is in good decorative taste. The production of replicas is a thriving industry, and if they are of honest fabric and sold at their face value only they have ornamental uses. Spurious old brass is hander to detect than any other class of counterfeits.

Medieval hrass is hardly possible to acquire except in the anction-room. It comprises pattens and alms-dishes, pilgrim signs and curfew hoods, astrolabes and sanctuary rings. Of a later age perforated homseamuleta, of which there are more than 1,000 designs, including rayed auns, horned bull's heads, and crescents. are charming in form and decoration. A full ret of thesc harness-trappings consists of a face-brass, $t$ two ear-pieces. six shoulder ornaments, and six or ten metals for the martingale over the chest.
Stuart and Georgian pipe-stoppers, fohseals, and other objects with engraved bases may still le met with in out of the way places. They irequently sinulate or caricature the leatures of famous men of the day. There are also miniature reproductions in brass of period furniture, such as Chippendalc tables, grandfather chairs, and the like. Some collectors specialise in old door-knockers, whose designs may be arranged to illustrate the development of taste. Gorgon-heads and other grotesque forms, derived from ancient sanctuary rings, are favourito designs for miniature linockers

Delightful figures-they are hardly statu-ettes-were produced in the 18th century


Brass Collecting. 1. Horse amulets. 2 and 3. Figures made by brassworkers' apprentices on completing their apprenticeships. A. Alms-digh, with desizn of Adam, Eve and Serpent ; early 18th cent. 5. Cande sanflers, 18th cent.
for the finials of door-stops and fire-dogs. They were often in pairs, such as peacock and pheasant, loy with dog, and girl with rabbit: hesides groups and variouq national and allegorical figures.
Brass should be kept dry by regular leathering. Unpleasing stains may le removed with chalk moistened by apirita of turpentine ; deep-scated tamish will yield to weak oxalic acid applied by a ring. followed by washing, and drying with whiting. Liquid polish serves for large surfaces, such as ivarning-pans. but if used for perforated or hanmered surfaces deposits innst not be left in the crevices See Benares Ware.

BRASS-BACK SAW. Small brars-back hand sawe are used for cutting thin, soft sheet metals and tubes, such as lorass, copper, or pewter. They are inexpensive, and are useful in the home workshop, being preferable to a hacksaw for cutting brass tulings. See Saw'

BRAWN : How to Prepare. 'luke lialf a fresh or salted pig's head, 1 carrot, 1 amall turnip, 12 peppercorns, 4 cloves, 1 blade of mace, 1 sprig cach of thyme, parsley and marjoram, and some salt and pepper. The pig's head should be well washed in tepid water, rinsed, and put into a saucepan with sufficient cold water to cover it. Bring slowly to the hoil and akin carefully; then add the vegetables, which should be cut into small pieces, the herbs and scasming. Simmer the whole slowly until the flosh leaves the lomes easily; then strain the liquid into a basin and put the head on a dish.

The meat has now to be cut from the head into sinall pieces and the tongue into thin slices, removing any skin or gristlc. Return the liquid, skimmed of all fat, to the sancepan with the hones from the head. Boil quickly till reduced to half the quantity, then strain over the meat. Scason igain if necessary with pepper and salt. When slightly cooled pour into wetted moulds and set aside to get cold and firm. Turn out to serve and garnish with parsley. The time requircd for hiniling the head depends upon its size, one weighing 6 ll . taking from two to three hours.

The inside of the moulds may first be decorated with some hard-boiled egg cut into thin dice or small fancy slinpes.

To make spiced brawn, use $1 \frac{1}{2}$ Ih. of lean beefsteak and a small pig's heat which has been in pickle for a week. Placo the meat and the head in $\Omega$ saucepan and cover with cold water. Bring to the looil quickly, skim well and simmer for 3$\}$ or 4 hours. Then strain off the liquor, reinove the bones, and clop the meat finely. Season the brawn with cayenne pepper, salt and a little allspice. Make the meat inoist with a little of the liquor carefully frced from fat, and prese it into a plain round mould with a heavy weight. It can be turned out next day.

For veal brawn take a knuckle or any bony piece of veal and wipe
with a clean cloth, removing any fragments of bone. Put the meat into an enamelled sancepan, cover with cold water, and bring it to boiling point. Skim the liquid well, add an onion stuck with cloves, and a teaspoonful each of salt and pepper. Sinmer very gently till the meat comes off the bones and the gristle is nearly melted. Having taken out and boned the meat, chop it into small pieces, add tivo or three hard-boiled eggs cut into alices, and season the dish lightly with salt, lemon juice, and chopped parsley. Arrange all in a mould. Pour a little atrained stock over it and set it aside to cool.
Calf's head brawn is useful, and if a little care is taken in arranging the pieces of egg in the top of the mould, it can also be made ornamental.

Take about l. It. of hoiled calf's head (q.v.) and 1 lb . of hoiled ham or bacon, and cut both into neat dice. Shell and cut three hard. boiled eggs first into thick slices, and then cut the latter into quarters. Arrange pieces of the egg in any pretty deaign at the bottom of a plain mould or basin, and then lill up lerosely with layers of the head, ham, and any egg that remains. Between each' layer sprinkle in a little seasoning, made hy mixing 1 teaspoonful of grated lemon rind with 2 teaspoonfuls of chopped parsley and salt and рерре:

Heat pint of the liquor in which the head was boiled. This should be a stiff jelly, but if it is not, recluce by boiling without the lid 10 ahnut two-thirds of the original amount. Dissolve in this stook 3 shects of gelatine, but do not let the liquid boil. Then atrain into the mould till the latter is full, and puta plate on the top of the mould with a weight on it. Leave until cold and set. Wipe off any fat that inay be on the top, dip the mould into hot water to loosen the jelly from it and turn the sliape out on to a dish, garmish. ing with lufts of washed cress or lettuce.

## Fish and Vegetable Brawns

For fish hrawn the ingredients are some white fish and the bones of a rabbit or chicken or some veal bones. It needs also a little onion, pepiser and aalt, some chopped paraley and hard hoiled eggs. Cover the looncs weil with water and stew them well and slowly. adding the pepper, salt, and onion liefore straining. Decorate $n$ mould with a little chopped parsley. Fill half full with altomate layers of llakes of cold fish and hard boiled cggs in slices. Then atrain in thic atock gently till the mould is full. When cold turn it out. It should be seried lecorated with parsley.

Egg and vegetable hrawn can be made as follows: lboil 2 eggs hard and alice them. Make sonc clear stock with a few bones, strain it through muslin, and to each pint of stock add $\frac{1}{2}$ oz. gelatine. Arrange in a wetted mould the slices of egg, some slices of tomato and cold potatocs, and reason with pepper and salt. After putting in one laver of these add a little of the stock in which the gelatine has been dissolved. When set add another Inyer of eggs, etc., and continue the process until the mould is full
To make rabhit brawn, thoroughly clean a rabhit, cut it into joints, and let it simmer gently for 2 hours. Then take the ineat from the bones, and cut it into small pieces. Arrango these in a plain, round mould with 2 hard-boiled eggs and $\frac{1}{1}$ lb. cooked ham, cut sanall. Add to 1 pint stock $\frac{1}{2}$ oz. gelatine, and dissolve it very thoroughly. Pour this over the rabbit and turn it out when cold.
BRAZIL NUT. Imported into Great Britain from South America, the Brazil nut is a favourite for dessert. The kernel yields an oil used by artists and watchmakers.

Brazil nut cutleta are made from 4 oz . bieadcrumbs, the white of one egg, 3 oz.
skinned 13razil nuts, \& pint white sauce, 2 teaspoonfuls mixed herbs, and a pinch of powdered mace Put the breaderumbs and nuts through a mincer, add the herbs, and mix all with the white sauce. Beat up the white of the egg to a stiff froth and add it lightly to the mixture. Shape the whole into cutlets and fry in hot fat : then drain and dish on a doily, garnishing with parsley before serving.

BRARING. Brazing is a method of uniting metal parts by means of a film of brass in the form of alloy, known as spelter. Metals that are usually brazed together are steel, wrought iron, brass, and copper. Cast iron is not usually brazed, as better results are obtained by autogenous welding.

The various stages in brazing are as follows. Thoroughly clean the parts to be brazed, apply a suitable flux to the joint, then assemble thic parts, and secure them so that they cannot move relatively during the brazing operation. Next apply the spelter to the joint. Heat the work thoroughly until the spelter runs or melts and unites with the metal parts. Finally clean the job, and remove any scale or surplus spelter.
The tools and materials required are a powerful brazing blow-lamp, or preferably a gas blow pipe supplied with air from a foot bellows, a stout iron pan on legs, and filled with coke or lumps of asbestos, some spelter, borax in powder form, and a few rough pliers or tongs for holding the work while brazing. Sotne soft iron wire and a packet of brazing pins aro needed to secure the parts, unless they are screwed or driven tightly together so that they cannot move while being operated upon.

A simple example is to braze a steel tuke into a steel socket. Clean the joint thoroughly by polishing with emery cloth, or by filing or grinding, and paint it with a solution of powdered borax. Now force the tube into the socket : there is no fear of its being too tight, as the brass will run into the joint although there is apparently no room for it The danger is in having a slack joint. A lirazing peg has next to be inserted. For this purpose drill a hole through the socket and tube, insert the small end of the peg, and drive it in hard with a light hammer.

## Use of the Blow Pipe

Now place the work on the brazing pan and pack asbestos cubes around the back and sides. leaving space for the burner flame. The idea is to retain as much heat around the joint as possible. Light up the blow lamp or gas blow pipe, adjust the flame to burn clean, that is, without yellow streaks or any trace of smoke. Move the lamp about so that the Hame warms up the asbestos and the metal generally. Watch the borax or Hux around the joint, and directly this begins to bubble and turn white, apply the spelter to the joint. Sjelter is obtainable in granular form, like brass filings, and can be mixed with an equal proportion of powlered borax. In this state it is applied to the joint with a metal rod. Heat the end of this rod, dip it in the spelter, and sufficient will adhere. Apply this to joint and as much more as is needed.

If spelter is bought in the form of brass wire it is roughly square in section and sold in rolls. Cut off a few feet and coil up one end. then heat the other and dip it in the powdered borax, a globule of which will adhere. Then heat the work stesdily and thoroughly, at the same time melting off a piece of the spelter wire, or brazing wire, as it is usually called. Push this with the end of the rod into its place, or as near as possible; continue to lieat the work, apply a little more flux from time to time to prevent the surfaces oxidising, and watch for the spelter to melt. When it begins to melt, watch where it runs. It should
disappear into the joint Spelter will follow the heat and the flux, and will not adhere to the metal except where the flux has been applied Brecarcful not to inhale the fumes given off during the brazing process.

To be sure of the job being a sound one, it will have to be turned over. When one side is brazed, kcep the flame on the work so as not to lose the heat, and turn the work over with the tongs. When satisfied with the job, turn off the blow lamp flame, and allow the work to cool off before touching it. When it is black hot, take it from the pan, holding it with tongs, and with a wire brush remove all surplus Hux and scale: being in a plastic state it should brush off easily. When quite cool, the scale has to be cleaned off, by pickling in a weak solution of sulphuric acid and water. The pickle should be made in an earthenware or glass jar and preservod for future use. Leave the work in tho pickle for an hour or so, then wash it in hot water. and filc and polish until the metal is clean and bright. If feasible, run some oil or paint into the interior of the pipe to prevent it from rusting.

The secret of success in brazing is clean work at the start, sufficient heat applied in the right place, and to see the spelter run nicely and freely. On soine work the spelter and borax mixture can be applied direct to the work and then heated, but generally on all steel or iron parts the brazing wire is the best.

13 rass and copper are brazed in the manner already described, but call for more care and skill on the part of the operator. The brass has to be heated to a dull red heat before the spelter will run, and at that heat the brass itself is on the verge of melting. It is best
to use a soft spelter strip or specialiy prepared white spelter, as this melts at a lower tempers. ture than ordinary brazine wire. The same care is needed at all stages of the work. Much small brasswork is, however. joined by a process known as hard soldering or silver soldering. See Brass; Soldering.

BREACR OF PROMISE. An action for breach of promise of marriage can be brought by $n$ man who has been jilted, but almost invariably the plaintiff is a woman. The lady must prove that the defendant promised to marry her. The promise need not be in writing or words lut may be presumed from conduct. The plaintifi's word and oath alone ane not sufficient to establish a case. She must be corroborated; and this corroboration generally takes the form of love-letters ; an engage-ment-ring; evidence that the lady was introduced by defendant to some other person as his fiancée.

It must be proved that defendant had broken his promise. This he may do by breaking it off formally; or by getting engaged to or marrying someone else; or by neglecting to marry the lady within a reasonable time. Fur a promise to marry means to marry within a reasonable time.

The damages reooverable are practically whatever the jury like to award. They generally give the plaintiff anything she is out of pocket for trousseau and the like; something for injured feelings ; and something for what may be called the value of the match. A promise by a minor (under 21) to marry is void; but if he inakes a fresh promise after he is 21 he may be sued if he breaks it. See Engagement : Marriage.

## BREAD AND BREAD MAKING

## Essential Facts for Every Honsewife

This entry is followed by several dealing with various uses of bread, and by other relevant headings, including Bread Basket; Bread Curter, etc. See also Baking; Diet

Tho necessary ingredients for household bread are flour, yeast, sugar, salt, and warm water. For small loaves, rolls, etc., baking powder may take the place of yeast, and butter, milk and eggs may be added. As a rule, 支 oz. yeast, a teaspoonful each of sugar and salt, and rather more than a pint of water are used to 1 lb . flour. The same proportions are employed for brown bread, but wholemeal flour is substituted for ordinary white flour.

The method of preparing household bread is as follows. Mix yeast and sugar well together, add a tablespoonful of tepid water (tepid being $\$$ boiling water and of cold), cover basin with a clean cloth and stand in a warm place until yeast is well risen and frothy. Meanwhile, measure flour into a basin and warm it, either in front of the fire or on the rack above the range. When yeast has frothed, pour it into a well, made in centre of tlour with a warm wonden spoon, and sprinkle a little of the Hour over it and a teaspoonful of salt round edges of Hour. Cover basin with a cloth, put in a warm place and leave until yeast has cracked well through flour. Stir in gradually the tepid water, preferably with a warm palette-knife, and the mixture is a warm palette-kni

Kneading presses the yeast cells between the grains of Hour, and by it the dough is rendered smooth and clastic. A warmed board, lightly sprinkled with Hour, must be used. Turn dough on to this and knead (i.e. rub firmly together and pound) with bith hands. The success of the loaf depends largely upon the kneading, and a light, firm touch with dry, warm hands is essential. When the dough has become smooth and elastic turn it again into a warm basin. cover, and set to rise in a warm place until it has at lcast doubled its size. This takes about 2 hours.

Then turn once more on to board and knead quickly and lightly before forming into loa ves. Thesc may either be stond upon a large, floured baking tin or small floured bread tins may be used. This done, let the dough stand (or prove) in a warm place for 20 min . It should always be remembered that uniform warmth is the secret of yeast bread. If raised in too cool a place a very close consistency will result : if too hot, a solid cake of Hour will tollow, or loaves with large holes in them.

During the time of final proving the oven must be niade very hot. All yeast bread must be baked in a very hot oven at first, to kill the yeast. After the bread has risen still further. and browned, the heat may be gradually reduced. Allow about 1 hour for baking a halfquartern loaf and $t$ to $\frac{1}{\frac{1}{2}}$ hour longer for a quartern loaf. When the loaves sound hollow on being tapped briskly underneath, they are done. They should bo cooled on wire trays and turned upside down.

## How to Make French Bread

French bread is made with Vienna Hour. Nilk is added to the yeast and sugar instead of water: tepid milk and sometimes a little beaten egg is employed to mix the dough. Kneading, rising, proving, etc., must take place as previously explained, and after forming into plaits, rolls, etc., the dough must be brushed with beaten egg and allowed to rise again for ten minutes. A very hot oven is again needol. Small fancy twists and rolls usually take about 15 min . to bake.
Any good pastry flour can be used for fancy bread. Currants, sultanas, or a pinch of mixeil spice or cinnainon mny be added if desired.

Three rolls of a richer variety are illustrated in Fig. 5, two of which are dealt with in the text. To prepare, sieve together in


Bread and Roll Making. 1. Kneadinf the dourh. 2. Pricking dough in baking tio. 3. Glazing rolls. 4 . Placing top on cottare loaf. 5. Milk ralls in lancy shapes

f, is $s$ and $s_{1}$ courlemp of Comulty Live. J.inf.

a warmed hasin $\frac{1}{2} \mathrm{lb}$. flour and $\frac{1}{2}$ teasjoonful small loaves should he brushed with beaten salt, ruhbing into them 1 oz. butter. In ogg. Ten minutes in a hot oven is sufficient nnother warmed basin mix a little less than for small baking-powder dinner rolls or loaves. $\frac{1}{1}$ oz. yeast, with $\frac{3}{3}$ tensponnful castor sugar ; To muke these rolls, sift with $\frac{1}{2}$ |h. fine llom then warm up $\ddagger$ pint or less of milk, adding to it a small, well-benten egg. Pour the latter mixture into the yeast and sugar, mix all well, and then add the whole to the flour and salt. Beat up all these ingredients, and put the covered dough in a warm place to rise for about one hour. When it has risen, divide it into four portions, and from one of thesc make a plait roll. Divide the piece into three equal parts, rolling each until it is about 5 or 6 in long.

Pinch these strips together at one end before plaiting them, and finish the botton in a aimilar manner.

The horseshoc roll is made by forming a portion of dough into a triangle and, taking the longest side, rolling it over to the point. Twist the roll to form a horseshoe, and cut it across the top in several places with a knife. The roll with a plaited effect on top is made by dividing a piece of dough into two unequal portions, and placing the smaller part, plaited in the way already described, on top of the larger piece, shaped to form an oblong. Let the rolls rise in a warm place for $20-25 \mathrm{~min}$. then brush them over with milk, and bake then for about quarter of an hour.

Method of Makins Aerated Bread
Aerated bread is so called because the bread is raised by means of the carbonic acid gas given off from baking-powder when moistened. It is made as follows: Take 1 oz . baking-powier and 3 oz. salt to every 2 lb . flour, incorporating the salt and baking-powder well into the flour hefore maistening. Pour about a pint of water into the centre of the flour and make it quickly into a dough. Divide it into loaves and brush over with milk. Put the loaves into the oven immediately. No time must be lost between the moistening of the flour and getting the loaves into the oven, otherwise part of the aeration will be lost. Bake in a quick oven for about half an hour.

Bread raised with baking-powder is made by simply rubbing fat into the flour and adding salt. haking powder and sugar. The dough is mixed with water or milk (the latter preYerably sour) and when formed into rolls or
$?$ teaspoonful baking-powder, and $\ddagger$ teaspoonful salt into a hasin. Rub in 1 oz butter and mix all into a stiff dough with I gill sour milk or water. Divide it into 6 equal portions and make these up into round rolls. Bake them about 10 min . and serve them hot. These rolls can be made suitable for tea if the butter is increased to 2 oz and a like quantity of castor sugar ndded : also, if an egg is beaten up and odded to the liquid whon mixing up the flour.

## Value of Wholemeal Bread

Wholemenl bread, which includes all the bran, may pmove indigestible for some people, or may even produce irritation of the digeative tract. But those who ain digest it neceive additional nourishment, ineluding a much larger portion of organic phosphates, which are indispensable to the chemistry of the body. Also, in wholemeal bread we retain the vitainins which are so necessary to growlh.
Without a doubt, wholemeal bread is the linead which should the supplied to children. Anong the well-to-lo the deficiency in vitamins and organic phosphates may te made good by other articles in the dict, such as butter, eggs, and fresh vegetables; hut children who are brought up on skim milk. margarine, and white bread are starved of things necessary to their proper growth, and rickets and ill-detined forms of disablement may result.

With regard to the irritating effects of wholemeal bread on the intestinal tract, this may be in many cases the stimulus required to produce a proper innvement of the bowela and prevent or cure constipation. New bread is npt to be indigestible; it is better to use it a day old. The proper toasting of bread makea its digestion easier; but this does not apply to hot buttered tonst, on which the butter has been made less digestible by heat. If buttu is used, it should be put on when the toast has cooled.

In diabetes it is necessary to limit the amount of starch in the patient's diet, and starchless bread is sold for this purpose. It is made from gluten, the sticky substance in dough, brnn, casein, the pinteid in mill. curd.
nuts, and almonds. Some samples are quite frec of atarch, but others contain more or leos of it. Such bread should he bought of as reliable maker to ensure ita being what it is represented to be.
BREAD AND BUTTER PUDDING. ' 'o prepare this, butter a piedish and aprinkle currants or sultanas or spread a little jam or marmalade on sufficient slices of bread and butter to half-fill the pie-dish. Heat 2 eggs to a froth and mix them with a pint of mille and is tablespoonful of white sugar. Pour in this custard and let the bread soak in it for half an hour, or until it is soft. Stand the pie-dish in a deep baking-tin with water round the diah, and bake the pudding slowly till set and browned lightly. The water round the dish together with the slow baking provent the custard froin curdling.

BREAD BASKET. The craftworker call make the raffia bread basket shown in Fig. I with one hundle assorted colours and of natural raflia. It measures 8 in . aeross whon linished and is horcered with blue, orange white, hrown and black raffia.
Thead a raffia needle with a strand of nitural raffia and take six morethreads level nt one end. Bind these together with the tirst, taking eight or nine wraps over from front to back. Now coil into a small ring,个 in. in diametor, to begin spiral for base. going in a left-hand direction. Take a few "raps with needle-strand mund the ring and coil and then make a knot-atiteh, by bringing the needle through from the back betwcen the coil and the ring on the left of the last stitch. Then take it across front of this stitch and pass needle through on the right of this stitch. bring it round to left again, between ring and coil. This part of the process is finished by taking needle round coil.
liake a long stitch, by taking needle thongh centre of ring from the back, then over cuil, as before, and make another linutstitch. Continue the operation in this way until the one row is completed, then thicken foundation coil by adding a few more striunds to make it $\frac{1}{3} \mathrm{in}$. thick.

When the base is 6 in. across, gradually raise the coil to form the fingt row of the side of the basket, and make each succecding row a trifle vider, until the sixth row gives a diameter of 8 in to the bread basket. Carefully watch the shaping and see that the millos me woll balancerl

The horder is now begun with "original weave " instead of knot-stitch. For this take the raffia round the coil and insert the needle under one of the stitches in the previous row, Hus securing the loose coil to the baslict. Point needle in slanting direction to left when inserting, and then procced to make every atitch in patterned border in this manner.


Bread Rasket. Fig. 1. Basket waven in raffa in several bripht colours


The design is shown called raspings, as some bakers sell them when in Fig. ‥ It is built they have rasped over the surface of the loaves. up by use of the Put any crists left from making white crumbs, colours, row by row or any small stale pieces of bread, on a tin in a as shown in the chart, monderately hot oven and bake until they Fig. 3. Taper off the finishing end to $n$ point and bind the last inch of coil to previous coil.

If the diameter has worked out at more

$2 \mathrm{~B} \quad 0 \mathrm{~W}$ Br Blk

Fig. 3
Bread Basket. Fig. 2 (above). Design of the rafla
wenving. Fig. 3. Chart showing colour schemes
than 8 in . or less, the design must he adapted to fit before introducing colours. A cardboard circle 8 in . across fitted now and again to the inside, as the basket is worked, helps to lieep the sides to shape.

The aunateur can also nuake the wooden bread basket or bost in Fig. 4, which exhibits Norwegian influence. It is made by cutting the botton, Fig. 5, from $\frac{1}{2}$ in. wood, such as mahogany or oak. and the edges are bevelled as indicated. The two sides, Fig. 6, are cut from similar material not more than $\frac{3}{3}$ in. thick, bent to shape, glued and pinned to the hase, the ends being held tngether temporarily by strings wound round them.

The two handles are sawn to shape from a piece of material 6 in. long, $1 \frac{1}{2} \mathrm{in}$. wide, and 1 in . thick, as in Fig. 8. The V-gmove, Fig. 7, is cut out with $\Omega$ chisel to fit closely on the ends of the side pieces, A, B. The horns are carved, and when completed the handles are glued and pinned in place. A cover piece, $C$, Fig. 7, is cut to shape and glued in position in the apex of the triangular joint at the ends. The construction is clearly indicated in the section, Fig. 9. The work is completed by sand-papering and polishing, or by stencilling in liquid washable colours.

BREADCRUMBS: In Cookery. Finer if rubbed through a wire sieve with Whe hand than if grated, fresh white crumbs are used for puddinges bread sauce, and often for crumbing fried foods, although dried crumbs will ho found best for this purpose.

To prepare the latter put any fresh white crumhs that cannot be used in a baking-tin in a slow oven to dry, but not colour. Turn them over now and then, and when quite dry and crisp re-sieve them, and when cold store in a dry tin with well-fitting lid. These will keep for ycars, as long as they are dry, and are used chiefly for coating foods brushed with beaten egg previous to frying.

Dried browned crumbs are often


Bread Basket. Figs. 4 9. Basket or tray made in wood, in the lorm of a boat, with explanatory diagrams a cut thick or thin as requircd. and past the cutter. These inachines seldom give trouble, and only require keeping perfectly clean and occasional sliarpening.

BREAD FRITTERS. Use either ordinary household bread or French dinner rolls, cut into rounds. Cut $\mathbf{6}$ or 8 neatly shaped pieces of hread or molls $\frac{1}{4} \mathrm{in}$. thick. Heat $\frac{1}{2}$ pint of milk with the thinly pared rind of half a lemon till it is well llavoured. Dissolve in this a tea spoonful of white sugar: take out the lemon

rind, and pour into the milk a well-beaten egg. Pour this mixture on to the bread, and have ready a frying pan containing 2 oz . of butter.

Directly the bread is soft, fry the pieces a golden brown on each side in the hot hutter. Lift out of the pan, drain well, sprinkle with castor sugar and serve quickly with jam sauce (q.v.)

BREAD PAN. An old-fashioned but re liable bread pan is made of earthenware, with an earthenware cover Such pans have the advantage of maintaining a more equable temperature than enamelled iron bread pans. Scrupulous cloanlincss is essential together with periodical removal of breadcrumbs, and the placing of the vessel in a cool, dry place

BREAD POULTICE. Cut uj bread, stale if possible, into small pieces and put into a bowl which has been scalded. Pour boiling water over, cover bowl with a plate and put by the fire for a minute or two it is then beaten up with a fork, excess of water being re moved by wringing the mass rapidly in a towel, and tios poultice is applied between layers of muslin If a piece of jaconet or oiled silk is applied 8 a as to overlap tho Bead Cuter wirb loar whit is placed on the back of the plate or is pushed wil! be retained longer. See Poultice

BREAD PUDDING. To prepare this, soak $\left.\frac{1}{2} \right\rvert\, \mathrm{b}$. stale bread in cold water until soft. Drain and press out water, put in a hasin and mix with 3 oz . butter, niarg., or chopped suet. Add 3 oz . Hour, 3 oz . sugar, $\ddagger \mathrm{lb}$. currants or sultanas and a little chopped peel. Beat an egg, mix with a gill of milk, and stir these in with about $\frac{1}{\$}$ teaspoonful mixed ground spice or nutmeg. This pudding can be either steamed for it hours in a greased hasin covered with buttered paper, and served hot, or baked in a greased pie-dish for about I hour in a moderate oven, and served either hot or cold.
BREAD SAUCE. To make bread sauce, which is served with chicken, etc., boil about $\frac{1}{2}$ pint of milk with a small onion in which a fow cloves have been stuck for flavouring. Add 2 oz. of soft breadcrumbs and cook gently for 15 min . It should be seasoned, a very little powdered nutmeg added if liked, then a piece of butter, and, if desired, a little cream.

BREAKAGE. It is illegal for a mistress to deduct anything from a servant's wages to pay for any crockery that the girl breaks when washing or dusting, unless she has expressly agreed with the girl that she will do so. If a maid breaks anything on purpose, or by gross negligence, the mistress could, no doubt, sue her in the county court for the damage done or dismiss her summarily; but beyond that she cannot go. The law regards accidental breakages as one of th ose incidents of domestic service that may happen without anyone being specially to blam3. See Servant.

BREAKFAST : How to Serve. The British habit of eating a good breakfast encourages the housewife to make the meal as attractive and varied as possible. Many people, men especially, are most conventional in the matter of bacon and eggs; though fried tomatoes, potatocs, parsnips, bananas and mushrooms can all be served in turn with the bacon for a change.

It is convenient to provide a hot dish and a cold one, where there are several in a family.

Fior instance, with hot fish, cold bacon or a decorations of the room, breaklast china and galantine may the on the sideboard: with table linen may introduce more colour and eggs, soused herrings, brawn or sardines. As a loot dish, uncurled whitings cooked in a fireproof dish with butter and parsley are often liked for a change, or dabs fried whole with a grilled tomato placed on top. Dricd haddock is apt to be woolly unless a thick one is chosen, and well basted with milk and a
be mone informal than those in use at other menls. Thus cottage china may be seen with check cloths, or orange ponttery with unbleached linen appliqué with fruit and flowers. As a general rule the patterned service looks best with plain coloured linen edged perhaps with border to tone.


Brealfast.
A wholesome breakfast of fruit, brown bread and butter and coffee, the a
lumpl of butter lsefore serving; kippers are good cooked in a tin in boiling dripping and then toasted for a minute or tipo to crisp them. These dishes, when servell, may be on a henter on the sideboard, or sent to table in attractive oven-ware.
Eggs can be cooked in many ways, but a simple plan is to put some butter into a Hat fireproof dish and, when melted, break the eggs into the dish and replace in the oven for a fow minutes till set, sprinkling with a littio chopped parsley to serve.

## Value ol Cereal Foods

Porridge is a valuable adjunct to the family breakfart. Many children take a dialike to this, and the reasons are usually hecause it is not stirred enough, and is therefore lumpy; because it is not cooked enough, or hecause the salt. which Havours the ontmeal, is forgotten. A change froin porridge is a saucerful of one of the ready-cooked cereal foods which, served with hot or cold milk with stewed fruit or a little crenm, is most nourishing. Fruit should always find a place on the breakiast table. Some people eat only toast and butter with grape-fruit or an orange, while the habit of linishing up breakfast with an apple is an excellent one for children.

Stands must be placed under hot tea or coffee pots if there is no tray or if this is of wood. For coffec a good mixture is equal quantities of Mocha and Plantation, with a very sniall anount of French chicory. if impossible to roast and grind the beans at home, only a small quantity of colfee should be bought at one time. A change for children is a big jug of cocoa made with milk. Should there he any sour milk left over from the day before, it does not take long to make n few soda scones, or ordinary rolls may be popped into the oven for a few moments

A well-laid table is a great appetiser. A cheerful scheme is fruit in some quaint pottery bowl, or one of polished wood, on a coloured damask tablecloth, with jam, etc., in attractive dishes. While preserving harmony with the

What is known as a breakfast service in a shop is a somewhat incomplete affair, unless several silver or other ware articles are to supplement it. It is sold for 6 or 12 persons, and usually only consists of that number of cups, saucers, and plates, a milk jug, a sugar basin, and a teapot. Brenkfast dishes, toast rack, egg cups, larger jplates, coffee pot, hot milk jug, cream jug, slop basin, jam and butter dishes are not included.

For those who prefer everything to match, or who do not wish to have silver articles used daily on account of the cleaning that Hey involve, there are a good many stock patterns. in which it is prasible to buy each piece as required, including the extra articles named, together with poriidge or stewed fruit jlates, and grape-fruit holders. A stock pattern has the further advantage that any lorenkage can he replaced.

In earthenware-or $n$ as it is often called, semi-porcelain-these stock patterns are reproduced in some of the old designs suoh as Chelsea, Worcester, Lowestoft, etc.; they are not expensive, and the jugs and dishcs in plain old-fashioned shapes are attractive,
especially it breakfast cloths and napkins are cross-stitched in colours and designs to correspond with patterns selected
In pottery there is not so much sariety. except in bright colouring, particularly suitahle for country house use. In china there is a wide innge of Hower and conventional patterns. For the nursery amusing rhyme illustrations and animal designs in stock patterns can be ohtained. These suggest delightful inhlecloths to correspund. See lplpliqué; 'Tablecloth.
BREAM. Wrap the cleaned lish in lntered paper, and bakc in the oven for about $\hat{f}$ hour. A more elaborate way is to stuff the lish with forcement made of breadcrumbs, chopped suet. and anchovy paste or chopped oysters, with inace, salt and pepper as seasoning. 13ind the forcemeat together with milk or heatenup egg, and cook the stuffed fish in the oren for about 40 min ., keeping it basted all the time with dripping. Brenin may also be hroiled. In cleaning do not remove the scales
BREAST : In Cookery. This name is given to the joint of mutton, veal, or venison below the shoulder, and including the thin end of the rils. A sinilar piece of beef is called the brisket (q.v.). I brenst of mutton can be stuffed and boiled or roasted, and is bettel honed, or it is difficult to carve
Skin and bone the lireast, taking away some of the fat, then spread it about $\frac{1}{2}$ in. thick with forcement, sage and onion, or some whilici stuffing, taking care that the stuffing does not come too near the edge of the meat. Roll up and tic with tape, then drop into just enough warm water to cover and simmer slowly Skin off any scum, lut keep the lid on the saucepan as much as possible. It should require 15-:0 min hoiling to every lb and 15 min over. It is equally good served with hot enrrots and turnips, or cold with salad.

To roast, hone, stult, and roll in the same way, and put in a good oven. Baste well, and allow $\frac{1}{2} \mathrm{hr}$. to the lb . Serve it with apple sauce. This dish is known as muck duck.

Breast of lamh can be coolsed without honing. Trim and put in $n$ stewpan with enough stock to cover. Add a buach of herbs and an onion stuck with a few cloves, and let the whole simmet gently until the liones can easily be removed. Season the meat, brush over with egg and hreadcrumbs, and hang in a broiler heíore a clear fire, turning it so as to brown both sides. The dish should be servel hot with mint sauce.

To hoil a breast of veal, corer with wnrm "ater, adding paraley and a few peppercorns. Allow 20 min to the lb . and 20 min . over. Serve with onion or parsley sauce and hoiled hacon. It can also lie broiled similarly to breast of lamb, but just before serving sigueezo the juice of a lemon over it.

A breast of venison can be stewerl, roasted, or broiled in a similar manner.

## Breathing and Breathing Exercises

## How to Improve Health and Strength

## This article is one of an important group that den! with the care of the hody. See also Gymnastics ; <br> Plysical Training, etc.

The process of hreathing, or respiration, is being drawn downward into the aldomen one by which carbonic acid is removed from the ribs being elevated, and the breastbone. the hlood, and oxygen is supplied. The esprecially at its lower end, being moved carbonic acid, produced ly combustion in the forward. For free and full inspiration it is tissues, comes from all parts of the body, neocssary that neither the cliest nor the chiefly in the plasma, or blood-fluid. The abdomen shall be constricted by tight clothing oxygen conbines with the haemoglohin in the In ordinary expiration no muscular effort red corpuscles, and is distributed to every is made, the chest and lungs contracting by part. Hence the necessity for maintaining the their own elasticity ; but in forced expiration, blood in a healthy condition, with abundance of red corpuscles. Breathing is controlled by the respiratory centre in the medulla oblongata, or bulb.

Inspiration is accomplished ly increasing the size of the chest cavity, the diaphragm
as in coughing, sneezing, singing, etc., many muscles come into action.
The number of respirations of a healthy aduit is about 14 to 18 per min., one respiration occurring to each 4 or 5 beats of the henrt. During cxercise and in feverish disenses, the
rate of hoth breathing and the heart-beat is increased, and as a rule both go up and down together. In some morbid states the respira. tions are diminished.

The air changed in the lungs of a healthy adult at cach reapiration, which is called tidal air, is aliont $20 \mathrm{cu} . \mathrm{in}$. By a forced inspiration 100 cu. in. morc can le breathed into the lungs. This is called complemental air After
(f) The arms are held at a sllflit angle frmm the sides of hie hody. on inspiration the nims are turne ivall puslicel forward On cypirtlon tic armanal and ribs return to atarting poaition and the alshoniun wall is contracted. See Clicst
BREATHLESSNESS. Short ness of breath on exertion may be due to a large number of causen, e.g. obesity, anaemia, ndenoids, emphysema, organic disense of the heart,


disordered action of the heart, neurasthenin, Bright's discase, the a busc of tobacco, and tight lacing. See Anaemia; Heart; Lung, etc.

BREECHES. Whether designed for walk ing or riding, sports underwear for women, or period costume, the general style of breeches is a loose thigh, a close knee, and a tight fit helow the knee. Thi looseness aliove the knee should be at the sides, and never at the inside of the legs, where the garment should be clean fitting.

Walking breeches are fastened below the knees hy either buttons or laces, the latter being arranged to come on the front of the leg, while the former should be just off the shinbone, on the outer side.

Riding hreeches should le vory loose on the outsides of the thighs, the knees should le tight, and helow the knees skin tight. Extra insitle leg length is necded, to provide the necessary "arch" for sitting the horse. The
materials are of heavy weight and firm texture, such as woollen or Bedford cords. Velvet cords are sometimes employed. Knee strappinga may be of the same material as the breeches, hut are moro often of buckskin. Either leggings or top boots are worn

BREEZE BLOCK. Fine cinders, crushed coke, furnace clinkier, and burnt brick are used under the name of breeze in the construction of blockis for house building. When made up in the form of concrete, breeze bloclis arc lire-resisting, light and porous, suited for partitions and other internal walling The surface is rough and takes plaster readily, while rooden sheetings or battens can be nailed directly to the blocks.
As a lloor covoring breeze blocks are laid on a damp-proof course set direct on tho concrete foundation. The hlocks are set in mortar, and if laid to a fair level the floorboards can he nailed directly to them. The clamp-proof course may be any hituminous sliceting. or good rooling felt if set in hot pitch.
Cuko breeze hlocks, which aie often used for cxterior wallings of bungalows and other dwellings, should be built in the form of a hollow wall, with a cavity between the inner and outer skins, cross-bouding being effected rith galvanised iron wall ties, or loy using some of the ready-made hollow bricks.

When a limited number of blocks are wanted they can he made up on the site, by casting in woorden inoulds, which need not be anything more elaborate than shallow boxes of suitable size, generally about 24 in . long. 12 in . wide and 3 in . deep. The concrete is mixed in the proportions of 1 part of Portland cement to 5 parts of coke brecze, these being measured by hulk, as in a pail, and not by weight. Only sufficient water is added to make the mass hold together; complete mixing is essential. The blocks arc set to break joint. See Cement ; Concreto.

BRIBE. It is not an unknown thing for tradesmen to pay what they call commission to domestic servants. If the miatress knows about it, and permits it, well and goorl. But if she does not, the law regards cvery such payment as a bribe paid to the scrvant.
The servant may le summarily dismissed and is legally liable to disgorge everything received. An action will lie against the tradesman for damages.

Further, a criminal prosecution will lie against the tradesman and the acroant. It makes no difference at all that the tradesinan has only charged ordinary market priccs.

## BRICKS AND BRICKLAYING

## Materials and Processes Described and Hustrated

## Related articles include Architecture; Building; Garage; Greenhouse; Mortar, etc. Ses also Drawing

Bricks are the stiple material uscd in Great and 3 in . thick; they weigh on the average Britcin for walls and general house building about 7 lb . each when dry. A brick will purposes. Good bricks are durable, but require careful selection for outside surfaces, hoth in regard to weather-resisting properties and artistic olfect. They have a longer life and lower cost of mainteriance than most other building matcrials; their fire-resisting qualities are good, and insurance rates for brick buildings are generally less than those for other forms of construction. timher especially. Brick build. ings arc casier to raise money upon, and they sell morc readily.

Brickwork generally is measured by the rad of 272 ft . super, reduced to $1 \frac{1}{2}$ bricks in thickness. Sixtcen bricks will make a wall one brick thick and 3 ft . long of 4 counses, or 1 ft . in height. A 9 in . wall would take just twice that number. When laid Ilat, 32 bricks will be needed to cover 1 sq . wil. ; that is, an area of 9 sq . ft. ; but, if laid .on edge, 48 bricks would be required.

For ordinary purposes, bricks can be reckoned ns measuring 9 in . long, $4 f \mathrm{in}$. wide,
frequently absorb 7 to 8 oz. of water. For outside facings a good rule is to reject any brick that alosorbs more water than 15 per cent. of its dry weight.

The kind of brick in most general use is known ns the Fletton. It is hard and square but not of good colour, and is reputed not to last long in damp and exposed places. It is so lacking in porosity that plaster will not alhere to it, but has to hang on to the mortar joints in the brickwork. Flettons are a raw red in colour, and are extenaively employed in building walls which are faced with bricks of other kinils.

The Ioondon stock brick hasquite a different character. It is aoft, sandy, and porous, and able to hold plaster. Fromis hugienic point of view it is better suited to house building than the Fletton, because it will breathe, or allow air to pass through the walls.

The red, sand-faced, hand made facing-brick is the most highly esteemed wherever it is
abtainable. It is made chiefly in the southern foundation to rest and eastern counties. In the north, west, and upon. After marking Midland the pressed red briek of even shape out the ground, a and amooth surface is used for facing. Staffordshire blue bricks are in demand for foundation work, or any purpose where the mnximum resistance to damp is of importance.

Glazed bricks with a white or coloured surface are made of fircclay and glazed in the same way as pottery. Thoy are used for halls and bathrooms and in courtyards for external facing where light is lacking.

On the top edges of garden walls and parapets or gables of houses coping bricks are usecl. specially shaped to throw off water and protect the brickwork under them. Splay bricks and others with mouldings on one edge or one end are used to form plinths, strings, comices, or window-sills on the external faces of buildings.

Amateur Bricklaying. Although bricklaying is a skilled trade, simple work is quite within the capacity of the amateur. For most work, a 9 in . wall suffices; in fact, for small erections, such as the lower part of a greenhouse, a $4 \frac{1}{2}$ in wall will be quite serviceable. Nothing should be attempted above 8 ft . in height, becausc the matter of scaffolding for higher buildings involves operations in which experience is essential. A brick wall must have a solid and level to act as guides. trench must be dug, in which to pour the concrete for the founda. tion. Upon this foundation are laid the brick footinge, consisting of two courses or rows of bricks. The foundation concrete should be wider than the lowest course of footings, and for a singla storey building may be 2 ft . wide and not less than 6 in . thick. This allows for two courses of footings built with bricke, and as these should be buried below ground-level, the bed of the concrete must be not less than $1 \mathrm{ft}$.3 in . deep. Before digging out the ground, stakes should be driven in to define the comers and angles of the trenches, both inside and outside, and, in.addition, lines or cords should be stretched tightly between the stakes so as


Bricklaging. Fig. 1. Laging lootings. Fif. 2. First courses of footings, showling lapping of bricks. Fig. 3. First course of wall, showing bonding and closers, and bow headers in front wall become stretchers in aide wall. Fig. 4. Commencing second course of wall. Fig. 5. Footings and quoins built up to four courses, showing bonding at gtopped end for doorway. Fig. B. Wall four courses bigh. Fig. 7. Testing brickwork with plumb-line


The ground should be dug out correctly to these lines, and pegs should be driven in along the midille of the trenches so that the tops of the pegs are al! at the correct level for the finished concrete bed, acting as a guide when filling. If the earth shows signs of falling in at the sides, keep it in place with rough boarils set vertically on edge and secured with short stalies or pegs. Make the bottom of the $t$ rench hard and firm. Prepare a convenient part of the ground on which to mix the concrete, and then shovel it into the trench, ramming it down with a ramnter, and taking care to teat the surface to ensure that it is level both across the trench and lengthways. A spirit-level on $\pi$ straight batten of wood, at least if ft . in length, is reputired in order to get the foundation concrete level. The pegs previously inserted should be accuratel! levelled by cominencing from one corner and adjusting the other pegs accordingly until all are level While the concrete is setting, the mortar-if lime is used-should be prepared.

First Stare in Building a Wall
Next ret lines along the sides of the work to lay the bottom course of footings by, ! in. from the centre line of the wall to be built. Put the lines on the outside and work from the inside. Spread a bed of mortar 18 in . wice in such quantity that when pressed down it will make a joint about $\ddagger$ in. thick. Then bed down the bricks in two rows of headers (Fig. 1). As the bedding proceeds the excess mortar that squeczes out at the sides should be picked up with the trowel and thrown on the bricks already bedded Lay the firat course thus all round the foundation and flush it up with mortar as the work proceeds, to fill the joints. 'This and the next course may be laid without putting any mortar on the bricks to form vertical joints.
Proceed similarly with the next course of footings, joining as shown in Fig. 2. The course will be $1: 3 . \frac{2}{2} \mathrm{in}$. wide, $6 \frac{3}{} \mathrm{in}$. each side of the centre of the wall. Flush up with mortar as before; that is, fill all joints with mortar.

On these two footing courses, which require only ordinary care in la!ing, begins the brickwork proper. Stretch two lines at right anglea as before, $4 \frac{1}{1} \mathrm{in}$. outside the centre lines of the walls, and work now on the outside. The first operation is to build up 4 courses of bricks at the intersection of the two lines, fo form the angle, and a similar quantity at the other end of the piece of wall to be now built. Fig. 3 shows the first course in plan, and Figa. 4 and 5 show the angle in elerntion. These corner or end picces must be plumbed ul) on buth faces with the plimb rule in order to ensure the wall being upright.

This done, the line is stretched from corner to corner at the level of the top) enge of the first course, forming a true line to work to when laying this course. The course being finished, the line is removed to a similar position on the second course, and so on till four coursea are built (Fig. 6). The operations are then repeated for nother our courses. First the corners are taken up, filled and plumbed, then the work lilled in course by course between
The bond illustrated is linglisla bond, the casiest to build and the strongest when built. (Diagrams showing the chief types of bond are given in Fig. 8.). Observe carefully the arrangement of bricks in the illustrations, noting the positions of headers and closers. The vertical joints, called in the trade perpends, must he correctly, that is vertically, over one another the whole height of the wall.
The damp course in amateur work is hest composed of a double course of slates or ordinary tarred roofing felt in long strips 9 in. wide, beddel in mortar and wit! mortar on it to receive and bed the course alove it. The damp course should be at least 6 in . above the level of surrounding ground and below the lowest woodwork, the purpose being to prevent dampness rising from the ground, is slates are impervious to moisture.

The amateurcan

supplement the in. formation given here and contirm it by watching $n$ bricklayer at work. The mortar can be thrown on and the l,ricks set in place very quickly, strik. ing them on the top with the handle of the trowel to levelthen. Special care must be taken hefore bedding each brick to apply a pat of mortar to the end or side to form the vertical joint, and also to llush up cach course with mortar to fill up the whole of the internal joint. Thesimplest way of linishing the oxternal mortar joints between the bricks is by striking them as the work proceeds. This is done simply by cutting off the excess of mortar that aqueezes out when the bricks are berlded, using the trowel as a knife placed flat on the face of the work, thus pressing the mortar with the trowel along the upper edge of the joint, until it is very slightly below the surface of the upper brick and flush with the face of the lower brick. For the inside surface of the wall a flush joint is better and is made by pressing the exuding wet mortar with the trowel, and making it flat or flush with the wall. The edges should be neatly trimmed off with a trowel, guided by a straight edge. A pointing trowel is best for amateur use on this work, being smaller and lighter than the ordinary bricklayer's trowel. When the mortar




Brick. Fig. 8. Kinds of bond in general use. A and $B$, English bond. $C$ and $D$, Flemish bond E. garden wall bond. F, stretching bond
has set for an hour or so the wall can if necessary be waslied down with clean water and a hard brush, to remove any surplus mortar from the face of the bricks and leave them clean and bright.

Vertical work next to n door-frame or a window must be jointed and honded in the same way as shown for the corner of the wall. Figs 6 and 7 show tho honding for left ordinary coveled with olteropping pants. and right hand ve- Overburut (buri ticals respectively Openings should he placed so that brick dimensions can be adhered to in the brickwork, i.e. stretchof wall ahould bo multiples either of $4 \frac{1}{2} \mathrm{in}$. or 9 in. it length. This avoids cutting of bricks Joints should not lie less than $z_{8} \mathrm{in}$. in thickness.

Bricks have to he cut to act as closers and for other purposes. This is done as follows


Brickuork : its use in the garden. Not only the dry wall, with its outcroppings of rock plants, is made
of brick, but also the piers of the pergola. Above, small brick courtgard laid at three different levels
(Fig. 9) : Mark a line on the brick where it has to be cut, then press a bricklayer's bolster or chisel on the line and strike it a light hlow. Repeat the operation on other sides, then lay the hrick on a smooth, firm surface and atrike the holster a firm, hard blow, thus cutting the brick. See Cement ; Concrete.

Brickwork in the Garden. Apart from wall use, bricks are effective in place of paving for small gardens and courts, for cottage approach paths, and for steps; also for cdging lily ponds, for floors in summer-houses, piers for pergolas and path-designing in sunk rose garilens.
In formal town gardens the rich warmth of red bricks economises labour, as it intensifines the colour value of flowers arranged in small, neat hedding sections, or in stonc vases, and does away with gravel or grass The contrast of stone or metal ornaments adde to beauty all the year round, and evergreen shrubs scem brighter ngainst brick-work.
For pergola piers, antique facing-bricks miny be used either in the yellowish or reddisi, purple range of colours. A grey or fawn mortar joint should be chosen, as white spoils the effect. For paths and practical steps, harder paving bricks can be ohfained: while for small surfaces, 6 in fireplace bricks may look more suitahle instead of those of the standard 9 in. length. When making dry walls. or wide ateps for a rock garden to the ordinary bricks can be used. Overburut lburn


Brick-work in the garden. Brick ateps arranked in expanding aemicircles lead to a seat of which the back and front are of brick
rreath of orange hlossom, or of orange hlossom and niyrtle Jewelry is not usually worn by the bride cxcept the bride. grooin's gift. No rings are worn on the occasion before the ceremony. If she carries a houquet that also is his gift
The bride walks "p the church on the arm of her father, or whocver is to give her away, and at the chancel steps the bridegroorn awnita her. She takes her place on his left. the veil over her ace, and when the cremony is ended she gocs out to the wall) bricks may be chosen to adil to the vestry on his lefl arm. In the vestry ahe signs pleasing irregularity of the colour scheme and her maiden name, and comes down the church diminish cost of material by more than half on her hushand's right arm with her veil for retaining walls where mortar joints are used.

The surface for paths should be even and laid on an ash foundation, which admits of quick drainage after rain. The bricks may he laill flat and lengthwise as in stuetcher courses of masonry.

Round a sundial, or other central ormanent, bricks may be laid withont mortar, so that mose or little rock plants can grow througli tho crevices. A wide terrace or kitchen garden path may have the middle of paving bricks or stones and t.he sides of bricks laid without mortar. This treatment is suitable for the Istter path when llowers are grown on either side, and it continues a decorative effect from the house or flower garden to an alcove or ornamental comer where brick-work is again amployed.

Before beginning to lay out any scheme, a plan should be carefully drawn to scale of the proposed brick-work. See Garden.

## Bridal Wreath. See Francoa

BRIDE. It is usual for a bride to wear a white wedding dress, though a colonred one is occasionally chosen, and many bricles are married in the clothes in which they are going nway. A widow who re-marries does not wear white. It is said that the bridal dress should inclucle :

Something old, and something new ;
Something lorrowed and sonething blue.
The veil may fulfil two of the requirements. for hrides often horrow an old and leantiful lace veil. This can be arranged under a thrown hack See Marriage; Wedding.
BRIDEGROOM. With the assiatance of his hest man the briderronm nakes the arrangenents for the wedding, as far as the church or place where it is held is concerned, and pays the expenscs incurred there. He must be ready to receive the hride on arrival, and is responsible for the arrangements for leaving the church and departure for the honeymoon. See Best Man.

BRIDESMAID. For a very quiet "edding bridesmaids may be limited to two or dispensed with altogether: but if it is to be a society function the number may vary from four to twelve. In this case the bride will see that the bridegroom's relatives are duly represented.

No tactful bride will allow her bridesmaids to wear colours that do not suit them or to he involved in expense beyond their means, and in planning the dresses she will hear this in mind. It is customary for the bridegroom to inake a present to each bridesmaid, and if honquets are carried he provides these too.

On the wedding day the bridesmaids arrive first at the church nnd await the coming of the bride. Upon her arrival they follow her up the church and atand behind her throughoul the ceremony. The principal bridesmaid takes the hride's gloves, houquet or prayer-book, and holds them until the service is over. The head hridesmaid follows bride and bridegroom into the vestry, and generally sigus the register. Finally, the bridesmaids leave the church behind the newly wedded pair.

## Bridge: The Principles of its Play

With Hints on the Three-handed and Two-handed Variants of the Game
Consult also the special article on Contract Bridge
Bridge is a development of whist, of which fresh cut is necessary to decide which of those the present form is properly known as rogal auction bridge, but, as this game has superneded all other variations, it is usually referred to aimply as bridge. The ordinary game is for four players, but it can be played hy three or by two.

Four players cut for partners, for choice of seats and for deal. The drawers of the two ligher cands are pastners against the drawers of the two lower cards. The cutter of the lowest card has the first deal and the choice of seats. In cutting, ace ranks as the lowest card and the other cards in order of their suit values Two players cutting cards of equal value, unless such cards are the two highest, cut again. Should they be the two lowest, a

## f wo deals. <br> Partners sit opposite one another. Thus in

 the diagram, A and 13 are partners against $Y$ and $Z, \%$ being the dealer and declarer.
## Y (dummy)



The cards are cut by B, and Z deals the cards one at a time in rotation, heginning with A, the player on his left. After all the cards are dealt, but not before, each player looks at his cards. The dealer has the first right of making $a$ bid. The object of the game is to make 30 points by tricks alone. 'Two games
won out of three constitute a ruhber, for which the winning side scores 250 points above the line. No third game is played if one side wins the first and speond game. Honours are scored, hut do not count towards gatne. 'The' ralue of tricks and honours varies with the suit declared as trumps. The suits in bridge rank and count thus:

Clube
Iliamonds
11 riats
spades
No trimpa
The score at bridge is divided into points, honours and penalties. It is kept on a sheet or Wock suitahly marked.

Little slain (i.e. where one side makes 12 out of the 13 tricks) scores 50 . Grand slam (i.e. where one aide makes all 1:3 tricks) scorea 100 Winners of rubber score an additional 2:0 points. The value of the trick declarations are subject to alteration by doubling.
The honoure are ace, king, qucen, jack and ten of the declared suit. At no trumps the aces score as honours.

Honours and penalties are scored ahove the line only and trick scores below the line. No one can score below the line except the peison left in with the final declaration and his partner (the dummy). They can only scorc helow the line if they make their contract, i.e. all the tricks they bid or more. 'The partners who are playing against the declarer are known as the adversaries. They can acore above the line only.

The following table summarises the system of scoring and is frequently printed on the backs of the scoring blocks:

| Trick Scored Ench t.rich ahove six counts |  | Spacles | Hearts 8 | $\underset{\substack{\text { Din- } \\ \text { monds } \\ 7}}{ }$ | Clubs is |
| :---: | :---: | :---: | :---: | :---: | :---: |
| HONOURS ScORES 3 (simple lionolims) | 301 | 18 | 10 | 14 | 19 |
| 4 (divided) .. | 10 | $31 ;$ | $3:$ | 28 | 24 |
| 5 (dlvided) . | - | 45 | 40 | 35 | 311 |
| $t$ (in one hand) | 100) | 72 | 64 | 50 | 18 |
| $t$ (in one hand and 1 in partner's, 5 honours in all | - | 81 | 72 | 03 | 54 |
| 5 (in one hand) | - | $\mathfrak{O}$ | 80 | 70 | 311 |

'To bid, the denler, \%, having lookal at his cards, mukes a declaration, or, if he elects to pass, simply says "No" or "No bid." The bilding then proceeds to $A, Y$ and $B$ in suc. cession, the final decision os to what are to be trumips reating with the player or the side who declares to win the greateat number of points. 'l'hus \% derlares one spade- 9 points. A can now declare two in any of the suits or one no trump- 10 points. Y can advance the bidding hy a call of two spades or anything over the value of 10 , and so on. When two declarations are equal in point value, the one which involves making the greater number of tricks overcalla the other. Thus four clulss will overcall thice hearts- 24 points

Under the American rule of "majority calling." now little followed in Great Britain. four clubs ( 24 points) would outhid three spades ( 27 prints).
A player may double his opponent's declaration when it comes round to his turn to call, and it is open to either of his opponents to re-double. Only one re-double is allowed. The double does not affect the value of the tricks so far as the bidding is concerned. Thus two hearts overcall two diamonds doubled. But doubling and re-doubling reopens the bidding and gives each player the chance of a fiesh call.

A player may not double his partner's declaration. Only the final deciarer, as the player of the two hands is called, can scoie
below the line. In order to do this he must fulfil his contract.

Penalty for failure to gain contract is 50 points per trick scored above the line to oppo. nents. If doubled 100 points per trick, and re-doublat 200 points per trick. If the declarer is successful in making his contract after it has been doubled he rereives a bonus of $B 0$ pointa for contract (scored above the line like honours), and 50 points per trick for each trick he obtains in excess of his contract. If redoubled he receives 100 pointa for contrict and 100 points per trick for each overtrick. Thus \% bids two spades and is doubled by $A$ He makes his contract and one over. He scores 54 below the line (value of three apmes doubled) and 100 nbove the line ( 50 for con. tract and 50 for overtriok), plus any honours he may holel.

Principles of Bidding. The aim of hidding is to discover the best combination in which the hands can be played to the advantage of yourself and your partner. No trunpes is the most important declaration, being the only call on which you can go game from a love score ly making $?$ tricks. One method of determining if you are strong enough to bicl no trumpsoriginally is known as the Rohertson rule. By it an ace counta 7 , a king 5 , a queen 3 , a jack si and a ten 1. When any such cards collectively total 21 with at least three suiti guarded, the hand is good 'enough for a first call of one no trumps. Other holdings which justify the same useful call are
Four aces (even without ot her court cards).
Three aces and other curds of value.
Three acces and two protectrd kings
T'liree aces, a king and "gunrded queen (i.c. quaen Two aces and good cir
Two acem and good cirds, such as king, queen. Jack, or king, jath, tell in one suit.
One are and " good all-mund hand-something of One ace with protectio
likellhood oi taking in the other three suits and lukellhood ot taking at least four tricks.
one hoe herading a long gult with two other suits
well gurndeul well minnded
and a proper protection ins liave two long sults
The suita are divided into major suita (apales and hearts) and minor suits (diamonda and clubs). A first bid in a major suit ahould show at least five of the ruit with top honours -nce, king or king, queen, jack. Don't bid on a suit of four except when youl have the four top honours. Even then some ouitaide strength is necesarary. And don't bid origin ally from length alone. A suit of six or seven headed by queen or king should be reserved for second round bidding. In cases where you hold great length, such as king, queen, to aeven or.cight, it is often arlvisable to bid three of the suit straightaway, not merely to indicite great length, but to prevent your opponenta and your partner from interfering with the call.
The first bid of a minor suit must alwaya show top honours. It may be made on four or even three (if the three be acc, king, (queen) 'Ihe object of the declaration of a short minor suit is to encourage your partner to make a stronger bid. It is informative. Bids made on the second or subsequent rounds of bidding do not convey the same information as original hids. They may be made on suits of five or six or more, which should he headed by queen.
Always hear in mind the difference letween original and secondary bids. You are justified in supporting your pirtner much more lightly over hia first call than in the case of "forced or secondary bid. If your partner hids two suita, support him in the one in which you hold the greater length, and if his first hid fits your hand and his second hid does not, put him hack into his firat call.
If dealer has passed, you are in the position of original declarer, and the remarks about his procedure apply to you. If dealer has called it suit which you can over call with one of a
higher suit you should have five tricks in it. If you over.call with a tivo contract, yoll ahould be able to make six tricks in your hand. If you go no trumpa over dealer. or a previous caller, you must hold a guand in the sulit which is called against you.

If $Z$ and $A$ have passed and you, as third hand decharer, are not very atming it is likely B has a good hand. The beat that you can do is to call one of the suit you want led in cas 13 goes no trumps. If, however, $\%$ and A have both made a bid, you will aupport your part ner's bid, unleas you have a much atmonger call yourself. Don't show a fresh suit unless you have reason to believe it is better than that bid by your partner. Ind be careful not to take your purtner from a major anit bid into a minor one.
If all three playem have pasued, fourth hand should rlso pass, unless he has a hatnd at least two tricks atronger than that which justifies an original bid of one.

Play of the Cards. Lean ly heait the following table of leads. They are most im. portant, as they convey definite information as to the contenta of your hand.

## Holding the 'inuap Soit gaye

Ace, king, quesen, etc
Ace, king, etc.
ace, king only
ace, queen, jack
Ace and three or more
small ones
hing, queen, Juck and oue
amall one
$h$ ing, queen, ${ }^{\text {jack and }}$
two or more
King, queen etc.
King, Jack, ten
Queen, jack und ten or nine
Jack, ten, illne or elalit Ten, nine, eiklit

King, followed ly ${ }^{\text {King }}$ areen
King
lec, thenkink
Are, followed by quee..
Ace
Kins
$\underset{\substack{\text { King } \\ \text { King }}}{\text { King }}$
King
Jack
Quen
Jack
Ten

| Holdius At Co | Truyps Lend |
| :---: | :---: |
| Ice, king, ¢fueen, ete. | Ring |
| Ace, king with meven | hing |
| Ace, jach, 10, etc. | .Jnck |
| tce нnd small onew | 4 tI |
| King, queen, Jack mud |  |
| two or more | King |
| King, queen, 10, etc. | King |
| King, queen with seven in sult | King |
| Klug, queen with lews |  |
| than seven | +1 |
| lifng, jack, 10 , etc. | .lack |
| Queen. jach, 10 or 8 | Queen |
| Jack, 10 and $\mathbf{0}$ or 8 |  |
| 10. 9, 8, |  |

From all otlier coubinatlous land fourtl higheat.
When lending a suit that your partner has called, lead the highest of the suit, unless you have five, when you should lead your fourth best. Some players do not lead the highest when they hold four, and there are oc-asions when it pays not to do so. But as a general rule it is hest to lead your highest, even with four, and vith any lexwer number it is exsential for you to do so. When your partner has not called, lead your strongest anit against a suitcall, and your longeat igainst a no-trump call.

The Eleven Rule. The leas of the fourth best, except when you hold three honours. againat a no-trump bid is based upon the eleven rule. which it is most important to learn and understand. This rule is that when a player leads his fourth bext card of a suit, if the value of the card led the deducted from 11, the remainder gives the number of cards higher than the one led which are not in the leader's hand. Thus, suppose the seven of hearta is led, third hand holds queen, eight. four, and dummy has jack, six, five. By an application of the eleven rule, it is evident to the third phayer that the fourth player has one card, and one card only. of hearts higher than the seven. If the fourth hand has made the declaration of no trumps, there is a stmang supposition that his one high card is either the ace or king. Therefore, the third hand should pass the seven led and not put up his queen.

The following general hints may be given Lead through atrength and up to weakness Suppose you are leading, and dummy is fourth hand, lead up to dummy's weakness It will enable your partner to make a trick which he might not otherwise make. Dn not finease againat your partner. Iead the higheat. phay the lowest of a sequence. Force declarer's strong hand whenever possible Forcing is leading a card which the opponents must trump to win.
The full code of the laws of royal auction liridge (two long to be reprinted here) is pul). lished in most text books on the game, or can be obtained scparately. It is not necessary to learn thein by heart, but it is mont neces. sary to have a good working knowledge of them. Particular attention should be paid to renalties for revokes, leading out of turn. calling out of turn, and cards exposed during play or aleal.

Bridge for Three. Three handed auction, otherwise known as cut-throat or skip, is played by three players, all against all. The simplest method is for the three players to nit on three sides of the table, leaving the fourth seat vacant. and to keep their seats throughout the rubber. The cards of dunimy are then dealt to the vacant seat.
The dummy is alwaya dealt to the same hand and receives the first, second, or thind card, depending which player is dealing. The dealer inakes his declaration or passes, and the bidding continues as at auction bridge. The tinal declarer of the highest hid plays dummy's and his own hand, and shifts dummy's cards to a convenient prosition ficing him.
If a player double out of turn, he forfeita I(0) pointa to pach of his alversaries, and the player whose declaration has been so doubled shall have the right to say whether or not the double shall stand. The bidding is then resumed: but if the double has been disallowed, the said declaration cannot he doubled by the player on the right of the offender.

The rubber consists of four games. but when two games have heen won by the sume player the other or others are not played. When ihe decharer makes good his declaration, he scoren as at auction bridge ; when he fails to do so, he loses to each of his ndversaries.

## Variation in Scoring Rules

The scoring is the mame as at auction bridge, except with regard to honours, which are scored by each player severally; i.c. each player who has one honour in cluda scorea six : each player having two honours in clubs scorss 12 ; a player holding three honours in clubs acores 18: a player holding four honouns scores 48, and a player holding five honourn in clubs scores (i0), and similarly for the other suita. In a No trump declaration aces count 10 each. and $10 x$ ) if all four be held by one player. Ono hundred pointa are scored by each player for every game he wins, and the winner of the rubber adds a further 250 points to his score. At the conclusion of the rubber the total scones obtained by each player are added up мерarately, and each player wins fomm, or loses to, each other player the difference between his score and that of the said other player.

As generally played the bidling is a ganuble for dummo. The dealer generally opens with a bid of two no trumps if he has any cards of value at all, on the principle that whatever good cards he may find in dummy will help to establish his indifferent lot. His bid has the alvantage, if he is not doubled, of putting up second caller to three no trumps or three of a suit, which third hand may possibly lie able to doulse to the advantage of the dealer.

Among varietics of three-handed bridge a variation now widely played is the doaling of the first fous cards blind face down th the
middle of the table, the romaining 48 cards heing distributed in four 12 -card hands Final declarer, before examining his dummy, looks at the four blind cards and distributes them as he wishes. one to himself, one to dummy, and one to each adversary. This procedure given still more spirit to the bidding, and adds to its uncertainty.

Double Douinmy. In double dummy the players sit next-not opposite-to each other, and deal alternately. The deal is decided by cutting tho cards, the lowest card winning the deal and choice of seats. Four hands of 13 cards are dealt, two face downwards and the two dummies (ea:h opposite one player) face upwards on the table. The following is the position of players and dummies:

13's Dunimy
A's
Dummy $\square$ B
The dealer. 13, has the first declaration, and bidding proceods as at auction bridge. There is no blind calling in this game, for it is obvinus that each player knows exactly what carda are in his opponent's hand. Expert players frequently can declare the number of tricks they will make or lose, and write down the score without playing the cards; but leas practised players will always find ample opportunity for finerso and subtlety of play in playing their cards out.

When the declaration is left with $A$, the lead is from a closed hand through two open hands up to a closed hand. When $B$ is the seclarer, the lead is from A's dummy through an open and a closed one up to a closed liand. ()n account of this difference the cut for choice of seats has an added importance Some players agree to change seata niter each rubber. The scoring as to honours and tricks and penalties is us in ordinary auction bridge.
An excellent variation of ordinary double dummy is afforded by the use of card racks. These ingenious devices, which can be obtained from most stores, enable each player to conceal his dummy's cards from his adversary. The players sit at adjoining sides of the table with the racks in front of them at a convenient angle. The cards are dealt into four hands. Before the bidding begins each player picks up the hand opposite to him and places the cards in his rack. Bidding, playing. and scoring are as in double dumms.
The game is more intereating than ordinary double dummy, herause, although each player knows his opponent's 26 cards, he does not know how they are distributed hetween the two alversc hands. Another variation is to make the bidding take place before the dummics are looked nt and placed in the racks.

Blind Auction. The game of blind auction, firat described in the "Daily Mail" in 1919. was the invention of the late Colonel F. de B. Young, C.M.G. It is far more interesting and less cumbersome than double dummy bridge, and is played as follows

Thirteen cards are dealt to each of the two players, the remaining half of the pack being pliced faoe downwards. The dealer makea the first call, which his opponent can over-call or double, just as at auction. After the hidding is finished the game proceeds, and the result is scored exactly as at auction. This first hand is, of course, pure chance. Neither player knows what the other has got, as there are 26 cards unaccounted for, nad anything may happen. The strangest bids may aucceed. But after this first hand has been played, the remaining 26 cands are dealt, 13 to each player. The dealer bids first, as before, and the hidding and scoring are as in nuction.

Now comes in the test of memory and skill. A good player with a card memory will know every card that is in his opponent's hand from the cards that were played on the first round.

He will, thereione, be able to make his cal with absolute matliematical accuracy. He knows just how far he can bid with asfety and when his adversary has overstepped the mark and can he doubled effectively. This is an especially good game for novices, since it cultivates card memory and teaches the necessity of noticing every card.

Draw Auction. Another good two-handed game is draw auction. The carda arc dealt 13 to each player. The 27 th card is placed face upwards on the table, and the remaining cards are put beade it downwards, to form the pack. There is no bidding, the hands being played as at no trumps. The non-dealer leads for the first trick Each player must follow suit if he can.
The player winning the first trick takes the exposed card to replace the one played. His oppionent, who loses the trick. draws the unexposed card from the top of the pack and turns the next card face upwards for the winner of the second trick to take. This is repeated after each triok until the pack is exhausted.

Now begins the game proper. At the end of this prelininary skirmish each player holds 13 cards, and he makes his hid as at auction. His opponent can outbid hinı, or double the bid or раяs. Tricks are now stacked and scored as in the regular four-handed garne. The playing of the first 26 carils before the game begins enables the player to locate valuable cards, to build up his hand for the declaration, and to weaken an opponent's hand by forcing him to play out high cards. There is much opportunity for judgement in avoiding taking worthless exposel cards and forcing them on the adversary. Once the second stage is reached the players deal with known quantities and can bid with accuracy.


Briage Parly. Card table covered with black moire and equipped with The scoring pads
brightly decorated must be fixed before the gaine begins. ash trays and glarses
tugether also. This is important, for a goon player gets little enjoyment out of the game when inferior players are at the same table, and a mediocre player feels out of place when asked to play with a hridge expert. If there are only two or three tables and all the players are equally matched, the hostesa may ask her guests to arrange tables and partners by cutting before the game begins. When scveral hostesses combinc to form a bridge circle, and the play takes place in rotation at the various houses, much of the difficulty in arranging tables is olviated, as players get to know each other's merits at the game The hostess must be responsible for arranging the stakes, which

Folding card-tablea can be bought so reasonably that the household may be equipper with one or two. Unless smokers' stands are available, better than the small size, 24 in. hy 24 in ., is a card table 30 in . by 30 in .. as the little extra space at the corners accommodates ash trays without so much inconvenience to play. The most useful tables have racks for

## Improvind Upon Green Baize Tables

In order to bring the tubles into relation with the decorative scheme of the room, it is often necessary to cover the green cloth or baize tops of the tables. These removable covers are easily made in furnishing velvet or moiré, trimmed at the edge with tinsel galon. Or the tables can be permanently covered with hlack moire, as shown in the one illustrated. Two clean packs of cards nust be allowed for each table, and alan four scoring pads and pencils. These may be charmingly decorated. The pads may have puinted or stencilled covers, embiroidered, or worked in raffia (q. v.), while the pencils may be tasselled with silk or light wooden heads. Occasionally there are differences of opinion, which are best and most amicably settled by reference to a book of rules.

The average draw. ing-room cannot take more than two or at mont three card-tables to allow ample roont for chairs, etc. Gond light sliould fall on each table, and the ronm must le pleasantly airy and yet, in colder weather, sufficiently heated.

There is usually an adjournment for tea or light refreali. ments during the afternoon or evening. At a small party such refreshments
BRIDGE PARTY: How to Give. Many may be prepared on a side table. Otherwise hostesses find that a bridge party given every they are served in the dining-room, and the two or three weeks is a means of discharging their social olbigations and ensures a pleasant afternoon's or evening's entertainment. The invitations may be by telephone or by informal letter. For an afternoon party the hours are from 3 to $6 \mathrm{p} . \mathrm{m}$. or 6.30. For the evening, from 8.30 to $11.30 \mathrm{p} . \mathrm{m}$. If guests are asked a quarter of an hour hefore play begins, coffeeand ligueurs if liked-can be served, and there is less danger of play being held up by late artivals.

The hostess should make up her tables an that the various plajers are suitably arranged ; really gond players together, and those whose play is of an inferior calibre placed at tables
gueats at each table go at the conclusion of the rubber, sfter the hostess has in general invited them to do so. Any variety of sandwich, made with brown bread and butter, or white, or with bridge rolls, amall cakes and fruit salad in glasses, may be served with suitable drinks either for the afternoon or evening party. See At Home; Sandwich.
BRIDLE. The bridle is that part of the harness of a horse that fits on to the head and to which the reins are fastened. The bit is that part of the hridle that goes into the mouth, and to the rings attached to it are fastened the various straps that fit the head and connect with the reins. Bridles are made
of steel and leather, and their care is part of the duties of the groom or coachman. See Bit: Driving; Harness; Riding.

BRIGHT LINE BROWN EYE MOTH.
This name has been given to a stout-bodied moth with reddish-brown forewings which measure, w hen outspread, $1 \frac{1}{2}$ in from tipto tip. The paler hindwings arc darker towards the hind margin On the forewings there are several in. definite marks but towards
 caterpillar is a Rarden Deat the middle of the front half there is a kidney-shaped mark more or less yellow. This is the brown eye. The white line is near the outer margin, slightly waved, but in the middle forming a distinct W .

The pale green or light brown smooth cater pillar is dotted with black and more minutely with white: along each side is a yellow line and three greyish lines run down the back. It feeds throughout the summer on low-growing wild plants, but in the garden attacks turnips, cabbages, tomatocs, etc

BRIGET'S DISEASE. Nephritis or Bright's disease is the name given to inflammation of the kidneys, which may be acute or chronic. The principal causes are exposure to cold and wet, especially after alcoholic excess, poisons of fevers, e.g. scarlatinn or tonsillitis, or irritant poisons like carbolic acid, can tharides or turpentine. Acute nephritis may follow a large burn.

The onset miay le insidiuus, the patient feeling ill in an indefinite way, or headache or shortness of breath may be the first symptoms. In children the disease may be ushered in by convulsions. Within a few hours the characteristic puffiness of the face and eyelids or ankles and pallor of the skin are probably observed, while the urine becomes much darker and also contains albumin.
The acifte form of the disease is always scrious, because it causes accumulation of poisonous material in the syatem through the kidney being thrown out of action more or leas. The chief signs may be headache and vomiting or there may be drowsiness and convulsions, followed by unconsciousness. This condition is known as uraemia Sudden dropsy of the lungs with great difficulty in breathing and a copious liquid expectoration may occur at any time, and the doctor should be sent for at once.

During the attack milk should be the only food taken. A hot moist pack should be tried. l'rotecting one-half of the bed with a rubber sheet covered with a woollen blanket, the patient should be gently lifted on to this, and then thoroughly enveloped in several thick nesses of blankets wrung out in water as hot as he can bear. He may remain in the pack from 15 to 20 min . Convulsions in children would be treated with a warm bath.
In chronio Bright's disease two main varieties occur, the large white kidney and the small red kidney. Those who indulge constantly in alcohol are specially liable to the former, men more so than women. The commonest variety of the disease is the small red kidney, which in its primary form may be described as a premature ageing or wearing out of the kidney substance. The regular use of alcohol and over-eating (especially of meats) together with a sedentary habit of lifo, are probably the chief causes.

Though the disease cannot be cured, much can be donc to retard it, and with proper
treatment, and in particular with a certain amount of self-denial and control of his appetites, the patient may usually look forward to many years of fair health and activity. He will require to take regular easy outdoor exercise, avoiding over-fatigue. He should keep to a simple, nourishing, largely vegetarian diet, be moderate with his tea and coffee, and give up alcohol in every shape and form. The bowels and the skin must be kept active. Two or four grains of cascarn at night, or a teaspoonful of Epsom salts before breakfast, may be taken. To kecp the akin active, a daily bath at the temperature of $80^{\circ}$ to $90^{\circ}$ should be taken, followed by a brisk rub down with a rough towel. Plenty of plain water, mineral water, or weak leinonade should be drunk between meals to keep the kidneys well flushed out See Kidney

BRILL : Ways of Cooking. Steamed brill contains more flavour and nutriment than boiled. Wash, dry, and trim 1 lb . or more of cut brill. Rub over with a little lemon juice, and lay it in a sten mer, covering it with a piece of greased paper. Heat the water under the steamer, and boil steadily for about 30 min ., or until a knife can easily he slipped along between the bone and the flesh. Lift out carefully and place on a warmed fish-napkin, or fishdrainer, on a hot dish. Garnish with slices of lemon and serve with a tureen of fish sauce. One pound of brill is sufficient for 4 persons.
Brill is la Conant is as voury. Wash, dry and fillet ahout 2 lb . of brill. Lay four slices of fat bacon in a lireproof baking-diah, and place three thin slices of Spanish onion, with neatly cut pieces of brill on the top of them. Melt 1 oz. butter in a saucepan, stir into it $\frac{1}{2} \mathrm{oz}$. flour and spread this on the fish. Dust with browned crumbs and a little seasoning. Cut two more slices of bacon into fine shreds. and scatter these over the crumbs. Cover with a piece of greased paper and hake in a morlerately hot oven for about 20 min. . or until a skewer can be easily pushed into the fish. For the last 5 min remove the paper. Gamish with thinly cut slices of lemon and crossway lines of fincly chopped parsley. Sufficient for six or eight persons.
Grilled brill is easily propared. Fillet it, saving bones, etc., for fish-stock. Warm 1 oz . butter, and brush over the fillets and season them. Heat and grease the gridiron, lay on the fish, and grill for $10-12 \mathrm{~min}$., or until slightly browned. Place on a hot dish, with a little hutter rubbed over each piece, and a dust of pepper. Serve with parsley, anchovy, or lobster sauce. See Fish; Sauce

BRILLIANTINE. The threc different kinds of brilliantine-separable, inseparable, and solid can be made as follows: Separable brilliantine is composed of 12 oz . almond oil free from acidity, 20 drops perfume, and 6 oz . absolute alcohol shaken well together. Inaeparable brilliantine is made from 2 oz . castor oil, 8 oz. rectified alcohol ( 60 over-proof) and 60 drops perfume. Solid brilliantine is prepared from 4 o7. white vaseline and 10 drops perfume. If a green colour is required a small amount of chlorophyll, obtained from green leaves, is added. See Hair.
BRIMSTONE. Popular name for sulphur is brimstone, and in combination with treacle it is much used for skin eruptions. Brinstone in powdered form is mixed with treacle in the proportion of $\underline{\varrho}$ or. to a pound of treacle. The
dose is two teaspoonfuls each morning Solid brimstone, in the form of stioks, is placed in the water which dogs drink, as a blood purifier. The brimstone does not dissolve in the water, but it contains sulphurous gas in the interatices, which communicates a sulphurous taste to the water. Sec Sulphur

BRINE BATH. By using the Droitwich or other salts in the proportion of 10 lb to 30 gallons of water, brine baths can be prepared at home. They are useful in sciatica, lumbago, and ohronic rheumatism. The bath should he maintained at blood temperature $\left(98^{\circ}\right)$. The patient should stay in it for 15 to 30 min ., then be quickly dried and put to bed. See Bathing.

BRIOCEE : A Fancy Bread. For this yeast cake, put $\left\{l_{1}\right.$, Hour on a board, making a well in the centre. In the well dissolve $\frac{1}{2} o z$. yeast in a little tepid water, and then enough water to mix the whole into a soft paste. Knead well, form into a hall and alash the sidea with a knife. Leave in a warm place to set the sponge.

Now take $\frac{3}{3} \mathrm{lb}$. Hour, and into a well in the centre put a level teaspoonful of salt and of sugar and a teaspoonful of water. When dissolved add 4 oz butter (melted) and 3 beaten eggs. Mix and knead well. The sponge should now have risen to threc times its size. Spread it out on the paste and knead them together until full of air bubbles. Form into a cottage loaf, or into small $t$ wists and rings, brush with egg, and bake in a moderate oven on a liaking sheet. Currants, candied fruits, etc., may be added if desired. See Bread.

BRIQUETTE. Coal dust, with a binding material such as clay, tar, resin or sawdust, is made into briquettes or blocks of fuel. Coal-tar, pitch and ordinary coal tar are most generally used. but satisfactory briquettes have been made with clay. Resin is cxpensive as a binding agent and, like saw. dust, is too inflammable The blocks arc made either hy heating the pitch and coal dust together or by mixing the coal dust with tar without hert.

BRISKET: A Cut of Beef. For an appe tising method of stewing brisket or breast of beef use this recipe. Rub vinegar and salt over 4 or 5 lb . fresh brisket and leave for 2 hours before dressing. Cover with stock in a small stewpan and skim well after bringing to the boil. Simmer slowly for $\frac{8}{}$ hour, and then add a carrot, half a turnip, 2 strips celery, $1 \frac{1}{2}$ onions, 8 peppercorns, a few sprigs parsley and thyme, and seasoning to taste. Continue cooking slowly for 2 hours.

When just done, heat 1 oz . butter in a sauce. pan, witli 1 tablespoonful flour, and cook until the mixture becomes golden-brown in colour. atirring irequently. Take out meat and remove bones, then strain stock, and add sufficient water to make up ? pint. Pour this into pan containing the butter and Hour, stir it until the mixture reaches hoiling point, boil for 2 or 3 min ., and season with salt and pepper. Serve as a sauce separately, but garnish the meat with the vegetables. See Beef.

BRISTOL BOARD. The smooth-surfaced white cardboard known as Bristol board is used mostly by black-and-white artists. Since the same whiteners and amooth surface are exposed, however much of the board is scraped away, it is admirably suited for all kinds of pen-and-ink work. It is made in all sizes and thicknesses. It is often employed as a mount for pictures. See Mounting.

BRITANNIA METAL. In the manulac such as bacon or a butter sauco, to increase ture of tea and cotfee pots, dish-covers, spoons, sto. Britannia metal is largely employed, being silvery white with a bluish tinge It may be electro-plated with silver, but being, when of good quality, a hard alloy and capable of taking a high polish, it is often used in its own natural condition

Britannia metal articles must not be leftto dry. for examplo-on the hob of a fireplace or anywhere exposed to flame or a very high temperalure il damaged they may be repaired by soldering

As cleansing agents, liquid metal cleaners may be used, but there is nothing better than warm water with a little soda, or plain soap and water, followed by a very soft brush and a wash-leather with the least touch of putty powder See Electro Plating.

BROACH. Long and slightly tapered. these tools are invaluable for rapidly enlarging holes in metal, hardwood, or fibre. Broaches, which are sumetimes known as taper reamers, are made in numerous sizes, from a very fine one to in. It frequently happens that on a job such as fitting a joir of hinges, the screws are just a shade too large for the hole. In such a case a lew turns with a broach will enlarge the hole, and the job can be at once colupleted. These broaches are frequently fixed into wooden handles: but a better plan is to uso an adjustable handled tool holder

BROAD BEAN. Of this bean plant the two ohial types are the Longpod and the Windsor, and several varieties of each. The longpud beans are now chiefly grown. Inforniation on the cultivation of the broad lean is given in article hean (II.v.).

How to Cook. Broad beans are nutritious, but should be euten with soine fatty food,
such as bacon or a butter sauco, added after cooking, as it tends to harden the beans if put into the water when boiling commences. Young broad beans, when taken out of their thick, woolly pods, can be cooked in boiling water, to which a little sugar is added, until tender, probably 20 to 25 min They are then drained and served in a loot dish with parsley sauce and boiled hacon, served separately
For broad beans à la crème boil 1 pint of young broad beans until soft Then remove the whitish skins, and put the green beans in a stewpan with 1 oz butter, and dredge in 2 teasponnfuls flour and 1 oz grated cheese. Toss beans in this, and pour in $\&$ pint cream and milk mixed, or only milk. Add a dust of sugar, some seasoning, and 2 teaspoonfuls chopped paraley Stir gently until boiling, then heap them in a hot dish and garniah with sippets of toast

To make broad bean soup put a quart of shelled beans and a sliced medium-sized onion into a saucepan of boiling water, and boil until soft. Drain off and save water for stock, unless it is blackish. Remove tough, outer skins, and rub green part of beans through a hair or wire sieve. The former will inake the smouther soup, but the latter requires less time and labour.
Melt 1 oz. butter in a saucepan, into this stir 1 oz . Hour and $?$ pint milk and stock mixed. Boil and stir this mixture until it forms a sauce. Blend this with the beans, arding more milk or cream if necessary. It should be of the consistency of rich cream when finished. Season it with care, then strain it into a tureen, and serve it with

## Broadcast Receiving Sets

Main Factors to Consider in Their Choice
Other information is given in such arlicles as Aerial: Amplifice; Condenser: Eliminator ;
High Frcquency; Selectivity; Short Wave, etc.

Broadcast wireless sets are of twotypes, mains are desirable if satisfactory loudspeaker results and battery operated. Typical portable sets have two screen-grid high frequency stages, a rectifier, and two low frequenoy magnifiers. The screen-grid H.F. valves may consist of two choke coupled, or one choke coupled and one tuned stages The latter gives higher amplification, but necessitates an additional tuning control. Since geared drive condensers and natched stages are employed, the extra condenser does not necessitate greater operating skill

Signals are reccived on a frame aerial, wave chanying being carried out by a double throw switch, whish may also provide a means of disconnecting the valve filaments. The loudspeaker is normally of the adjustable cone type. The filament current is derived from an unspillable 2 volt accumulator, H.T. current fioin a 108 or 120 volt dry battery, and grid bias from a 9 or 18 volt unit

In a good design the screen-grid valves are biassed in order to decrease the anode current. Failure thus to apply a negative bias will entail a frequent renewal of the H.T. battery.

Portable sets give their maximum results when rotated so that the plane of the selfcontained aerial points in the direction of the broadcasting station. They are very selective, but for volume and range are inferior to a similar receiver working from an indoor or outdoor aerial and earth.

Non-portable battery operated receivers may comprise up to five valves, and are designed to work with an outdoor or indoor aerial. For head-phone reception a simple one or two valve set is adequate. Given an efficient rerial, a two valve set (rectifier and low frequency magnifier) will work a loudspeaker at distances up to 40 miles from a regional transmitter. Three valves or more
are to be obtaincd from more distant stations A well-designed three valve set may be expected to receive ten stations on the loud. speaker. Skill in inanipulation may increase the number. The type of aerial has a marked effect on range and volume. A detector and two low frequency magnifiers will give good long dintance reception with an outdoor acrial, whereas the addition of a high frequency
amplifying stage is usually necessary to ensure similar results on an indoor aerial Given an averace aerial and earth three valves should provide loudspenker volume up to distances of $70-80$ miles from a B.B.C. Regional atation, and 150 miles from Daventry 5 X X, but local conditions may increase or decrease the range.
Larger seta having one or two tuned high frequency stages, a rectifier, and two low frequenoy magnifers, make possible reception over long distances, and arc suitable for operating permanent magnet or mains energised coil-driven loudspeakers

Triple capacity diy cell H.T. batteries or H.T accumulators are essential in order to supply the anode current required for the effective operation of the valves. This current may amount to 20 milliampores, and at this rate of discharge the life of a triple capacity dry battery inay not exceed three months When the battery is partially run down, the set fails to give its maximum results, and distortion, low frequency howling, etc., are liable to occur. H.T. accumulators are more suitable for these larger sets.

All-mains reccivers obtain their low tension, high tension, and grid bias voltages entirely from the lighting mains. Differently constructed sets a re made for use on D.C. and A.C.

## Direct Current Type of Receiver

The D.C. type present greater problems in design than the AC. type, brcanse :
(a) Transformers cannot he employed to step un the mains voltage na in A.C. and consequently the H.T. voltnge aiter amonthing may be ton low to apernte the valves at their maxinum emeiency (of. 100-110 volt mains). Tlifs npplipe partlcularly (b) The wheh the out put valie is a super-ponire one of waterulains voltage has to be cut down by means flamients.
(c) Precautions are necessary to ensure completc isolation of the set from the majus.
1.C. receivers are generally designed for $100-110$ and $200-250$ volts $40-60$ cycle mains. The high tension and low tension voltages are obtained from a built-in unit, comprising a transformer with H.T. and L.T. windings, dry metal or valve rectifier, smoothing chokes and resistances. In high magnification receivers it is usual to interpose special filters between the mains unit and the set itself to obviate mains hum, and " motor-boating."
A.C. sets employ similar circuits to the battery operated types, but utilisc directly or indirectly heated valves. Owing to the high efficiency of A.C. screen-grid valves, receivers


Broadcast Receiving Set. Battery-operated four valve recelver employing a screen-grid high frequency stage. Apparatus viewed from above, looking towards back of front panel


Broadcast Receiving siet. Mains-operated inree vaive recester showing (left) complete A.C. maina unit for bigh-tension and low-tension current. The anit is connected by a plug to a lamp holder of the house lighting syatem
with two stages of high frequency amplifica tion require elaborate screening to ensure stability. The ease of obtaining high anode voltages facilitates the usc of mains energised coil-driven loudspeakers, as distinct from the less critical cone types. It is thus possible to achieve more realistic reproduction of the hroadcast programmes

It is n common practice to make mains sets elf-contained, the loudspeaker being placed bencath the receiver and mains unit. The wooden front of the cabinet usually acts as a baffle for the cone or diaphragm, and assists the adequate production of the bass notes.
Mains reccivers are connected up to any convenient wall-socket or lamp-holder, a length of flexible cord, terminating in a suitahle plug, being supplied for this purpose. In some cases the lighting system also forms the aerial, while in others an outdoor or indoor aerial is used. The former method is convenient in certain instances, e.g. in flats, or where it may be necessary to inove the receiver from one room to another. The flexible wire must be the sort intended for electric lighting or power, and not the less heavily insulated liind used for bells, etc

## Factors in Choosins a Set

The latest designs embody such refinements as concealed pilot lamps to indicate when the receiver is "on" and to illuminate the tuning scale. The latter is calibrated in wave lengths and not in degrces; the wave-length of the station being known, the scale is merely rotated until this figure comes opposite to the indicator. The tuning controls are of the thumb control type, and are arranged so that they can be adjusted simultaneously or separately.

Radio-Gram receivers have a switching device which enables the low frequency mag nifier to be employed in conjunction with a gramophonc pick-up. The more elaboratc ones include an electrically driven turntable. together with a pick-up and tone arm, so that it is jrossible to receive broadcasting or reproduce gramophone records at will.

The following factors are of importance in choosing a suitable set
(a) Accessibility with respect to the removal of the lves when they need replacement.
(b) Gond cabinet work and mechanical solidity
(c) Criap reproduction, with the high and low noter In adequate proportlons. Intelligibility of the speaking volce. Freedom imm reaonance. "boominess," backgmund nolses, etc.
(d) Simplicity of operation, tozether with soine means of adjustlua the volume without limpairing selectivity or of introduclnz distortion
(e) High aclectivity and wive-change switching the receiver is to be used for the recention of atations other than the local.

BROCADE. Brocades are always figured and usually in Horal patterns, and generally the pattern is woven. According to one classification brocades have their groundwork formed by the warp or lengthwise threads, and their ornamentation by the weft or crosswise threads. The name inplies a rich decora tive fabric, usually carried out in silk, artificial silk, or mixtures of silh and cotton, with or without metallic throads.

BROCCOLI: To Grow. For practical purposes broccoli may be called the winter type of cauliflower. Sowing is donc as with curly kale, and the gardener who requires broccoli from October to May should make three sowings at regular intervals during April and May. Broccoli should not be planted between potatoes. To guard against injury from quick thawing after frost, the plants should be bent over until the stems are almost parallel with the ground, inclining the heads to the noith if the rows run east and weat, and west if they run north and south.
Some varieties are suited for autumn, some for spring, as follows:
Autumn: Michaclmas White, Self-protecting, lutuinn Protecting Walcheren.
Early Winter: Christmis White, Snow's Winter White, Early Purple 8prouting.
Late Winter nnd Early Spring: Knight's Pro. ecting, Penzance, White spmuting, Leamington Late Purple Sprouting.


Broccoli : two varieties of this winter veretable apring. Right, Late Queen.

Late Spring and Larly Summer: Model, Jate Queen, Methiven's June, latest of All.

The following standard sorts would give a good succession if sown together early in Ipril: Walcheren, Snow's Winter White, Leamington and Latest of All, always por vided the winter was fairly open
How to Cook. Strip off the outer and all withered leaves, cutting the remainder leve with the flower. Soak well in cold salted water with heads downwards to draw out any insects. Then cook for $10-15 \mathrm{~min}$. in boiling salted water, the flower part downwards and the pan uncovered, to preserve the colour. Test by piercing with a skewer, and when tender drain well, put on a hot dish and serve with a tureen of melted butter. Broccoli breaks if boiled too fast. The colnur and crispness of this vegetable will be speedily lost unless it is at once taken out of the water when cooked

With cheese sauce boiled broccoli makes an cxcellent dressed vegetable. Lay the cooked heads neatly on a huttered au gratin dish and coat with cheese sauce. Dust the surface over with two tablespoonfuls of grated cheese, mixed with a amall tablespoonful of browned crumbs. Put dish in the oven and bake quichly until the checse is browned and serve at once. See Cablange: Caulillower; Curly Kale.

BROGUE. This heary-soled shoe has a tongue which folds over the instep to prevent water entering the eyelet holes. Brogues arc used when heavier sporting boots are unnecessary. Imitations of the real article are sold, with punched toc-cap and vamp, and sometimes with the fringed tongue

## Broiling. See Grilling

BROMIDE PAPER. Bromide papers of different surfaces. glossy, matt, and of different tints, white, cream, etc., are almost exclusively used for making the so-called gaslight prints and enlargements from photographic negatives.

The paper is so sensitive to light that an exposure of a second or two bchind a negative placed a few feet from an electric lamp or gas mantle is sufficient to print a picture on it It is too rapid to be printed by daylight. After exposure, a picture quickly appears in a developer, which, in two or three minutes, produces a print of black colour. All operations up to and inoluding fixing must be done by orange or yellow light.

One or two small picces of the paper are exposed for different times, and developed in order to find the correct time for which to expose the paper. If the picture comes up slowly and remains pale, the pajer has been exposed for too short a time; if it comes up quickly and soon becomes dark and foggy, the exposure has been too long. The paper should he exposed so that a bright and vigorous print is ohtained with ahout 2 min . development. Practically every bromide paper yields


Left, Purple Sprouting, sown in winter or early Left, Purpie Sprouting, sown
wn in apring or early sommer
first-rate results with amidol, metol, or metolhydroquinone devcloper.

The exposed sheet of paper is placed, coated side up and without previous wetting. in a dish and flooded with enough developer to cover it; or a number of pieces may be quickly slipped at intervals into a larger quantity of developer. When fully developed, as shown by its vigous and depth, each is rinsed in clean water for a fow seconds and lixed in a bath made by dissolving 4 oz of hypo and $\frac{1}{2}$ oz. potass. metabisulphite in 20 oz ol water.

Chemicals for this fixing bath may be bought as acid fixing salts. Each print is best fully inimersed under the surface of the bath for a second or two ; and as prints accumulate in the hath they must be moved about so as to separate them from one another and ensure their being fully fixed. This is best done with a rounded stick, so as to avoid contaminating the fingers with hypo. which must on no account be alluwed to get into the developer. Prints will be fixed in 10 or 15 min They are then washed for an hour in running water, or in successive lots of clean water which is renewed every 5 min . Dry by hanging up on a line with clips or by laying out on blotting paper.

The black colour of bromide prints may readily be changed to brown or sepia, or to red, blue, or green. Of thesc toning processes, the one which is most largely used is sepia toning (q.v.).

BROMIDES. There are several druge ol great use in modicine which owe their virtues to the possession of the chemical element called bromine. They are potassium bromide, sodium bromide, ammonium bromide. and hydrobromic acid. All these preparations have practically the same action and are used for sleeplessness, nervous excitability, palpitation, etc., but when the drug has to de taken over a long period sodium bromide is preferred to potassium bromide.

The bromides are given in whooping-cough, ammonium bromide being considered the best for the purpose. Diluted hydrobromic acid is often taken with quinine. It helps to dissolve it and also to prevent the disagreesble effects sometimes produced by quinine. Giddiness may be alleviated by one of the bromides. and if full doses are taken every 3 hours for several days before going on board ship, seasickness may be prevented or diminished. Sleeplessness due to worry and nervous excitement may be relieved by 30 grains of potassium bromide in half a glass of soda water. Another use is in irritable conditions of the pharynx and larynx. In epilepsy bromides are given over long periods.

Bromism is the condition produced by overdosage with bromides over a period and is characterised by mental dullness, heaviness of the legs, unsteady gait, drowsiness, anaemin, an acne eruption and other symptoms. The addition of a little arsenic to the mixture usually prevents any eruption when bromides are being taken.
BROMPTON STOCK. This is the popular name ut a variety of the genus Mathiola, a half-hardy, biennial flowering plant. The seed is sown in May. In cold districts it is wise to winter the planta in a frame and put them out in spring. The plants nverage about 18 in . in height, and the flowers are sweetly perfumed.
BRONCHITIS: Care and Cure. While rarely dangerous to healthy adults, bronchitis is serious for infants or old people, in consequence of its tendency to spread to the lungs. It may be defined as catarrial inflammation of the mucous membrane which lines the bronchial tubes or air passages of the lungs.
Acuts bronchitis is most common in spring and autumn ; it may develop from an ordinary
cold in the head or be part of some nilment, such as measles, influenza, or whooping cough, and is due to the invasion of the air passages by germs. The attack begins with symptoms of a cold in the head, including perhaps sore thrnat. There may be little or no fever. The extension of the catarrh downwards produces hoarseness and a raw feeling in the chest, behind the breastbone. The tubes feel irritable, and there is a hard barking cough which may become paroxysmal. The chest feels tight and oppressed. At first there is only a slight sticliy sputum, but in about $\pi$ week's time this becomes freer, and increases the patient's comfort.

In treating bronchitis the patient should be confined to his room, and it may be necessary to put him to bed. A hot bath or a hot mustard and water foot-bath and a mustard plaster npplied to the chest are useful. The inhalation of steam from a jug of ateaming water, to which a teasponnful of Friar's balsam has been added. helps to soothe the racking cough, the patient covering his head and the jug with a towel If there is difficulty in getting up the sputum, ipeca cuanha wine in 10 minim doses may be given three or four times a day in a little water.

When bronchitis descends into the lungs, affecting the tiny end branches of the bronchial tubes, the patient's restlessness and distress increase. the temperature becomes higher, he has much grenter difficulty in breathing, and the cough is more marked. The lips and the finger-tips are often livid. The immediate attention of the physician is essential.

## Emersency Treatment

In a child the condition may be ushered in by convulaions, and the child should be put in $\Omega$ warm bath. During the course of the illness the child maty suddenly become very blue and breathless ; there also the warm bath would be used and cold water thrown on the child's chest to induce decp hreaths. These measures are, of course, only pending the arrival of the doctor.
After several attacks of acute bronchitis the lungs, particularly in middle-aged persons, may lapse into a chronic oondition ; but more often chronic bronchitis is associated with some other condition, such as heart disense, emphysemas (barrolshaped chest), diseased states of the lung induced by dusty occupations, gout or chronic kidncy diseasc. Frequently the disease takes the form of a cough, which


Brompton Stock. Flowers and foliage of the double red variety, useful for beds and borders
develops regularly at the start of each winter and lasts until the following suminer.

Sufferers from chronic bronchitis should pay particular attention to keeping the bowels regular. Two to three grains of cascara taken at night are usually all that is required. For the morning cough a hot alkaline drink, such as the following, sometimes gives relief :

## Podium bicarbonate <br> Potassinm bicarhonate <br> Chloroform water

- Irams

1 dram
4 ounces
Take one tablespoonful, mixed with two tablespoonfuls of very hot water, immediately on waling.
A thorough rubbing of the chest with ordinary soap) liniment or hartshorn and oil, and then covering the chest with a warm jacket of flannel, is also advisable in chronic bronchitis. See Cough; Lunge.

BRONCHITIS KETTLE. Special kettes made to emit a great volume of steam, which moisture is useful in assisting the breathing in bronohitis and similar complaints, are made and sold for this purpose. In case one of these is not at hand, an ordina ry kettle can be used. Filled with water, this should be placed on the fire and allowed to boil freely. With thin cardboard or brown paper, or, if theso are absent, with ordinary newspaper, a large trumpet-shaped roll should be matle.

## Place the narrow end

of this over the spout of the kettle and the wide end near the patient's bed, which, for this purpose, must be fairly near the fire. The-roll can be supported hy putting a piece of tape round it and fastening the other end of this to an overbanging projection of some kind. This improvised kettle will be found very useful in attacks of croup (q.v.)
BRONZE, Genuine bronze is generally found in the home in the form of atathary and ornaments. It is an alloy, chiefly composed of copper and tin, and is harder and more durable than copper or brass. Bronze has a pleasing dark brown colour, and is capable of taking a high polish.
The so-called bronze powders are metallio colouring materials used in the same way as gilding preparations. The article to be treated is coated with gold size, after which the bronze powder is sprinkled evenly over the surface. Various tints are to be obtained, in addition to powders simulating gold, silver, aluminium, etc.
Bronze Collecting. When selected with taste, bronze figures or vessels are restful to the eye. A classical centrepiece, such as a good bronze replica of a full-length Mercury, may be appropriately flanked by a pair of unglazed Parian figures ; it would lose in effect if placed between pieces of highly decorated china.

Egyptian bronzes are often forgeries rather than replicas, except such things as sphinx paperweights, and have little decorative merit of their own. It is otherwiso with the statuary bronzes of the Renaissance, or some admirable modern works. These are in some instances availalile in replica, and artistic reproductions have to be distinguished from inferior castings which are turned out abroad in great numbers for cheap decoration.

Replicas of ancient Chinese and Japanese temple bowls, koros or incense-burners, lanterns, hells, and Buddhist images are desirable nequisitions. The modern school of Japanese bronzists has produced excellent work, including animal groups and figures, worthy to be set out with choice porcelain jars. Some Saracenic and Persian work, especially when damascened in silver, and certain bronze lamps and figures from Ceylon are also good.
The natural patina or crust of genuine old bronze is often initated in replicas, and such finishes are not to be rejected if carried out sincercly. The intentional production of tints and sheens, either by oxidation or by liquid varnishes, reaches its highest level in eastern hronzes. Their effects are sornetimes due to the admixture with the copper-tin base of silver and other metals, sometimes to the use of metallic pastes, which are burned in and polished. Imitation patina is produced by green varnishes, which are liable to flake. or by al ammoniac.
Art-bronze is a term applied to much metal work of a trivial kind, and is especially affected by producers of tasteless ornaments, and thin stampings used as furniture panels. The collector of bronzeware for its antiquarian intereat usually preserves his treasures in cabineta. They may include a great variety. from werpons of the Bronze Age to AngloSaxon buckles and brooches, and medieval bella cast before brass had displaced bronze.
Natural patina ought not to be scoured sway. Inartistic stains may be removed, without destroying the patination, by means of a half-lemon dipped in salt. Sometimes antique bronze when unearthed is found to be oxidized throughout, and in that condition cannot be cleaned at all.
BRONZING. By the process of bronzing any article made of metal, wood, plaster, or other material is given a hronze-coloured surface. Iron and steel are bronzed by exposing them to the vapours of hested aqua regis, and dipping them infe melted vaseline. Plaster and wood are coated with size, then a metallic bronze powder is applied.
Dilute aulphuric acid and dilute nitric acid produce a bronze colour on many metals. The most artistic effects are ohtained by the use of bronzing acids on brass or copper ware. The acids are obtainable from any dealer in such substances.
The brass object is first cleaned and polished, either by mechanical means, as with emery powder, or by dipping in dilute nitric acid and washing off in hot water. The work is dried in hot sawdust, and must not be touched with the hands. Make a rubber of fine wood-wool shavings or linen, wearing rubber finger-stalls on the finger-tips to prevent the hands getting atained. Slightly warm the work, then wipe it over once only with the bronzing acid Keep the work free from draughts, and move it about over, but not too near, a gas flame. A deeper colour can be obtained by using a stronger solution or by repeated and continued applications of the rubber, slways taking care to work evenly.

BROOCB. The simplest form is the safety pin; all other hrooches are elaborations of the same idea. For a valuable brooch a good safety catch is the best form of insurance against loss.
In the case of the brooch fitted with a hook or a point-protecting catch, a safety chain should be attached. There is little difficulty in attaching it to the brooch, provided there is a small aperture through which the jump ring can be passed and afterwards closed with a pair of pliers. Instead of a safety chain, an efficient catch known as a fish tail can be fitted by a jeweller without much trouble. It consists of a amall plate, shaped like a fish tail, as in Fig. 1, and operated by a smal hinge set close to the existing entch. Fig. 2
illustrates a good form of safety catch, known to jewellers as the Tiffinny catch
Should brooch pins lreak or come out, it is quite a simple operation to replace them. Retailers of jewellers sundrics stock hrooch pins of all sizes in metal and gold. Perhaps the best investment is to buy a packet of assorted metal pins. If the old pin has broken off and the joint por tion is still in tho brooch, it can be removed by tapping out the piece of wire on which it is hinged with a stout needle and a light hammer, or the side of a pair of pliers. Take from the packet a pin long enough for the brooch, and, holding the head in the pliers, carefully file from each side of the joint sufficient to allow the pin to fit the gap from which the broken piece has been removed. Then take a piece of brass wire and file it slightly taper, so that it will go into the hinge, and force it home, as indicated in Fig. 3. Afterwards, with a file, nick the wire on each side of the linge, as shown in Fig. 4. break it off, and finish by filing it flush.

## Care of Gem Brooches

Long bar brooches, if sct with stones, ahould not be used to fasten thick material, as the weight of the material may atrain the setting, so that the stones become loose and drop out. If the pin has got strained and lost its apring in this way, it can he temporarily restored. Hold the brooch in the left hand, and, with the thumb and firat finger of the right hand, gently bend back the pin close to the joint. All hronches set with stones should be examined periodically, to make aure the gems are tight and the settings in good order.
A brooch set with jewels may be cleaned with warm water, a few drops of cloudy ammonia and an old toothbrush. 1)o it in a hand-basin and not over a lavatory basin or sink. Should a stone be lost in this way, open the trap fitted in most waste-pipes, as the gen has probably been stopped in this. Mothers with young children should not wear brooches unless fitted with a point-protecting device.

Sometimes a brooch pin will turn up at the point, and on withdrawing will bring with it a thrend of the material. The point can easily

Broocb. Figs. 3 and 4. Fitting a new pin and nicking it with a fle previous to fling fush
be straightened out. Hold the pin llat on a hard surface and, with a stecl linitting needle, as though sharpening a pencil, presa atraight the distorted point. A pin that is blunt at the point may be sharjened with a few rubs on a piece of emery cloth.
BROODER. This is the name given to a heated chamber connected to one or more outer chambers or chicken runs. It is an adjunct to the chicken incubator, and is used in order to raise chickens artificially when it is not possible to make use of a sitting hen. See Chicken; Poultry.
BROODINESS : Row to Cure. This condition in a hen is characterised by a peculiar clucking noisc, accompanied by feverishness, indicating the desire to sit. Apart from clucking, the desire to sit is further evidenced by the hen sticking tight to the nest. She should either lie allowed to obey her instincts by being entrusted with a aitting of eggs, or broken of the habit

To break up a broody hen, as it is termed, is quite a simple matter if taken in hand in the early stages. At the first indication of hroodiness, remove the hen to a coop with a slatted Hoor, that is, a floor composed of Iathes nailed crossways two inches apart. The coup is raised from the ground by bricks placed at each corner so as to allow of a free current of air beneath

In such a coop it is impossible for a hen to sit with any degree of comfort, and, being obliged to roost willy nilly, she quickly loses the desire. A few days confinement will auffice to curc her, and in the course of a week or so she will resume laying. See Poultry

BROOM: The Plant. This name is given hoth to cytiaus and geniata, hardy apring and summer Howering shrubs of great garden value. They thrive particularly well on poor or light land. When planting brooms it is important to choose small plants which have been grown in Hower pots; large plants lifted from the open ground are liable to fail

Some of the brooms are tall shrubs suitable for grouping in the flower garden and shrubbery ; others are of low growth and may ic grown in the rock garden. Of the tall kinds, which bloom in spring or earlv summer. some of the most beantiful are Cytisus albus, white, praccox, cream, scoparius, the common yellow broom and its variety andreanus, bronze red and yellow. Beautiful low growing brooms are Catisus Ardoinci, yellow, kewensis, cream, and Beanii, yellow. The genistas are

in full beauty in summer-all have yellow flowers. The brooms come readily from seeds, which may be sown outside as soon as they are ripe. or in spring in a cold frame. Cuttings


Broom. A tavourite hardy broom (Cytisus andreanus),
bearng red and yollow flowers in easly summer
strike in sandy soil if inserted under a hand. light in summer or early autumn. Layers may be put down in autumn.
A greenhouse species, genista, much grown by market gardeners, is a neat shrub with small, sweet-smelling golden flowers, continuing in bloom for a long time. It is grown in soil composed of two parts loam, one part peat and sand. Propagation is by cuttings in sping, preferably in a propagator. Small pieces of the new wood root readily in sandy peat, the more so if a heel of older wood is taken with the cutting. The plants which result should have the points taken off when they are 6 in . high, in order to cause them to break, and the side shoots thus obtained should also be stopped when about 4 in . long; this ensures neat bushes with several branches.

From May to midsummer the plants may be kept in a cold frame, and watered and syringed regularly. From that time to October they will be better on a bed of ashes in the open. They should be housed in autumn. A winter temperature of $45^{\circ}$ to $55^{\circ}$ will suit them. After they have flowered they may be cut hard back, re-potted, and syringed. They will then break afresh, and, after the necessary cuttings have been taken, may be hardened in the frame.

BROOM : For Sweeping. Brooms are made of bass, white fibre, hursehair, bristle, and coconut fibre. The stocks or handles are of alder, birch, and beech, and with the exception of certain bass brooms, the knots are invariably set with pitch. The so-called hair broom, for household use, in best qualities is of pure bristle at least 4 in . in length. Other qualities are less economical in the long run.

Points to look for in a good broom are the long, springy flag-ended bristles and the even pitch-set knots, with the outer row of knots well spread. It may be found that the outer knots are small and close made of bristle, with the inner knots large and composed of inferior mixtures. These can be detected by placing the hand across the surface of the
broom and noting the greater readiness with which the bristle will spring back when released, as compared with the less springy substitute. The knots in a good hair broom are set outwards to obtain tho maximum spread for the sweeping surface.
If the tufts of hair are stuck in with pitch, known as pan work, the holes should be well filled and a neat ring of pitch be visible at the edge of each hole, and there should be no waste of space inside the outer row of knots. When not in use a broom should be stood up in a reverse position or hung up. The best carpet brooms are made of Venetian whisk, straight, stiff, and durable. In most homes the carpet sweeper has ousted the carpet broom for Hoor sweeping, but it is still employed for upholstered furniture. Superior makes are fitted with plush protectors at each end of the stock, thus minimising risk of scratching fragile furniture, polish, etc.

In the yard or outdoor broom pure bass serves best. For very hard wear these are faced with knots oì cane or whalebone. Water will not deteriorate bass, but stiffens and keeps it in condition, so it is suitable for washing-down purposes.
The common coconut fibre broom is a cheap substitute and valueless. For hard wear, as in stable use, whalebone is mixed to give an added stiffness and durability, and in the case of heavy scavenger brooms the front row of holes is filled with split cane.
To obviate slipshod attachment of the handle an attachment can be procured which will enable the broom to be used both ways, trebling the life of the bristles, and the twoway metal attachinent fits and secures any ordinary broom-handle.
For sweeping up the litter made by falling leaves, cut grass, and so on, the garden broom or besom is highly satisfactory.
Garden brooms are made from birch twigs, cut from the trees after the periodical clearing of woods which is constantly going on. The twigs selected are up to about four feet long, and these are bunched with the strong ends level, and then tightly bound together with strip or split cane, one strong binding at the end and two or more at intervals of a few inches. A stout staff with pointed end is then driven up through the tied ends to make a handle, which is fixed by a plug passing between the bindings and through a slot or hole previously cut in the handle. See Brush.

BROOM RACE. This is a useful article for the home, and will also commend itself for the ease with which it may be made,


Fig2


Fig. 3


Fig. 4


Fig」
and the small amount of material required Fig. 1 shows the rack complete, consisting of a wood back, with pegs to hold brushes and brooms. Details of the rack appear at Figs 2 to 5. A hardwood, such as birch or elm, could be used, or ordinary deal would be very suitable. The best finish will be with stain or varnish, or varnish alone.

The back, as at Fig. 2, is 1 ft .6 in . long by 6 in . wide, and should not be less than ${ }_{3} \mathrm{in}$. thick. The long pegs for the brooms, two of which will be required, are shown at Fig. 3, and must be cut from wood in. thick. A tenon 1 in . deep by $\{$ in. long is formed at the back end of these pegs for fixing to the back of the rack. The shorter pegs for hand brushes are seen in Fig. 4, and at the back end of each peg a tenon $\frac{1}{2} \mathrm{in}$. deep by $\frac{7}{3} \mathrm{in}$. long is formed. Figs. 3 and 4 show $\frac{1}{2}$-inch squares.
Mortises are cut through the back of the rack to receive the tenons on the ends of the pegs, and a chamfer about $\frac{i n}{} \mathrm{in}$. square is cut around the edges of the back, as at Figs. 2 and 5. The pegs are glued to the back. For hanging the broom rack, two holes should be bored through the back, so that it may be fixed to the wall with a couple of brass-headed nails
BROSE. This dish of Scottish origin may be prepared with pease meal. Put two tablespoonfuls of this into a basin and stir into it $1 \frac{1}{2}$ gills boiling water. Put the mixture into a saucepan and boil carefully for 5 min . Season with salt and pepper, add a piece of butter the size of a walnut and serve very hot with milk.
For another variety of brose, break sufficient stale brown bread into inch pieces to fill a $\frac{1}{2}$ pint measure, and stale white bread to fill a pint measure. Put these brown and white pieces into a double-pan, add 2 oz . of butter and $\frac{1}{2}$ pint of milk, then cook it until the bread is quite soft and the milk absorbed. Add salt or sugar to taste, and serve in hot porridge bowls. If the bread is very stale more milk will be necessary. It is best not stirred during cooking.

BROTH. The unclarified stock made from beef, mutton, veal, chicken, etc., is garnished for broth with neat cubes of the best parts of the meat, and vegetables used in its preparation, with the addition of a little iice or pearl barley boiled in it.

BROWN: In Clothing. For autumn and winter wear, brown in varying shades is always in fashion, as the colour is warm and looks well in heavy fabrics. For women there is also the advantage that it tones with most furs. For country, sports and travel wear, brown is a good choice, as it does not show dust, and smart accessories for both sexes, shoes, boots, knitted wear, scarves, etc., can be obtained in this range more easily than in any other colour. Lighter colours can be successfully dyed brown.

BROWN BOOTS : Their Care. In making brown leathers for boot uppers, it is essential that the boot maker should use skins which are free from defects. After tanning the raw skins it is customary to sort them over carefully, and to employ those which are at all defective for lower grade blacks. This influences the price of the finished boot or shoe, so that good brown boots are dearer than black.
After a few days' wear cheap brown boots lose their smart appearance. This may not be so noticeable in the case of cheap black footwear, as manufacturers can more readily
fake the uppers of the black boot after the latter has been made. But with brown hoots touching up can only be done on a small scale with a pigment finish. Such finishes consist of a pigment colour similar to those used in paint manufacture, and some binding substance like shellac. When this is applied to the defective grain surface of the leather, the tiny particles of pigment fill up seratch marks, etc., forming a smooth surface. After a little wear this finish hecomes ineffective, and the hoot begins to look shoddy.
Cleaning and Reviving. No polish should be applied to the surface of brown or coloured hoots until all the dust has been removed, otherwise the bright brown tone of the leather will gradually dull. If it is desired to revive the original colour, the following method has been found satisfactory. The boots are placed on trees and brushed with a warm solution of soft soap. Ordinary soap is useless for this purpose. This is then washed off with clean water, soft soap rubbed into the leather and allowed to remain until nearly dry, when the excess of dry soap should be wiped off with a damp rag and the boots allowed to dry thoroughly. If a good polish of the required shade is applied the brown boots should look like new.
Trouble is often occasioned hy grease spots on brown hoots. Apply a paste of fuller's er reth, which should be left to dry before wiping off. It absorbs most of the grease without taking out the colour, and a second application should complete the absorption. If water or rain spots are allowed to dry, the lenther is likely to be spotted with light patches. For these blemishes make a stiong decoction of shag tobacco, and lightly touch them with the liquid until they resume the requisite deeper shade. Then apply a good polish to the whole surface

## Black Boots from Brown

To convert brown boots into black needs anre if the job is to be undertaien at home First, all dirt should be removed with a clenn brush. Then polish is removed by going over the upper with a cloth or sponge soaked in netrol,-followed by $a$ similar application of methylated spirit. This, of course, must be done in the open, fivay from naked lights The boots are allowed to stand for some time in the open air, in order that all the petrol left in the leather may volatilise. The surface is next lightly rubbed with a cloth dipped in either $n$ weak soda solution or some weak ammonia, after which the uppers are wiped over with warm water
By this time all foreign matter should have been removed, and the cleaned surface is ready for the dye, which can be bought at any leather goods or oil and colour stores. Two applications or more will be needed, then the bonts are allowed to dry, slowly and thoroughly. They must not be put in front of a fire to dry. Finally, the uppers are blacked over with n good black boot polish
Brown Boot Polish. The pastes employed for shining brown leather boots have a basis of beeswax and turpentine, the yellow colour being given by an aniline dye such as bismarck brown or phosphine. It is sometimes necessary to remove stains and discolorntion before applying polish to brown boots. The beat clennaer is a thick cream of gum tragacanth to which 2 per cent. of oxalic acid has been adder. See Boot.

BROWN BREAD. Unfermented brown bread can be made in this manner. Mix well Ib. wholemeal with $\frac{1}{} \mathrm{lb}$. white flour, 1 tcaspoonful each salt and sieved carbonate of soda, and two teaspoonfuls sieved cream of tartar. Rub finely into these 2 oz . margarine, butter, or dripping, and mix to a soft dough with about $\frac{1}{2}$ pint milk. Knead quickly and lightly, and shape into two round loaves.

Gash rather deeply across the top, place on a Houred baking-tin, and bake in a quick oven for about 30 min ., or till well risen, lightly browned, and firm in the centre. If there is butter-milk or sour milk, use that for mixing. and only one teaspoonful of crenm of tartar. See Bread.
BROWN BREAD PUDDING. Make 4 oz . brown breadcrumbs by rubbing stale hread through a wire sieve. Put $1 \frac{1}{2}$ oz. hutter into $n$ basin. warm slightly, and add 2 oz. castor sugar. Beat these with a wooden apoon nnd stir the yolks of 2 eggs into the creamed mixture, then add crumbs, grated rind of a lemon or an orange, a few grains each of grated nut. meg and powdered cinnamon, and a gill of milk. Mix all together and stir in lightly the whipped whites of the eggs. Pour the mixture into a well-greased basin, twist a piece of greased paper over the top, and ateam the pudding gently for 1 hour. Turn ont to dish. and pour round the pudding hot jam or other aweet snuce

BROWN HOLLAND. This plain, unbleached linen fabric for children's dresses and the like is imitated also in cotton. The window holland, usually brown and emploved for blinds, is nlmost always of cotton, finished in a special mnnner to throw off dust.

BROWNING. For colouring soups, gravies, and puddings, this is sold in bottles, but may be made at home. Put 4 oz . white sugar into a saucepan and stirover a low fire till the sugar is melted. Boil gently, and when it turns a rich brown, pour into the pan $\frac{1}{2}$ a pint water. Boil gently until the consistency of warined treacle; stir occasionally, and skim if necessary. Cool, pour into a clean bottle, and cork for use. Well-made browning should be neither bitter, from overcooking, nor sweet, from insufficient colouring of the sugar.

## BROWN JOHNNIE PUDDING.

An excellent steamed pudding made by mixing 6 oz . each flour, finely chopped suet, and golden syrup with 1 teaspoonful ground ginger. Beat an egg frothy, mix with $\frac{1}{2}$ a gill milk, and beat these into the flour, etc. Have ready a thickly. greased basin, and the water boiling in the steamer.

Put one teaspoonful of bicarbonate of soda in a small basin, mix smoothly with two teaspoonfuls of milk, and stir thoroughly into the pudding mixture. Turn it at once into the hasin, twist a piece of grensed paper over the top, and steam for two hours. Turn out on to a hot dish, and pour round it some hot sweet sauce.

## BROWN PAPER.

 Brown paper is sold in shects, the most or dinary size being 29 in by 40 in ., with 24 sheets to the quirc. Three qualitics are obtainable, according to the thick.
## ness required.

BROWN ROT : To Prevent.
During the suminer and early
autumn fruit trees are frequently attacked by a disease which produces on the fruit soft brown areas. These increase in size until the whole fruit is affected.

Diseased fruits which become nttached to the tree gradually dry up and shrivel, and these produce a new crop of sporea and spread the disease.

The best preventive measure, as is pointed out in Leallet No. 86 issued by the Ministry of Agriculture. is the removal and destruction of all mummified fruits during winter. They should be collected, and either burned or deeply buried. All infected spurs, together with cankers on the stem, should be cut out.

When fruit is to he stored, the greatest care should be exercised in discarding all fruit showing signs of brown rot. for the disense will


Brown Rot. Left, apoles aflected by rot. Right Brown Rot. Leit, apples aflected by rot. Right.
fruiting spur, showing pustules of the same fungus By permission of II.M. Stationery Othice and
not only continue to develop in the affected individuals, but will spread to others. It is advisahle to spray with a tar-oil wash in winter and with Bardeaux mixture before the blossoms open and again as soon as they have falien. See Apple.

BROWN SCALE : How to Spray. Goose. berry, curriant. peach and nectarine are all linble to the attacks of the insect known as brown scale The insect leaves n pale scar when removed from a twig, and it has a preference for the older branches. The remedy is winter and apping washing, of which particulars are supplied in Leaflet No. 223 issued by the Ministry of Agriculture.

Complete pruning before spraying operations are commenced; and in old and badly infected trees remove as much of the old wond as possible. The spraying apparatus should have the nozzle fitted at an angle of about $\left.4^{\circ}\right)^{-}$degrees so that the spray may be conveniently directed to the undersides of the branches where the insects are usually more abundant.

The best winter wash is lime-sulphur. The concentrated lime-sulphur solution can be bought ready made, and should be diluted to winter strength-3 quarts of lime-sulphur ( $1 \cdot 3$ specific gravity) to 10 gal. water. A good paraffin emulaion is



Dissolve the
Brown Scale. Undersides of, left. larva and, right. young female, highly magnified; $m$., mouth: c. channels to respiratory tubes. Right, peach twig affected by brown scale soft soap in about a gallon of boiling water. Remove the soap solution from near the fire, and while still hot add the parnffin. Churn the mixture very thoroughly, add soft water to make $10 \mathrm{gal} .$, nod make sure that there is no paraffin lloating on the surface.

BRUISE : Its Treatment. The colonr of a bruise is due to the blood which has escaped from the vessels into the surrounding tissues. It is usually at first a bluish-black.

To prevent the further escape of blood intu the tissues, an ice bag or a series of towels wrung out in cold water should be pliceed over the part. The ordinary lcad water and opium lotion poured on a handkerchicf and
then bandaged loosely over the bruise is a good home remedy.
If the skin is broken, and oozing is taking place on the surface, wash the part well with running water for a few minutes and dust it thickly with boracio acid powder or paint with tincture of iodine. Then apply a piece
of boracic lint, and bandage as firmly as is comfortable. Place the lower part at rest ; if a lower limb, elevate on a pillow; or the upper, place in a aling. A hot bath taken soon aftel the injury will help to relieve pain and stiffness. After a few days massage the part gently. See First Aid : Sprain.

## BRUSHES FOR HOUSEHOLD AND GARDEN USE

## How to Choose and Keep Them in Good Condition

Further details will be found under such headings as Boot Brush; Clothes Brush; Paint Brush : Tooth Brush. Sec also Broom; Carpet Sweeper; Vacuum Cieancr

Brushes are divided into two kinds, simple and compound, according to the way they are made. The former consist of one tuft only, un example being the brushcs used by the artist ; and the latter of more than one tuft. among them being most of the brushes used in the home. Brushes in which the tufts are placed side by side are known as stock brushes.
The principal raw matcrial used in the manufacture of brushes is bristle, almost wholly pig or hog bristle. This is collected, partly sorted, and sold in lengths from $1 \frac{1}{6}$ to 7 in . It is dressed, comhed, and mixed before heing made up according to the particular class of work for which it is intended. Bristle s exceedingly springy, and will maintain this property under ordinary conditions until worn away by use. Hence the chief value of bristle for making brushes.

## Materials Other Than Bristle

Among other materials used are fibre (Mexican grass), Mexican whisk, Bahia bass, and horsehair. Fibre and drafts (horsehair) are the chief materials used for mixing with bristlea as well ay for substitutes. Skunk fur is used for a light dusting brush with an adjustable head convenient for edges of panelling and for lighting fixtures, as shown in the illustration. A finely cut rubber brush, arranged in a spiral round wire is excellent for cleaning bottles and vases.

For fancy brush handles and backs, roseavood, satinwood, und ebony lend themselves to an excellent finish. Owing chiefly to the increasing cost of bristlcs, imitations and substitutes aro plentiful and lead to unsatisfactory wear in some cuses.

Scrubbing-brushes made of a mixture of fibre and hass, and known us union, are cheap and serviceuble. The one illustrated with a long handle working on a swivel saves kneeling and stooping. Shoe, stove, and similar brushes arc made with the root end of bristles to obtain the required stiffness. Best mukes are wirc-drawn, with screwed-on backs. Small hand brushes bristled both sides are convenient for removing dust from cushions and
rugs. Racks for holding brooms and brushes are illustrated under the heading Broom.
Fibre and Bristle. High prices call for an examination of brushes used for decorating, A common fibre brush is intended for rough work where lime is used. Whether tied on the handle in two knots with wire or string, or nailed on with tin or leather, a good finish is usually an indication of a well-made brush. The sash brush or tool of more than a dozen sizes is best made in a forked handle, and bound with a string or copper wire. The bristles are held together with a cement of resin and oil, and pulled into the handle while they are hot.
The distemper or whitewash brush with two knots is an expensive article. Five to 6 in . bristle is used, and the wire, which should not be stinterl, may be secured by solder at the corners. All first quality distemper brushea are stamped pure bristle, or covered with a similar guarantee. Black Chinia bristle, while good in appearance, does not compare in usefulness with other bristles, mainly because it does not carry or hold paint or distemper.

A moderate ululteration of bristle with fibre and horsehair is quite acceptable for ordinary purposes. A popular brush, and one that has replaced many more expensive varietics, is the flat tin varnish. These are made of China bristle, and in sizes of an inch and upwards, and are intended for general use, including varnish work. They are usually bevelled at the top of the bristle, which gives them the appearance of a part-worn brush.

A common fault with all paint brushes is the presence of frec or loose hairs, which have not been caught by the cement or held by pressure, and one by one come out to spoil work and weaken the brush. Passing the hand over the top of the bristles, as if to test the spring, will cause these undesirable hairs to rise, and any considerable quantity denotes an unsound article. These loose hairs arc particularly objectionable in pastry brushes

In the process of making, paint brushes have probably been subjected to extieme heat and


Brush : two labour-saving patterns. Left, light brush of skunk fur, with adjustable head, for dusting lighting tixtures. Right, scrubbing brush with long bandle working on a swivel, which saves kneeling
other unhcalthy conditions. and manufac turers frequently issue instructions to pur chasers which should be strictly observed, or the maximum of wear will not be obtained. During intervals of work paint brushes should be suspended in the paint or distemper and not allowed to rest on the working end, otherwise they will become clogged and for a time unworkable. Before putting aside after use, they should be thoroughly cleaned and ready for use on the next occasion. Much can bo done by wiping out on old boards, and water will remove any remaining whitewash or disteniper:

Paint, varnish and enamel brushes must be suftened and squeezed out in a little turps or paraffin, and finished with $\Omega$ warm solution of soap and hot water, working on a stone sink or board and removing all traces of turpentine or paraffin, as this destroys any cement in the brush.
BRUSSELS CARPET. The floral designs in worsted Brussels are seldom in use, but the hair carpete, made from cowhair, and aold in natural, undyed grey or brownish inixture colouring, and also in many good ahader, are tasteful, durable and cheinp. Black or coloured borders to these squares look well in small living rooms and for bedrooms. For a stair and passage carpet it is more dependable in the undyed than in the dyed shades See Carpet.
BRUSSELS SPROUTS. The leaves at the top of the Brusacls sprouts stein are excellent as a vegetable, but should be left until all the sprouta have been gathered.
The seed is sown outcloors carly in April. and the seed. lings are planted finally in June or Juily. For an early autumn crop seeds are sown in a frame in February.

Loose sprouts are generally the resuit of over. crowding and tou light a soil, which, perhn pls, has been badly dug. Directly the lower leavea turn yellow, and part conprany with the stem underalight pressure, the sprouts may be removed, but there must be no wholesale
 clearance of the leaves. The stem is cleared of sprouts from the bottom upwarde.
The best varieties include Exhibition, Landon Market, Aigburth, and Standard. Medium-sized plants, with medium-sized sprouts of superior Havour, are given by such varieties as Matchless, Wroxton, Scrymger's Giant and Imported. Sinallest of all is Dwarf Gem. It is an excellent little variety that reaches inaturity much more guickly than large varieties. Moreover, while the larger varieties require at least $2 \underline{f} \mathrm{ft}$. each way to give of their best, 18 in . suffices for Dwarf Gen.

The enemies of Brussels sprouts are the name as the peats of other greens, with the addition of the cahbage enowy fly (q.v.).
How to Cook. The usual method of cooking this vegetable is by boiling. Trim, rinse under cold water and leave to soak for an hour in cold salted water. Drain them and
put into a saucepan of boiling salted water. If using hard water put in $n$ small saltapoonful of bicarbonate of soda, for hard water spoils the colour of green reget ables.

Boil quickly until they are soft througlt, but not broken, probnbly for about $15-20 \mathrm{~min}$., and then pour into colander, drain and return to pan. Add for 2 lh . sprouts $\frac{1}{2} \mathrm{oz}$. hutter, a little dust of pepper and $n$ few grains of grated nutmeg.

Brussels sprouts au gratin form an excellent supper or luncheon dish, prepared with 1 lb . cooked sprouts and checse sauce. See Au Gratin; Cheese Sauce.

BRUSSELS SPROUT SOUP. This delicate green purée can be made entirely with milk. Creami increases nutriment and richness, but is not essential.
Trim and wash 1 lb . Brussels sprouts and put in a saucepan of fastboiling salted water, with a small onion and a very small saltspoonful of bicarbonate of sods. Boil quickly until they are soft. Drain off water and with a wooden apoon rub them through a sieve. Put back these sieved ingredients, or purce, atir in one quart of boiling milk and reheat without letting it actually boil, or the colour will not be so good. Add one gill cream and season carefully. The soup should be is thick as good cream, so add more liquid, or a little thinly mixed cornflour, and rehoil it, even should the colour suffer, if the consistency is wrong.
BUBBLE AND SQUEAK. Use up $\ddagger \mathrm{lb}$. cold potatoes, 2 oz . fnt cooked bacon, $\ddagger \mathrm{lb}$. of cold cabbage or other cooked vegetahles, some pepper and salt, and some fat for frying. Nash potatoes. chop cabbage, cut bacon into small squares and inix all together with sessoning. Heat the fat in a frying pan, and fry the inixture until brown on both sides; then shape into a Hat cake. It should be served very hot.
BUCKET: For Household Use. The strength and durability of galvanised bucketa can best he judged by the weight. A common bucket with seamed sides weighs about 3 lb . a good quality riveted about 5 lb ., while a very strong contractor's bucket with a welded iron hoop around the rim or a similar hoop at the bottom weighs nhout 10 lb . These weights are for the 12 in. size.
Firc buckets, enamelled red or bluc, weigh about 4 lb ., and when usel for fire protection purposes should be hung on a bracket, and always kept full of water.

For home dairy purposes, enamelled buckets are used, but once chipped they should he discarded as there is a risk that a small prorticle of the enamel may get into the milk.

Wood pails for stable use made of oals have narrow galvanised iron hoops. They need to he well looked after, otherwise the wood shrinks or they develop leaks.
The cnamelled bucket, with or without lid, quichly becomes rusty if no nttention is paid to keeping it in gool condition and free from dirt. A convenient form of housemaid's pail has an exterior receptrole for a scrubbing brush, and a small one for holding the soap. Another pattern has an interior receptacle and a oinder sifter that facilitates the process of cleaning the grate.
Ordinary galvanised buckets are quietened by hinding the handle or bail with cord, or litting a rubber ring. An enamelled bucket that has been chipped can be tiented with
bath enamel applied to the damaged places, and put on in the same way as for a bath.
BUCKRAM. A stiff material made of very coarsc linen or cotton, and usually stiffened with glue, huckram is used to stiffen the edges of articles in dressmaking and fancy work, etc.. or as an interlining.
BUCKSKIN. Deerhide or sometimes sheepskin, tanned in a particular way and dressed with oil to render it Hexible, is used under the name of buckskin to make riding breeches nnd gloves.
Buckskin may be washed with sonp and wram water, rinsed and dried, but this dries nad stiffens by removing the oil dressing. An nunce of yellow ochre rubbed into a paste with a teaspoonful of salad oil, and then mixed

th coloured arc immune from the attack of birds. but by smartly jarring the attacked branches with a stick numbers miny be brought down into an upturned umbrella or shect, from which they may be collected and destroyed.

BUG. Although the word is frequently used in the American sense to indicate any kind of insect, it is npplied correctly to insects of the sub-order Hemiptera, which live by imbibing the juices of plants or animals. The bed hug is a well known example of the animal feeders, but the great majority-there are about $4 \overline{0} 0$ British species-confine their attentions to plants.

The plant-feeders in Great Ibritain seldom occur in sufficient force to cause appreciahle damage; but in other lands they include the mosquito-blight of the Indian tea-gardens, the chinch-bug that attacks corn, and the cottonstainer that depreciates the cotton crop.
The bug, or bed bug, is a flat, oval insect, a fifth to a quarter of an inch in length, with six legs and a pair of antonnae hefore the prominent eyes. Its colnur is chestnut-brown or a mahogany tint. It has n characteristic odour which helps to make it a pest. Introduced from abroad about three centuries ago, the hed bug spread rapidly and settled in wainscoting and heavy furniture. To-day, with our cleaner habits, it is less abundant; but the most scrupulously clean houses may be invaded by its walking in, or by its introduction with fumiture, either from factory or sale-room.

To allay the irritation set up by its attack, the affected part should be touched with liquid ammonia, sweet oil or tincture of iodine. Any article of furniture known to harhour the bug should have ita suspected corners and crevices painted with either of the petroleum oils applied with a painter's sash tool. Where the infestation has assumed more serious proportions, the room should be fumigated with sulphur, all crevices of windows and doors, as well as the chimney, being made tight, and the door kept closed for 24 hours after the sulphur has been ignited.

The bed hug has been convicted of acting at t:mes as carrier of the germs of relapsing fever, and it has been suspected of transmitting ot her diseases. Cockroaches eat bugs, and the same good office has been attributed to the minute reddish ant, which is itself a pest in some houses. See Ant; Apple; Cockroach.

BUGLE : How to Sound. The bugle is akin to the trumpet, but hins a shorter and more conical bore; it is used chiefly for calls in the army. The anunds that can be produced are the natural harmonic serics


These sound a tone lower, as the instrument stands in the key of B flat. It is always
written for, however, in C. Of the above sounds, the lowest $\mathbf{C}$ (fundamental) is of weak tone, and is not used. The B flat also is rather too Hat to be available, while the highest C is not employed for the army calls.
The instrument should be held firmly, but not too tightly, in the middle of its thickest portion, not too near the mouthpiece. The lips being placed to the mouthpiece in such a way that none of the breath is wasted by eacape at the side, the player utters the syllable "too," the tongue being hetween the lips and quickly drawn back. The first en deavourshould he to produce the middle $\mathbf{C}$ as a holding note When this can be done with certainty, it may be varied rhythmically by the device of tonguing (" too too "), and subsequently the other notes can be produced by means of increased pressure

BUHL. The chief characteristic of buhl, or houle, work is the application of tortoiseshell veneering on The surface is inlaid with delicate tracery in metal, especially brass, and these inlays are adorned with tortoiseshell tracery. Brass feet, bracket, edgings and other ornaments are


Buhl Work. End ol a commode made of pine with brass ebony and artoiseshel marginetry work
18th century

18 th century
Hu-dermission of the Director. Dictoria
also used, either to protect the corners and edges of the piece or for decorative purposes

Trouble with the brass inlay in buhl work is probably due to the perishing of the adhesive used in the laying. In the endeavour to press the hrass back into position a kink often develops, and this must he removed as far as possible by taking out sufficient brass to enable the inlay to be hammered on something hard slipped under.

Shellac cement, either heated or reduced to a thick consistency in methylated spirit, may answer the purpose. The cabinet naker's method is to use the best Scotch glue of good consistency, and full hot Have at hand some means of pressure that will apply to the position of the inlay-i.e. a weight, a handscrew, or even a strong 4 in . paperclip may answer ; also some flat pieces of wood and brown paper. Apply the glue, using no inore than is necessary, to the back of the brass, and press back into position with a hammer-head. Then lay the brown paper over, and the flat wood over this, before applying the weight or handscrew for compression. The brass must be held in position till the glue has set.

# Building: THE Legal Aspect <br> Important Points for the Prospective House Builder 

## The following article affords a valuable introduction to such entries as Architecture; Bungalow;

Cottage: Garage; House. See also Drains; Garden; Sanitation

The man who proposes to build his own house should first of all familiarise himself with the exact legal character of the intended property, and the obligations that may be laid upon him, particularly by local authorities.

In Great Britain certain acts of 1925 made various changes in the land laws, in the direction of greater simplicity. Land may be either freehold or leaschold. Freehold means that land and the house upon it are held in fee simple, and is the nearest thing in law to ahaolute personal ownership of land.

Leasehold means that while a man purchases the bricks and mortar of the house from the builder, he docs not purchase the land on which it stands, but hires it on lease for a stated number of years, 99 in most cases, but occasionally 999, at a fixed yearly rental. The ground landlord, besides retaining his proprietary interest in the land, acquires the same interest in the house built upon it, and at the end of the lease can, through his descendants, gain absolute possession of the house. Moreover, the tenant at the time may he obliged, if the house needs repairing, to execute those repairs at his own expense, and in the case of an ordinary dwelling house has no claim on the ground landlord for any part of the outlay.

The holder of a lease of agricultural land has the right to claim compensation from the ground landlord in respect of buildings that have improved the value of the land. But the only protection available to the non-agricultural leaseholder is by way of modifying clauses in his covenant with the ground landlord, entitling his heirs to get back from the latter a little of what they give him.

More often than not the ground landlord, owing to his tenant's indifference as to what may happen 100 years hence, succeeds in
imposing a restrictive covenant that lenves the leaseholder with little choice as to the kind of house he may build or the use he makes of it when built. Restrictive covenants are also attached to the sale of many freehold building estates, but these generally relate to atipulations as to the number of houses to the acre, the piohibition of offensive trades, building in front of a certain line and so on.

There are three methods open to the purchaser of a freehold house. He may pay the whole purchase price in cash; or he may obtain a fixed or jermanent mortgage on part of the value, subject to the mortgagee's right of foreclosing: or he may obtain an advance from a building society, repayable by instalments, plus intercat on the capital, each inonth, quarter or year, according to arrangement. The last is the method usually chosen by those who cannot put down the whole price.

## Terms of Contract

When the purchaser has made his arrangements with the builder the next step is the signing of a contract. With this goes the payment of a deposit, in most cases 10 per cent. of the total purchase money. The contract binds the builder to finish the house by an ngreed date, and the customer to completc the purchase on entering into possession on that date. In the interval a formal deed for the conveyance of the property is drawn up usually by the purchaser's solicitor, who submits it to the other party for approval. In small and straightforward transactions it often happens that the builder's solicitor acts for both parties, in order to keep down the costs; but when investigation of tithe is necessary, or any other point is involved on which dispute might afterwards arise, the purchaser will do well to have his ow n solicitor.

The charges of solicitors for advising vendors and purchasers of real property are regulated according to the amount of the purchase money. These charges, which are payable ly each of the two parties, may, however, le varicd by written agreement or reduced by one solicitor acting for both. Both a contract and a legal conveyance must be stamped The Stamp Act imposes a scale of charges which work out at ahout 5 s for every $£ 50$ of the value, if the latter exceeds $£ 500$. When a huilding society's financial help is required, the borrower is called upon to pay the surveyor's fee and expenses, and a snia! fee, amounting to lUs. per cent. as a rule, on the value of the loan.

## Authority of Local By-Laws

There remains to be considered the purchaser's relationship, to the local anthority. When the house is to be erected on a developed residentinl estate, he will find that such matters as the submission of plans for the local authority's approval have been arranged for, and the builder will see to it that the plans involve no breach of the local by-laws. But if the site is on undeveloped land, and the builder does not accept any responsibility for a breach of the local by-laws which the plans may involve, then the purchaser should study these by-laws very closely indeed By-laws, though they have in several instances heen greally modified, are still stringent enough to add considerably to the cost of the house, entailing heavier construction than is alisolutely necessary and limiting the range of materials

In any case the matter of future road charges aliould be carefully investigated. Very often a building firm developing an estate will undertake the construction of everything connected with it, including drainage and roads. The latter are made with the authority's approval; but even then the authority does not renounce its right to call upon the occupiers of houses on a particular rond to remake the road at their own expense in accordance with the authority's ideas. The builder may give a personal assurance that no such demand will be made for a number of years, but he will rarely give it in writing. and it is always as well to allow for this contingency in estimating the ultimate cost of the house. The only site that is immune from the danger of road cliarges is that fronting on a road that the local authority has already taken over and made up.

BUILDING SOCIETY. A building society exists primarily for the purpose of recciving money from its members and lending it to them or to others to enable them to buy or build houses. In the United Kingdom huilding societies must be registered, and the registrar of friendly societies examines their accounts. The funds of a society must he invested upon mortgages of real or personal property, or in trustee securities. Two-thirds of the money advanced on mortgage can be borrowed hy the society
To become a member of a building society it is usually necessary to buy one or more shares. For these payment can be niade by instalments and the member's liability is limited to the shares he holds. In addition, the societies receive money on deposit, paying interest on this according to the state of the money market, but usually giving a higher rate than the banks. Money on deprosit can he withdrawn often without notice, although in the case of large sums notice is required.

Money may be horrowed either on building society nortgage or on ordinary moitgage, the security given being a mortgage on the property. In the foriner case it is for any time not exceeding 1.5 y ears, monthly repayments of principal and payments of interest being inade. In the latter case, the principal is repaid by quarterly instalments, but these repayments do not begin until three years have elapsed. Interest is paid monthly, as in the case of
the other class The rate of interest varies and selecting bulbs. Hyacinths are graded und commences on the day the mortgage is executed After the first year it is charged on the balance of the principal which remains unpaid at the beginning of the year. An additional I per cent. is charged during the first three or four years of the mortgage.

An applicant for an advance should fill up a form of registration and pay a registration fee of ls. The property to be nortgaged is then surveycd. For this fees a verage a guinea for each $£ 500$ of the mortgage below $£ 1,000$, and a guinea per $£ 1,000$ above. Extra travelling expenses are liable to he charged for property more than five miles distant.

The officials of the society will, on receipt of the surveyor's report, decide whether or not the advance shall be made. If the decision is finvourahle, the entrance fecs on the shares necessary to make up the amount of the advance should then be paid. The title deeds or the abstract of the title should be handed to the society's solicitors, who, if the title is approved, will prepare the mortgage deed, and on its execution and the receipt of the law charges will pay the amount.
The scale of law charges is $£ 3$ is. for an advance not exceeding $£ 500$; $£ 44 \mathrm{~s}$. for one between $£ 500$ and $£ 1,000$; and $£ 1$ ls. extra for each $£ 500$ or fraction of $£ 5(0)$. Persons who wish to erect a house cannot, of course, obtain money upon it until something is in existence. In such cases it is usmally possible to arrange for the buider to wait for his money, or the hulk of it, until it can be olitained from. the building society. See Mortgage.
BULB : How to Grow. In the popular sense hulls include daffodil, hyacinth, narcissus, iris, tulip, crocus, lily, snowdrop, and many others, some of which are not really hulbs, but rhizomes or cornis. Bulbs should be lieavy in proportion to their size. Soundness may betested by pressing the thumb on the hollow at the base: this will be firm if the bulh is sound and soft if the hulb is unsound. Reject all soft, spongy hulbs. Flower grouth must be preceded by atrong, healthy ruot action, and the cultivator should give it every encouragement.
Both size and weight have to be conaidered in



Bulb. Above, two examples of indoor culture: left, single narcissus; right, white Dutch Roman hyacinth. Below, fritillaries grown out of doors
the free passage of water. The compost should be thoroughly mixed some time hefore it is required for potting. It should be moist but not sodden.

If new pots are used, they should be well soaked for several hours, and allowed to dry. Figa. 5 and 6 in the diagram show correct potting, with ample drainage, and the bulbs resting on a base of silver sand. Bulbs should not be planted deeply, as in Fig. 7, or too much above the badly drained soil, pictured
in l'ig. 8. To drain,
place n large piece of broken pol over the drainage hole, smaller pieces over and around it. and still smaller pieces above these, then some of the rougher parts of the compost.
Bulbs Grown in Water. Bulbs are also grown in glasses of water rainwater when possible. To keep it pure, a fow pieces of charcoal are put into the glass, as shown in the diagram It is not necesaary for the bulb to touch the water; it should rest just a bove the surface, as in Fig 1, not in the water ns in Fig. 2. Loss of water must lie marle good from time to time. Bulbs in glasses are best kept in a dark cupbonrd until they have made considerable ront growth, as shown in Figs. 3 and 4 of the diagran Staking is sometinies essential. and wire supports should be emploved.
Some bulhs, more especially the bunch-Howered narcissi, do well in bowls when placed among pebbles and water, but the more customary mothod for indoor culture is to plant in a mixture of shell and fibre.
is a first saze bull, and will command the best price for the particular variety. Nevertheless, a bult is often less than 2 in . through and still a first size bulb, as the varieties differ in respect of the size of their bulbs. The bulbs of daffodils, tulips, and lilies vary a good deal in size. If lily bulbs are shrivelled they should be laid in coconut tibre refuse about a fortnight before planting.

There is no better compost than three parts of sound loam, one part of thoroughly decom. posed leaf-mould, half part of decayed cow manure, and sufficient coarse sand to ensure
soil. Very little pruning is required. The Langley bullace is the best for gardens. See Damson; Plum
BULLDOG. The big head and wrinkled face of the hulldog are read by anme persons as the outward and visible signs of a savago


Bulldog. Champion of this breed, showing the massive ahoulders and widely aeparated front leas
disposition. Yet there is no dog that is safer and that will with a sweeter temper endure all the indignities that may be put upon him by a young child. As a house guard, his methods are his own : instead of warning off an intruder by barking, he prefers to adninister punishment silently, and he is not persuaded easily to relax his hold.
In selecting a bulldog, choose one whose body is broad and thick-set, and his head large even in proportion to his body and square-looking-as deep as broad; the thin, amall ears set high on the head, the upper part falling to the side. The mugh, broad nose should he black, the nostrils large and wide, separated by a sunk line. The thick, muscular neck should be short and arched; the chest broad and deep, keeping the short, straightboned forelegs far apart. The hind lega should be long and less massive; and the round, smooth tail should taper sharply in its short length from a thick base. His gait should be heavy and slouching. The maximum weight for a bulldog is 30 lb .
There is a toy race, known at shows as the ministure bulldog, which is in every respect save size a replica of the ordinary breed, hut its weight is limited to 22 lb . The French bulldog is apparently a variety of the smaller breed, but distinguished from it at a glance by its erect ears ; those of other bulldogs are always drooping. See Dog.
BULLET WOUND. The first-aid trentment of gunshot wounds may involve the treatment of haemorrhage, fracture, and shock. It calls for the greatest care to avoid further contamination of the wounds by dirt. thereby incressing the dangers of septic inflammation and tetanus.
Bleeding from the wound may be arrested by pressure as described under bleeding, or in the case of a limh by an improvised tourniquet.
Firm pressure should not be applied on the skull or over broken ribs. Simply apply cloths wrung out of clean, cold water. Such cloths should also be put on a wound of the abdomen, and then a towel pinned round or two broad-fold bandages. Fractures of the limbs should be fixed oy padded splints, and of the ribs by broad-fold bandages, before an attempt is made to remove the patient.

Wounds should be washed by pouring over them cold boracic lotion, if possible, or cold water, and then covered with boracic lint or clean rags. Shock is treated by kceping the
patient covered up, chating the limbs, upplying hot bottles, and giving hot drinks of tea or coffee, or, if all blecding from a linib be stopped. a little spirits and water.

In wounds of the trunk care will have to be taken in giving anything to drink at all till the doctor's arrival. A bullet may remain in the body without any bad reault whatever, though if it is easily removable it is desirable to take it out See Bandage; Bleeding: First-Aid; Fracture; Tourniquet.
BULL MASTIFF. Although a cross breed pure and simple the Bull Mastiff has been accepted by the Kennel Club in its classification, and this has enabled the breed to achieve prominence. At one time known as keeper's night dogs, their duty is the protection of person and property. A bull mastiff with its massive frame and stout build is necessarily a formidable foe. The prevailing colour is brindle, either light or dark, but fawn specimens are not uncommon. A dog of this breed should be massive in all proportions -the head heavy, the jaws level, and teeth sound and strong: the neck thick and well rounded, the chest deep, the ribs well sprung, the loins short and strong and the limbs big boned, atraight, well carried and well placed in relation to the body. Common faults are cowhocks, splay feet and weak quarters. Careful training is necessary.

BULL TERRIER. The modern examples of the breed have less of the bulldog atrain and more of the terrier of their original ancestry.

Except for his black nose and small black cyes, the bull terrier should be wholly white, with a close, short cost of stiff glossy hair. The head is long and Hat, wide between the aemi-erect ears and tapering to the nose. The jaws are long and powerful, and the nostrils open. The shoulders are muscular and alanting, the chest wide and deep, and the legs straight. The rather short tail tapers from a thick base to a fine point, and is carried without curl at an angle of $45^{\circ}$. The bull


Ball Terrier, a powerfully built breed of dog
terrier varies in height at shoulders from 12 in . to 18 in ., and in weight from 15 lb . up to 50 lb See Dog.

BUMBLE BEE. The bumble bee performs a useful service in the garden by fertilising flowers, but sometimes it causes injury, particularly to broad beans and antirrhinums The honey being secreted deep in the blossom, the bee has a difficult task to force its body down to the nectaries. It finds an easier way by puncturing the calyx and petals from outside, and then drawing up the sweetness from within. The result is that pods in embryo are often spoiled by the puncturing and fail to develop properly, with a consequent reduction of crops. Šee Bee.

BUMBLE FOOT. The heavier breeds of poultry are more particularly subject to the disease known as bumble foot. It consists
of a swelling in the hall of the foot which, soft at first, gradually hardens and, becoming full of pus, is very painful. The cause is com ${ }^{-}$ monly attributed to the fowl jumping to the ground from a high perch, hut it is also liable to arise from injury caused hy contact with hard substances, such as glass or rough stones

The symptoms are lameness and a disposition to squat down. To cure it, apply bread or linseed poultices, and then cut and expel the pus, afterwards applying a simple ointment. The foot should be bandaged for a ferr days, and the hird placed in a pen by itself where it cannot perch lut has to rest on straw. See Poultry.

BUMBLE PUPPY'. This children's game can be plaped by two or more persons. A pole should he planted firmly in an open piece of ground. The height of the pole varies with, the space availahle, as the taller the pole, the greater the space required, but it should not lic much shoiter than 10 ft .

From the top of the pole an old tennis-hall in a string or erocheted bag is suspended by a stout cord to about 3 ft . from the groundl. The firat player muat hold the hall out and strike it with a racket, his aim being to wind the cord round the pole before his opponent is able to hit the ball hack. When one or the other player succeeds in so winding it the game is won.

If there are more than two persons playing sides must be taken. The great rapidity of movement neceasary and the quick accord between hand and eye make it an excellent practice for lawn-tennis. The game is also called stick-tennis or apiro-pole.
A game of whist played regardless of rules is given the name of bumble puppy, which is also an alternative name for the old game of nine-holea.

BUN : Plain and Spiced. Of inuch the same consistency as bread made with yeast. sweetened, and currants or raisins adcled, for buns the dough is formed into rounds and browned well on top.

Spiced buns are alan marle with yeast. The following is a good recipe to be used for these or hot-cross huns: Sieve 1 lb . flour, $\frac{1}{2}$ teaspoonful mixed powdered apice, and a good pinch of salt into a warm basin, rubbing into them $t \mathrm{lb}$. of hutter. Then make a well in the centre of the paste. Put $?$ o7. compressed yeast into another warm hasin with a teaspoonful sugar and beat to a cream. Stir in $\frac{1}{2}$ pint lukewarm milk and 2 well-beaten eggs, and then pour all into the centre of the flour, etc Mix the whole lightly and beat until smooth : then cover the basin and put it into a warm place so that the dough may rise to twice its original size This should take ahout $1 \frac{1}{2}$ hours.

Clesn 3 o7. currants by rubbing them on a sieve with a little flour, and add to the risen dough, together with a little less than $\pm \mathrm{lb}$. castor sugar. Shape the dough into small huns and place on n greased, floured tin a little distance apart. For hot-cross buns mark a cross on each with the back of a knife. Ieave them in a warm place for $10-15 \mathrm{~min}$., when they should he almost double their original size. Then brush over with milk and hake in a hot oven for $10-15 \mathrm{~min}$ See Bath Bun; Rock Bun.

BUNG : Of a Barrel. In everyday use, a bung presents three problems? how to get it out, how to replace it, and what to do when it is not tight and allows the contents to leak.

The withdrawal of a tightly fitted hung is almost impossible without danaging it, but a sharp atecl spike. curved at one end and handled at the other, will sometimes prove effective. Careful prizing with a screwdriver is nccasionally successful, or three corkscrews inserted into the bung, ticd
together with string and then pulled. When be found helpful in securing a tight joint
all else fails the bung can lie driven through into the interior of the cask.
This necessitatcs the construction of a substitute Provided a sufficiently large piece of cork is available, fashion it into a hung by cutting the cork with a penknife. Otherwise a circular piece of wood, such as that from the end of an old comice pole, is easily shaped with a chisel and rasp. To obtain $n$ good fit, try the hung in the hole and give it a twist; this will show up the high spots on the bung. and by cutting these off a good fit ultimately reault $A$ diak of washlenther or cloth will tealed by in

## Bungalow: Plans and Building Details

Four Typical Examples of Attractive Dwellings Described and Illustrated
The reader may usefully turn to Architecture; Bricklaying; Cottage; House; and other articles dealing with constructional matters; as well as to Building; Drawing, erc.
For the purpuse of this article the word but wasteful in pasangea, and the hroaler type hungalow is assumed to mean a house with all of plan, compact as regards communication, its rooms on one floor, to be lived in all the but lavish in the height and spread of its roof. year round, and one that in construction and It is for these reasons that most examples quality of finish will bear comparison with save the amallest assume the $L$, the $U$, or the its higher-built neighbours. The bungalow $E$ shape, the additional cost of hips and can offer real advantages in reducing running valleys heing compensated for by the leseer and service ex-


Bungalow. Fig. 1. Bungalow at Stalnes, with verandah facing the Thames ; below, plan showling arrangement of rooms round a central saloon Desioned oll T. Davison, A.R.I.B.A
from which all the rooms are entered. The drawbacks of the first type are obvious; whether it is worth considering on account of the large gain in cubic contents-that is, costis for the occupier to decide. Fig. 1 illustrates the central-room type. This is a compact little riverside bungalow; in winter the many doors incidental to this type become a serions drawback. In Fig. 2, a cosy-looking bungalow of permanent construction, the same type of plan is rather more developed. There is a small vestibule to screen from outside draughts, and a comfortable sitting-room independent of the common living-room.

When we consider the second type of plan, in which the rooms are separated by communi cating passages, or hall, we at once come on the great difficulty of the bungalow designer He must compronise between a long, narrow building, which is economical of mof span Bung holes can be enlarged or made with a tool known as a bung horer, but a drill and a cabinet rasp will answer. Steel drums containing oil and wood preservative are much more convenient if patent comhined bung and pourer be substituted for the customary cork. A home-made substitute is simply made and consists of a bent tube, ahout $\frac{1}{2} \mathrm{in}$. diameter and an air inlet pipe about $\frac{1}{1} \mathrm{in}$. bore, and curved. Both are inserted into holes drilled in the cork bung. The drum can be sealed by inserting a cork into the mouth of the tube. See Barrel ; Cork

Four Typical Examples of Atwactive Dwelings Described and Wustrated ralleys heing compensated for by the leseer
sage is relatively hoth short and well lighted.
The L-shaperl type bungalow is shown in The L-shaperl type bungalow is
Fig. 4, $a$ well-arranged and welllighted plan, which is also compact and easy to roof. This example also possesses the excellent arrangement of placing the living rooms en suite, so that two moderate moms can, on occasion, be thrown into one large one if required.
All these examples, with the possible exception of Fig. 1, illus. trate bungalows which are meant for more or less constant residence. and built of permanent materials. They can thus be fairly compared with the average two-storey house, and offer distinct advantages. On the other hand, the week-end bungalow, for merely ata ying in, is so varicd in size. purpose, and construction, that it is impossible to generalise. Being built for a different atandard of life, the materials of ten are poor, and the general level of finish such as would not be tolerated in an ordinary house. Owing to the absence of a stair-
ronf span and
decreased pasdeoreased

Tho bungalow shown in Fig. 3 tends to the $U$ shape, and has the charm of that most sympathetio of all roofing, reed thatch. The ingenious disposition of the rooms will be noticed in this example since, although it contains four bedrooms, the winding pas-
ad well lighted.
case, it is usually easier to give any desired aspect to rooms than in the two-storey house This concession, however, is modified by the difficulty of gmuping hedrooms and, without excessive passage way, keeping their donors away from the entrance hall, a desirable point. Site and aspect uaually have greater influence upon the plan in the bungalow than in the house. The most accommodating site is one with access from the north or north-cast, which gives service quarters, etc., on the colder entrance side, with the living quarters to the south or southwest, overlooking the gardens and catching the mnxinum of annshine.

Whether bedroonis should face east or not is a mintter of personal choice. A small point that is often overlooked is the value of some suggestion of plinth or baso, lest our bungalow tend to look like the top portion of a house half sunk in the ground. For the arme reason the utmost should be made of any littlc difference in level, terrace, or steps.
The roof will usually be sprearling and low in pitch, if only for the sake of economs, and this, if well proportioned, combined with broad eaver, will de much to give a restful effect as well as a useful shadow. Chimneys. in the nature of things more numemus in the bungalow, should be grouped and arranged when possible to sit squarely on a ridge, or at least should hear some definite relation to the ronfing scheme rather than protrude apparently at random, as is so often scen. Scale should be carefully conaidered, and accessories such as railings, porches, trellis work, etc., are most useful in preserving this. The usual fault is to make them too clumsy and lacking in elegance. If the roof is of thatch it is better to form the gutters and downpipes of wood in the old manner

## Brick the Best Material

The moat general and, other things heing equal, most usually satisfactory material for the walls is brick. Whether this is finished with facing bricks good enough as regards texture and surface to he left, or whether cheaper bricks are to be used, and the outside to be finished with plaster or limewashed. depends upon tho materials obtainable and restrictions of oost. In any case, unless mugh.
plaster is to be applied outside. the walling of the building in order th ensure weather-proofness, should he hollow.
An economy that is perfectly antisfactory in one storey buildings is two walls of brick on edge with the through hearlers acting as bonders, or ties. This requires an external covering of plaster, etc., but effecta a saving in hricks, and is amply atrong ennugh to aupport the small "eights of $\Omega$ bungalow:
Many efforta have been made to popularise wood construction in England. It is worth


Fig. 2. Bungalow at Penshurst. Kent, built of brick, rourbcast, with tiled roof and renuine half-timber work in the gable. Above, plan
noting, however, that noting, however, that
in America, one of the great homes of building in wood, there has been a growing tendency to revert to brick construction. Wood construction usually implies a solid braced framework of wood, covered externally with overlapping boarding, the inside walls being plastered or covered with a sub. stitute, such as asbestos
sheeting, match, or pressed fibre hoarding. The main advantage of the wood house is the speed with which it can be erected compared to other forms of construction. In general, too, its initial cost is less, though a well-const ructed wood house is by no means much cheaper than a brick one, especially if solid foors and substantial foundations are employed. Its disadvantages are obvious-shorter life and greater upkeep; in fact, hefore building a wood house its yearly cost of upkeep and repairs should be ascertained and capitalised and added to the initial cost.
Pise-de-terre, that is. walls of earth rammed between shuttering until homogeneous, is a very old method of building. On account of its inherent weakness it is unsuited for lofty walls, and therefore more particularly applicable to the bungalow type. It alsn needs to be made of considerable thicliness, this latter failing being its grentest charm. Like the wood building, however, it requires ordinary brick foundations and chimneys, and some form of surface protection. Fig. 3 shows a bungalow of this material, in which the pleasing effect of the softened corners will be noticed. As, however, many soils are unsuitable for this method, the prospective builder will do well to obtain expert advice before deciding on his site.

## Use of Concrete for Walls

Concrete forms a fourth method of wall construction. This may be either cast in shuttering on the job, or the wall built of previously east blocks. Systems are innumerable. Probably one of those using cast blocks with two or more cavities in their thickness will make the beat wall. In general, concrete for domestic building is not now widely used. For inside walling, however, the thin wall of "breeze" concrete blocks has almost entirely superseded the division of plastered studding.

Assuming a raft of concrete over the site, the floors may be either hollow or solid. In the first case the board is laid on wood joists, on dwarf brick walls, a short distance above the surface concrete, having-what should be, but often is not-a well-ventilated space belon. The alternative is to lay the foor hoards solid on the concrete in mastic. on the principle of a wood block fioor. This


Bungalow. Fig. is. Bungalow at Heanlieu, Hants. The walls are made of pisé-de Dexioned bu Leonard Murlin, F. $\boldsymbol{H} /$ B A
method has heen rapidly gaining in favour of late years, owing to its convenience and greater safety from dry rot.

Setting aside such materials for the roof as ashestos compounds and corrugated iron, there remain slates, thateh, or tiles, which may be either flat, as in Fig. 2,
or the pantiles. If slates are or the pantiles. If slates are used, an endeavour should he made to obtain
one of the thicker varieties and to vary the colour. They usually look best over a whitewashed wall. If a sawn stone ridge is not used, the ordinary half-round ridge tiles, alternately tarred and whitewashed, make a good sulstitute.

Windows may be of casement form, either wood or steel, or the familiar boxed sash window. There is little difference in the cost between them, what there is leing rather in favour of the casement. If casement windows are used with shutters, these should open inwards, a fact which must be remembered when designing inside curtains.
Internal arrangements on different principles are indicated in the plans ac companying Figs. 1-4. Various detailed arrangements, which are common to house and bungalow, are discussed under the heading Architecture. Bungalows are naturally harder to heat $t h a n$ houses, and if a central heating system is used, special attention should lie paid to


Fig. 4. Bungalow in Nottingham, without chimnegs, as beating is
by gas. It is of stucco-faced brick blocks. Above, plan Desiuned b|l D. Howilt. I R.I B.A.

securing sufficient tall to the pipes More over, bungalow chimneys, on account of their lesser height, are rather more susceptible to down draughts, and trees or buildings arljacent must be considered. There will usually be found ample room for storage purposes in the roof. Rough hoarded and provided with a generous-sized trapdoor, it becomes a useful box-roon, etc.

## Comparison with a Small House

It is interesting to consider the relative merits and cost $\mathrm{o}^{\prime}$ a bungalow and a twostorey house. The average iden is that it is much chenper to obtain the same accommodation in bungalow form, that passages are eliminated along with staircase, and that by having one storey half the brickwork is saved. Such conclusions cannot be said to be justified. As to actual saving, the omission of stairs, upper flooring, joists, etc., is obviously in its favour, but the area of ground llooring is practically doubled. As regards walling, the gain is small, since the lower height is usually more than offset by the grenter perimeter. Chimney stacks, too, though less in height, tend to be more numerous and less easy to group Damp course foundations tell heavily against the bungalow, as also does increased roof area, with its consequent greater length of gutter and ridge On the other hand, there is greater speed in ercction, and certain advantages, such as decreased scaffolding and easier supervision. Many of these points do not apply to the very small and simple bungalow, which may, cven in initial cost, prove the cheaper. Ahove a certain size, however, the one-storey type tends to overtake and pass the house, though many will think the relatively small increase in first cost more than justilied by its inherent advantages.
I careful analysis made hy Mr. Edwin Gunn, FR.I.B.A., concerning the approximate cost of a bungalow and a two-storey cottage of almost identical accommodation gave a working result of 9 per cent. extra to the former in initial cost. This granted, however, the advantage of having all the rooms on one floor

is undoubtedly great and is increasing with the steady development of mechanical devices.
BUNION : How to Treat. A bunion is a swelling over the joints of the foot; it is usually found on the first joint of the great toe. It occurs with displacement of this toc towards the other toes by pressure of tight, badly shaped boots, or in cases of osteoarthritis. The resulting irritation causes thickening of the skin.

The first step towards a curc is the provision of a properly shaped hoot, that is to say,
straight on the inside. It may be necessary to have a boot specially made so that there is no pressure on the inflamed part. If the deformity is at all pronounced, a metal aplint may have to be worn

If inflammintion occurs, tincture of iodine may be painted on, one or two coats nightly for thren or four nights; but if there is suppuration, a doctor will have to let the matter out. See Corn ; Font
BUNSEN BURNER. Universally used in laboratories and workshops, the Bunsen burner may be called the foundation design of all gas cookers and domestic gas fires The principle of the burner is to utilise the velocity of a Buphthalmum. Name of the hardy jer jet of intlammable gas or vapour issuing from cnnial popularly known as ox-eye (q.a.).

## BUREAUX: ANTIQUE AND MODERN

## Practical Hints for Collectors and Handicraftsmen

Other articles of similar nature are Cabinet: Chair; Chest; Sidebard. See also Chippendale; Inlaying; Joint; Sheraton; Walnut, etc.

There are only a few bureaux of enrlier date than the reign of Queen Anne in existence, these being chiefly specimens from Cromvellian times Walnut bureaux are $\Omega$ familiar feature of Queen Anne furniture. They usually had a glazed case or a cabinet of drawers ahove, were fitted with a sloping lid, and surmounted by pediments of various kinds, which never entirely went out of fashion right through the 18 th century.

Bureaux were made by Chippendale and Hepplewhite. The former made many that had ahove a bookcase enclosed by two doors, or a china cabinet. Above the cornice the broken pediment is found, and sometimes in the centre a crown and feathers. The inside fittings followed the Queen Anne models as regards their arrangement, but with carved decoration or lacquer work. An oak bureau should cost less than one of walnut or mahogany, because the tro last-named woods were used for finer pieces. Mahogany bureaux over 150 yeara old are rare.

Secret drawers were often concealed in the complicated interiors of burenux. A place where one may be looked for is on either side of the central pigeon-hole, where a little decorative column is sometimes placed. That column hides the drawer, discovered by putting the hand through the central pigeon-hole to the back and feeling there for n secret spring which releases the column, which then comes away with a narrow drawer behind it. Another drawer-a very simple device-may be placed at the hack of two little brackets which are sometimes found to right and left of a central recess undernenth the row of pigeonholes. These small brackets simply come out as drawers.
Antique Patterns. The illustrations on this page show fine examples of hureaux. No. 1 is a somewhat unusual example. Made of walnut towards 1700, it stands on cabriole legs with hoofed feet. The top is fitted with eight small drawers, four pigeon-holes and in the centre a cupboard. The pillare on either side of the cuphoard should be noticed, as they form the backs of two secret slots, intended for hiding papers.

No. 2 is typical of the Chippendale period to which it belongs. The fine lacquer work ornamentation showing Chinese inspiration and influence and also the broken line of the pediment should be noted.

No. 3, of walnut, lias interior fittings not unlike those of No. 1; but the four long drawers in the body of the piece suggest a more practical design, which has been very considerably imitated since.

Apart from its decorative effect, a burcau takes up leas room than a writing-table, has deeper drawer space, and affords an opportunity of quickly enclosing a considerable amount of correapondence.

Making a Bureau. For the bureau shown on the next page, Fig. 5, mahogany stained to a rich plum colour, and either hright or dull polished, is successful, while waxed walnut has always a refined appearance Oak, stained and polished to a Jacohean or mut-brown colour, will leave little to be desired for Fig. 3, and birch. heech, and basewood are efficient substitures for a cheaper article, all these three taking stain well

For a medium sized article the np portioned width may be 2 ft . 6 in.. whilst a small size may be put at 2 ft . wide. The height to tahle top is 2 ft .6 in. and the enclosed slope rises from 10 in to 12 in. nbove this. The

depth back to front is 1 ft .5 in . over the side Two different styles of burean are pictured. and taking the onk or Jacobean (Fig. 3) it will he seen that the main construction consists of two parts. The case encloses drawers and pigcon-holes, heing separate from the base support, which is in the form of a atoul, with recessed top into which the case drops. A front elevation of this bureau is given nt Fig. 1, showing fairly deep drawer accommodation in the general dimensions marked, the width being 2 ft .6 in . The depth of 1 ft .5 in. marked olt the side elevation allows for ample servicc. If shallower drawers are desired. the stool could be increased in height by a couple of inches or so with good proportions. A sketch of parts which will be handy for reference is secn in Fig. 4, which shows clearly the chief joints and fittings.

The sides (A) are of $\$$ in. thick hardwood, or Fin. thick if faced The front ed ge is vertical for 1 ft .4 in ., and then is cut back to n point $9 \frac{1}{2} \mathrm{in}$. from the bact edge, to which it finishes at right angles and at a height of 2 ft .3 in . This 9 ? in. takes the top shelf, which should be of equal thickness with the sides.

The inner ahelf or table top (C), in line with which the fall will open out, is best dovetailgrooved into position, but could be tenoned or dowelled to sides. It is shown as of equal width with the sides, but could be of 11 in . width only, so that, when fitted, it projects 1 in. under the stationery box (inserted later), and gives a bcaring. The joint into sides is stopperl $\frac{1}{2}$ in. from the front edge of the sides, and the part pushed home.
The hearer rail (D, Fig. 4) is $2 \frac{1}{2} \mathrm{in}$. to 3 in. wide by 8 in . thick, and enters into the sides with a couple of tenons. A couple of similar rails can be dovetailed in at E , one at front and one at hack, instead of the full width bottom of the case.

The runners ( $F$ ) are tongued to the rails in addition to being grooved to the sides, and are a clean-up from stuff 3 in. wide. They should also he grooved as well as the inner edge of rails to receive dustboards(G). whichare


Bureau : antique examples. 1. Walnut bureau on cabriole legs and boof leet, late 17th century. 2. Piece at the Chippendale period ornamented with lacquer work. 3. Walnut bureau with shaped Interior Attings 1 and 3, courtesin of Gill \& Reloate. Lid. 2, Victoria and Allert Museum. S. Kensington

edges of the
sides and top shelf.
The ata. tionery case is practically n separate box for in. sertion, and optional in its arrangementof pigeon-holes and drawers, eto. 'The surround cant he of $\frac{3}{1}$ in. thick. ness, dovetailed or nailed to.
devirable to limit the drift of dust in course of service.

A check or short inner up right $(\mathrm{K})$ is fitted $\frac{3}{4}$ in. away from case sides on each side of the upper drawer, entering with a couple of tenons topand bottom; the resulting fin. space hetween serves for the slide (J) to travel in.

The slide supports the fall when down. It is made 3 in . wide, and noounted on a block (H) to make up the balance of height with the top drawer. The slide can be ensed from ifin. thickness, and should travel smoothly without play

J'he drawer fronta (L, M) are shown in lig. 3 ns bruken but can be mitred ul in manner indicated at Fign. 4 neat effect. The section is $t$ in. wide and is obtninable in 10 thick by eady for, and is obtrinable in 10 ft . longths endy for glueing and pinning as reglimed. The
 otoms 1 in ., all dovetailed together in the usual manner. Handles of the pear-drop variety, with bolt and nut fastening, are preferuhle for the Jacobean design (Fig. 1).
The back can be of $\frac{\mathrm{g}}{\mathrm{k}} \mathrm{in}$. or $\ddagger$ in. thickness, matched or plain, and may lic rebated in or screwed on. The grain should run horizontally.

The fall or Hap (as Fig. 3) call be framed up of $\frac{1}{2}$ in. thichness, with a panel $\frac{1}{2}$. net clamperl each end and screwed behind. A $\}$ in. by $\{$ in. section mould is mitred up to drop in of face. Alternatively the fall can be framed up of $\frac{3}{3}$ in. thickness with $\frac{1}{2}$ in panel grooved in. and the recess moulded on the solid. It will he rebated to lap partly over tho

## Burglar alarms for the Home

## How they can be Fitted and How they Work

The article on Burglary that follows gives other information about protecting the home against burglars. See also Alarm and the entries Battery; Circuit, and athers thal deal with electrical matters

An alarm should he workel automatically by the entrance of the intruder, and so wake the inmates. For this purpose the beat syatem is electrical.

For effective working a burglar alarm de. pends on the operation of a contact either hy the opening or shutting of a door or window. Every jossible means of entry should be fitted with an alarm contact, and the design is important, as the apparatur may stand a long time without attention. A rubbing contact tends to clean itaelf automatically, and is therefore better than a push contact.

Fig. I shows the door or window contact consisting of an arm carrying two contact
plates normally separated from each other these are forcel together by menns of a paw whenever a door opens beneath it. The device is fixed to the architrave over the door. Window contacts nre made on the same principle. Figs. 2 and 3 illustrate arrangements of contacta applied to a window and wo arranged that the circuit is completed if the window sash is moved.
One form of door or window contact is emberlded in the woodwork, and consists of a barrel and plunger normally preswer inwards by the door or window-sash. When this moves, a spring forces the plunger
outwards and makes contact between tivo
contact plates, thus ringing a bell. Burglar alarma are connected in the same way as an electric hell, but without a press in the circuit. If it is desired to disconnect the alarms it is best to introluce a switch in the main lead from the battery.

A nother method is to arrange a clock in the circuit, with adjustable contacts so that it automatically opens or closes the circuits during any prearranged hours. The clock may be electrically driven, or, alternatively, of the spring-driven type, but the latter nust be wound up regularly.

## Relay in the Alarm Circuit

An ingenious device consists of a relay in the alarm circuit. When a window or donr is opened the circuit is closed, the relay releases a catch that in turn releases a weight or apring sufficiently strong to close a switch in an electric lighting circuit, with the result that not only is the nlarm bell set a.ringing, but the house is illuminated at the same time.

Where it is intended to protect aparticular object of value, such as a safe, a spring contact is concealed heneath the floor covering, so that if the safe is moved the circuit is closed, and the alarm given.

The foregoing paragraphs have denlt exclusively with open-circuit systems which can easily be put out of action by cutting the wires at any point. In the closed cincuit alarm system the essential feature is that when in action the circuit is closed, a current of electricity flowing constantly along the wires and through the alarm contacts. The moment this circuit is opened, as by the opening of a window or door, or hy outting the wires, the aiarm bell rings. The ainateur must be particularly careful not to mix up the two systems of wiring: nor to use any apparatus unsuited to the conditions for closed circuits.

The wiring diagram, Fig. E, illustrates a typical alarm circuit; but us many contacts as needed will, of course, be wired on the same principle.

There are several methods of wiring on the closed system, two of which are illustrated. These show simple arrangements and only a few contacts; but given adequate battery power, any number of contacts can be intro. duced. Contacts on the closed system are connected in series, that is, the wire from the liattery goes to one terminal of the lirat contact, und continues from the other terminal of that contact to the second contact, and so on in serios, ultimately returning, via the bell or relay, to the hattery.

## Alarm Attached to a Door

Fig. 4 shows a single door contact at $A$, with a bell of the ordinary vibrating type, with the addition of a third terminal. this being in connexion with the contact poat. I hattery of Daniell cells is shown at C , and a switch at $D$, as a cut out for use when the ularm is not needed. When this switeh, $\mathbf{D}$, is closed, current Hows from the hattery, through the switch to terminal 1 on the bell, thence through the magnet coils to terminal 3 , through the contact $A$, and hack to the battery. This energises the bell's magnets, and attracts the armature, pulling it out of contact with the contact post, and maintaining it in this position until the circuit is broken. as by the opening of the door. When this happens and the circuit is broken, the bell armature fies buck and makes contact with the screw on the contact poost, the bell then rinying in the same way as an open circuit hell. It will continue to ring until the door is again closed.

This system suffers from the defect that if the door is again clused, or the severed wines reunited, the bell will cease to ring. For this reason a relay can be introduced with allvantage, as it can be used, as shown in Fig. 5, to close a local circuit to a continuous ringing
bell. In this case the Daniell cell, $C$, passes the nuts buried in tho current through the wire and contacts to the relay magnet coils, and then back to the cell. The relay being thus energised attracts the armature, $A$, of the relay, pulling it away from the contact screw, B. It thus acts as an automatic switch, for, on the opening of any contact, the current ceases to flow through the relay; the armature, A, flies back and makes contact with $B$, thus closing the local circuit through the bell. This being an ordinary continuous-ringing bell, it will keep on sounding its alarm although the door contact be again closed. The bell can only be stopped ringing by opening the switch $D$ and resetting the catch on the bell.
The ideal protection is obtained by combining hoth systems, fixing open and closed contacts at every point to lie protected. Separate wires are run for both sets of contacts, and if these wires are braided or intertwined, it is almost impossible to sever them without ringing the bell.
It should be noted that the expression window closed need not necessarily imply the entire closure of any window If it is desired to have some ventilation, all that need be done is to introduce a framework, covered or otherwise, between the window-sash and the top of the window framework. Or even a strut of wood between the sash and the contact. The window should be werlged to prevent the wind shaking it, as this would tend to relense the atrut and start the alarm ringing.

The battery for any closed circuit system has to be of $\Omega$ suitable type, as the current is flowing constantly. The battery that is in most extensive use for this work is the Daniell (q.v.). Other well-known batteries alao used are the Edison-Lalande. the Fuller and the Bunsen.

BURGLARY: How to Prevent. The best plan after installing an alarm system is to attend to such mechanical devices as will make entrance impossible or at least difficult.

Adequate protection is often provided by building in strong iron bars for bathroom, larder and frequently kitchen windows. Casement windows can have the protecting bars cranked or bent outwards, as in Fig. 1, to allow the window to open. Such bars are best inserted and securely cemented into the hrickwork. Window bara screwed to woodwork are readily prized out. If it is nesessary to fix such bars, they had better be affixed with coach-bolts,
the nuta buried in tho wondwork and covered with a wood plug, as in Fig. 2.

Locks, bolts, and fasteners should next receive attention. The sockets into which the latch of a lock catches can be reinforced with a strap of iron, securely screwed or bolted to the woodwork. The fastenings of the lock itself should also be examined and strengthened if need be. The keys of all ordinary locks should be left in place and sceured from turning by inserting a crossbar of metal through the bole in the handle of the koy and fastening the metal bar so that it cannot be removed or shaken out, or by a spring metal Intter cannot be pushed back. bent wire, as shown in Fig. 3. This prevents the safest way is to drill and tap a hole through the lock being picked or the key being turned. the meeting bars, and screw them together

Door holts are best if set diagonally and with a countersunk head metal screw
fastened to the door frame, with a socket fastened to the door. This arrangement is more difficult to undo with a wire through the letter-box, than the normal arrangement of horizontally placed bolts. Incidentally, protect the letter-box with a stout hard steel wire grating or letter-basket. Inother safeguard to a holt is to insert a hardwood plug into the hariel behind the holt, so that the

A sash window is best protected by drilling a hole through the inner or lower sash, and half-way into the upper; a piece of metal pushed into this hole effectively locts the two. The aame plan can be adopted when it is desired to leave the upper sush open, the hole in this case being drilled with the sash in the desired position. The metal peg should be practically flush to avoid its withdrawal by anyonc putting an arm through the opening.

Casement windows with wood sashes can be plugged in a similar way to ordinary sash windows. With metal casements probably


Burglar Alarm. Firs. 1-5. Diagrams illustrating appliances and electric circuits to give warning of attempts to open windows or doors

After all the doors and windows have been madc secure from within, one at least must be fastened from the outside. One way of doing this is to fit one or more carriage-locks, like $\Omega$ railway carriage door-lock, ainking it into the doorpost. This is actuated with a carriage key from the cxterior. The keyhole is covered with a knoh, and is unlikely to attract attention. See Bolt ; Lock, etc.
Burglary Insurance. A useful form of insurance is that against loss by hurglary, housebreaking, and theft of property from tha house. Burglary is a rolbery from a dwell. house by night. Night means between 9 p.l. and $6 \mathrm{a} . \mathrm{m}$. of the next day. Housebreaking is a rohbery from a dwelling-housc between 6 a.m. and 9.j.m.

Both offences connote a breaking in or a breaking out. If a thief finds a door or window open, and gets in that way, he ia not a burglay or houselireaker; hat, if ho steals anything, he has committed larceny from a dwelling. house. A householder ought to get a policy covering him against these risks. When a theft of any soit takes place, the insurance company should be informed at once, as well as the police.
In this kind of insurance, as well as all others, it is essential to insure up to the full value of tho property. If not, only a proportion of the loss-the same proportion that the total value of the goods insured bears to the amount insured will be praid for. See Insurance.

BURGUNDY. Burgundy is a wine from the Hante - Bourgoyne. Baswe - Buourgoyne. Maconnais and Beaujolais, in France. Fuller in body and of greater alcoholic strength than claret, it possesses a fine, clear. dark-red colour and charming bouquet. The wines which rank the higheat of all the Burgundy wines are Romanée Conti, Clos de Vougeot, Contact Contace Chambertin, Nuit St . Georges, Nilits - Prémeaux and Corton.

Many fine wines come from Pommard, Volnay, Savigny and from Beaune in the Côte-d'Or. The last named
is perhaps the best known amongst the cheaper Burgundies, although unfortunately many chemical decoctions are sold under the name of Beaune which have never come from Burgundy. A true Burgundy can always be known by its clear dark red colour and bouquet Safe Burgundies of certain vintages are Volnay, Pommard, Mercurey, Moulin-ì-Vent, and Beaujolais

Burgundy matures quickly, and a wine of 10 to 12 years old is in its prime. It should be slightly warmed before drinking; if brought to the dining room an hour or two before dinner it will get the right temperature. Bur. gundy should be decanted carefully so that the deposit does not get into the decanter.

BURGUNDY MIXTURE. A useful spray for potatoes, to prevent summer blight, is named Burgundy mixture. To make a 1 p.c. solution put 1 lb . copper sulphate in $\pi$ wooden tub containing 8 gal. of water and allow it to stand a few hours. When dissolved, put $1 \frac{1}{2} \mathrm{lb}$. sodn in $\frac{1}{2}$ gal. hot water and when dissolved cool down with it gal cold water Pour the 2 gal . of soda solution slowly into the large tub. Its method of application is identical with that of Bordeaux mixture. See Bordeaux Nixture; Potato.

BURN : How to Treat. Injury cnused by dry heat or Hame is called a burn; a scald is the result of moist heat. There are various degrees of burning. It may cause simple redness or greater redness and blistering, but leaves no scar on healing (first degree).

Destruction of all the layers of the skin mny be caused nlong with the nerve endings, so that there is less pain, but a deep and permanent scar remains (sccond degree). If the tissues underlying the skin are destroyod the result is deep scarring with deformity (third degree). Charring of the bone may nlan occur. The immediate effects are the pain and some degree of shock

The doctor should be suminoned al once if the burn is a! all severe, or if shock is present.
Pending his arrival shock should be trented


Children may very carefully he put in a warm bath: this will help the shock and facilitate the removal of the clothing from the burnt part. If any burnt clothing adheres to the part, it should be soaked thoroughly, and if it does not come away easily, it should be cutoround.

With regand to first-aid dressing, there are various suitable remedies; the one chosen will depend upon what is handy. Greasy applications should not be used except for slight burns, as they are usually difficult to remove. If blisters are small they should be left, but if large they should be pricked with $n$ clean needle or scissor-point. A good method of dealing with them is to thread a needle with white cotton and to boil these for a quarter of an hour in a clean pan. The needle is passed thmugh the blister from end to end, and the cotton cut, leaving about half an inch on either side. The fluid contained in the blister gradually drains away.

For burns of the tirst degrec one of the following can be used : A dusting powder of zinc oxide, 1 oz and boracic acid, 1 dram Vaseline or carbolised or boracic vaseline. Zine ointment. Bicarhonate of soda, inade into a thick paste and applied in a good layer. Olive oil. Lint soaked in a 1 p.c. solution of picric acid, or picric gauze, moistened Where blisters are present, lint or clean linen or cotton spread with boracic ointment or carbolised vaseline should be applied.

Paraffin preparations may be used for burns of the first and second degree If not available, the burn should be covered up with cloths sonked in boracic acid solution, or in the case of a limb it might be immersed in warm water in which a heaped tablespoonful of boracic acid has been dissolved till the doctor see. 3 it. The cloths should he kept moist with the solution, as if allowed to dry they adhere to any raw surface.

When much scarring takes place after $n$ burn, there is a tendency for the senr to contract. and if a joint is involved its movement mny be impaired: or where opposed surfaces are involved, they may adhere together. The greatest care should therefore be taken in carrying out to the letter the instructions given by the doctor regarding the position in which the parts are to be kept. See Ambrine; Bandage : Carron ()il: First aid: Scald.

BURNER : How to Keep Clean. In oil lamips for table or wall use the burner is generally made of several pieces of brass, oranty arranged. One part adapted to screw into the reservoir or oil container is called the body; nnother part, to guide and support the wick, is the wick tube, and a part to support the glass or shade is the gallery.

The wick tube generally has an extrat part to accommodate a shaft and $\operatorname{cog}$ whecls to raise and lower the wick. Oil burners for heating stoves are made on similar lines, but some burners have perforated metal cones in place of a chimney, and these vaporise the oil, which then burns his sides, and giving him hot drinks -tea or coffee, or a little diluted spirita, or a teaspoonful of anl volatile in a with a hot, blue flame
wineglass of water. The patient should be kept perfectly quiet and free from worry.
one or more atmospheric hurners. These automatically mix the air and gas in correct proportions to ensure a hot fame, although the hest makes are fitted with independent means of adjustment.

To obtain the best results from any form of burner, clennliness is essential. A dirty oil lamp always gives off a strong odour. See that all screw-threads on lamp bodies and fillers are sound, and that the requisite washers are present and in good order. Parafitin oil burners are eagily cleaned by removing the wick and boiling the burner for half an hour in strong sodla water, drying off over the fire.

Incandescent gas burners should be cleaned from time to time by removing them from the bracket or fitting, taking the burner apart. and blowing or brushing away all dust and accumulated dirt. If this cleaning is not done occasionally the nir passages beconie clogged with dirt, and a greater proportion of gas has to be burned. The same remarks apply to warming and cooking stoves. The burner is in this case generally made of cast iron When dirt or dust accumulates within the passages cast into the burner, it is removerl by hoiling in soda water, or by brushing. See Acetylene; Bunsen Burner: Gas; Lamp.

BURNING BUSH. Dictammus fraxinella, as the burning bush is known to botanists, is a herbaceous hardy perennial, 2 to 3 ft . high.


Burning Bush. Flower apikes and leaves of a garden plant with a particularly pleasant scent
It benrs alternate pinnate leaves and purplish red-veined Howers in summer, and has a pronounced and agreeable odour. During hot weather the plants exude a volutile, inflammable oil which may ignite if a lighted match is put to it. If stocli is wanted, it is best to break up one plant only and use small portions of the flealiy ronts.

Bursitis. Name applied to inflammation of the bursa. See Housemaid's Knee.

BUSHEL. The bushel is a measure of capacity used for grain, fruit, and other goods. The imperial hushel mensures 22182 cubic in., and contains 80 lb , or 8 gallons of water; but there are other bushels, generally of local signiticance In dry neasure the bushel contains 8 gallons or 4 pecks, and 8 bushels go to the quarter. The bushel of English wheat, rye, and maize contains ( $\mathrm{j}_{0} \mathrm{l} \mathrm{lb}$., the bushel of barley 50 lb ., and that of onts 39 lb . The bushel of foreign wheat is 62 lb . Sce Dry

## Measure: Quarter.

BUSH FRUIT. This term is usually applied to small fruits 'such as raspberries, currants and gooseberries, but larger fruits
also may be grown in bush form, e g. the apple. Bush fruits are commended to those with only limited space, and, given suitable soi and position, provide good crops with very little trouble November is the best time for planting. After-care is important, light hoeing and freedon from weeds being of great benefit. Under-cropping with low growing vegetables, if necessary, may be carried out alniost to the stemis of the trees.
BUTCHER'S BROOM. A native evergreen, found on the heaths, butcher's broom has angled, erect stems, and rigid, twisted spiny leaves, on the centre of which the greenish white flowers appear in early spring. They are followed by red berries in early winter. The height is 2 to 4 ft . This shrub is dioecious, i.e. male and female fowers are on separate plants. Both must be planted to ensure fruits. A good slırub for shady places.
BUTLER : His Duties. The butler is the head man-servant. He has charge of the wine cellar and the plate, supervises arrangement of meals, and directs the servants who wait at table It is the butler's duty to announce visitors whom the fontman has admitted and ushered in. If there is no valet, the butler looks after his master's wardrobe and secs that his clothes have been brushed and laid in readiness. At night he sees that the house has been properly closed up. The butler generally takes his meals in the housekeeper's room, and is responsible for the indoor men servants
BUTLER'S TRAY: To Make. The principal ohject of the butler's tray is to provide a corner where dishes can be placed while neals are served. It consists of an oblong tray on a stand, and has flaps on either side : when raised and fixed, these form an edging to prevent plates slipping off the tray. Holes cut in the llaps allow the fingers to pass through so as to carry the tray (Fig. 1). The stand is X -shaped and collapsible.

Another type, without Haps, and carried by means of fixed handles, is simply made either in mahogany, oak, or white deal. The top should be 2 ft . to 2 ft .6 in ., and 18 in . wide, using $\frac{3}{3}$ in. material. If deal is used, a piece should be olitained which is 9 in wide and double the length required. This is cut in two and the pieces glued together, so as to get the 18 in . of width required for the top.

Two battens about 2 in . wide are screwed to the underside (Fig. 2), the edges and corners


Butcher's Broom. Spray of foliage and berries of the evergreen beath plant. See above
being hevelled. These not only strengthen thetray but prevent the wood from warping through hot dishes being placed on the tray. A narrow edging should be fixed round the sides with round-headed hrass screws
A convenient height for thic stand is 2 ft .9 in . It is made in two separate frames, one fitting inside the other, so that one will be 2 in wider than the other. If the top is 2 ft . in length, the legs should be cut off 3 ft. 1 in. long, ! rom 1 cut off 3 ft. 1 in
widh heing if in . Pace all the legs together and mark across bored large enough to take the collar, which is them the centre, where a hole is hored to take the bolt, which should he as thin as possible so as not to weaken the legs; also mark the length. The legs have to be cut at an angle to conform to the top and floor.

Next, screw at the top of each pair of legs a cross-piece 3 in . wide, and another piece 6 in . from the bottom 2 in. wide, as in Fig. 3, allowing 2 in . difference between cach frame; the top pieces are bevelled at the same angle

the top pieces are bevelled at the sane angle be fixed after polishing.

## Butter and Butter Making Simple Methods for Use in the Home Dairy

Consult further Diet; Vitamin; and the entries in this work on Checse; Cream; Milk, etc. See also Churn ; Separator

Butter is essentially the fat of milk. fresh milk is allowed to stand for several hours, the fat in the form of cream rises to the surface the larger globules first, and the small ones only after a long period. The cream, alimmed from milk that has been allowed to stand, contains besides the fat also some of the curd (casein) of the milk and some of the watery part, of which the skinı milk principally consists. This method of obtaining cream for butter-making leaves still some of the milk fat anong the skim milk. The milk is placed overnight in large shallow basins and in the morning the cream is skimmed off.

A more effective separation is olbtained by the use of a machine called a separator. This revolves at a high speed, some 1,000 revolutions per minute, and, as the fat and the water are of different weight, the fat is driven in a layer to the top, and is drawn off by a tube fixed at the plane where the watery part ends and the fat laver begins. These machines are made in amall sizes, suitahle for lome use. In one of these small separators an iron enamelled stand and crank are screwed to a table, and on them rests the separator proper, consisting of an upper bowl-like part into which the inilk is poured. In the bottom of this bowl is a small hole plugged by a metal rod. This must not be removed until the separator is revolving at full speed.

Beneath this bowl, and fitting into it, is another small howl containing a number of inverted, cone-shaped disks fitting closely one over the other. These revolve when the crank linndle of the separator is turned, and by their rotation the fat or cream is separated from the watery part of the milk. The cream runs out through one spout and the separated inilk through another, and hoth arc collected in separate basins. After the separator has been used, it is taken apart and its component portions washed in boiling water to which a lump of washing soda has been added. It is then rinsed in clear hoiling water, dried and put together again. The crank-handle should be oiled two or three times a week.

Each day the cream reparated can be run into the same basin and then set aside to ripen or becone fit for churning. When the cream is two or three days old the buiter is of a richer colour and Havour. The beat temperature at which to churn the cream is about
$60^{\circ} \mathrm{F}$.; if it falls below this the churning has to continue longer lefore butter inaterialises. In hot weather it may he desirable to stand the churn in a hasin of cold water to which chips of ice should be adrled.

Churning and Washing. For use in small households, the best kind of churn is a glass jar with a screw top, through which passes a rod holding wooden paddles inside the jar and a handle for turning them, like that of a mincing machine or egg whisk. The churn and paddles must be scalded hefore use, and everpthing must be thoroughly clean. The top of the churn is taken off and the ripened cream poured into the jar. The top is then screwed on and the handle turned, slowly and steadily at first, and gradually quicker, until the revolutions of the paddle are almost sixty a minute The cream lecomes thicker until it is like a thick custard. After a few more turns of the paddle it becomes grainy and little tlecks of butter appear.
The churn is then opened and a cupful of cold water


Butter. Simple butter maker for bousebold use
Courtesy of the Slainest Kitchen
Equipment Co., Lid. thrown ill It is then screwed down again and the paddle gently turncd. After ahout six turnsthe grains of butter becone bigger, sticking together in clots, and most of the buttermilk sinksto the bottons of the churn. The churn is then opened and its contents poured into a basin. Clear water is put in a second basin, and by spoonfuls the butter is lifted out of the but. termilk and


Butter. Making butter pata : 1. Place butter on mould. 2. Cutaway surplus, firat top, then bottom balf. Butter. Making butter pats : 1. Place butter on mould. 2. Cut away surplus, frat top, then bottom balt.
3. When monlda are separated, the pat will come ont. 4. Pair of moulds. Eutter cooler in pottery a courtesy of Staines Kitchen Equipment Co., Ltd.: 5. courtesy of Selfridge at Co, LId.
placed in the water. The butter is squeezed and off. To serve as a hot vegetable, soak 1 ll . kneaded with wooden spouna to get rid of the butternilk. The washing water is changed repeatedly until it remains clear. If butter. milk is left in the butter it will not keep, and also has a sour Havour. When the last washing water has been drained off, the butter is sprinkled with fine salt and the latter well worked in ; this helps to preserve the butter.

The quantity of butter produced by a given quantity of milk varies. The average should not fall much below $\frac{1}{2} \mathrm{lb}$. from a gallon of milk. If too much water is left butter soon turns rancid. When the quantity made is for domestic use, the butter may be first prepared as described, and then renixed with a small quantity of fresh milk. If prepared for commercial purposes it must not contain more than 24 per cent. of water. The commendable points about milk-blended butter are that it has a pleasant flavour and a oreany consistence. It does not keep well, but in small quantities this is not so important.

Butter, heing easily contaminated, should be kept in the coolest part of the larder, away from meat, fish, onions, or other strong. smelling foods. When choosing salt hutter, test it by plunging a knife into it. If, when withdrawn, the knife has an unpleasant odour, the butter may be regarded as rancid.

Butter contains the food principle or vitamin also found in beef-fat, the yolk of egga, and in fish-oil. As a fond butter is a heat-producer. In an average diet about two ounces per day, including cooking, is enough. It can be prepared from the milk of goats, asses, etc., but the pronounced Havour does not commend these to people familiar with ordinary butter.

Butter Cooler. The various types include those made of porous pottery, the butter being placed on a tray which reats upon another containing water. The cover is placed over the butter and rests in the water, with the result that the porous pottery alisorbs a considerable amount of the water and so becomes cool. Butter coolers are also made in zinc.

BUTTER BEANS. Prepared and used similarly to haricot beans, these beans are largeı and pussess a more delicate Havour. The skins are somewhat indigestible and if desired may be removed by putting soaked beans in boiling water for a fow minutes, and then into cold, when the skins will easily come
beans overnight, then put into a saucepan of cold water, with a piece of dripping or a lump of fat Boil until tender (2-3 hours), replenishing with hot water, if necessary, and

In making a collection of buttertlies or moths two methods are adopted: to catch the mature insects with a net, and to rear the caterpillars. By the latter method more perfect specimens will, as a rule, be obtained.

The butterfly net is made of mosquito netting or leno, with a hem of stouter material around the mouth through which passes the cane frame. If made at home it is advisable to purchase a brass Y-tube. The lower arm of this fits on the end of a stick and the upper arms take the ends of a curved cane which, hefore bending, measures about 3 ft . The depth of the net-bag should be twice the width of its mouth, and should have a rounded bottom, the stick being the length of a walking-stick.

Armed with this net, the collector visits such places as he has onserved to be the haunts of buttertlics: flowery fields, green lanes, heaths, the borders of woods and the open rides through them. For butterllies this must be in sunshine, jreferably in the morning. Moths, being mostly night-fliers, must be sought after sunset. While many moths are attracted to light, others may be trapped by dipping rags in a boiled mixture of coarse foot-sugar dissolved in beer. The rags are pinned to trees, or a stripe of the sugar painted on the tree trunk. These baits are visited with a lantern; the moths will be captured easily, each in a separate glass-bottomed box, about $1 \frac{1}{2}$ in. in diameter.

Many kill their hutterflies whilst still in the net by nipping the forebody between finger and thumb; and if neatly
about $f$ hour before serving add salt and other seasoning to taste. They are excellent eaten with boiled bacon, or they can be served with tomato $o$ cheese sauce on hot buttered toast
To make rissoles, prepare $\frac{1}{2}$ pint beans as above, adding 1 teaspoonful mixed herbs with sensoning about $\&$ hour before done. Pass through sieve and mix with yolk of one egg and $\frac{1}{f}$ pint stale breadcrumbs Shape mixture into balls or flat cakes, coat with white of egg and more breadcrumbs, and fry golden brown.
A good thick soup) is made by soaking and skinning 1 pint benns and putting them into 3 pints cold water or unsalted stock, with celery, ollion, tomatoes, chopped parsley and pepper. (Salt must not be added until beans are tender) After hoiling pass the whole through a sieve, boil up and add 1 oz . hutter and more water or stock, if necessary. A ham-hone or bacon trimmings, adderl while soup is cooking, improves the llavour. See Beans: Haricot Beans

BUTTERCUP. The yellow buttercup of the meadows and pastures is a wild species of the Ranunculus, and is also known as the crowfoot. This is a very troublesome weed in gardens. It must either be spudded out or killed by dropping carholic acid on the crown of each plant. Another method is to dip an iron skewer into sulphuric acid and force it down the centre of the plant. The best reinedy, however, is thorough digging of the ground, picking out and destroying all the roots as digging proceeds.

## Butterfly and Moth Collecting

## Securing and Preserving Favourite Specimens

Following the entry Birds' Eggs, another articic that deals with a collecting hobby, the reader will find instructions about making a suitable cabinet for his exhibits


Butterfly Collecting. Glass-bottomed bos, 1t in. diameter, used for catching moths
performed this is effectual by compression of the chief nerve centres. Others put their captures into a cyanide killing bottle, or bring them home alive, each in its box.
Specially made entomological pins of various sizes are used for pinning, and these are obtained from the dealers by the ounce, $\frac{1}{2}$ or $\frac{\mathrm{oz}}{\mathrm{oz}}$ A pin of a si\%e proportioned to the stoutneas or slenderness of the insect's body is passed straight through the fore-body (thorax) and the protruding point inserted in the central groove of a corked setting board. The wings are then carefully arranged in the conventional manner, and secured in position by strips of thin card pinned to the cork surface, hut not through the wing. The antennae and fore legs are secured in a similar manner. The specimens should be allowed to remain un disturbed until the hind body has become stiff, which takes from 10 days to a fortnight A little disk of paper with the locality where talien and the date should be translixed by the pin under the insect.
Caterpillars for rearing may be obtained by noting plants whose leaves have been partiy enten; the spoiler may le hiding on the under side of the leaf or lower down the stem. The beating of trees $\rho$ r bushes over an open umbrella will yield many eaterpillars. At home these should be placed on $n$ sprig of the proper food in a breeding cage, which may be a bo: with a glass front and with perforated zinc or wire gauze at the back or topl The food can be kept fresh by having a small hottle of water with a hole bored through the cork large enough to take the sten of the plant.

In the cabinct drawer the insects should be arranged in vertical rows, each species with a neat label bearing the name below the speci-
another. It can be made in wood, metai, or other material. It is in woodwork that the butt joint is mostly used, and it is generally
mens, which should include one of each sex, an exampie sct with the lower side uppermost, and any others that show marked departure from the typical form, colour or markinge. The latter are known ns aberrations and varieties

The drawers of an insect eabinet are undivided, the bottom is lined with sheet cork to receive the points of the fine pins, and the framed glass lid fits airtight. - There are cells to contain camphor or powdered naphthalene, as without one of these deterrents the specimens will be reduced to dust by mites, look.
 secured by glue, nails, or screws.

## There are certaín

 essentials to success in making a simple butt joint. The work must be measured correctly, cut off square and true, and assembled and nailed together in proper order.In metal work, a butt joint is usually riveted, brazed, or welded, examples being the riveted butt joint of a girder or bridge and the welded butt joint of ordinary gas pipe. See Box ; Joint.
BUTTON. Small machines and supplies of button moulds are obtainable for making cloth-covered plain buttons, thus enabling the home dressmaker to turn them out neatly covered in any kind of self material.
Craft workers in metals can make enamelled and filigree buttons, and also original designs in beaten metal. Neat fingers and a hook are needed to plait strips of leather into buttons suitable for tweed coats.
The larger sized moulds, if for embroidered


Butterfly Collerting. Some requisites: 1. Breeding cage lor caterpīlars. 2. Setting board with specimen in position beneath.
thin paper for drying. 3. 8pecimens in position in cabinel drawer
buttons, may be covered by hand. Cut out a circle of material half again as lice or other oncmies. The calinet should stand clear of the wall-especially an outside wall-to ensure safety from damp.

Should a cabinet be considered too expensive an item on beginning the collection, the insects may be housed safely in storeboxes which can be obtained from any dealer for a few shillings. A very suitable cabinet for butterflies or moths can be made on the lines of the birds' egg cabinet described under that heading.

BUTTERFLY FLOWER. The schizanthus, or buttertly flower, is a greenhouse piant that blooms abundantly in summer. The best results are obtained by sowing the seeds under glass in September and repotting the seedlings us is necessary, finally placing them in 7 -in. pots. They develop inte fine plants and bloom in May and June. Seeds may also be sown in the greenhouse in spring. There are many varieties. The colours include rose, orange, and lilac, as well as white.
BUTTERMILK. This is useful in making liscuits, cakes, scones, etc. When comlined with bicarbonate of sorla, less cream of tartar is required than where fresh milk is used.

Butterscotch. Sce Toffee.
BUTT JOINT. The simplest of ail joints is the butt, which might bo described as the abutting of one piece of material on to
large as the mould, whip round the edge, pluce over mould, and draw up tightly, finishing off underneath. In most cases it is better to embroider the material, either in sills, wools, or beads, before it is cut up into oircles for covering the moulds ; but care must be taken to keep the design within the area of stuff that will show on the right side when the button is finished.

To sew buttons on firmly, stitch many times to and fro through the garment and the holes in the button or its shank or the material covering it. Finish before fastening ofl by winding the ootton tightly severaltimes round stitches, between the button and stuff. A thin material may be strengthened if a sma!! s quare of stuff is put on the wrong side of the


Buttonnole. 1. Making a round end. 2. Buttonhole with round end. 3. Buttonhole-stitch. 4. Making square end. 6. Buttonhole with square end. 6. With counded and square ends. See above.
garment and sewn in with it and the button For heavy coat buttons strain is avoided by a small button placed on other side ot the mateial and stitches taken through both huttons.
BUTTONHOLE : Bow to Make. Before cutting buttonholes important points to decide arc whether they are to run across of down; whether they will look better rounded at one end or square at both ends If the button is to rest at one side of the buttonhole when the yarment is fastened, then a round end at that side allows the button to fit in snugly.
To make certain that buttonholes are even, take a piece of light cardboard and make a notch in this, within one end, corresponding to the distance required between each buttonhole, and thus mark their positions. Buttonholes are usually sewn with $\Omega$ thick twist cut a little longer than the length required for one buttonhole. The starting of a new thread before the buttonhole is complete spoils the even effect. Take'z of a yard of twist for a ? in. buttonhole and proportionate lengths for a larger or smaller one. Usa buttonhole scissors for cutting and make a clean slit of the required length - Where the rounded end is to lie, hollow a little out with the scissors. If the material is woolly or liable to fray, it is necessary first to overcast all round with cotton Where the buttonhole is to be worked through a double thickness, it is important to tack round the position for the buttonhole, to keep the layers from slipping when working.

Commence stitching at the end farthest from edfe of material, and work from left to right Insert needle through buttonhole from back to front about $\frac{1}{8}$ in. from lower cut edge, and taking the rloubled silk that comes from the eye of the needle, put it under the protruding point of the needle from left to right: then draw the needle through, pulling it upwards so that the knot of the stitch conics exactly on the cut edge of the buttonhole. Repeat for the other stitches, making them exactly equal in length When the rounded extremity is reached the stitches must diverge like the points of a star. For a square end make a row of buttonhole stitches at right angles to the line of the buttonhole and have knotted ends inwards, but first make two or three straight stitches across the end. See diagrams below, also Appliqué.

BY-PASS: How to Test. The name is given to a mechanical device whereby a gas burner (for example) can be lighted up or turned down without matches. One type of construction is seen in the diagram and consists of a separate small passage-way. controlled direcily by the gas tap.

In the best makes of gas-burner the by-pass has $a$ regulating screw and locking nut. The lock nut is to hold the screw in place when the correct adjustment has been lound. If the by-pass llame is too small it wilk be blown out by the rush of gan from the burner, thus cnusing an escape which, in $n$ closed room, may have serious consequences; if too big, it will waste the gas and cause the mantle to be blackened and soot up.

With some makes of incan. descent burners the gas thp turns off the gas to the by-pass when the burier is fully lit, but re-admits
ges to the by-pass when the light is lowered Such burners need care. ful udjustment, or are linble to fail if turned on or off ton quickly.

The nozzle of the hy-pass tulse will become ohoked up with deposit after lengthy and continued use; it can be cleanerl by
wiping with a dry rag and pricking out the hole with a very fine wire, or a burner pricker. On most gas gey-


By-pass. Sectional diagram o incandescent gas burner, sinow sers the by-pass jet is controlled by a small tap, but the same principles of adjustment and cleaning apply.

cABBAGE. Growing treely in all soils, tho cabbnge is a very hardy plant. It can be sown to yield produce at most seasons, hut chiefly in spring, early summer, and autumin. If the hearts are not cut too low, but near the base of the lower leaves, the stump will throw up secondary sprouts.
It enjoys a deep, rich soil, but while the ground may with advantage be fertile, it should also be firm. especially for the spring orop. Yard manure of any kind is suitable. Sulphate of ammonia or nitrate of soda, 1 oz . per sq. yard, should loc applied occasionally in spring and summer.
Cabbages for late summer and autumn are sown in March and April, for spring in July and early in August. One ounce of seed should produce 1,000 plants. Like borecole, cabbago is transplanted. Large sorts arc planted out $2 \frac{1}{2} \mathrm{ft}$. all ways, medium sorts 2 ft ., small or very compact varieties, 18 in .

Some varieties of cabbage nre suitable for sowing in spring, others for sowing in July and August. Excellent soits to sow in summer are Harbinger, April, Flower of Spring, Mein's


Cabbage. Diagramg illuatrating points to be observed in planting. 1. Cut of tap root at a belore planting. 2. Place in hole and lever over soil with dibber (a). 8. Correctly planted cabbare. 4. Bady planted in dry soile. $\quad$. Method of planting in wef soils

No 1, Ellam s Early and Finperor, they will supply produce in spring and early summer. The following, if sown in March. will furnish cabbages in late summer and autumn Little Pixie, Tender and True, In perial, Enfield Market, and Winningstadt.
Colewort is a first-rate small cabbage to sow in April and May for autuinn produce the seedlings should be thinned out to 10 in . apart, not transplanted. Red or pickling cabbage is sown in August. Savoy cablogge, a valuablo hardy winter veretable, is sown in April and May The Drumhead cabbage, from an April sowing, yields firm hearts in late autunin.
The Portugal cabbage, or couve tronohuda, is valued for the sake of its thick midribs, which are almost as good as senkale, ns well as for the head of cabbage. It is grown from seeds sown under glass in March or out of doors in April.

Chou de Burghley, which produces a broccoli-like head, is sown under glass in March for an autumn supply, or out of doors in May for spring use.

Bolting or premature running to seed is most troublesome in the spring crop sown after midsummer; it is most likoly to occur when a dry autumn is follower by a wet winter. Sowing the right varietics at the right time nlanting on a lirm bed in October, and hoeing


Cabbage. Above, conical cabbage. Right, hardbearted cabbage of Drumbead variety
must never bo pouied down the sink without afterwards flushing it with water. It is better to pour it away outside if possible, since it often has a strong and somewhatobjcctionable odour:
Stuffed calsbage provides an excellent way of using up scraps of meat. Should there be no scraps in the larder use $\frac{1 \mathrm{~b}}{}$. of sausages, preferably pork. Wash and trim a savov cabbage, put it in a pan of boiling, salted "ater, and boil it until it is half donc, then drain it well. Cut it nearly in half, and remove a piece out of the centre.
If using sausages, remove the skins and mix with the meat a good dust of salt and pepper, 2 dessertspoonfuls chopped parsley 1 dessertspoonful ohopped onion, and 1 oz rice, whioh has first been boiled until tender in salted water. If scraps are being used, cut off all skin and gristle, chop the meat finely, and use it instead of the sausage-meat. Next press the mixture into the cavity in the cabbage, put the two halvos together, bind them round with a piece of tape, then wrap the whole in a pieco of muslin, put it in a pan with plenty of boiling salted water, and loil until the cabbage is tender. Take off the muslin and tape, arrange the cabbage in a hot dish, and pour round it some brown sance. This is sufficient for four persons.

CABBAGE APHIS. This is a pest fre. quently found in colonies on the outer leaves of
 the cabhage. It does not affect the hearts, ex cept by weak ening the con stitution of the plant. If the planta havo good soil to grow in and are stimulated by vigorous hoe. ing, no further steps are neerl ed. Should the pest threaten to gire them a serious check, it may be as wel! to use an insecticide; but this is only likely while:the and feeding in spring are measures which are plants are young; at a later stage the outer likely to prevent boiting. See Black Rot.

Cooking the Cabbage. To boil cabbage, first remove all discoloured leaves and the stump of the stalk. Halve the cabbage, or, if it is large, quarter it, and then remove a wedge shaped picce from the stalky centre. Wash the cabbage and let it soak in cold salted water ; then put it in n saucepan containing plenty of fast-boiling water, allowing to each quart of it a tablespoonfu of salt and a piece of soda the size of a large pea

Boil the cabbage quickly, the lid being off the pan, for 15 to 40 min . or until the leaves and smaller pieces of stalk are tender. The time needed will depend on the age and size of the cabbage. Strain off the water through a colander, pressing the cabbage firmly. Heat again in the saucepan with 1 oz . butter ; add season ing and serve in a hot vegetable-dish, cutting the cabbage across in portions.

The water in which greens have been boiled


By permisgion of II.M. Slationerll Ohice and lie Milistry of Auriculfure
thase of the cabhage moth burrow more into the hearts of the plant. In a normal year the pesta can be kept under control in n small garden by hand picking. During the periods when white buttertice are seen on the wing in some number, orops liable to attack should be examined about once every 7 to 10 days, and all clusters of eggs should be crushed.

It is unwise to use poisonous aprays on green vegetables, but syringing the plants, especially underneath the leaves, with paraffin cumblaion or with a solution of anlt, 2 oz . in 1 gallon of water, does good Paraffin emulsion is made by dissolving a handful of soft soap in a little hot water, adding an eggeupful of paraffin and 2 gallons of water. This treatment is necessary in July and August. If the above simple solutions do not prove sufficiently effective, the following auggestions are offered in Leaflet No. 109, issued by the Ministry ol Agriculture

Slaked lime in powder or lime and soot are sometimes dusted on the plants when damp Fences, etc., surrounding allotments should be searched for the chrysalides of white butterflies. When the ground is dug, a look out should be kept for the brown chrysalides of the cabbage moth, which should also be destroyed.

CABBAGE FLY. The larvae of a grey ty infest cahbages in summer and cause them to turn yellow and droop in the hot sun. Its naine is Anthomyia brassica,


Cabbage Fly larvae. highly magnifed or the cabbage fly and it must not be confused with the aphis or green fy. The male cabhage fly is quite a slate colour; the female is lighter. Spraying or the wholesale use of insecticides is not of much use. The only safe plan to prevent thic pests from spreading is to pull up infested plants and burn them, at the same time giving the ground a good dressing of lime.

CABBAGE MOTH. The cabbage moth is a dark brownish grey in colour ; the caterpillar varies in colour between green and brown.

It feeds
uponlettuee, mangold and various wild plants. but is especially fond of cabbage. Unless care is taken in dissecting
 and washing close hearts before cooking, the full-grown anterpillar may make its appearance at the table. The moths should be watched for in the evenings of June and July, when they are egg-laying. The eaterpillars feed from July to October, when they go under ground to pupate and pase the winter.

The most cffective method of dealing with this pest is to hunt for the caterpillars, which feed during the daytime as well as at night. The plants may be watered with sospsuds, a little paraffin oil being added; hut this should not be done if the cabbages are likely to be cut within a period of four or five weeks.

CABBAGE ROOT FLY. One of the most destructive of insect pests, the cabbage mot fly attacks cabbages and cauliflowers chiefly, but also sprouts, broccoli, and turnips, young regetables suffering more severely than older plants. If an affected plant be pulled up it will be noticed that most of the small lateral roots have been eaten away, and the maggota are to be found around the inain
root or in the soil elose by. It is in the maggot stage that the insect is injurious, the flies causing no direct harm.

A most ratisfactory method of control is to protect the plants by means of taried felt disks particulars of which are contained in the Ministry of Agriculture's Lerllet No 122. The disks act as a mech. anical device preventing the flies from laying thoir
surface of the disks free from soil. Once the plants have made good growth they have been tided over the most vulnerable period. and the soil can be earthed up over the diaks. is the latter are then no longer necessary
CABBAGE SNOWY FLY. Resenibling in appearance a minute moth, the eahbage snowy Hy is a lour-wingerl insect allied to the scale-insects. With wings fully spread it measures only $\frac{1}{\text { d }} \mathrm{in}$. across Bath boily and winga are coated with wax in a meal-like forno. and this is shaken off where their yellow elliptical eggs are laid, so that the presence of the latter is revealed by these dusty patches. In spring they may be seen Huttering about the cabbages and laying their eggs on the undersides of the leaves. The flat little larvae that emerge sack the juices of the plant, and the evidence of their presence is a yellow-
egge near the roots of the plants. The disks should beplaced quite flat on the ground round the steins of the plants directly the latter are planted out.

It is also advantagenus to earth the soil up slightly around the plants, so as to form a flattened rirge. It is important to keep the

## CABINETS: ORNAMENTAL AND USEFUL

## For the Connoisseur and the Amateur Woodworker

Related articles are those on Bookense; Bureau; Chair. Sce further Birds' EgR Cabinet; Coins; Corner Cupboard; Cutcery; also Antique Furniture; Cabinct Making

At first little more than an oblong hox, the cabinet, owing to the skill of the Flemish workmen in the 16th and 17th centuries, became a magnificent piece of furniture. The wood was carved, inlaid or polished, and the piece adorned with ivory, tortoiseshell, or precious stones. The doors were beautifully painted, sometimes on the inner sides as well as the outer. The interiors were often remarkable for their elaborate decorations, these taking the form of floors made of alternate aquares of ebony and ivory, and adorncd with columns and mirrors, the whole resembling a palace hall in miniature.

Cabinets were made in England in the 17th century. when walnut came into vogue Flemish influence was strong, but something was copied from Chinese cabinets, which were then being imported : hence the use of lacquer,

in
in which excellent work was done towards the end of the century. The stands were beautifully carved and sometimes silvered. In the 18th century some eabineta were made of mahogany, but lighter woods were still much favoured, satin and tulip among them. Annther development was the introduction of glass into the doors, these onbinets heing chiefly used for the display of ehina, glass, etc.

Making a Mahogany Cabinet. The cabinet shown in elevation in Fig. 1 could be carried out in mahogany, when it would go well with any furniture of the Chippendale type. It has an enclosed centre cupboard and two glazed cupboards at sides. A glazcd door might be fitted to the centre compartment also if deaired.

The base should be taken in hand first. The long rails at back and front are tenoned

Cabbage Root Fly, A fully Cabbare Root Fly, A. fully end of lafor. D, pupa.
 g patch on the other side of the leaf
Washes and sprays have been recommended for dealing with this pest, but sceing that it is always on the underside of a bmad. greasy leaf all liquids run off the upper surface without affecting them The only practicall romedy is to locate the larvae by means of the yellow patches, and then either to destroy thein by pressure or by cutting off the leaves and burning them.

into the outside legs, and the end rails are similarly tenoned to the legs. The two inside legs are bridle jointed to the front rails. A shallow groove the width of the leg is cut on the front of the rail. Fig. 3 (E), and the rest of the thickness of the rail is taken out of the leg. The rails may be shaped with the bow saw. The shoe for the legs is shown in Fig. 3 (A). A centre cross rail might he ndded to stiffen up the base. Mould-
ings are
mitredround as shown in Fig. 2, and supported by blocks glued to railsand mouldings at shor
intervals.


The construction of the carcass is shown in Fig. 2. The partitions may be dovetailed or tenoned to the top and bottom. If the latter plan is adopted the tenons should be uredged after glueing up. The top and lottom are lap dovetailed to the sides of the carcass. The back is mateh boarded, each board being fixed with two screws at top and bottom. The frieze box is of solid mahogany, the front corners being mitre dovetailed together and the back lap dovetailed. To allow for the width of the mouldings on front and sides the back rail of the frieze box is made a little wider. The top is fastened to the frieze by pocket screwing. The top moulding is shown
in Fig. 3 (B). The pediment has base and capping moulding as indicated in Fig. 3 (C) and (D).

The doors are mortised and tenoned together and then rebated. Slats are fitted for the bar mouldings, the ends being stuh tenoned, and the slats halved wherc they cross. An astragal moulding, or a plain rectangular one, may be used for the bars, which are glued on to the slats. The panel of the centre door is caul veneered. the pieces being first fitted and glued to a sheet of stiff paper
The shelves, which rest on fillets, are fitted so that the front edges come opposite the second and third bars from the bottom.

## CABINET MAKING IN THE HOME WORKSHOP

## The Tools Required and the Principles of Construction

Further practical guidance for the amateur on this subject will be found in the articles Anmateu Carpentry; Workshop, cte. See toa Bench; Joint; Tenon; also Chisel; Plane and other tools
Cabinet making includes the making of tool, and later, for fine work, may be added a all the finer articles of furniture, such as 6 in . or 8 in . dovetail saw. The bow saw is bureaux. It is thus distinguished from required for shaped work, and a compass carpentry, which refers to the constructional saw, with its long tapering blade, is useful forms of woodworking, such as roofing flooring, staircasing, etc.

Most articles of ordinary household furniture can be made by the man who understands tools and is fairly proficient in their use, and if to some knowledge of timber is added skill in the making of joints. the cabinet making that can be undertaken is only limited by congiderations of time and cost. or interior' shapes which the how saw cannot conveniently cut. With delicate shapes in thinner wood the ordinary fretsa $w$ is used.

Rough boards are first dealt with by the jack plane, and if a worker buys his timber in the rough he will also require a trying plane, which is requisitioned after the first operation with the jack plane. The smoothing planea smaller tool-is used to bring the board
Cabinet making differs from carpentry not only in regard to the character of the work, but also in the timber used. Speaking generally, the cabinet maker uses hardwoods, such as oak, mahogany and walnut, whilst the carpenter works in the softer woods of the pine, fir, and spruce families. Hardwoods are chosen for furniture because of their durability, the extra strain they can withatand, and their rich colour and pleasing grain. It is obvious that the working of oak is more laborious than the working of yellow pine, and also that surfaces which are to be polished must he brought to a higher degree of finish than boards which are to be pminted or varnished. Cahinet-work is finer, and calls for more careful workmanship than that necessary with carpentry; the material is more costly, and the aim is to produce something which is pleasing to the eye as well as of practical use.
Tools Required. A hand saw with blade of 24 in . or 26 in . is required for cutting boards lengthways. A smaller tool of the same type is the panel saw with an 18 in blade. A tenon saw of 12 in . is an cssential

! ? 3 feet of construction of the carcess. Fig. 3. Sections of mouldings and other working dramings. Sea text fur lettering


Fig. 2

硅

2. Details rails

Cabinet Making. Figa. 1-3. Diagrams illustrating some of the principal joints used in making a table and a light bookcase


to a further degree of accuracy, and leaves it ready for scraping and glasspapering. Of other planes there is a great variety. many being of iron. The toothing plane, with the cutting-iron milled to resemble saw teeth, is used to roughen the surface of a board preparatory to veneering. The router is for grooving timber across the grain. In addition there are planes for rebating, for ploughing, for shooting shoulders and mitres, and the range of moulding planes

Other tools required include $n$ range of
 a ratchet brace and boring bits, a try square, marking gauge and cutting gauge, a couple of spokeshaves, oilstone, glue kettle, rasp. file, two screwdrivers (large and small). several bradawls, pincers, pliers, mallet and hanmers. A substantial bench is necessary: and a pair of hand cramps.

Principal Joints Used. Apart from a knowledge of joints, some of the general principles of cabinet construction should be clearly understood. A plain table of the simplest type, for example, is put together as Fig. 1. The legs (A) are mortised on their two inner faces to receive the tenons of the rails (B). If lower rails are to he introduced to strengthen the legs they will also be tenoned in, as at C. In the illusiration a stub tenon $(D)$ is shown on the top of the leg. This will enter a shallow mortise cut in the underside of
the top. The top itself will be glued down omitted; in heavier doors the tenon is usually and additionally held either by pocketscrewing through the rails or by fitting glued blocks in the angles formed by rails and top.

In the case of a table which is to be fitted with a drawcr, the method of construction usually followed s shown at Fig. 2 The ends ( E ) are tenoned to the leys, but at front, instead of the upright rail, as in Fig. 1, there is a top rail (F) and a drawer rail (G). The upper rail is dovetailed to both eg and end as indicated; the ower.rail is tenoned to the leg. Drawer runners, etc., will afterwards be added. When a shelf with n rail is wanted below, the usual method for a light table is to tenon the rails $(\mathrm{H})$ to the legs. The shelf (J) is cut at the corners to fit the legs, and screwed to the rails from underneath. A section of this is shown at K .
When articlen such as small hoolicases. light sideboards, etc., are built with solid ends (Fig. 3), dovetail housing is adopted as the method of securing rigidity. A section of the dovetail housed joint is shown at A. In the case of the illustrntion sketched, the top of each end would be cut to enter a doretail groove trenclied in the top. The lootton shelf would be similarly dovetail housed to the ends, the joint in each case being stopped back about $\} \mathrm{in}$. to mask it in front. The middle shelves might he plain housed, as adequate rigidity is secured by adopting the method of dovetailing at top and bottom. The shaped rail shown under the top and also helow the hottom shelf is tenoned to the ends and glue-hlocked hehind.

Carcass Construction. The term carcass is usually applied to the framed box whioh forms the akeleton of articles anch as wardrober, cabinets, cheats of drawers, and bookcases. Fig. 4 indicates the carcass of n small wardrolse. The carcass would atand on a framed hase, as shown, and have a loose frieze and cornice above. The top and hottom of carcass are dovetailed to the ends, the Intter being rebated for a framed back

Large articlea of furniture are often made up of two or more carcasses. A tall hookcasc or bureau will have separate carcasses for the lower cuphoard and the upper case, whilat a threedoor wardrobe will probably be made up in threo carcasses. The back of an enclosed article is sometimes matchboarded, but more usually framed up. Lighter itema are now frequently fitted with three-ply lmards. In the case of heavy furniture of the sideboard type, corner posts are added. To these framed ends are housed, and in front the carcass is connected by means of rails, dovetailed or tenoned in as in the case of a table.

Doors for cabinets, wardrobes, book cases and sidehoards are framed up of atiles and rails, mortised and tenoned together and rebated for their panels. Except in the case of very amill donss the thickness for atiles and rails is generally $\frac{7}{\text { f }} \mathrm{in}$. net. Wardrobeand bookcase donrs which have to carry glass will need to be heavier. The width of the framing varies from $1 \frac{1}{2} \mathrm{in}$. to 3 in ., according to the size of door. At Fig. 5 (A and B) are shown the mortised stile and tenoned rail of $n$ door. The tenon is indicated with a shoulder, as C , and the stile is, of course, mortised right through. For light dones the shoulder may be
wedged, as indicated by dotted linea at $C$.
In the case of a cabinet with double doors, the meeting atiles may have an applied astragal on the right-hand door, as $D$, or the atiles may be relonted to engage as $E$, a liead


Cabinet Making. Fig. 4. Details of carcass construction.
Flg. 5. Diagrams showing details of door construction. See text leing run up the edge of the righthand stile to soften the joint. On the beat work all astragal is rehated in as $F$. Fig. 5 also slows aome typical examples of door plaineat treatment in indicnted at G, n flat frame, with the panel sunk not mom than jom. in. it H the frame has a simple mould run in the solid. J,
again, slinws the frame rebated to take an applied moulding, whilat at $K$ the trentment adopted for heavier doors is indicated.

Working drawings for a dining-room calsinet are given on page 172, and otiler articles to which reference should be made are Bookcase, Burcaux, and Birda' Egg Cahinet. In the latter some leading features of cabinet construction are shown in detail, with large scale drawings.
CABINET PUDDING. For a hot puiding, well butter a plain mould and decorate the hottom with halvea of glace cherries. Break up ahout four atale sponge-cakes, and pack them loosely in the mould in layers, with $n$ fell chopped cherries or mixed candied fruita. Bring $\frac{1}{4} 10 \frac{1}{1}$ pint of milk to hoiling point, and beat up 2 egga; let the milk cool slightly, and then pour it gradually on to the egga, atirring all the time. Add aliout 2 tablespoonfuls sugar and a few drops of vanilla or other casence to the cuatard, then atrain it over the cake in the mould, not quite filling the latter Let it stand for at least $\frac{1}{2}$ hour. Cover the top of the mould with a piece of buttered paper, and steam it very gently for one hour. Turn it on to a hot dish and serve with it any good sweet sauce. If preferred this mixture can lie hakied.

For a cold cabinet pudding omament the bottom of a plain mould with cherries and angelica, cover these with a thin layer of clenr jelly, and leave it to set. Line the side of the mould with 3 oz.. of Sa voy biscuits, splitting the biacuita in half and arranging them alter nately with back and front to the mould. Put 2 oz. of broken


Cabriole Ler, late 17th century pattern

Next make a custard by benting up the yolks of $4 \mathrm{eggs}-\mathrm{or}$, if preferred, $\geq$ wholc eggs-and ndding $\frac{1}{2}$ pint milk. Pour this mixture into a jug, atand it in a raucepan of hoiling water over the fire, and stir until the custard thickens. Melt $\frac{1}{2}$ o7. leaf gelatine in a little hot water and strain it into the custard. When cooled, add $\frac{1}{2}$ gill of cream, with sugar and vanilla to taste. Mix all well together and pour it into the mould. When quite set turn it carefully out on to a glasy dish.

CABRIOLELEG. This carved leg found in certain styles of furniture
has a projecting rounded knee at the top and n gradually tapering lower part, which is often carved with representations of a hoof. n shell, or an animal's paw grosping $n$ hall. It is a feature of the Queen Anne styylc and was much used by Thomas Chippendale. In quite a different sense the word is used for a chair with upholalered back, arms, and seat, helonging to the Hepplewhite period. See Chair: Chippendale; Hepplewhite; Queen Anne.

CACHOU. By this name is known a small sweetment with aromatic flavouring which is alowly dissolved in the moutl, to diaguise the odour of intoxicating liquors, tobacco, etc. For this purpose enchous are generally carried n a small box.
CACTUS: How to Grow. If the cactiare to be grown in a room, a very light and sunny position in front of a window should be selected. In

the plants to flower, as in almost all cases the horsoms are exceedingly beantiful. The chief points to be noted are: In the first place, never give n cactus plant a lange pot-that is to say, always let it be rather smal for the size of the specimen. Second$l y$, begin to water the plants freely in April, but keep the soil rather dry
in winter. Thirdly. Cactus. Variety called Old Top. fight typical phyllocactus in bloom in the hot summer weatherlet the cacti simply bake in the sun, in order that all the shonts may become well ripenerl.
Perfect pot-drainage is essential. Fibrous loanm should form part of the soil, but nearly an cqual amount of sand and brick rubbish should le added: morenver, each pot should le one-third fult of drainage material. About April is the lest time to carry out the potting of cacti. Raising from seed is a very slow process. and by far the quickest method of propagation is hy cuttinga. Practically any part of the stem will grow if the piece has heen dried in the sun for several days before leing inserted in a mixture of losm, leas-mould, and small crocks. The cuttings are potted up as soon as they are rooted. The following are the principal kinds of cacti

## Cereus Echinocactus <br> Mamillaria Echinopals <br> Melocactus <br> Opuntla Pereskla <br> Phyllocactur <br> Rhlpenlis

piphyllum
Moat of the phyllocacti are very fre Howering, and a splendid whitebloomed
variety is alhus superlus. The well-known red, so often seen in cottage windows, is also another useful kind of phyllocactus. The epiphyllums, inany of which bloom in the hutumn and winter, are very graceful subjects. being crimson, pink or white in colour The genus cereus has amongst it sonie freehlossoming kinds.
CADDIS WORM. This insect is a very attractive inmate of the aquarium, owing to its habit of building a oylindrical case of sand grains, gravel, grass-stalks, small leaves, or gnail whells, each species selecting particular materials. They are the larvae of the caddia Hy There are about 150 British species, the larvae being found in ponds and streams Their long, pale bodies are soft, except the head, fore-body, and sir legs, which have a. horny skin. To protect the soft hind-body they construct cases by uniting their building materials by silk filaments, with which also the tube is lined These they drag over the bottom or haul up the stems of the water. weeds, upon which they feed principally. Some species ure carnivorous, and in the aquarium will destroy other aquatic insects.

When the larva is full hrown it moors its case to weeds or stones. spins a sillien web over each end of its tube, and changes to a nymplı with free legs. Ultimately it leaves its case and olimbs ont of the water, throws of the nymph-skin, and spreads the four hairy brown winge of the caddis fly. See Aquariun


Caddis Worm. Protective tubes made by these worms and attached to twirs
CAERPHITLY CHEESE. This cheese is considered to be specially suited to the needs of the underground workers. The moat popular kind of Cuerphilly is a cheese of the quickripening variety, available for consumption a fortnight to three weeks after manufacture. It is, therefore, of a perishable nature and deteriorates in quality after four to six weeks. becoming dry. This cheese is inade from morning's and cevening's milk.

CAFFEIN. Alknloid found in the dried leaves of tca, in the dried seeds of coffee, and in other vegetable preparations. The dose in medicine is 1 to 5 grains. Preparations in common use are cafficin citrate, dose 2 to 10 grains, and effervescing caffein citrate, dose (if) to 120 grains

The chief action of caffein, whether taken as a drug or in tea or coffee, is to stimulate mental activity. All the faculties become on the alert, the inagination is kcener, and thoughts work faster. It also wards of fatigue. If the dosing is continued, as in prolonged, excessive tea or cofiee drinking, an overwrought state of the whole nervous system results. Caffein has also a marked diuretic effect on the kidney tissues, increasing the flow of urine. The drug is therefore much used in heart dropsy, and other conditions in which it is desired to deplete the body of fluids through the kidneys. The effervescing caffein citrate is frequently prescribed.

Caffein is frequently used in heart disease. either alone or combined with other heart stimulants, such as strychinia; or it may he


Cairn Terrier, a small sporting dog
used in the form of colfee. When phenacetin is prescribed for headache, culfein citrate, 2 grains, may be combined with 8 or 10 grains of the former, with cafiein counteracting any depressing effect of the phenacetin on the heart, and also enhancing the efiect on the headache. Caffein is recommended for asthma.

## Cakes and How They Are Made

General Directions about Materials and Methods

## Further details will he found under the heading of various cakes, c.g. Dundec; Genoa. See also

 Raking; Decoration; IcingCake mixturea may be conveniently divided into four main groups: (a) Plain cakes, in which butter is rubbed into a relatively large quantity of Hour: (b) Richer cakes, in which the sugar and butter are creamed (i.e beaten to a cream) and Hour and other dry ingredienta added suhsequently; (c) Sponge mixtures, which contain no butter, and (d) Gingerbreads, in which the hutter, sugar, and syrup (or treacle) are melted together and poured into the dry ingredients.

Recipes covering each group are given below Variations of these proportions and methods may be preferied by sonie cooks, but the examples given have been found satis. factory in practice. It is to lee understond that wherever butter is mentioned, margarine may lve substituted if deained, or for fruit caken, a mixture of lard and butter.

Plain Cake Mixtures. A very plain mixture, suitable for an ondinary round cake or for amall oakea ( 12 to $\frac{1}{2}$ th Hour) may be prepared as follows: Rub 3 o\% butter into $\frac{1}{2} \mathrm{lb}$. Hour. Add $\ddagger \mathrm{lh}$. sugar and either $\ddagger \mathrm{ll}$. currants or a teaspoonful of curaway reeds. (Alterna. tively, teaspoonful of vanilla casence may be ailded after the egg and milk). Beat one egg, add to it rather less than a gill of milk. mix with dry ingredients, put into a greased cake tin and bake one hour in a morlerate oven. The 12 amall cakes require 20 to 25 min . in a quick oven. By using $\frac{t}{2}$ gill only of milk, a good rock cake mixture is obtained.

Another goond cake of this type is called Bachelor Cake. To make it, add a teaspoonful of haking socla to ${ }_{3}^{3} \mathrm{lb}$. of tlour. Then rub in 3 oz . butter. To the mixture add $\frac{1}{2}$ th. augar, 1 oz . each of cinnamon, allspice, and ginger, teaspuonful of ralt, 2 oz . chopped mixed peel, 2 oz. blanched and shredded almonds, $10 z$ caraway seeds, $\frac{1}{\underline{1}} \mathrm{lb}$. washed and dried curranta. $\ddagger \mathrm{lb}$. stoned raisins, and enough buttermilk to make the mixture into a moist dough After beating for 20 min . place the dough in a greased tin, anid bake for ahout 1 hour in a moderate oven.
Richer Cakes. A good sultana aake (Fig. 1) can be prepared as follows: Cream $\frac{1}{2} \mathrm{lb}$ hutter with 6 oz. castor sugar. Add giadu. ally and alternately 1 lb . Hour and a teaspoonful baking pouder and four well-beaten egga. (If self-raising flour is used no bakingpuwder is required) Stir in a gill of milk, a pinch of salt and either $\frac{3}{4} \mathrm{lh}$. sultanas or $\frac{1}{2} \mathrm{lb}$.

2 to 5 grains of the citrate heing given at bedtime and again during the night.

CAIRNGORM. Semi-precious stone of the quartz family. It is largely used in the mounting of Highland dress accoutrements ; also for jewelry, chiefly hrooches and buckles, seals and beads. In colour it varies from a pale sherry tint through all degrees of smoky brown to almost black

CAIRN TERRIER. This is an extremely popular variety, being a keen, aporty little dog. and one that is particularly suitalle for living within the family circle. Apart. from this it is used for ousting foxes from rocky caims where "bigger dog could not go Consequently he requires a strong muzzle for his size. I fair average weight is ahout 14 lb ., but the tendency is towards a smaller breed. The cairn is a short-legged, compactly built little dog with a rather foxy head, alert eyen, and small, pointed ears.

The outer cont is wiry and hard, and there should be a good under coat. The colour may be sandy, grey, brindled, or nearly hlacl:. Dark ears and muzzle on the lighter culours are appreciated Eyes are dark hazel. Sec Dog.
sultanas and $£ \mathrm{lb}$. finely chopped candied jeel, and heat thomughly. Put mixture into as cake tin lined with greased paper and hake from $1 \frac{f}{d}$ to 2 hours in a rather slow oven. If a metal skewer insorted into the cake comes out dry, the cake is done.
A rather inore elaborate cake of this type is known as Angel Cakc. To make it, cream 4 oz . butter with 4 oz. castor sugar, add 2 well. beaten egge and sift in $\frac{1}{2} \mathrm{lb}$. Hour mixed with 1 teaspoonful baking powier. Add $\ddagger \mathrm{lh}$. sultanas, 2 oz. each of preserved cherries (quartered) and choppled preserved pineapple. Nix well, and if the mass seems too dry, soften with a little milk, but be careful not to make it. too moist. Stir in a few drops of eraence of lemon, place in a cake-tin lined with wellhuttered paper and bake in a moderate oven for about is hours. The success of this cake depends on the thorough beating of the eggs and the gentle mixing of the flour.
A very rich cake, suitable for Birthday or Cliristmas Cake, can be marle, icod and decorated, as follows: Line a large cake-tin with greased paper (sce Fig. 2), and then put d lb. butter in a warm basin, heating it with a
 sugar, creaming the two ingredients together until they resemble whipped cream. Beat four egge to a froth, stir them gradually ints the mixture, and beat well. Sieve ilb. of tlour, half a level teaspoonful of salt and two teaspoonfuls of ground allspice, adding these lightly to the whole

Mix together 6 oz . currants, 6 oz . sultunas, 1 oz glacé cherries (quartered), (s oz. mixed chopped peel, 2 oz shredded blanched almonds, and the grated rind of a lemon. afferwards


Cake. Fig. 1. Good sultana cake, a recipe for making which is given in the adjoininR column


Cake: stages In making a rich cake. Fig. 2. Cake-tin greased and lined with paper. Fig. 3. Turning the baked cake on to a sleve to cool. Fir. 4. Almond paste apread on the top. Fig. 5. Cake covered
stirring them into the other ingredients Pour in 1 gill milk and 4 tablespoonfuls brandy, turn mixture into eake. lin, and smooth the surface quite level, using a knife dipped in hot water. To prevent the cake from burning undernenth, a layer of salt or sand about an inch thick may be put in the bottom of the haking tin. and covere-t with preasod paper. Then bake the cake in a moderate ouen or about $2!$ hours. and turn out on to ת sieve (see Fig 3)

When it commences to brown, lay a piece of thick paper over the top, letting it rest on the exlge of the band that stands up above the tin. When culd, cover top of cake lirst with almond paste (q.v.) and then with myal icing (Figs. 4-6), nnd decorate it with caramelised fruits.
 Anished cake decorated with ornamental flowers in icing The latter nrc prepa onf augar in arepared by boiling $\frac{3}{} \mathrm{lb}$. of water to moisten it, and stirring it over the fire until it becomes golden-brown in colour, and adding a few drops of lemon-juice. Take some greengages and apricnts, cut into halves, and some whole grapes: dry these thoroughly and drop them into the caramel mixture immediatcly after it has ceased to boil. When well conted, put the fruits carefully aside to dry, and then arrange them on top of the cake. Instead of the fruit decoration, suger flowers may be userl, made with an icing tuhe, and coloured (Fig. 6).
For $n$ child's birthday cake, candles in tiny holders, the number denoting the age of the child, may form part of the decoration.

The necessary ingredients for royal icing are 2 lb . of icing sugar. 4 whites of eggs, and the juice of 2 leminns. Rut the icing sugar through a hair sieve into a basin, nake $n$ well in the centre, and put in the slightly beaten white of egg. Mix in a little of the sugar fron the sides, then add half the strained lemon juice, and nix the whole to a rather moist paste, adding more lemon juice ns required. If the lemons are large, all the juice inay not be needed. Use the icing at once, smoothing it over with a large knife, dipping the Intter in cold water occasionally.

Rich cakes should alwnya be made a month or more before they are required for use; theyshould be packed (when cold) in several layers of greaseproof paper kept in a dry and airtight place.
A Madeira mixture may be prepared as follows. Take 3 eggs and their weight in sugar and self-raising flour and the weight of 2 egga in butter, and Havouring to taste. Cream butter and sugar, addl eggs and llour gradually and alternately, stir in flavouring cssence and beat very thoroughly. Put mixture in a calietin lined with greased paper and bako at once in a moderate oven from 1! to $1 \frac{1}{4}$ hours.
To make layer or sandwich cakes use 2 eggs and their weight in butter, sugar and selfmising flour and mix as for Madeira cake. Bake layer cake (Fig. 7) for a hout 1 hour in a rather slow oven. For Sandwich Cake, or Victoria Sandwich, divide mixture into two equal parts and bake in sandwich tins (greased
and tloured) for ahout 15 mill. in a brisk oven Layer calie should be cut through twice and spread ivith jam (preferably raspherry or apricot) or with whipped cream, sweetened and thavoured as desired. One cxcellent filling is made with minced Brazil nuts and sweetened whipped cream. A sinuple icing can be made by heating (not hoiling) I lb icing sugar with rather lese than a gill of water and a teaspoonful of the desired flavouring Pour over cate while warm and ornament with glacé cherries and walnuts or angelica.

Sponge Cake Mixture. One way of preparing this is to take 2 or 3 eggs and their weight in sugar and flour. Whisk eggs and sugar for about 15 min. and fold tlour in lightly and thoroughly. Have ready a tin lined with buttered paper and sprinkled with sugar, put mixture in at once and bate in a hrisk oven for about 3 hour For jamsand wich. divide mixture into two parts and bake in sand wich tins. This should take about 15 min in a brisk oven. It is very imporiant that this mixture should be made quickly and put into oven at once, and that oven door should not be opened until it is nearly done.

Gingerbread. A good plain gingerbread is prepared as follows: Melt $\frac{1}{\mathrm{lb}}$. sugar. $\frac{1}{2} \mathrm{lb}$. margarine, and teacupful of golden syrup in a saucepan over the firc. Beat up 2 eggs, and when the melted syrup is cool, add them to it and bent all together. Sieve together 1 lb . Hour and 2 teaspoonfuls of ground ginger, make a well in the centre, nad into it pour the syrup, etc., mixing and benting the whole thoroughly.

Dissolve $\frac{1}{2}$ flat teaspoonful hicarbonate of soda in $\frac{1}{2}$ gill of milk, mix it with the other ingredients, and tarn the mixture into a greased cake-tin. Bake the cake in a moderntely hot oven for 1 to I? hours, then turn it on to a sieve and leave until cold.

The temperature of the oven should always be fairly high before calies arc put in In a gas oven the burners should be left full on for about 10 min . previously and turned down about half way when cake is put in, i.e rather less than half way for a 'brisk' oven and rather more than hall way for a 'slow' oven. The oven door should not be opened for at least 20 min . after a cake has been put in, and when baking sponge cake, not until cake is likely to be done. The oven, it is to be noted, should be hotter for small and light cakes than for fruit cakes.

To make a cake level for icing, a slice is sometimes cut of the top and cake turned upside down; but if mixture be kept higher at sides of tin than in the middle before putting in oven, the necessity for this is obviated to a great extent. Another method is to place a sheet of paper lightly neross the side lining paper (which should always be higher than tin) as soon as cake has risen and brow ned slightly.

CAKE STAND: How to Make. Silver or plated silver stands having two or three tiers, and fitted with chinil or glass plates, are useful for the table.

Floor cake stands vary from $2 \frac{1}{2}$ to 3 ft . in height, and arc made in metal and wood.


Cake. Fig. 7. Layer cake with jam flling. the top iced and decorated with walnuts and glace cherrnes


The shelves ( $F$ ) are cut from wood $\frac{1}{2}$ in thick, and tenons similar to those shown at Fig. 4 are formed at each end for framing into the uprights (A) A rim (G) is fitted above. each shelf to keep the china plates in position. These rims should le cut from wood $\frac{1}{3}$ in thick. They atand $\frac{1}{} \mathrm{in}$. in from the outer edges of the shelves, as shown at Fig. 4 The inner diameter of the rims must he large enuagh to fit the rims at the buttom of the platos, which will prohably le about 6 in The enges of the rinis could be be celled as shown. The rims

Some of thesc fold up into small compass and have two or three tiers. To mntch the furniture of the room, stands are made of walnut, plain and inlaid mahogany, fumed oak, and other less expensive woods. One of the handsomest is madc of black mahogany inlaid with English gilt, and having a jingoda design. Other Chinesc designs are introduced on lacquered stands in colours to suit the scheme of the room.

A threetier cake stand is shoum in Fig. 1. There are threc shelves carricd by side framework, which is provided with suitable feet at the botiom. The framework is connected by a crossbar at the lottom and a handle at the top. The vood selected sliould, if possible, match the surroundings in which the stand will he placed, aak (fumed and wax polished) or any of the polished cabinet woorls being suitable.
The dimensions given in the diagrams are suitable for china plates about $0 \frac{1}{2} \mathrm{in}$. in diameter, so that, if larger or much smaller plates are to be used, the dimensions given should he altered accordingly. The framework at each side oonsists of two uprights (A) which are 2 ft .9 in . long by $\mathrm{f}^{\mathrm{f}} \mathrm{in}$. square ; a foot (B) nnd a top rail (C), which are cut from wood $\mathcal{i n}$. thick to the shape and dimensions shown in Figa 2 and 3 The uprightsare tenoned into the feet and top rails, as shown at Fig. 2, the length of the uprights between the shoulders of the tenons being $2 \mathrm{ft} .7 \frac{\mathrm{f}}{\mathrm{g}} \mathrm{in}$. The bottom crossbar (D) is $11 \frac{1}{2} \mathrm{in}$. long by $\frac{8}{8} \mathrm{in}$. thick. This bar is tenoned into the feet ( $B$ ), the length lietween the shoulders of the tenons lreing $10 \frac{1}{2}$ in. The handle ( E ) is shaped as shown at Fig. 3 from wood $\frac{3}{3}$ in. thick. It is notched $\frac{1}{8}$ in. over the top rail ( C ) and is fixed with scrowis driven through the rails. This completes the construction for the framework.
 are glued to the shelves. It is usual to cover
the shelres inside the rims with haize. In fixing the shend insie thes joith baize. In fixing CALAMINE. This is another carhonate, and prepared calamine. which is used in medicine. is got from it by crushing and pulverising. The common cala. mine ointment. which is much used in inllamed conditions of the akin for its slight astringent effect, is piepared by mixing one part of calamine with five parts of benzonted fard. Colaminc may also be used as a lution.

## CALANDRINIA.

 The annual kinda may be sown under glass in March or ont of doors in Ipril; they need well-drained soil and a aunns spot. Grandiflora ( 18 in. ), rose, and speciosa (!) in.) crimson purple, should be grown. Unibellata has magenta flowers.CALCEOLARIA
laria is groirn in pots for green house decoration

in May and June: the thowers are brillinntly coloured and make $n$ atriking display Seeds are sown in May and June in pots of fincly sifted sandy soil, and the plants are grown in a cold, shady frame during the summer. In autumn they are placed in the greenhouse, a temperature of 15 to 50 degroes being suitable.
The dwarl shrubliy calceolaria, in yellow, bronze and other shades of colour, is a favourite summer bedding plant ; it is not quite hardy except in warm, sheltered places, and is propayated by cuttings set in bnxes of soil in a frame in September. Planting is clone in May Golden Gcm is a favourite variety. There are several charming small-Howered calccolarins which arc invaluable for the greenhousc in summer ; chief among them are integrifolia, amplexicautia, Burbidgei, and Clibrani The John Innes strain of calcenlaria provides plants 18-24 in. high, which bear amall flowers in many colours. The shrubby kinds are in creased by cuttings taken in late summer, the others from sceds sown in May.
The seed is very small and, in the case of choice varictics, is expensive. The compost is of Inam, pent and silver sand placed in a box on a Inyer of broken crock, as shown in $c$ and d, Fig. I, and moistened by sinking the loox in water. The seed is spread over the surface and covered with $n$ little of the finest silver sand, as in $b$, Fig 1. The box is kept in semi-shade in the greenfionse covered with a shect of glass, as in $a$, Fig. 1, and when the plants are up they are renoved to a frame, as in Fig. 2, liept there woll watered until potted when the leaves are about an inch long, as in Fig 3, and later transferred to a llowering pot, as in Fig. 4. A good mixture is one part each of loan and clecayed hotbed manure to half a part of silver sand. Propagation of the shrubby varieties is by cuttings talien late in autumn with long heels sliced almost perpendicu. larly from the parent plant, as in Fig. 5, and inserted in a cold frame, Fig. 6.
The plants should be grown in a warm, moist position close to the glass. They last well in a cool atmosphere, but are very susceptible to fog. When they liave died down for the period of rest, they should loc kiept very dry, or the bulhs will rot.

CALCULUS. A stone-like concretion known as calculus is found in the human hody. especially in cavities which act as reservoirs. Thus, in the gall hadder, biliary calculus or gall stone occurs; in the pelvis of the kidney, renal calculum; in the hadder, vesical or urinary calculus.

The innterial of which a calculus is composed is frequently found to have gathered round a nucleus, e.g. blood clot, dried nuous, or a amall foreign body. Such a concretion may give rise to few or no symptoms until it begins to miakr its way down the duct which empties the reservoir, when it may cause excruciating pain, as in hiliary and renal colic. It may liccome stuck or impreted in the duct. See Gallatone ; Kidney, etc.

## Calendars for Household Use

## Examples that are Easy to Make and Useful

Bent Iron Work; Passe Partout; Stencilling are among the entrics that those interested in making a calendar may consult with advantage

A calendar is quite simple to minke. The punched in the top of the suede through necessary material, in the shape of cardmoard which a narrow ribbon is threaded to form or suitahle paper, having bcen ohtained, all that is necessary is to tako a copy of the calendar for the previous year, and to move hack ald the dates by one, cxcept for a leap year, when they must be altered by two. This the Sundays in January, instead of reading 4, 11, 18,25 , will read $3,10,17,24$. This done, with


Calendar. Fig. 1. Diagram sbowink how a bird calendar can be made from velvet and cardhoard so that room is left to fix a arranged calendar after the stoncilling is completed Appropriate atencils-a blue bird, a squiriel, a ship, etc.-can be hought to be used with watercolour, and a small Jap brush An alternative is to paste a photograph or a coloured print-outlining either with a black or coloured border, put in with pen or brush-on the mount. A amaller mounting board may be used and a booklet calendar fixed by two short lengthe of narrow ribbon to hang below the board. A strip of firm paper ahould be pasted at the back of board and booklet in order to hold the ends of the connecting ribbons in place.
Stencils many be used ou coloured suède. Trake a piece about 7 in. by 3 in., place it on a llat board and stencil, on the suèdo side of the leather, the small design chosen. Mandarin inks or liquid stencil colours may be used. A border is painted or inked round the piece of suede, and appropriate words written. with the same onlouring material, above the tab calendar. Aholeis


Calendar. Figs. 2 5. Perpetual calendar in boz form, with
a loop at the back and tied in a amall bow in front. The lower end of the calendar may be fringed or the corners trimmed.

Lucky black cats, squirrels or birds, may be cut out of velvet and pasted on cardboard mounts cut to the ahapes of the animals. A paper pattern should first be innde by the help of a transfer. Glass beads may be used for eges, fastened by wires at the back, the visible ends of the wires being covered with a dab of black paint to form the pupils of the eyes. The calendars can be gummed on the animals Original designs can be drawn on the cardbonrd and cut out to form the pattern from which to cut the velvet covering. The latter may be touched up with paint to improve the outline.

A calendar on which the figure of a bird is the main feature is shown in Fig. 1. A piece of cardboard is cut into a circle except for an cxtension at the bottom, as shown in the illustration, nnd is painted black. The figure of a parrot is then outlined, the upper part being on the circle, while the tail part, which is below it, is fitted with a backing of cardhoard. A piece of blue velvet is pasted on to the figure, cxcept that in one place, as shown in the diagram, a piece of green is substituted The bird is npparently supported on a bough, mund which claws. also of cardbonrd, must bc cut, and these should be covered with yellow cloth. Finally the calendar proper can be hung on to the tail. and the whole suapenderl by a ribbon. Following the samc design, other colours and figures can he used.

Perpetual Calendars. A perpetual oalendar is illuatrated in Fig. 2, details of construction being given in Fige. 3, 4, and 5. The work is simple; the side pieces are gronved to receive the font and back, the former being cut out and glazed. The top and basc can be cut from the solid or built up from several layers.
The rollers are shaperd its shown, and carry the linen band on which are marked the numerals 1 to 31 . The upper and lowe mollers have the names of the months and the days of the week respectively marked upon them. Tho work is completed hy staining or polishing.

Another perpetual calendar is introduced into a linen sampler embroidered in cross. stitch, as seen -in the illustration, Fig. 6, with $\boldsymbol{a}$ diagram, Fig. 7. showing back of calendar.

First take the atrips of ribbon to match the colour of linen used and trace with a pencil on each, very neatly, the days, dates and months. Outline thesc in black silk. Next draw the design on the linen and embroider the anmpler in cmos-stitch (q.v.), using delicate, old-world pinks, blues and greens. The little lady has yellow hair, pink and blue dress, vellow and green llowers. Blue French knots


Fig. 2

form her eges and her face and arms are out. lined in pale pink. The zig-zag deagn is in black, pinks, blues and yellows The slots for the day, dateand month, are firgt buttonholed and then cut so that the strips may be inscrted. The sampler is backed with cardbnard, slots being cut oxactly to correapond with those in frunt to allow the strips to be moved round. Join each strip to makc $n$ ring at the back (see dingram) and frame in a passe-partout frame

CALF. The llesh of the calf is known as veal, and is a very delicately-Havnured white ment. The brains, head, heart, tongre, liver, sweetbread and kidneys of the calf are alan used for the tiable, while jelly is made of the feet. The tongue, liver, and kidneys arc smaller, more ten der and delicately flavoured than those of the bullock, but the method of cooking them is practically identical. See


Brains; Liver; Sweetbread: Venl.


Calendar. Fig. A. Perpetual calendar on an embroidered sampler in cross-stitch. Fig. 7 (above). Back of calendar

CALF: The Leather. If tho pelt is to be turned into old-faghioned calf leather it is tanned by steeping in an infusion of bark or other vegetable produce containing tannin. The leather, according to methods of finishing. will be cither calf for boot uppers, gloves, etc.

There is inother process of dealing with the velt, and that is by immersing in a bath of chromium salta, which produces chrome leather. This may be finished black, when it hecomes hox calf, or a shade of brown or yellow, known as willow calf.
Another finish is velvet calf. In this process the natural grain is carefully removed in the buffing machine, leaving the surface with a fine velvety nap. In wax calf the finish is on the flesh side, and the grain or outer surface of the akin hecomes the inner surface. This is employed for heavy bonts, for shooting, fishing, and for agricultural bonts. It is said to withstand the effect of stable and field wear better thnn chrome leather.
Calf uppers of heavy boots should be freed fom all dirt and thoroughly dried after use

They should be treed to preserve the shape. and before wear given an application of dubbin if the weather is wet, or of good blacking if it is dry.
Patent calf is perhaps the most reliable patent leather that can be purchased. This is perfectly waterproof, and here again to assist the patent surface to be maintained it should be fed occasionally with a little castor oil lightly rubbed over and then wiped dry with a soft rag.
Russia leather owes its characteristic odour to the birch bark with which it is tanned. Like most other fine leathers, the original has been imitated, and much of the so-called Russia leather is tanned with other materials. and then scented with birch tar oil.
In dressing calf a certain amount of acid is a boorbed which has to be removed by washing. When the leather is required for book. binding this elimination has to be very thorough, otherwise the acid will in course of time cause the leather to deteriorate and mt away. See Boot: Leather.
CALF'S FOOT JELLY. Wash 2 calf's feet thoroughly in boiling water, chopping each into 4 pieces. Put these into a saucepan with cold water to cover them, and allow them to boil for 5 min . Lift out the 2 feot, throw away the water, and replace the feet in the saucepan with 5 pints of hot water, boiling it gently for 5 to 6 hours and keeping the stock well skimmed. By this time the liquid will be reduced to about 1 quart. Strain off, let it get cold, when it will be a jelly, and then remove grease from the surface, finally wiping it with a clean cloth dipped in boiling water.
Turn the jelly into a clean pan, add $\downarrow$ pint of sherry, 6 oz. loaf sugar, the thinly-pared rind and strained juice of 3 lemons, 3 cloves, 1 in . of cinnamon, and the washed, crushed shells of 2 eggs and their lightly-whisked whites. Whisk all these ingredients over a moderate heat until the jelly boils up to the top, of the pan. Let it sink again and rehoil it. Do this twice; then allow it to settle for 10 min . by the side of the fire, kecping it covered. Strain it into a basin through a clean, coarse teacloth kept solely for this purpose, first scalded by pouring boiling water through it. Pour the jelly back again through the cloth two or three times if at all cloudy. Next pour the clear jelly into a wet mould, or moulds, and leave till set.
It is wise to test the stifiness of this jelly by cooling a little of it quickly If too stiff add a little more sherry, water, or lemon-juice. If wished, omit the wine and use more water and lemon-juice, or add brandy or port wine in place of sherry. If a clear jelly is not required leave out the shells and whites of the eggs, and after boiling the jelly for a few minutes, strain it through a hair sieve or a fine strainer. This is sufficient for about a quart of jelly.
CALF'S HEAD. Wash the head thoroughly and trim, making sure that the eye, the inner part of the ear, and all the soft, bony parts from the nose have been removed. Leave it to soak in cold, salted water for 2 hours; then lay it in a saucepan, with enough cold water to cover it, and boil it for 10 min . Throw away this water, put back the head with fresh water, and add 1 onion, 1 carrot, 1 turnip, and a few sticks of celery, all cut into small pieces, a emall bunch of herbs, 6 peppercorns, 2 cloves, and 3 allspice, the last nanued being tied up in a small piece of muslin.
Let all these simmer for 3 to 4 hours, or until the meat is perfectly tender and comes away from the bones. Skim the stock well, lift out the head on to a hot dish, and serve whole with hot maltre d'hôtel sauce poured over. Alternatively, cut the meat off the bones into large, neat picces, arrange on a hot dish and pour over the sauce, garnishing the head with sippets of toast and cut lemon.

Another way of treating calf's head which has been boiled is to cut it into slices in. thick, sprinkling the pieces on both sides with grated nutmeg, flour, and ralt. Fry these a light brown, then put each piece into a stewpan. Mix a teaspoonful of four with a little water till smooth and add it to the butter in which the head was fried, afterwards pouring in gradually $\frac{1}{d}$ pint stock together with a wineglassful sherry and a tablespoonful Worcestershire sauce. Season the whole with a little cayenne and a tablespoonful lemonjuice, pour the sauce over the meat, and let all simmer for a quarter of an liour.

Calf's head is often served with tomato sauce. This dish is made from a boned, cooked
 macaroni. Divide the macaroni into piecen about in. long, and boil rapidly in salted water until tender. Cut the meat into small slices, pour the tomato sauce into a stewpan, and add to it the strained macaroni and the meat. Sicason it to taste, and heat thoroughly. A calf's head makes a good brawn, and mock turtle soup can also be made with it. See Brawn; Mock Turtle Soup.
CALICO. The name is derived from the Indian port of Calicut, from which a large part of the calicoes worn in the western world used to bo shipped.
What makes one calico better than another is the quality of the raw cotton used to begin with, the fineness of the threads from which it is woven and the number or closeness of those threads. Cotton cambrics, jaconettes, long-cloths and nadapolams are included under this heading. Calicoes may be bleached, unbleached, or partly bleached, or printed, by machine or hand, in most colours. See Cotton.

## Californian Bluebell. See Nemophila.

CALIFORNIAN POPPY. The eschscholtzia, or Californian poppy, is commonly seen bearing deep orange towers with a yellow


Californian Poppy. Flower of the
Californan PoppJ. Flower of the
Californian Tree Poppy, Romneza
range scarlet ; and frilled pink
This showy annual is raised from seeds sown in the open in spring and autumn, and the scedlings thinned to about 9 in. apart. A light, friable soil and a sunny site are most suitable. In many gardens self-sown seedlings are numerous

CALIPERS: For Measuring. These instruments are generally made of metal with firm joints; that is, the joint is so constructed that the calipers, when set to any given measurement, will not readily be displacod. They are made in various forms, those shown here being from 3 in . to 24 in . in length. The outside calipers are pearshaped and adapted for


Calipers. Diegram showing how they should be used for making inside and outride messuromonte
measuring the diameter or thickness o a rod or bar. The inside calipers, used for measuring the bore of a tube or the diameter inside a ring, have outwardly turned ends or jaws.

The method of using is illustrated It is cssential for accurate measurement that the calipers should be held erect and the jaws kept at right angles to the axial line of the work. Inside calipers are hcld in a similar nianner. with the centre of the joint on the axial line of the bore of the work The distance outside the jaws is then compared with a ruler to olitain the dimension. In the case of outside calipers the dimension inside the jaws is taken. Improved calipers for very fine measurements have a acrew adjustment. Spring calipers can be easily and quickly adjusted with considerable accuracy, by means of the screw nut. Thread calipers for measuring the diameter of screw threads have extra wide jaws, while odd leg or jenny calipers are for scribing the centres on a bar or for other marking out and measuring purposes.

CAIL : Elow to Pay. In the country and smaller towns it is customary for the older residents to call first upon newcomers. They may call because asked to do so by a mutual friend, or, quite correctly, as an act of courtesy, without introduction. If invited to meet the newcomer at the house of a friend, they would be almost bound to call at an early opportunity, unless they wish to alight both friend and newcomer.
This rule is obviously impossible in the larger towns, and therefore a ncwly arrived person has to take the initiative in such matters. She will usually have some kind of social introduction to one or two people, and will duly leave cards on them, or should her social circle be very large, she may send her secretary to leave carda. In India and most of the British dominions and dependencies this also applies. The newcomer will leave his or her card on the residents (as a rule the card is merely put into the letter-box or into a special box for the purpose fixed to the gate of the drive) and will write his name in the book at Government Houso, and such as desire the acquaintance will then take steps to improve it.

Leaving Cards. Usually the time for calling is from 3 to 6 p.m., from 3 to 4 being the most formal hour for mere acquaintances. When the lady called on is not at home, the caller should leave one of her own cards, and if married one or two of her husband's, one of his being for the lady of the house and the other if she is married for her hushand. After a first call it is usual to leave only one of the husband's cards.
"Not at home" is often a polite formula, and may mean that the lady of the house is in but is not receiving. This must not be taken as a slight, and the caller, unless on very intimate terms with the mistress, should not ask any questions of the servant, but leave her cards. A man should not call on a lady unless she invites him to do so It is usual for men to leave their hats and sticks in the hall, and not take them into the drawing-room.

The caller should not present cards to a servant when the mistress is at home, but should follow to the drawing-room door, where the name should be given, if unknown, to the servant. After shaking hands, the visitor should sit down near the hostess without

A formal call should only last about a quarter of an hour. It is usual to offer tea, but the offer is not usually accepted unless tea is already being served in the room. Women do not rise when other visitors are introduced unless they wish to show particularly courteous
attention. A man would get up at the eame time as his hostess, who always rises to greet a visitor of cither xpx. The same rule applies when a guest is leaving.

Etiquette of Introduction. When introducing, a man must always be introduced to a woman, whatever their respective rank or position, and, in the case of people of the same sex. the less important is introduced to the more important. An unmarried lady is always introduced to a married one, unless the former is of superior rank. The rule is to how only on being formally introduced, but this is not usually adhered to if the people are introduced by the hostess as personal friends of her own, when it would seem frigid not to shake hands. If jeople have only bowed they do not usually shake hands, but bow again, at parting Cards should be left or a call returned within a week or ten days. See At Home; Etiquette.

CALLIOPSIS. The daisy-like flowers of the calliopsis (or coreopsis) are orange, yellow, crimson, and brown, growing on stems $1 \frac{1}{2} \mathbf{f t}$. high. The annual varieties are sown out of doors in March-April, where they are to bloom in summer. Several kinds are perennial, but as they are liable to perish after having llowered it is wise to sow seeds annually in June; the best are auriculata superba, grandiflora and lanceolata, all three bearing yellow flowers

CALL SIGN. In wirelcss telcgraphy this is an identification signal by which a transmitting station may be readily recognized, thus facilitating the transmission and reception of messages in Morse code. Call signs are also used by broadcasting stations.
CALOMEL Calomel or mencurous chloride is a white, practically tasteless powder frequently used in medicines for its purgative action. It also acts as an intestinal antiseptic. Calomel is usually given at night, dose from one-half a grain to 5 grains, when the constipation is accompanied by headache, heavily coated tongue, and feeling of fullness in the pit of the stomach.
A saline such as Epsom or Carlshad salts or back draught (compound mixture of senna) is usually given in the morning following. It clears away bile from the gall bladder. In various forms it is used in syphilis; combined with glycerin and solution of lime it forms hack wash, which may be used as a lotion for sores of this complaint. It may be applied as a dry powder to relicve itching.

Calomel, the mercurous chloride, should not be confused with corrosive sublimate, or mercuric chloride, which is much more poisonous. See IBlack Draught.

CALUMBA. The dried root of the calumba plant, which is obtained in E. Africa, is used for medicinal purposes, being a bitter stomachic, increasing appetite and aiding digestion. As it contains no tannin it does not form a black, inky mixture with imon, in this way resembling quassia. Useful preparations are the infusion, which is made with cold water, dose $\frac{1}{2}$ to 1 oz ., and the tincture dose $\frac{1}{2}$ to 1 dram. In anaemia the following may be given, a tablespoonful being taken in water thrice daily after food :


As another illustration of the use of calumba in medicine, the following may be given to increase or stimulate the appetite, the dose being one tablespoonful in a wineglass of water, taken thrice daily just before foud :

## Nitrohydrochloric acid (dilutc) <br> Syrup of oranges

CAM : In Mechanics. The cam is a projection on the side of a revolving mechanism, such as a shaft, which causes any fitment
that is brought into constant contact with be distinguished by the presence of certain its profile to perform a reciprocating motion. stronger hairs of a darker hrown. Camels With internal combustion engine design the grow two kinds of hair, one relatively short cam is used for other purposes than the operat- and downy, grown on the body; the other
longer and coarser, on the liaunches, hump. and mane. The long hair is combed out as far as possible but a littie remains

The hair of camels is collected in Central and Northern Asia, and manufactured in the same way as wool in Great Britain and other countries The natural colour is fawn made into un dyed blankets, dress. ing-gown cloths, etc. See Wool

Camel Hair Brush. Thebest paint brushes in this hair are made with a knot of camel hair securely tied and pulled into a tin ferrule, which ing of the valve gear, such as the operating is then in most cases fitted with a long of the oil pump, and also of the water pump handle of plain coloured or ebonised wood. that is sometimes fitted to assist the cooling Camel hair is of a soft, silky nature, and tho system. In these cases the shape of its profile end of the brush being pointed, the smallest differs considerably from the cam employed quantity of anything in liquid form can le for valve gear work, inasmuch as its action is applied. To clean the brush after use, a littlc more gradual, a steady reciprocating movement paraffin should he worked into the hair, the being all that is required, as illustrated at $A$. B shows a cam with equal sides and a rest period at the top, i.e. a period of the cam's rotation during whioh the part being operated remains stationary This design gives a quick opening, a long rest period at full open, and a quick closing. It C is given a cam having a moderately quick opening, a shorter rest period and a slower closing. D shows a cam with equal-sided faces and no rest period at the top. Generally apeaking, it may be noted that the more rapidly a cam performs its lifting function, the more severe will be the blow given to the part to be lifted at the beginning of the operation. See Motor Cycle; Valve.

CAMBRIAN WARE. The term loosely comprises all the ceramic products of the Swansea works down to 1870, but collectors prize the opaque china, not true porcelain, produced after 1802, and decorated with painted shells, butterflies, birds and flowers, or with local landscapes. Swansea china, a softpaste porcelain made after 1814, often bears decorations in the same style. There are also saltglaze stonewares and cream-wares, represented by jugs, tea-sets and other patterns, as well as mantel. piece figures, unglazed buff reliefs, some Egyptian black, and imitations of Etruscan ware. Milk. maid-and-cow figures are charming and characteristic examples. See China; Pottery.

CAMBRIC. Cambrics are made both in cotton and in linen. They are of light-weight, fine and closely woven, and much used for making handker. chiefs. Linen cambrics are cooler to the touch than cotton and stand more washing. See Handkerchief.

CAMEL HAIR. Very soft and warm to the touch, camel hair can sometimes


Cambrian Ware. Some of the princlpal marks on Swansea china. 1. Impressed mark, rare on china, common on pottery. 2. Impressed mark common on early
examples.
mat. 5 .
Common marks. B. Impressed mark, late period. 7. Transier mark, latest period
brush squeezed out and washed in warm water and the hair pointed with the fingers
Camel hair pencila are made of knots fixed in quills of birds' feathers varying in size hetreen those obtained from the goose and the lark; the smallest si\%es are found in a child's paintbox. Handles are supplied to fit into the quills.

Another use for camel hair is in the thin. flat brush made for damping paper for the letter copying press. The brush for painting the throat with iodine or other preparation is also composed of camel hair, the knot being pulled into a large quill, which is sometimes bent to facilitate reaching the inside of the throat. Care should be taken to see that the knot of hair is securely fastened, See Brush.
CAMELLIA. This evergreen shrub is generally grown under glass, hut it is fairly hardy and may be planted out of doors in warm sheltered spots. In the greenhouse camellia is grown in larger flower pots or in a bed of prepared soil. Thorough drainage is neccssary, and a suitable soil compost consists of peat and loam with and added freely. If grown in pots the plants should be set out of donrs in the summer and replaced under glass in September A temperature of $50-55$ degrees is suitable.
Healthy plants have a habit of setting far ton many buds. It is best to reduce the number, before the buds have developed, to not more than one on each shoot

After fowering, the plants should be pruned, hut only sufficiently to preserve the shape of the bush Crowding shoots may be thinned and atrag. gling oncs shortened.
Propagation is effected by means of gralting under glass in spring. If re potting be necessary it

should be done directly the flowers are over, but should never be undertaken unless the pots are obviously crowded with roots. Cimellias should bo sponged occasionally for "hite scale, and fumigated for green fiy if necessary

Good varieties are alba plena, white: Comtersa Lavinia Maggi, white with deep rose
stripes: fimbriata, whito; Lady Hume's Blush, flesh pink: Mathotiana, glowing red : C. H. Hovey, crimson ; Donckelaari, crimson and white: Reine des Bcautés, rose: Thos. Moore, carmine.

CAMEMBERT. This is a popular variety of soft cheese. In France, its native country, it is usually made from whole milk of a quality similar to that given by Shorthorns. Often, however, separated or perfectly sweet skimmed milk is mixed with the new in proportion of 1 to 5. Usually made from Sept. to May, these cheescs are small; they weigh from 10 to 13 oz ., about $5 \frac{1}{4}$ gallons of mixed new and skim milk being required for each dozen. See Cheese.

CAMEO. This is a piece of relief carving in stone, such as sardonyx, chalcedony, ngato. The layers of colour peculiar to these stoncs are utilised to form a backiground, after the front portions lave been carved away. Cameos are also made from a variety of shell consisting of two layers. one of which is pink and the other white. The dosign is carved in the upper or white later, while the lower or pink layer forms the background.

The value of the cameo depends on the beauty of its carving. A genuine cameo should be carved entirely out of one pieco of material ; many imitations consist of a badly carved subject cemented to a background of a different coloured material. Cameos may be cleaned by washing in warm soapy water and gently brushing with an old tooth brush.

## Cameras for the Amateur Photographer

## Hints on the Choice and Use of the Best Modern Types

For the principles of Camera Work see Photography; their detailed application is described under Developing; Enlarging; Filnt: Plate: Printing, etc. Other aspects are discussed under Cinema; Telephotography, etc.
There have been continuous developments at a time. They are available in a wider range in camera design since photography became a popular hobby, the general trend leing towarda greater compartness coupled with increased efficiency. Better lenses and more precise adjustments have made it possible to produce with the modern pocket camera crisp sharp negatives that will enlarge to any reasonable sizc. Cameras taking smaller negatives than the once almost universal $\ddagger$ plate ( $4 \ddagger \times 3 \downarrow \mathrm{in}$.) are theretore now popular. The $3 \ddagger \times 2 \ddagger$ in is now the most popular size, but Vest Pocliet (2! $x / \frac{15}{8} \mathrm{in}$.) is widely used. Other popular sizes are $4 \frac{1}{4} \times 2 \frac{1}{i n}$. and Postcand ( $5 \frac{1}{2} \times 3 \frac{1}{i n}$ ).
Most modern cameras can be loaded in daylight. The majority of them take roll film ; canteras primarily intended for glass-plates (which have to be loaded in a dark room) can be made daylight loading by fitting a film-pack adapter and using film packs Daylight loading films are the most convenient form of material when a number of pictures are to he taken. Glass plates are preferred by those who wish usually to make only one or two exposures


Camera. Fig. 1. "Brownie " simple boz-form camera for snapshots in good light, with portrait attachment for close-up photos Courtesn of Kodat. Ild.
at a time. They arc available in a wider range
of speeds and colour sensitiveness than roll films, but are equalled in this by cut film, a molern material used in plate slides.

With practico and intelligent application of the principles of photography good negatives may be niade with the cheapest camera and the simplest lens. It is only necessary to realize the limitations of the lens, and not to attempt subjects which are not within its scope. The leginner who blindly snaps at a fast-moving motor-car, or even people walking in a street, with a cheap caniera and its neces sarily slow lens is making failure inevitable The more expensive camoras are fitted with faster lenses, admitting more light, and there fore pernitting shorter exposures, i.e. quicker snaןshots.
Three Main Types. There are threc main types of cameras : box form, folding pocket, and reflex. Cinematographic cameras are dealt with in the article on the Cinema.
The hox form is the simplest type, repre sented by the box "Brownie" (Fig. 1, to take pictures $34 \times 2 t$ in., or $4 \frac{1}{4} \times 2 \frac{1}{2}$ in.). A simple lens is fitted so that snaps can be taken only in fairly bright light, but the camera is so simple and solidly constructed that a very high proportion of good pictures results. Interior construction and shutter mechanism are seen in Figs. 2 and 3. A somewhat more expensive form in the "All-1)istance" (Fig 4) which, with a special type of lens gives sharp images at distances from 3 feet upwards without a portrait attachinent. It includes a direct vision-finder, seen on the right of the camera, and a film-registering device which keeps the film flat without tension during exposure. The lens is hooded, and so prevents
light fog due to glare from the sky, or other causes of diffusion of light in the lens, a frequent cause of foggy-looking negatives.


Folding pocket cameras are made in all sizcs from the V.P.K. (vest pocket Kodak Fig. 5), $2 \frac{1}{2} \mathrm{in}$. $x 16$ in., to $5!$ if. $\times 3 \frac{1}{4}$ in. (postcard pic tures). Some are self-erecting, the lens front being automatically pulled into position as the basehoard is


Camera. Fig. ; ${ }^{1 \text { nterior of No. } 2}$ box "Brownie;" Fig. 3. Shutter
mechanism, A, B, and C
pulled down; in other types the base is pulled down and the lens front slid out on runners, as the example given in Fig. G, which takes roll film 21 in. $\times 3 \pm$ in., has a two-position lens giving accurate focussing at all distances between 3 ft . and 9 ft . and 9 ft . and infinity, and a three-speed shutter The wire frame in front folds out ns a direct view-finder.
Various types of lenses and shutters are fitterl to folding cameras, from the simplest to the most expensive. A good modium priced camera equipped with a $f 6.3$ lens will enable snaps to bo taken successfully even on dull days. Simple box cameras are fixed focusonly objects more than, say, 10 ft . away will be sharp unlesa a supplementary lens, a portruit attachment, is used. Folding cameras usually


Camera. Fig. 4. Box-form with "All-Distance" Camera. Fig. 4. Box-form with "All-Distance"
lens giving clear focus from 3 feet to inflity Courtesy of Ension, Led.
have $\pi$ focussing attachment; by setting a pointer at the appropriate distance on a scale the lens-to-film-distance is idjusted.

The Siand Camera. The types of canteras named above are primarily hand cameras, though most of thens are fitted with a bush for attaching to a tripod when time exposures are to le given. The hand or stand cantera is a type that takes plates, cut films or film-packs, and has a proper ground-glass screen for focussing the image when used upon a tripod, in addition to a pointer and scale for use when the camera is used in the hand. This type of camera is one which is largely used by the more practised amateur, since it enables him to use colour sensitive plates (orthochromatic or panchromstic), which give better colour rendeings than the ordinary roll film

Most cameras of this pattern fold up small enough for the pocket, plates being carried in dark slides, or n larger number of flat films in a film-pack with adapter. The example shown in Fig 7 will take plates or flat films of various sizes from $3 \frac{1}{2} \times 2 \frac{1}{2}$ in. to $\frac{1}{t}$-plate It has $n$ double extension, by means of which the front and its lens can be racked out for focussing near objects, and a rising and falling front. It is asually fitted with a better type of lens than the fixed-focus camera, e.g. an anastigmat of 17.7 or f 6.3 aperture.

The Reflex Camera. With the reflex camern (Fig. 8) focussing is done visually up to the moment of exposure on a screen at the top of the camern. The Gmflex is fitted with a very fast lens and a shutter giving exposures from is to Forn second, so that it can be used for high speed subjects which would be blorred with an ordinary camera
The general principles of a reflex cannera are illustrated in Fig. 0. $P$ is the plate holder ; I is the revolving back for horizontal or verlical pictures; $F$ is the focal-plane shutter; $M$ is the hinged mirror which swings to the dotted position during exposure of the plate ; $G$ is the ground glass upon which the object is viewed; $H$ is the viewing hood; $L$ is the lid to cover hood when folded down; $R$ is the rising and falling front ; $S$ is the sky shade and lens cover: ' I are the sliding guides and racks; V is the focussing pinion

The focal-plane shutter consists of a blind running close in front of the plate and having in it a slit, the width of which can be adjusted. The blind is wound with a spring, and when released passes very rapidly in front of the plate, giving an exposure which may be as short as rôd of a second

Choice and Use of a Camera. The choice of a camern depends upon the amount of moncy an amateur can nfford, and upon the kind of work it is desired to do. The lens is the most important part of the camera. The best lenses are known as anastigmats, next to them come the rapid rectilinesrs (known also as doublet or R.R. lenses), and after them come the single lenses, the chenpest form, which do excellent work when properly used
If the would-be photographer wishes to do ordinary snapshot work he cannot do better than choose the best roll-film camera he can afford, deciding the size of original negative desired (always remembering that it may be enlarged), and the quality of the lens. Better use a small size with a good anastigmat lens than a larger size with a single lens.

In ordinary use in temperate climates, cameras, either hand or stand, will last for


Figs. 5 and 6. Roll-flm types. Left, Fest Pocket Kodak with time and instantaneous shutter. Right, Ensign with "All-Distance " lens and 3-speed shutter Courtcsll of Kodali, Led., and Ensign. Led
years without nceding any repair. The only care which they require, other than abstinence from rough liandling, is occasional wiping of dust from the inside of the bellon's with $\Omega$ damp cloth.

In all the patterns of the hand camera which have bcen described, with the exception of the rellex, the user has to do two things in order to get a satisfactory picture. Onc is to hold the camern so that the exact picture required is seen in the finder. For this purpose it is best to use the direct-vision finder rather than the misleading, so-called "brilliant" finder generally found ahove the lens at the camera front.
The second essential is to obtain a sharp picture. With a tripod camern the actual picture is viewed on a ground-glass, and the lens moved in or out and adjusted by using a smaller stop until the necessary sharpness of definition is seen. With most hand cameras the distance of the principal part of the subject has to be judged by the eye, and the lens then racked in or out until i pointer on the focussing scale comcs opposite the mark corresponding with the judged distance. Some experience is necessary to judge distances with sufficient correctness.

The smaller the camers and the smaller the stop in the lens the easier it is to obtain a sharp picture, even though the distance of the subject has not been quite correctly judged.
A cause of failure among many beginners is


Camora. Fir. 8 (left). "Graflez" model of reflez camera with bigh speed lens and shutter and focussing mirror. Fig. 9 (above). Sectional diagram of reflex Courtesu of Kodali, Ltd.

causing a certain muscular vibration, the effect of which in the picture is slight fuzziness. In the use of a very small camera it is always advisable to press it gently against some rigid supiort when making un exposure

Even the chenpest hand cameras allow of much better pictures being taken if used on $n$ light tripod. If this is done, a longer exposure can be giren by using what are called the time and bulb adjustments of the shutter, marked respectively $T$ and $B$ on the shutter scale Set to T , the shutter is opened by pressing the trigger and remains open until the trigger is


Camera. Fig. 7. Folding plate nond fim-pack or cut-fim type for advanced work, with rising front and anastigmatic lens Courtesus of Ensiun, Led
agnin pressed. Sct at $B$, the shutter remains open as long as the trigger is kept pressed. By using these adjustments, fully exposed pictures may be taken, even in a very dull light and with the slow lenses fitted to the most inexpensive camerns. But the subject must not contain objects in movement.
CAMOMILE. This is a fnmily of hardy rock and border plants. The flowers are white, silvery grey, and yellow, and the planta, which are mostly summer-flowering, do not need any special cultivation. Anthemis Biebersteinii grey leaves and yellow flowers, 12 inches, and macedonici, white flowers, 6 inches, are suitable for the rockery. Kelwayi and tinctoria grow 2 feet high and are valuable border Howers.
Carnomile Tea. The dried flower-heads of the camomile are sometimes infused at home to make camomile tea. It is made as follows. Soak 1 oz . of the dried Howers in a pint of boiling water in a covered pan for 15 min. Then strain off the liquid and add sugar
to tasto. It acts as a mild tonic and is good for sleeplessness. If given hot it pronotes perspiration. and administered warm acts as an emetic. The infusion obtained from a chomist is of a unitorm strength, and the dose is 1 to 407. 'The drug is used in this way as a tonic and stomachic, as it is an aromatic bitter

A camomile poultice is an old household remedy for inflammation and sprains. For this purpose the flower-heads aro put in a bag and boiling water is poured over them. The oil, in doses of $\&$ to 3 minims, is a stimulant and antispasmodic, like other volatile oils.

CAMIPANULA. Some of the most delightful hardy tlowers for borders and for the rock garden are found among the bellflowers or campanulas : $\Omega$ few are suitable for the greenhouse. The border kinds flourish in sunny or slightly shady places and in ordinary soil which has been dug deeply and manured. llanting may be done in autumn or spring. The best perennial oampanulas for the hardy Hower, border are persicifolia and its varieties Telliam Beauty, blue, and Snow King, white, $2-3$ feet ; glomerata, blue. 18 inches; Hendersoni, mauve-blue, 12 inches: lactiflora, palest blue, 2-3 feet; latifolia macrantha, purple, :3-4 feet : latiloba, blue, 2 feet, and its white variety Theso may be raised from seeds sown in fine soil in a frame in spring or by detaching and replanting rooted pieces in summer. lictiflora may perish after flowering; it is wiso to raise seedlings every ycar or to take care of self-sown seedlings.

The campanulas suitable for the rock garden thrive in moist, gritty soil in slight shade. The best are pusilla, blue, and its variety Miss Willmott. paie blue; muralis, purple blue; G. F Wilson, purple-blue: pulla, purple: garganica, lavender blue; carpatica, blue. The last named is more vigorous than the others. reaching a height of 12 inches when in bloom.
Some of the rock garden campanulas are difficult and must be grown in very gritty, thoroughly drained soil such as is provided by a moraine. Among them are Allionii, cenisia, Rainerii, and Zoysii. Seeds sown in spring in pots of very fine soil placed in a frame provide the best means of propagation.
The chimney bellflower (campanula pyramidalis) is a handsome plant, 3-4 feet high, suitable for planting out of doors or for cultivation in pots. Seeds are sown in March under glass to provide flowering plants the following year.
 Campanula blue. and its white variety, $a l b a$, make charming plants for the room, window, or greenhouse ; they should be sown in suspended pots, for they are of droop.


Campanula. Bell-like flowers of C. Allionii, a rockery plact. Above, C. carpatica, grown as a pot placit
ing growth. They are easily raised from secds in spring and need a compost of loam, lealmould and sand.

The popular Canterbury Bells are varieties of campanula medium. There are single, double, and cup and saucer rarieties in white, pale rose, purple, lavender-blue and other shades. The plants are trented as biennials : sceds are sown in boxes of fine soil in a frame in May. The seedlings are planted on a reserve border when large enough, and are put out in autumn or spring when they are to bloom the following summer. They are useless after having flowered. Plants which do not bloom in the year following seed sowing should not be disturbed : they will Hower exceptionally well the next yoar. See Canterbury Bell.

CAMPHOR. Camphor is a pungent crys. talline substance ohtained by the distillation of the wood of the camphor laurel. The commonest preparations used in inedicine are:
Camphor water-dose, 1 to 2 oz.
Spirit of camphor-dose, 5 to 20 minims.
Compound tincture of camphor (paregoric)-dose,
to 1 lludd dram. This contains opium.
Liniment of camphor and ammonia.
Rubbed directly on the skin camphor has a stimulating effect, dilating the superficial blood reosels, and leading to an immediate feeling of warmth. As this passes off partial loss of sensation in the skin follows. It is for these effects that camphor liniments are so commonly used in chronic rheumatisni, sprains, bruises, neuralgia, etc.

Internally caniphor has a stimulating effect on the stomach, increasing both its muscular movements and the outpouring of gastric juices. It is also a heart stimulant, frequently prescribed when the pulse is thin and feeble. As it has a mild diaphoretic action on the skin. camphor is added to many cough and cold mixtures. The compound tincture of camphor was a common household remedy for colic and diarrhoea. It should not be forgotten that this preparation contains opium.

Spirit of enmphor may be taken at the beginning of a cold, 10 dmps on a lump of sugar. Camphor balls arc used for rubbing on chapped skin It is of service in relieving itching, and for this purpose the spirit may be dabbed on, or camphor water may be used as the basis of a lotion, e.g. zino oxide 1 dram, glycerin 1 dram, camphor water 1 oz. ; to be shaken well before applying.

Camphor Balls. Owing to its high cost camphor is comparatively little used in the home, but its effioacy in keeping away moths and other insects from clothing has long been recognized. Three or four camphor cubes about ${ }_{3}{ }^{3} \mathrm{in}$. square placed in the drawer or trunk in which the clothes are kept will preserve them from all the ravayes of insects. To protect dried botanical specimens a little powdered camphor should be dusted between the leaves of the specimen book.

Camphor is useful in insect powders. Equal parts of camphor and boracic acid is an excellent powder for dusting on animals to prevent attacks by fleas. The addition of pyrethrum powder in the proportion of about three of pyrethrum to one of mixed camphor and boracic acid forms an insect powder which is good against practically all insects. A cheap substitute for camphor, sold under the name of moth-balls, or carbon-balls, is not composed of camphor at all, but of naphtha. lene. A handful of naphthalene balls will protect stored clothes from moth, and the powdered form of naphthalene will take the place of camphor in insect powders.

CAMPHORATED CHALK. A popular dentifrice is made by mixing camphor with precipitated chalk in the proportion of camphor 1 oz . to chalk 9 oz . The camphor is first reduced to a fine powder in a mortar by rubbing it with a few drops of rectified spirits of wine or spirit of camphor. The spirit
soon evaporates when the chalk is stirred in. It is advisable to keep camphorated chalk in a bottle to prevent evaporation of the camphor See Chalk: Teeth.

CAMPHORATED OIL. This is another name for the liniment of camphor, which formerly was official, and consisted of 1 oz . of camphor dissolved in 4 oz . of olive oil. It is used as a stimulating liniment, and is especially useful for chest complaints in children. The official liniment now contains ammonia, and is known as the liniment of camphor and ammonia. Camphorated oil is preferable for young children, however Camphor in sterilised olive oil (camphor 1 part, olive oil 5 parts) is used as a heart stimulant in pneumonia, intluenza, and other diseases. It is injected under the skin in doses of from 10 to 30 minims, and has proved most useful See Camphor.

CAMPINE FOWL. Owing to its economical qualities this fowl is much esteemed by many poultry keepers in Great Britain. It is a prolific layer of good-sized white eggs, and when fattened makes a plump, though rather small, table bird. There are two colours, gold and silver. See Poultry.

CAMPION. There are both annual and perennial kinds of Campion (silene); they flourish in ordinary soil in a sunny position.


Campion. Flower heads of Silene armeria, a pretty
The most popular annuals nee varieties of Silene pendula; they are grown chiefly for spring bedding, as a groundwork to beds of bulbs. Bonetti, deep rose, and Douhle Saltnon, pink, are two good ones. Seeds are sown on a narrow border in July, and the seedlings planted finally in October. Seeds may be sown in April to provide summerflowering plants. Silene armeria, 12-15 inches. has rose-coloured flowers in summer; seeds are sown in April.

Of the perennial kinds the most useful are Silene alpestris, white, 6 inches, and schafta, rose, 6 inches; both are suitable for the rock garden. Silene acaulis, which forms a moss-like cushion and bears rose pink flowers in April, is difficult ; it is most likely to bloom if grown in gritty soil in the moraine. Silene maritima flore pleno is an attractive plant 6 inches high, which bears double white blooms in summer. Sceds sown in fine soil in a frame in spring provide an easy method of propagation ; the stock can also be increased by division in autumn or spring.
CAMP STOOL. In the folding camp stool, types of which are shown in Figs. 1 and 2, the seat is usually of canvas and the legs are pivoted. The commonest type is that in Fig. 1. The canvas is stretched when the legs are open and folded when closed.
Fig. 2 has a wood seat, and the joints at the tops of the legs have to be made to suit, for the seat must fold over, instend of collapsing like the canvas stool. One pair of legs are


Camp Stool. Figs. 1-5. Easily made stools and details of
pivoted to the seat and the other pair are detachable from it, so that it can tum over as if hinged. The pivoted joints generally swivel on a rivet. Another way is to use a screw, as in Fig. 3, instead of a rivet. The piece of wood nearest the head of the screw should be sufficiently slack to swivel with. out turning the screw, and the thread of the latter should be immovable in the other piece of wood The lower parts of the lega are united by cross pieces, varietics of which are shown in Figs. 1 and 2.

Slats on the legs or hack are screwed on. They are often a little longer than the actual distunce over the lega, partly to avoid short grain beyond the screw holes and partly to "void flush surface where one part shows end grain and the other side grain. Another reason is that the projecting ends act as stops for the folding parts.

The round rod connecting the lower ends of the legs in Fig. 2 is glied into a bored holc (Fig. 4), or may be secured by a wire nail. The hole is not bored entirely through the leg. In seats of the kind shown in Fig. 1 the tope of the legs are generally tenoned into the rail the canvas is tacked to (Fig. 5). The tenon may or may not go completely througk. The wood is usually bireh or beech.

CAMSHAFT. The shaft that drives the cams operating the valves (inlet and exhaust) of an internal combustion engine is known as the camshaft. Except in very large engines the cams are usually formed ns part of the rhaft. In the casc of the overhead camshaft, it is so designed that one cam operates two valves. See Cani; Motor Cycle; Valve.

CANADA BAISAM. From this resinous substance, obtained from a Canadian tree, Canada balsam cement is macle. It is used for mounting microscopic objects and mending broken glass. The cement is a thick, glassy liquid prepared by dissolving 3 oz of Canada halsam in a bottle containing 3 oz . of henzol. thie contents being slaken until the balsam has dissolved. The anlution niay be obtained ready prepared from most firms dealing in microscope accessories.

CANAPE. These may be either rounds or fancy-shaperl pieces of bread and butter, cut very thinly, and served with savouries. Cut shapes in tonsted or fried bread are sumetimes known as canapés, but are more often called croûtons.

CANARY. In buying a singing canary it is important to make sure of two thingsthat one is getting a cock bird, and that it is young. A healthy singing pet should live at least 10 years, and mary even reach twice that age, but its length of life will naturally depend on the constitution with
which it starts and on the carc it receives in $\Omega$ week. A piece of cuttlefish bone should be the matters of food and housing. The hest stuck in the wires for tho hird to exercise time to buy a singing hird is in the summer or autumn, when the young birds of the season's brecding are on the market. To be certain of the sex it is necessary to hear the bird sing; for, so far as appearances go, cock and hen canaries are so much alike that only expert fanciers can distinguish them, and even they cannot always be certain.
The plumage should be very close and neat and the legs and feet quite amooth, with delicate claws; if the legs look rough and horny, owing to the projection of the erlges of the scales covering them, and if the claws are long and coarse, the hirll is either aged or has a poor constitution, the overgrowth of horn early in life heing a bad sign. The birl should also be active and restless in its move ments, and alwnys ready to burst into song. The colour is quite immaterial, though most penple prefer a pure yellow bird.

## Best Sinsind Canaries

The smaller breeds of canaries are the best for pets, as they arc more active and hardy than the large kinds, and their song is not so loud and piercing. In fact, the best singing canaries are the small Rollers. These have a beautiful soft running song, without the high notes, which are often rather too prominent in that of the ordinary canary.
To keep a canary in condition, unc should buy as large a cage as space and funds permit. and this should be of the pattern with slips of glass round the bottom to prevent seed being scattered about the ronni. The best shape is oblong, and the cage should be hung in a room where the temperature does not vary much, placed well out of any draught, out of reach of the cat, if one is kept, and not above the gas.

The food should be canary and rape aeed, and the latter should be the brown summer rape, at any rate for Rollers. A few grains of hemp may be given daily as a treat; but this is too fattening a seed to be given at discretion. A spray of millet to peck at makes a change. The only delicacies that should be allowed are green food or fruit, which should be given daily. In summer groundsel, chickweed, Howering grass, or dandelion can generally be had; tender lettuce and watercress are also gond, and a slice of ripe apple is much appreciated. But too much of this raw fond should not be given, as if stale it is injurious; nor should any be used in a frosted state in winter. When the hird is moulting it may have a piece of stale sponge-cake daily, but not at other times.

Sand should always be available so that the bird can select the grit it requires for grinding its food; it is usual to cover the drawer of the cage with this, but as long as a teaspoonful or so of sand is put down whenever the cage is cleaned, the drawer can be just as well covered with sawdust or cedar litter. It is best to cover the drawer of the cage with paper bc. fore putting the litter on, and the cage should be cleaned out after the bird has had its bath, which it should have at least twice

put out in late spring, not in autumin. Moreover, in an aviary there should always be at least three hens to every cock, with a proportionate number of nests. If they are jimperly boused, they will bear the winter as well as British finches

CANARY: A White Wine. Wine produced in the Canary Islands was formerly drunk in England under this name The best is called Bidogne or Vidonia winc. It is a dry, white winc somewhat resembling Madeira, but with less body and perfume. The name Canary was formerly applied gencrally to dry white wines, many of them inixed with sugar and cinnamon.

CANARY CREEPER. Grown as an annual. the canary creeper is popular for training over trellises, up porches and above


Canary Creeper. $\begin{gathered}\text { Sprays of flowers and leaves of the } \\ \text { quickrowing creeper }\end{gathered}$
window-boxes. The secds are best sown under glass in spring. in pots or hoxes, and the young plants sct out in May or June. The plants grow fast in moist fertile soil, and soon come into bloom. The llovers are amall and a bright pale ycllow in colour, and are produced very freely. For rapidly covering fences, concealing ugly spots in newly formed gardens, this creeper has few equals.

CANARY GRASS. A hardy perennial, canary grass or phalaris, of 3-4 ft. high, has various names in different localities. Thus it is known as bride's laces, French grass, gardener's garters, lady grass, lady's garters, lady's laces, painted grass, ribbon grass, silver grass, sword grass. It is a fickle waterside plant, which frequently reverts to type. It thrives in any soil which contains plenty of moisture, and can bo propagated by division in spring. In a variegated form the leaves are strijed with white or pink. The species Canariensis is not often cultivated Its seeds are the well known shining canary seed of bird-lovers.

Canary Seed. When ripened and dried this is sonietimes given, slone or forming part of a mixture. to canaries and other birds.

CANARY PUDDING. Well grease some small moulds place 3 oz . each of butter and castor augar in a basin, and beat them to a cream. Mix together 6 oz . of Hour, one teaspoonful of baking powder, and the grated rind of a lemon. Well beat two egga, and then beat them into the butter and sugar. Add the flour, etc., lightly, also the strained juice of a lemon, and lastly 2 tablespoonfuls of milk. Half-fill the moulds with the mixture, cover them with a piece of greased paper, and steam them for of an hour. Turn them out and serve with jam sauce.

CANCER. For malignant tumours of all kinds the general name of cancer is often used, such tumours having the characteristics of growing again when removed, of reappcaring as secondary growths in organs perhaps far distant from that attacked hy the original growth, of leading to wasting and great general wealiness, and of eventually killing the patient

Cancer of the throat is said to be frequent in smokers, and thesc may have induced chronic catarrh by tobacen smoke. A jagged tooth may produce cancer of the tongue. In countries where the men eat their food hot cancer of the stoniach is common, whereas it is almost unknown amongst the women, who eat their fond cold Cancer of the stomach occurs usually on that part of its lining which would be irritated by hot liquids.

The chief signs of cancer are a rapidly developing tumour or the formation of an ulcer. with a hard Hattish hase, and irregular, hard edges. Contrary to common belief, pain is not a common early symptom, though it may be very severc in the late stages. The treatment of cancer is the extirpation of the growth by opcration, and if this is done early enough the likelihond is that the discase will not recur. Unfortunately too many people put off seeking advice about lumps or sores or haemorrhages till the disease has obtained a wide hold on the parts affected or has heen disseminated to distant parts.

Radium and X-rays have produced good rusults, but, with the exception, perhaps, of roclent ulcer, the proper treatment of cancer is carly operation. The other forms of treatment find their proper aphere in those cases which unfortunately have been allowed to get heyond a point where operation is of any use. They may prolong life, but can to little more.

Relief of Cancer. To mitigate the ravages of cancer much research work has been done, chiefly by the Imperial Cancer Research Fund, 8, Queen Strect, Bloornsbury Square, London, W.C.I, and the Jritish Empire Cancer Campaign at 12, Grosvenor Crescent, London, S.IV.I. For sufferers there is a National Society for the Rclief of Cancer, at 15, Ranelagh Road, London. S.W.I, and Cancer Hospitals in Fulham Load, London, S. W. 3. and Nassau Strect, London, W.I.

CANDELABRUM. A holder for two or more candles, the branches of the candelabrum may be attached to a bracket for fixing on a wall, or to a standard for placing on a table. The wall canclelabrum with two or three branches has been extensively adapted for electric light, the bulbs being shaded by scrcens of silk fixed vertically.

Brass candelabra are often lacquered, in which case they should be simply wiped with a soft cloth, and only sponged with warm soapy water; any attempt at polishing will destroy the lacquer. If medallions of Wedgwood ware or china are let in, do not loosen the cement with which they are fixed by too hot water or much rubhing.

CANDIED PEEL. There are three kinds of candied peel, viz. citron, lemon, and orange, and the method of preparation is practically the same for each.

In the following $S$. American recipe for preparing candied peel at home, rinds left over from jellies, etc., can he utilised. Soalk the rinds from $\&$ oranges or lemons in slightly salted cold water for 3 days. Then drain, rinse, and boil the rinds in freah water until they are quite tender. Make a strong syrup) by loiling together 2 hreakfastcupfuls of white sugar and onc breakfastcupful of water for 5 min., keeping the pan uncovered.

Put the conked rinds into a brsin, pour over them the boiling syrup, cover the basin and let it stand for 2 days. Ifter that time strain off and hoil the syrup). Put in the rinds again and boil them until they look semi-transparent.

Probably they will need $1 \overline{5}$ or 20 min. hoiling Talie out the rinds, lay them on llat tins, put a little of the syrup in the hollow centre of each piece, turning them up like cups, sprinkle all over with castor sugar, and dry them in a cool oven. If they are not dried in one day, continue on the next. Keep the rinds in airtight tins, using them as required. Besides its use for flavouring calies, puddings and other sweet diahes, pee! can be cut into shapies for the decoration of shortbread.

CANDLE. The cheaper sorts of candles are generally minde of paraffin shale wax. Others are of stearin, which is pure white, harder, and more opaque than the paraftin cand!e and burns longer, hut is more easily hroken. On the other hand it can withstand hot weather when the paraltin loses its shape A inedium grade is manufactured from an admisture of the two, and costs very little more than paraflin. Tallow candles, which are a dirty yellow in colour, are now chielly used by plumbers and in engineering works, having leern superseded in the household ly the cheaper and more serviceable wax candle. Spermaceti, which is obtained from the cachalot whale, is employed in the nanufacture of the most expensive candles.

For photographic purposes, carringe lamps, and invalid food heaters, the candles in usc are similar in composition to the domestic was candles, lut are made with a special wick, which generates little heat; othcrwise, being burnt in a small enclosed space, the was would quickly dissolve.

Candles are sold by weight, the various size units, sixes, eights, 12 's, ctc., indicating the number of candles going to the pound. The usual sizes for domestic use are sixes to 14's. All sizes are equally economical, as the smaller thie candle the smaller is the wick inserted, and therefore a given weight of candles of any size will burn the same time as a similar weight of any other size. Candles, it should be noted, improve with leeping; if the was in allowed to harden, they will last longer and give a better light.

Decorative Uses. Coloured candles arc used in room and table decoration, in silver, glass, or other ornamental candlesticks. The
 four lights, c. 180010 Courtesy of Chapple \& Montell, London


Candleshade. Stages in cutting out parchment to make an ornamental shade best coloured candles are solidly dyed, and and quarters of the silk are made to correspond not surface tinted, and taper in shape. They with those of the frame. Attach the silk to may be obtained in many shades to tone the covered wire by sewing, the raw edges with any colour scheme Candles are often being tumed inside.
used for dining-table lighting in preference to other methods of illumination. Miniature candles in various colours are used to border a birtliday cake.
Self-fitting candles are usual in white, but if a colonied candle will not tit the candlestick,


Candleshade. Lelt. candleshield consisting of orange silk stretched on a homemade wire frame, decorated with a daisy stencil and edged witb gold galon. Above, candleshade made from drawing paper
immerse thie end of the former in a cup of warm water, and while the wax is still soft, push it into the candlestick.
Candle grease may be removed from clothes by placing a piece of blotting-paper over tho grease mark and pressing it with a hot iron. In obstinate cases fresh pieces of paper should be placed under the imn until all the spots have disappeared. See Night Light.

CANDLESHADE : How to Make. Silk shades may be made on wire frames with thin silk and necessary trimmings. Fluted or square shades are a change from the usual round shape; or the shield type of shade can be used when the candles are placed on shelf or bureau, or for electric candle lampa in wall lighting.
To make a round or square silk shade first cut narrow strips $\frac{1}{2} \mathrm{in}$. wide, either selvedge, or crossway; if there is plenty of material available choose the latter. Cover the whole wire frame by tightly binding with the strips of silk; when starting a new sttip, sew securely to prevent the material slipping. When the frame is completely covered, cut pieces of silk sufficiently deep to allow neatening at top and bottom. The length of silk depends whether it is to be perfectly plain or to be gathered or pleated on the fraine For the Intter method, measure round the bottom of the frame, and allow about as much again for the gatherings.

A good trimming is a tiny ruching (see Bag) of the silk sewn on the edges of the frame, or coloured wooden beads of different shapes may he threaded to hang from the frame in a kind of fringe, or a very narrow silk fringe to mateh the shade may be used on the lower edge. Such shades are suitable for electric candle lamps

Silk shields may be plain or designs may be painted or stencilled on them. The edge should be fastened with a cord or narrow gimp. Mandarin inks are the hest colouring mediun to use for sliades as they are transparent. Stencilled designs may be outlined in embroid. ery silks, as in the shade illustrated Parchment shiclds can be hought cheaply, and decorated hy means of oil-paint transfers.

When making round parchment and paper shades, the stiffness of the medium may render a frame unnecessary, and the shade, when completed, is placed on a holder with adjustable clip. Although the word parchment is used, real parchment or vellum is not often employed for shades, owing partly to the cost and the limited supply, partly to the fact that more skill is required to work on vellum. To ob. tain the pattern, use any suitable paper ; pencil a circle round an ordinary meatplate for outer cipcle and round a cup or small saucer for the small circle The distance between the two circumferences gives the depth of the shade. Cut this wide circle in half, and there will then be patterns for two candleshades.

Amongst the simplest and cheapest kinds of candleshades are those fashioned of cartridge paper. These may have plain tops and coloured borders, or may be hand-painted with Chinese designs of dragona or birds, or illustrating the Willow pattern. The choice of colouring and design must he influencerl by the room and candlestick. See Lampshade.
CANDLESTICK. In places in the country where neither gas nor electricity is available the candle is still the only illuminant for the bedroom, which

Mark the lialves and quarters of the strips of silk with a contrasting cotton, alsn the top and hottom rims of the frame. Run a gathering thread at both top and bottom edges of silk, join to form a circular strip, and gather the silk and place it in position on the frame, raking care that the halves


Candlesticks in mood, that on the left of oak, the other being turned complete from a plece of cocus Courtens of Georue Adums
is usually provided with standard candleaticks for dressing-table and mantolshelf. In addition a candlestick with a base for holding the matchibox is placed on the hall table early in the evening for each person in the house.

Where candles are not $a$ necessity, the candlestick is used for its ornamental quality, enlianced by coloured candle or sharle. Very tall standarda are made in polished or acquered woods, or severe designs are carried out in metals, and faceted mirror glass The


Candlestick: antique examples. 1. English, late 18th century candlesticks, that on the left being of gilver gilt, the other two ol silver. 2. Brass church candlestick, early 16 th centurg. 3. Flemish brass double candlestick, 16th centurg. 4. English patterns: left, late $17 \mathrm{th}^{2}$ century : right, Cromwellian
1.3. by nermission of the Director. Vieloria and Albert Museum
older types in pewter had a base shaped like a bell and a grease tray half-way down the stem. Later models of brass, copper, or silver had bases square, round or oval with columns surmounted with a capital to form the socket, or with grooved or spiral stems. These are particularly suitable for dining-table use and in crystal glass are also popular and sometimes adapted for electric lamp candlea
Wooden candlesticks of simple yet pleasing pattern are readily turned by the amateur who has a small lathe or a mandrel. Those shown in the previous page, worked in oak and cocus woorl reapectively, were madc on a Verschoyle mandrel (See Lathe). The larger of the two is $10 \frac{1}{2} \mathrm{in}$. high; the base (turned separately) is 48 in . across. The other pattern is turned complete from $n$ piece of cocus. It is 8 in . high, the hase measuring 3\} in. Sec Mandrel; Wood Turning
Bedroom Candlesticks. Portable candle sticks of plain coloured pottery with a screening back are a good choice for bedroom use, as they protect the wick from draughts, and also serve to arrest grease splashes Candlesticks in silver or other metal which have no special fittings such as these should possess a wide tray to catch any grease as it falls. A good deal of trouble in cleaning is saved if a Hat glass disk, with a hole for the insertion of the candlc, is placed on top of the candlestick

CANDY. The accepted definition of this term is a sweetmeat made of hoiled sugar, with numerous tlavourings and colourings added. See Sugar Stick

CANDYTUFT. The annual varieties of candytuft are favourite odging Howers for beds and horders They are of various colours,
 crimson. purple, rose, lav. cnder, etc The plants are of the easiest possible cultivation and make a brave showfor several weeks Seeds are sown in April where the plants are to bloom in summer and the seedlings slooutd be thinned to about 6 inches a part.
Candytuft. Flowers of the
Derennial Lttle Gem variety
There ale some charning fowers among the perennial condytufts. They look best in the rock garden, where they will drape the houlders with shects of hloom in spring. They llourish best in well drained soil and should le planted in autumn or spring. The lest sorts are Iberis sempervirens, garreyiana, and gilsraltarica, all with white Howers. One named Little Gen is of compact growth and suitable for small rock gardens. Cuttings taken in June and placed in pots of sandy soil in a frame will soon form roots.

## Cane: The Material and its Uses

## Hints on Making and Repairing Cane Furniture

Bamboo; Basket; Rush are other articles in this group. See also Armchair; Chair; Table, etc.

By retson of its qualities of lightness and strength, cane has many uses in preference to wood, whether in the form of circular rod or split into strips. Large diameters of rod are used for the framework of light chairs and tables, for oric-
 ket bat handlos, and similar purposes. Walking - sticks and fishing.rods are often of cane Small canes arc used similarly to willow for wicker. work articles. Naturally tlexible, cane is still more easily bent hy soaking in hot or cold water, or by the Cane. Fir. 1. Principal varieties cane used for furnitare

Cane furniture has much to reconmend it for in addition to its durability it is easily and quiokly cleaned. It does not collect dust so readily as upholstery, and may be washed with warm water and a scrubbing brush, or with the garden hose. It is important that cane furniture should not be too springy, since the spring only lasts a short time, and in order to obtain it a good deal of strength has to be sacrificed.
The weight is another test of quality, the heavier furniture betokening a strong frame. When buying cane furniture special attention should be paid to the finish round the top and arms of the chairs, etc. In properly made cane all this is woven and has no piait or beading fixed on with tacks.

There are different varietics of cane, as scen in Fig. 1. The outer skin is retained for all purposes where strength is clesired. The cane used for the back and seat of chairs is narrow strip, consisting chiefly of the outer dry heat, which prevents cracking and splitting when sharp bends liave to be formed
The split cane is used for purposcs where the whole cane would not be sufficiently flexible or would be needlessly thick. One of ita chief uses is for the seats of chairs. It can also be very closely woven to form a kind of fabric. The hard outer skin gives great tensile strength to very thin and narrow strips. The interior, or pulp cane, is also strong, and is used in strips for winding round the nailed-togcther framework of cane chairs and other articles.

The woven fibre is manufactured into furniture which shows to great advantage when coloured. Besides its use as garden furniture, woven cane of this type can be utilised in nurseries, bedrooms, and country living-rooms, as it can be procured or painted to tone with any colour scheme. The table illustrated is glass-topped in green glass to tone with shot green and gold paint used for the woven cane.
 of wider cane is put round on top of the seat
skin, and can be bought from most hasket makers and furniture repairers.

How to Re-cane Chairs. In the course of time chairs require re-caning, as the cane gets strained and slack and breaks in places. Thic new cane should be soaked in water for about 24 hours before using. This not only makes it more pliable, but it gets swollen by the water and dries and shrinks after the worli is completed, and this strnins it tighter than would otherwise be possible.
The work usually commences lyy removing the old cane from the seat 1 portion may be


Cane. Glass-tonped coffee table in Lloyd Loom woven fibre, and procurable in many colours
cut out and kept as a pattern for reference in case there is trouble in lacing correctly. All round near its inner edge the seat has a row of holes, about $\frac{3}{\pi}$ in. dinineter, and $\frac{5}{5} \mathrm{in}$. apart. In some of these wood pegs will be found wedging the cane, and these must be punched out. Commence the new lacing by putting in double strips of cane from back to front of the seat, as in Fig. 2, the rounding or glossy side of the strips being kept uppermost. The dotted lines show how the strips pass beneath from one hole to the next. A steel awl and a number of tapering wond pegs (Fig. 3) are used for temporarily holding the cane at each hole, while it is strained across the seat to the next.
Then the lacing at right angles to this is put in similarly, except that it goes under and over alternately, as shown in Fig. 5. This separates the double strips slightly. The next stage is to insert single diagonal strips. These also pass beneath the edge from one hole to the next. Details of crossing are shown in Figs. 5 and 6. As seats are not square, it is not always possible to get geometrical accuracy around the edges, and canes must be put through the most convenient holcs.

When all the lacing is done, alternate holes are permanently pegged, and an edging
to cover the holes. It is pegged in at the corner holes, and tied down (Fig. 7) with cane at the alternate holes, which have not leen pegged, the cane passing from one hole to another leeneath the seat. Where lengths have to he joined the cane is tied with an ordinary linot, as in Fig. 8.

Making a Pulp Cane Chair. The pulp cane chair in Fig. 9 consists of a framework, as in Fig. 10, of thick cane or villow rod, roughly fitted toget her and nailed in the first place and afterwards strengthened, as well as given a neat appearance, by the pulp cane binding which is wound around the joints and rods, and forms a woven or laced fabric in the spaces which have to be filled There is a great deal of variety in such chairs, both in design and details of construction.

In the framework of these chairs two rods are often used side by side instead of one They need not depend entirely on the binding for holding them together, for they can be nailed. Smnller members joining main ones, as in Fig. 11, are nailed first and bound after.
Where joints occur, the parts are usually cut nore or less to fit each other. Fig. 12 shows an end of one rod hollowed to lit the side of another. A nail would usually be driven as shown, and afterwards strands of split cane might he wound round both. Rods crossing

fig. 9


CANKER : In the Garden. This disease affects fruit trecs. chiefly npples and pears Predisposing causes are undrained soil, careless or late pruning, or the attacks of insects Frequently where a branch has been torn off by the wind or sawn off roughly, the bark fails to gow over it. and an entrance is left for the fungus spores Apple canker is evident around the fruit spurs, and as soon as it is detected the branch afficted should he cut far lack from it and burneal. The fruit of cankered times is often cracked and worthless See Appla; Pear.

The tern canker is sometimes used synonymously with roup in ©owls, but it is in reality a development of diphtheritic roup in its last stages. See Roup

CANNA, or Indian Shot. These handsome plants may be grown in pots in the greenhouse or in flower beds out of doors in immer: The broad foliage is green, brown, ol hronze, and the flowers are of many colnurs.

Cannas are not hardy, and need to be wintered under cover The strong, thick rootatocks form large masses, which can he taken out of the beds in autumn with soil adhering and stored in a frostproof place for the winter. These clamps can be divided in spring. It is usual to pot each division, and to plunge the pots in hottom heat, but thovean be started in a warm frame or grcenhoirse. When they have hegun to grow they should be hardened off in a cold frame,
Cane. Figs. 9-15. Processes in the construction of a chair in pulp cane
hard. Germination is hastened by soaling the: seeds in water for 12 hours, then sowing in a warm greenhouse. The seed niay be covcred with half inch of soil.
When grown in pots the plant needs a rich, porous compost A mixture of three pails loam. one part lenf-mould, and two partis decayed manure, with plenty of sand, suits it It should he well watered, and when the flower spikes push up, liberal doses of liquid manure should be applied.

CANTALOUP. A small ribbed variety of the musk-melon, it was originallo cultivaterl at Cantalupo, near Rome, and so ohtained its name. A good wny of serving it is to embed it in crished ice for 10 hours or more. then cut it in halves or thick: slices, and remore the secds. leaving on the rind Serve with a lump of ice in each portion, and hand salt and fine white sugni, some people preferring to eat it with salt. See Melon.

CANTERBURYBELL (Campanula medium). This is a great farourite among hiarly horder plants: if the dead flowers ure


Canterbury Bell. Spray of bily-like fiowers of this vigorous and hardy garden plant
picked off regularly the plants will blnom throughout the summer from early July. The Canterbury hell is useless after it has flowered, therefore $\Omega$ fresh stock of plants must be raised each year. Seeds are sown in May in a box of fine soil in a frame, and in due course the seedlings are planted on a reserve border: there they remain until October, when they are set where they are to flower the following year. Any plants which do not bloom then should be left undisturbed: they will form giant specimens the next year.

There are many varietics of Canterbury bell -single, double and cup and saucer flowers in purple, rose, lavender, white and other ahades. All thrive in ordinary soil that has been well cultivated. Those who have no room for raising seedlings may buy plants in autumn or spring.

CANTHARIDES. The drug knoirn as cantharides, or Spanish Aly , is prepared from a dried beetle found in Spain, Russia, and Southern Europe. Preparations used are tho plaster, tincture, and an ointment.

Its intense irritant action makes the drug valuable for external use to produce redness or blistering of the skin, and so relieve deepseated pain and inflammation, e.g. in such conditions as pleurisy and sciatica.

A mixture of one part of cantliaridine ointment and two of soft paraffin is recommended as a pomade to stimulate the growth of hair.

It should be discontinued for a short time if is a mistake to have canvas shocs tightly much irritation is produced
In poisoning, give an emetic of mustard and water, and then white of egg. No fatty substances should be employed. See Blister: Hair: Poisoning.
CANVAS: Its Domestic Uses. Nany different kinda are made, and the name is


Cavas for embroidery. Leib single-tbread canvas; centre, donblethread or Penelope canvas: both actual size. Right, canvas used as the rroundwork lor wool rars
cloths woven from hemp, flax, and cotton libres. In packing-canvas nothing beats the uld-fashioned hemp for durability, but it is so much dearer than jute-hessian that it is little used. Jute frays more ensily than hemp and does not stand sunlight or damp во well
Green rot-proof cotton canvas, as used for cart and rick-covers, trunk coveringe, boat and motor car covers, in addition to being waterproof is immune against insect pesta, for its green colour is due to salts of copper. Sailcloth and tent-cloth, hoth olose-woven fabrics, and made from linen or cotton, are often called canvas ; the linen kinds are the stronger and more expensive. What are known as tailors' canvases or padilings are used in bisting, stiffening and inter-lining garments, and it is important that these should not shrink or stretch if the garment is to retain its shape. Canvases for interlining are made also in hair

Artist's canvas is a special flax fabric made for oil puintings. Fancy cottons made in square and sometimes open-work weaves are described as canvases. Wool canvas is a rather open-textured fabric. Ordinary tarpaulin is a tarred canvas.

Double-thread canvas has two threads running vertically and two horizontally close together, so that there is a small square space between the threads This canvas is employed for the coarser varieties of tapestry, and it is the chief groundwork for cross-stitcl. When stiffened it is used for tops of stools, and cushion covers, worked in silk and wool respectively. It is also uscd for bead purposes and hags. There are also two varieties used for homemade rugs, the first size with a mesh a bout $\$$ in for ordinary rug wool, and the larger size cinvias for cable wool. On the latter, though not much in use, home-miade rugs can be made to resemble sheep-skin rugs. Finer enshroidery is worked on single thread canvas See Bead; Cross-stitch: Hessian; Waterprooting.

CANVAS SHOES. Canvas or stout linen is employed for making the uppers of a rariety of shoes and also for cricket and sports boots. The soles of canvas shoes may be of leather, ns in cricket shoes In this case the canvas or linen drill should be of strong texture, and the soles should be made of well-tanned leather so that it will hold the spikes without bending or warping, a common fault with cheapquality cricket shoes.

Canvas shoes for tennis and sports wear are soled generally with rubber, which is either attached by stitching or solutioned to the uppers. It is in this attachment of the soles to the uppers that the variation in the quality of plimsolls is most apparent. In a poor quality, cheaply made, the sole will frequently after a few days' wear part comprang with the upper,
fitting. Not only does the canvas or cotton not stretch with the movement of the foot, ns is the case with leather, but it actually contracts and shrinks when wetted Rope-soled canvas sandals are worn for bathing.

In cleaning white canvas shoes the pipeclay should be wetted and a thin coating well rubbed in. Care should be taken not to soak
the fabric too much or it will sbrink in drying. They should preferably be dried in the sun.

CAPACITY. Electrostatic capacity is mensured by the quantity of cleotricity which has to be transferred from one isolated conductor to another to produce a potential difference of one volt. The unit of capacity is the farad, and is the capacity of a condenser which requires $n$ charge of one coulomil to increaso its potential by onc volt. A microfarad (mid.) is one millionth of a farad. See Condenser; Diclectric.

## Cape. Sec Cloak.

CAPE GOOSEBERRY. The true Cape Gooseberry is Physalis edulis, from South Afrioa, which provides edible fruits in that country. In British gardens other kinds arc grown for the anke of their large orangered oniamen tal "fruits" "hiol cluster onsteins about 2 feet high. Thesc "fruits" are really enlarged calyces within which the truc fruits are found They are popularly known $\begin{gathered}\text { a } \\ \text { Chinesc }\end{gathered}$ and Chinese lanterns, and are most decora. tive in the garden and in vases indoors

when cut. Physalis Franchetti and Bunyardii provide the finest fruits. Buth are hardy perennials suitahle fur planting out of doors in well drained soil and a sunny place. They may be increased ly division in ear'y autumn or by عowing seeds in a box of soil in a frame, or out of duors in spring.

CAPER. This name is given to the small, dull-green, unopened flower-buds of a trailing shrul, which grows wild in Greecr, N. Ifricn, and various parts ol S. Europe. It is cultivated to a small extent in Great Britain.

The bud is picked long before the llower is ready to bloom, and the further it is from that stago the more pungent the condiment

After the buds have been picked and left in vinegar for a time they are sorted into sizes by sifting them through sieves with mieshes of varying sizes, then loottled and namod accordingly, being classilied as nonparcil, capuchins, capotes, etc. Capers are used for farnishing purposes and for flavouring sauces.

Caper Sauce. This may to either white or brown To make the white sauce, melt 1 oz . butter in a small saucepan, add 1 oz flour, and cook them together for about 3 min . over a slow lieat without browning them. Next add gradually a pint of hot stock, stir it till it hoils, Then cook it gently for 5 min. Take 2 tablespoonfuls of capers, cut them in halves, add them and 2 teaspoonfuls of caper vinegar 10 the sauce. Seuson it to taste with pepper and salt, and it is ready to serve. If the sauce is to be served with boiled fish, use fish stock

Fur the hrown sauce, take 1 pint of any gond brown sauce, season it carefully with salt, pepper and grated nutmeg, and hoil for 15 min . with 2 tablespioonfuls of caper vinegaratid add to it one tablespoonful of halved capers.

CAPERCAILZIE. This game-bird is also called capercailie, woud-grouse, or cock-of-thewoods For roasting it in first prepared and trussed us for a turkey or fowl, and inside is placed 4 oz of raw beefsteak, which is, taken uut after the cooking and may bo used in the preparation of patties, mince, etc. A few slices of fat bacon are laid over the lireast of the bird, with slits cut in the rind to prevent them ourling. The bird is then put in a linkingtin and roasted in the oven or before a clear bright fire for about one hour, with frequent basting with milk. When it is abuut threeparts couked, remove the slices of bacon-save them also for some cold-meat dish-dredge a light dust of flour over the bird, baste it, and let it thoroughly finish cooking.

Tu serve, remove the slowers, strings, etc., pour round a few sponfuls of clear, hot gravy, and garnish the dish with tufts of washed watercress that have been seasoned with a few dropse of salad-oil and a little salt and pepper. Extra gravy and bread sance ' $q$ v.) should accompany the bird. A bird will be eufficient for about seven or eight persons.

CAPON. This term refers to a cockerel, apecially treated when voung and reared for the table, not for brecding purposes. It becomes specially large, and is plumper and better flavoured than ordinary fowls. Capons are trussed and cooked in the same way as directed for fowls. Sce Boning

## Cappings and Cornices

## Some Typical Moulds and How they are Fitted

Such entries as Bookcase; Cabinet; Cuphoard may usefully be read in association with the one below. Sec also Dowelling; Moulding

When setting out an article which is alout to be constructed, special regard must be paid to the importance and finish that a suitable capping or cornice is capable of imparting to the assembled effect. Too frequently any section that may be ready to hand is worked in without the slightest attention to its suitability.

In fitting cappings, these may he finislied with plain square edges, or the edges may be rounded, nosed, or thumb-moulded; or, again, the edges may be beaded or have a bevel taken off the upper or lower edge accond. ing as this is below or above the edge when fixed in position. Generally speaking, however, a three or more membered mould will give a
distinctly enhaneed effect The simplest form of capping is that used as a terminal tinish for posta, and frequently employed in the construction of bedstead ends As indicated in Fig. 1, the caps on a 2 in . by 2 in . post tinish about 4 in . by 4 in . square by $\frac{7}{8}$ in. thick with a Hat top This portion is improved by a raised and rounded finish. for which purpose a 4 in . by 4 in square of $\}$ in. thickness is glued on to the flat, or the detail can be finished from material $1 \frac{1}{8} \mathrm{in}$. thick net. These cappings are best fixed with a stub tenon cut on top of post to enter $"$ corresponding mortise in capping, but threc small dowels can be utilised instead. One dorel is a mistake, as the capping will be liahle to tivist out of the square.

The capping mould, often seen at the back section is sometimes completed by glueing $\Omega$ of a hall table or dinner wagon or on the top of lining slip behind in the angle formed by the a washing-stand back, is sonetimes fixed to pitch of the mould in other instances it


Capping. Patterns described in the tezt, showing in section mothods of attachment and other details By arrangement wilh Evans Bros., Lid., London
the face of the rail, and in other instances (when below the level of the eye) is fitted to the topedge of rail. In the former case it may be glued and pinned into position, but is hetter screved from thi back (Fig. 2), and either mitred or returned on itself at cnds with the chisel. Better work nay have the section rebated into the face of rail, as indicated by clotted line. When fitted to top edge, the eapping is dowelled on as Fig. 3, flush at back, and with a projection of $\frac{7}{8}$ in or $\frac{7}{8}$ in. at front, according to the section in use. The bead grooved in below the capping mould in Fig 2 is often added when a shelf is not provided above the tiles or marble panel of a washstand back. If well above the cye, the capping (Fig. 3) might be screwed instead of being dowelled into position.

## Methods of Fixing Moulds

The cornice mould of a well-made article of minor dimensions would probably be worked on the edges of a solid top of $\frac{3}{3} \mathrm{in}$. or $\frac{7}{8} \mathrm{in}$. thickncss, whilst in common, hastily constructed work it is often merely glued on or pinned on. A neat method is that indieated in the section, Fig. 4. The mould is let into the fricze rail about $f$ in., and a $\frac{z}{8}$ in. top fitted into the rebate formed by the rise of the mould beyond the top edge of rail. Another method is shown at Fig. 5, the mould being tongued to a lining slip behind it to form a rebate for a dustboard to drop in and be screwed. Either of these methods could be npplied to a wall cabinet as well as to cupboards of larger size.

In some forms of cabinet work the cornice and frieze may be built up in the manner indicated at Fig. 6, the top being housed into the frieze rail, and the frieze mould mitred at corners out of slips about $2 \frac{1}{4} \mathrm{in}$. by $\frac{1}{4} \mathrm{in}$., glued to under edge of frame. Stock moulds miny be obtained from the furnishing wood yards, the whole section of which, as at Fig. 7, is cut out of 1 in . material or less, to be glued into position on the cornice framing. Such a
will be held by angle blocks at intervals of 9 in . or so apart. The top is shown as screwed down to the framing, and the method with lining slip is suitable for an article such as a china cabinet. Below eye-level a solid $\frac{z}{8} \mathrm{in}$. or $\frac{1}{3}$ in. top to overlap had best be provifled, to be glue-blocked under into position. The entry-holes of screws are unsightly, and, even when well-stopped, tend to show through the surface finish owing to shrinkage of the wood.
Another fixing for the upper mould is that given at Fig. 8, the top being made to project beyond the carcass sufficiently to cover the pitch of the section below it, which is glued into position above and helow Such a section would be suitable for a divarf linen cupboard of Jacobean type, or could be adopted in the construction of a mantel.
An instance of a solid top mould is given at Fig. ?, the rail under being rebated to receive a lining flat of $\frac{s}{8} \mathrm{in}$. material or so, thus extending the mould with a sort of frieze effect. l'raming and top are glue-blocked behind, and the eection is very suitable for an oak' cuphoard. In the section at Fig. 10 this method is developed, the arrangement being useful where it is desired to achieve a carved friezc effect after the Jacobean style.

## Attachment of Loose Cornices

Loose cornices separately made to be casily detachable from bulky pieces of furniture (such as a wardrobe) are usually fixed into position by means of glued blocks on the upper part of carcass. Cornice and frieze moulds are mounted upon a separate framing. In cheap work the framing nay be found to be merely mitred and nailed together at front and sides, with a glued block in the inner angle. A back rail is nailed and glue-blocked at back to hold the whole thing square, a stretcher rail being also similarly fitted in centre. The cornice mould is glue.blocked into position and nailed, and a dustboard is usually omitted, as indicated in the part plan (Fig li).

A slietch of a loose cornice is given at Fig. 12 showing it in position on wardrobe carcass as viewed from above. Height over all may work out at 4 f in. to 6 in , according to detail. The method of dovetriling front and side rails of framing is given at Fig. 13, and from this it. will be seen that the mould is mounted higher than the front and side rails to form a rebate for the dustboard top. The side rails have the back rail fixed to them by means of a housed dovetail, and the stretcher rail between front and back rails by means of a dovetail into each. If properly done the whole thing should be thoroughly firm when glued up. The throughdovetailing is masked by means of facing slips of the hardwood in use ( 1 in. thick or so), glued on after mitreing at corners. The width of these slips is determined by the height of the cornice mould which beds upon the top edge of them.

Another effective method is to pitch the cornice high (Fig. 14) and rehate it to receive the dustboard.

When fixing a cornice mould, in cramping up after glueing it will be necessary to use a suitable block to fill the space caused by the pitch or projection of the members between the jaws of the hand-screw. Where the Hat member, often dentilled, exists a square slip of necessary size will suffice, but in other cases it may be necessary to scribe the block to prevent it slipping when pressure is applied. It may be found that use can be made of a spare cut of the mould in use for that purpose, possibly with a layer of felt between to avoid bruising any points of contact.
CAPSICUM. This plant is grown for the sake of its red and yellow fruits, so much in demand for pickles and flavouring. It is raised from seeds sown in a lieated glasshouse in March; the scedlings may be grown in (i-inch pots or planted out of doors in a sunny place in lunc. They flower in July, and yield pors ready for picking eatly in September. They are very ornamental when in full fruit.

Chilli or Chili pepper is obtained from capsicum, and cayenne pepper is the ripe fruit dried and ground. Fresh red or green chillies are procurable at certain seasons. Capsicums are sometimes stufled with forcemeat and served as a sa voury. (See Cayenne; Chilli.)

In medicine capsicum is valuable because it stimulates the flow of salivary nnd gastric juice, thus promoting appetite and digestion, and correcting dyspepsia. It relieves liatulence, and $\frac{1}{1}$ to 1 grain may be given in $n$ purgative pill to prevent griping. For theso purposes the tincture may also the employed in doses of 5 to 15 minims, in a mixture.

For chilblains one may rub on either capsicum ointment or the B. P.C. stronger tincture of capsicum; but these preparations should not be used if the skin is broken. The liniment of capsicunt may le used in painful affections like lumbago and sciatica. Capsicum wool and capsicum gangee tissue act like thermogene and are warm and stimulating.

CARAFE. Glass water-bottles for bedroom use have a tumbler to match. Bottles or carafes of old green and wine-coloured glass, with old-fashioned stoppers, are obtained or copied for table use. For cleaning the carafe, shot, which may be bought at any oilshop, pieces of charcoal, or of raw chopped potato with warm water, may be slaken in the carafe. For rinsing, cold water must always be used. See Glass.

CARAMBOLA. This is the fruit of an evergreen tree widely grown in India. The fruit is yellow, about the size of an orange, and full of juice, but acid. It is caten as a preserve.

## Caramel, See Browning; Toffee.

CARAMEL PUDDING. Both the custard and the rice caramel puddings given here are popular with children, and very wholesome.

To make the first, put $\& \mathrm{lb}$. lump sugar and $\ddagger$ pint water in a small saucepan, and let them boil until the mixture turns a golden colour like toffee. Pour it quickly into a plain dry mould, coat the inside of it all over by turning the mould round, and then leave it until it is cold. Put 4 yolks and 2 whites of egge in a basin and beat them, frothing them as little as possible.

Bring pint milk to boiling point. When it has cooled slightly, pour it gradually on to the eggs, and add to the mixture a tablespoon ful of castor sugar and a few drops of vanilla. Strain this custard into the mould, covering the top with buttered paper. Steam the pudding very slowly for about an hour or until it is quite set. The water should hardly bubble, for unless the custard is cooked very slowly, it will be full of holes and spoilt.
If the pudding is to be served hot, let it stand for a minute before taking it out of the saucepan. Then turn it very carefully on to a hot dish. If it is to be served cold, let it stand for an hour or more before turning it out. If preferred, 3 whole egge can bo used instead of 4 yolks and 2 whites.

Sugar, rice, milk and eggs are the ingredients for a more substantial caramel pudding. Make the same quantity of caramel mixture as is given in the first recipe, and with it line a plain mould thoroughly.

Put $\boldsymbol{L}^{2}$ oz rice in a saucepan with a pint milk and let it aimmer very gently for about an hour until the rice is tender and has absorbed the milk. Neat beat up 2 eggs, add them and 1 oz sugar to the rice. Turn the mixture into the prepared mould, twist a piece of buttered paper over the top, and steam the pudding for about three-quarters of an hour. Then turn it out on to a hot dish, when the caramel will run all round the dish like sauce.

CARANISL SAUCE. Put 1 oz . loal sugar into a steel pan, or one not lined with tin, and let it melt and cook till it is a rich brown. Add 1 pint water and 6 oz . more sugar, and boil these until a little forms a strong thread between the thumb and finger when tested. Flavour with vanilla, and stir in a teaspoonful of corntlour mixed thinly with cold milk. Stir and boil for five min., then strain it. It should be served with hot puddinge.

CARAT. Carat is a term used by goldsmiths as a measure of purity of gold. Fine gold is 24 carats; 22 carat is 22 parts gold and 2 parts alloy, either copper or silver or both ; 18 carat is 18 parts gold and 6 parts alloy, and bu on down to 0 carat; 8 carat and 14 carat are not recognized in England.

CARAVAN. The horse-drawn caravan is largely used for holiday tours, while a lighter type is towed by a motor-car. Caravans used as permanent residences are in many places subject to special by-laws. See Holiday; Motor-Car ; Sanitation; Tent.

CARAWAY. The seeds of the caraway plant, with their strong aromatic flavour, are used for flavouring cakes. The essential oil of caraway seeds forms important ingredients in various tonics, condiments, wines and cordials. See Seed Cake.

CARBIDE. The chief use of carbide of calcium is in the production of acetylene gas.

Carbide can be bought in $\frac{1}{1} \mathrm{lb}$. and 7 lb . tins, and in iron drums or barrels holding from 28 lb . to 2 cwt . It greedily absorbs moisture, and will take it up out of the atmosphere. Hence, when a drum is once opened it is advisable to empty the entire contents at once into some form of special storage bin with an airtight lid. If the storage bin is not closed properly a white, powdery crust will form on the top of the carbide ; this crust is, of course, so much waste.

As acetylene gas is explosive, and may be given off accidentally or without being noticed
from a store of carbide, a licence to keep carbide must be obtained from the local authority if it is desired to store more than 28 lb . at a lime. See Acetylene.
CARBOLIC ACID. The drug is generally used in the liquid form. It is used as an antiseptic, and at the same time relieves pain, but if employed as the liquid acid, or if lotions are too strong or left on too long, the skin and other tissues are destroyed.

Carbolic acid lotion may be in the strength of 1 in $20,40,60$, or 100 . If the lotion is made at home, hot water should be used in order to ensure thorough mixing; and the lotion should be kept in a poison bottle. It may be used for washing wounds or sores, but is also applied on lint or gauze which has been wrung out of it. When the dressing is to be covered with gutta-percha tissue or oiled silk only the weaker lotions should be used. The 1 in 100 lotion may also be used as a gargle in sore throat and usually brings much ease, but it should not, of course, be swallowed. This strength could also be sponged on the skin to relieve itching.
Carbolic oil is often used for burns, but to be useful it must be fresh. The glycerin of carbolic acid is better, and this is also a useful application in boils and carbuncles. A few drops of this instilled into the ear may be helpful in relief of pain.

Lozenges and pastilles may be obtaincd from the chemist for use in sore throat or septic conditions of the mouth. If a little cotton-wool be rolled on the end of a match and dipped in the liquefied acid it may relievc toothache if it is gently rubbed round a cavity in a tooth. Someone should do this for the sufferer, and should use cotton-wool or a rag to protect the cheek and gum.
Polsoning by Carbolic Acid. In poisoning there is intense burning of the throat and mouth, whitening of mouth and lips, and the characteristic smell of the poison. The doctor should be sent for, and in the meantime 1 oz of Epsom salts dissolved in a tumbler of water may be given, with demulcent drinks later.
Sometimes symptoms of carbolic acid poisoning, noted chiefly by a sudden darkening of the urine, may develop when large skin surfaces are being treated with carbolio acid antiseptio dressings. Here the treatment consists of the immediate substitution of some other antiseptic for the carbolic, and the taking of half a teaspoonful of Epsom salts in half a wineglass of water four times a day.

Household Uses. The chief use of carbolio acid in the ordinary household is as a dis. infectant, and for that purpose it remains a favourite, although a good grade of coal-tar disinfectant is much more efficient, besides being relatively non-poisonous.

Carbolic acid should always be kept in a labelled bollle and.in a locked cupboard, owing to its poisonous nature.
For use a 1 in 20 solution is convenient, and this is made by adding about 4 oz . of the pure carbolic acid into a $\frac{1}{2}$ gallon of water, and shaking up well.
In cases of infectious illness, all infected bed-linen, blankets, and underclothes should be soaked in this solation for about 12 hours before being washed. The spreading of colds would be lessened if all soiled handkerchiefs were similarly treated before being washed.
The sheet hung over the door of the sick-room in cases of infectious illness is frequently moistened with carbolic solution. When required the fluid may be used in a scent spray for freshening the air of the sick-room. Floors which have been soiled with infected material should be washed over with the carbolic solution. For sweetening drains, sinks, and water closets, the solution should be swilled over the appliance, and allowed to remain in contact for two hours. See Disinfectant; Poisoning.

CARBOLIC SOAP. Carbo'ic soap consists of an ordinary soap to which a small proportion of carbolic acid has been added, but it actually contains so little of the ac:d that its disinfectant action is small and must not he too greatly relied upon. Carbolic soap has, however, a definitc use. The smell is particularly wholesome and cleanly and will replace offensive odours

CARBONIC ACID. Carbonic acid gas is given off in breathing, combustion, fermentation, and putrefaction. The proportion of the gas in pure air is about $4 \frac{1}{2}$ parts in 10,000 : more than this can be tolerated, but if the amount in the air of a room exceeds that limit, drowsiness and faintness are produced. (See Ventilation.)

Aerated waters are charged with carbonic acid gas, which process gives them their piquancy.

Poisoning by carbonic acid gas occurs sometimes when people sleep close to lime kilns, when a charcoal or other fire is lighted in a room without a chimney, in the holds of ships, and especially in coal-mines by the after-damp or choke-damp. A condition of asphyxia is produced. Remove the patient to the open air without delay ; practise artificial respiration, and if possible give oxygen. If the patient recovers, the effects of the poisoning soon pass awray.
CARBONIC ACID SNOW. This is one of the most successful agents for removing birthmarks, warts, and for the treatment of lupus and other skin affections. It is prepared from liquefied carbonic acid gas, and the snow should only be applied by a doctor.

CARBONIC MONOEDIDE. Known also as carbonic oxide, this is a highly poisonous gas present in ordinary coal and water gases. It is also formed when any substance is burned in a quantity of air insufficient for complete combustion. Coke and charcoal stoves sometimes give it out in dangerous quantities. A slight escape of gas in the house may gradually produce symptoms of carbonic oxide puisoning. There is a considerable percentage of carbon monoxide present in ordinary coal gas, and the greatest care should be taken to see that all gas connexions and fittings are absolutely gastight. The action of the gas when breathed in is to form a compound in the blood which ultimately ends in asphyxia. The gas burns with the characteristic blue flame which is seen in a very hot fire or charcoal stove. The formation of carbon monoxide in this way, indeed, has been a very frequent cause of death where charcoal has been burnt in rooms which are insufficiently ventilated.

No brazier or similar heating apparalus should ever be used in a closed room. For a similar reason, the use of a geyser in a bathroom is dangerous unless adequate ventilation is ensured.
The gas is not readily displaced from the blood by oxygen; hence resuscitation by artificial respiration is sometimes very difficult. The symptoms are great weakness, a throbbing headache, nausea, and giddiness. Later thene may be convulsions and then unconsciousness. Send at once for the doctor. Until he arrives practise artificial respiration. This may often have to be continued for several hours. See Artificial Respiration.

CARBON PAPER. Prepared with carbon, or other material, so that it reproduces on paper or other substances placed beneath it a copy of any design or outlines, it is chiefly used in typewriting to obtain a duplicate, and for a similar purpose when the writing is done with pen or pencil. Other uses include the transference of a design on paper to the surface of some other material such as wood, leather, or canvas, which has subsequently to be modelled, shaped or worked upon The carbon paper used for typewriting purposes is not so sensitive
as that for penoil use, as the force of blow struck by the type face is considerably greater than the pressure exerted in hand writing.
Pen copying carbon paper is very clean in use and produces excellent duplicates, when the original is written with a fairly fine or hard nib The best results are obtained from carbon papers by keeping them llat and free from dust and excessive warmth, which tends to dry them up. See Typewriter. of making photographs from ordinary negatives on sensitive tissue. This tissue consist. of paper coated with a mixture of gelatine and a pigment, some 30 different colours being a vailable. The tissues and other carbon materials are made by the Autotype Company. It is best for the amateur to buy the tissue ready sensitised.

In making a print, the tissue is exposed (behind the negative) to daylight. The negative must have an opaque border, made by pasting narrow atrips of black paper round its edges. As the tissue is of deep colour, the action of light upon it cannot be seen ; it is necessary to ascertain the required time of exposure by means of an actinometer. From the appearance of the negative it is fairly easy to judge how many sections of the P.O.P. must be exposed in succession to match the tint in order to give the correct exposure to the tissue under the negative.
The action of the light on the tissue is to make part of the gelatine insoluble in hot water. Un. fortunately, the
action of light
is chiefly on the surface of the tissue, which liecomes covered over almost all parts with a skin of insoluble gelatine. The varying amount of insoluble gelatine which, with the pigment held fast by them, will finally form the picture lie underneath this skin, together with all the soluble gelatine which is to be dissolved away.

## Transferring the Tissue Coatins

The tissue coating has just to be transposed to another piece of paper, so that the soluble parts are on the surfacc. This is done by soaking the exposed piece of tissue in cold water along with a piece of transfer paper, which is paper coated with hardened gelatine. After soaking for a minute or two, the dark surface of the tissue and the gelatine surface of the transfer paper are brought together under the water, then laid on a sheet of glass or other flat surface, and pressed together with a squeegee, which is a stout strip of rubber mounted in a wooden handle. The two sheets are then left for about 15 min , and the print is then rearly to be developed.
The developer is simply water at a temperature of about $100^{\circ} \mathrm{F}$. On soaking the pair of papers, which have been squeegeed together in this hot water the mixture of gelatine and pigment soon begins to ooze out from the edges. As soon as this is seen to be taking place the original paper of the tissue can be readily stripped away, leaving the picture, as yet invisible or very nearly so, on the transfer paper. On further soaking in the hot water the dark coating of pigment dissolves away revealing the outlines and light and shade of the picture. It is best to assist the process of development somewhat by pouring hot water over the print from a cup. In this way parts

CARBON PRINTING. This is a process
such as heavy shadowa may be lightened by extra treatment, or by using slightly hotter water. In all, development should not require more than 5 to 10 min . When the picture is seen to be of the correct depth and clearness in the lightest parts it is laid carefully, face up, in a dish of cold water, and is then soaked for about 5 min . in a hardening solution nade by dissolving loz. of alum in 20 oz . of water. A washing of 5 min . in running water is given before drying.

Owing to the transfer of the tissue coating to a fresh support the picture obtaincd from an ordinary negative becomes reversed. This may be overcomc by making a reversed negative, or, in the case of film negatives, by printing with the tissuc in contact with the plain side of the negative.
Carbon prints are of a very high degree of permanence, sinco only permanent pig. ments are used in making the tissues. Morcover, the only chemical, bichromate, is very completely washed out in the hot doveloping water. For good results on bought tissue, negatives of good contrast and quality are necessary Sec Negative Photograjhy.


The action on the coating of gelatine and pigment is that they are rendered insoluble proportionately to the silver in the bromide print.

This form of carbon printing has several very positive advantages. There is no need for daylight; the whole process, including the making of the bromide print, is done by artificial light. There is no reversal of the drawing of the picture, but at the same time a reversed picture can easily be made.
For working the process two stock solutions are required. The following is the stock solution A for the sensitising bath
Potussilum bichromate
Potassium ferricyanido Potarsium bronido
Water
102
1
10
20
20
The stock solution $B$ for the acid bath is made up as follows: Acetle acid, glacial
Hydrachloric acid, puro
Formaline, solution as sold
The sensitising bath is made by mixing some of the A solution with three times its bulk of water. The acid bath is made by adding 1 oz . of the B solution to 32 oz . of
 water The sensitising bath may be used a large number of times in succes. sion, but it is best to throw away the acid bath after each day's use. To make a carbro print, a sheet of pigmented paper is immersed in the sensitising bath and turned over once or twico in about 3 min . Meanwhile bromide print should have
CARBORUNDUM. A manufactured been soaking in clean water. There is nothing
article composed of silicon and carbon, carborundum is used as an abrasive in the form of wheels, flat slabs or stones, and in various other shapes suited to the sharpening of many kinds of tools and appliances. Carborundum powder is made in various grades, and is a splendid grinding compound.

It is also obtainable in the form of a sheet or cloth, the carborundum being applicd to it in the same way as emery cloth Long strips of this material, made in the form of an endless belt, are used for grinding amall articles or cleaning the scalc from a casting.
A carborundum combination sharpening stone is a handy form of oilatone, ns it has a coarso face for rapid cutting on one side and a fine face for whetting on the other.

Carvers' slips for the sharpening of gouges and other carving tools, and the points, slips, and sticks of different shape are invaluable for finishing off dies or any small, àccurate metal work, as they can be used as a fine file.

When using carborundum powder or cloth remember that it is an excellent abrasive; therefore, when the work is finished, every care must be taken to see that all trace of the powder is cleaned off the work.

CARERO PROCESS. The Carbro process is a method of carbon printing which is very much simpler to work, yet yields results identical with those of the carbon process. In it pigmented paper of any of the large variety of colours used in carbon printing is exposed, not to light under a negative, but simply to contact with a bromide print or enlargement after having heen soaked in a certain mixture of chemicals.
special about the bromide print except that it should be printed with a white margin. If it is not made with this margin, the sheet of pigmented paper must be about $\frac{1}{2}$ in. larger than the bromide print.

At the end of 3 min . the pigmented paper is drained from the sensitising bath and laid face up in the acid hath, where it is allowed to stay for a time ranging from 15 to 25 sec . The longer timc of immersion yields carbro prints of less contrast. While the pigmented paper is in this bath, the bromide print is taken from the water and laid face up on a level sheet of glass. The sensitised pigmented paper is then taken straight from the acid bath and laid, coated aide down, upon the bromide print. The two are immediately pressed into contact by means of a squeegee. The pair of papers is then placed between sheets of greaseproof paper and allowed to remain in contact for about 15 min

## Special Method of Developing

During this time a shect of transfer paper is soaked in clean cold water, and when the 15 min . have expired the pigmented paper and bromide print are gently pulled apart, and the former laid, coated side down, on the transfer paper, squeegeed into contact and left between blotting hoards for about 20 min . At the end of this time the original sheet of paper which was coated with the pigment is stripped away, by immersing the pair in water at about $100^{\circ} \mathrm{F}$., leaving the picture on the transfer paper, though hidden in the mass of pigment. The further development of the picture is exactly the same as in carhon printing. The bromide print undergoes a bleaching action
by contact with the sensitised pigmented paper. It is washed in several changes of water for half an hour, and then restored to its original state by placing it in an ordinary developer, such as M.Q. or amidol. After a further wash of a few minutes, the bromide print may be used at once for making other carbro prints, or be dricd for future use. See Carbon Printing.
CARBUNCLIT. The commonest sitcs for a carbuncle or local gangrene of the tissues underlying the skin s.re the back, the nape of the neck, the shoulders and the buttocks. The chief differences between a boil and a carbuncle are that the latter may be an inch or more in diameter, is inclined to spread, and in the later stages has three or four openingss in its surface leading down to the core, whercas a boil is usually much smaller, docs not spread, and the skin is broken in but one place.

A carbuncle is most likely to occur in one who is in a debilitated and generally run-down state of health, perhaps as the result of chronic disease or of living in insanitary surroundings or of insufficient food. A blow or a squeeze may be the exciting cause. A typical carbuncle begins as a hardish, painful swelling under the skin. Soon it becomes softer and doughy, and then later the purplish red skin gives way, and the core may be seen beneath as a greyish white slough.

Unlike a boil, a carbuncle requires immo. diate treatment at the hands of a surgeon. The name carbuncle has been sometimes wrongly applied to malignant pustule or anthrax. See Boil.

CARBURETTER: Details and Working. A carburetter is a device used on internal combustion engines to ensure a proper explosive mixture in the engine. Broadly speak ing, for petrol an explosive mixture consists of one volume petrol vapour to twenty volumes of air. Should the mixture be too strong it will not explode rapidly, thereby creating loss of power in the engine, as well as causing the engine to get unduly hot. On the other hand, should the mixture be too weak, the resultant symptoms would still be loss of power, but probably accompanied by popping in the silencer, caused by late firing of the weak mixture.
With few exceptions, the method of pro ducing an explosive mixture is carried out by spraying the petrol from a fine jet, by drawing the air at a high velocity through a choke tube, in the centre of which this jet is placed. The suction is due to the fact that the pressure of the air at the restricted part of the passage, that is the choke tube, is decreased at tho same time that the velocity is increased. The petrol as it issues from the jet into the stream of air is broken up into very fine globules. See Fig. 1, which also shows the functioning of the simplest type of carburetter.
To obtain perfect carburation at all engine speeds is by no means easy of accomplishment, for there is no perfect carburetter, i.e. one capable of giving correct mixture under every varying condition of engine requirement and atmospheric changes. A rich, slow-burning mixture is necessary for starting and slow running; a slightly rich, quick-burning
mixture when accelerating; a fairly weak and may be controlled by hand or automixture for fast running on the level: and a matically, generally the former. They are rich, slower-burning mixture for hill climbing. With varying claims to these essentials there are dozens of different makes on the market.
Carburetters, as a whole, may be said to be of either the single or multiple jet pattern With the former one main jet is employed to serve the dcmands of the engine at all engine speeds, the pilot, or slow-running jet, only coming into operation when the throttle is closed. The necessary adjustment of the mixture to the needs of the moment with the single-jot type is usually provided for by means of the throttle, which is 80 arranged that
more air is admitted at high engine speeds.
The multiple-jet carburetter is one in which three or more jets are so arranged as to be uncovered one at a time, by the opening of the throttle, as more power is wanted. Another popular type which may be said to be closely allied to the multiple-jet family is that in which the proportioning of both the air and petrol are automatically controlled, an ordinary butterfly throttle being employed to govern the engine speed. Briefly, this type has a tapered needle which fits into the petrol orifice, the base of the needle being secured to a piston Valve; this valve also covers Mirture of to Engine the air port of the carburetter, and is operated by the suction of the engine, which is so arranged an to create a vacuum at the back of the valve, hercby drawing it off its seating more or less as the cngine speed varies.
When tuning a carburetter, the same results may be obtained by different methods. A weak mixture may be corrected by fitting either a larger jet or a smaller choke tube. Whether the former or the latter will result in giving as much power with petrol economy will be found by test. Broadly speaking, a change of jet is preerable to a change of choke tube, because the latter may seriously restict the area called for by the particular engine being dealt with. Further, as the air velocity would be much higher with a small choke tube than a largo one at a given engine speed, it follows that the suction on the jet would also be greater, in fact most likely out of proportion to the extra air control, whether of automatic or mechanical design. On the other hand, should the mixture be too rich, which is traceable by licavy petrol consumption and a hot engine, always try a larger choke tube first; and even should this cause missing and bad acceleration, it may be accepted as a step in the right direction, following on by trying jets of different sizes before changing the choke tube.

To overcome some of the difficulties of carburation an additional independently controlled air passage may be provided. Thus extra air valves are sometimes fitted between the carburetter and the engine,


Carbaretter. Fig. 2. Panctured float caraing flooding Carbaretter. Fig. 2. Punctured iont caraing fooding
only intended for occasional use, and the carburetter is controlled independently during normal running. The so-called air valve on two-lever motor-cycle carburetters need only be operated occasionally, for example, when starting.

Carburetter Troubles. These are generally due to piartial or complete stoppages caused by dirt choking up the gauze filter or the jets themsclves: tracing and curing such troubles is a simple matter Fuel supply from modern pumps with highly efficient filtering systems has greatly reduced the occurrence of clirt in petrol tanks and carburetters and its consequent troubles.

Water in the carburetter gencrally produces a complete stopping of the engine ; in clearing water out of the carburetter the petrol tank should be inspected at the same time, othcrwise the trouble will recur immediatcly. Flooding at the jet may be due to dirt under the needle, wear of the needle and its scating (Fig. 3) or a punctured float (Fig. 2). Flooding means waste. bad running and risk of fire. See Bowden Control ; Motor Car.

CARDAMINE. Most of the species of cardamine or bitter cress are weeds, but pratensis (Lady's Smock) and its double variety, 12 inches, are pretty early summer flowers of pale lilac shade. Propagation is by division in spring.

CARDAMOM. The small dark brown capsules of an E. Indian plant known as cardamoms are highly prized in tropical countries as a condiment for flavouring curries and also sweetmeats. In Europe they enter into the preparation of numerous curry powlers, cordials, sauces, and for spicing cakes.

Cardan Shaft. See Propeller Shaft.
CARDBOARD. Strips of thin cardboard will serve instead of wood to light the fire. An old hatbox packed with hay, straw, or saw. dust inakes an excellent hotbox in an emergency. A piece of cardboard fitted in the bottom of an old bucket will render it serviceable for dry material.

CARDIGAN JACKET. The cardigan jacket is a knitted woollen coat, buttoning in front. A couple of side pockets and Hat bindings for the edges and buttonholes are desirable. Fitting close, the cardigan can be worn in winter in addition to ordinary clothes.

Cardinal Flower. The popular name of the red-flowered Lobelia cardinalis. See Lobelia.

CARDOON. Closely related to the globe artichoke, the blanched stalks and main root of the cardoon are eaten instead of the unde. veloped flower-head. It is hardly suitable for small gardens, but in large ones it is often grown in trenches like celery, but given more room. The trenches should be larger, and be 4 ft . apart, with the plants 3 ft . apart.

The seeds may be sown under glass in March and the plants put out in May. Another way is to sow in the open ground in April for the current year's yield. The plants are generally strong enough for blanching in August, when the leaves aro drawn together, bound round with straw to the tips, and covered with earth. They blanch in about two months. Recipes suitable for cooking celery (q.v.) may be used for the cardoon.

CARDS: For Visiting. Visiting cards should be stamped with a copper-plate die in script. A usual size is $3 \frac{1}{2}$ by $2 \frac{1}{2} \mathrm{in}$. for ladies
and 3 by $1 \frac{1}{2}$ in for men. The name, placed in the middle of the card, is prefixed by the title (if any) or Mr., Mrs., or Miss An address and telephone number may be put in the left-hand botton, corner, if desired, and should be in a smaller script.

Cards are not sent in upon arrival at a house for a visit, except in business interviews On leaving after a call has been made, a lady may leave on the hall-table one of her own cards and one of her husband's, or of any male relative with whom she resides, e.g. her father or son. If her hostess is married or has a male rclative living in the house, the caller may leave tivo of her husband's cards as well as her own.
When no call is made, cards may be left at the door upon the following occasions After invitations to a formal dinner, dance, At Horne, or any similar function : if the lady of the house is not at home when a call is made ; when one is inquiring in cases of illness : and to intimate a change of address.
Business cards may have the profession or trade in brackets under the name, with some essential details, which, however, must be few and as short as possible. The name of the newspaper, in the case of a journalist, or of the firm with which the owner of the card is connected, may be put upon a card.

A very narrow black edge may be used upon the card to indicate mourning; but this is no longer usual. See Call; Etiquette
CARDS, PLAYING. Bridge, whist, poker cribbage and other popular indoor games are played with packs of cards. A full pack contains 52 cards, but some games, e.g. bezique, are played with a smaller number, certain cards being removed. There is an excise duty of 3 d . a pack on playing cards in Great Britain. See Bezique; Bridge: Crib bage; Nap; Poker. Whist, etc.

CARD TABLE : How to Make. For card playing tables are made in all the woods used by cabinet makers, and are covered with green baize One type consists of a square of wood supported on legs which can be folded up, enabling the table to be put away in the minimum of space

There exist some fine specimens of antique card tables, chiefly of walnut and other light wonds. The one shown in our illustration dates from the early 18 th century. The top is of oak veneered with walnut, the carved walnut legs being graceful specimens of the long cabriole with ball and claw fent. The top is covered with green cloth, the under surface of the hinged portion being treated with green moroceo leather. When open it shows a top of four equal sides interspaced by four oval concaves for money and counters, and a plain circular panel at each corner to hold candle. aticks The underframing is hinged so as to


Card Table of oak, veneered with walnut, of an early 18th century English make
Victoria and Albert Museum, S. Kensingtun
permit two of the !egs to support the leal when open, just as in the ordinary Hap-leaf table of to day.

Figs. 1 and 9 show a simple folding card table A suitable size is 2 ft . by 2 ft ., the finishing height being anything between 2 it. 3 in and 2 ft 6 in For a longer and narrower top a size 2 ft 6 in . by 1 ft .8 in . is of service.
Mahogany is the best wood lor the top. Pine or oali may be used Elevations of the opened table are given at Figs. 1 and 2. The top may bo put together with hard. wond tongued joints and clamped at ends with 2 in clamps, the only finish to also being slightly rounded, say. 1 in . by 1 in . of each length on the angle. In another way, a deal top can be grooved and tongued up, and have the edges finished with slips of 1 in. by 1 in material mitred and screwed or nailed on all edges and finally rounded off.

I better specimen of work would the to frame up the top, which could then be of material in lengths of 4 in width, with the grain alternately reversed and grooved into a framing 2 in. wide. the latter being mortised and tenoned together right through and wedged. The underside will be battened on with pieces 1 ft 9 in by 2 in . by $\}$ in. or $\}$ in net screwed on As shown on the plan, Fig 3, the position for these battens may be 4 in. from outer edges of top, which will make them 12 in . apart.
The trestles are made of material $1 \frac{1}{2} \mathrm{in}$. by 1 in ., finished with the edges slightly rounded. These are pivoted together (Fig. 2, B) either with a lengtl of 1 in . dowel (hardwood) or with tapped and nutted $\frac{3}{\frac{3}{3}}$ in iron rod. An alternative method of pivoting is to sink a nut into the end grain of a tightly butted length of 1 in by 1 in. wood (say, beech, birch, or satin walnut, if oak is not available), and enter the bolts, through the trestle lengths, into the nuts after the manner indicated at Fig. 8. For these trestles four pieces, to finish 2 ft . 10 in . in length, will serve, the pivoting point being found 1 ft . 7 f in. from lower end or
the edges being to round them, the corners 1 ft . $2 \frac{1}{2}$ in. Irom topend, and not in the middle


Card Table. Kigs. 1-9. Diagrams show construction of a lolding card table Two lengtb
Two stiffening rails (A) are screwed to the crossed pieces, say, $1 \frac{d}{d} \mathrm{in}$. by 1 in ., or 1 in . by 1 in . will serve, fixed at about 3 in to 4 in. up, and the same may be done to the part above the pivot. At the top end of each trestle pair a length of $\frac{1}{4}$ in hardwood dowel is fitted to holes tightly, and wedged or pinned. The centres for these holes will be found by noting the position of the part at C, Fig. 2, the top end of trestle lengths being finished by rounding off the end grain

In Fig 9 a perspective view of the table opened out is given From this it will be seen that the top is attached to the dowel rail at $1)$ by means of a pair of sockets, such as arc used for a bolt to shoot into, two suitable kinds being indicated at Figs. 4 and 5, to be screwed to battens. These sockets servo as hinges to pivot the top and allow it to shut down on to the dowel rail at E , attachment teing by means of a couple of hooked plates, as at Fig. 7, to be screwed on, or a couple of coat hooks, as at Fig. 6, will serve.

It would be possible to replace the dowel
 If these are drilled each end for pinning and with brass sockets and hooks, the effect would be smarter. In folding the table fiat for standing against a wall the parts $\mathbf{D}$ and E approach $F$ and $G$ respectively, and the top lies upon them. See Bridge Party.

## Card Tricks for Home Amusement

## Some Examples Needing only Sleight of Hand

This article contains information that will usefully supplement that given under the headings Children's Party; Evening Party. See also Conjuring

The tricks described here require no apparatus, no conjuring skill, and yet will provide plenty of amusement.

A slight manipulation with a pack, or with a number of packs preferal:ly, will enable any one to puzzle an audience completely. Prepare a pack of cards by placing all the odd cards together, the $1,3,5$, etc of each suit, calling the jack and king as odd, and all the even cards together, and place the two halves of the pack on top of each other. It is perfectly safe to show the cards to the company, for it is most unlikely anyone will see how they have been divided. Now ask anyone to choose a card, and note which half of the pack it is chosen from, the oild or even half. Return the card yourself, making clear you are not looking at it, but return it to the half from which it was not originally chosen. Then deal all the cards, face upwards, in rapid succession, announcing that you will stop at the chosen card. Naturally, it is the only odd card in the even half, or vice versa.

Another trick is absurdly simple, but its very simplicity l, affles nine people out of ten Six cards are laid solemnly on the foor, and the performer announces that he will make any one of the cards selected by the company disappear. A card is chosen, the performer turns up his sleeves and slowly picks up the cards. He holds them for a few minutes in his hands, and then alowly puts them back on the floor, when the indicated card is found to have disappeared. The explanation is rarely guessed by any who do not know the trick. In picking up the aclected card the performer runs his thumb, which he has casually moistened with his tongue, down the side of it, and the next card adheres to it. The cards when picked up should be carefully alined up and given a firm squeeze before being laid down again, so that the two carda should stick firmly together.
The four knaves trick is performed in this way. The performer runs through the pack and picks out the four knaves, keeping up a
running story ol four knaves who are gong to rob a house The story is purely to distract the audience, and to hide the modus operandi of the trick. The four knaves are held out fanwise in the left hand and the fact fully impressed on the audience that they are four knaves. The fan is closed and placed on top of the pack, face dounwards. The performer then takes the top card of the pack, which is also the top card of the four, and places it, without showing it to the audience about a quarter way down, telling a suitable story about this knave robbing the upper part of the house
The next is similarly placed about half-way down, the third of the way down, and the last left on the top of the pack. The performe then gives the cards a sharp double linock which, he informs his watchers, has so frightened the three knaves in the pack that they have all hurried to the top of the pack to join the knave there. As he does so he turns over the four top cards and shows the four knaves. The explanation is that belind the back card of the fan of jacks are three other cards Properly squared up with the jack they do not show, and when the fan is closed and placed on the top of the pack, it is these three cards which are placed, one after another, in the pack, leaving the four jacks in position

It in always a good plan to prepare for the next trick while the audience is thinking about the last. During such an interval make a quiet mental note of the two top cards of the pack, and then ask anyone to divide the pack into three heaps, and announce that you will name the top cards of all three heaps. The usual method of dividing a pack into three heaps is by cutting off almut one-third to forn one heap and dividing the remainder into two equal heaps. So, the two top cards of one heap are known, and the top cards of the other two are not. Let the known heap be called $A$, and the other two heaps $B$ and $C$, and suppose that the two top cards in $A$ arc the ace of diamonds and four of clubs.

## How the Trick is Performed

The performer calls out that the top card of heap C is the ace of diamonds, and picks it up. Without showing it to the audience he says "Correct," and states what the top card of $B$ is. The card he names is the top card of $C$ he already holds. He picks up the top card of B, calls out "Correct," as before, and names as the top card of $A$ the card from $B$ he has just picked up. As he picks the top card off A he holds all three cards, which have been correctly named, so that the audience can see them. The object of knowing the second card of the heap $A$ is so that the trick may be repeated on demand to prove there is no trickery in it

The trick shown in the illustration almost explains itself, and its very simplicity usually prevents the secret from being discovered. The four aces are apparently placed on the table as shown, and the rest of the pack dropped on top of them, and shuffled all thoroughly together. One of the company should be then asked to find the four aces. The ace of hearts is missing, and is produced from any place where the performer has previously hidden it

The cleverness of the following trick lies in the fact that though the victim apparently chooses a card at random from out of the pack. the card is in reality chosen by the performer. The trick consists in clever question and state ment by the periormer, enabling him to elim. inate every card in the pack save the one chosen. The performer knows the position of one card in the pack. It is immaterial whether it is the top or botton card, or the seventh card down from the top, say, so long as he knows its actual position. For the sake of explanation, one will suppose he knows the top card-the three of spades By question and answer he forces his victim to name it.

A Series of Questions. The questions are imilar to the following you prefer in suite. red or black ?" If the other asys "Red," the performer says, "That lenves the two black suits, spades and clubs," and continues as helow. If he answers "Black," the perormer says: "Very well and which of the two black suite do you prefer, spades or clubs?" If the "iotim answers performer continues with his question. "Clubs," the pays "aves spades," and continues, "And now which cards of a suit do you prefer, those cards from the ten to the ace, or those from the nine to the two?" If the victim chooses the nine to the two, the performer continues as below. If he chooses the ten to the ace the performer replies, "That leaves the nine to the two of spades. Divide them into two parts the nine to the four inclusive, and the three and the two. Which will you have?" If the victim, as he most likely will, says the nine to the four, the performer replies, "That leaves only two cards, the three and the two of spades. Which will you have?" If the victim says the three of spades, the performer quietly asks him to turn up the top card of the pack. If he chooses the two, he says, "And that leaves the three, does it not?" The victim agrees, nnd the performer turns up the top card-the threc of spades.
The end of the trick should never be ex plained, as it always causes intense astonish. ment, to those who do not know it, how the chosen card should be on the top of the pack (or, of course, any other position known in advance to the jerformer). He is firmly convinced that he himself has chosen this one card out of the 52 in the pack. The whole essentials of the trick consist in taking or leaving each suit and each set of cards in turn or not, as necessary, according to the colour, denomination, and size of the known card.

CARIES: In the Teeth. Dental caries is a slow progressive destruction or rotting of the hard substance of the tonth, caused primarily by acid acting on the outer part of the tooth.

The foods which become decomposed in such a way as to form acid are sugara and cooked starches. These, known collectively as carbohydrates, encourage the multiplication of acid-forming parasites or bacteria, more especially in the crevices of, or between, the teeth or wherever the action of the tongue, lips and saliva does not easily remove them The enamel benenth the carbohydrate and
bacteria is softened or dissolved by the acid formed, and broken down. The destruction of the tooth generally proceeds more rapidly when the enamel is broken through

For the prevention of caries it is particularly desirable that the food at the end of a meal should be of a cleansing nature, so that the mouth will be left free from the carbohydrates previously caten. This means that artificially prepared carbohydrates, e.g. sweets, breail and jam, or sweet biscuits, should never be allowed to terminate a meal, but should be followed by some natural food such as uncooked Íruit, or vegetables like celery. If these foods are undesirable, as, for example, with very young children, withhold highly sweetened foods altogether, and substitute hard, unsweetened foods, such as toasted bread or crusty bread and butter. See Teeth
CARMINATIVE. Peppermint, cloves. allspice, cinnamon, cascarilla, bitter orange. alcohol, etc., used to relieve flatulency and intestinal colic, are exainples of the remedies termed carminatives. By stimulating the stomach and the intestines into more forceful movements they help to expel the gas which has accumulated in the digeative tract.

For babics dill water may be used in teaapoonful doses, and a little bicarbonate of soda may be added with advantage. For others, peppermint water, which is more pungent, is useful, the dose being one to four tablespoonfuls, and here also bicarbonate of soda, perhaps half a teaspoonful, should le added; or soda mint tablets might be taken, See Cascara; Indigestion.
CARMINE. Being a particularly fine sed colouring, carmine is much used for cooking and confectionery purposes. It is practically the anme as cochineal, and both are valualile, not only on account of their colour, but because they are absolutely harmless and devoid of flavour. A small hottle of carmine will last an ordinary household a long time, as a few drops give a good deep pink. Two or three drops at most are ample for a pint of cornflour blancmange. See Cochineal.

CARNATION. There are four chief types of carnation--the border carnation, which is grown in flower beds out of doora and blooms in summer; the perpetual-flowaring carnation, which is cultivated in pots under glass and blooms all the year round, though chiefly in autumn, winter and spring; the annual carnation which flowers in summer from seeds sown in spring; and the Malmaison.

The border carnation is a fine old English flower of which many oharming new varietics have been raised in recent years. It flourishes best in well-drained soil; on heavy land it is a good plan to raise the camation hed 6 or 8 in . above the ground level, so that the plants are not waterlogged in winter. Well-dug soil with which a little decayed manure and mortar rubble liave been mixed suits them. In most gardens planting is best done in September or October, in very cold districts the plants are wintered in a frame and planted in March

Border carnations are propagated by layer ing the shoots in July. The layers will be well rooted by the midतle or end of September, and may then be taken up and replanted at 15 in. apart to form a new hed of carnations; they will bloom the following year Large plants can be obtained by leaving the layers undisturbed. It is not necessary to layer border carnations overy year; they may le left untouched for at least two or three years. Such plants will bear large quantities of flowers. Another way of raising a stock of border carnations is to sow seeds in a box of soil in a fraine or greenhouse in March. When the seedlings are well developed they are planted out of doors, preferably where they are to bloom, at 18 in . apart. It is necessary to sow seeds of a really good strain to obtain a large percentage of double blooms. Carnations
$1940$

grown in this way yield more flowers than those raised fresh from layers cach year Border carnations can also be increased by cuttings, though these are less certain than layers. Some of tha best varieties of horder carnations are : Crystal Clove, whito; Royal Clove, pink: Bookham Clove, crimson: Margaret Keep, hluah pink; and Steerforth, white marked with crimson. All the ahove varieties are fragrant

Other border carmations of brilliant colouring are Mary Murray, yellow ; Dr. Raymond Crawfurd, orange buif: Miss Josephs, old rose; Yvonne Thomas, lavender; Fair Fllen, white marlied with lavender; Jessie Murray, white marked with mallve; Mrs E Charrington, white marked with lilac; Grenadier, scarlet ; J. J. Keen, apricot and rose ; Linliman, yellow and scarlet; Pasquin, vellow, pink and lavender.

Perpetual-flowering carnations are grown in immense quantities under glass to supply

Malmaison carnations are little grown nowadays. They need similar conditions to the perpetual-flowering carnations. They are grown in flower pots 8 in . in diameter, and are increased by layering in summer.

Annual Carnations. Carnations which bloom the same year in which seeds are sown are useful as pot plants in the greenliouse and or filling sumı mer flower beds. The best strain ol sced vields a good percentage of double flowers of various col. ours. The seeds are sown in FebruaryMarch under


Carnation : three types. 1. Perpetual flowering carnation. 2. Bloom of the Malmaison. 3. Border carnation


CARP. Like all fresh-whter fish, carp requires to be cleaned as soon as possible after it is taken out of the water, or it acquires a rank, muddy flavour. Carp is perhaps nicest if stuffed and baked, or it can be filleted and fried or plainly grilled.

To stulf and bake a earp, mix together 3 tahleapoonfuls fresh white brearlcrumbs, 1 tablespoonful chopped suet, 2 teasponfuls finely chopped parsley, and I terspoonfu! powdered herbs A little minced shallot may also be added. Add a seasoning of salt and pepper, and bind all with a beaten egg Press this stuffing into the cavity made by cleaning the fish, and sew the edges together with coarse Hiread Brush the fish over with benten egg, and diedge it well with crumbs

Grease a fireproof baking-dish, and ourl the lish in it so that the tail can be fastened in the mouth with a skewer made from a pointed match Put ahout $1 \frac{1}{2} \mathrm{oz}$. of butter or dripping in with the fish for hasting purposes. It will take about an hour to cook. Serve it in the dish in which it was cooked, emoving the string and skewer A lish sauce can In poured round it, or merely the fish juice and butter in the dish can be used to moisten it

Fried carp is also good After cleaning it, with a sharp linife reminve the llesli from the bones, and cut cach fillet into convenientsized pieces. To improve the llavour, lay tho fillets to soak for an hour in a mixture made


Carp. Stuffed carp ready for serving. It may be garnished as shown or a fish sauce noured round
of a tablespoonfuls olive oil, 1 tablespoonful vinegar or lemon juice, 1 tenspoonful each chopped parsley and onion or shallot, and salt and pepper.
Turn the pieces now and then. Then drain them from the marinade, dredge well with Hour, and fry thein in hot dripping until well browned. Serve the fillete with a garnish of cut lemon, anchory sauce, and any roe taken from then, which must be egged, crumbed, and fried seprarately.
Carpentry. This term refers to the con structional forms of woodiv.orking, e.g. roofing, llooring, etc. See Amateur Carpentry.

## Carpets and Carpet Repairing

## Selecting and Laying them to the Best Advantage

Sce the articles on Bedroom: Dining Room and other rooms of the house; also Colour Scheme;

## Linolcum, etc., and the colour plate herewith

The first thing for the buyer to decide is the approximate amount he is prepared to spend on $\pi$ carpet. This being settled, the choice of qualities is sutomatically narrowed down.

If a thick carpet is required, the purchaser will probably first turn to hand-knotted car pets, which may be either British, Europenn, or Oriental. Thie cheapest hand-made carpets are Indian. Beautiful designs are seen in Oriental productions of good quality, especially in Chinese. Modern hand-made French carpets are flat, being woven after the style of the old Aubusson. If any doubt is entertained as to the knot, the intending purchaser should bend open the pile, across the width, when the tuft of yarn will be seen, firmly knotted, or, more strictly speaking, looped round the warp threads. Even this, however, is no guarantec that the carpet is hand-knotted, for there are power-looms capable of imitating very closely the Oriental knot. This is not saying that such earpete are
necesarily inferior to hand-knotted carpeta of corresponding quality; indeed, they may be as good or better; only the buyer should not le put off with a machine-made carpet if he is secking a hand-made one. The machinemade will be appreciahly cheaper.

The carpet should also be examined to ascertain its pitch, that is, the number of tufts in any unit of lengthand width of tise fabric. Hand-tufted carpets vary generally from 9 to 100 tufts to the square inch, though there are qualities even finer than the latter. Brondly speaking, the coarser the pitch, the heavier will be the fabric: also, tho coarser will the design appear. The finer carpets. though lighter, will be more expensive, owing to the slower production and higher cost of weaving.
Axminster and Wilton Pile. Apart from hand-tufted carpets, depth of pilc alid luxurious tread can be obtained in many qualities of machine-made Axminster and

Wilton Axminster, with its comparatively thick woollen yarn, lends itself in particular to the production of soft and heavy qualitics The depth of thic pile can be gnuged not only by pressure of hand or foot, but also by opening up the pile between the rows across tho width of the fabric, and noting the height which the tuft stands up from the back Heavy qualitica are nlan made in Wilton.
purposes; but, although the loops have a certain resilience, the fabric has not the same richness as Axminster and Wilton Hair carpets are the best known lonp-pile fabrics and are exccllent in natural colour for stairs and as a background for Oriental rugs. These carpets are also a good choice for hedrooms and are obtainable in many sliados by the yard and seamless


Carpet. Example of a modern picture carpet. The design being known as "Banks of the Stream." and carried out In many aoft pastel ahades. The carpet is of hand-made British workmanship

Courtesy of waring if fillow. I.ld.

Below thesc in value comes a variety of qualities in Axminster, Wilton and chenille, which form the bulk of the avcrage carpet dealer's stock, the retail prices of which will he within the means of the average bouseholder. These comprise the standard qualities in the three fabrics mentioned, all of which have either a tufted or cut pile surface, and give a comfortable, if not luxurious effect.

In Axminster the pattern is formed by tufts of woollen yam that are cut off and inserted double in the bolly of the carpet. It is practically unlimited in colour effect, and is made in all widths from 12 or even 15 ft . down wards, that is, both in seamless carpets, in hody, borter, and stair, and in sewn carpets made up in 27 in. breadths. The most typical and popular Axminster quality is about if in thick with about 45 tufts to the square inch.

Wilton is made of worsted yarns, the velvety surface being obtained by the cutting of the warp threads that form the pattern after they have been looped over the wires in the loom. This type of carpet is limited in colour, but is susceptible of finer effects of design than Axminster, owing to the greater closeness of pitch. A typical quality of this fabric is alrout $\frac{7}{8}$ in. thick, utilising five or sir colours, and with about 90 tufts to the square inch It is made in widths up to 54 in ., and also in seamless carpets.

In chenille Axminster the pile consists of chenille fur, which is inserted as one of the wefts and woven on to the loody of the carpet. The design is apt to show a certain irregularity (not necessarily unpleasing), and the pitch is coarser than in tufted Axminster or Wilton. Chenille carpets are generally seamless, and a standard quality is about five rows of fur to the inch. They are to be ohtained in excellent colourings.
Loop-pile Carpets. Below these medium qualities thers are cherper guades of Axıninster, Wilton, and chenille, and there are aiso she Brussels, tapestry, and ingrain fabrics Brussels is a loop-pile fabric, made in much the same way as Wilton, but with the loops left uncut. The clean but rather hard surface makes it a suitable floor-covering for some

Ingrain Carpets. Scotch, or art squares, are of a different class of manufacture, the design being obtained by combinations of the warp and weft threads The surface of the fabric is flat, and cven in the heavier qualities it cannot be regarded as a luxurious carpet.

What has bcen said so far applies to carpets with a surface composed of worsted or woollen yarns, combined with a backing of woollen, cotton, linen, or jute warp and weft. Carpets, however, are also made solely of jute. The lower cost of this material cnables a carpet to be produced at a cheap price, but dyes are lces satisfactory and the fabric lacks resiltence. Coir, or coco-fibre, carpets are obtainable in attraotive de-ibns and colourings for lungalows or usc on stone floors.

Decorative Considerations Colour is often the first consideration with the purchaser of a carpet, and rightly $s o$, as tiles, walls, curtains. ctc., may have to be matched or pleasantly contrasted in the scheme of a room.

In the first place, the carpet should be regarded as the base of a dccorative scheme, and in most cases should be darker in tone than any other part of the room, because it presents the largest mass of colour and because it forms a background to the furniture. This is not to be interpreted as ruling out all light-ground carpets; but such can only be employed with discretion, and in association with appropriate wall treatments and furniture. A well. lit room can stand a darker and richer carpet than one with small or few windows, where a carpet with fairly light ground colour may be Inid with the object of aiding the lighting of the room by reflection.

In most effective schemes three or four harmoniously contrasting colours are employed A room decorated strictly on the self-colour or tone on tone principle, as, for instance, with a carpet in three or four shades of blue, blue walls, blue woodwork, and blue curtains, might be harmonious in a sense, but not pleasing. The proper use of semi-complementary colours is one of the secrets of an effective colour scheme.

The choice bet ween a plain or self-patterned and a multi-coloured carpet is largely a matter
of taste. In the caso of the lormer the selection of a colour scheme is to some extent simplified. It is certain that it is not desirable to have too much pattern in a room; that, for instance, a figured carpet, figured curtains and figured wallpaper would be most difficult to harmonise, and unrestful. Broadly speaking, the prevailing colour of the walls and curtains should contrast harmoniously with the prevailing colour of the carpet, while there should be notes of some of the colours of the carpet in other details of the room.

The question of design may be of minor importance compared with the consideration of colour ; but the right selection of a pattern is of high value in successful furnishing, as the adoption of a scheme in a room in which consistency and harmony are carried out in colour and also in design leads to perfection in interior decoration.

A definite and pronounced style, if adopted for the carpet, should be carried through the rest of the decoration. For instance, if geometrical patterns are liked, these go best with quite modern furniture, wall and window schemes. Carpets are obtninable representing every hnown period; and if a householder wishes to furnish his room completely in the Adam, Louis XVI, or in any Oriental style, he can do so by tahing a little trouble.

Choice, however, is not limited to definite periods or to very striking designs. Many carpets of unobtrusive and harmonionsly blended patterns and colourings tone perfectly with curtains and furniture of different styles, provided that the cobur scheme is right. It may be sound advice to a liouscholder who has to choose a carpet for a room with decorations of a nondescript or even a mixed character to select a plain carpet or one in a good Oricntal style. Picturc carpets are made in Ixminster, ot more expensivo ones are hand-made, as secn in the illustration herewith.

Care of Carpets. One of the problems which may occur is whether to fit the carpet to the room, or to have a bordered square with a margin of floor hetween the edge of the carpet and the skirting. The former choice may be more cosy, and looks well with a plain pile or hair carpet, but the latter is clcaner and more economical, enabling the room to be swept more easily, and the square can be changed end for end to equalise the wear. Oval and round carpets suit many rooms.

Carpets should be be cleaned with a vacuum cleaner or brushed regularly with a carpet sweeper, or a broom that is not too hard.

The Laying of Carpets. The tloot should be perfectly clean before the carpet is laid After removing any old nails from the boards they should be scrubbed with soft soap and warm water, and allowed to dry thoroughly before the carpet is laid. This is an importanit point, and it is advisable when possible to do the scrubbing a fow days beforehand, and to have a fire lighted in the room for a few hours to ensure thorough airing. If the carpet is laid over damp boards it is liable to rot.

The character of the surround must be decided upon, and it must be dealt with before laying the main carpet. If the surround is to consist of the plain boards, stained and polished, this must be done several days beforeliand to ensure thorough drying of the stain. The width of the surround should allow for it to extend for 2 in . bencath the main carpet, and before applying the stain the oxact width to be stained should be marked on the lloor with chalk.

When the surround is made of linoleum it is a good plan to use an underlay of tarred paper. This prevents damp from rising through the linoleum, and it also prevents moisture from injuring the flooring.

The tirst precaution in laying the carpet is to put a suitable underlay in position. This
keeps the carpet Irum direct contact with the the same thickness as those used in the floor, makes it wear very much longer, and also gives an impression of softness and comfort that is absent when the carpet is placed directly over the boards The underlay can vary considerably in character, and is, as a rule, not fixed firmly to the floor or only held in position by means of a few small tin-tacks. The best underlay is a plain and inexpensive grey felt.

Once the underlay is securely arranged the main carpet must be rolled and placed in position. A chalk mark should be made to indicate to where it must extend In the case of a valuable or very thick pile carpet it is desirable to call in an expert, who has the tools necessary for stretching the carpet properly. Failing this, care must be exercised by the amateur to stretch the carpet well. Only a amall portion should be unrolled at a time, and the roll used to pull and stretch the carpet after the free edges of one side have been fixed. The best kind of caruet nail is a patent brass nail which passes through the carpet and into a brass groove, socurely holding the carpet in position. It is quite easily drawn up without tearing the carpet when the latter is removed for shaking.

Fitted Carpets. In the caso of a fitted carpet completely covering the floor, the dimensions of the room must be carefully noted. If possible, an expert should be sent for to make exact measurements; but if this is impracticablo for any reason, then a rough plan should be made of the room. The outside measurements, by the floor along the skirting-boards, should be taken, also the measurements of fireplacc, any recesses, etc. These dimensions, together with the measurement of the room diagonally from corner to corner, would enable a carpet manufacturer to make up a carpet in the exact size required. If an expert is not available to fix the carpet, care must be taken after fixing the underlay to stretch the carpet to its utinost and to fasten it down securely. To ensure this a wide brush such as painters use can be shorn of its bristles, and then used by pushing it along the surface of the carpet to press and stretch the carpet properly, so that it. lies perfectly flat upon the floor.

Carpet nails as deacribed above should be used at cach corner and across the doorway. In other parts of the room the carpet will be held in position sufficiently by the weight of the various pieces of furniture.

Stair carpets need care in laying over under. felt or stair pads. Sufficient stair carpet should be bought to allow of at least an extra $\frac{1}{2}$ yd. for each flight of stairs. This extra length makes it possible to rearrange the carpet about four times a year, so that the wear is distributed evenly over the whole length; without it, the carpet will quickly show signs of wear at the edge where the tread falls on each step.
The extra length of carpet can be folded up smoothly under the last step or under the tread of the carpet of the top landing at the head of the flight of stairs. In laying a stair carpet it is advisable to start at the top, securely nailing down the top edges. The carpet is then gradually unrolled, drawn down and fixed in position by means of the stair rods. Each step is gradually covered in this way and the carpet drawn taut, so that it lies perfectly even and straight over each tread of the staircase.
Repairing Carpets. When a carpet is in need of repair this work may be entrusted to the firm from which it was purchased; but if amateur workers should desire to attempt repairs themselves, the following hints may be useful. A supply of the raw material is necessary; cotton, linen, jute, and worsted or woollen yarns, the latter in the same shades and of approximately
the same thickness as those used in the
manufacture of the carpet, should be obtained. and stout needles of a suitable size

If the back of the fabric has been de stroyed, it will be necessary in the first instance to sew in carefully threads repre senting warp and weft. This done, the pilc surface may be sewn on, in different stylen. according to the nature of the fabric. Occasional stitches present no difficulty, but if a patch of even 3 or. 4 sq in . in a patterned pile carpet has been burnt, considerable care and skill will be required to restore the correct design and colour.

In the case of a Brussels or tapestry carpet the missing threads are replaced by others sewn round wires, which represent the original wires in the loom. With Wilton or Axminster the tufts are sewn into the back, and cut off with scissors on a level with the existing pile surface. Tapestry velvet can be treated similarly.

Chenille Axminster occasionally suffers from breakage of the fine cotton threads which hold down the fur of the pile If the fur is not lost or destroyed, it can easily be sewn down again ; but if it is lost, it is hardly possible to obtain any of the correct pattern of the fur, and the next best thing s to sew in tufts as in Wilton or Axminater.
Repairs to a machinc-knotted carpet, or to one which shows the pattern on the back, to be done oorrectly involves sewing the tuft yarn right through the body of the fabric Repairs to the coarser types of hand-tufted carpets may also he made in this way, but repairs to a fine Persian carpet should not be attempted by the amateur. For cleaning car pets special soaps are used. See Soay.

CARPET BAG. A carpet bag takes its name from the material of which it is made and is used for the transport of workmen's tools, cricket and sport.
 away, bringing the end joint of webbing way from the sown-up sides of the bag. The joins C D can then be covered with leather or webbing stitched in place. A canvas lining should be cut to a similar pattern and sewn to the top of the carpet prior to attaching the binding. Handles can be affixed where de. sired.

Cricket and other carpet bags can be recovered by unpicking all the stitches. flattening out the old material and cutting a new piece of carpet to correspond. This is then sewn up in the same way as the old oarpet and attached to the frame. work. In many cases cricket bags have a stiffener of card or leather; the purpose of this addition being to keep the buttom in shape.

CARPET BEDDING. Plants which are dwart in habit, or are kept dwarf by clipping. are arranged in formal beds ao that the diversity of colour of Hower or foliage given the beil a carpet-like appearance. The art of wo arranging them is called carpet lxedding. This operation is usunlly carried out by the aid of a wooden bench or form upon which the gardener can kneel or sit.

Clever gardeners can work out most ntricate designs in the varying colours of bedding plants. The plants need continually clipping and cutting back, or the bed becomes ragged and loses its trim, neat aspect The chicf kinds used arc alternanthera, echeveria, mesembryanthemuin cordifolium variegatum, herniaria, sempervivum, golden leather. and sagina.

The diagrams on this page are typical examples of carpet bodding, and although the make-up of the beds is largely a matter of individual taste. the suggestions given may be accepted as giving a pleasing diversity of pattern and colour. Fig. 1 shows an ivy leaf; $A$, silver foliage with dot plants if dark-leaved nasturtium; $B$ and $C$, vermilinu and gold, rose and carmine, or mauve and purple. Fig. 2 shows a corntlower: A. maroon : B , gold or silver foliage with petals in two shades of blue. Fig. 3 shows tobacco blossom ; $A$, gold: $B$, white: $C$, lenon : D, faint lilac : F . mauve : F . decper mauve : $G$, dark purple: $H$, pink or silver. Fig. $\ddagger$ shows A, deep rell lobelia; B, white lobelia: C, golden feather: D, Iresine ; E. Silene pendula compacta rosea: $F$, miniature swert alyssum: G, gold violas.

Fig. 5 shows A and B, Eeheveria secumda glauca; C, gold inesembryanthemum ; I), penny myal: E. golden pyrethrum, linerl with Alternathera paronyohoides: G, Iresine Lindenii. Fig. 6 shows A, scarlet nasturtium : B , golden nasturtium: C , sweet alyssum: D, blue violas; F. Echeveria secunda glanca: F. dwarf beet or Iresine. Fig. 7 shows a lily: A, silver green foliage: 13 , white: C. dee] rose : D, blush: E, yellow ; F, royal blue. Fig. 8 shows a maple leaf : A. dull gold with dot plants of scarlet crimson; B, Californian bluebell or pale bluc violas; C, gold, scarlet. crimson, or deep blue. See Bedding.

CARPET SWEEPER. A carpet-sweeper consists of a circular brush enclosed in a wooden box on wheels and fitted with a long handle. The dust is collected in the box, which should have rubber comers to prevent. damage to furniture.

A carpet sweeper will last for years, and do its work easily and effectually, if it is kept in proper order. Fach day, after use, the dust


Carpet Bedding. Figs. 1-8. Diagram showing several different deaigns which oan be employed in laying out formal beds. See article above
$B_{y}$ apeciul arrangement wilh Amalrer Gardentag
and Huff accumulated in the box must be removed, and the brush itself kept free from hair, cotton, etc In most kinds an automatic comb is fitted for accomplishing this In time bits of hair, thread, etc., will get wound round the axle of the sweeper between the wheels When this is the case the frame work should be drawn away from the axle, and the brush taken out so that the axle may be cleaned. See Vacuum Cleaner.

CARRIAGE. In general this word is used for any vehicle used for carrying, but more especially it means a vchicle drawn by a horse or horses and owned by a private individual Carriages are called by different names, according to their shape, size, and other conditions.

Carriage Licence:. In Great Britain a tax is charged upon carriages kept by private persons. For four-wheeled vehicles drawn by one horse this is 2ls. a year, but if drawn by two horses it is 42s. Two-wheeled velicles pay 15s. a year. Vehicles used for business purposes are charged nothing, but a tax of 15s. a year is paid by the owners of cabs plying for hire. Carriage licences can be obtained from any post office.

CARRIER: Of Disease. In medioine this is the name applied to persons who are found to be carrying in their bodies virulent micro-organiams which are capable of producing disease in other people if communicated to them. Thus diphtheria and cercbro-spinal fever carriers have the microbes of these diseases in their throats, and these people may not themselves have suffered from the disease which they carry, or only so inildly that it has been overlooked. Enteric fever carriers are persons who have recovered from the disease but who continue to pass the germs in their stools
When a case of diphtheria (q.v.) arises all residents in the house should be examined to ascertain whether or not they are carriers.

CARRIER : The Legal Aspect. There aro two kinds of carrier, the common carrier and the special carrier. A common carrier holds himself out to carry goods from one fixed place to other fixed places on payment of his customary charges. A special carrier undertakes special journeys on terms arranged for each journey. A railway company is a common carrier, a furniture remover a special carrier.

A common carrier is bound to accept for carriage and to carry all goods of the kind he professes to carry so long as he has room for them and the consignor will pay the usua! charges. Apart from any special term, he is liable for their safety and safe delivery, quite apart from his negligence, except for acts of God and the King's enemies. Thus, if they should be stolen by armed thieves, or damaged by someone else's negligence, he is liablc.

Railway companics are only liable for goods sent at owner's risk if the goods are lost or damaged by the misconduct of their servants. See Parcel Post.

CARRIER PIGEON. Noted for its stately grace and dignified bearing, the carrier pigeon is held in high esteem by fanciers. No pigeon commands higher prices, as much as $£ 200$ having been paid for a show specimen. Possibly, on account of its name, many wrongly attribute to the carrier the characteristics of the homer; but although at one period it possibly possessed them, they are non-existent in the English carrier of to-day See Pigeon.

CARRIER WAVE. A continuous wave of constant frequency which is radiated all the time broadoasting is being transmitted. The carrier wave is modulated or varied by sound vibrations picked up by the miorophone in the broadcasting studio. See Microphone.

CARRON OII. A soothing application for burns and scalds, first used at the Carron
ironworks, Stirlingshire, received the name of Carron oil. It is prepared ly shaking together equal parts of lime-water and linseed oil. when a thick cream is obtained. This is freely applicd to lint or soft rags, and placed upon the burn or scald. Carron oil is improved by the addition of 1 or 2 per cent. of an antiseptic. such as carbolic acid or eucalyptus oil.

CARROT. This valuable root vegetablc thrives best in deep, well-drained soil: but heavy land can be made suitable by cultivation and by adding sand, sweepings from garden paths, grit, and leaf-mould. Lumpy soil will produce ill-shaped roots. As the seeds are small. the ground surface must be well broken down with fork and rake before they are sown.
The main crop of winter roots is obtained by sowing seeds thinly in shallow drills 10 in apart in April. The sceds are covered suffciently by passing the rake over the drills. The seedlings must be thinned out gradually until


Carrot. Early Gem carrots, a prolific and proftable variety. Above, rights, banch of Long Reds
they are 6 in . apart: the final thinnings will be large enough to use in the kitchen. During the summer months the soil between the rows must be hoed frequently to kecp down weeds. In October or carly November the roots are lifted and stored in sand or soil at the foot of a wall or fence. Often they are placed in boxes in a shed, but in such conditions their flavour deteriorates.

A sowing of an early varicty in July will yield small roots of excellent flavour in autumn and early winter. 'To provide young carrots in summer, seeds should be sown on a warm sheltered border in March. By sowing on soil placed on. a hotbed in a frame in November, and during the winter, a succession of small early roots is obtained.

- On deep, well-tilled soil the long-rooted varieties, e.g. New Intermediate and Long Surrey, may be sown. For ordinary garden soil James's Internediate and Scarlet Intermediate are more suitable. Uf the small- rooted sorts for sowing in March and again in July, French Short Horm, Early Gem, and Scarlet Horn should be chosen. Varieties to sow in a frame in winter are Parisian Forcing, Farly Nantes, and Inimitable Forcing.

How to Cook. The carrot contains no starch, but a large amount of saccharine matter, and is of great value as a flavouring vegetable. loung carrots are most

wholesome, and the fine colour of the outer portion lends a decoralive touch to stews.

Carrots should never the peeled. After they are washed take a sharp knife and lightly scraje off the outer coating, scraping from crown to root. It is best not to do this until the last moment. or the flavour is weakened. Young carrots re quire about $\frac{1}{2}$ an liour's cooking. and old ones about 1 hour's.

If to be stored during the winter, put them, if possible, on a slate slab, cover ing them with sand. Carrots when used tor garnishing purposes are cleancd and cut into various designs, after which they are boiled in slightly salted water. Grated carrots are often used in Christmas puddings and added raw to salarls.

To boil carrots, cut off the green tops and rootlets of 2 lb . of carrots; scrub, then scrape the carrots downwards until they are quitc clean, taking care to cut out all specks. Lay them in cold water, cutting them, if large, lengthways into quarters. Place them in boil. ing salted water, and boil them until tender. Pierce them with a skewer to make sure they are soft. Drain off all water, and serve them either plain with butter and pepper, or with melted butter sauce, or chop finely, reheat in the saucepan. and serve with 1 oz . of butter and a dusting of pepper. In the last case the mixture is pressed into a mould and case the mixture is preased into
turned out into a vegetable dish.


Carrot. 1. Insafliciently thinned. and, 2 amply thinned plants. 8. How to sow orrrots : a, hole levered with c, seed sown on top with fine soil: c, seed sown on top and covered with ane trom trost in arrots stored awn from frost in fine moil or eand

Young carrots, boiled whole, may be served with rarsley sauce made from a lump of butter the size of an egg, half a handful of finely. chopped parsley, the juice of balf a lemon, and a little seasoning. Toss these ingredients in a pan over the fire for a few minutes, and then pour the whole over the carrots, serving at once.

Carrots with mint-glaze are excellent. To prepare them, wash and scrape about 3 or 4 medium-sized, well-coloured carrots. Slice these into $f$ in. thick rounds, and boil them for 10 to 15 $\min$. Then drain off this water and in its place put 2 tablespoonfuls white sugar and 2 oz . butter. Stir in 1 tablespoonful washed, finely chopped, fresh mint leaves, cover the pan, and let its contents simmer until the vegetable is tender and has a glazed appearance. Then arrange in a hot dish, pour over any juice, and add salt and pepper. A pretty dish is made if a border of cooked peas is added.

CARROT FLY. Carrots are frcquently much injured by the larvae or maggots of the carrot fly. which hore into and feed upon the

roots, causing them to become brown or rusty. and finally rotten. In some eases the growth of small roots is entircly checked. It has been noticed that the pest is worse in dry seasons.
In appearance the carrot tily is shiny black or dark greenish-hlack in colour and ahout $\frac{1}{2}$ in. long, with $n$ wing expanse of nearly $\frac{1}{2}$ in The maggot is yellowish, about $\ddagger \mathrm{in}$. long
The tlies appear in spring, and may be seen upon the lower leaves of trees and bushes, especially near brooks and streams. When the carrot roots are well eatablished the Hies lay eggs upon them just below the surface of the ground. When young, the maggots especi ally attack the outer parta of the carrot.

When it is noticed that the tops of carrots change colour prematurely, the roots should be examined and the infested parts forked up and destroyed As a preventive measure spraying with paraftin emulsion is recommencled. A paraffin emulsion may be made and applied as follows :
Dissolve 1 lh . of soft suap in 1 gal . of boiling water, and, whille still hot, add 1 pt . of paraflin and churn the imixture thoroughly
When required for use add 1 gal . of the inixture to 9 pal, of water, using rain water or water which is not very harel.
Spray the carrota soon after the seeds have germimated and immediately after they have been thinned.
Sawdust impregnated with paraftin laid alongside the plants helps to keep away the Hies in carly summer. Pressing the carth close round the stems after thinning the seedlings tends to prevent the llies from egg laying
In localities where the attack of the Hy is very prevalent, a supply of carrots can usually he maintained loy sowing early varieties in a sheltered position in March, for early use and again in July for autumn and winter.

CARROT PUDDING. Several puddinys of which carrots are a constituent are some times known as carrot puddings. One of these is Victoria pudding, while another is made as follows: Mix together with a little inilk 4 oz . of grated carrots, the same quantity of suct, flour, and currants, 3 large tablespoon fuls of golden syrup, and the grated rind of a quarter of a lemon. Steam the whole in a hasin for $1 \underline{1}$ bours, and turn out to serve.

CARROTSOUFFLE. An excellent sulffle is made with cold cooked carrots. Rub sufficient through a tine sieve to fill a break last cup. Molt 1 oz . butter in a saucepan. stirring into it 1 oz . llour. When well blended, add the sieved carrots and stir the mixture over the fire until it boils. Cool it for a minute or so, then bent in the yolks of 2 eggs, and wenson all these ingredients carefully. A tiny pinch of powdered mace is an improvement.
lut the whites of the eggs on to a plate, and heat them with a knife to a very stiff froth. Fuld theme whites very lightly, but thoroughly,
into the carrot mixture, then turn it either into a buttered fireproof soufflécase or a greased pie dish, or into some small fluted paper soufflé cases. These must only be about two-thirds full, unless a greased paper band is tied round outside the mould to support the mixture as it rises. Bake these souffés in a quick oven for about $15 \mathrm{~min} .$, and, when cooked, add a dus of tinely chopped parsley over the top.

CARROT SOUP. In a good recipe for carmot soup only the red part of the carrots should he used. Melt 1 oz. of butter or good dripping in a saucepan, add to it 1 heaped breakfastcupful of the chopped red parts of raw carrots. Turn the pieces about in the hutter for 10 min., taling care that they do not colour in the least. Next add 1 quart of stock, and boil the soup gently until the carrots are quite soft, which will depend on their age. Rub the soup through a hair or fine wire sieve, put it back into the saucepan. which must first be rinsed with cold water. and let it re-hoil. Mix a level tablespoonful of cornflour smoothly and thinly with a little cold stock or water. dedd it to the boiling soup, and stir it until it re-hoils, then let it cook gently for ahout 15 min ., removing all grease from the surface.
Season the soup carefully with salt, pepper, a few grains of nutmeg, and $\frac{1}{d}$ a teaspoonful of
castor sugar lastly, add about $\frac{1}{2}$ a tencupful of carefuily-hoiled rice. Serve the soup in a hot tureen If no atock is available use water, adding, if liked, a litt'e meat extract. This is also linown as Crécy soup.

CARVERS. This term is applied to the knife and fork that are used for carving fool They differ in shape and make according 10 whether they are meat carvers, game carvers or fish carvers. Meat carvers have long blades, 8 to 10 in. in length, a usual size for household purposes being 8 in . Carvers for ham and other cold meats are best with long narrow blades. The essentials are a good halance, : well-proportioned handle and a keen cdge. The two former are provided by the inakers the latter can be developed at home with the aid of a table stecl or sharpener

Fish carvers are preferably made o! silver hut cheaper patterns are made in electro-plate

Game carvers are shorter in the hlade than meat carvers, have longer handles and n different halance. They are usually inade o good-class steel, either plain or rustless The former take a very keen edge. For carving poultry and game, patent sécateurs are also used Fashioned like large curved-bladed scissors, they are equally effective for disjoint ing an uncooked fowl, or for carving at table Sise Cutlery: Fork Kinife; Steel

## Carving for the Home Table

## Correct Ways of Cutting Meit, Poultry and Fish

## See also the entry Boning the usual curs and ioints provided by the rctailer and given under Bacon; Beef: Mutton, cic.

The correct carving for table of meal, middle is reached, when the slices should poultry, and fish has considerable influence be only $\frac{1}{2}$ in. thick. When the middle is past, on the flavour, which may be spoiled by again serve slices alout 1 in., until the tail is indifferent carving, and is also moreeconomical reacherl. One side of the salmon is now clear
For meat and poultry there are three neces sary implements : a good sharp knife with a fairly thin blade, a strong, two-pronged fork. and a steel, which, however, is only required in case of emergency, for the knife should be well sharpened before it is placed on the table or the sidehoard.
A good carver will consider the prarticular tastes of those he is serving, and also take care to cut the meat neatly so that it is not dis. figured if brought for the second time to the table The cook may make the carver's task easier by placing the joint or bird on a dish quite large enough, and also) hy refraining from filling this with gravy
It is better when a dish is much garnished to remove the joint on to a llat dish, conven ently placed, to obtain full control for carving
Figs 1 and 2 slow how, with a pair of forks, the centre bone s removed from n fried sole. It is not oonsidered correct to fillet a fried sole, as the llesh adheres to the forks, but in the case of a grilled sole, by all means, yes. Always rememher to cut the fins off with pair of scissors before cooking. It makes the dish look much more appetising. When carving a salmon a void break ing the llakes, and cut crossways. Run the knife along the hackhone first, then right through the belly. Carve from the head in slices about 1 in. thick, until the


Carving. Figs. 1 and 2. Separating the backbone neatly from the flesb of a fried or grilled sole by means of two forks

slice of the breast should be served with each leg. The fork should never be dug into the lireast of the hird.
Small birds, like plover, quail and snipe, are served whole. Woodcock, partridge, grouse, and pigeon are usually cut into halves.
The carving of a turkey is a similar operation to that for a fow. Remove the leg (Fig. 10) place the bird on its back, and start carving from the centre of the breast towards the side. The logs should be cut into slices and served with pieces of breast and stufting.
The carving of a goose is similar to that of turkey. With a woast gosling remove the legs as in the case of turliey, then cut the wings away, leaving the breast. Carve the breast


Carving. Figs. 3 and 4. When carving a surloln loosen the meat from the chine and then carve downward. Fig. 5. For a ham, make an incision at the knuckle and carve towards it. Fig. 6. For a ler of mutton, make an inclsion and carve fairly thick slices. Fig. 7.
the long cut. Then carve the opposite side of the shoulder. giving a slice with the long cut. Which will inake a good portion. A small piece of the oyster should be served, this being regarded as $n$ great delicacy It should be remembered to out down the bone in a rather slanting manner.

In dealing with liare or rablit, separate the legs and shoulders. and cut the back part into portions. If a knife is inserted into the joint, and the back raised up, the opern. tion is simple.

To carve a fowl, or a pheas. wisy up the slices should he out alternately ant, hold the bird firmly on a dish by inserting from right and left sides, or they would eventually become as large as a plate.

With a leg of pork the method is naturally similar to ham, but it is advisable to remove the crackling. Then the slices can be cut as thin as required.

Thicker slices of a leg of mutton (Fig. 6) sliould be carved than for beef. First make an incision at the knuckle. Continue until a hone at the top of the leg is reached. Then cut left and right sides alternately.
The heat way to carve a saddle of nutton is to run the linife along the chine bone, and under the meat along the riks. Cut down to the bone on the cross, then slices from the outside, which is called the flap. This will make the piece V-shaped. Two slices of crosa-out and a piece of fat are generally sufficient for a meal. .

Commence carving a shoulder of mutton (Fig. 7) from the blade bone to the angle bone; this is called


Carving. Figs. 8 and 8. For a fowl, remove lers leaving wings intact to enable the carver to quarter the bird. Fia. 10. When carving a torkey, first separate a ler from the carcass and then carve slices from the breast

Courtesy of $d$ Lnons \& Co.. Lid.
the carving fork into its leg, then loosen the lege by cutting skin, following the natural curve of leg. Now turn fowl on breast and out sharply through backhone. Remove legs from wing (Fig 8). Now cut, wings in tive
 and cutting to wards and through the wish. hone, then repeat operation: by fol lowing the first incision and cutting right through the breast the fowl is quartered. The portions call be increased by cut ting the wings from the hreast with winglets at tached, making two portions, and dividing each leg into two. A sinall a teasjoonful of the liquid extract, may be taken at bedtime, of smaller doses, 10 to $\because 0$ drops of the liquid, or a grain of the dried extract, may be taken before each meal, 3 times a day.

The aromatic syrup may also be used in appropriate doses To cover the exceed ingly bitter raste of the liquid extract it may be inixed with an by inserting kinife equal amount of liquid extract of liquorice and in centre (Fig. 9) taken with a little tincture of orange or chloro

CASCARILLA. This dried bark has aromatic bitter properties, and two medical preparations are made from it. The infusion dose $\frac{1}{2}$ to 1 oz , which does not keep well, especially in warm weather; and the tincture dose $\underline{d}$ to 1 dram. It stimulates appetite and digestion and makes a useful tonic in con valescence from an acute illness. A tablespoonful of the following may be taken thrice daily in a wineglassful of water, at or after meals: Tincture of cascarilla, 6 drams; tincture of orange, 3 drams ; syrup of orange. 4 drams; chloroform water to 6 oz . See Appetite; liet.

CASE HARDENING. This process con sists in increasing the carbon content of the surface of a steel relatively low in carbon,
so that by being heated and then quenched it can le hardened like other atcel. Simple case hardening may lee carried out by any amateur $A s$ an example, suppose a new cone has been made from ordinary mild steel, and that it is desired to harden the surface. When sufficiently heated and surrounded by carbonaceous material, mild steel


Casement. Fir. 1. Metal casement window Figs. 2 and 3 Fastener
and stag lor wooden casement
will absorh cartion, and the longer the time the steel is in the carbonaceous material, the deeper becomes the case hardening effect.

Having obtaincd a metal box, take some clean old bones, crush them up as finely as possible, sprinkle a layer of the bone dust on the bottom of the box, place the cone in position, and pack it all round until it is huried in bone dust. Fix on the lid by means of a catch. or wire it on with steel wire. If a very hot fire can be raised in the kitchen stove, this may be used as a furnace wherein to heat the box thoroughly and its contents This must be kept glowing red-hot for half an hour or so, when it may be removed from the fire, the lid knocked off, and the contents dropped on to the hearth. The cone can then he picked up with a pair of tongs or pliers and dropped into cold water.
If several pieces are to be case hardened, it saves much trouble to purchase one of the ready mixed carburising compounds sold for the purpose. See Hardening.

CASEIN. Organic substance contained in milk and cheese, being the essential ingredient of the latter. Casein can be desiccated and prepared as a substitute for eggs in baking, as the basis of an enamel paint, and as a substitute for glue in the making of cement. See Cheese.

CASEMENT: Of the House. In domestic architecture the casement is a window in which the sash is lung upon hinges to open like a door. The expression, the casement, is generally understood as referring to that part of the window that opens and shuts. By casement window is meant a vindow of the cottage type, and as a rule made with inultiple panes of glass.

Commercial casement windows are made in a wide variety of pattems and sizes: those commonly in use measure 20 in ., 39 i in., and $58 \frac{1}{2}$ in. in over-all width, and either 3 ft ., 4 ft ., or 5 ft . $1 \frac{1}{2} \mathrm{in}$. in height. The total area in square fect of all the casement windows in a room should never be less than 10 p.c. of the flonr area: and preferably more than this for efficient lighting and ventilation. Various combinations of the nindows enable requirements to be met. By having one casement to open on the left hand and another on the right hand, with possibly a transom or top hung casement, at least one window can be
open in any weather (Fig. 1). The one that opens with its back to the wind or rain very seldom permits the weather to enter the room.

The modern tendency is to use the casement window in preference to the sliding sash type; it is made either in wood or metal. The latter has many advantages, for metal windows are wind and weather proof: they are not affected by moisture, and they never jamb or stick in their frames Another advantage is the greater glass space in a framc of given size, metal framing not leing so wide ns wood

Exist ing window openings can often be converted for casements by removing the

showing wedqe shaped slot for fastener
important when fitting the Instenes that it should draw the sash closely against the stopping, for which purpose the rubbing plate is generally made tapering or wedge-shaped. When newly fitted the fastener should draw the window up tight when the lastener is just at the hottom of the wedge-shaped part. This allows for future wear.

Fittings that have been in use for some time may have worn, and the fastening is then insecure, allowing the window to rattle and admit a draught This is remedied by resctting the fastener, recessing it further into the frame, or hy packing out the rubhing piece See Blinds; Burglary; Curtain; Window. etc

CASEMENT CURTANN. These curtains are madc of the same depth as the casement. and drawn along rods fixed to the frame They are provided with rings sewn on to the base of a hem about 1 in deep, and made with a drawtape. which allows a perfcctly even distribution of the fullness.

The rods should be accurately measured and have proper brackets The rings should lie threaded twice with a cord, so that they can be drawn or undrawn. Each ensement will have its own curtain, and if, as is usually the casc in a bay-uindow, there is a row of lights above the casements, these should be provided with curtains In this way light can be regulated more easily than by the single pair

The use of thesc curtains is not conlined to casement windows they are employed in place of blinds for small нash-windows, and also in full-sized sash-windows. one pair of curtains being allowed for each sash. They are made of various washing materials of casement cloth, cretonne, shantung or Bolton shceting. The term casement curtains is sometines loosely used for any short curtains, but here it applies only to curtains as shown in Fig. 1 on this page, which are fixed within the window frame. Sec Curtain

CASHMERE. Real cashmere is a superlativcly soft wool or hair forming the under coat of the Kashmir goats of Tibet and the Central Asinn platenu

Many goods made not from goat hair, but from fine wool. are customarily known by this name. Cashmere stockings and socks are ordinarily made from tine-spun merino wool Cashmere suitings and dress materials are made from the finer qualities of worsted The real cashmere wool is used in high-grade knitted wear See Shawl.

## Cash on Delivery. See C.O.D

CASSAREEP. The juice of the cassava. root, with the addition of several native spices, yields the condiment known as cassareep. It is introduced largely into a West Indian pepper-pot, and enters into the composition of many sauces

## Cassava. See Tapioca

## Casseroles and Casserole Cookery <br> An Economical Method which Conserves the Flavour of Food

Sec Beef; Chicken; Game and also the articles on allied methods of cooking, e.g. Braising; Stewing
This process is slower than that required by ordinary utensils, but, on the other hand, less fuel is required, the food is cooked evenly, and none of the valuable juices are allowed to escape in stcam. It is on this account the most wholesorne form of cookery. Owing to the elimination of waste, even inferior cuts of meat can be used with advantage. French cooks were the first to realize the advantages of casserole cookery, and it is extensively used in that country. Braising is carried on to perfection in a casscrole.

Quite a number of dishes can be cooked in a casserole, and are best brought to the table thercin. This saves re-dishing, ensures the food being served really hot, and reduces the labour of washing up. Also, it is a most convenient method of cookery for the busy house.
wife, as the fond is cooked without constant attention and can be kept hot for a long period for any late comer to a menl

A useful casserole which can le placed on a gas boiling burner, turned low to a blue Hame, has an outer casing with a turned-in rim. forming a cavity into which heat ascends until the food inside the casserole is cooked.
Casserole of Chicken. Fowls cooked in this way can be successfully made tender and succulent even when they would be otherwise tough. Cut a fowl into neat joints and season each with pepper, salt, and a pinch of pounded mace. Put some slices of broon at the bottom of the casserole and lay the chicken or fowl on these. Having sprinkled over them a linelyminced onion, pour over all half-pint of white stock. This done, the casserole can be covered


Casserote Fig. 1 Lasserole ai chicken. ior coosing a tougb burd
buil together, stirring till smooth. Your this over the tail, and add 2 carrots 1 turnip, and 2 onions. all prepared and cut up small
A bouquet gami and a little spice, with a few peppercorns, should be tied in a muslin bag and put in with the vagetables Simmer gently over the fire or in the oven trom 2 to $2 \frac{1}{2}$ hours, pouring in a little more stock if required Before serving, the gravy must be cleared from fat and the spices and bouquet removed (Fig 3)

Cod with Artichokes. Among the fisl, that can be cooked in a casserole are cod haldock. hake, plaice, salmon, sole, turbut and whiting. A good way and placed in a moderate oven for an hour, or with cod is to flake $1 \mathrm{lb} .$, peel 4 Jerusalem arti it can be p!aced on the hot-plate of a range chokes. and put them into the casserole with and the contents simmered for an hour. If a gas stove is used a thin iron plate or an asbestos mat put over the stove will enable the casserole to simmet thereon This recipe can also be used lor other poultry or for game The cassero!e illustrated (Fig. 1) is of ylass with a plated silver mount for table use.
Ways with Meat. Onc of the beef dishes that can be cooked in a casserole is the shin Take 1 lb . of this and, after wiping it, cut it into small pieces and add four slices of fat


Casserole. Fig. 2. Beel casserole served In an earthenware diah. Fir. 3. Casserole of ortail. to which carrot, turnip and onion are added. the whole cooked in a china digh
bacon Then place it in the casserole with two finely-minced onions, a scraped carrot cut into small pieces, some mustirooms or mush room ketchup, and a pint of stock Bring it to the buil and let it simmer for three or more hours. Strain the gravy and add a dessertspoonful of Hour smoothly mixed with cold water, or, if preferred, with a glass of claret The beef can then be returned to the casserole and again allowed to simmer. Fig 2 shows this dish ready to be served in the casserole. Oxtail is also an excellent choice for cassorule cooking. Having cleaned the tail and cut into pieces, fry them in 2 oz of butter or dripping When the pieces are a rich brown, put them into a casserole, and cook in the remaining fat $1 \frac{1}{2}$ oz of fine flour, then, by degrees, add $1 \frac{1}{2}$ pints of good brown stock, and let all


Casserole. Fig. 4. Appetising breakfast dish of flsh baricot beans and egrs, served in a klass casserole

3 pint milk, 1 oz. butter, a dessertspoonful minced onion, pepper and salt to tuste. Cook gently in the oven until the artichokes are soft, then add sufficient melted butter sauce to cover, bring to the boil, add a squeeze of lemonjuice and garnish with Gnely-chopped parsley before serving in the casserole

Earthenware for Vegetables. As regards vegetables, cabbages, cauliflowers, spring greens, spinach, turnip tops, green peas, celery, brussels sprouts, and Frenoh beana

While casting in iron can only be done effectively in a foundry. the non-ferrous metals like lead and brass offer plenty of scope for the amateur who lias provided himself with the necessary tools. Which are neither numerous nor coatly. Such work has a particular attraction for many, and it is ruite unlike any other mechanical prucess. For casting in lead, one or two iron ladles, a wire skimmer or spoon for removing the dross and a few simple modelling touls are all that are necessary. The lead can be purchased from most ironmongers or plumbers, as can the fine plaster of Paris used for the moulds. For casting in brass or aluminium a furnace is necessary The addition of a few plumbago crucibles, a pair of crucible tongs, moulding sand, and flasks or moulding boxes, complete the equipment.
larly good braised in a casserole First parboil the celery for 10 min in salterl water and then drain it. Place in the cassarole with sufficient boiling brown stack to cover the celery and put in the oven till tender. Serve with chopped parsley and a chopped, hardboiled egg sprinkled over the top Fruit cooked in syrup, to be afterwards served cold, is better stewed in a casserole, as not only is the Ilavour consersed better, but also the colour and shape

Beforc being used, a casserole, it of earthenware, should be toughened or scasoned by filling it with cold water to which a liandful of salt has been added Bring the water slowly to the boil, and then leave it to cool in the casserole Another method is to melt some fat in the pan, smcar it well all over the inside and out, and bake it in a cool oren. A casserole is best used in the oven or on the hot-plate of a kitchener, and should never be placed directly over a fire or a fully-turned-on gas-jet. Glass casseroles should be used in the oven only The food in these is cooked not only by the hot air of the oven, but also by radiation of the glass
Breakfast dishes are appetisingly served in glass ware A good recipe is made from I lb. of left-over cod or haddock, two boiled and mashed potatoes, I lb. haricot beans, boiled and pressed through a sieve, and four poached eggs. Make $\frac{1}{2}$ pint anchovy sauce, place with faked fish in casserole, add potat() nnd put beans on top of these, also several dabs of butter. Heat slowly in oven and before serving place poached eggs on top (Fig. \&).

To clean casscroles, wash them inside and out with hot soapy water to which a little soda has been added, and rinse them with warm water In case of very dirty pans. fill them with cold water containing a little soda and place them on a hot-plate to heat the water and so loosen the dirt. Stains may be removed with sifted ashes or silver-sand.

CASSIA. A group of trees and shrubs of which only cassia corymbosa is commouly grown in British gardens. This is an evergreen shrub, 6 ft . or more high, which bears yellow, pea-shaped flowers freely in summer; it is not hardy and must be kept in a warm greenhouse for the winter. It will cover the back wall of a greenhouse if planted in a horder of loany soil, or it may be grown in large pots and used in Hower beds in summer. Propagation is by cutting under glass in spring.

Oriental varieties of the same shrub provide the purgative senna leaves of conimerce. Further species include the Hashish, or Turkish dream drug.
The bark of the cassia used in cookery resembles cinnamon in appearance, smell and taste. See Cinnamon.

## Casting in Iron, Lead and Brass <br> Methods and Equipment for the Amateur Metal Worker

A knowledge of this subicet will help materially in making many of the articles described in this work See also Lathe; Metal Work: cte.

Casting in Lead, For first attempts at casting the amateur will be well advised to used lead or type-metal. Wuoden moulds can be used, and the lead melted in an iron ladle over the kitchen fire. Cast lead panels or plaques can be noodelled in wax or plasticine, and cast in plaster moulds, the lead casting being carcfully scraped wherever any rough edges or faulty places develop Almost any simple article can be made after lirst planing up some soft wooden blocks of appropriate size.

In making a wood mould of an artiole to be cast, sume skill in woodworking is required, since the mould must be a replica of the article itself in reverse, and a core must bo provided if the article is hollow. The following system avoids a great deal of this trouble.


Fig. 1. Plaster mould for casting a toy soldier. Left a hollow balf mould : right, the other ball, with the casting in place
model, somewhat smaller than the linished model, then to coat the exterior with dental modelling wax, and shape this to the desired form with modelling tools. Three or four wires are then driven partly into the model in the least conspicuous piaces, and the compo and produces excellent results. The first sitc model coated with plaster as hefore, thing required is a replica of the desired casting: this can be an existing object, such as a toy soldier, or the article can be modelled in wax or plasticine. However it is made or obtained, the remaining processes arc the same. The object is rubbed over with vascline, then slightly warmed to ensure the vaseline flowing into every crevice, and the surplus is wiped off. Next stand the object on a piece of glass, a tile, or a smooth board, well greased, and make up some plaster of Paris into a thick paste. This is best done by putting some cold water in a howl and sprinkling the plaster on to it, stirring the water gently all the time and always in the same direction. Continue adding plaster until the mixture is thick and sticky (like clotted cream, but not so thick)
Heap the plaster up and around one-half of the model, keeping the plaster in place with a temporary wall of clay or plasticine which has been previously built up. Allow the plaster to set, which will take about twenty min or less, remove the clay and the model, and clean up the surface of the plaster to a tlat face, using an old table-knife. Drill two or three holes into the body of the plaster, and fix into it little wooden pegs with rounded ends. These should protrude about $\frac{1}{2}$ in. from the face of the plaster, and enable the two halves of the plaster mould to be put together in proper register. Replace the model, vaséline the face of the plaster, and well vaseline the pege. Then huild ul the other half of the mould with plaster as before. The result is as in Fig. 1.

To cast from such moulds, remove the model, wipe off si much of the oil from the vaseline as possible, and coat the interior with powdered blacklead. Then tie the two pieces of the mould together with atring and pour in the lead from what will be the bottom of the model. Some elaborate models will require the moulds in three, four, or more parta to enable them to be removed from the casting without heing damaged.

When it is desired to make a hollow lead casting, it can be done in one of two ways. An ordinary mould can be made, the lead poured in, and immediately poured out again As the skin or surface in contact with the mould is the first to chill and set, only the inteitor parts will be molten, hence a more or less hollow casting is the result. A similar method is used commercially for casting lead toys and for similar purposes. Disadvantages are unequal thickness in the casting, frequent distortion, and a tendency for holes to form in the outer surface.

A better plan is to make rough plaster chimey whe the
except that the whole model is entirely covered, the only openings being the venthole for the exit of air and the gate or entrance for the molten metal.
When the plaster is quite dry it is placed in a dish in a hot oven with the gate downwards, the heat melting the wax, which Hows out of the mould into the dish. The planter core remains in position, as it is held firmly by the wires. A space must be hollowed out in the wall of the mould around the gate o form a trough into which the molten lead may be poured. The lead Hows into the space hitherto occupied by the was, and when cool the mould is broken open and the casting removed. The plaster in the interior can be chipped out with a amall chisel, and the holes inade by the pegs closed up with a spot of solder.

It will syatem requires an opening soniewhere in the casting to enable the plaster to be removed : generally this can be arranged under the feet or at the hack. When using plaster or metal moulds it is desirable thoroughly to warm them before introducing the molten metal.

Casting in Brass. A simple furnace suitable for melt ing brass or small quantities of iron is illustrated in Fig. 2, and can radily be made from bricks. The furnace is 18 in . square, built with nine courses of bricks set in cement on a concrete foundation 4 in. of a wooden core or box 6 in. square: the tiue is similarly cored with a $3 f$ in. diameter wooden block. At the hack of the furnace other bricks are set up to support the chimney, which is made from 4 in diameter stove pipe, and is 24 ft. high, for which reason it is desirable to place the furnace outside the house and against a solid brick wall to which the


Casting. Fig. 3. Furnace damper. Fig 4. Simple gas-heated furnace

The grate is inade from a regula. stock cast iron fire grate and is supported on two bars of iron built into the brickwork. The top of the furnace is closed by a fire brick 12 in square and 2 in . thick. All joints åre made airtight with fire clay. In use, a fire is made with gas coke worked up thoroughly hot, the furnace again filled with coke and the crucible set in position on top of the fire The lid is then placed on the furnace top and luted or made airtight with fireclay A damper: at the top of the chimney is a convenience in regulating the fire, and is operated by a long wire. as in Fig. 3.
Such a furnace should melt 5 lb . of cast iron in of an hour, brass being melted in inuch less time. After every hicat the fire grate must be pulled out and the slag cleaned away with a rake or scraper. as if allowed to cool off it will adhere to the lining of the furnace and be difficult to remove.

Where gas is available a very simple furnace can be rigged up by using the gas blow pipe as a heating medium. The furnace is simply built up from fireclay bricks, well jointed with fireclay and provided with a lid and a hottom of the same material, as in Fig. 4. The lid has a small and slanting hole ahout $1 \frac{1}{6}$ in. in diameter cored through, and a hole is left in the side of the furnace to receive the nozzle of the blow pipe. The gas is then turned on and lighted, the bellows operated steadily, and the gas adjusted until the flame entirely fills the furnace and thick. The interior is lined with fircclay, squeeze it tight and on opening the hand if解 poured in when wet, and is formed by means to pieces, it can be used for moulding, other-


Casting. Fig. 5. Useful tools employéd in casting. A. Hardwood rammer. B. Crucible tonga. C. Siere. D. Double-ended trowel. E. and F. Skimmers or rakes. G. Crucible ring or book
through the fine sieve. After mixing, damp the material to make it cling together. Moulding boxes can be made from wood 1 in


Casting. Figa. 8-8. Moulding bor, pattern and core or canting an alaminium candleatick
thick, just like an ordinary lidless box but with triangular corner pieces glued and nailed to the inner corners as in Fig. 6. The boxes can be any size to suit the work and are made up solid and then sawn asunder. The ends should have dowel pins or guides to make them register properly; the parts are kept together with a hook and eye on each side. Note the holes (A and B) drilled to act as a gate for pouring in the metal, and for a vent which allows the steam or gases to escape: when the metal overflows at this latter hole it indicates that the mould is full.
In use, the wooden frame is laid on a wooden baseboard and filled with damp moulding sand rammed in tight and levelled off flush with the sides. The model or pattern is now pressed into the sand until half the pattern is embedded, and the surface is then finished of leve! with the sides. Place the top box on the lower one, sprinkle the surface of the sand in the lower box with dry parting sand, that is finely powdered fire-brick dust, and then fill the top box and ram home the sand.

## Preparing the Mould for the Metal

Separate the two, remove the model or pattern by rapping it with a stick, dust the surfaces with fine charcoal, cut a passage way to the gate, and another to the vent, also drive a knitting needle through the sand in one or two places from the cavity formed by the pattern, these to act as additional air vents. Replace the top box, and clamp them both together, then pour in the molten metal. The brass casting will come out much cleaner if a little powdered resin is spinkled over the mould faces prior to replacing the top box.
The amateur can use new brass obtained from the metal merchants. Ornamental drawer handles, door fastenings, keyhule plates, and similar cabinet fittings may be cast in brass. A number of small models might be cast together in the same box. the cavities being joined by a channel to allow the multen metal to flow from one to another. The thin bonding piece thus produced is easily removed when the casting is cold. Alu.
minium is cast in much the same way, but larger pouring gates and ample air vents are needed. The metal should not be over. heated and should be poured as soon as properly melted.
Plaster casts can be madc in plaster or wood moulds. The plaster is mixed to the consistency of thin cream and poured in the same way as if it wero metal. The moulds must be well oiled with lubricating oil prior to putting in the plaster. The surplus oil is poured out before casting.

Fig 7 is a pattern of a short candlestick cast in aluminium. It should have the base recessed so that it will stand steadily on n surface that might not be quite flat : the top should be hollowed slightly, so that the melted greasc will not run over the edge. If the pattern were made thus, however, it could not be lifted from the sand of the mould, so the preliminary pattern differs a little from the finished article.

In Fig. 7 the outline shows the pattern itself, and the heavy dotted lines show the details of recessing the base and candle holder. The candle-stick is best finished by turning in a lathe, and therefore a piece is shown projecting from the base, to be held in a self-cen tring chuck, or for a carrier to be put on it and the candlestick held between the centres of the lathe.

The projecting piece at the other end is termed a print, and will not appear in the casting, as it pro. duces the hole for the candle. The faces of both ends are slightly conical to allow the pattern to leave the sand easily.
A core is required, as shown separately in Fig. 7, and in position in Fig 8. It should be of the diameter of the print. Its length should
 be that of the projecting print plus the depth of the hole required in the top of the candlestick. shown by the dotted lines. This core can be made out of ordinary bath-brick sawn and filed to the required shape. When the pattern has been taken from the sand, the core

is placed in the impression which was left by the print and butting aqainst its end (Fig. 8). The melted meta will How round the core, and this will pro. duce the hole for the candle. The print should not be made any shorter than shown, or the


Castle Nat. Laft, aut removed. Right nut in place on bolt with aplit pin inferted but not fally bent over
melted metal might float it up. When the casting is taken from the mould, a metal plug can be fitted to the hole, so that the work can be centred to run true in the lathe, and it can be turned all over. The base can be turned flat and recessed, and then with a pointed tool the projecting piece can be parted off.

CAST IRON. Although one of the cheapest metals, cast iron is of little use to the amateur worker, except in the form of small castings for the construction of little engines and other mechanism. It is widely used for all kinds of domestic appliances, from drain pipes to gas stoves, and, being brittle, must not be struck with a hammer. It can only be satisfactorily repaired by autogenous or acetylene welding. In drilling holes a handclrill or brace and a sharp twist drill are employed, but no lubricant must be used upon the drill: if it shows a tendency to heat, it should be cooled with a few drops of water.

CASTLE NUT. This is the name that is given to an engineer's nut having a projecting portion which is slotted: it is secured by a split pin, inserted through a hole drilled in the bolt. The provision of six slots enables the nut to be tightened up to a nicety, is of a turn sufficing to bring a slot opposite the hole in the bolt.
To unscrew a castle nut, the split pin must first be removed by bending the ends of the pin and straightening them as much as possible with the pliers. The pin is pulled out with a pair of pliers or a split pin extractor. The nut can then be removed with a spanner.
CASTLE PUDDING. Whether baked or steamed, this is usually made in small moulds or cups. Choose two good sized eggs, lay them on the scales where the weights are usually put, and weigh against them first butter, then flour, and lastly castor or granulated sugar. the former being best.

Beat the butter and sugar to a cream and add the eggs one by one, beating each well in. Next add the flour and a good saltspoonful of baking-powder. Stir these lightly in : lastly add two tablespoonfuls of milk. Turn the mixture into some well-buttered moulds and cither steam them for about 45 min . or bake them, when they will only take from 25 to 35 min . Turn them out on to a hot dish, and make a little hollow in the top of each and put in a small spoonful of jam.

CASTOR: How to Fis. The kinds of castors mostly used comprise the socket, screw and plate sorts : to these may be added bedstead log and truck castors and glides.
In dealing with a socket castor (Fig. 1), not only must height be


Cator. Fig. 1. Socket cator. Fig. 2. Screw cator. Fig. 8. Roller-
bearing plate castor. Fig. 4. Ball castor. Fig. 5. Diagram illastrating how to replace the castor on the leg of a bedstead carefully observed. but the diameter of the socket at its mouth, because any difference in this part will mean either packing for a size too large, or paring the wood if tonsmall, in buth cases inadvisable to attempt. It often nocurs that a screw castor (Fig. 2) will break, and that the atump of the screw will remain in the wood;
this should he removed by the hel ${ }_{i}$ of a.strong pair of pincers.

Plate castors (Fig. 3) are standardised into sizes, and made with either iron bowl or wheel. or wood, the last named being better for domeatic use These heing attached by screws in the plate, are easily fixed, and simple to attach to any chest or piece of furniture for the first time.

Ball-bearing castors may be procured in either ancket or screw patterns, the object of such lieing to make movement more rapid and easy ; but whether such casturs are satisfactory is an open question Glides are ex. tremely useful if in the correct position, and con be driven home by means of a hammer with a piece of wood to protect the plide. Glides are nade circular or trinngular but the former is recommended as being best. Fig. 4 shows a cominon type of ball castor made in n number of sizes for chairs, tables, etc.

To replace a bedstead castor (Fig 5), first remove the old castor, taking care that the pin of the bedstead is straight and the edge of the hurr at the end filed off before attempting to fix the new castor. If the chill or casting at the foot has been allowed to hecome worn so as to have sposiled the seating against which the castor is to work, it may be found helpful to place an iron washer under the castor to form a now sating, but this should not be done imless absolutely necessary. The castur being in place, add a small washer on the top and then rivet over the peg, which will, if sufficient turnover be given. retain the castor in its working position
T'o fix a set of socket castors where none has previously been used will need careful and accurate use of chisel and gouge. laking precaution that the tapered wood end of the ley, be it either table or chair, is exact in the length of the taper, as well as being correct in the extent of its tapering. Use $a$ screw gimlet for each screw hole so as to give every screw a good start, and be careful, especinlly in dealing with oak and mahogany, in both of which it is easy to get a split, to turn the screw gantly and quite straight. It must also be remembered that the outside of the socket should tie Hush at its mouth with the wood of the leg as it enters when in place. See Armchair: Chair; etc.

CASTOR : For Table Service, A pepper castor is often called a pepper pot. Sugar castors are made of silver or electro-plaie, or of glass with a silver sprinkler top. Remove the top from the pot when cleaning it, and it it is all silver, empty the sugar out. Caked sugar is removed from a glass pot by filling it with hot water and letting it stand. See Pepper Pot ; Silver.

CASTOR OIL. This oil is a good purgative, especially for children. In doses from half th, two tablespoonfuls it is often taken by adults.
Varying from 15 drops for a three months infant to a teaspoonful or more for a two or three year old child, castor oil is a remedy which can usually be preseribed with benelit at the onset of most infantile disorders. In stead of plain oil, the B.P. mixture of castor oil may be taken. The dose is one to four trblespoonfuls.

Where in a grown person there is diarrhoea, caused by the irritation of undigested food in the intestines, one to two tablespoonfuls of castor oil, to which has been added 10 to 15 drops of tincture of opium (laudanum), is sometimes a very effective cure.

To disguise the taste it may be takien floating on a layer of peppermint water, and covered with a thin layer of brandy. See Constipation.

CASTOR OIL PLANT. This is the common name of Ricinus communis, a member of the spurge family, which is grown for the sake of its large. handsome leaves and some-
times used in sub-tropical flower heds for the The plant correctly named Aralin Sieboldii is summer. There are varieties with leaves of also called the castor oil plant. different colours, e.g. Gihsonii, bronze, and cambodgiensis, dark crimson. The planta are raised from seeds sown in loamy soil in a warm greenhouse in Fehrnary, the seedlings being poited finally in 5 -inch pots and planted out early in June. They may be placed in larger pots and grown for conservatory decoration.

## Cats: Varieties and Characteristics

## With Hints on the Care of these Domestic Pets

Other articles in this group deal with Dog: Rahbit and other animals kept in the household

When only one or two cats are kept, no hardness of the wood, and a piece of old special accommodation need be set apart blanket utilised as the actual berliding. An old for them. but if catting on a more extensive scale is desired, $n$ hox-room or light and airy attic makes $a$ suitable abode, while a substantially huilt wooden house makes an ideal garden, backyard, or general out-of-doors cattery. Cats stand any reasonable amount of cold, but damp and draughts are fatal to success. if not indeed to the animals them selves A sunny room or a cattery situated in a sunny aspect is a big asset in cat-keeping, as folinity loves sunlight, and one of $\pi$ cat's greatest pleasures is to lie on a shelf or other resting-place at the window, and while enjoving the sunlight, taling a keen interest in all that it sees outside.

Whether hept in a special room or cattcry, or simply as a house cat, the animal should have its own bed. Which may be a basket with a hlanket in it, but a roomy hox, raised a few inches from the ground, and thus above floor draughts, is preferable. A cube sugar-box makes an ideal sleeping-place. The lid should be removed, and the box placed on its side; the upper side then forms a roof which keeps off draughts, while if a broad spar of wood is nailed along what is now the front of the box at the bottom, the bedding will be kept in place and the lower draughts excluded. Neither straw nor hay makes suitable bedding material. Some layers of newspaper can be placed on the bottom of the box to break the
 pillow or not ton coarse canvas bag can be filled with clean wood shavings, and if these are not too tightly packed, they malie $n$ cosy and comfortable bed
Sanitary hoxes or pans should be placed in an out-of the way corner, but always where the cat can get to them with ease. Weil-broken peat moss or ashes from the ranges make the hest sanitary earth. Sawdust alone is not to be recommended, as it sticks to the cat's paws and cost, is carried outside the hox, and usually some is licked off the coat and swallowed Sawdust mixed with the ashes inakes a friable and ahsorbent material, but sawdust alone should be aroided. If the pans are emptied and their contents renewed every dav, they will never smell : apart from that, a cat will not use a dirty sanitary bos, and it is the neglect of that necessary clcanliness which engendery bad liabits.
As soon as it can leave the nest. prent the tiniest kitten will seck instinctively for some earthy material, and if a shallow pan is placed close to the nest, and kept in the one place so that they know where to go, kittens will never give their owners any trouble in that respeet. A pot or box of coarse grass should he giown and with regular watering it will keep freah indefinitely: Cats cat a lot of grass, as it acts as an intermal cleansing agent, and is particularly necessary where long-hairel ents
are liept, as their swallowed fur is apt to gather in and stop up the intestines

All cats indulge in claw-sharpening, and for this purpose they should havo a log or piece of rough wood into which they can stick their claws. It it is rough enough to catch their claws, and heavy enough not to move when they are using it. cats will never scratch lurniture A flat piece of rough wood on which a cat can sit and clarv is the best form of sharpener.

## Varied Dietaries

When house scraps do not suffice to feed the feline fanily practically any of the proprietary dog foods can be requisitioned for the feline menu: that is, any of the broken-up or kibbled foods, and not the actual dog bis. cuits. Cod'n head, well boiled, and sufficient of the liquid poured over it for the lood to nbsorb without being sloppy, and then the flesh of the heads taken awry from the bones ind mixed up with the soaked food, make a nourishing and appretising meal. Or a sheep's pluck, namely, the lights, liver, and herrt, can te secured from the butcher, well boiled. the liquid poured over the food in the snme manner as the cod's head liquid, and the llesh itsell cut up and added Rabbit is a size-making dietary, and horse flesh is excellent, but the latter should be guaranteed pure.

Kittens should be fod on any of the proprietary infant or puppy foods, and should lie taught to lap when they aro about tliree weeks old 'The strain on the mother cat is thus lessened, and the digestive upscts caused by the sudilen tranalerence from the matemal to other food is avoided when the bittens are completely weaned. Cow's milk is neirly always injurious to kittens, because of the preservatives it contains, and for the same resson it disagrees with many ndult cats. luoth cats and kittens should be allowed abundance of clean water to drink

Varieties of Cats. Cuts are classified in two main divisions-Persians, or longhairs, as they are usually called, and shorthairs. The latter include the varjous British varietics as well as Manx, Siamese, Abyssinians, and Russian Blues.

Blues are the most popular of all the feline tribe and the most remunerative for the average cat-lover. Any shade of blue is permissible, but soundness and evenness of colour are essential There must be no dark patches, no tabby markings, and no white hairs. Blacks are jet-like cats, and the most difficult point is to get the colour a rich black to the roots of the cont B!ue and black kittens frequently have white hairs acattered over their bodies, and are often rusty or brownish in their top conts. These blemishes usually disappenr with the kitten coats, and if the roots of the cost are sound in colour, the white-haired bittens make the best-coloured adults.

## The Eyes of Coloured Cats

Creams should be a rich cream or straw colour, the paler the better, but there must be no suapicion of a washed out or whity appearance. Reds should be as rich orange or recl as nossible, but they and creams atill have a tendency to show tabby markings, and the majority of the reds are more or less shaded. Als these varjeties should have orange, a mber, or hazel eyes. White should be pure white with no creamy tinge, and their eyes must be blue, a deep sapphire being the ideal. Some white cats have odd eyes ; that is, one blue and the other orange, and these cata are quite good for breeding from.
Chinchillas, which should have green eyes, should be one clear sparkling silver from nose to tail, that exquisite appearance being attained by each hair being tipped with silvery-grey, the ground colour being white. Brown. red, and silver tabbies should have orange eyes. 13rowns and reds have respective
ground colours of sable and orangc, with markings of black nad red respectively, while silver talibies have a ground colour oi silver with deep hlack markings. The word "tabby" is often interpreted as meaning a female cat, but what it really stands for is the maried or atrined cats, as distinct from the patched ones, which 'atter are tortoiseshell a nd tortoiseshell and white. 'Tortoiseshella should have patches of red, cream, and black, the richer the colour and the more distinct the patches the better, while tortoise-and whites are tortoiseshells witl whte, but the white must not predominate Both varietiea should have orange, a mber, or hazel eyes
The British shorthnirs are self-blue black, white, red, and cream, though creams and reds are very seldom seen. There are also brown. red, and silver tabbies, and tortoiseshells and tortoise-and-whites. The British shorthair is built on finer lines than the Persinn, and is not so cobby, the head is not so round, the nose is slightly longer: the neck should be long and graceful, the legs of medium length, without the clumsy appenrance of the Persian: and the tail long, thick at the base, and ta pering towards the end The coat should be close and s mooth and never woolly. Rusaian Blues are sealakin-coated blue shorthairs, lankily or snakily built, with long narrow heads and laces nud green eyes. The real spalakin

texture and pile of cost is their first casential ; a woolly texture means a cross with a Persian Manx are tailless cats, with very cobby bodies, long hind legs, a round rump, big head with well-cleveloped cheeks, and a rabbit-like coat.
Colour or markings are of no importance in Manx. Abyssinians or bunny cats are found in two varjeties: browns and silvers. 'I'he one should be rich rufus brown and the other pale silver in ground colour, with rabbit-like ticking. They arc more finely built than British shorthairs, but not quite so snaky as Russian blues. Siamese, or the royal cats of Siam, have pale craam coloured bodies, with seal-brown faces, tails, and legs. Their eyes should be blue, and their coats have a woolly texture. Siamese kittens are white when born, and in aged cata the beautiful cram body colour has a tendency to darken anil smudge. Occasionally Sianmese are bred with blue instead of self-brown points.
Care of Persian Cats. Because they are less common and more pictureqque, Peraians, especially the blue variety, assure u greater certainty of profit, but the market for Siamese and Russian blues is almost equally keen. Except that they require regular grooming if
their coata are not to become nuatted and dishevelled. Persians are no more trouble to keep than are shorthairs.

Persinns should never bo wnshed, except by the experienced cattiat: with the exception of the white variety being prepared for a show, washing is never necessary Persians should be groomed with a long-hristled brush, and in long siveeps from the root to the end of the coat If the brushing is done in short staccato dabs, the hair is liable to become broken. A rub over with s short-bristled brush, followed by a hand grooming, is all the toilet that shorthairs demand. Bran heated in the oven, then rubbed into the coat and brushed out, is an excellent dry-clean for dark coloured cats.

White fuller's earth is the best cleanser for white or light-coloured cats

CATALEPSY. Catalepsy is a state of morbid sleep in which the patient's body and limbs remain in any position in which they are placed, while the power of voluntary morement is lost It cecurs in persons who are hypnotised A severe form of prolonged catalepsy is known as a trance

Callses which may bring on an attack are suilden fright, shock, or any deep mental emotion or prolanged depression. Generally the attack is sudden, the patient fainting away and becoming pale and death-like. She generally stays in whatever position she may be placed, with perhaps wide upen oyes The temperature falls, the heart weats slowly, and the breathing becomes shallow. The face may be set in a fixed smile, and the pupit is dilated.

The attack may end in a few minutea or last for several hours, and may continue for drys and even weeks. To s layman the patient often has all the appearance of being dead. A cataleptic pationt requires the care of a skilled physician.

CATALPA. With its nearly heart shaped leaves and clusters of summer flowers which are white narked with purple and yellow catialja bignonioides, or Indian bean, makes a charming lawn tree. It thrives well in town gardens. The yellow-leaved variety, aurei, is very attractive. Propagation is by sceds.

CAT AND MOUSE. At least 12 players are required for the game known as cat and mouse. All of these except two sit in two rows, facing each other, learing it gangway letwcen them and room to pass bet ween their liacks and the walls or furniture. The other two players are the eat und mouse. They stand, blindfolded, at either end of the gangway. The cat calls meow! The mouse squealis in answer, and then the cat has to chase him between and around the rows of players. If the cat has no idea of the wherealiouts of the mouse, he may call meow ! rgain, and the mollse has to answer, however near to the cat he may be When caught. the mouse becomes cat and chooses his own mouse.

CATARACT : In the Eye. Cataract is opacity of the lens of the eye, causing nore or less blindness. It niay develop from no apparent cause with the advance of age (senile cataract), usually after 50 , or in diabetes, or may be due to accidental injury to the lens Sometimes it is preaent from birth.
As a rule the first symptom is a group of tiny stationary speriks before the eye The general vision gradually grows dimmer, and the sufferer may note that hie sees best when the light is not particularly bright. But n bright light may not be disturbing. or may the even more agreeable.
As the condition advances vision is diminished, till at last there is usually only perception of light but none of objects. The cataract is then said to be ripe, and the pmoses may take months or even years When the cataract has reached this stage
the treatment consists of removing it entirely, and making up for its absence by wearing a glass lens in front of the eye. In this way excellent vision is nearly always obtained.

While the cataract is ripening reading may be made easier by shaping a cone of cardi. board, with its base shaped to fit over the socket of the eye and the further end brought down to a diameter of $t \mathrm{in}$. or less. The inside is blackened. The better eye is used. See Eye.

CATARRE. Infiammation of a mucous membrane, e.g. the lining of the nose, the bladder or the gastro-intestinal tract. The word has in view the increase of the discharge from the mucous membrane concerned, as in the running nose, but it is retained in cases where the discharge is scanty or absent; for example, the dry catarrh of the bronchial tubes, apt to affect old emphysematous men, in which there is a very distressing cough with little expectoration. The name is also sometimes used for inflammation in the walls of the air vesicles of the lungs. See Bronchitis ; Cold ; Conjunctivitis; Cough, etc.

Catchfly. This is a name given to several species of lychnis (q.v.).

CAMERING: For the Home. In the country, with most perishable commoditios, so to speak, at the door, catering resolves itself into carefully thought-out menus, taking due consideration of the days when it is possible to get fish, to make a change in the planning of courses from poultry, eggs, vegetables, etc., and keeping an eye on the store room. which should always be kept well stocked with tinned and bottled food in case of emergency.

On fish days, for instance, a boiled fish course might be served at luncheon, and a fried one be included in the dinner menu; the next day, for breakfast, kedgeree or fish cakes, or a fish salad, or curried fish at luncheon, might use up the remains of the boiled fish, and kippers or dried haddocks might supplement eggs for breakfast the morning after.

The caterer for a small family in a town, buying such provisions as fruit, cakes, bacon, fish, etc., may be well advised to carry them away in the shopping basket, because hooked orders are often not dealt with until late in the day. Moreover, unleas top prices are paid for special reserve stocks, the finest market value has been carried off by careful housewives, and only the second best is left. Other advantages of personal catering are that it enables the buyer to see the particular bargains of the day, and to get better service by tactful praise or complaint.

## The Week's Menus Planned in Advance

Some people find it answers to plan a week's menus in advance, leaving one or two blank spaces for speoial dishes which may present themselves to the cook's imagination as suited to the doing up of left-orers, according to quantity, so that as many things as possible towands the week's catering may be got in on one day. Friday is a good day to choose for this scheme, because of the extra week-end shopping that is necessary anyhow, and because things in bulk, such as groceries and vegetablea, that are ordered on Friday, do not keep on arriving through the busy Saturday and are known to be safcly in the house, leaving only the perishable goods to be brought in.

When giving a party, a few days beforehand plan and write down the menu; then, taking each course in turn, make a list of things with the quantities of each that will have to be bought. The special things can be chosen at the caterer's convenience, and each item ticked off on the list as it is purchased, so that nothing is forgotten. See Breakfast : Dinner; Luncheon.

CATRRPILLAR: In the Garden. It is said that the caterpillar consumes on an
average half its own weight in a day, and certainly there are no worse pests in a garden. From the moment they emerge from the egg until they settle down to the chrysalis state they steadily devour leaves and shoots. Caterpillars are the offapring of common butterflies and moths, and by killing these winged insects a step forward is made in preventing the destruction caused by their progeny. They are dealt with in the notes concerning the trees and plants which they damage.

Means of Destruction. Hand-picking of caterpillars, killing of butterflies and moths, crushing of eggs which are found in clusters on the underside of leaver, are the surest means of riddance. Syringing or spraying with soft soap and paraffin solution, in the proportion of one gallon of suds to a wineglassful of paraffin, is a deterrent: but care must be taken to spray the underside of leaves to make it effective. Fruit trees should be grease-banded at the end of September, in order to trap wingless female moths, which crawl up the trunks and deposit egge at the base of dormant buds, from whence caterpillars come in the spring, attacking. growth with disastrous results. See Butterly: Cabbage: Caterpillar.

CATRARTIC. Any drug known as cathartic is used to open and clear the bowels, which is done by increasing the peristaltic movements of the intestines and by rendering their contents more liquid. Cathartics are graded according to the effect they produce.
The mildest aperients or laxatives, such as sulphur. prunes or liquid paraffin, merely produce softened motions. These are semi-fluid, however, if castor oil, senna, calomel, aloes, etc., are given. It should be understood at the same time that these drugs in sufficiently small doses will have simply a laxative action, without producing a reaction in the shape of constipation, which is apt to occur when they are given in large enough doses to act briskly. They can therefore be utilised in chronic constipation.

None but the milder cathartics should be given to children, old or debilitated people, except under medical advice. The entire lip. The hybrids far outnumber brisker cathartics tend to produce griping the species, those of the labiata group being and are usually combined with an aromatic, the finest. e.g. ginger, in order to prevent this. See Aperient ; Constipation.

CATBITER. This is a long, hollow instrument used to tap certain cavities of the body through narrow passages. One form is used to draw off fluid from the urinary bladder. Of various sizes, catheters may be rigid, made of metal, or semi-rigid, of a varnished woven network, or soft, made of soft rubber. Frequently on account of enlargenent of the prostate gland elderly men have constantly to use catheters.

The greatest care must be taken not to introduce dirt and infection into the bladder. If a soft rubber catheter can be passed, it should be boiled for a few minutes before use, washed in running water after use, dried, and kept in a clean, dry receptacle till the next occasion.

Before use the catheter is placed in warm water, and lubricated before it is inserted with clean vaseline if necessary. After use it is washed thoroughly in running water, inside and out, backwards and forwards, using a little methylated spirit if there is difficulty in removing grease. It is thoroughly dried and is then placed in its receptacle. The hands and
third group also has the
two-leaved stem, but has an
the end of the penis should be thoroughly washed before using the catheter.
If the semi-rigid type of catheter is used, this should be soaked for an hour before use in a 1 to 2,000 solution of perchloride of mercury, and then lubricated with the carbolised oil. After use it should be well washed in cold water, then soaked for ten minutes in the perchloride of mercury solution, and finally carefully dried with a clean towel, and put a way in a clean box until an hour before it is next required. This type must never be boiled.

CATEODE. In an electric primary battery cathode is the name given to the negative plate or element. The positive pole or terminal of a cell is joined to this negative element. which becomes the starting point of the current to the outside circuit.

In an indirectly heated wireless valve the cathode is the cylinder surrounding the heater element. The cathode is coated with oxides, which give a free emission of electrons at a comparatively low temperature, and is normally connected to a point in the circuit having a zero or in some cases a positive potential in relation to earth. See Accumulator; Battery : Cell : Electrode ; Valve.

CATMWEYA. One of the chief groups of hot-house orchids consisting of some fifty species and innumerable hybrids; many have large and particularly handsome flowers.

The labiata group of about 20 species has a single broad ascending leaf, and the flowers are large, usually lilac or rose-purple with a richly coloured lip and some yellow in the throat. This group includes Cattleya labiata, the original species introduced about a century ago; Mossias and Mendelii, blooming in spring; Dowiana, Gaskelliana and Warsce. wiczii, flowering in summer and early autumn: Percivaliana, Schroederae and Trianae, which flower in winter. New hybrids, raised in large numbers by orchid growers, are now chiefly cultivated.

In the slender bulbed or diphyllous group, the flowers are smaller and have a three-loved lip, the stems bearing a pair of spreading leaves at the summit. $\Lambda$ third group also has the Cattleyas are casily grown in a suitable house, and a succession of bloom can be maintained practically throughout the year. Artificial heat is generally required, except perhaps in the height of summer. The following temperatures ( $F$.) should be aimed at :
W0inter: $55^{\circ}$ th $60^{\circ}$ at night ; $60^{\circ}$ by day ; $65^{\circ}$ to $70{ }^{\circ}$ च'th sü.

8prink and autumin: $60^{\circ}$ to $65^{\circ}$ at night; $05^{\circ}$ to $70^{\circ}$ ly day; $70^{\circ}$ to $75^{\circ}$ with sun.
$5^{\circ}$ to $80^{\circ}$ with to $18^{\circ}$ at night ; $70^{\circ}$ to $75^{\circ}$ by day : $75^{\circ}$ to $80^{\circ}$ with sun.
These plants do best in pots in a fibrous compost, which must be sufficiently open to allow of the free passage of surplus water, abundance of water being required during active growth. The compost may consist of decayed leaf-mould and fibre in equal proportions with a little chopped sphagnum moss. The pots should be about half-filled with clean crocks. The proper time for potting or adding new compost is when the plants begin to produce new roots.

Cattleyas differ in their time of flowering, especially in the C. labiata group, some of which bloom immediately the young growths
are completed, others after a short rest in the autuinn, while the remainder wait until the following spring; a little more water should be given as soon as the buds begin to push in the sheaths See Orchid Pron. Cat'le-a.

CAUL. A caul may be bought separately, or a piece of it should be sent with a joint of lamb. Pieces of caul are used in which to wrap cutlets that have been spread with sone farce or forcemeat before they are grilled or fried. Chopped mixtures of meat, game, etc., are wrapped up in pieces of caul previous to baking them. The caul forms a protection to the food, and by the melting of the fat, of which it is mainly composed, the meat is tasted and kept moist

CAULDRON. Originally made in wrought or cast iron, cauldrons now survive in the form of coal receptacles. These are stamped from sheet iron. A coat of dull black paint speedily restores their appearance if worn. See Coal Box.

CAULIFLOWER. "What is the difference between cauliflower and broccoli"? is a question which is asked frequently. Both are varieties of the same species of wild plant (brassica oleracea), but broccoli is hardy, cauliflower is not. Cauliflower, which has Whiter "heads" than broccoli, and is considered to be of finer Havour, is available only in the summer and early autumn, whereas broccoli is in season from autumn until late spring and early summer.

To provide the earliest crops in May and June, seeds are sown in a box of soil in August ; the seedlings are potted, kept in a cold frame during the winter, and planted on a sheltered border in March. The frame must be ventilated freely in mild weather and covered with mats in severe frost. It may be necessary to protect the plants occasionally with bracken or straw should severe weather set in after they are planted out of doors
Suitable varieties for sowing in August are Best of All, Early Snowball, First Crop, Magnum Bonum and All the Year Round. A sowing of these varieties in a warm greenhouse in January, the seedlings being planted out in March-April, will provide a succession of produce.
The chief sowing is made on a propared seed bed out of doors in April or in boxes of soil in a frame or greenhouse in March. Beforo they become crowded the seedlings must be transplanted to a reserve border in rows 8 in . apart. In June they will be large enough to plant out finally at about 24 in . apart. Good maincrop varieties to sow in March-April are Autumn Queen, Autumn Giant, Early Giant, and Walcheren.

Cauliflowers need deeply dug, rich soil to ensure free development, and watering is necessary in dry weather in summer. Any


Caulifiower. Three heads of the Walcheren variety
with leaves cat as propared for cootring
check to growth is likcly to lead to indifferent results. They are not a success in poor. shallow soil.
The cauliflower is subject to attack by clubroot, gall-weevil, and the grub of the cabbage root-fly. In a blind plant no vestige of a heart nppears, but in its place there is a small cluster of pale leaflings. Such plants are useless A check to growth, perhaps due to drought, is the principal cause
How to Cook. To prepare a cauliflower. for boiling, after trimming off the leaves and stump, notch the stalk deeply so that a piece can be removed from its centre. Lay the caulillower in a deep basin with cold, salted water and a dash of vinegar. This soaking is necessary to extract any caterpillars.

After the soaking, to prevent scum settling on the flower, place it head downwards in a saucepan of boiling salted water. Select a pan that is sufficiently small to keep it in position ; if too large it usually turns over so that the Hower is uppermost.
Care is needed not to over-boil this veget able. Test the flower by finger pressuro or with a skewer. Time for cooking depends on age and size A small one may only require 15 min ., a large one as much as 40 min . A fish slice is useful for raising and draining the cauliHower when cooked, then place it in a hot vegetable dish, straining over it plain melted butter sauce, or else serve it plain with a small lump of butter on top and a dust of seasoning.
Caullifower au Gratin. Put a hot, boiled cauliflower on a hot au gratin dish or a picdish. Squeeze the cauliflower gently together in a clean cloth with the hands, so as to press it into a neat shape. Melt 1 oz. butter in a saucepan, stir $\frac{1}{2}$ oz. flour smoothly into it, add $1 \frac{1}{2}$ gills milk, and stir over the fire until the sauce boils and thickens. Add 1 oz grated cheese, and pepper and salt to taste.
Pour this sauce all over the canliflower, sprinkle 1 oz more grated cheese over the top, and lastly a few browned crumbs, with a few bits of butter here and there. Put the dish in the oven until the cheese is nicely browned, then serve it at once. This sauce will be sufficient for a small cauliflower.
The dish is as practicable made with the remains of a cold boiled cauliflower as with a fresh one. If the dish is required in a hurry, it can be browned under the grid An alternative is to break the sprigs of cauliflower and place a layer to each layer of cheeso sauce. Twice the quantity of the sauce is required for this method: which makes a richer dish.

CAUSTIC. Caustics are substances which burn. Fuming nitric acid, glacial acetic acid, arsenic, nitrate of silver, carbonic snow, the electro cautery, and Pacquelin's cautery, a hollow metal point heated red-hot by benzine blown into $i t$, are the chief caustics and cauteries used in medicine. Warts mny be removed by nitric acid or glacial acetic acid, applied on the end of a match, otherwise the use of these agents should be left to the doctor.

CAUSTIC SODA. Being much stronger than ordinary washing soda, caustic soda is often used for cleaning sinks, pots and pans, and for other domestic purposes. It is a coarse white powder or in the form of pencils or sticks which become moist after keeping, and has a strong burning effect on the skin. For domestic use the proportion is 1 oz . in a pint of water.

In cases of poisoning, large draughts of water should be given mixed with acids such as vinegar, citric acid, lemon-juice or tartaric acid; then give white of egg and olive oil.

CAVIARE. There are several kinds of caviare, which is a delicacy made from the salted roes of sturgeon and other fish of the same family. It should be eaten fresh, when it is a greenish-grey tint, succulent, and in shape like small pearls. Those who appreciate
caviare eat it quite plain with crisp, dry toast and salt, cayenne, and perhaps a dash of lemon- juice. It is not suitable for hot savouries, and is best kept on ice till required. It should never be touched with metal, bone spoons or wooden skewers alone being permissible.
Caviare Prawn Crouttons. These are made by stamping out a dozen rounds of bread, each the size of a five-shilling piece and about in. thick. Fry them a golden brown in oz. of butter, and leave them until they are cold. Place a teaspoonful of caviare on each crouton, lay a shelled prawn on top, and use a few thin shreds of gherkin as a garnish Arrange each croutton on a tiny plate, and serve one to each person.
CAYENNJ. Cayenne is a red, pungent, intensely hot powder, sold and used as cayenne pepper. It is prepared from the fruit of several varieties of the capsicum. See Capsicum ; Chilli ; Chutney.
CEANOTEUS. The mountain sweet or Californian lilac is a group of leaf-losing and evergreen shrubs of great decorative value.


Most of them need the shelter of a wall; a few are hardy enough to be planted in the open garden except in cold districts. The flowers of most of them are of some shade of bluc. The chief favourites for the open garden are hybrids between Ceanothus americanus and Ceanothus azureus: there they grow from 2-4 feet high and flower in July-August. The best of them are Gloire de Versailles, blue, Ceres, rose, Indigo, dark blue, and Rose Perle, rose. They should be pruned in spring by shortening the shoots or branches of the previous year's growth.
Ceanothus veitchianus is a beautiful blueflowered shrub, in full beauty in May, for planting against a sunny wall, where it will grow 6 feet or more high. Others suitable for a sunny wall are divaricatus, papillosus, and thyrsiflorus, all having blue flowers in AprilMay. When the flowers are over these wall shrubs ought to be pruned by shortening the side shoots of the previous year's growth to within a few buds of the base. They flourish in ordinary well-drained garden soil and are increased by cuttings set in a !rame in July. Pron. Cē'-a-no'-thus.

CEDAR : The Tree. The cedar of Lebanon attains to a great age and size and forms a magnificent tree in time.

The Mount Atlas cedar forms a beautiful pyramid when planted with plenty of room to develop and with shelter while young. The foliage is less sombre than the cedar of Iebanon. The so-called blue cedar, atlantica
glauca, is very handsome. The deodar cedar dens dcodara) is a most graceful tree for gardens Cedars need plenty of room and thrive hest in well drained loamy soil.

CEDAR: The Wood. Of the several varieties of cedar, the one grown in England is an ornamental tree the timber of which is seldom used, and is not of much value. The pencil cedar of N. America is the wood used for lead pencils. It is light reddish brown in colour, with a fragrant smell, and has close, straight grain, easy to work and easily split. IV. Indian cedar is darker in colour, and has

## Ceilings and How to Repair Them

## How the Amateur Worker can Make an Effective Job

Related articles include Cornice: Distcmper; Moulding: Plastering. See also Adam Style;

some resemblance to mahogany The Himaayan cedar is a valuable timber trec in India
Cigar boxes are made of cedar It was formerly used a great deal for wardrobes, boxes and drawers, because motlis and other insects dislike its smell and tastc. It is used for some parts of pleasure boats; for, though soft and brittle, it is more durable than some woods when exposed to alternate wetness and dryness. The trunk of the cedar tree, owing to its low branches, decreases in diameter too rapidly to allow long planks to be cut from it. See Wood

In England the plaster ceiling, as we know coming upon the same joist, as they would be it, was developed in Elizabethan times. The more liable to tear away from their nails, and patterns of these ceilings are often rich in design, the monotony of the surface being broken by the ornament of slight or heavy projections, often elaborated with pendants Towards the end of the 17 th century the character of the ceiling began to alter. The constructional beams were no longer hidden, but were used in combination with crossbeanis and curvilinear ribs of equal heaviness to break up the surface into a series of recessed divisions or bays. Ornament was concentrated on and near these beams and ribs, and its character became bolder and more massive. This style was succeeded by a reversion to the Hatter surface decorated in low relief.

Ceilings are a feature in houses built by the Adam brothers. and some of these have been taken down and removed. The brothers seized upon the llat style then in vogue, and perfected it by substituting an intelligible classic design for the somewhat confused essays of their contemporaries. In these, panels are suggested only, with slight lines and rings of leaves and araliesque. The moulds of the ornamental clevices of Robert Adam are preserved and used for many modern ceilings.

Apart from such ornament niodern decorators use colour in ceilings; sometimes to tone with the walls when these arc in pale colours, or with the frieze only when the walls are panelled; sometimes in contrast, as for example when a ceiling is stippled in golden yellows to enhance walls of plain colour with mouldings enriched with gold metallic paint.

The inner covering or roof of a room is generally finished in plaster work, or may be constructed of boards, 3 -ply panelling, or building boards such as beaver board and the like. Plaster ceilings are built up on a groundwork of laths, the boards being nailed directly to the ceiling joists or rafters; but it is frequently better to employ special battens so as to utilise the boards to the best advantage A good ceiling should be artistic in appearance, homogeneous and dustproof, preferably linished white or in some light colour.
Lath - and - Plaster Ceilings. A lath-andplaster ceiling is formed by nailing laths to the underside of the joists, as in Fig. 1, with a space of approximately in between one lath and the next to form a key for the plaster, which should be pushed up through the spaces and grip the edges of the laths. It is important to have straight-grained, wellseasoned laths in order to avoid breakage or rotting after fixing. Rent laths, shaped by cleavage of the wood, are better than sawn, since they contain more continuous fibres, and are, therefore, stronger. Usually, however, sawn laths are employed, and those known as "lath and a half" in thickness should be olitained.

In commencing the work, some 10 or 1 ? laths, 4 ft. long, are nailed in position, then a similar number of 3 ft . laths, and so on. This is to prevent all the joints at the lath ends
allow the ceiling to crack in a straight line from side to side of the room. In a new house the partitions running in the same direction as the joists are left incomplete wherever possible until the lathing has been carried from end to end of the building. By this means a great deal of lath cutting is avoided. Partitions running at right angles to the joists are built to the required height in the first instance, and are generally used as structural supports to the joist ends. The laths run parallel to these latter partitions, and do not have to be cut for them.

## The Three Coats of Plaster

The plastering is applied to the ceiling in three coats, all composed of lime and sand, but mixed in different proportions. The lime is pure chalk lime, and is prepared by slaking lumps of quicklime in tubs containing excess of water, and then straining the liquid.

The first coat (Fig. 1, A), known as the scratch, pricking-up, or rendering coat, is made of coarse stuff composed of one part of lime with three parts of sand by measure, with ! lb. of long, clean ox-hair to every cubic yard. In good work the floating, or second coat (B), is applied after the pricking-up coat is thoroughly dry, to avoid breaking the key of the mortar, i.c. the connexion between the mortar bclow the laths and that pricked up into the spaces between them. Floating and pricking-up are sometimes performed in one coat, but the attention devoted to obtaining a level surface (floating) detracts from the elfort necessary in forming a good key by vigorous trowel work.
The third finishing, skim, or setting coat (Fig. 1, C), is of fine stuff composed of lime putty (q.v.) and washed sand in equal proportions, and is applied after the under coats have dried and settled into position. A setting coat


Ceiling. Fig. 1. Diagram showing construction of a lath-and-plaster ceiling A. Kendering coat. B. Floating coat. C. Setting coat. D. Cornice. Bracket. F. Ground. G. Ornamental work cast in nieces and fred to $F$.
lime putty to hasten its setting properties The proportions of lime-putty and plaster vary considerably at the discretion of the plasterer, but one part of plaster might be added to three of putty. No extra sand is added for the plaster of Paris, and in some cases the gauged stuff is left free of sand altogether, since plaster of Paris and other hard-setting gypsum plasters are not able to work with such large quantities of sand as lime mortar.
The employment of sheets ol asbestos com pounds, compressed wood pulp or three-ply boards, beaver board, and the like, permits of ceilings being formed without the delay involved in waiting for plaster to set and dry out The sheets are cut to the required sizes, and nailed at their edges to small wooden battens fixed in position at suitable distances on the underside of the floor ioists The exposed surface of the ceiling sheets is usually whitened or distempered, and the joints covered with slats of wood, arranged to form panelled patterns of ribs across the surface.
Ceilings in country houses are Irequently made with the plaster in narrow strips between the floor joists in order to present an oldfaghioned appearance by contrasting the colour of the wood with that of the plaster Small rough strips of wood are nailed to the sides of the joists to receive the ends of the laths, and after the plastering is complete small moulded strips are sometimes fixed to the joists to cover the joint betwcen the wood and the plastet.
Where plastering has to be applied to a broad wooden surface, special precautions have to be Iaken to ensure a key. In cheap work the beam is roughened with a great number of small gashes made with the corner of a broad chisel, an adze, or a hatchet, in such a manner that the chip is not detached, but is forced to stand out from the surface As an alternative, broad-headed or clout nails are partly driven into the beam. If laths are used they must not be fixed direct to the face of the beam, but to rough battens nailed upon it in such a manner as will keep the back of the lathing from $t$ to $\frac{1}{2} \mathrm{in}$. from the bean to allow room for the key of plaster which oozes round the lath

Lathing should never he fixed direct to the underside of a boarded floor, but always to the joists, otherwise the spring of the flooring boards will crack the plaster. The laths must be supported at every 15 in . of their length, or the plaster will be apt to crack.

Repairing a Ceiling. Among the tools which will be found of use in making or repairing a ceiling is the hawk, a wooden board about 12 in. square with a short handle projecting beneath it, used for holding a supply of material preparatory to depositing it on the ceiling with a trowel. The setting coat is applied with a wooden hand foat, which works better if it is kept thoroughly clean and wet, fiec from lumps of dried plaster. The angle float is used for working in the corners between the wall and ceiling. A lath hammer is useful if much of this work is to be done, as by its aid the laths can be trimmed to length. The ama teur will probably feel disposed to tackle the repair of an existing ceiling before launching out on new work. Fig. 2 shows a typical hole in a ceiling. Certain precautions are desirable, includ ing the following. First break away all loose plaster around the


Celing. Firs. 2 5. Stages in mending a broken ceillng, the laths being repaired and covered with two coats of plaster, one rough and one fine
the plaster work, and can be covered with plaster of Paris.

A better plan is to get up into the roof, brush off all luose and dirty material from the back of the ceiling and pour over it sufficient water to saturate the hack of the ceiling. Then immediately apply a grouting of liquid plaster of Paris, pouring it all over the damaged parts. It will set very quickly and make a sound key to hold the ceiling in place. This method depends for success upon the complete removal of all dust and loose stuff from the ceiling. The strutting must not be moveduntil this plaster has thoroughly set, and is dry and hard.

Cracked ceilings are best repaired by scrapingout the cracks with a chisel or scraper to enlarge the hole sufficiently to take the plaster or lime-putty which is used damaged part. Then examine the lathing, and to make goud. The edges of the cracks must be if any of it is broken, cut the laths out by saturated with water to ensure a sound joint. chopping them off with a chisel, half-way across a joist, to provide a fixing for the laths which are to take their place. These can then be cut and fitted (Fig. 3). Next prepare the coarse stuff, and thoroughly brush allay any dust and loose pieces of plaster, especially around the walls of the hole. Thoroughly damp the laths and the surrounding plaster work and then apply the coarse stuff with a trowel. The plaster has to be thrown at the laths rather than merely put up against them, the object being to force some of the coarse stuff through the spaces between the laths so that it can grip securely (Fig. 4).
The finishing coats (Fig. 5) arc then applied. When applying the first force it up hard against the existing work and keep it damp for some hours by brushing it with water. When a moulded ceiling has broken away from the laths it can often be made good by strutting it up with uprights of wood, bearing upon boards placed on the ceiling, the whole driven up tight with wedges under the feet of the struts. Screws with large washers about 1 in . in diameter can then be driven into the joists about 10 in . apart. These will draw into
saturated with water to ensure a sound boint.
Spots and dirty marks on ceilings can be removed with a weak solution of starch and water, painted on, allowed to dry, and afterwards rubbed briskly with a coarse Hannel.

The cmbellishment of an existing or a new ceiling can be carried out with fibrous plaster ornanients ohtainable ready-made, and only requiring to be secured in place with strong plaster. Cornices and mouldings are generally worked in plaster.

CELERIAC. Turnip-rooted celery, as it is sometimes called, finds less favour in Great Britain than in the other countries of Europe. The edible part is the enlarged base of the stem which is well shown in the illustration. The plants are raised from seeds sown in a heated glasshouse in Fehruary-March: the scedlings are treated as advised for celery and arc planted 18 inches apart in June in rich soil. In August the roots are covered lightly with soil, and in early autumn they are lifted and stored in soil or sand until required.

To cook celerinc, wash and trim a root, put into boiling water and boil till tender, skin it,
cut it into slices and serve with white sauce.

# Celery: From Garden to Kitchen 

## The Culture and Cooking of a Favourite Vegetable

This article contains also recipes for special celery dishes and information on celery pests. Sce furiher Fcrtiliser; Trenching

Celery stands almost a lone among vegetables in being equally palatable either when cooked or in its natural condition. There are two types in common cultivation, the red and the white Opinions differ, but the white has perhaps the advantage in being earlier, the red in vigour and flavour, so that it is customary to grow both. Good white varieties are Giant White, White Gem, and White Queen. A1, Sulham Prize and Standard Bearer are some of the hest red varieties. Early celery may be planted between rows of peas: late celery may follow early peas and broad beans. Those who want celery in August or Septeniber should sow in gentle bottom heat in February or put the pans of boxes on a shelf in a mildly heated house. A fine surface compost
is deairable. A covering of half an inch will be ample. The scedlings must be transplanted at 3 inches apart in boxes filled with a mixture of loam and leaf-mould. When nicely rooted they arc hardened off in a frame and planted out of doors in May.

Seeds to provide the main winter crop are sown in boxes of light soil in a slightly heated greenhouse or frame in March. When the seedlings are large enough they are planted in a bed of rich soil at 4 inches apart in a frame and from these are transferred to the open garden in June.

Trenching. Trenches are not essential, but they provide a convenient means both of feeding and blanching the plant. To prepare a trench, remove the top soil, break up
the under soil, and liberally interlard it with decayed manure.

A trench for one row of celery may be not less than $\frac{1}{2}$ a yard wide, and for two rows 2 ft . wide, the plants in this case being set in opposite vacancies. If the plants are grown in single rows in a series of trenches, the latter should be 4 ft . apart, and run north and south.

The depth of the trenches when finished should be 9 or 10 in ., allowance being made for returning just enough of the top soil to cover the roots.

The Cuthill method of trenching, which has produced the finest celery in the world, consists in digging a trench two spades deep and 5 to 6 ft . wide, banking up the mould on either side. Fill in with a foot in depth of strong manure, such as decomposed cow dung, and cover it over with three or four inclies of mould for planting in ; or, if the ground is very tich, half the quantity of manure.

Finc celery, especially for early supplies, can be obtained without trenching, being, mercly planted in a slight hollow in rich, well-tilled soil. The blanching is mainly done with brown paper, or with special blanching bands, but a little earth is generally drawn up to the base. The trench system is lietter for winter celery.

If there is plenty of ground available, the trenches may be made a month or so before planting, and as soon as the ridges have loeen formed at the sides of the trenches lettuces may be planted on them. As the celery grows, any sucker shoots that spring up should be picked out. The plants will grow the faster if water and liquid manure can be supplied.

When the plant is half-grown, 1 oz of nitrate of soda in a gallon of water, $\frac{1}{2}$ oz. phosphate of potash in a gallon of water, and $\frac{1}{2}$ oz. each of superphosphate and nitrate of soda (or sulphate of ammonia) in a gallon of water,


Celeriac. Stalks and roots of the turnip-rooted
used alternately, will work wonders. Anothes good change is 2 oz. Peruvian guano per yard of trench, dusted on the soil in showery weather.

When the plants are a foot high, a loop of raffia nay be slipped around them, and when they have grown another 6 in ., a second adiled, fixing one near the bottom, and one, not very tight!y, near the top; in this case this should lie done before the earthing, in order to lieep, the soil out of the centres. For earthing up, the soil should be just damp, not sodden or moist at the top and dry below, or running to seed may follow.

The earthing should be thorough, even though it is not completed in one operation. When several rows are grown in each trench, temporary divisions will have to be made with boards of the width of the trench while the earth is being packed among the plants. If there are slugs about, lime should be userl freely. By the time eart hing is completed-and that should be in advance of severe frost-the earth should be level with the topmost tip of leaf. Celery blanches in 6 or 7 weeks from the time of being eartherl.


Celerg. Diagrams illustrating method ol culture. 1. Trench properly prepared: a, sloping sides: $l$, good soil ; $c$. manure; $d$, cast ont soil, with catch crops krowing at $e$
3. First earthing-up

First earthing-ud 4 Final earthing-ud
How to Cook. Celery should he carefully washed, the outer stalks should be pulled off, and all the green tops, except the very young ones, cut away. When to be served raw, the head should be split lengthwise into four or more pieces, or every stalk separated, and served in a celery glass lialf full of cold water


Head of Celery For cooking purposes, celery may be dried and stored. The sticks are cut in strips 1 in. long, left in a cool oven for a day or two until hard and crisp, then packed in airtight bottles, and when required for flavouring crushed to a prowder with a rolling-pin. Celery seeds are also used for flavouring.
To stew celery, the sticks are simmered in slightly salted "ater for about 45 min . They are then drained and served with white or brown sauce. Cooked celery is also good When dipped in batter and fried. Cardoon (q.v.) may be cooked in the same way.

In order to make celery and macaroni stew, $1 \frac{1}{2}$ heads celery and 1 oz. macaroni should be boiled for 35 min . in separate pans each containing salted water Theyare then drained and dropped piece by piece into 1 gill hot white sauce. A sprinkling of pepper and salt is added, and the whole allowed to simmer for 20 min . Prepared in this way, but cheese sauce sulstituted for white sauce, celery and macaroni, or celery alone, arc also excellent au gratin. (See Cauliflower.)

Another good way of utilising celery is in a sauce for serving with boiled poultry. In this case wash and ohop 2 small heads of celery, putting the pieces in a sancepan with sufficient cold water to cover them Cook these slowly for a little less than $f$ hour, stirring frequently; then add some white sance made from J oz, butter, $1 \frac{1}{2} \mathrm{oz}$. flour, 1 pint milk,
and a little pepper and salt, and stir until the mixture boils.
To make celery soup with a large head 2 pints of white stock or water and $\frac{1}{2}$ pint of milk are required. The white part only should be used Two rashers lean bacon, two onions, $1 \frac{1}{2}$ tablespoonfuts flour, 1 oz . margarine. with salt and pepper, are also needed

The bacon is cut into pieces 1 in long, and the onion and celery sliced fincly. The vegetablea should then be fried in the margarine in a large saucepan. The bacon, stock, and sensoning are added, and the whole simmered for about 45 min until the celery is tender. The contents of the pan should be rubbed through a fine sieve and the purée returned to the pan. the milk added, and the whole brought to the boil. The soup is then thickened by the addition of the llour, mixed to a paste with a little cold milk, and the whole cooked for about 5 min ., stirring all the time.
Celery Diseases. The most troublesome disease to which celery is liable is leaf spot or blight ; one cause of the prevalence of this is bad seed. It is wise to buy seed of the hest strain which has been treated in the way advised by the Ministry of Agriculture as a means of preventing leaf spot. If any doubt exists the seeds should be steeped for threc hours in a solution of formalin, one part in 600 parts of water. Holding a leaf up to the light and looking through it enables the grower to recognize this disense which gives rise to dark spots on the leaves and may eventually render the plants useless. Spruying with Bordeaux mixture immediately diseased leaves are noticed is advised If only a small number ol plants is grown all the diseased parts should be cut off and burnt.

This fungicide is also recommended as a preventive of celery rust. It is of
 the celergleal: magnifled


Celerg. Buccesslul methad al bianching celerg gromn on the gronnd level by wrapping the stalks in paper collars which exclude the anolight

The hest preventive measures are to spray the plants occasionally in late spring and early summer with paraffin emulsion for the purpose of keeping off the llies. Paraffin emulsion is made by dissolving a handful of soft soap in a little hot water, adding an eggcupful of paraffin and two gallons of water. Some good is done by cutting off those parts of the leaves attacked and burning them It is most necessary that unused parts of diseased plants and those attacked by pesta be not left lying about or thrown on the rubbish heap; they should be burnt CELL: In Electricity. This apparatus is used to generate a current of clec tricity by means of chemical decomposition A simple cell is composed of two elements, a positive and a negative, inmersed in a liquid known as the electrolyte A single accumulator is also known great importance to spray early; once these as a cell. The so-called dry cell has the diseases are firmly established on the plants it electrolyte in the form of a paste
is a!most impossible to destroy them
The attacks of the celery Hy usually begin in April and may last into December. The larvae live upon the juicy substance between the upper and lower skins of the leaf. which eventually shrivels up, with the result that the stalks and stems of the plant cannot grow and fill out properly. l'arsnips suffer in the same way from these pests.


Celery Leaf Spot or Blight : the chiel celery diseasc. 1 Plant attacked by blight. 2. Effect on leal. 3. Inlected fruits

Cells are generally classed under two headings, viz., primary cells, which generate current, and storage cells or accumulators, See Accumulator ; Battery : Daniell Cell.

CELLAR. The hest situation for the cellar is on the north side of the house, and it should be partially or wholly underground if advantage is to be taken of the non-conducting properties of the carth in preserving the cellar from heat in summer. Houses built on soft soil may have cellars economically formed in the basement botween the foundations of the walls. The maintenance of an equable and low temperature is import. ant when a cellar is used for storing Sea Coal Cellar; Wine Cellar.
CELLARETTE.
Some sideboards have a druver lined with zinc or other metal and divided into compartments, one for each bottle of winc, etc. Originally the cellarette was distinct from the sideboard, and was placed beneath it. Fine examples were made of rosewoodand mahogany. some being oval or octagonal in shape. They were bound with brass bands and, in addition, had a receptacle for ice
'CMLTO : How to Play. The violoncello is the bass member of the violin family, and for orchestral purposes is usually supplemented by the double-bass, an octave lower. Its beautiful tone makes it a favourite instrument for amateur players, and a capable per former is always in request. In appearance it resembles the violin, but it is played from between the knees of the performer its lower end being supported on a stem sufficiently long to prevent the bow touching his body when either of the outer strings is played.

The four stringe are tuned in perfect fifths, thus:


The strings are of gut, the two lowest being covered with silver or copper wire. They are played with a bow, which is drawn across them at right ang!ea about an inch from the bridge. In piano playing it should be rather nearer the finger-board, but in the opposite direction in forte playing. For orescendo increase the speed and pressure of the stroke, the process being reversed for diminuendo. Besides the $F$ and $G$ clefs, the $C$ clef, on the fourth line, is used as for the bassoon.

A start should be made by trying to produce a good, steady tone from the open strings. To this end it is necessary to pay chief attention to the use of the bow, which should be firmly grasped by the fingers, yet so as not to interfere with the freedom of the wrist. When a satisfactory tone has been acquired, the study of stopped notes follows, by practising different intervals, 2nds, 3rds, etc.

Owing to the length of the strings and the consequently wider distances to be reached by the fingers, the principle of the fingering differs from that on the violin. Broadly stated, it consists in the use of the next finger for a semitone and of the next finger but one for a whole tone, though this procedure is not invariable, especially in the higher positions, as will be seen by the exercises given in tutors for the instrument.

In order to reach the higher notes, the left hand is gradually shifted nearer the ribs of the 'cello. When the index finger is used to produce a second above the open note, the hand is in the first position; the second position is when it reaches a third above the open note, and 80 on. Thus on the A string the index finger will play $B$ in the first position, and $C, D, E$, $F$, etc., in successively higher positions.

Sometimes a false nut is made by placing the thumb across two adjacent strings, and then fingering according to the method on the violin. This is useful for high notes; but players prefer the ordinary stopping, as the tone is stronger and more equal.

After use the 'cello should be wiped with a dry duster to remove any particles of resin from the belly, and it should be kept in its case, so as to preserve it from the dust, which otherwise will certainly find its way through the $f$ holes, to the detriment of the instrument.

CBLLULIIIS. The term is used to describe a rapidly dangerous variety of inflam. mation of the soft tissues underlying the skin or lying between the muscles. The cause is always some pus-forming germ which either enters the tissue through a wound or is brought there in the blood stream, e.g. the microbe of erysipelas. It is more liable to affect debilitated persons, e.g. those suffering from diabetes or chronic kidney disease.

The first symptom is a rapid swelling of the whole part, with redness, tenderness, pain, and some fever. On pressing the finger against the skin a small pit or depression is formed which may remain for some moments after
the pressure is removed. In the next stage the whole of the skin over the part involved becomes dark red, tense, and firm from the swelling of the tissues underneath.
The inflammation in cellulitis rapidly spreads, so that when beginning above the wrist, for example, within a day or two the whole arm may be hard, brawny, and greatly increased in size. Unless vigorous treatment is instituted the tissues under the skin become gangrenous, and the skin itself becomes purple or blackish, and then gives way. By this time the patient is usually in a very low state, with high fever, rapid, irregular pulse, and all the signs of severe constitutional disturbance. He should be under medical care at once.
CELLULOID. Largely used as an imitative substitute for ivory, celluloid is manufactured in rods and sheets, the latter more or less transparent. The material is elastic, readily machined and worked, takes a high polish and is capable of exhibiting very beau-

Cement: Its Varieties and Uses

## Methods of Use Clearly Explained for the Amateur

This article may be read in association with those on Brick ; Bungalow; Cottage; House, etc. See also Concrete; Lime; Mortar

Materials known in the building trades as cement include numerous varieties of lime and Portland cement. The former requires different treatment, and is dealt with separately, the following notes referring to Portland cement, which in appearance is a greyishgreen material in the form of a fine powder. It should be perfectly even in grain and free from lumps, the presence of the latter inclicating that the cement has got damp and has deteriorated.

Cement sets or goes hard by the action of water. a process known as hydration. It becomes harder and more durable in combination with certain other materials. Mixed with an equal or greater bulk of sand, the material is more practically useful, and is known as mortar. When the aggregate is in comparatively large pieces, such as broken brick or gravel, the resulting mixture is known as concrete.

It is vitally important for good work that the cement be uniformly distributed through the sand or aggregate, and that the water be uniformly applied and dispersed. While cement imperfectly mixed is thus a source of danger, when properly handled it is one of the finest of building materials, and has great possibilities for the amateur constructor. It can be cast in moulds, or worked up with a trowel on existing brickwork or lathing: a whole house can be built with it, and all kinds of garden seats, rollers, sundial columns, ornamental figures, etc., eithercastor moulded while the cement is workable.
Cement can be purchased in small quantities at an ironmonger's, but it is nore economical to purchase a sack of cement from a builder's merchant. This weighs about 200 lb . As the strength of cement depends largely upon its correct manufacture, it is always advisable to
buy the best quality.

The nmateur may begin by taking a handful of cement and gradually damping it with a little water, stirring the powder about so that the water is evenly distributed throughout. At first the cement will be crumbly ; a little more water added to it causes the mass to hang together, and to retain its shape if moulded with the hand. Continue the experiment by adding a little more water to the cement and keep mixing it until the material feels slimy or greasy. This state is known as a fat cement, and is the best state in which to work it with a trowel. Now leave the material for a few minutes, and it will be found to have set. It will not be dry : indeed, it takes several days or even longer for the water to dry out. The point to notice is that the cement has undergone a chemical change, and setting has reached its maximum strength. The whole purpose of wetting is to bring this about, and the cement is then left to dry out. If it is knocked about with a trowel before it has dried and more water added, the material will mix up and look very much as it did before setting, but its real strength will have gone.

How to Mlx Cement. The best way to mix $n$ small quantity of cement is as follows. Provide a strong solid board or table about 4 ft . square upon which to mix the materials. The grading or proportioning of the materials is known as gauging ; the gauging is done by bulk,
 or measure, and not by weight. Suppose
thecement is wanted in the form of mortar. Take one pailfulof cement and empty it on one corner of the board. Then take a pailful of clean, well-sifted sand and spread it over the board with a trowel. Sprinkle about $\frac{1}{3}$ of the cement over the sand, put another pailful of sand on the cement, and sprinkle another \& of the cement over it. Finally, add the remaining sand, and the rest of the cement. Turn it all over with a shovel, and rake it over
until the grey colour of the cement is seen to be evenly mixed with the sand

The complete mixing must he done dry, and a good result is obtained by using two mixing boards, shovelling from one into a sieve on the other, and sifting the mixture. When properly mixed, sprinkle with water from a watering can with a rosehead, and keep stirring until the whole mass is well mixed and in a workable condition. For casting in moulds use it moist ; for bricklaying and rendering, or any trowel or moulding work, use it fat

Cementing Large Areas. The application of cement to bricklaying is dealt with in the article Brick (q.v.). The repair of cracks in floors and walls, as well as the coating or facing of a wall with cement, known as rendering, is done generally as follows, using the mortar as described For cement facings on brickwork, chip out all loose material, rake out the old mortar from the joints between the bricks with a chisel to a depth of $\frac{1}{t}$ inch, thoroughly wet the wall, and then smack on the cement by a sort of throwing action, so that it is forced hard on to the brickwork; and smooth it over with the trowel, and keep the cement damp for some hours by spraying it with a little water to a void cracks due to a too rapid drying Floors are dealt with after the same method
A now lloor laid in cement is generally composed of several inches of concrete and faced with a 1 in. thickness of granolithic cement, made by mixing cement, sand, and fine granite chippings in equal proportions When dealing with large areas it is a convenience to break them up into sections by laying battens of wood on the concrete about 3 ft . apart and filling in between them with the cement facing, removing the battens and filling in the gaps as the work proceeds. Considerable skill is required to trowel up and lloat off a flat floor. A long straight lath resting on the tops of two adjacent section battens, and worked about in different direc tions, will greatly aid this work by producing a level surface, only needing floating off
Cement can lie applied in the form of a wash to the surface of brickwork, old cement or plaster work. It consists of a mixture of cqual parts of cement and sand, and is applied in a liquid form with an old whitewash brush
Casting and Moulding. The casting of cement is carried out in shaped wooden moulds ; alternatively, those made of plaster of Paris can be used. The cement is rammed into the mould by hand in a damp condition, and the mould can be taken to pieces and removed from the casting as soon as the cement has set sufficiently. It should then be soaked with water and left to set hard and dry off. Very good results are obtained by using cement and and in equal proportions. Moulding in cement is carried out more or less on the lines of clay modelling by shaping the material with sweeps or boards cut to a template, or by means of trowels of different shapes, and wooden or other modelling tools.

Keen's cement, made from alum and gypsum, is used in plastering (q.v.). It rets very hard and is useful for repairing damaged surfaces.

CEMENT : For Mending. For uniting the hroken edges of china objects a cement such as the following is required. Soak 1 oz of isinglass in $\mathbf{2} \mathbf{~ o z}$ of water overnight; then place the mass in an earthenware jampot ; put this in a saucepan containing a small amount of water, and heat until the isinglass has dissolved. Next udd $\mathbf{l}$ oz. of strong acetic acid, stir well, and pour the cement into smiall bottles.

For use, the bottle containing the cement is placed in hot water until the cement liquefies. The edges of the broken china object, having been warmed, are smeared with the cement, then brought together and kept in position until the cement has set.

For mending knife handles, mix together flowers of sulphur 1 oz , powdered resin $\xlongequal{2}$ oz. kaolin 1 oz , and fill the hollow handle. Next heat the tang of the knife nearly to redness, and press it into the handle, holding it in position until it is cold.

For sticking leather patohes on hoots the following cement is used. Dissolve by continuous shaking gutta-percha raspings, 1 oz., in carbon bisulphide 5 oz . 'The surfaces of the leather patch and the boot are cleaned hy means of fine sand-paper, the cement is spread upon the surfaces to be united and allowed to evaporate. Then the patch is placed in position and smoothed with a knife handle or rubhed with a warm iron. See Canada Balsam ; Crockery, etc.

CENTIGRADE. This is one of the chief ways of measuring heat by a thermometer On a centigrade therinometer freezing point is marked 0 degrees and boiling point 100 To convert centigrade degrees into Fahrenheit multiply by ${ }^{5}$ and add 32 . Thus 300 centi grade $=\frac{9}{5} \times 30(3)+32=572^{\circ}$ Fahrenheit. To convert Fahrenheit degrecs intocentigrade sub. tract 32 and multiply by $\frac{\dot{3}}{6}$. See Fahrenheit Thermoneter.

CENTIPEDE. Millipedes and centipedes are found in all parts of Great Britain Millipedes are injurious in the garden, feeding oll roots of all kinds, while centipedes are harmless to plants. Of the latter the variety mostly found in the garden is long and slender and is common in leaf-mould. Sce Millipede

## Central heating for the Home

## A Typical System and How it Operates

See Anthracite; Gas; also Boiler; $\begin{gathered}\text { Range, and other entries dealing with the heating } \\ \text { apparatus of the housc }\end{gathered}$

The heating of a huilding by radiators or pipes supplied with hot water or steam from a single boiler is known as central heating. Several systems are in use For domestic purposes the onc or two-pipe drop systems for low pressure hot water are probably the most satisfactory.

With a central heating installation only one fire requires attention, while a good boiler does not need stoking more than two or three times a day, and will remain alight all night. The heat transmitted by the radiators is healthy, mild, and agreeable, and there are no noxious fumes. The temperature can be regulated at will, and any individual radiator can be put out of action when not needed, or hrought at once into service by merely turning a tap. The following notes refer to small domestic installations suitable for the average dwelling house of eight to ten rooms.

There are two distinct methods of low pressure hot water heating. The object of the first is to warm the whole house and in maintain it at an equable temperature. The second is designed for local heating: that is to say, the bulk of the heat is applied to the warining of one or two principal ronms, the others being warmed as required Coinbination systems, where one fire suffices for cooking, hot water supply, and heating. are now uvailable, and the type of kitchen range illustrated in Fig. 1 will serve several radiators


Central Heating. Fig. 1. Combined boiler and cooking range, which also supplies bath water Courtesy of Natlonal lladiator Co., L.td.
in addition to providing domestic hot water and ample cooking facilitics for the average dwelling house

A central heating boiler may be heated by coal, colic, wood, oil, or gas. Anthracite and coke arc the most satisfactory nolid fuels. Gas may prove expensive for continuous heating, which is the essential feature of a central heating installation Oil is economical for large installations, but for small private houses the initial cost of the oil-


Fig. 2. Independent boiler for supplying a number of radiators. Fig. 3. Efficient type of radiator for central beating
Courlesu of National Radiator Co.. t.id
hurning plant is gencrally considered prohibitive, and in any case auxiliary power, such as electricity, compressed air or steam is necessary for atomising the oil. The heat necessary to maintain the system oncc it has been raised to its highest temperature is that required to make up the heat logt from the rooms. This is the secret of the efficiency of the independent central heating system.

A typical boiler is illustrated in Fig. 2. It is made up of four panels connected at top and bottom by hollow headers. The panels com. prise a series of small upright waterways. The fire and ashpit are surrounded by a waterjacket. This boiler also functions as a radiator, and will warm the kitchen or living room, where it is situated

Dampers are provided to regulate the fire by controlling the entrance of air, the opening of the ashpit draught door increasing the heat of the fire, and vice versa.
The size of the boiler must be sufficient to maintain all the radiators constantly at full heat. When reckoning the size of an installa tion, allowance must be made for the geographical position of the house. A dwelling on a hilltop, expored to the full force of a winter gale, obviously requires more heating
than a building of identical sizo in a sheltered required on this level, they prsition The area and position of the glass windows also play an important part, the loss by radiation through the glass windows being very considerable Taking a fair average, the following sizes of radiators are required to maintain a temperature of about $65^{\circ}$ The figures represent sq. ft . of radiator surface:
Small bedrooms
Larger bedrooms
Pasage way
Entrance hall
Dining monm
Draw!
Dowm
required on this level, they
are connected by the down pipe $F$. then through pipe G. It will be seen that any of the radiators can be shut off by closing the valve, but without impeding the flow in the pipe. The pipe should be galvanised wrought iron steam quality, and it in in the bore.

A smaller bore expansion pipe is connected to a small cast iron or galvanised ex.

The tutal may be put roughly at 200 sq . ft. of radiator surface To this must be added an amount to cover the losses in the connecting pipes, which can be greatly reduced by lagging the pipes wherever possible with asbestos or ither non-conductor of heat. The above hypothetical installation woald require is boiler containing about $10 \frac{1}{\mathrm{sq}} \mathrm{g}$. ft . of heating surface, and measuring about 36 in . high. 15 in wide, and 20 in . deep.

Having decided upon the boiler, the radiatnrs can be selected necording to their capacity


Central Reating. Fis. 4. Diagram ahowing low pressure hot weter drop aystoin. 800 toat lor lettering
The latest type of radiator has small fluted columns, as shown in Fig. 3. The smallest size may be a four-column $5 \frac{1}{2}$ in. wide or thereabouts, composed of six sections 24 in. high. A pattern suitable for the larger bed. rooms would measure about 30 in . high, and be composed of ten sections. For the largest rooms a six-column type can be chosen, having, say, eleven sections 36 in . high or 13 or 14 sections 30 in . high, according to the space available. A long low radiator is sometimes more convenient than one of fewer sections but greater height

Such radiatore as those illustrated in Fig. 3 are made of cast iron, with the internal waterways formed when cast. The sections are connected by taper threaded internal nipples. lilet and outlet connexions as well as a tapping for the air release valve are provided.

The pipo system has next to bo planned. Desirable features are compact pianning. minimum lengths of piping and gradual easy falls to all pipes. In the drop system (Fig 4), the heated water ascends by the flow pipe to a cross-pieco HP at the highest point of the avstem; branches aro taken as at AB to the return pipes CD. The radiators are con. nected by short branches, as at $H$ and J with a valve on the top inlet of the radiator. On the gmund floor, when radiators are
pansion tank M, another pipe being taken from the top of the tank as an overflow on to the roof. A safety valve should, however, be fitted to the boiler and maintained in porfect working order.

Connexions are made where necessary by means of the standard elbows, tees, and bends, screwed on tightly and the joints made water-tight with red lead or, other jointing material Various types of valves are available for controlling the supply of hot water to the radiators. The air release valves are simple plug-cocks and are screwed into the radiators.
The position of the boiler will be governed by convenience. It should be well away from woodwork or inflammable material, placed on a good solid fireproof floor, such as a bed of cement concrete $\delta$ in. thick. The need of carrying the smoks pipe either through the wall to the outside air or into a conveniently situated tlue must not be lost sight of. Otherwise the boiler is best placed in the most convenient position in the house, from whence the flow pipes can rise with as few bends as possible, consistent with an allowance for the expansion of the pipes when heated.

CENTRE. Centres are used on lathes and other tools to assist in supporting the work, and to locate it truly on the centre line of the shaft. The centre itself is in various forms; the point centre is pointed in shape, the cup or hollow centre is inverted, and the vee-centre has a $V$-shaped slot cut across at right-angles. Many small bench drilling machines are provided with such centres.

Centre to Centre. This expression is frequently found in descriptions of "how to make "articles. It means that measurements are taken from the centre line of one part to the centre line of the other part. It is the most


Centre. Implemonts used in iathe work ; top, point oentre : middle, vee centre; bottom, cup centre
accurate way of marking out a job For example, floor joists may be specifled as being 15 in . centres, meaning that their centre lines are 15 in . apart. Such joists are "frequently 2 in . thick, but as they are only rough sawn, it would not be satisfactory to measure the gap between two joists, as this would vary slightly one from another, and the ultimate result would be unsatisfactory.

The word is also used in connexion with the naking of chocolates. See Chocolate.


CENTRE PUNCE. A centre punch is one having a sharp.pointed end, made of tool-steel, either hexagonal or circular in section. It is used for marking the centre of a hole, for dotting a line on metal prior to cutting it, and sundry other similar jobs. It is used by holding it ereot upon the work, with the point exactly on the centre. A sharp blow is then struck with a hammer on the head of the punch; this makes an indentation in the metal and thus marks the centre. The point should be kept sharp by grinding.

An automatio centre punch has a spring-actuated self-contained hammer which strikes the blow when the punch is pressed hard on the work. They are very convenient in use. Bell centre punches are handy for marking the centre on the end of a metal bar. A centre punch or several of different sizes are essentials to almost everyone desirous of working in metal.
CERAMICS. Under this Cluded the plastic arts of the potter and the worker in clay fabrics. Thus the name includes chinaware (porcelain), faience, pottery (earthen and stone wares) and terra. cotta Ornamental bricks and tiles are also branches of ceramic art. Owing to the fact that great potters experimented with many clay fabrics in making their wares, china marks are sometimes used on both earthenware and chinaware. See China: Faience; Pottery.

CERTAL. Foods made from cereals, i.e. from grains such as wheat, barley, oats, etc., provide the starchy substances which are neccssary for life and health. Besides supply. ing starch, wheat flour and oatmeal furnish a fair amount of proteid or flesh-forming food, and oat meal alsocontributes asubstantial amount of fat as compared with the meagre quantity con. tained in other cereals. Mineral salts are also represented in cereal foods, chiefly in the form of phosplastes of potassium and magnesium: but the amount of these in fine flour is small as compared with that in wholemeal flour.

Rice contains little else than starch, and what little of the other food constituents it does contain are generally removed by boiling it. The proper way to cook it is by thorough steaming. Oswego, corn flour and hominy are obtained from snaize by acting on it with caustic potash. See Barley; Bread; Diet; Flour ; Oatmeal ; Rice, etc.

Cerebro-spinal Meningitis. This is the medical term for the disease better known as spotted fever (q.v.).

CFREUS. Several species of cereus bloom at night, hence its alternative name of torch thistle.

Among the best sorts is the rat-tail cactus, (flagelliformis), so called owing to its slender wiry growth: it bears pink flowers in spring, and is a desirable plant for a hanging basket or for growing in a window. Fulgidus, with its scarlet flowers in early summer, is good for a small house. Grandiflorus bears large white flowers, often nearly a foot across, and is fragrant on summer nights.

These plants require a very porous soil. and it is usual to add shattered bricks to the loam when preparing a compost for them. The pots may be filled nearly one-third with crocks for drainage. In summer they should have a light, sunny position in the green house
or window; in winter they must be kept under glass safe from frost and given very little water. They are propagated by inserting portions of the matured leaves or stems in sandy soil in summer. See Cactus
CERTIFICATE. Certain documents that are issued by public and other bodies, usually containing evidence ahout a person's status or proficiency, are known as certificates. Copics of certificates of birtha and marriages are required for various purposes, e.g. insur ance. These are usually obtained where the birth is registered or the marriage celehrated ; but if not they can be obtained from the Registrar General, Somerset House, London, W.C., or the Registrar General in Edinhurgh

As regards marriage certificates, copies can be obtained from the incumbent of the church in which the marriage was celebrated. Death certificates, signed by a medical man, are also issued and are necessary for burials and cremations, as they are for the proving of wills. Copies can be obtained for a small charge.

Certificates are given by various bodies, hoth those that examine in education generally, such as the joint board of Oxford and Canbridge, and bodies that specialise in one suhject only, e.g. music. Certificates from medical men testifying to sound bealth are also re quired from applicants for various public and other positions. See Birth; Death; Marriage.

CESSPOOL. This is a receptacle for the sediment from a drain. Cesspools are of tivo kinds; those adapted for all kinds of drainage, and others intended for sink and hath wastes only. Many old houses in the country have nothing more than an open pond to deal with this class of sewage, but its presence is a menace to health and should be destroyed.
The drainage of the pond is generally accomplished by cutting trenches to conduct the water on to the land, previously filling in the trench with coke or gravel and covering with turf, if the land is pasture. The bottom of the pond should then be covered with un slaked lime, and a few days afterwards the sediment and soft material should be dug out, carted away and deposited in shallow heaps on the land as remote from dwelling-houses as possible.
The drains to the pool must be removed or stopped up with concrete, unless they are to le used for the new cesspool, in which case they must be tested before use. If the pond is to be used as such, the bottom should be cemented over, or covered with a layer of clay 6 in . thick, then a layer of straw, and finally another $\boldsymbol{6}$ in. layer of clay, well rammed and consolidated.
Points to observe in making a cesspool are to place it as remote from the dwelling as


Ceaspool. Sectional diagram showing the correct method of lining and connecting a cesspool for house dralnage
cossible, never less than 70 feet, or any greater distance as prescribed hy the local authorities, and equally remote from springs, wells or brook. The drain to the cesspoo ahould fall gradually towards it. The outlet from the cesspool should fall as rapidly as possible, and discharge into an automatic distributor, or into trenches filled in with coke or gravel, and covered with turf.

The cesspool itself is preferably excavated to a depth of 6 or 8 ft or more, the botton made up with 6 in of concrete, the walls built of brickwork, filled in at the back with concrete, and rendered with a $l$ in thickness of strong cement mortar, gauged 1 of cement to 2 of sand. The top can be briclied over, or covered in with old railway slcepers and turfed over, leaving an opening large enough to adinit a ladder and giving room for the in gresa and exit of a man for cleaning purposes.
This opening should be covered with a cast iron manhole. To jrevent any smell working back into the house, an interceptor trap and ventilating pipe must be built into a inanhole formed between the drain and the cesspool The outlet pipe from the cesspool should be 2 in . below the level of the inlet pipe, which should terminate in a downward direotion by fixing a bend a little before the end. See Brick; Cement ; Drain ; Sanitation.

CHARLIS. A class of delicate, thin white wines, sometimes incorrectly described as white Burgundies, is known as Chablis.
This wine may be served with fish. A refreshing drink for hot weather is Chablis cup made from the following recipe: Dissolve 4 lumps of sugar in a $\&$ pint of boiling water. Put this into a bowl with a slice of lemon-rind, and after about $\ddagger$ an hour add a bottle of Chablis, a wineglassful of sherry and $\frac{1}{2}$ pint water. Mix well, and after straining add a bottle of soda or seltzer water, a sprig of verbena, and a fcw strawberries. Ice and scrve in small glasses. See Burgundy; Wine

CHAFING. Wherever there is pressure on the skin, or where two skin surfaces rub against one another, chafing may occur. Wash the part several times a day with warm oft water and soap, dry carefully by dabbing the part with a soft towel, and dust the skin with powdered talc.

Where excessive perspiration is the cause of chafing, this scented jowder will be found agreeable :

Oil of rose geraniun
Salicylic acid
l'owdered zinc oleate
Powdered starch
See Blister; Foot; Skin, etc.
CHAFING DISH : How to Use. A dish in which light cookery can be done at table s useful at breakfast or for late suppers. Chafing dishes are usually made of silver or electro-plate and possess an outer vessel to contain water, an inner pan with handle and $\&$ cover, stand, and a heating stove. The last named is often a spirit lamp, but clectric chafing dishes are obtainable with a disk stove with two heats

For frying and quick cooking, the inner pan of a chafing dish should be placed directly over the lamp; but when gentle heat is required, as, for instance, in the preparation of such dishes as scrambled eggs and stewed oysters, the hot-water pan should be placed beneath the

cooking-pan. It is important that all utensils belonging to a chafing dish should be kept scrupulously clean, and the food served quite hot. When a spirit lamp is not in use, keep the cap on, otherwise the spirit will evaporate. A toaster is an invaluable adjunct to a chafing dish outfit. It is best to have all food to be cooked in the chafing dish prepared hefore hand. Such food as sausages, fishcakes, rissoles, savoury haildock or kipper, can be ready cooked and reheated in a little butter or a suitably prepared sauce. See Sa voury : Supper.

CHAIN: Its Home Uses. Chandelier chain is stamped from sheet brass by machinery and has many uses. Ladder chain is applic-
 able to similar purposes, and can be used with small sprocket wheels for driving toy engines.
Jack chain is another machine-made form in brass, galvanised iron, or bright iron, and with single or double coils. It is useful for all kinds of light work

Bicycle Chain. All the above chains are neerely in the nature of a tether; but others are used to transmit nower, like the bicycle chain, which consists of side plates or links, rollers and crossbars or rivets There are several makes of such chains, of which the improved Renold is illustrated. This method of construction is applied to cycle and to motor cycle chains from
Chain. Component parta of imchain
$\frac{B}{8}$ in. to $\frac{z}{z}$ in pitch
imum life and service fron To obtain maximu roller chain, they must be luhricated freely. If the machine has an oil-bath chain case, make sure that a sufficient oil level is maintained to bring the bottom side of the chain into the oil; otherwise remove the chain about every three months, thoroughly clean it by immersing in a tray of paraffin, wipe dry, and then immerse it in melted chain lubricant, working the chain about to get the lubricant into the bearings. An important matter with a chain is to run it at the correct tension. It should not be run dead tight, hut when the top side of the chain is tight, it should be possible to move the bottom side up and down a hout in See Bicycle; Motor Cycle.

Chain. Measure of length. It is 22 yd or $\mathrm{ij}(\mathrm{ft}$. in length and is divided into 100 links each of 7.92 in . Ten chains make a furlong

CHAIN STITCH. In needlework therc are three varieties of chain stitch-namelv, machine stitch, embroidery, and crochet ; all of these have the common purpose of link ing together stitches that are comprised in the form of a chain. See Crochet ; Finbinidery ; Sewing Machine.

## Chairs: Choosing, Making and Mending

Advice for the Collector and the Craftsman

Related articles include Adam Stylc; Armehair: Chippendale: Dining Room ; Drawing Room Sheraton, ete. Sec also Baby Chair; Cahinet Making; Easy Chair

Most British households possess at east one chair. the Windsor, which expresses the development of this piece of furniture from stool to chair.
The two features which distinguish all Windsor chairs and are peculiar to them are the saddle-shaped seat and the fact that the hack is structurally separate from the lower part. These two features are seen in no other chairs in the world. The Windsor is British and one of the very tew pieces of furniture which is not a derivative from forcign sources Old ones of undoubted authenticity can therefore be more easily ohtained in England than anywhere else. Those made of yew are the best.

Old Windsors. A William and Mary Windsor has a crest rail with its upper profile bow. shaped There is probably a crown in the middle. Some of the rails beneath the seat and the uprights of the back may be twisted or of barley sugar pattern. In a Quecn Anne the centre splat of the back is probably fiddle shaped and the legs cabriole. Later, this chair may show Prince of Wales's feathers. This type in varied forms appeared for quite 100 years. The arch back, which can bc identified by its name, has horseshoe arms. The front stretcher beneath the sest is curved away towards the back legs
Wheel back is a very common form, so called because the centre splat of the back contains a perforated shape resemblines a wheel It is probably derived from the well-known Hepplewhito feature. V-stretcher backs are so called because for extra strength two strctchers are put into the back of the chair in a V-shape, the point of which is formed by the stretchers meeting in a specially made tailpiece of the sent. The other ends of the two stretchers are fixed into the crest of the back
The chairs of the 17 th century, genuinc specimens of which are rare, but have been widely copied, are those belonging to the periods of James I, Charles I, the Commonwealth and the Restoration. In this category may also be placed those of Willinm and Mary, but they are not so distinctively English ns are the earlier ones.

Chairs by the Great Makers, Chippendale chairs are so called because they are in the styles followed by Thomas Chippendale, mostly adaptations from the French of the period of Louis XV.
The average collector may take it that Chippendale chairs were usually made of mahogany, with a wide seat in front narrowing towards the back; they stand on legs aquare or mainly square in section, have a bow. ahaped crest-rail, and a perforated, decorative convex back. Many so.called Chippendale chaira have cabriole or club legs, with ball and claw feet ; it is doubtful whether Chippendale himself made many chairs with such legs. The decoration was by means of carving Inlay was rarely used. The mahogany was heavy and of close grain. Ribbon back, Gothic and Chinese Chippendale chairs are among the styles which are specially valued by collectors

Hepplewbito chairs are also principally made of mahogany, and the wheat-ear is a favourite form of carved decoration. Many are painted, and the typical specimens have either a shicld or heart-shaped open back and show the wave-line, a serpentine curve in furnitura. The front line of his chair-seats is often bow-shaped, and the arms are held by curved supports Sherston chaira have thin, tapering
egs, angular backa, and are rather small as a rule in the seat They are often of satinwond and the decoration painted or inlaid 'The crest rails are straight, or nearly strnight. with slight breaks. Late in life Sheraton was influenced by the Empire period.
The chairs designed by Robert and James Adam are not within reach of the ordinary collector. They are both carved and painted and genuine examples usually fetch very high prices.
As chairs of any kind were not conmon in England before the reign of Charles 11, it will be seen that numbers ol so-called Jacobean chairs which are offered as antiques must of neces. sity be spurious.
The oak chairs of the time of James I have heary framework, both legs and back heing of timber square in section, and held together by rails simply mortised into the uprights. Panelled backs were common, and carved ornnment had little or no modelling Where chairs had arins they were simply acrolled, over supports which were

= were upholstered They were often inlaid as well as carved, and the ball and claw foot was first seen about the end of this reign.

Making a Chair. A change for the ordinary Windsor chair is that shown in Fig. 1. White deal could be used for a cheap variety

The main dimensions arc 18 in . from the floor to the seat, and 3 ft . 2 in to the top of the back In plan, the seat should be 1 ft . 2 in. at the back, increasing to 1 ft . 5 in . at the front and 1 ft 3 in from back to front The rake of the back should he similar to that in Fig 16 tion of the stretcher, one of the most important contributions to chair maling in this period.
Practically the whole Queen Anne period produced chairs in walnut wood The stretcher work disappeared, the cabriole lcg came in and the knees were frequently carved with a shell Backs ware still high, and there wis a concave centre splat resembling a fiddle in shape in the back. Many clisirs of this period
ports, thes twisted formation being also scen on the rails and legs Cane panels werc often used for the backs In the time of William and Mary walnut was commonly used ; and the twisted rails gave place to gracelully designed turning. A feature was the elabora-
also possible in waxed oak The chair (Figs 2 and 3) has a total height of 2 ft . 11 in , height of back being 1 ft .6 in ., and of seat (at bach) 1 ft . 5 in., the front of seat being $\frac{t}{2}$ in higher. Width of back at top is 1 ft .2 l in. diminishing to $1 \mathrm{ft} .1 \frac{1}{2} \mathrm{in}$. at seat, depth (back to front) of seat being $1 \mathrm{ft} .1 \frac{1}{2} \mathrm{in}$.

In setting out the back legs the most econo mical methorl is to mark them out close to gether on a narrow board of a sufficient thick ness to allow of cleaning up to the following detail dimensions. 'Total length finished 2 ft .83 in . to joint of top rail, an additional I in being allowerl for the tenon here. Thir face should finish 1 in. in width throughout the back leg, but the thickness will vary between $1 \frac{1}{}$ in net at the seat height and 1 in net at ground. The upper portion of back leg can be lessence to ? in thickness with D sertion. The rake at reat height is $2 \ddagger$ in

The top hack rail has broken corners, and in style will go well with furniture of Queen Anne or Chippendale character. This piece finishes 2$\}$ in. wide net, and should be carefully shaped to the outline indicated. In setting out, the best way will be to allow $\frac{1}{2} \mathrm{in}$. radius for the quadrant internal breaks, and strike the parallel outer shapings at Id in. radius. The rail may be flat. but in practically all chairs of similar type the effect is improved by working to n curve, which in this case could be $\frac{1}{2}$ in apring (i.c. depth) only. The lower edge of rail will refuire mortising or grooving $f$ in repme mortising or grooving $f$ in the dinishing receick the back panel or spla the finishing thickness being $\frac{7}{8}$ in net to $1 \frac{1}{6}$. $2 \frac{1}{2}$ in at top over all, narrowing The lower rail of back is fitted 1 ft .1 in . 1 ft .1 in or 1 ft . $1 \frac{1}{2}$ in. helow. clear of top rail and, if curved. should An enlarged set-out of the back correspond with the latter in depth. finishing size being a clean up from $l$ in. by $l$ in. and should be tenoned into position

The back panel can be of $\frac{8}{8}$ in. thickness, or slightly leas. and is $3 \frac{1}{2} \mathrm{in}$. wide. shaped back to about $2 \frac{1}{2}$ in., an extra $\frac{1}{2}$ in. full being allowed in length for stithos top and hottom. The quar. tored effect indicoted at Fig. 4 is
well worth carrying mapped in I in. squares is shown at Fig. 4. out in veneer, and is The seat is framed up of pieces $1 \frac{1}{2}$ in. wide not difficult to lay if by $\overrightarrow{3} \mathrm{in}$. net, usually dowelled together, and is the meeting edges fixed to the back legs by notching and by a are clcanly cut with hardwood peg right through. The back rail of the grain to match seat is often allowed a trifle extra width and is up nicely. A front shaped. The seat is caned in the ordinary elevation and side way 'The legs can be worked from lengths view of this chair of $1 \frac{1}{2} \mathrm{in}$ material to finish 1 i in at top, tapering are given at Fig. 3. to $f$ in, helow which the swell for toe can be The back, it will be $1 \frac{1}{\mathrm{l}} \mathrm{in}$. by $\frac{7}{8}$ in high, this latter projecting noticed. tapers slightly more at front than at back of legs. A


Cbair. Fig. 1. Simple kitchen chair. Figs. 2-3. Bedroom chair, with diaprams giving details and measurements for making. Fig. 4. Showing bow the back of the bedroom chair may be shaped and sized front rail between legs can be fitted at a height of $10 \frac{1}{2}$. from ground
A Dining Room Cha!r. lrig. :s shows a


Fig. 5. Example of single chair belonging to dining room guite. Figs. 6, 7. Front and side elevations of dining room chair. Fiz. 8. Diagrams of tramemork of seat, and method of plotting design of chair back. Fig. 8. Back of chalr serviceable and graceful type of chair for dining-room purposes. Oak is most suitable, but both beech and birch are serviceable if well stained so that they do not quickly wear white. Choose only the pick of wellseasoned wood, fairly straight and regular in grain, and free from knots, shakes, and bruises that would tend to weaken its resistance to a strain that is often considerable. The general height for a standard chair-seat is fixed conveniently at 1 ft .6 in ., but is often found to be 1 ft . $5 \frac{1}{2} \mathrm{in}$. to top of front rail, after levelling and a loose-pad seat, such as that shown at Fig. 12, if well stuffed, will add a trifle to this. Should it be desired to provide a stufied or spring seat, the seat rail will need to be lower in order to allow for moulding up

For the standard or small chair the width across the front is a full 1 ft .6 in ., and across the back it is from $1 \mathrm{ft} .2 \frac{1}{2} \mathrm{in}$. to 1 ft .3 in . The depth of seat, front to back over rails, is 1 ft. 5 in for the person of average height, but in special cases for a tall person a depth of 1 ft .6 in . to 1 ft .7 in . will be found more comfortable. A fairly high back is shown, height from seat rail to top of capping on back legs being 1 ft .11 in ., the top back rail entering the back legs 1 in . lower at a height of 1 ft . 10 in . The back may be made 2 in. lower without detriment to proportion. Width at top of back over uprights or hack legs is the same as at ground level, $1 \mathrm{ft} .2 \frac{1}{2}$ in. to 1 ft .3 in Where armchairs are provided they are often termed carving chairs, and at times the seat is increased in height to 1 ft .7 in The width across front of seat is a full 1 ft . $9 \frac{1}{2} \mathrm{in}$., and at back is 1 ft . $5 \frac{1}{2} \mathrm{in}$. Depth, back to front over rails, should be the same as for standard chair. The height of back can be 2 in . in excess of that of the standard chair; width of back is uniform

The standard chair is shown in elevation (front and sides) at Figs. 6 and 7, with main dimensions marked. These will be of assistance in making a full-size set-out on lining paper
which in all cases should be done, and to and where the front legs project on the inner facilitate which a pencilled extract of following sizes will save constant reference to letterpress The back is shown to enlarged scale at Fig. $\theta$ The back legs (A) finish $1 \frac{1}{2}$ in. wide on face throughout, and thickness at seat height is 18 in ., which is tapered to 1 in . net at top and at ground respectively.
The method of setting out this part of the work is shown at Fig. 8, A, plotted out in 1 in. divisions of width and 2 in . divisions of height, the height of seat rail being noted at 1 ft .6 in ., where the rake or depth of curve is 13 in ., measuring from a line touching topand bottom of back leg. Some economy of wood can be effected by settingout
egsclose together on the same board.
The top back rail (B) takes a piece 1 ft .3 in . by 31 in. includ. ing tenons and paring, and when finished will measure 3 in. wide The lower rail (C), is in wide finishes like the top rail $\frac{7}{}$ in. thick. Both rails can be tlat, but the general appearance and comfort to back will be improved by working the rails to a curve in the manner indicated at Fig. 8, B, out of thicker material. The centre panel (D, Fig. 9) can be 21 in . to 3 in . by 会 in. thick, stubbed into rails top and bottom, taking a length of 1 ft .3 in . including joints. The narrow bars or uprights (E) on each side of panel finish $\frac{7}{4} \mathrm{in}$. by f in. thick. By way of embellishment, three flutes can be worked on the back lega, and two scratched beads on the bars close to the edge will improve them. Height of rail (C) above seat-rail is a full 3 in .
The reat-frame rails, shown enlarged on plan at Fig. 8, C, finish 2$\} \mathrm{in}$. by $1 \frac{1}{8}$ to $1 \frac{\mathrm{in}}{\mathrm{i}} \mathrm{i}$. thick. and will require careful tenoning into back and front legs. The joint is cut in line with the rails, and entered so as to give as long a tenon as poss:ble, mitred to meet. A section of front and side rails is given at Fig. 8, D, showing a $\frac{A}{B} \mathrm{in}$. rebate for seat-frame $\frac{7}{i} \mathrm{in}$. or in. deep with the outer edge rounded. The front legs should not be less than $1 \frac{1}{\frac{1}{2}}$ in. by $1 \frac{1}{\frac{1}{2}} \mathrm{in}$. and might finish $\frac{1}{} \mathrm{in}$. larger for a firm chair. They are shown as tapered with the lower 11 in . shaped to form a toe as a relief from plainness. In framing up it will be noticed that the back legs are joined square with the back rail, whilst the front legs finish at sides in line with the side rails of seat, but not quite Hush with them-say in. projection uith the projection rounded away at edge.

## Supports for the Movable Seat

The interior angles of seat are stiffened by the fixing of braces cut out in 1 in . material 3 in. by 3 in. to shape, and screwed into position tlush with the bottom of rebate so that they give extra support to the pad frame. An improved finish to the seat-frame is secured by moulding the top edges ovolo at front and sides. The back seat rail is not rebated.

The pad-seat is upholstered on a separate frame, and is indicated by dotted line on plan, Fig. 8, C. This frame should be preferably of birch dowelled together or bridled and screwed, and is made a full $\frac{1}{i n}$. smaller than the rebated opening to receive it, as an allowance for the covering material. material should be that of the depth of rebate
and where the front legs project on the inner fit. Upholstery of pad-frame could be carried out in hide, but a change would be velvet or mohair. Tapestry may also be used.
The underframing shows three rails, one high up connecting the two front legs, and one rail to connect each pair of front and back legs. The arrangement stiffens the chair considerably, and with the front rail as shown, has the


Chair. Fig. 10. Light drawing room ohair. Figa.
11-14. Bhowing detalls of joints, bsok, and seat
advantage over the ordinary H-pattern framing of not tempting the sitter to put his foot upon it. No rail is necessary between the back legs, but it can be added if desired. Size for the rails may be about $1 \frac{1}{8} \mathrm{in}$. by $\frac{8}{8} \mathrm{in}$., or the front one may be wider, say $1 \frac{1}{8} \mathrm{in}$.

Drawling Room Chalrs. Since drawing room chairs are lighter in construction than dining room and other types, it is essential if the chair is to last any time that all the material should be sound and of good quality and that the maximum amount of strength be obtained by good workmanship and careful planning of the joints, etc. The best plan is to make a full-size drawing of the chair, giving side and front views and a plan of the seat (Figs. 11, 12, 16 and 18). The setting-out of the back legs requires careful attention to get the correct rake (notice that a straight, perpendicular portion is always left where the side seat rails join them).

The method to mark out the back on the wood is as follows: Prepare the wood the total length and thickness required, and wide enough to take the rake, and square up the front edge. At this edge mark the position of the straight portion required for the seat rail joint (the edge being already square and straight) and mark the remainder of the leg and back from this point. The chairs should be finished with french polish.

Fig. 10 is a light chair to be made in mahogany with a loose seat (Fig. 12). This style
would do cqually well for any living room. the upholstery being varied accordingly. The main dimensions can be scaled out from Fig. 11, using the 3 in . squares as a scall. (thus the height of the back is 3 ft ., and two pieces 4 in . wide will be required from which to cut the back legs). At their widest part on the front side these should measure $1 \frac{1}{8} \mathrm{in}$., tapering downwards to $\frac{18}{5} \mathrm{in}$., and upwards to $\frac{g}{\text { g in }}$.

The front legs at the top are $1 \frac{1}{8} \mathrm{in}$. and taper to $\frac{7}{6} \mathrm{in}$. Note that these are bevelled away to line up with the side rails, which are necessarily at an angle caused by the front of the chair being wider than the back. The front and two side rails are rebated $\frac{z}{8} \mathrm{in}$. on the inner edge to take the loose seat and a moulding is worked on the edge (see Fig. 14). The rebate is continued on the leg and the moulding worked on it after the chair is glued together. All the rails are tenoned into the legs and the joints strengthened with angle brackets (Fig. 12). The top rail of the back is mortised to take the uprights (Fig. 13) and the intermediate rails stub-tenoned.

The centre back portion is cut from a piece of $\frac{1}{2} \mathrm{in}$. material, the triangular shapes being cut out. When glueing the chair up, glue the back and front first and allow to set before fixing the side rails. The loose seat can be made from any of the cheaper hardwoods and is either halved or mortised together. An allowance of $\frac{1}{8} \mathrm{in}$. should be left all round to allow for the thickness of the material with which it is covered.

For a drawing room this type of chair looks well covered in striped material-either self-striped satin, or a vari-coloured taffeta. Irocarle or damask is suitable, or a loosc cover can be casily made to match those of other chairs, etc., in any living room. Rep. is suitable for a dining room chair of this make, or any good fabric with a geometrical design. Damask may also be used if the other furniture in the dining room is of the light character with which this chair would be a good choice

## Mahodany Chair with Stulfed Seat

Fig. 15 is a chair of similar character but having a stuff over seat and an under framing. It is set out and proceeded with similar to Fig. 10. A wide and shallow rebate is worked on the rails over which the material is tacked (Fig. 17). The front legs are easily rebated after glueing up. The lower side rails are of $\frac{1}{\frac{1}{2}} \mathrm{in}$. material and are $\frac{7}{7} \mathrm{in}$. wide, they are tenoncd into the legs. Note that the shoulders of both joints will be at an angle. The joining rail is dovetailed into the side rails. When preparing the top back rail, which is dowellod into the uprights, the dowel holes should be bored before cutting the rounded portion, as it would otherwise be liable to split away (Fig. 19) Half-inch beech dowel is the best to use. The slats are stub-tenoned between the two rails, and are in wide at the top and taper to about $\frac{1}{2} \mathrm{in}$. Use $\frac{1}{2}$ in material for these.

Chalr Repalring. This is often easily done. At Fig. 20 two common leg break. ages are shown. Always repair such breakages before the fractured edges have got rubbed. The part, will then fit closely : whereas, if there is delay, the ragged edges may get injured and a neat joint may be difficult to effect.
The front leg is re. paired by means of a long dowel inserted (Fig. 21) First cut off


Chaif. Figs. 20-80. Diagrams illustrating how various breakages oan be easily monded. Eee text
the small turned fragment which is attached to pared to permit of the wedged tenon acting like the top square block of the leg. Use a fine a dovetailed joint. After the four seat rails tenon saw. and cut across at AA. Warm the broken surfaces, glue the little part which has been removed to the main body of the leg, and lay the work aside till the glue is set. Now bore both parts of leg (square portion and turned piece) for a long dowel (B), which should be of beech or oak not less than $\frac{8}{4} \mathrm{in}$. in diameter. The dowel must go well up into the square block and at least 2 inches into the turned leg beyond the fracture. Glue everything well, and the leg will be stronger than before.
The back leg is repaired with screws, as at Fig. 22. If any of the splinters are loose. glue them down so that the parts will fit quite closely. Hold these together, and, at the angle indicated in the diagram, carefully bore holes for two screws, one at each side (aee CC'). Countersink for the heads. It is well to use a tine bradawl first, and then a gimlet. The screws must be of a fairly tine gauge, and either $1 \frac{1}{\mathrm{in}}$. or $1 \frac{1}{2} \mathrm{in}$. in length. Try the screws. and, if all is right. warm the broken surfaces; apply thin hot glue and screw up. At the two ends of the joint (DD) insert a couple of ncedle-points. The holes countersunk for the screw heads are filled with a cement made with beeswax and resin. This is stained to the colour of the wood, and when trimmed off and rubled over with polish the repair stould be satisfactory.

## The Repair of Frame Joints

Chair frame joints frequently work loose on account of the glue giving way. Seat rails are tenoned to the legs, and when the tenons beconie loose the leg is unsteady. The inside angles of chairs are usually braced, either with a strut wedged in, as Fig. 23, or with a brace screwed on, as Fig. 24. If the bracing works loose the leg will probably be insecure. The joints of a chair with wood seat can be repaired with little trouble; but in the case of an upholstered seat, it is well to allow the repair to stand over until the chair needs to be re-upholstered. In this latter case it may be stripped, and then re-covered after the joints have been repaired.

Knock the parts loose and scrape off all the old glue. As the tenons may have become a little too small, owing to shrinkage, they should be wedged in order to tighten them. As the tenons do not go right through the leg they will have to be blind-wedged, as Fig. 25. That is, two cuts are made in the tenon and narrow wedges inserted. When the tenon is glued and driven home with the mallet, the wedges increase its width and thus ensure a tight fit. 'The mortise holes in the leg may be gently:
have been glued up the braces or struts are glued and screwed in position. Work of this sort usually requires to be cramped up with a regular joiner's cramp, the method of using which is shown in Fig. 26. The eramping is very important, as the glue will not hold satisfactorily unless the parts have been put under heavy pressure.

Kitchen chairs, which are frequently used for purposes for which they were never intended, have a habit of falling to pieces, but if properly repaired they will be as good as new. Taking Fig. 27 as a typical example, the best plan is to knock all the parts separate, marking each, so that its correct place is known. Clean off the old glue, and, if any of the leg joints fit rather loose, take a paring off the ends, so that a thicker portion will make the entry. A broken stretcher rail may be repaired in the way already described for a back leg (aee Fig. 22). It may, however, be less trouble to make or buy a new stretcher. Glue the rails to legs, and then glue and knock the four legs into the seat, using the cramp if possible. See that all four legs are level.
Coming to the back, if the tenons of the two outer uprights are loose they will have to be wedged (Fig. 28). The wedges are driven in from the underside. If the top pin which enters the shaped rail is broken, cut it off, and


Chair Bed, shown in two positions: open for use at night, and closed to form an eary chair
Courtesy of Oplsmann \& Co.o. Led.
fixed to the seat. The holes in the top rai are then glued, and this part coaxed on with the mallet. It is usual to wait and see that everything is correct and in line before driving in the wedges used to strengthen the outer uprights

The arms of kitchen armehairs often come loose owing to the breaking of the screw which holds them Punch out the head of this serew. The other end may be withdrawn with the screwdriver if a nick is first made across it with a file. The new screw should be insertod so that the smooth shank will pass the line of joint (see Fig. 30). It will then run no risk of breaking, and the countersunk hole may be filled with a stopping of some kind.
CRAIR BED. This is usually an arınchair, generally provided with an iron framework, which unfolds so that it can be used as a bedstead. The chair legs and seat remain in their normal positions, and the article is extended by turning over the upper part of the seat and lowering the back. The extremitios of the extensions are supported on extra legs which fold. It is fitted with cushions, usually three in number, which serve as a mattress. It may be entirely of iron or may have wooden or brass lege.
The illustrations show snother form of chair bed. When folded this has the appearance of an upholstered easy chair. The seat and back are folded down, as shown, to convert it into a bed. See Bed Sitting Room

CRAIR RAIL. This is a wooden moulding fixed to the walls to prevent damage by chair backs. It can take the place of the dado, and if different shade or colour of wall covering is used above and below the rail, the result can be made very pleasing. The moulding can be obtained in the white, i.e. not stained or painted, and when ordering allowance should be made for waste in mitring corners. There will usually be at least 10 corners, and 2 ft . extra should be obtained.

Start on the longest lengths of wall first : the short lengths and odd corners can be fitted with the moulding left over. The mitres for the corners should be cut neatly with a tenon saw, and with the aid of mitre box or board. When making the joints for the fireplace and bay window corners, do not forget to cut outside corners, or some of the moulding will be wasted in recutting. If it is necessary to join some of the lengths, do not mercly lay them end to end. Cut each end at
an angle of $45^{\circ}$, so that they can be o v erlapped. Such a joint will scarce ly be noticed when glass papered and painted.
Cut nails should be used to fix the rail to the wall and a suit able height is 36 to 39 in. from the floor. Punch the heads of the nails well in and cover with plaster of Paris; putty is sometimes used, but it shrinks in drying, and is unsightly. The rail should be treated to match the other wood work of the room. The moulding can also be obtained in oak, ma hogany, or walnut.

CRAIIS: In the Soil. Chalk is not so good as lime for heavy soils, but on light, sandy land it is to be preferred, because of its slower action. For this purpose it should be finely ground and put on the land in winter. Caicareous soils with solid chalk a few inches below the surface dry out quickly, and the best way to keep trees and plants flourishing in such land is to mulch the surface in early summer
So far as soil treatment is concerned, a great deal can be done by breaking up some of the chalk with a pick or strong fork, and using rotting or charred turf, or burnt clay, if procurable, as freely as possible. A good deal of it should be packed below and around the roots of each tree See Gardening; Rose ; Soil.
CHALR STONES. These are gout stones or tophi, which form beneath the skin in gouty patients, frequent sites being on the ear or knuckles. They are composed of urate of soda. See Gout.

CRAMBERMADD. In a hotel the chambermaid's duties are similar to a housemaid's in a private house. She attends to the bedrooms and bathrooms, and the passages and staircases in that part of the house where these rooms are situated. She brings hot water if it is not laid on, draws the window blinds, and calls visitors. She makes the beds, cleans the rooms, lays and lights fires.
CBAMBBERTLN. One of the most famou of all the red Burgundy wines is Chambertin. It possesses a fine, clear, dark red colour, and fulfils on the palate the promise held out by its charming bouquet. Soft and velvety, it is never sugary or "spirity." It is a warm, generous, and at the same time delicate wine. See Burgundy; Wine

CHAMFERING. The object of chamfer ing may be either for decorative purposes or to lighten the appearance, or sometimes simply to remove a sharp edge. It is usually at an angle of $45^{\circ}$ with the main surface, though it may be worked at any angle which the particular nature of the work requires.
The commonest form of chamfering and the quickest to carry out is when it is run along the entire edge without stopping (Fig. 1), in which case the work is done with an ordinary plane. In a type more frequently used the chamfer is run for a certain length and then stopped a short distance before reaching the end. Figs. 2 to 6 are typical examples of stops employed; Figs. 3 and 6 are more suitable for oak work. Frequent use is found on the insido edges of framings, such as panelling, and work for ecclesiastical purposes makes great use of chamfering.
In cases where the stop is flat, such as Fig. 6, the flat side of a chisel is used to cut the wood, and the reverse side for such as Figs. 2 or 3. As it is impossible to use an ordinary plane for the whole length of a stop chamfer, the ends have to be cut with a chisel or a bull-nose plane, which is capable of working very close to the ends, as there is only a very short distance between the cutter and the

front of the plane. Where a great deal of chamfering is to be done, a special chamfer plane (Fig. 7) is often used, the advantage of which is that it can work right up to the stope, and automatically regulates the depth of the chamfer
When a very deep chamfer has to be cut, it is advisable to make several saw cuts at various points along the cdge (not quite down to the finished depth), to obviate the tendency of the wood to split out when removing the bulk of the waste with the chisel; for should the wood start to split, the sp!it cannot run farther than the next saw cut. The chamfer is finished off with a chisel and plane. Finally a scraper is used, and then glasspaper.

Sometimes the tool known as a chamfer shave is used for chamfering. In appear-
 Heidsieck, Irroy, Moēt and Chandon, Perrier Jouet, Pol Roger, Pommery and Louis Roederer.

The champagnes shipped to Britain are generally dry, and styled brut or nature, which should mean that they contain no added sugar or liqueur. They are obtainable in half bottles, pints, quart bottles, magnums (double bottles holding 4 re puted pints), and jeroboams (double magnums). Cham. pagne keeps better in bulk.

Ice should never be put into it as it spoils the fla vour The bottle should be placed in an ice pail for 10 to 20 min . before serving. At a dinner party where various wines are served champagne is usually given with game or entrées and after. The best glass for champagne is tulipshaped with a deep stem ance it is like a spokeshave (q.v.), and used in the same way. It is capable of producing splayed and stopped chamfers.

CEAMOIS LEATEER. For cleaning windows and glassware, and as a polisher for metal ware generally, nothing is better than so-called chamois leather. It is really made from sheepskin, which after being freed from the wool is split into two layers. The top layer, or grain, is made into a variety of coloured leathers; the under layer, or flesh split, is used for chamois leather. It is treated with fish oil, and during oxidation the colour changes from white to dark ycllow. The skins are pressed and washed to free them from excess of oil, and the leather is then bleached and finally buffed to give it a fine nap.

The two characteristics of chamois or oil leather are its softness and its resistance to the action of water. For this reason the name washleather has been given it, and washable gloves are made of it.

In washing these gloves a simple method is to wear them, while a good washing in warm, soapy water is given, working them about on the hands so as to remove grease and dirt. Wash again in clean, warm, soapy water, and if a little soap is allowed to remain in them when they are hung up they dry more satisfactorily.

A cleaning leather is the better for frequent washing in soap and warm water with a little borax, afterwards insing in cold water. Then squeeze it, pull the leather out flat, and spread on a board or table. When almost dry, pass it through the hands and stretch it out until it is flat, repeatedly smoothing the surface. In this way the leather will dry soft. See Glove ; Leather.

CBAMLPAGNE. This sparkling wine re quires to be looked after very carefully. If there be the least sediment or deposit the wine requires to be filtered into fresh bottles. The wine matures quickly, and is at its best after from 8 to 15 years, although there are instances of champagne having retained its excellence after 40 years. Champagne is known by the name of the shippers. Amongst the leading brands are Ayala, Bol. inger, Clicquot, Goulet, cease to bear children: and as the change
froquently affects the mind as well as the body, especial care of the health is always called for. The age at which the change occurs is generally between 45 and 50 , but may be either earlier or later in certain cases The child-bearing period usually lasts about. 30 years.
The manner in which the climacteric occurs is irregular In some cases inenstruation sud. denly ceases, but in most it first becomes irregular, remains on for two or three years, and then finally stops. Fxcessive bleeding at the periods or blceding in the intervai should not be accepted by any woman as due to this cause alone without consulting her dootor.
Amongst the symptoms common ut this time perhaps the most unpleasant are flushings of the face and limbs, frequently preceded by chilly sensations, and followed by profuse perspiration. Some women are prone to corpulence while others become thin Osteoarthritis is another of the evils to which women are exposed Nervous symptoms are frequent, while headache is rather common, but often due to the need for glasses Other symptoms are backache and indigestion.
The first thing necessary for a woman who is suffering from the troubles incident to the change of life is to realize that they are natural, and that they will pass away in the course of a few years. This will ease her mind. At the same time, however, she should realize that some increased attention to her health is advisable for a fow months, or even years. The following aperient is useful :
Confection of senna .. .. .. .. .. I oz.
Confectlou of sulphur
Mix well. Take one teaspoonful at night when necessary.
As an alternative, one to three grains of cascara or a liquid preparation of cascara may be taken at bed time. The following simple dinner pill may be tried:
$\underset{\text { Extract of inux vomica }}{\text { Aloln }} \quad . . \quad .$.

| 8 |
| :--- |
| 3 |

Make into 12 pills. Take one pill after the evening meal when required.

If the appetite is poor, a tonic may be wseful. Strong tea, indigestible foods, and alcohol in any form must be avoided. Warm baths at bedtime, two or three times a weok, are soothing to the nerves.

Many women are prono to be emotional : they should strive constantly to control them. selves and, generally speaking, to take a cheerful view of life, which does so much to banish worry and anxiety. The troublesome Hushings are often relieved by bromides, and the following may be taken:


Cinnanuon water (enough to make) 6 oz .
Make into a mixture. Take two tablespoonfuls after the midday and evening meals when required.

It has to be pointed out that bromides are only to be taken when really requirod; if their frequent use is necessary, it should be under the oye of the doctor. Flushings are also helped by taking ichthyol. Beginning with a tablet of $2 \frac{1}{\frac{1}{g}}$ grains, the dose is increased gradually till in about three weeks time four tablets are being taken thrice daily. If at any time there is a persistent taste of the drug in the mouth sufficient has been taken. Iron may be required in some cases where there is shortness of breath and want of general tone due to anaemia, and may be taken in the form of Blaud's pills or in a mixture. See Anaemia.

CRLAPERON. Originally a hood worn by matrons, the word chaperon came to be applied to a married woman who took charge of an unmarried girl on social occasions.

A hostess often gives dances and dinner parties to which it is understood that clisperons are not invited, the hostess Lerself acting in that capacity to any unmarried girls prasent. At important aocial functions girls are chaperoned at least during their first. season.

CBARACTER : The Legal Aspect. it is usual for mistresses when engaging i servant to ask for a charactor, that is. somothing from a former employer about the antecedents and qualifications of the person requiring the situation. A character of this kind should never be given unless asked for.

Even if what a mistress says in giving a character is in fact untrue, yet if she says it honestly she will be protected by the law so long as she is not actuated by spite or malice.

Beware of giving a false character. If a mistress dismisses a servant whom she knows to be a thief, and out of gond nature writes that she is honest, and in her now place she steals, her old mistress is liable to the new mistress. A servant who obtains a situation by a forged or false character is liable to fine or imprisonment. So is anyone who knowingly gives a servant a false character, by means of which the servant obtains another situation. See Servant

CRARADES : How to Play. This game ts suitable for any number of players above 7 or 8. Two persons pick up sides, and one side then goes out of the room and chooses a word of two or more syllables. each syllable teing a soparate and complete word, e.g. sel-fish (sell fish). The syllables are then acted in two scenes and the whole word in the final scene

The usual method of procedure is for the syllable to be spoken by one of the players, though there is no need for the scene itaelf to give any direct representation of the word. Another method is for the syllable to be acted, though not necessarily spoken. Thus, in the example chosen, the first scene might show a shop, with a brisk trade, and the second might represent a party of fishermen coming home with their catch, while the whole word should not be difficult to act ; two children playing could easily convey the necessary effect. At the end of the performance the audience has to guess the word chosen.

The game is more successful if a fen words have been selected beforchand and a possible scenario drawn up, otherwise the time occu. pied in discussion by the acting party is apt to be wearisome to the inembers of the audience.

Historical charades is a picturesque variant of this game. The word to be guessed is the name of some person famous in history or fiction, and a short name is generally chosen, as upon its length depends the number of scenes to be enactod. Each scene depicto an incident in the life of some other celebrity whose initial letter occurs in the name selected for the charade.

No names are introduced by the actors that will give the subject away. About five people can comfortably take part in the scenes. No theatrical costumes, scenery, or other property are necessary ; the house can furnish all that is required in the shape of a few shawls, scarves, sheets, hats, coats, and walking. sticks. See Children's Party.

CRARCOAL : Its Domestic Uses. Al. though charcoal has a limited use in the house, it has excellent deodorant properties, as well as the power of taking the colour out of certain solutions. It is produced by partly burning certain kinds of wood and bones, the former varicty being known as wood charcoal, and the latter as animal charcoal

Wond charcoal finds one of its chief uses in the garden. A fow pieces mixed with the mould in which plants are potted keeps it sweet. For a similar reason a picce should be placed in the water of the glasses in which
bulbs are grown. Stakes driven into moist ground resist decomposition for long periods if the ends are first put into a fire and so partly converted into charcoal. Similarly, casks charred inside resist fermentation better than uncharred casks
Mixed with any foul inaterial charcoal helps to destroy the odour. It has been found to absorb any smell that may arise when clothes are put away in a wardrobe or chest of (lrawers. For this purpose somo moderate sized pieoes should be placed among the clothes. Powdered charcoal serves as a tooth-powder, neutralising some of the effects of decay.

Some coloured liquids, e.g. red wine and fruit juices, lose their colour when filtered through powdered charcoal. Charcoal should not be used to purify drinking water.

CHARLOTIE RUSSE. A jelly mould is lined with a little jelly at the bottom and when nearly set glacé cherries are pushed through


## Charlotto Rasse, a delioious party sweot

it to the bottom of the mould and sponge cakes or savoy fingers placed round the sides. A dessertsjoonful of castor sugar and half a clessertspoonful of gelatine should be dissolved in a $\frac{1}{2}$ pint of milk over gentle heat. Tho milk is then strained and a few drops of vanilla cssence added; also, if desired, a tableapoonful of sherry. Half a pint of cream should be well whipped and the strained milk stirred in when cool. The mixture is poured into the mould and left in a cool place or on ice until it has set. when it is turned out

CRARPIE. Shredded linen used for the dressing of wounds is termed charpie. It is made of Hax between layers of gauze, and used to form part of the first field dressing of the soldier; but gauze is now deemed to be sufficient. The shredding makes the dressing more absorbent and protective, but these purposes are usually achieved by the use of gauze or lint and absorbent cotton-wool. See Bandage ; First Aid.

CBARR: How to Cook. Amongst fresh water fish charr is highly nutritious. It should be washed well and dried before cooking To fry it, cut the fish into steaks, coat with egg and breadcrumbs, and fry in hot fat, or the fish may be first dipped in batter.
Charr inay be broiled or grilled. Cut the fish into steaks about 1 in . thick, season with pepper and salt, wrap in pieces of oiled paper, and gently broil them over a clear fire To grill charr with a gas fire, place it on a greased grid-iron and put this under the griller, which must not be turned on full. Charr cooked in any of these ways should be garnished with lemon or parsley, and served with melted butter sance.
CEARTREUSE. There are three kinds of this celebrated liqueur. The white variety is the mildest; the green is the most potent and highly prized, especially in France : the yellow is the liqueur most widely used in all countries. Chartreuse is distilled from certain aromatic plants. See Liqueur.
CBARWOMAN. A charwoman is a worker who goes out by the day or hour to clean private hnuses, offices and shops. She may be paid by the week, day, half-day or hour, and her pay may include or exclude food.

A charwoman must be insured under the health insurance scheme, but not against
unemployment. If she works tor a single employer he is responsible for the weekly pay. ments. If, however, she works for a number of employers the one who employs her on Monday is, strictly speaking, responsible. In some cases, however, the employers agree to take it in turn to pay the employer's share of the prem:um.

If a charwoman is employed regularly-for instance, once a week, or once a fortnight or month-she is a workman within the ineaning of the Workmen's Compensation Acts and the employer is liable for compensation if she is injured by an accident arising out of and in the course of her employment. It is wise, therefore. to include her as a servant when insuring against risks under this act. If employed only on odd occasions she does not come within the act. See Insurance.

CRAUDFROID SAUCE. A gencral favourite for coating meat made up into cold entrées, chaudfroid sauce requires skilful cooking to be of the right consistency. To make the white variety, heat up pint white sauce, adding to it 3 sheets of gelatine, previously dissolved in a little white stock, and 2 or 3 tablespoonfuls of cream. Strain the whole through a tammy cloth, and use the sauce when it is just on the point of setting.

Brown chaudfroid sauce is made from $\{$ pint good brown sauce, $1 \frac{1}{\text { tablespoonfuls liquid }}$ aspic, and 2 oz meat glaze. The glaze is dis. solved in the sauce before the aspic is added, and the whole strained and used when cooling. See Sauce.

CHAUFFEUR. The driver of a motor car is termed a chauffeur, and certain qualifica. tions are required for the post. He must be in possession of a driving certificate, which ehould be free from endorsement, and in view of the responsible nature of his work he must be of good personal character. He should also have the technical knowledge required to do his own repairs and to keep the car in proper condition.

He ranks as a skilled mechanic, and is generally an outdoor servant. Both men and women are employed.

The employer is liable for injury or damage to person or property caused by his chauffeur's negligent driving or handling of the car while on his master's business. But if the chauffeur takes the car out for his own purposes-e.g. to call on one of his own friends, or for a joy. ride with the housemaid-and does damage while so engaged, the employer is not liable The latter nust always insure against accidents to third persons and property caused by his car when driven by his chauffeur.

A chauffeur must be insured under the national health insurance scheme and the employer is responsible for the weekly payments. Unless the chauffeur is a woman, the cmployer must take out a licence enabling him to keep a male servant. This costs 15 s. a year. See Insurance; Motor Car: Negligence : Servant.

CEEDDAR : A Mild Cheese. This is one of the cheapest varieties of cheese. There are several methods of making Cheddar, besides the noted west of England way, other varieties coming from Ayrshire and Canada.

Cheddar cheese is usually made from morning's and evening's milk that has been ripened. The correct degree of ripeness is difficult to gauge, and the inexperienced maker can only determine it accurately by tests. One way of ripening the milk is to keep it at such a temperature during the night that enough acidity will develop to ripen the morning's milk partially when this is added. The other method is to add a ripening or souring agent, such as a starter, to the milk in the morning, and allowing it to remain until sufficient acidity is obtained. The former method is satisfactory with careful handling, but the employment of a good starter will give more reliable results.

## Cheese and Cheese Making

## Some Practical Bints for the Small Dairy

Our Encyclopedia contains articles on the various kinds of cheese, e.g. Cheshire and Stilton. This entry is followed by a number of entries on cheese dishes. See also Diet; Milk

Cheese is a valuable food-stuff, more especially double cheese, which is made from whole milk, and contains a large percentage of protein and fat. Unfortunately it is diffioult to digest. It should be eaten with bread or biscuit in order to ensure that it is thoroughly masticated and sufficiently broken up before being swallowed. Soft, fresh cream cheeses are more easily digestod than most other varieties. Cheese is a more concentrated form of nourishment than the best beef. Lean meat has about 70 p.c. of water, whereas good cheese contains only about 30 p.c. Fortunately, for those with a tendency to indigestion, cheese can be eaten with impunity if grated or pulverised. Puddings and other dishes of milk, eggs, and grated cheese are extremely nourishing.
The standard English cheeses, such as Cheddar, Cheshire, und Derby, are too large for the smallholder to make, as he does not usually have more than 7 to 10 gallons of milk daily, and only a portion of this is available for cheese-making. In addition the utensils required for making the larger cheoses are somewhat expensive.

Hygienic Making Conditions. It is essential that the milk intended for cheese-making should be perfectly clean and in good condition. Almost. any clean, airy, and well. sheltered building having a good floor is suitable for cheese-making purposes, and if a cellar is available in which to ripen the pressed cheeses, so much the better. If a dairy has to be built, it should be of brick, with a cement tloor falling to a channel which leads to a suitable gully placed outaide the ${ }^{-}$dairy and
communicating with a proper drain. If pressed and ripened cheeses are to be made, a similar building, to be used as a curing-room, should be erected in line with the dairy, but sunk about 2 ft . in the ground, and provided with a floor of cement. A series of shelves, on which to place the cheeses, should be put round the ripening-room, and the walls of both rooms should be limewashed at least twice each ycar. When not required for cheese, the making-room would do duty as a butter dairy.

A suitable size for the making-room is 10 ft . by 8 ft ., and for the ripening-room, 8 ft . by 8 ft . The roof inay be of tiles, thatch, or galvanised sheeting, lined underneath with boards. All ventilators and windows should be made to open and close as desired, so that the rooms can be kept at a suitable temperature. In order to save expense, both rooms may be made of wood placed on three or four courses of brick to prevent rotting. If built of wood, the outside walls would need to be double, with an air space between. The inaking-room should usually be kept at a temperature of $62^{\circ} \mathrm{F}$. to $66^{\circ} \mathrm{F}$., and the curing-room from $58^{\circ} \mathrm{F}$. to $62^{\circ} \mathrm{F}$.

Cheese-Making Requisites. A table 6 ft . long by $2 \frac{1}{2} \mathrm{ft}$. wide, with raised sides and ends, and lined with tinned sheeting, is necessary. This table should slope to one corner, and be provided with an outlet and pipe to allow of proper drainage of the whey from the cheeses into a pail below. One or two well-made oak tubs in which to coagulate the milk are required; they should be of a
capacity of 6 gallons each, and be provided
with close-fitting wooden lids The maker will need a large knife with which to cut the curd a milk-strainer, curd-ladle, skimmingdish, and thermometer, cheese-moulds. boards, straw mats, measures, choese-draining rack, set of wall shelves on one side of the wall, measur-ing-glasees, pails, and brushes: alno weights up to 28 lb . with which 10 press cheeses, and ${ }^{\text {a }}$ supply of rennet extract. The measuring-glass, I oz. size, should be sub-divided into drams.

Method of Making. A pressed cheese, which is crasmy in texture with a distinct chcesc flavour and very palatable when ripe, is quickly made. Six gallons of fresh, sweet milk are required for one cheose of standard size The circular cheese-moulds should be $6 \nmid \mathrm{in}$ deep by 6$\}$ in. diameter, strongly made of tin. and perforated all round. In addition, the moulds should be provided with a circular tin disk and wooden follower.

The milk is first raised to a temperature of $90^{\circ}$ F., and rennet, in the proportion of I dram to 3 gal., is added to bring about coagulation. The rennet is diluted with six times its volume of water, and then stirred into the milk. The milk is then stirred deeply from 3 th 4 min., after which the surface is kept gently moving to prevent the fat from rising. until coagulation sets in. The tub or vat is then covered with the rooden lid until coagulation is completed. The approximate time to cut the curd may be reckoned by multiplying by $2 \frac{1}{2}$ the time taken for coagulation to appear after the rennet is added, thus: Time of adding rennet. 8 a.m. Time coagulation commenced, 8.15 a.m.$15 \mathrm{~min} . \times 2 \frac{1}{2}=37 \frac{1}{2} \mathrm{~min}$. Time to cut curd 8.52 a.m. The curd-as the coagulated inilk is termed-is ready for cutting when it feels firm and springy, and splits with a clean fracture when a finger is inserted and lifted upward through the curd.
A large knife, long enough to reach to the bottom of the vat or tub, is taken, and the curd carefully cut in cubes $\frac{f}{} \mathrm{in}$. to $\frac{1}{2} \mathrm{in}$. in size, tho horizontal cut being made with a skimming dish. After cutting, the curd is gently stirred by hand, care being taken to remove particles adhering to the vat.

The temperature is now raised to $106^{\circ} \mathrm{F}$. If a jacketed vat is used this is done by passing hot water into the jacket. The temperature should not be raised faster than $1^{\circ}$ in 3 min., and the curd should be kept stirred during the process. If the cheese is made in a tub or unjacketed vat, the following procedure is adopted : If there are 6 gal . of curd in the tub and the temperature is $86^{\circ} \mathrm{F}$., it has to be raised $20^{\circ}$ to $106^{\circ}$. This temperature is attained in 4 steps of $5^{\circ}$ each. The first step therefore, is to raise each of the $6 \mathrm{gal} 5^{\circ}$.

## Heating the Whey

A cheese cloth is laid over the vat and pressed down on the curd; a supply of whey is then ladled off into a bucket and the temperature of this raised by the immersion of the bucket in hot water. The temperature to which the whey should be heated is estimated thus: If 2 gal . of whey have bcen taken off, these 2 gal . must be raised $15^{\circ}$ to $101^{\circ}$; if only 1 gal . had been taken, then the temperature would have to be raized $30^{\circ}$ to $116^{\circ}$. The temperature of whey should never be raised above $120^{\circ}$.

When this heated whey has been returned to the tub, the mean temperature of the whole 6 gal will be $91^{\circ}$, i.e. the first increase of $5^{\circ}$ will have been effected. The three further stages in the process of raising the temperature to $106^{\circ}$ are carried out in the same way. The stirring of the curd should be continued until the curd becomes tough and bright, and the particles, when pressed together in the hand fall apart and do not crush. The curd is then allowed to pitch and the whey is poured off through a straining cloth.

The curd is now spread evenly over the bottom of the vat, and salt in the proportion of 1 oz . to 2 gal . of milk is mixed into it. The
curd is then carefully packed into the mould, ripened lor renneting. If no test lor acidity is at ntersals until the curd has a slightly aoid which should previously have heen lined available this must be judged, but carc should taste and smell, when it may be cut into slices with a chocse cloth, and put to press with be taken that the milk is not over ripe or the 2 cwt. pressure. It is turned tho same checse will work too quickly evening and returned to press until the following morning In the morning the cheese a talien from the prese seven in a calico bandage and again returned to the prese io 1 hour, after which it should be placed in a is added at the rate of ono drain (mixed with
 four gallons of milk, and the whole should be well stirred for 3 $\min$ To prevent wasto the cream should be gently stirred in just before the milk begins to curdle. The curd is Soft Cheese. A soft cheese which is usuready for cutting when ally designated Cambridge cheese is made it breaks cleanly over from whole milk and is in demand during warm weather.
 'I'wo cheeses can be made from a little mure than 6 quarts of milk. It is un ivise to mako larger quantities than required for speedy consump) tion, as this checsc deteriorates quickly The teinperature at renneting should be from $92^{\circ}$ to 95 F About 1 dram ol rennet should be added to the quantity of
 milk mentioned, and the cheese tub should be care. ully covered. It s advisable to use is amaller tub when making not more than four cheeses. The rennet should be diluted and be stirred infor 4 min . When the curd os apt and the
Sairly dry draughty room lor two days and then in the ripening room. It will be ready for use in about three weeks, when the weight will usually be about $6 \frac{1}{2} \mathrm{lb}$.

Unscalded Cheese. A checse not unlike Welsh Caerphilly is quickly made and digestible but does not keep well as it is unscalded. It is a popular cheese for consumption with salads in hot wenther

This checse is made from mixed morning's and evening's milk As an insertedfinger, the curd retains a large percentago of which is usually moisture (the whey), very little acidity is 40 to 45 min required, and, unlike the varieties requiring after renneting longer periods of ripening, it can be made in It is now out cold weather. Five gallons of whole milk into pieces about will make a cheeso weighing about 7 lb . the size of $\frac{1}{2}$ in The moulds for these oheeses should bc cuhes, this procers flat. $9 \frac{1}{2} \mathrm{in}$. by 2 in ., with removable bands taking 10 to 15 whioh sink down as the cheese presses min., during Where a number of these cheeses are made which time the they are piled one on top of the other when put whey should be to press, and only the top one requires a stirred gently follower or board. Small moulds to make When the curd 1 or 2 lb . cheeses can also lie obtained and are is evenly cut and very convenient, as any number fiom 4 to 12 cheeses can be pressed at the same time with a large board placed between each layer. milk is at once atroined into the cheese gat octle lor or tub and well stirred to get rid of the odour whey is now of the cows and to lower the temperature drawn off. With slightly; in cold weather it is covered to small quantities maintain the desired temperature so that a (e.g. 5 gal.$)$ this certain amount of acidity will develop to ripen is best done by the morning's milk when added. In warm pouring off the weather it is unnecessary to cover the evening's whey through a milk. When a starter is used, the evening's cloth (over milk should be cooled down to $70^{\circ} \mathrm{F}$. as soon another vessel) ns obtained, to check acidity, and stirred and then gently tipping the curd into the cloth whey is on the surface, the curd may be occasionally during the evening to prevent and tying up into a bundle. It is now left for removed with a skimming dish and placed the cream rising. Neat morning, when thic 20 min ., and then cut into 3 in . cubes and the in the moulds in thin slices, a portion of temperature of the milk bas been raised, a whole moved and turned to assist drainage. unbroken curd being set aside to forin a smooth amall quantity of starter may be added to It should then be tied up again for another 20 upper surface on the oheese. The moulds are produce enough acidity, so that when the min, after whioh the pieces should be pulled in two pieces, the bottom portion holding a morving's milk is added the milk is sufficiently apart and again ticd up. This should be done threaded straw mat, which prevents the curd
secaping, whilc the upper one is pierced with draining holes They are about $7 \frac{1}{2} \mathrm{in}$. long by 5 in . wide and 6 in . deep, and should be made of elm wood. Moulds made of tin should not be used, as in these the curd rapidly loses heat, and drainage is thereby retarded. With tin moulds the curd settles into a flat cake, but with wooden moulds the curd adheres to the sides, causing the cheese to settle in the middle first. thus producing a curl in the curd.
These cheeses are not turned at all, and are ready for use $w$ hen the wooden moulds can be removed without the cheeses losing shape, each chcesc weighing well over a pound. They are consumed fresh, being sold along with the straw mat upon which they have been drained,

Cheese Hopper. Small yellowish. white maggots, known as cheese hoppers, some times swarm in cheese where care has not been taken for its protection against insects. They are the grubs of a tiny black fly (Piophila casei) which lays its eggs upon cheese. Maggots have the mouth formed for sucking, and to reduce solid food to a condition in which they can absorb it they have to discharge upon it a fluid that will dissolve it. In this process chemical changes take place that may be highly injurious to the human system. The part of the cheese attacked should be cut away and destroyed.
Cheese Mite. Flour, linseed, and other household stores, as well as cheese, are attacked by Tyroglyphus siro, or the cheesc mite. It get.s into cracks in the rind of whole cheese, or in air cavities of cut surfaces, and reduces the food to powder. Some consider that the presence of the mites improves the flavour of the cheese. Under the microscope, the powder resulting from their activity is seen to consist of dead mites, cast skins, etc. The injured portions should be cut out and the sound part scraped thoroughly, to get rid of mites, the rind getting attention as well as the edible portion

CHESSE CAKE. For the lemon-cheese filling these require 2 oz. sugar, 1 oz . butter, 3 oz flour, 1 egg, 1 tablespoonful milk, $\frac{1}{2}$ teaspoonful baking-powder, a pinch of salt and a little lemon flavouring. Crean the


Cheese Cakes made with pafi paskry, the contres boing filled with jam and a lemon-choose mixture
butter and sugar, and add a well-beaten egg and the sifted flour. Beat well, and stir in the baking-powder and essence. Line some deep patty tins with puff pastry (q.v.), then put in each tin 1 teaspoonful each of raspberry jam and the mixture, and bake in a hot oven for about 15 min .

CHBESE CROQUETTE. Either vermi. celli, macaroni, or spaghetti may be used for cheese croquettes. To prepare them, boil together $\&$ pt. each of milk and water, adding 2 tablespoonfuls of spaghetti broken into short lengths. Boil these for about 10 min . or until the spaghetti is tender, and in a separate saucepan melt 1 oz . butter, stirring into it $\frac{1}{2} \mathrm{oz}$. Hour, and then the cooked spaghetti and milk and water. Stir and cook the whole gently until it boils and thickens, then mix in 2 oz grated cheese, and season it well.

Turn the mixture out on a plate to cool, and when cold enough to handle form it into cven-sized balls Beat up an ogg on a plate brush some of it over cach ball, and then roll it in breadcrumbs. Heat some frying fat in a deep pan, and when it begins to smoke put in the balls, a few at a time, and fry them a golden brown. After Iraining them, serve on a paper doily garnished with parsley.

CFIEESE FONDU. An appetising supper dish is prepared by mixing 3 tablespoonfuls of grated cheese and the same quantity of milk into 3 well-beaten eggs. Sicason the whole carefulty. Thickly butter three little fireproof dishes and pour enough of the mixture into these to fill them about three-parts full. Bake these gently until they are lightly set and delicately browned, and serve them immediately in the dishes in which they were baked. Thin rolled brown bread and butter or thin fingers of dry toast should be served with this dish.

CRIDESE FRIMIER. Mix 3 oz . of flour with a dust of salt, and in a separate basin beat the yolk of an egg with $\frac{1}{2}$ gill milk and


2 tablespoonfuls melted margarine Stir these into the flour and beat the mixture well Cut 6 oz stale cheese into small strips or fingers, season with salt, pepper, and a few drops of vinegar. Beat the white of an egg to a stiff froth and fold it lightly into the batter, dipping the pieces of cheese in this and sliding them gently into a pan containing smoking-hot frying fat. Fry the pieces till they are golden brown in colour, turning them once to make sure that they are cooked on both sides Drain them well, heap them on a hot dish, and serve them at once.

CFISESE PUDDING. As this pudding sinks rapidly after leaving the oven, it requircs to be served at once. To make it, stalk $\frac{1}{} \mathrm{lb}$. tomatoes, dip them for a few seconds in boiling water, and then peel them. Slice each tomato thickly and lay the slices in a greased pie-dish. Mix 6 oz. grated cheese with 3 oz. fresh breadcrumbs, and in a separate basin beat 2 cggs to a froth, mixing them with $\frac{1}{3}$ pint milk. Stir these into the cheese and crumbs, adding as much more milk as is necessary to make the mixture the consistency of a thick batter. Season it carefully and pour it into the dish over the tomatoes. Bake the pudding in a noderately hot oven until it is set, well puffed-up, and browned.

CHEESE SAUCE. A sauce for serving with au gratin dishes, or with stewed celery or seakale. It is prepared as follows: Melt 1 oz. butter or margarine in a saucepan, stir in $\frac{1}{2}$ oz. flour and, when smooth, add slowly $\frac{1}{1}$ pint milk (or pint milk and $\frac{1}{3}$ water). Continue stirring until mixture boils, then add $1 \frac{1}{2} \mathrm{oz}$. grated cheese, preferably Parmesan, salt and pepper to taste, and, if liked, a little grated nutmeg. When serving an au gratin dish, mix a similar quantity of grated cheese with a tablespoonful of browned crumbs, sprinkle this over the sauce, add a few smal pieces of butter, and bake the dish in a
quick oven until the cheese melts and browns. See Au Gratin.

CRESESE STRAWS. These are firequently used as a savoury instead of cheese. Mix together 2 oz flour, 3 oz . grated checscl'armesan if possiblo-and add a few grains of cayenne and salt. Into these lightly rub 2 oz butter, and mix to a stiff paste with the raw yolk of an egg beaten up with 2 teaspoonfuls of cold water. Knead and roll out into a strip about 4 in . wide and $\frac{1}{8} \mathrm{in}$. thici: Cut the mixture into narrow strips like large matches and bake them on a tin lined with greased paper in a quick oven till they are a delicate biscuit colour. They burn very easily, so need care; they are also very brittle and require gentle handling. They keep for at least a week in a tin, and can be re-warmed

CEDESSE TOAST. This savoury is made by boiling six almonds for 2 min., skinning and slıredding them, and then frying them a light brown in a little salad oil. Coarsely chop 1 tablespoonful of chutney, put it into a small pan, and add to it the fried almonds, $\because$ tablespoonfuls grated stale cheese, and a little salt and pepper. Heat all these ingredients thoroughly and serve heaped up on small rounds of hot buttered toast. Small pieces of fried bread may be used instead of toast.

CRESSE TURNOVER. Thesc can be caten immediately after making, or reheated the following day Mix together 1 oz . of boiled rice, 2 oz . of grated checse, an egg, and 1 tablespoonful of thick cream, and season the whole with salt and red pepper. Make $\frac{1}{1} \mathrm{l}$. of pastry ( q v.), roll it out thinly, and cut it into six neat rounds On each of these pile a tablespoonful of the mixture, damping the cdges of one side of each and folding the pastry over to make semicircles. Have ready a pan of deep fat heated to boiling point, drop in the turnovers, and fry them to a golden brown, afterwards sprinkling them with salt and serving very hot.

CBIF' : A Professional Cook. The chef is the principal cook of an hotel or restaurant. or of a house where a considerable staff is maintained. He must be a master-cook who has had experience in a first-class kitchen, and should be provided with a diploma from a recognized school. He-or she-must be able to compose a menu, and to take the principal part in or direct its preparation ; he is expected to be capable of devising new dishes, and not to be entirely dependent on the recipes of any cookery book.

It is possible to secure a complete profcssional training in the properties and qualities of different foods, and in the science of their preparation, at various places.

A chef's cap is made of white duck, $t$ will, or linen. It is of no special size, and can be mado by cutting a round of material 22 or 23 in . across, and pleating it into a band, 2 in . deep, and folded to the exact size of the head.

CBIELSEA BUN. This is made from 4 oz of Hour, oz. butter (melt ed), a little more than $\ddagger$ oz. yeast, $\frac{1}{\frac{1}{2}}$ teacupful of milk, and about 1 oz sugar. Cream a pinch of the sugar and the yeast together, pour the milk over the melted butter, and mix all together with the warmed flour to a light dough, kneading it well. Leave it to rise, then repeat the kneading process, and roll the dough into a square. Spread it orer with $1 \frac{1}{2}$ oz currants and oz. sugar, roll it up, and cut it into 5 or 6 pieces. Let these stand for a few minutes, coat with a little beaten egg, and then bake the buns in a hot oven for about 15 min .

CRISLSEA CAKE. The ingredients required for a Chelsea cake are 10 o7. Hour, 4 oz . butter, 6 oz castor sugar, 5 eggs , $\frac{1}{2}$ gill milk, and a teaspoonful baking-powder, and vanilla to taste. Sieve together the flour
baking-powder, and a pinch of salt, and cream together the butter and sugar. To the latter add the eggs, beating each in scparately, then the flour, etc., and lastly the vanilla and milk. Put the mixture in an oblong baking-tin lined with two layers of buttered paper, and bake it in a moderately hot oven or about an hour.
In the meantime, prepare a filling for the cake by chopping up 2 tablespoonfuls of dried and shelled walnuts, and pounding them in a mortar with the same quantity of ground almonds, a tablespoonful of apricot jam, and a little lemon-juice and orange-flower water. Add enough sieved icing sugar to mix the whole to a smooth paste. Slit the cake into halves and put the icing between them.
Make a little white icing and pour it over the top and sides. Decorate with halves of walnuts and preserved rose or violet petals.
CBISLSEA CBINA. True Chelsea is always soft-paste, 'easily marked by a knife, and as most imitations are in hard porcelain,


Chelsoa Cbins. Examples of the delioatoly coloured and graoefally thabioned old English ware. The oharacterigtio Agures represeat: left, Justioe, and right, Diana
due to a method of manufacture which begins with the formation of a caterpillar of cut fringe.
Ordinary cloths are made by one weaving but chenille fabrics are made by two. First o all a fabric is woven in bands of colour, and then that fabric is slit lengthwise into narrow strips, so providing the caterpillar-a furry coloured strip of fringe supported by length wise threads, arranged to hold the fur securely. This caterpillar is re-woven across a thinner set of threads, and the colours form the pattern seen in the completed cloth

Chenille may be cotton, wool, silk, or other material. Cotton chenille is made into selfcoloured window curtains, and their colour has a peculiar bloom, due to the method of making. Wool chenille is made into a variety of seam less Axminster carpet squares. Chenille in various colourings is also extensively used for embroidery, knitting, and crochet work.
The pile of chenille can be made either long or short. The article is generally decorative rather than durable, although good wear is given by the best qualities if fairly treated. It should be realized that chenille is less able to stand severe treatment than velvet fabrics of mor substantial construction, and the articles should be used with care, especially in cleaning. Rough hand ling is likely to break the light warp thread which form the support of the caterpillar or pull out the fur from its foundation.

Cotton chenille window curtains can be washed in a lather of good soap flakes; as the surface is bushy and rough, handling is to be the presence of a forged mark, either the avoided: it is advisable to steep them well, triangle or the anchor, should not deceive.
Chelsea ware began with undecorated groups in translucent white, like skimmed milk, and passed thence to four-sided bottles and octagonal tea-ware, decorated with Aesop's fables or Japanese designs. After producing hexagonal jars, dishes in the form of birds and regetables and the like, Sères and Dresden influence introduced rich ground colours, especially pea-greens, turquoise, and the peculiar Chelsea claret, with panel paintings of pastoral scenes and Oriental birds. Besides the figures and groups, knife-handles, stick knobs, scent-flasks, etc., were much favoured.
Careful imitations were formerly made at Coalport and Paris, and there are many inferior modern forgeries. These may often be detected by their gaudy colouring, the flesh tints of the cupids, and the tell-tale gilding of the anchor. See China.

CEISLSEA PENSIONER. The name is given to a prescription for rheumatism and gout which was. obtained from a Chelsea pensioner. It has been subject to many alterations, but the following is probably the original prescription: Powdered guaiacum, 1 dram; powdered rhubarb root, 2 drams; cream of tartar, 1 oz ; sufphur, 2 oz . : and one nutmeg, grated. These powders are mixed together and then made into a paste or electuary by incorporating honey 12 oz . The electuary is taken in doses of from one to two teaspoonfuls, night and morning. siee Rheumatism.
C:IFNTLLE. The name is derived from the French word for caterpillar. Chenille trimmings and furnishing fabrics all have a vertain velvetiness of appearance, and this is
rinse thoroughly, and dry in a good current of air. Wool chenille curtains and table-covers can be dry-cleaned more safely than washed.

CRISQUE. A cheque is a negotiable instrument-that is, it can pass from hand to hand like cash unless it is marked " not negotiable." Thus, if a cheque is stolen or obtained by fraud, anyone who takes it in payment of an account or cashes it and does so in good faith without notice of the frand or the theft, and before it is overdue, has a good

The cherry tree flourishes best on well drained land, on a subsoi! of sand or chalk ; there, in time, it develops into a large tree and is long.lived. It may, however, be grown on ordinary soil that is well cultivated. When cherries are planted in small numbers in gardens the difficulty of protecting the fruit from birds has to be considered, for unless the trees are netted the birds will spoil the crop. For this reason amateurs should plant bush or pyramid trees in preference to standards which take up a lot of room and cannot be netted conveniently.

Another detail of importance is this: all varieties of cherries are considered to be selfsterile and unless several are planted together the blossoms will not be cross-fertilised, and thus the chances of a successful crop are remote. For this reason it is useless to plant solitary cherry trees unless there are a number of others in the immediate neighbourhoor.
title to it and can enforce payment. A cheque is overdue when it has been more than a reasonable time in circulation and a chequc over a week old may well be overdue.
A cheque may be made payable either to a named person or 'order,' or to a named person or 'bearer.' The payee of an order cheque cannot transfer it to anyone else or obtain the money for it without writing his name on the back-'indorsing' it-but a bearer cheque passes from hand to hand by delivery without indorsement. If the person to whom a cheque is transferred is not paid by the person who transferred to him. he can sue the drawer.
If someone forges a man's signature as drawer of a cheque and his bank pays it, the bank must bear the loss, however clever the forgery ; but if a man makes a cheque payable to Jones or order, and someone forges Joncs's name and caslies the cheque the bank can charge it against the drawer's account. The bank is supposed to know the signature of its customers, but not the signatures of persons in whose favour its customers draw clieques.

Crossed Cheques. A precaution frequently taken in writing out a cheque is to cross it by drawing two parallel lines across it thus $\geqslant$. A cheque so crossed may be indorsed by the payce in the usual way ; it cannot, however, be exchanged for cash at the bank, but must be paid into a banking account If in addition the name of the payec's bank is written between the lines of the crossing the cheque can only be paid into that bank. The addition of the words " $a / c$ payee" to the crossing means that the cheque cannot be indorsed to any third person by the payee.
Another method of protecting a cheque is to write on it the words ' not negotiable' either with or without a crossing. If a cheque so marked is indorsed by the payee to some third person, that person and any subsequent indorsee can have no better title to the cheque than the person from whom he received it Thus if such a cheque is stolen or obtained by fraud, the holder cannot recover on it, even though he took it in ignorance of the theft or fraud and for value.
Always present a cheque the same day it is received if possible. A banker is bound to honour (i.e. pay) a customer's cheques drawn on him so long as he has money enough in his account. If the bank dishonours a customer's cheque when there is money to mect it, the customer can recover damages, which may be very heavy if he is engaged in trade or busincss.

Cheroot. See Cigar.

# Cherries: The Fruit and its Varieties 

## With Methods of Preparing Them for the Table

## See articles on other fruits, e.g. Apple; Plum; and for cultivation Grafting; Pruning, etc. Other

 uses of cherries are deacribed in the shorter entries that follow this maln headingThe matter is complicated by the fact that onme varieties of cherry are inter-sterile. tha is to say, the flowers can be cross-fertilised only by certain other varieties.
The result of experiments has been to classify most varieties into six separate groups: those in one group will not crossfertilise others in the same group, but they will cross-fertilise those from any other group. When making a choice of varieties. therefore, it is wise to choose one from each of the following groups rather than two from the same group.
A. Knight's Early Black, Black Eagle Early Rivers and Belford Prolific. B. Frog more Bigarrean, Bigarreau de Schrecken and Waterloo. C. Emiperor Francis and Napolcon. I). Governor Wood and Fiton. E. Kentish Bigarreau.
Other cherries are less difficult of management, and if a mixed collection is planted
 left, clusters of small red morello cherrles, much used in cooking
simmer gently until tender in an enamelled pan or cassemole, with to every pound of truit $\frac{1}{2}$ pint water and $1 \frac{1}{2}$ table. spoonfuls sugar
Stuffed cherries make pretty dessert sweets. and are prepared by rolling some almond paste into neat little halls, making a slit in the cherries, and insert ing a ball in each. The cherry is then molled in the hand to mako it round, sprinkled with castor sugar and put into a tiny paper case.

Owing to their decorative appearance, cherry swcets are liked for parties. Cherry jelly is a favourite. To prepare this, wash and pick 1 lb . cherries, remove the
natislactory crups may be expected. Among them are Noble. White Heart, Black Heart. FHorence and Gcant d'Hedelfingen.
13isha and standard cherry trees are grown in the open garden, standards at 30 ft . apart, bushes at 12 ft . apart Fan-trained trees are suifable for planting against a wall facing south, west or east: they should be 18 ft apart
The sweot cherries, which comprise all those varictiea named above, bear their fruit chiefly on spury-short, sturdy shoots bearing blossom huds. The principal pruning is done in early August when summer laterals or side shoots which are likely to crowd the tree are stopped at about six leaves from the base. These shoots are again shortened in winter

As cherry trees become older fruit spurs usually form freely and little pruning is nceded. In fact, severe pruning does harm and may lead to an attack of gumming."
Standard cherry trees need less pruning than bushes or pyramids; the branches are thiuned out in autumn to prevent overcrowding. The growth of cherry trees on a wall must be limited and the summer and winter pruning of the side shoots is necessary. Cherry trees which grow luxuriantly but do not produce fruit should be lifted and root pruned early in November ; that is a better practice than prining the branches severely.
The morello cherry, which is so valuable lor coroking purposes, flourishes best on a west or north wall. It needs quite different pruning from the swcet cherries. This takes place in Inte summer as soon as the fruit is gathered. and consists in cutting out parts of the old whonts to make room for those of the past summer's growth.
Pests and Diseases. Black fly usually infests the leaves of cherry trees in early summer. They should be sprayed frequently with an insecticide immediately the peat is tirst seen. Gumming is a malady which is difficult to denl with. Its presence is indicated by an exudation of a sticky gurn-like substance Irum the branches. Planting in wet, heavy, ill-drained land and severe pruning are pre. disposing causes. If the silver leaf discase, recognized by the silvery grey appearance of the leaves, attacks a cherry tree it ought to be uprooted and burnt.

How to Cook. The cherry, whether it is fresh. preserved, or crystallised, is a favourite fruit with cooks. and may be used in a variety of ways. It is best stoned before being cooked. If a cherry-stoner is not at hand, the fruit may be stoned by pushing a smooth, thick quill thruugh each cherry from the stalk end. In this way the stone is pushed out and the fruit left intact To stew cherries, let them
stones, and put the fruit in a saucepan containing \& pint water and $\boldsymbol{i}_{\mathrm{oz}}^{\mathrm{oz}}$. sugar. Simmer these until the cherries are tender, then atrain and add water to make up to the original quantity. Put in the strained juice of half a kmon, together with oz. gelatine. and stir the whole over the tire until the gelatine has dissolved.

Strain all the juice into a basin, and when it is cold and nearly setting, add enough cochineal to produce a pretty pink colour. Put the cherries into a glass dish, pour the liquid over them, and then lase the jelly to set in a cold place. This may be decorited with cream. angelica, crystallised iolets and cherries.
A good blancmange for children's parties is made from a quait of milk, 4 oz . each cornflour and cherries, 6 oz. sugar, and a little vanilla cssence. Put the milk into a saucepan and boil it, then add the cornflour mixed to a smooth paste with a little extra milk. the fire until it thick. ens, and cook it very gently for 6 to 8 min stirring all the time, then add 4 oz sugar and a few dmps vanilla cssence.

Stew the cherries in sufficient water to cover then until they are tender, adding another $\underline{\text { oz. sugar. Kinse a mould with cold water, }}$ and arrange a few of the cherries at the hottom ; then pour in some of the cornflour mixture, and lastly the rest of the cherries mixed with the remaining cornflour. Leave the hlanemange to sct.

Another decorative party dish is made from 1 lb . cherries, 3 gills water, the juice of $\frac{1}{2}$ a lemon, 4 oz sugar, toz. gelatine, I gill creain, and a little cochineal or carmine. Remove the stalks, wash the cherries thoroughly, and then cut them into halves and take out the stones. Put them in a pan with the water, sugar, and lemon juice, and simmer the whole until tender. Then strain off the juice and measure it, and if it is less than 3 gills make up the amount with water, afterwards putting it into a pan with the gelatine, and stirring it over a slow heat until it has quite melted.

Add a few drops of cochineal or carmine, put the cherries into a border mould rinsed out with water, and strain the juice over them, leaving the whole in a cold place to set. Turn out into a glass dish, and fill the centre with whipped cream, sweetened and Havoured with
vanilla. A tew whole cherrices may be placed round the top of the mould.
CHERRY BRANDY. This is a cordial which is good when home-made and when the best materials are used

A simple method is to fill a bottle full with cherries, not overripe and using half inorello and half black cherries; pour in brandy to the neck, cork it up well, and let it stand for a month. See Brandy.

CHERRY CAKE. By those who do not care for currants cherry cake is generally appreciated. To make it, sieve logether


Cherry Cake, cut lo hall to show the rlace cherries and candied peel with which it is Glavoured

I lb. flour and 2 level teaspoonfuls of baking. powder. Beat $\frac{1}{2} \mathrm{lb}$. butter or margarine and the same quantity of castor sugar to a soft cream, using less butter if a plain cake is desired. Into this mixture whisk 3 beaten egga, then fold in the flour lightly, adding 1 oz . chopped candied peel and 2 to 3 dozen glacé cherries cut into halves or quarters and well Houred. Stir in about 3 table. spoonluls milk, and bake the cake in a tin lined with greased paper in a moderately hot oven for about $1 \frac{1}{2}$ hours. This mixture might also be baked in small fancy patty pans for about 20 min See Cake.

CHERRY CIDER. The in gredients required are $\frac{1}{b} \mathrm{lb}$. stoned ripe cherries, a pint of boiling water, and a thin piece of lemon rind Bruise the cherries, pour the boiling water over them, and then add the lemon rind. A few bruised cherry stone kernels will be found to improve the flavour greatly. Soak the fruit in this way for 4 or 5 hours, then strain and sweeten the liquor with 2 oz . of sifted sugar before bottling it.

CHERRY JAM. As it is deficient in pectose, the substance that forms jelly, jam made with cherries requires the addition of apple or red currant juice to make it set To each lb. of sound fruit allow ? 1 lb . of sugar, 1 gill of red currant or apple juice, and two shredded sweet almonds. Put the sugar and the fruit juice in the preserving pan, and let it dissolve slowly by the lire.

Boil the mixture for 5 min ., add the ripe; sound fruit, removing the stalks and as many stones as possible, and lastly add the shredded almonds. Boil the jam gently until the fruit is tender, and the juice jellies when tested on a plate. Keep it well stirred and skimmed during the boiling. When cooked, pour off into dry, warmed jars, and tie down at once.

Cherry Laurel. See Laurel.
CHERRY PIE or Heliotrope. A nonevergreen shirul) with fragrant lilac-coloured Howers, the cherry pie or heliotrope grows
fast from seed sown in heat towards the end of winter, and can therefore be used in beds the same season. The reed may be sown in a hox or pan put in a warm glasshnuse in February, and the plants pricked off and hardened in $n$ cold frame, then planted out in June Any fertile, friable garden soil suits them.

Cuttings can be made of the young shoots in spring, inserted in sandy soil and placed in heat. During the winter the plants need very little water, but must be given air

Young plants bought in small pots in June should be planted in a sloping position about 18 in apart, and the side shoots pegged down from time to time as they extend

The greenhouse culture of cherry pie is easy. A suitable soil consists of loan with a quarter of leal-soil, a quarter of spent hotbed manure, and a fair amount of sand. Propaga tion is either from seed or by cuttings of the young shoots in spring.

When planted on a warin greenhouse border, cherry pie will very quickly cover considerable space on a wall, nad it will scent the whole house. All the attention it will need will be judicious watering, periodical tying-in, and occasional pruning. Standard plants can be secured by depriving the main stems of strong plants of all lateral shoots, and growing on until the plant has renched the requisite height.


Cherry Pie. Plant of beliotrope, of the Miss Nightinale variety in full flower

The following are some of the best varicties: Miss Nightingale, violet blue; Rose Clair, dark Whe; White Lady, palest blue: President Garfield, mauve-purple ; and The Speaker. violet-purple.

CHERRY PUDDING. To nake ns ordinary cherry pudiling, grease a small pudding-basin, sprinkling on the bottom of it a thin layer of brown sugar to form a caramel, and lining the busin with a good suet crust. (See Apple Pudding.) Remove the stones and atalks from 1 lb . cherries, and till the basin with them, adding 2 or 3 trblespoonfuls of sugar. Pour in a little water to moisten the fruit,


Cherry Pudding. A baked caramel-covered pudding made with cherries and euet crust
and then cover it with a layer of suet-crust. Bake the pudding in a moderate oven for $1 \frac{1}{2}$ hours, and turn it out of the basin before serving.

Cherry Sandwich Pudding. This is made by parhoiling 1 lb of black cherries in a syrup made by boiling 3 oz . granulated sugar in a saucepan, with a gill of water


Cherry Sandwich Pudding served with the syrap esulting from parboiling the cherries

When the cherries are tender, drain them, and reserve the syrup. Then beat 5 oz . margarine and the same quantity of sugar to a cream, add a pinch of ground cinnamon and the beaten yolks of 2 eggs , and stir in 5 oz . breadcrumbs, 4 tablespoonfuls of milk, and the stiffy whisked whites of the eggs. Put a layer of this mixture in a greased pie-dish, and on this place a layer of cooked cherries, then some more mixture, and so on until the dish is full. Bake in a hot oven for $\frac{1}{2}$ hour.
then turn it out on to a hot dish, and pour the syrup over it.

CHERRY WOOD. One of the chief uses for the wood of the cherry tree is in making tobacco pipes. It is valuable also for turned and fancy articles, and in small cabinet work. The colour of cherry wood is brown with u reddish tinge ; it has a smooth and fine grain easy to work, and takes a good polish. It is hard, but not very durable as it splits rather easily. See Pipe

CHERVIL. The kind mostly grown is the common chervil, the aromatic leaves of which are used for salads und garnishes, particularly those of the curled variety, which are more crisped. The chervil is an annual, and thrives in any ordinary soil, producing leaves fit for gathering in ahout two months from the time of sowing. It may be sown successionally from March onwards, and thinned to about 6 in. apart.

CHESHIRE CHEESE. Both as regards texture and flavour, Cheshire chcese possesses distinct characteristics, for while it is very open-grained it is yet mild, soft and full in Havour. It is perhaps the softest of the hardpressed varieties There are threc types of Cheshire cheese, known as early ripening, mediun ripening, and slow ripening. The cheese may also be coloured or uncoloured. See Chcese.

## Chess: The Pieces and Their Play <br> First Principles of an Ancient Game

The game of chess is played between two opponents, moving in turn, on a board of (i4 squares, arranged in 8 rows of 8 equares each. These squares are coloured alternately white and black (at times other colours, but always conventionally called white and black); and there must always be a white square in the corner to the right of each player. The opponents have 16 men each (also known as white and black) on the two rows of squares nearest to them, namely 8 pieces on the back row and 8 pawns on the row just in front. This is the position when a game starts.

The pieces on the back row are of tive different kinds. The king and queen stand in the centre, the queen being on a square of her own colour ; a bishop next each of them ; a knight next each bishop; and a rook (or castle) next each knight. The pieces on the hing's side of the hoard are known as king's bishop, king's knight. king's rook; the pieces on the queen's side of the hoard as queen's bishop, queen's knight, queen's rook. The pawns, who occupy the next row to the back onc, are called after the pieces standing behind them-king's pawn, king's bishop's paimn, commonly written KP, KBP, etc.
The notation of the chess


Chess. Fig. 1. Board set out with men placed in position ready to start the game

The theoretical object of a game of cheas is the capture of the hostile king, which brings the game to a close. When the king is liable to be captured on the opponent's next move. he is said to he in check; and if he cannot move out of check, he is said to be mated, and the game is over. Now and again situations arise where neither king is mated and the game has no decisive result

All the chessmen alike capture an opposing man by being put down on the square occupieed by that man, which is then removed from the board; but there is a considerable variety in the nature of their moves. 'Ihe king has the shortest and simplest move, being one square only in any direction-horizontal, vertical, or diagonal In Fig. 3, supposing the king stands on the square marked $X$, he can move to any of the dotted squares immediately surrounding it. As he cannot be captured, however, with. out ending the game, it follows that he cannot move into check and cannot stand on a square next the opposing king.

The queen's move is a prolongation of the king's move in each direction up to the edge of the board Standing on $X$, she can go not only to each dotted square, but also to any of board that is current among English-speaking the squares along the arrows shown in Fig. 3 peoples is derived from the names of the The rook has the horizontal and vertical moves pieces, cach vertical row, or file, being called of the queen, but the bishop has her diagonal after the piece standing on it. Thus, in moves only.
Fig. 2, white's extreme left-hand file is Neither queen, rook, nor bishop has the the queen's rook's, or QR , file. The squares power of jumping over a piece, whether friendly on which the pieces originally stand are QRI or hostile. The knight, on the other hand, can. (or QR square), QKt1, and so on: the The knight's move may be roughly described squares on the next horizontal row, or ns one square in $n$ horizontal or vertical rank, are QR2, QKt? and so on. From black's standpoint the figure is reversed, so that his $\mathbf{Q}$ side pieces arc to his right, his K side pieces to his left. A move is recorded, in this notation, in the form $K-K 2,(Q-Q R 4$, P-K3, etc., indicating both the man moved and the square to which it moves.
direction, followed by one in a diagonal direction away from where he previously stood. Thus, in the left-hand section of Fig. 4, if the knight stood at $X$, he could move to any of the dotted squares in a circle round it, regard less of whether the squares immediately next him were occupied by friendly or hostile men

From this jumping power ol the knight it sound development. Now development means Ki4, 1'—K4; 2 Kt—K133, Kt- (Q13:3: :; Pfollows that in the original position of the men (Fig. 1) the linights alone of the preses can move the others having to wait until the pawns have heen moverl.
The pawn's ordinary move is one square forward in $n$ vertical direction It does not however, capture an opposing man in this way, but by a move ono square forward diagonally. Thus if a pawn stands at $X$ in the right-hand section of Fig. 4 its ondinary move is to a, its capturing moves are to $b$ or c. On its first move in the game each pawn has the privilege, at the player's option, of a double move, i.e to $d$ in the diagram Both the single and the double move of the pawn are dependent on the absence of any obstruction in the path. There is also another limitation to the double move. If, in the diagram, a hostile pawn (but only a pawn, brought ahout as follows:1 P-K4, P-K4. not $a$ piece) stood on either of the squares $2 \mathrm{Kt}-\mathrm{Kl} 33, \mathrm{Kt}-\mathrm{Q} 133 ; 3 \mathrm{~B}-\mathrm{B} 4, \mathrm{~B}-\mathrm{B4} ; 4$ marked $e$ and $f$, then, in spite of the fact that a pawn on $X$ moved to $d$, the hostile pawn could capture it on a, liefore it reached d. This is called taking en passant. or in passing. On reaching the further side of the hoard in safety, a pawn becomes promoted to queen, rook, bishop, or knight, at the option of the player.
The move known as castling is $\Omega$ joint move of the ling and une of the rooks. It can only occur once in the game on each side, and then only if neither king nor rook has moved pre viously and no piece stands between them This operntion consists in bringing the rook up to the near side of the king, and simul taneously jumping the king over the rook to the square next heyond him. In this the king may not pass over $n$ square where he would be lisble to capture
In power the queen is easily first : the rook is second, the bishop third, but only a little and that not alwnys, above the knight (which in certain positions, indeed. is the more powerful of the two pieccs): while the pawn is the wenkest of the chessmen, with the exception that its potentiality of promotion even to $\Omega$ queen gives it a force much ahove its normal. In the absence of a queen on the board, a pawn which cannot be prevented from queening is obviously most powerful as compared with the remaining pieces Owing to the peculiar fenture of the king, whose capture would end the game, his value cannot well he eatimated
Types of Opening. There is no royal road to the openings at chess; and, though there are many excellent text-books, it is of little use to learn by heart the varintions which they give, without understanding the principles of


Chess. Fig. 3. Diarramshowing possible mores of king, queen, fook and bishod trom X. Fir. 4. Left, moves of a knight ; Right, those of a pawn


#### Abstract

getting the forces into play where they will


 (1) have increased powers and (2) restrain the powers of the enemy's forces 'The advanco of the two central painns releases hoth bishops and the queen The knights can como out independently of the pawns, and so the wry is the pawns, and so the wny iscleared for the rooks to operate in the centre, the king being got out of the way by castling. Thus we might get such a system of developing moves for ono side as P-K4, P-Q4, Kt -K B33, Kt-QB3, B-QBt B-K B4, castles, Q-K2 (or Q2), QR-Q1, KRKI, when every piece would be developed But clearly both sides could not deploy their forces thus without coming into direct conflict in the centre of the board 'I'he alternation of moves between the two must modify the development.

A typical opening is P-Q3, P-Q:3; $5 \mathrm{Kt}-133, \mathrm{Kt}-\mathrm{B}: 3$ 'This is a variation of the opening known as the Giuoco Piano, or Slow Ganie it is optiona now for both sides to castle, to bring out the $Q$ and $Q R$. and to move both rooks into the centre : but such procedure woulil not neres. sarily be the hest

A very different type of opening is seen in the various gambits A gambit implies the sacrifice of a pawn, and sometimes more, in the oprening. Here, for instance, is the Muzio Gam. bit, us illustrated in a game played by Morphy at the uge of 20: 1 P-K4, PK4: $2 \mathrm{P}-\mathrm{KB4}, \mathrm{P} \times \mathrm{P}$ (i.e. $P$ takes P): $3 \mathrm{Kt}-\mathrm{KB}$. P-KKt4 : 4 B B4, PKt5 ; 5 Castles, $\mathrm{P} \times \mathrm{Kt}$; 6 $\mathrm{Q} \times \mathrm{P}, \mathrm{Q}-\mathrm{B} 3 ; 7 \mathrm{P}$-K5. $\mathrm{Q} \times \mathrm{P} ; 8 \mathrm{P}-\mathrm{Q} 3, \mathrm{~B}-1 \mathrm{l} 3$; Q Kt-B3. White has given upa knight and a pawn for the sake of quick development and a very threatening attack, against which any alip by Black may lend to disaster.
Nowadays neither of these forms of the opening is in favour with the leading masters at chess: but they amples of two extrences in Modern practice devotes what are known as the


Cbess Board. Figs 1-4. Diagrams of board completed and in process of making
(lt, P×P: $4 \mathrm{Kt} \times \mathrm{P}$ ) The openings are intended to put the player in a good position for the middle game which, is the principal part of a chess match.

CHESS BOARD : How to Make. Fig. I shows a chess bnard which can be inexpensively made. The base of the hoard should be of three-ply wood surrounded by a fairly hold moulding; the base is rebated into the moulding, and the latter is mitred at the corner, while the facc of the hoard is covernd with the chequered playing squares.
With the playing space formed with $1 \frac{1}{2}$ in chequered squares the base will be 1 ft. square. in addition to which allowancc must be made for rebating the base into the moulding. so that the piece of three-ply wood required for the base must be $12 \frac{1}{2}$ in square, and it should be about in. thick The playing space consists of eight rows of chequered squares with eight squares in each row, sixty four in all. Half of the squares must lee cut from a light wond, and the other half from a dark wood. Holly and ebony will give the best effect.

To cut the chequered squares accurately and quickly, provide five strips of light woud, about 14 in . long by $1 \frac{1}{2} \mathrm{in}$. wide by $\frac{1}{8} \mathrm{in}$. thick, and four dark strips ul similar dimen sions. The stripy should then be glued up in the order shown at Fig ${ }^{2}$. After tho glue dry, one end of the gluedup strips should be cut quite square, and from it eight strips $1 \frac{1}{2}$ in wide ano cut, from which the com plete playing space may be formed. The chequered strips are fixed to the hase with glue as shown at Fig 3. care being taken to gluc the edges of the strips together as well as to glue the strips to the base. When the chequered strips are arranged correctly it will be found that there will be " surplus light square at one end of one strip and at the opposite end of the next strip, and so on, but there must be removed before the strips are glued to the base.
The moulding, which is mitred around the base, should be 18 in . wide by $l \mathrm{in}$. deep, and of a section similar to that shown at Fig. 4. Mahogany could be used for the moulding, and a piece of the section shown could be very easily worked by hand. A rebate or a groove is cut in the inner edge of the mould. ing, into which the base fits; the corners are unitred, and the moulding is fixed with glue. The best method of finishing the board will be by french polishing.

CHEST: In Human Beings. The important part played by the chest is sufficiently indicated by its position and the organis which it contains. Ailmente of the chest are of common occurrence and injuries to it may involve the lungs or the heart. and call for surgical treatment.

In men chest measuremient is regarded as a test of strength and stamina. Recruits for the army and navy, for example, must reach a certain standard in this respect. Tho chest measurement in most men varies from 33 to 40 in.

This region may be the scat of aneurian and of various tumours. Injuries of the chest may be slight and have no worse consequence than a bruise or a broken rib; or they may be anvere and result in damage to the lung,
the heart, or the covering membranes All scvere injuries require the attention of a surgeon. Until he arrives it is inportant that the patient should be kept warm, and in a state of complete rest.

First aid consists in tying a broad-fold triangular bandage mund the chest, the middle of the bandnge being placed over the broken ribs A similar bandage is then applied overlapping the first above or below, depending on the site of the fracture. A broad strip of flannel or a soft towel may bo used instead. and these are fastened with safety-pins The object is to restrict as far as possible the morements of the chest, but it is important that the bandage should not be firm enough to hurt.
Probably the most commun cause of pain in the chort is flatulent indigestion, and this often erronenusly icads the sufferer to bolieve that his heart is affected It is a mistake for anyone to try to make his own diagnosis The explanation of the cause of such pain must come from the doctor; in the meantime the patient should be placed at rest in the easiest position, and hot fomentations or a hotwatcr bag applied over the painful area.

Care of the Chest. Bestles indicatiny a good physique, a deep, well-expanded chest is a help to wearing clothes with distinction. Chest development by proper breathing can be augmented by the following exercises:

1. Stand with bead bent forward, shoulders and arms relaved : raise arms sidewiays ond atraighten back, letting the head an back with mouth open The cffort of the movement is concentrated between the shoulder blades, and the expansion of the chest Repest 6 timcs.
. Knecl and sit back on heels with hands clasped bchind, Head well back and chest expanded. Stil keepins head well back, hend the upper body iorwari until the chest almost touches floor in front of knees. Then relax upher body completely Gradually atraighten the back, the cheat and head being the las warts to be completely raised. and finlsh with ches well expmand
Exercise with a bainboo cane held hehind the shoulder blardes is helpful. especially if seated tailor fashion on the floor, as this position renders it impussible to hollow the back, and the shoulders must do their proper work in helping chest expansion. Send the cane to the right by straightening the right arm, and then to the left by straightening the left arm. Then raise the cane with both hands over the head and bring down to first position. See Adenoids: Bandage ; Breathing.

## Chests: Antique and Modern Pieces

Information of Value to both Connoisseur and Woodworker
The reader may usefully consult the many entrics that give practical advice to the amateur woodworker, e.g., Amateur Carpentry; Cabinet; Cabinet Making; Joint: Mortise

The chest is a development of the box. being neally a large box with a hinged lid. In addition to their obvious use for holding clothing and other personal and househnold possessions at home and when travelling, chestes were often, in the Middle Ages, used as seats.

These chests, however magnificent, were essentially boxes, but later they were raised from the ground by the addition of feet, and were used less than formerly for travelling purposes. Some were beautifully carved and ornamented with heraldic designs. Another class of chests, known as tilting coffers, were carved with representations of tournaments, or with figures of inythical monsters or heroes of chivalry. Examples are in the Victoria and Albert Musenm, S. Kensington.
Existing antique cheats are chiefly of the 16th, 17th and 18th centuries, although there are $a$ few of even earlier date, at which time they were a common article of furniture, serv.

wainscoting, way followed; thus earilier chests were carved in linenfold pattern, while the Jacobean cheats often repmoluce the pilastered and recessed oaken mantelpieces of that time. The three antique chests illustrated are of oak, the wood chiefly used for them in the 16 th and 17 th centuries and earlier, while mahngany and walnut were the woods selected for chests in the 18 th .
Fig. 1 is a finely carved specimen of English work dating from the 13 th century. Fig. 3 is $\Omega$ beautiful piece of work. This oak is heavily moulded and is inlaid with mother-of-pearl and ivury. Fig. 2 is a coffer of Inte 17 th century make showing a plainer style. It will be noticed that it is well raised on

|  | Long It. in. | Wide |
| :---: | :---: | :---: |
| 4 uprights (A) |  | 3 |
| 1 frint top mil (B) |  | 4 |
| 1 front hotiom |  |  |
| ruil (C). | 40 | 3 |
| 2 front inner uprights (I)) |  | 3 |
| 3 (ront panels |  |  |
| (E) . | 1.4 | 4 |
| Mould | 15 | 7 |
| $\geq$ upier end |  |  |
| 2 Inwer end rails (G) |  |  |
| $\because$ pranels. | 1 | 14 |
| Back. | 4 | $\cdots$ | feet, and slan that in the lower part ase two drawers, marking the development to chests of drawers (q.v.) which then were ousting the box chests.

Making a Chest. Fig. 4 shows a chest which can be made by the amateur, and will be suitable for the hall or for a dining room. The wond should be oak, stained to a rich
nut-brown colour and oiled, waxed, or Irench pulished to harmonise with the surrounding furniture In a quieter way some suggestion of an old effect can be obtained by finishing with red polish mixed with a small quantity of vegetable black Thuse who preter to make use of some other wood may be able to serve their purpose with birch or American whitewood, or something might be done with antin walnut. ash. or pine as subatitutes


Chest. sig. 4. simpie uning room caest which can following the instractions given below

The length of the top is 4 ft .3 in by 1 ft 10 in ., and height over all a full 2 ft . Size of box is 4 ft by 1 ft . 9 in. net. An elevation sketch of front and of end is shown at Fig. 5 and should be taken in conjunction with the sketch of parts at Fig 7 The uprights (A) should finish 2 ft . by 3 in by 3 in . If to Le fitted as pusts, but this part is frequently met with finished to a thickness of $1 \frac{1}{2}$ in to $1 \frac{1}{2} \mathrm{in}$. net They will be mortised for tenons on Iront rails to enter well home and be pinned, and the corresponding rails on ends are entered in a similar manner. Between the mortiscs the uprights are grooved for panels $\frac{1}{3}$ in deep
uprights are grooved for

| $\begin{gathered} \text { Thick } \\ \text { iuf } \end{gathered}$ |  |
| :---: | :---: |
| 3 or $1!$ | Bottom |
| 1) or? | ${ }_{\text {Lining }}^{\text {Lid }}$ |
| 11 or ${ }^{\text {\% }}$ |  |
|  | 4 ralls (.J) |
| 11 or $\frac{1}{6}$ | 3 jumals ( K ) |
|  | Stand (if reguired) |
| 8 | 4 4 uprights ralls (iront |
|  | buck) |
| $1 \frac{1}{6}$ or ${ }^{\text {a }}$ | ${ }_{8}^{2}$ raila (ends) |
|  | Mould |
| \% | 4 hall feet. 23 in . |

$\left(\begin{array}{cc|c|c}\text { Lnng } \\ \text { ft. In }\end{array}\left|\begin{array}{c}\text { Wide } \\ \text { in. }\end{array}\right| \begin{array}{c}\text { Thick } \\ \text { in. }\end{array}\right.$ The faces of uprights and rails (shown plain in Fig. 4) are often treated with scratch beady (Fig. 5).

The top rail (13. Fig. 7) is fitted from a piece 4 ft by 4 in . by $1 \frac{1}{8}$ in or $\frac{?}{\mathrm{l}} \mathrm{in}$., to be grooved for panels and for the entry of the inner uprights. It has shouldered tenons at each end The bottom rail (C) finishes 3 in by $1 \frac{1}{8}$ in. or $\frac{7}{8}$ in. The two inner up. rights (I)) take pieces 1 ft .4 in to finish 3 in. by $1 \frac{1}{8} \mathrm{in}$. or $\frac{7}{6} \mathrm{in}$. and are stubbed to rails top and bottom. The three panels ( E ) are allowed a size of $1 \mathrm{ft} .4 \mathrm{in} . \mathrm{by}$ 1 ft .2 in. hy ${ }_{8}^{5}$ in net for fitting These may be treated as plain or bevelled

mdicated witn three pancls at Fig 8 For this the stiles (II) take wo pieces 4 it 1 in by 3 in by $\frac{1}{6}$, and rails (.) four pieces ift 8 in by 3in hy i in.,to lse mortised and temoned together and pinned or wedged The framework is also grooved for the pianels to be fitted thush, Fig. !, allowance for panela heing 1 ft. 6 in by 1 tt. 3 in. hy of in lig. I3 shows fitting of back, and I'ig. 14 the jointing of front and end panels to prosto and inner uprights.

A Simple Siand. Those who would prefer to raise the chest ahove the ground, in order that the top may form an attrac tive side table, may con struct a stand similar to that indicated at Fig 10 The idea is usclul, too, for anyone already in posses sion of a chest of which the lower pait is dilapi dated, or where the plinth or legs have been short ened, making the whole thing rather squat. Such a stand can be 12 in high, and made with a

I'he detuil lor the panels shown in Fig. 4 is wel top, so that the cuest may drop in snugly. one that is casily nitred up of $f$-in. mould.

The two uppor end rails (F) are fitted from
 huttom rails (G) finish 3 in . wide to agree with the front. Both are tenoned to uprights and pinned-with panels grooved in, taking 1 ft . 9 in by 1 ft .4 in . by in net. The back is rehated into position behind and acrewed. It can be made up of threc hoards with the grain reversed and glued up, or (preferably) tongued and glued, using hardwnod longues. The botton is pieced up in the same manner and rebated to enter housings in front and ends. It may either be acrewed or glue-blocked under.

The lid should he tongued together, if marle up of lengths to the required width, 1 ft .10 in . a lining (Fig B) serewed on under can lap over the top edges of box at front and ends and serve ns a stop for drifting dust. The top, however, is best framed up in the manner

Details for making this stand, with secure joints for the rails and legs, are shown in Figs 11 and 12
legs (or uprights) take four pieces 12 in . by $1 \frac{1}{2} \mathrm{in}$. by $1 \frac{1}{2} \mathrm{in}$., or may be linished $1 \frac{1}{\mathrm{~g}} \mathrm{in}$. preferred. They may stand four square on the ground, hut are indicated at Fig. 10 as with 2 in . Hat ball feet dowelled in, of the type known as bun shape. The rails can be nllowed 4 ft .3 in . by 3 in . by $1 \frac{1}{\mathrm{~g}} \mathrm{in}$. for front and back, and 1 it .10 in . by 3 in . by $1 \frac{1}{\mathrm{t}} \mathrm{in}$. for ends, to be dovetailed inter uprights and he stilfened with braces in the angles as at Fig. 12 The brackets under provide some little finishing effect. They can be cut 3 in. by 3 in by $k$ in., to be dowelled and screwed into position. The mould, forming a lip edging behind which the chest (less its legs) will bed can be a $1 \frac{1}{2} \mathrm{in}$. by $\frac{\mathrm{in} \text {. section, glued and serewed }}{}$ as shown in Fig. 12. The cutting list is given

## The Chest of Drawers

## Construction, Renovation and Small Repairs

## See further Cabinet; Drawer; Dressing Table ; Tallboy; Wardrobe; also the preceding article Chest, and the entries dealing with the methods of the amatcur woodworker

A chest of drawers is in essence a chest into has there a further drawer, and the whole is which drawers have been fitted. For it the supported on five heautifully carved legs, three chest in ordinary use was made larger and the front cut away to admit the drawers

The early chests of drawers were of oak, and of walnut, veneered on oak or pine, dating from the time of William and Mary and Anne. The beautiful effects of the drawer-fronts were olitained by cutting and laying the wond in various directions. later in the 18th century mahogany became fashionable for these chests, and many fine specimens are in that wood. They are made by Sheraton, Chippendale and other great designers.

Of the two illustrations of antique chests given herewith, the first is of pino and oak veneered with walnut and lignum vitae. It follows tho conventional atyle in having two small drawers and two larger ones in the upper part of the piece, but the hottom is more claborate than is usually the case. The chest
in Iront, and two lehind, which in their turn rest on a plinth or stand. On each drawer are brass escutcheons and drop handles. The second is an example of Dutch work of about the same date. The supports of old cheats of drawers vary. Some are supported on a plintlı and carved legs respectively, but others rest upon short legs of a plainer kind.

A Man's Dressing Chest. The type of chest of drawers illustrated in Fig. 3 requires only a small space, and will be of special use to the man who likes a convenient glass for shaving. Tne chest is 3 ft . 6 in . high, having a useful set of drawers ranging from 4 in . to 7 in . deep. The glass is thus at a suitable height, and the whole article is not only neat and compact, but easily made hy those who have an average amount of cahinet-work skill. Oak is the most suitable wood to use, or, if inahogany be
preierred, the lower corner brackets should eft out and the leg pirtion tapered
The four posts should be prepared first. These are $1 \frac{1}{2}$ in square and are mortised to take the side rails and drawer rails, the top front rail lieing dovetailed as in Fig. G This dingram shows the top portion of a front leg with the top removed, the view being taken from inside the job. The prats are grooved to take the side panels, and the hack legs are also rebated for the back as in Fig. 5. The ends are glued together first and allowed to set hefore glueing the remainder If the job is to be atained a dark colour, it is advisable to put a little stain round the edges of the panels, so that in the event of their slirinking no white edges will become visible. The top dividing drawer rail is stub-tenoned between the two top rails, and all the rails except the botton are grooved to take the dust-hoards, as in Fig 6. The hottom one is rebated to take the bottom board, and is 1 in. thick. The draver rails measure $2 f$ in. by $\}$ in., and the runners $1 \%$ in by in.

Having put the carcass together, the runners may be fixed. These are also grooved for the dust-boards, and are fixed at the front by stub-tenons fitting into the grooves of the drawer rails (Fig. 6), and at the back anc screwed to the back prosts around which they are cut Note that thesc runners are in no way fixed to the side panels. To the tops of the runners the guides are screwed, being lengths of 1 in. squares, as Fig. 6 shows.

## How to Make the Drawers

The drawer fronts finish $Z$ in. thick, and the sides and hack if in., and all the parts are fitted separately to size. Fig. 7 shows the correct setting out for the dovetails An important point to notice is that the groove for the bottom is contained within the lower dovetail, so that this will not show a gap when the drawer is together. The total width of the back mensures from the top of the groove to the dotted line (Fig. 7), the top being rounded na shown. The bottom is fixed in a groove run along the drawer front. and at the side in grooved tillets with a rounded upper edge, as in Fig. 8; these are glued to the drawer sides. At the back, the bottom is screwed or nailed to the drawer back. It is usual to allow the bottom to stand out from the back, as shown so that if the bottom shirinks the screws can be talien out and the hottom pushed forward.

The top is moulded at the front and sides and overhangs 1 in. at the back to allow for the wall skirting. It measurcs 2 ft. $4 t$ in. long by 193 in . wide, nnd is fixed by screwing fmm undernenth. The aldition of the lower angle hrackets (glued and screwed) completes the lower part of the chest. The mirror supports are $1 \frac{1}{i} \mathrm{in}$. square, and are tenoned into the top, the rail being dowelled into them also the side brackets. The frame is mortised together and the glass fixed with wedges glued to the rebate (Fig. 9). The back board is screwed on, as shown. The glass swings on special brass movements made for this purpose The handles, of the drawers, if the jol, is in oak, should preferably be of the clrop type.

ConvertIng a Painted Chest. An old painted chest of drawers such as that illustrated in Fig. 10 is to he found in almost every house. If the paint has become worn, a practical plan is to strip the paint off and mount the chest on a stand. decorating the drawer fronts with mitred mouldings, and thus producing an attractive Jacobean chest (Fig. 11).
The plinth is usually attached with glue and nails, and strengthened underneath with corner blocks. These latter should he knocked off with a chisel before removing the plinth. The old handles, too, should be taken off The paint should then he cleanly stripper off, using one of the well.known strippers Every hit of paint should be got off, as when
later the job is stained any paint left on would prevent the stain from taking.

Any necessary repaiss may now he done to the chest, including lilling in the holes left liy the removal of handles andthe whole thuroughly glass-papererl, finishing olf trith No. I! Mouldings can lie purchased at a cabinet maker's store; either oak or deal is suitable For the chest illustrated about 60 ft. would be required. Mark out on the drawer fronts the position of the mouldings, and at the jutting portions glue on small slips of woorl $\frac{3}{16}$ in thick, round which the moulding is mitred (Fig. 14). The moulding inglued and pinned. and care must hie taken to iemove all surplus glue. The drawer stops must be removed and fixed further back to allow
the moulding to ntand on Iy alightly forward from the carcass of the chest

The stand may now be procecded with. Allowance must be made at the front and two sides for the moulding shown (Fig. 13), inside which the chest stands. The stand is mortisel together as in Fig. 12, using 2 in. stuff for the top rails and $\frac{1}{2}$ in for the hottom rails. When $t$ his has heen glued together and is quite dry. clean off the top and place the chest upon it in the required position, and lix the moulding round ; this will cnsure its fitting accurately. The moulding should he glued and pinned to the stand only, so that the chest is always free to he lifted off. The joh is now ready for staining: dark walnut water stain is the best to use. Afterwards polish it with wax, and tinally fix the brass drop handles.

Repairing a Chest. The illustration (Fig. 15) is an example of an old mahogany chest of drawers of the general type that any amateur might lie called upon to repair. The chest top is vencered with one sheet of mottled mahogany. the grain of which runs lengthways of the chest. The veneor is laid
unon yellow pine top (or core as it is termed), and this top has clamped ends similar to a draw. ing hoard. The edges of the top are cross-banded by glueing on ${ }_{a}^{3}$ in. solid mahogany strips, these being alterwards rounded off to give a finish to the work.
The caroass ends are of solid mahogany of the straight - grained varicty, commonly called bay wood. The front of the chest immediately under the top shows a


Chest of Drawera. 1. Example of English desirn, made in the late 17tn or eary fotu century. It is of plae and oak, veneered with walnut and lignum vitae. 2. Antique Dutch chest of drawars, with bowed front

1. Dictnrla \& Albert Muxeum, S. Kensinuton: 2. courlesy of Our Hones if Garilena
wide bearer rail, veneered with mahognny glue hardens would he obtained by using two curl vencers, jointed up to olitain the handscrews or G cramps, which would span neccasary width across the carcass front. across the drawer front. The edge of the bead The draiers have their fmnts vencered with should be hodicd up with french polish before mahogany curls, and small projecting cock lixing in pusition.
heads have been litted into rebates at the ends, At the top edge ol the drawer (Fig. 16 B) is but are simply glucd on to the top and bottom shown the method of letting in a small piece edges. The plinth or lower part of the chest of new wood to replace a bruised or damaged has been made in a separate portion, screwed portion, where it is not thought desiabibe to to the carcass.

One of the commonest repairs to an old chest re-fixing the lock, etc. The new piece is made of drawers is the renewal of a cock bead which to a dovetail shape and laid on to the existing has accidentally heen damaged by splintering head: then a mark is scratched around it with a piece out of the drawer, or the replacing of a needle or sharp penknife point. This will give a amall portion which has bcen broken during the exact size and angles of the new ploce, and romoval operations. Fig. 16 (A) showa a new the recess may be anwn and carefully pared out length of heading made out of a piece of old with a chisel. The new piece sliould be made mahogany. It is ready to be glued to the rather thicker than required, so that after bottom, and its mitred ends have heen cut fixing, a ahaving or two may be removed, this and tried in position. The lower edge of the leaving all Hush. The top edge will then have drawer should he carefully scraped to remove to be glass-papered, stained and polished in all trace of the old glue. The necessary pres- the required colour.

Owing to constant friction, tho lower edge of the drawer sides hecomes worn away as in. dicated by the line .lrawn on the side of Fig. $16(\mathrm{C})$. This allows the drawer to sag and thmes the front out of truth with the face of the chest. This shows an unequal margin of the cock bead. and alan canses the drawer to rint hadly. Drawery that have their lower edgen hadly worn should lie turned bottom upwards on the bench and the won portions planed away as indicated by the line at Fig. 16 . The planing will not


Chest of Drawers. Figs. 10-14. Palnted chest of drawers and diagrams showing bow it can be transformed into a piece of furniture in Jacobean style
interfere with the drawer bottom, which stands clear of the lower edge of the side by anything from in to in. A new piece. preferably of hardwood, is glued on to the existing drawer side and cramped in position. After, say, 24 hours, the surplus material may be planed off the newly-jointed piece. taking care to mark it out and make it parallel to the top edge of the drawer.

In other cases it may be found that the runner or piece that supports the drawer shows signs of considerable wear, and the remindy for this is to replace the worn runner with a new one. Runners are fixed in two ways, and it will be found that in most' of the old chesta a groove has been cut across the carcass end, as illustrated in Fig. 17, to receive the entire thickness of the edge of runner. This groove is generally ahout $\frac{1}{t}$ in deep, and the unner is simply glued into it. The end of the runner has a small tenon to engage the back edge of the front bearer. The partitions or dust-boards fit into the grooved edges of the bearer and the runners, and preclude any possibility of the runners working out of the grooves cut in the carcasy ends

## Another Method of Fixins a Runner

The lower part of Fig. 17 illustrates the second methor of fixing a new runner, and in this case no groove has been cut in the carcass end. The tenon on the runner is glued into the bearer gruove, the opposite end notched out and prepared to receive a screw. A dab of glue is applied to the carcass end as indicater hy the arrow. If the back edge of the runner be glued along its entire length, it does not allow for any contraction or expansion in the carcass end, and this will often cause a fractured or open end joint.

Fig. 18 slinurs such a fractured end, and, as it is practically impossible to knock the chest asunder and re-joint the end, it is necessary to glue into the crack or joint a small strip of wood with its end section wedge-shaped. If the fracture follows the general contour of the grain and a straight strip cannot be conveniently applied, the atrip will have to be cut into short lengths of say, 6 in ., so that they can be easily bent to the shape. Care must be taken to joint up the ends of the strips so as to leave no open joints. The job is thell cleaned off level and polished.

Another common repair is a broken foot Fig. 19 is a part sketch of a plinth which has been taken off the carcass and turned up side down The repair is carried out by cutting away the broken portion of the old font, until the new joint is in alinement with the top of the straight portion. This will allow the bull-nose plane to be brought into opera tion, so as to plane up the major portion of the joint, after which the existing mitie and comer block are scraped by using a toothing plane blade which has been temporarily reinoved fmm its stock. A new piece of woud is planed true on its lower edge, and the end is nitred This piece is glued in position and handscrewed down, whilst two ordinary screws hre inserted from the back of the corner block to secure it. When the glue has thoroughly set, the new piece is cut to the desired shape with a bow saw, as shown hy the dotted line. A fine sprig or panel pin may be driven in the edge of the shaping, as suggested in sketch. after the foot has been out to shape.
Fig. 20 shows how to effect a repair to a piece of braken veneer which has formed a cross-hand on the wide top benrer of the chest. Using a ateel rule as a guide to the penknife blade, a deep incision is made and the old piece of veneer removed. This may be accomplished by damping a piece of rag and placing it upon the damaged veneer. A hot iron is now applied to the rag, and the steam sn generated will soften the old veneer and glue to auch an extent that it may easily be peeled awny.
A now piece of mahogany curl veneer is fitted to replace the damaged part and is laid by the caul method. The caul in this case may be a piece of yollow pine wood which has been planed up and rubbed over with raw linseed oil. It is heated in front of a fire, and a piecc of clean white paper is placed hetween the caul and the glued veneer. The pressure is applied to the work by the handscrew, as shown. The work will in due course be levelled up with the steel scraper, after which it is glass-papered and
 polished. If
old curl veneers which have been cut forsome years he used, it will save much time and match. ing up when the polishing is commenced.

Fig. 21 re-
presents one
corner of the
chest where
the crosa-banded mould and the veneered top have been broken away. To repait this a cut is made across the corner and the old veneer removed by the methorl above deacribed. A suitably grained piece of veneer is selected and laid in position by the caul and handscrew mothod. A day later, a piece is glued to the oross-banded edge, and in due course it is rounded of to shape with a block plane.
The polishing and colouring up of the repaired portions of antique furniture call for great care on the part of the worker.
CHESTERFIELD SOFA. Stuffed all over, back as well as sides, to seat two or threc persons, this comfortable atyle of sofa is sometimes supplied with added loose cushions, which should he soft and resilient, while in some makes one end is adjustable to cnsure greater length for reclining.

In selecting a chesterfield it is necessary to get a good quality guaranteed by the name of the firm to be of gond workmanship, since it is not possible, even for an expert, to judge of the durability of the sofa in its finished atate, but any basic faults will quickly show through. The framework of beech or birch, the hracing of the frame, the spiral springs, the wehbing, all lie hidden beneath the upholstery, and it is upon these unseen parts that the lasting quality of the sofa depends The frame must be of well-seasoned timber, hirch being used in the best work; the spiral springs must be of well-tempered steel, and the workmanship should be of the highest standard.
The covering can be of various materials. according to the room in which the sofa is placed. For a lounge or living-roon, velreteen, velvet cord, tapestry, a durable nioquette, or a similar fabric of heavy weave, are suitable; for a drawing room, damask or veivet. This sofa is not suitably covered with any fragile material as it is usually selected for comfort and service.

How to Make. Dinensions for the chesterfield shown in Fig. 1 may vary slightly in length for individual requirements, 5 ft . 6 in. over all when finished being about the smallest useful size; 6 ft .6 in . the size most frequently met with; and sizes up to 8 ft . or 9 ft . for halls, institutions or ballrooms. The length for framework (Fig. 2) in the present case is put at 5 ft .6 in .; height to top of end posts, Ift $10 \frac{1}{2} \mathrm{in}$. or 2 ft ., to include castors : height of front rail (seat), 8 in . : and depth of sent, front to hack $\rho$ ver all, 2 ft. 6 in . to 3 ft . for a laige size. Settec frames of the chesterfield aize vary in detail according to the chatacter of the furniture they go with, but for a fixed end settee, the franie (Fig. 2), of which


Chest of Drawerg. Fig. 15. Example of an old mabogany veneered chest of drawers, a common type to require repair. Flgs. 16-21. Diagrams illustrating bow various simple repairs can be eflected
make. The woods generally used for fiames are beech and bircli, but pine or American whitewood could lee used for parts, the show


Fig. 3 gives a diagram of an adjustable head. The sectional view shows the head ercet with dotted line of stuffing, together with a dotted line of head lowered to a reclining position. All that is necessary to operate the action is to lift the head slightly, which disengages it from a bottom stop-rod, and allows the head to revolve to a lower angle, where it is stoppled by the extension piece hearing against a rail fixed for the purpos finm side to side of the box seat. The whorl limiu which these head scrolls are sliaped sliould be about $2 \frac{1}{2} \mathrm{in}$. thick, preferably of handiwod. to counteract any undue strail.
wood (in this case tho legs) being in onk, walnut or inahogany, as an improvement upon staining to match exist. ing fumiture.

In making a start with the setfec frame the front prosts ( 1 ) will be cut from 4 in by ( in., the rounded or scroll portion being made $\quad 11$ lop an extension piece to project $1 \frac{1}{2} \mathrm{in}$. or so, dorrelled on. This post is flush with front of settee, but in soinc instances is slinped or set back a few inclics from the front edge of seat rail, separate stumps (eitlier tumed or tapered) being jointed into the sent framing. The front rail ol seat (B) is $\$ \mathrm{ill}$. by 3 in ., preferably tenoned into ןosiion, but sometimes dowelled It is shown as straight, but is often whaped to break forward ns at $X$ (Fig. 2). The end (C) and back seat rails can lic somewhat lighter, 3 in . or $3 \cdot \frac{2}{2}$ en fill by ill. The scat frame should be boxed in at ends ancd or dowelled at front; shaped por. to a height of about $\bar{\delta} \mathrm{in}$. clear above ground. fions at comer are separntely worked and dowelled into position.

For the back legs (D) $\mathbf{2}$ in. by 2 in. matcrial will be required, the legs being continued to tho ground. If preferred they may finish into the back seat rail and have separate shaped legs dowelled or bridled into the sent framing. The top lack rail (E), 4 in . by 2 in ., has the centre upright at back (F) tenoned into it and into the sent rail, size for this and the centie stretcher (G) being 3 in by 2 in., the latter being dovetailed and serewed to the seat rails from lelow. The stretcher is sometimes aliaped with a dip or bend in the centre, or its place may be taken by one or two stout iron rods similarly slinped and werewed between the seat framing back to front. The stuffing or tacking rails (H) are made to finish 1f in lyy lif in.

## How the Adiustalle End is Made

I framo made to the foregoing sizes will be fairly stout for the size ( 5 ft ( i in.) mentioncd with lised end. I chesterlield settee frane, however, is nowndays usually made with one or hoth ends adjustable to let down to the seatlovel and serve as a lounge. In this manner the framing of Fig. 2 would have a similar upright to 1 built into the hack framework, as shown in dotted line ( $J$ ), and a separate head framing on the lines of $A, E, H$, hinged to let down. There are several head adjusting actions on the market, some of which are obtaimable through cabinet makers' sundriesmen; but, as a rule, they are somewhat complicated for the ainatcur to deal with Detajls of one are shown which would be of assistance to the average worker in making his settee with drop end, the best way leeing to inalic a smaller model in thin wood, so that the method of action is clearly understood. lefore cutting up good material


Chesterfield Sols Fig. 1. A comfortable sols which can be made by following the directions given in this article. Figs. 2-5. Working diarrams, including details of alternative dron end
tapered block, P, glued to the bux end will serve as a guide for the horn to slip bsick to its position after being lifted:
An enlargement of the end viers of the rods on the lower portion of the scroll (Fig. 5) indicates the stop rod $\mathbf{N}$, bedded ints, the bos sides to about two-thirds of its thickness, and the pivot rod M, passing through scroll and sccured by burring over on a washer, which may be thin and slightly sunk. The position of sheet iton braclicts is made clear at L, Fig. $\overline{\mathrm{J}}$. By a little manipulation it would be possible to obtaill an angle of adjustment for the hearl midway between the extreme points indicated by the foregoing, fixing being in the course of the dotted line near L, Fig. jo Sce Divan Ottoman : Settee: Upholstery

CHESTNUT (Spanish). The Spanish or swect chestnut, with green serrated leaves, grows up to ( 60 ft . in height. When ripe, the nuts are brown and glossy, but sweet and not bitter like those of the liorse chestnut (q.v.). This tree likes $n$ loamy soil with sand rather than clay. Propagation is by nuts sown in autumn or spring.

CHESTNUT: The Wood. 'Therc are tivu rarietios of wood, differing very much in chirracter, produced respectively by the horse chestuut and the sweet or Spanish chestnut. The lirst is a light. solt, spongy wood, which loses nenrly half its weight and a considerable nenount of its bulk in seasoning. It is used for turning bobbins and other small articles. Ior carving, packing cases and also lor mugh outdoor boarding where durability need not be considered.

The swoet chestnut is a more valuable woon, and is the onc in general use, being ensy to work. Comparntively hard and heavy, it somotimes serves ns a substitute for onk. In rough earpentry it is employed 'or fencing. palinge, pilcs, beams; also for colfins, door and window sills, in cabinet making and for fretwork. Ladders. small casks and hoops are amongst the innumeratile articles that are made with the wood of the Spanish chestnut.

CHESTNUT : In Cookery. Of all nuts the chestnut contains the least oil, is pmbably the most digestible, and many dishes une made with it. It is also employed in atuffing lor poultry and in sauce. To buil chestnuta, make an incision in the skin of each nut and put them into a saucepan of salted, boiling watcr. Buil thein for about $\frac{1}{2}$ hour, drain, and iemove the shells nad re-heat the nuts in a little butter.
If chestnuts are boiled for a few minutes beforo being roasted on a shovel over a goord fire, they will be cooked through to the centre instead of being done merely on the outside. as is so often the case with roasting
A savoury dish is prepared by mixing. onc cupful of boiled chestnuts, mashed and sieved, with the same quantity of mashed potatues, 1 oz . of butter or margarine, a teaapoonful of grated onion, and a little salt and pepper. Butter an au gratin dish thickly, fill it with the mixture, nad sprinkle the top with breaderumbs, together with 2 oz. of butter divided into small lumps. This quantity is sufficient for one or two jersons only
Chestnut Sweets. In order to minke chest. nut charlottc, cut some sponge cakc into a round about 2 in . thick, spreading the outside colges with a little royal icing, and fixing around it about 2 dozen savoy finger biscuits. While these are setting, put 1 lb chestnuts into boiling water, boil them for 10 min ., then remove the outer shells and inner husks.

Break the nuts into picces, put them in is pint of milk, together with 2 in . of vanilla pood, and stew them gently until they are soft. Then rub the chestnuts through a wire sieve, and mix the puree with is little castor sugar to taste, it gill of cream (whipped), 1 teaspoonful
lemon-juice and 3 oz nurrons glacés each sut in aboul eight pieces.

Put the mixture into the prepared casc, whip. sweeten and flavour annther gill of cream. and force it over the top of the mixture, using a large rose pipe and raising the centre well Decorate the top with pieces of glacé cherries and eryatallised flower petals.

Another attrantive rweet for a party is chestnut trifle. The ingnerlients are $A$ square sponge zakes, I lb cheatnuts, a little white wine, anme apricot jam, \& gill cream and sume custaid. Buil the cheat-nuts. akin and mash half, and nix them with 3 tahlesperonfuls of apricent jain. Leave the remainder of the nuts in hat water. Cut the sponge cakes open, spread them with the nut and jan mixture, and arrange them in a glass dish, sonking them with two tahlcsponnfuls of wine, or fruit syrup may be used in place of wine.

Cover the whole with a good thick custard. and when the latter is set. shell the remainder of the nuts and press them through a large-hnled sieve so that they fall like threads over the custard, leatving jlain $n$ round central apace.

These give character to the trifle. The central spare is then filled with whipped cream. See Christmas: Marron Glacé ; Royal Icing: Sauce: Stuffinц.

CHEVAL GLASS. The name is applied to a mirror swung between uprights which form a stand. The mirmr frame is made of 1 in. stuff, it in wide inoluding the moulding and is mortised tugether. The rebate for the glass is on the same level as the quirk of the m:sulding (Fig. 2), so that both the tenon shoulders will be level. the moulding on the mortised pieces being cut away. When ordering the glass allow the size to be $\frac{1}{16}$ in. small all round. Hig. 2 shows how the glass is secured by glueing wedge-shaped pieces to the rebate.

Glue the frame together and clean up and prepare material for the back. The panelsare ${ }_{1}{ }^{3}$ in. in. thick and the crosspieces $\frac{8}{8}$ in., thesc being grooved to take the panels. The vertical rail is in two pieces, tenoned into the other at the centre, and hoth are screwed to the frame.
As it is necessary for the panels to fit right on to the frame the rails are cut away, at the ends, on the underside, just the depth of the bottom flange, as in Fig 4. Screw these in position and fit the panels, rounding off the edges to give a lighter appearancc, and mark-


Cheral Giass in waluut, Queen Anne style
Courtesy of Harrods. Lid. on the inside their relative positions, so that they may bo replaced in the same places.

The uprights for the atand are 1$\}$ in. aquare and are chamfered at the edges as shown, the top being out to a finial shape. They are tenoned into the feet as in Fig. 5, the tenons being wedged from the underneath to give greater atrength. The feet are cut from a block of wood each ineasuring 16 by 3 by lif in. The corner lirackets are fixed after the uprights are glued, and fit into small grooves out to take them. The rails joining the uprights together are tenoned; the length is obtained from the mirror frame, an extranallowance being made so that this will swing

Irerly without touching The small centre ornament is stub-tenoned into the rails and


CHEVIOT CLOTH. Scottish tweed manufacturers used to make their coarser tweeds exclusively from Cheviot wool, and in order to make softer

The frame should be carefully polished before fixing the glass.

To fix the glass lay the frame flat on a lable and put the glass in position, being careful that it is right down in every part. Glue the wedges all round about 3 in . apart (the wedges are each about 1 in . long) and allow to remain until quite dry. The mirror is hung upon special brass movements which screw to the frame and stand. By turning a thumb. screw the glass is made to remain in any position. See Dressing Table; Mirror.
Chickens: Their Incubation and Rearing Advice on Raising Birds for Egg Production and the Table
Further information will be found under the heodings Coop; Incubator; Poultry. Sec also
Boning; Casscrole; Curry; EgR; Fowl; Soup and other cookery corries
Boning; Casserole; Curry; ERR; Fowl; Soup and other cookery entries
In the incubation of eggs, whether naturally hen should be allowed off the nest once a day under a hen or artificially in an incubator, for food and water, regularly at the same hour the first easential to success is strongly ferti- every morning. Sometimes a hen will refuse lised eggs. Where the number of chickens to leave the nest, in which event she must be deaired is not large the broody hen will suffice, but for more extensive operations an incubator is a necessity.
In the selection of a broody hen great care is necersary, as it does not always follow that because a hen clucks and takes to the nest she will prove reliable. Birds with nonsitting blood in their veins should be avoided. Pullets, too, are not always to be relied upon, and it is advisable to choose birds that are two years old or over. In sitting a hen nighttime should always be chosen. The nest should be made on the ground in a sheltered corner of a shed or outbuilding, and so placed that no other hens can have access to it. It is hest made by scooping out a saucer-shaped hollow, pressing it evenly down and lining it with straw.

The number of egga to be set will depend on the size of the hen. A small bird will cover 10 ; a large onc 15 . While sitting, the
gently lifted off. After this has been done a few times she will act for herself. She may remain off for a hout 20 min .

The food of a sitting hen should consist of maize, clean fresh water and grit being always within her reach. Should any eggs get accidentally soiled they must be cleansed with tepid water, and the nest material, if similarly soiled, should be renewed All being well, the cbickens should make their appearance on or about the twenty-first day.

Artificial Incubation. This is a more complex proposition, everything, apart from the eggs, depending on the capabilities of the machine used and the cere exercised in working it. In a amall way a 50 -egg machine may be quite large enough, but when it is desired to incubate a large number of chickens. one of at least $500-\mathrm{egg}$ capacity will be needed. For the average poultry-kecper, however, a $100 \cdot \mathrm{egg}$ machine will supply every need.

The mechanism and working of an incu bator is explained in the article on Incubators A good machine having been obtained, the first thing to be considered is where to locate it. A cellar offers many advantages; but wherever it is placed, the temperature must he even there must be no dircct draughts and no fire The machine should atand perfectly level and as firm as possible to ensure againat vibration. The mode of working the incubator will vary according to the principle on which it is constructed, but every maker sends out full instructions. The temperature is the same in all cases, namely, for hens cggs , from $103^{\circ}$ to $104^{\circ}$, reduced to $102 \frac{1}{2}^{\circ}$ the last seven days: and for goose and duck eggs, $102^{\circ}$ throughout. The eggs require to be turned regularly once a day, and it is as well to keep the large end uppermost. As the chickens hatch they are allowed to dry, and then removed to the brooder

Testing the Eggs. In both natural and artiticial incubation, the eggs should be tested for fertility by means of an cgg-tester An infertile egg will be perfectly clear, while all egg in which the germ has started to incubate and dried will appear thick and cloudy. A rotten or addled egg will appear black, but the fertile egg will exhibit small veins radiating from a dark red centre. The testing operation should take place on or about the seventh day, when all infertile eggs should be removed, and if in an incubator, replaced.

Immediately the young chick emerges from its shell, whether it is hatched under a hen or in an incubator, it requires air and warnth to dry completely ito down and to expand its lungs. Unless the hen is very nervous and resents interference, the shells should be removed from the nest as the chicks hatch, as otherwise an empty shell may cover up the chipperd air-hole of a hatching chick and smother it before it has time to free itself

There 18 not the same necessity for so much care with an incubator, as the eggs are less crowded, and in some cases there is an arrange ment by which the young chicks in struggling towards the light drop into the drying chamber In other makes the chickens will need to be lifted into the drying box or drawer shortly after they free themselves from the shell, and as soon as they are properly dry, and if they scem strong enough, they can be again shifted into the warm foster-mother or brooder Chickens hatched under a hen may be safely left with her in the nest for 12-24 hours from the time they leave the shell, but if she is clumsy or nervous it may be advisable to remove them earlier.

A coop having been prepared and previously disinfected by lime-washing or other method, the hen and her brood may be carefully removed to their new home. The hen should be lifted from the nest first, and the chicks carried in that, or an old hat, basket, or even the lonse pocket of a coat. In cold weather it is an advantage to use a small rather than a large coop, as the hen will have less mom to scratch about, and will brood the chickens better. It should face south and he protccted from cold winds by a hedge, fence or wall. if possible.

Day-old Chlcks. Many chicks are sold when 24 hours old. It is a good plan to place them on arrival in a brooder heatert to as near $95^{\circ} \mathrm{F}$. as possible for an hour or two. If no brooder is available, the birds inay be placed in a flannel lined basket reason ably near a fire. They should then be given a feed of warm stecped oatmeal or biscuit meal, and a little warm milk to drink. If the chicks have travelled a considerable distance, the best results will usually be obtained by rearing them under liroody hens, if a vailable. One or two chichs only should be given to a hen at first, and if she takes kindly to these the remainder may be alipped
under her wings. The ben should have heen sitting on "pot "eggs for some days before the arrival of the chicks
Management of a Brooder. The brooder or foster-mother is used when it is not always posaible to make use of a sitting hen. The ordinary brooder usually consista of a heated chamber which is connected with one or more outer chambers or chicken-runs It is of the greatest importance thint the brooder should be so constructed that the temperature is always kept equable thiroughout, and should be completely free from fumes at all times This latter specially applics to those corners of the brooder into which the young chicks are likely to crowd. Finally, it is essential that hrooders should be kept quite free from damp.

In most brooders the heating medium consists of a lamp, and in some types this lamp is placed outside the heated chamber und is rendered lireproof by the piovision of a jacket made of ashestos. In another type the brooding chamber is heated by means of a hot water tank, or by a circulating hotwater tube, which is run all rolund the inner walls. In a third type of brooder a hot-air tank is litted. This tank is heated by means of a lamp. The position of the lamp should in any case be so chosen that the fumes rising from it can be carricd away immediately.
$r$ Tho heat should be gencrated in such a way that the floor is properly warmed. Otherwise, if there is not a proper provision for warmth at floor-level, the chickens naturally crowd together in order to keep warm, nnd the strongest will climb on the backs of the weakest and either crush or suffocate thom. One way of making provision for such bottom heat is by means of a lamp which is placed in the centsc of the brooding chamber. The inner roof of this chamber is made of metal and forms a radiator. The heat which rises from the lamp strikes this metal roof and is reflected down to the chickens.

The newly hatched chickens should not be transferred to the brooder until the latter has been properly warmed. The brooding chamber should be prepared for their reception by heating it for one or two days. This heating will get rid of any damp which might have accumulated owing to winter storage or from any other cause Any dampness would
mean a targe mortality in the young chickens For the first week that the chickens are in the brooder the temperature should be kept as near $\left(\mathrm{GH}^{\circ}\right.$ as possible luring the second week this temperature may be gradually owered to $85^{\circ}$, and during the thind week to $80^{\circ}$, while during the fourth and the following weeks it should lie kept near $70^{\circ}$ 'Too much heat is as bad as too little A part from the use of the therinometer it is generally presible to tell to within a small degree whethet the temperature is too hot or too cold II the temperature is too low the chickens will invariably huddle into the corners of the browder or round the inmp and will utter plaintive cries: if the brooder is too warm they will gasp for breath and lie buddled about in a listless fashion on the lloor. Over. crowding of the brooder inust always be carefully avoiderl. As a genera rule, it will always be advisable to keep well within the number of chictiens specifierl by the inaker of the appliance as its full capacity

## Benefits of Scratchin\& for Food

The covered run adjoining the broorling chamber is usually converted into a scratching medium by littering the lloor thickly with cut chaff, a mony which dry chick food is scattered. This is an important pait of the rearing of chickens, since scratching for the food induces exerciae, generates natural warmth, and so keeps the chickens in fit condition to withstand any sudden changes of temperature, which are not always possible to guard against quickly. On sunny days, when the chickens can be conlined to the outer run, the brooding chamber should be opened up and exposed to the rays of the sun. As the season advances and the chickens outgrow the necessity for a heated brooder, generally at 4,5, or 6 weeks, they may be tiansferied with safety to a cold brooder

The ordinary cold brooder comprises nothing more than $n$ slceping compartinent and a coverel outer run. The sleeping chamber should be well ventilated, but it should be so constructed that no currents of air can play directly upon the inmates, and there should be just enough room to enable the chickens to huddle together comfortably for warmth. The floor of the cold brooller should be of


Cbicken. Oil-heated foster-mother or brooder, a useful appliance for rearing chickens when a sitting hen is not available. Adjoinlar the brooding chamber is a covered run

Courlesy of Sprall's loatent, LId
earth, above which a good Inyer of cut chat or peat moss litter is placed. and the floor of the outer chamber should be covered in a similar fashion

Feeding the Chicks. Chopped hard-boiled aggs and hreadcrumbs may be given 24 hours from the time they hatch, and this may he repeated 3 or 4 hours later At 48 hours old they can have fine chick leed, which will encourage them to scratch and excreise. Sawdust, sañd. or peat moss litter broken up fine, laid on the floor of the coop, when they are moved into it. will greatly encourage them to scratch, and will prevent them getting cramp. A wooden floor is always anlvisable if there is danger from rats, and will also keep them dry

From 2 days old they should be ferl every 2 or 3 hours from dawn to dark, and fresi, water may be given in a shallow pan, too shallow for them to drown themselves in If there is any danger from cats, rats or other vermin, it is advisable to attach a small wire run to the coop

## The Importance of Exercise

The ben should not be allowed to leave the coop at first, but the chicks can in this way obtain ample air and excreise without danger from vermin, or the possibility of the mother giving them too much exercise. It must be soen that the chicks have no difliculty in returning to their mother, and any difference in the height of the coop from the ground must be regulated by a brich or piece of wood.

The same carc should be taken with the foster-mother or brooder, and in both cases the chicks should always be shut in at night The coop must be cleaned regularly and all stale food and refuse matter removed. After the first 3 days an unlimited supply of fresh, clear water can be given. Special jars are obtainable which automatically regulate the supply of water, but mako it difficult for the chick to foul it or drown itself. Fine limestone grit in ama! pannikins should also be given If the weather is cold and damn and there is a tendency to diarrhoea, boiled rice once or twice a day will help to check it.

A grass orchard or small paddock or lawn is excellent for rearing chicks, as they will then have plenty of fresh green food, and ample shado ir very hot weather When possible, ground that has not had other poultry rumning on it for at least 6 months should be used The young chickens will then be healthy and less pronc to discase.
The feeding should he supplemented by coarser grain and chick feed as the chickens grow. Biscuit meal with a little meat meal may also be given. Some poultry raisers prefer to scald and give this slight!!y moist. whilst others-and this is the better mothod -dry it after scalding by mixing it with a little meal, such as Sussex ground oats. Dry foeding is much employed, i.e. a dry mash placed in pans or boxes, with a plentiful supply of fresh water always available. In a warm, dry season the chicks may be taken from the hen or foster-mother at 6 weeks old, but it is often better to leave them till 2 months old, unless the hen begins to lay again, when she may preck them.

Pullets and Cockerels. As soon as the sex of the chickens becomes apparent, e.g. from 2 to 3 months, according to the rariety, they should to separated and kept in different runs. From then onwards they are termed cockerel or pullet, and though they reach maturity from ©-8 monthis, these terms are applied until they attain their second year. Frame, not fat, is the aim of all successful chicken-raisers, and especially is this applied to pullets, many breeders using only grain and green food for these until they approach laying, when a wet or dry mash may be used once a day. Cockerels thrive on tit-bits of all kinds, scraps of moat.
etc. A mash of I part meat meal, I part pea or maize meal, I part supers and I part bran will he found very uscful. Susses ground oats. wet or dry, unay he given as a change.

Wheat, oats, barley and buckwheat are the favourite grains for rearing. but it is better to give a feed of one variety. with periodical changes to others, than to give all varicties in one mixture. Maize or Indian corn is fatten ing and warming, and should be used when it is clesired to supply these curalities. Cleanliness, regular and suitable feeding, dry housing, air and exercise are necessary in rearing of chickens

How to Cook. Chicken may be cooked in many ways, roasting and hoiling being the conmonest 'To roast, $35-45 \mathrm{~min}$ ahould be allowed, and the oven must be hot for the firat 10 min of cooking, and maintained at a molerato heat for the remainder of the time.
Sausage-meat or veal forcemeat can be used for stuffing the chicken, and its nddition makes the dish go farther The breast of the hird should he stuffed with the forcemeat, and a greased paper placed over it.
'The chicken should be trussenl. and small alices of hacon laid carefully over the breast It should be placed in a baking-tin in the oven, with some good beef dripping, and frequently hasted while cooking. When half. cooked, turn the bird over nud brown the back, then after 10 min . turn the breast uppermost again. While the hirr is roasting, the liver and gizzard should he put to simmer in ahout $\frac{1}{2}$ pint of well-scasoned stock for the making of the gravy.

When the clicken is cooked, skewers and string used in trussing should be removed, and the bird placed on n hot dish. 'The fat should be drained of the baking-tin, and the prepared stock poured into the tin and boiled up for a few minutes. It may be coloured with gravy colouring and more seasoning added. The gravy should be strained into a saucetureen, and hread sauce sorved separately, while whtercress, washed and drained may form a garnish

## Improving the Flavour

'T'o boil a chicken, first truss it, then rub it all over with half a lemon, and tic over the breast 1 slice of fat bacon, cutting a few alita in the latter to prevent it from curling up. Wrap the bird in a piece of buttered paper; then wash and prepare $\xlongequal{2}$ onions. "t carrot, a tumip, and 2 sticks of celer!, cutting all thesc into halves and putting them in a large stewpan, together with n bunch of mixed herbs, 3 cloves, and 4 peppercorns tied in a piece of muslin. Pour in enough hot water to lill the pan nbout half full, and put it over a noolerate fire. When the stock boils. put in the chicken and let it simnter very gontly for 1 to $1 \frac{1}{2}$ hours Then take the bacon from the breast, remove the greased paper, and wipe the bird with a clean cloth to rid it of greasc. Serve the chicken on a hot dish with egg sauce poured over it.
Chicken may also be fried, a good method being to cut the fowl into nent joints and remove the skin, afterwards dipping them into a mixture consisting of 2 tablespoonfuls of thour, I teaspoonful of salt, and a dust of pepper and cayenne. Mclt 2 oz. of bcef dripping in a small frying pan, put in the pieces of chicken, and fry them until they are golden brown on cach side. Keep them hot while 5 or 6 neatly cut pieccs of bread are ficel in the same fat; then slice three tomatoes, fry them for a couple of minutes, and lay them on the slices of bread. placing a piece of chicken on top of each Garnish the whole with small bunches of well washed watercress and chopped parsley.

Ideas for Re-cooking. The remains of roasted or boiled chicken can le minced. To I Ih. of finely chopped chicken allow' 2 oz . margarine, 2 oz. flour. I pint stock, and some poached
eggs. The stock can be prepared from the hones and trimmings of the chicken. Stir the flour into the margarinc melted in a saucepan, add the stock, and simmer the whole for a hout 15 min Seasoning should lie added, and the chicken then placed in the stock. Leave the pan by the ride of the lire until the bird is thoroughly heated, and serve it garnished with poached eggs, allowing one egg to ench person and one or two over. Finely chopped hoiled ham can be mixed with the chicken if desired in the proportion of 4 oz of ham to 1 lh . of chicken

The iemains of a cooked chicken may also be dovilled for breakfast or supper, using a tablespoonful each of salad oil, tomato sauce, chutney, and vinegar, 2 ahallots peeled and finely chopped, and a dessertapoonfirl of lemon juice. Cut up the chicken into convenientsized pieces, pour the salad oil (or oiled butter) on a plate, and dip each piecc of chicken in it, sprinkling over them on hoth sides ahout a teaspoonful of pepper and salt nixal l'ut the pieces on a gridiron, and grill them before a clear fire for 7 or 10 min ., turning occasionally, and taking care not to burn them.
l'ut the shallots in a stewpan with the vinegar, and cook them over a fire for 10 min with the lid off, then ould the chutney, tomato sauce, lemon juice, about is grains of cayenne, and a saltspoonful of aalt. Stir all together, and boil for 5 min . Serve the chicken arranged on a hot dish, with the sauce poised round.
Invalid Cookery. Specially suited for inclusion in an invalid diet is a gruel made as follows. Chop ${ }^{3} \mathrm{II}$. chicken meat vory linely Soak a little less than $\frac{f 1 b}{}$. breaderumbs in sufficient milk to cover them, and then rub them through a sicve into a saucepan contain. ing the chopped chicken, $1 \frac{1}{2}$ pints chicken atock, and a little scasoning. Boil the gruel for a couple of minutes, when it should be very thick, and serve it immediately.

Another easily digested and nourishing dish is chicken jelly. A small chicken should be boiled until tender, the meat then sliced and placed round the sides and hottom of a mould The bones and remains of the chicken should he put back on the stove with the liquor in which the chicken was boiled, and slightly seasoned. These should be simmered slowly over gentle heat for two hours. The stoct shoukd be atrained and poured into the mould When cold, the jelly should be turned out.

A suitable dish for invalids is chicken mousse made by mincing 6 oz. raw chicken, pounding it well, and adding to it $\frac{t}{2} \mathrm{oz}$ margarine and $\frac{1}{2}$ gill of thick white sauce. Continue the pounding process, and add 2 eggs, one by one, mixing and pounding them well with the other ingredients. Season the whole, put it through a sieve, and then atir in 1 gill of unsweetened condensed milk. Grease a large inould, three parts fill it with the inixture, and then cover it with a greased paper. Place it in a steamer and steam it for about 1 hour, then turn it out on to a hot dish, coat it with white sauce and decorate it with parsley.

CHICKENPOX. Onc of the commonest fevers of childhood is chickenpox, which occurs chietly in epidemics and is extremely contagious, so that inmediate isolation of the patient is always necessary. It is commonest in children up to six years of age, but nlso occurs among older school children, and grown-up people may contract the disease if they did not have it when young. As a rule a person can only have it once.

The first symptoms are slight fever, pains in the limbs and sonnetimes sicliness, occurring 11 to 19 days after infection. Within 24 hours a rash appears on the body, or on the face and scalp; the small, hard red pimples form blisters iilled with clear, transparent fuid. In a few days these dry into erusts and drop
off, rarely leaving any scar unless the ohild has been allowed to scratch or pick at them The pimples or vesicles niay break out inside the mouth in some cases and cause pain in swallowing
The chie! dangers to guard againat are inflammation of the kidneys and hronchopneumonia, so that the patient, after being isolated from the rest of the fanily or the school, must be protected from chills and draughts, and kept in bed till the crusts have formed. Custards, puddings, and other light milk diet are the rule, but ot herwise no special irentment is required. If the itching about the face is troublesome, the following lotion will give relief, and should be applied with a pad of cotton-wool

## Carbolic acid (illycerin <br> llectilled spirits of wine witer <br> $1^{1 \text { tcas,monflil }}$ <br> a tablesioun?ula <br> ${ }^{1}$ pint

CHICKWEED. The mouse ear chichweed (Cerastium vulgatum) is a common and iroublesome annual weed which sows itself frcely in gardens Cerastium tomentosum (anow in summer) is a vigorous, low-growing. spreading plant with grey leaves and white llowers in early summer; it is very attractive in a sunny place but must he kept in bounds by severc cutting back when the blooms are over. Cerastium Biebersteinii is similar but has larger Howers

CHICORY or Succory. The ehicory plant is a hardy perennial bearing toothed hue flowers in summer. It thrives in ordinary soil, and the

seed is sown in $\frac{1}{2}$-in. deep drills, 8 inches apart, ahout midsummer to provide roots for forcing.

The seed. lings are thin. ned to 6 or 8 inches apart. In autumn the roots are lifted as they are needed for forcing If placed in hoxes of soil, below the surface, in a cellar or other sightly warm dark place they will start into fresh growth. As it con. tains both sugar and starch, the root of the chicory plant has a food value, and when ground it is widely used for mixing with colfee. The usual proportion is one part of chicory to four parts of coffee. It is alsn employed to darken the colour of soups and gravies. The tr, to winter salad, or may be cooked for use as a vegetable. See Idulteration; Coffee; Salad.

CHIFFON : In Dress. This soft-finished, inther open-textured silk of light weight is used with lace or for fragile dresses and scarves, etc., in either plain colours or patterned variotics. Light and pliable silks of other descriptions are sometimes ealled by the additional name of chiffon. This there are chiffon velvet and chifion taffeta.
CHIFFONIER or Cheffonier. Of French origin and descended from the eabinet. chifioniers became popular in Great Britain
in Victorian times, and were chielly made in rosewood or inahogany, fitted vith knobs and handles of brass. They are still seen. usually taking the place of a small sideloard The doors are well panelled, with brass beading along the edges, while the feet are often in the shape of claws. In the finer pieces sphinxes and other figures in gilded bronze serve for supports to the article. See Sideboard

CHIGNON. Word used to denote a roll of hair in the nape of the neck. The ladiee of the 18th century padded this roll of hair With a stiff cushion of false hair. It was then powdered and pinned in position with pronglike pins and curls were attached to it. A century later women in dressing their hair threw it forward over their faces: they then pinned on the chignon pad and dressed the hack hair over it, tucking the ends under the chignon. Sec Hnir

CFILBLAINS : How To Cure. Hue to exposure to cold, chilblains painfully alfect the fingers and toes in the form of purplish inflammations of the akin, rometimes running on to blisters and ulcers As a rule, the sufferer's circulation is not very active, or he may he run-down. There is intense aching and tingling, with swelling and purpling of the akin. When blisters form and break, leaving ulcerating surfaces underneath, the chilblains are said to be broken.

The patient must see that gloves and boots are worn loose, socks thick and all-wonl, and frequently changed. The fent should be

## The Child: Its Care and Training

## Dietary, Hygiene and Legal Status

The first ycar of life is deale with under Baby. See also Adenoids; Croup; Measles and other complaints to which children are suhlect. Children's Party; Doll, ete., may a!so he read

All healthy voung animals, the human included. are playful and active during waling hours, and noed a large proportion of rest in consequence. During the second and third years 12 hours' slecp at night, say, from 6 p.m to 6 a. 1 n ., with a couple of hours during the morning and another hour or two in the afternoon, is a healthy allowance, though individua children vary a little in their requirementa As the child grows older and his interesty increase. the daytime hours of sleep become shorter, but a rest after the midday ineal should be encouraged up to $\overline{1}$ or ( j yeary of age. Early bedtime houra are most important throughout. Children from 10 to 13 years of age should have 11 hours' slecp, and from 13 to 16 or 18 at least nine hours.

From the earliest age they sloould be trained to slecp alone, in their own cots or beds. A hair mattress is the best, though during the second year, when control over the bladder is still imperfect, bran, which is easily and chenply renewed, may be used. The bed-eloth ing should be as light as is compatible with warinth, blankets being supplemented in cold weather with an ciderdown instead of a heavy quilt. For very young children it is advisuble in winter time to warm the cot beforehand with a hot-water bottle, which should be re noved when the child is put to bed. Light woollen sleoping suits, with long slecves, should the used for boys and girls, at least during the cold season.

The importance of fresh air in the bedroom cannot be over-emphasised. Fresh, cool, cir culating air has a stimulating and beneficial effect on the body, and, as children spend such a large part of their time asleep, effective ventila tion of the bedroom should alwavs be secured, So long as the hed is protected from direct dranghts, the bedroom window should ahways be kept well open. An exception may be made in very foggy weather. In very cold weather the air of the room nay be maintained at a
suitable temperature (about $55^{\circ}-60^{\circ} \mathrm{F}$.) by
placed in warm water at night and dried briskly. A hot-water bottle in bed is not desirable, but if it is used it must not be placed near the feet. If the hands aro cold warm them by rubbing together or washing in almost cold water.

The circulation should be stimulated by regular outdoor exercise and a generous diet. Cod-liver oil should be taken, or cod-liver oil and inalt. A teaspoonful of tho syrup of the hypophosphates of iron, quinine, and strychnia thice times a day, after meals, is an excellent tonic for an adult. Benefit may accrue from taking calcium lactate in 15 grain doses (5 grains for a child) thrice daily for two or three days at $n$ time. If the taste is ohjected 10, add as many drops of the liquid extract of liquorice.
la soon as the redness and swelling appear the affected parts should be prainted with tincture of iodine or campliorated alcohol rubbed in. They are then powdered with hismuth, salicylate, 1 part, and stareh, I part If the heat and irritation persist it is well to apply zinc ointment or an ointment of ichthyol 30 per cent. in vaseline.

If iblisters form and bieak. cover the whole part with a piece of lint, spread $\frac{1}{b}$ in. thick with boracic ointment, nud handage tightly; or this ointment may be used: linch tar, I dram: zinc oxide, 21 drams: vaseline, 5 drames For washing the sores, especially if they are suppurnting, there is nothing better than equal parts of hydrngen peroxide and warm water. See Boot: Foot: Hand
artificial heat, such as a fire or radiator. Winter and summer, whencver conditions are possible a daytime aleep ahould be arranged for in the open air

The Child's Diet. By the age of 2 or $2 \frac{1}{2}$ the first dentition should be completo, so that during the second year the diet must be gradually modified to train the child's powers of mastication and digestion. Theo meals a day should be the rule throughout early child hond, with no more than a little milk and water, soup. or something equally digestible at bedtime.

From the second year, one pint of milk. for drinking and cooking, in tho daily dietary is enough. Too much slop, food should not be givon, but at breakfast and tea chewing should be encouraged by serving dry buttered tonst, rusks, unsweotened bisenita, outcakes, and such-like. Small quantities of jain (without pips or akins in the case of young children), syrup, or honey can be added, or atewed or fresh fruit, ripe apple or mashed banana, for inatance. Well-cooked porridge served with milk is wholesome, but whould not be given constantly. Meat or fish dishes at breadifast are not necessary for young children, though bread lightly cooked in bacon fat is good occasionally. Milk. cocon. or weak chocolate are suitable drinks for bicakfast and tea Tea and cofioc are best withheld until after 9 or 10 years of age

At the midday meal small quantities (1 or 2 oz .) of meat or fish or a lightly cooked egg should be given. Until dentition is complete the meat should be cut up into fairly smal pieces, and varicties should be limited to mutton, chicken, rabbit, underdone beef or tripe. Small portions of boiled potato, cauliHower, or well-cooked eabbage may be given from I yoar, also a little carrot, turnip, onion or parsnip, provided they are mashed.

Vegetable proteins, such as peas, bears, and lentils, which are very wholesome, but rather more diflieult of digestion, are best withheld
until after the second or third year. All varicties of milk pudding, junket, jellics, steamed or boiled suct pudding with syrup, also baked apple or sieved stewed fruits, may be given from one yoar, provided the ohild is of average development. Beyond two yeara more variety may be allowed, also light home-made pastry. Fresh fruit and vegetables, a certain amount of which is always neccssary in the diet, may be given occasionally in the forin of a finelychopped salad

From 7 or 8 years onwards, when the child begins to go to school, supper, if a light tea be given, about 4 o'clock, needs to be a more substantial meal. Meat is not advisable, but soup, fish, or a well-made egg or cheese dish may be added, with milk pudding or fruit. This should be given at least an hour befone bedtime.

## Foods for Growing Children

From the age of 10 or 11 years onwards, $n$ period of rapid growth and development, both boys and girls need a plentiful supply of whole. some food, but meat once a day is enough. At no age should anything between meals be allowed except water to drink, and the best time for this is half an hour or an hour before meals. Drinking at meal times should he limited, and the habit of sipping between mouthfuls that some children are allowed to acquire is certainly a had one. Highly seasoned dishes, sauces, pickles, vinegar curries, or fricd foods should not be given to children. A few wholesome sweets or plain chocolate may be allowed, preforably as an adjunct to a meal.
Children should be given to understand they arc expected to eat what is set before them. A small percentage of children display idiosyncrasies towards certain artioles of food, such ds fish, egge, or some varicties of fruit. Skin rashes, maybe vomiting, with fever, follow ingestion of these particular foods. If such be the case they should be omitted from the diet, and medical advice ohtained if necessary
The Use of Aperients. A word may here be said about the use of aperients. The child should be trained from infancy to empty the lower bowel daily, preferably after the first meal of the day. The atomach and intestines have natural, rhythmic movements of their own which need to he respected and cultivated. An unnecessury dose of purgative medicine may upset this delicate neuro muscular mechanisin for indefinite periods.
Washing and Bathing. For the first few years of life a daily warm hath, preferably at bedtime, is the easiest and most rationa means of keoping a child clean ; but beyond the age of 4 or 5 a hot bath once or twice a week is enough. From early age, however the child should be trained to the use of cold water. Unless contra-indicated on medical grounds, the body each morning should he first lathered and then sponged all over with tepid water, the temperature of the latter being gradually reduced until water from the ordinary cold tap is used Rub hriskly with a bath towel afterwards.

As a general rule quite young children soon learn to appreciate this proccsa, which has a stimulating and invigorating effect on the whole body, and no doubt tends to increase resistance to catnrrhal infections. Provided the reaction aftervards be brisk, healthy boy: and girls should take a cold (i.e. $70^{\circ} \mathrm{F}$ or helow) plunge bath each morning, followed up by simple gymnastic exercises for a fow minutes When the hot hath is not due at night, ex posed parts of the hody sloould be washed before going to bed
Tecth must be cleaned moming and after the last meal at night, the latter being the more important. If particles of food, eapecially starchy varictiea such as bread and biscuits, remain around the teeth during the night,
fermentative changes take place and the enamel of the teeth is injured. Examination by a dentist at regular intervals-about once cvery six months-is most important. The hygienc of the nose is also very important. Children should be taught as young as possible to blow the nose and use a pocket-handkerchief. If the nasal cavities become blocked the child tends to develop a habit of mouth breathing, which is one of the factors in the development of adenoids and their attendant cuils.

As children approach the age of puberty it is desirable that they be given simple instruc tion about sexual life and its results. One of the parents is the most suitable person to do this; but if he or she feels unequal to the task, there are excellent little broks to be had dealing with the subject, or the services of it sympithetic teacher may be enlisted. Girls should also be told beforehand the nature of the menstrual perinds, which usually start from 13 to 14 years of age

The Legal Side. A father is the guardian of his legitimate children. But if the father and mother do not live together, and there is $a$ dispute as to which of them shall have the custody of the children, the court will take account of the children's welfare, and of nothing else. Unless the mother has been guilty of adultery, or is a drunkard, or there is some other reason why she is not fit to have the custody of then, children of tender years are practically always handel over to the mother. She may even be appointed their legal guardian and the father entirely ousted when he is unfit to be guardian, as, if he has been cruel to them, or is a conlirmed drunkard and wastrel, or is living with another woman, or brings his children into contact with immoral persons

## The Father's Ridhts in Religion

'I'he father has a right to say in what re ligious faith his children shall be brought up, but even this right is subject to the qualification that the interest of the ohildren is the chief consideration. If he has allowed them to he brought up in one faith, and then turns round and says that they must ohange, the court will not allow it if the judge finds that it would unsettle the children in their religion and possibly result in their growing up in an irreligious atmosphere. This right of a father to dictate the religion of his children continues even niter his death

Any agreement before marriago as to the religion in which the children shall be brought up is worthless, for the father can still insist on all the children being brought up in what ever religion he choosea, subject to the qualification stated above.

A child's earnings belong to the child, not to its parents 1 child earning money who lives with his parents is entitled to bargain how much he will pay for his kecp, and the parent has no right to demand his wages and make him an allowance for yocket-money. A child's misdeeds are his own, and he alone is responsible for them. So that a father cannot be called upon to pay, for example, for windows broken by his son. The father (mother if no father) is responsible for a child of school age attending school, and may be fined if the ohild fails to attend.

A father cannot be compelled to maintain a child capable of supporting himself or herself; but if a child of any age is, by reason of infirmity, whether mental or bodily, incapable of self-support and becomes a charge on the rates, the poor law nuthorities may summon the parent and obtain a magistrate's order that the parent shall assist in defraying the cost of maintenance. A father is bound to provide a child under 16 with sufficient food, olothing, and medical attendance; and if he does not, is liable to be summoned for neglect,
and fined or iniprisoned. The mother of an illegitimate child stands in the place of the father of a legitimate one.

Baby Farming. Any person who, for pay. ment, takes charge of children apart from the parents, must notify the local nuthorities within 48 hours of 80 receiving any child. If the child dies, or is transferred else wherc, or if the baby farmer changes her (or his) ouldress the fact must also be notified

These local authorities can appoint inspectors to visit the homes and regulate the number of infants which can be kept in them Persons are not allowed to keep children if their premises arc insanitary, or if they have been convicted of previous offences. They must have no insurable interest in the lives of the children kept by them. False or misleading statements relating to matters to be notified aro offences. Penalties for offending against the Act are imprisonment for not more than six montlis, or a fine not excceding $\mathbf{£ 2 5}$. English law also forhids persons to insure the lives of children, except under rigid limitations

Child Labour. In Great Britain local nuthorities have power to make by-lawa restricting the employment of children of achool age; and to regulate street triding by chililren. Any rules made can be ancertained at the office of the town, or urban, district council. Under the age of 12 children must not take part in public performances held in premises licensed for music and dancing or the sale of liquor; if over 12 years of age, they may be permitted on application to the local authority.

It is a legal offence for children under the age of 14 to be found on licensed premises, and for anyone to scll cigarettes to any peraon under the age of 16, whether for his own use or not. The police have powers to seize cigarettes or cigarette papers in the possession of any person, apparently under 16, whom they find smoking in a strect or other public place.

Juvenile Courts. These are held for the hearing of offences by children. Parents may be ordered to pay the fine imposed on the ohiklren. Children are prohibited from secing certain cinematograph films unless accompanied by an adult, and in the case of other films are excluded altogether. The chief legislation on children and their protection is found in the Children Aot of 1908, the Educa. tion Act of 1921 (England and Wales), and certain other enactments of like nature

CHILDBIRTH. The expectant mother, besides making a sufficiently early arrangement with a doctor and nurse, must make other necessary preparations, for although childbirth is a perfectly natural and physiological process, it exposes the natient to the risk of infection by microbes. The room in which she is confined should, thercfore, be thoroughly clean.

When there is a choice of rooms, let the one chosen be as large and airy as possible, and provided with a fireplace. The hedsteal ahould be plain and easily cleaned, and should be placed so as to permit of easy access from either side, screens being used to prevent draught. It ahould have a good spring matt reas and over this a clean liair one. A mackintosh or waterproof-shect is placed over the latter, or, where this is not available, scueral layers of olean hrown puper. Over this is placed a blanket and then a sheet. The bed is to be protected by putting a sheet of mackintosh below the hips and covering it with $n$ draw. sheet, which consista of a piece of sheeting folded to the breadth of about a yaril.

Labour takes place in three stages. In the case of a first baby the whole procers occupies on an average 16 hours, but it may be shorter, as it usually is in subsequent confinements, or much longer. The doctor should always be summoned at once when labourbegins.

It may be useful here to mention some of the more necessary things which should be procured in anticipation of a confinement : one or preferably two mackintosh or waterprool shects, drawsheets, at least three ahdominal binders for the mother, two or three dozen sanitary napkins of the largest size, 1 or 2 lb of absorbent cotton wool, some stout linen thread cut into lengths of about 10 in . or atrong narrow tape clean lint or linen, a bottle of lysol, large and small safety pins, a clean nail-brush, antiseptic dusting powder, a pot of vareline, clean scisors, and two basins. Three or four lengths of thread are tied together at each end to form a ligature, and two such are required. They should be boiled for half an hour before use, or in an emergency dipperl in lysol solution. Lint and other dressings may be baked in a hot oven for half an hour. care being taken not to scorch them Alidominal binders, towels, sheets, etc.. should be freshly laundered and put away. See Baby

## CHILDREN'S PARTY. To be successlul.

 a children's party requires an organized programme. It is easier to entertain children under 11 by themselves, as they like to play games and to have the undivided attention of sympathetic grown-ups while older children often get bored with romping. It is usually a mistake to in vite any child under five cxcept to a real nursery partyOn the invitations, sent out about 10 days beforehand, the hour of leaving should be stated, to avoid any confusion in the fetch. ing arrangements. Some hostesses engage a conjuror, a ventriloquist, or have a private cinema show, as a second part of their entertainment, finishing about 9.30 , the older children staying on after that to conclude the party with dancing

For a younger children's party beginning at 3.30 , a room in which to play games should be cleared of everything except a gramophone or a piano and chairs. The nore brightly this room is decorated the more quickly everyone gets the right spirit for a party On arrival, most children are apt to be serious, and something must be done lirst to helj, them to get over their shyness. A jolly game such as musical chairs, or one of its variants, is a good start, while presents-trifles from a $6 d$ store provided to send everyone away happy at the finish also make for success. The old-frashioned bran tub is voted rather messy for indoors, and the lucky dip has taken its place This is simply a large laundry basket or hox prettily disguised and filled with toys. A cloth is spread over the top, and each child puts a hand under this and drags out a parcel.. Or the presents may be hidden about the room in which tea has been served, and the party end with a treasure hunt.

## Making the Tea Table Attractive

Refreshments are most important at all children's parties. The table should be gay with a variety of cakes, fruits, and sweets. For small children there should not be too many rich things, but different layer and iced sponge cakes and varieties of fancy breads and buttered rolls. Fruit salad in pretty individual glasses always pleases. At a winter party crackers are an attraction. A large selection of coloured balloons are also useful, and can be given, one to each child, after serving as decorations, at the end of the party.

After tea all the old-fashioned games will go merrily. The great thing is to change a game directly it shows signs of tlagging. When halt a dozen children have been caught in blind man's buff it is well to start its variant. One person is ioindfolded and given a stick to hold The others take hands and dance round him in a circle until he bangs on the floor as a signal to stop. He then points the stick at somebody and says, Make the noise of a cat, dog, or any other animal that occurs to him. The person
addressed has to take hold of the stick and obey the order, while the blind man tries to identify the voice If he succeeds in guessing rightly he changes places with that person. After this game may come musical bumps, hunt the slipper, or any other game that may be suggested. Most children will like some dancing to a gramophone. Competitions also, with prizes, always seem successful. A favourite is to give each child a balloon that has not been blown up, together with a short piece of tape; stand the children in a ring and at the starting signal they begin to blow up the balloons, a prize going to the biggest, after everyone has either tied up their attempt, or burst it in the effort to win the prize.

Illustrations of fairy storics and nursery rhymes can be cut out of cheap paper cditions, the names removed, the pictures pasted on cardboard, and the child who guesses the most correctly is the winner Where a hostess is specialising in a young children's party, a marionette or a Punch and Judy show, which can be hired through the entertainment department of a big store, will be sure to prove a great success as a finishing touch to a party of this kind

For older children; at a later hour, there would he either a sit down or buffet supper. If the latter, it is well to have small tahles, with chairs, scattered about the dining room to put glasses, etc., on. Most children delight in a stand-up supper; it has all the joy of the picnic, and hoys feel pleasantly unrestricted as to what they may consume. After supper, should there be no entertainer, dancing is the rule: sometimes the party is a bigger success when the guests are in lancy dress. In some houses the children have a passion for charades, and love to get them up secretly with some of their friends before the day of the party. Any costumes that arc to be worn should be put out ready in bedrooms beforehand, and a stage-manager chosen to superintend.

A summer party is pleasantly and quite easily arranged where there is a large garden, and all sorts of outdoor games can be played. Sports can be organized, with three legged, wheelharrow, obstacle, egg-and-spoon, and sack races. Tea is served either in the house or in a marquee, and in the evening there can be a dance with supper and an orchestra in a marquee lit by Chinese lanterns. Sec Charader; Christmas; Fancy Dress.

CHILL. Exposure of the body to a draught of cold air or to dampness may bring on a chill. The patient feels shivery, may be nauseated or sick: there may be severe headache, a degree or more of fever, and he feels he is in for some
illness. In a few hours all symptoms may pass off: on the other hand, congestion of some internal organ may follow, when the chill is said to have settled in the lungs or liver, etc. The commonest results of a chill are a cold in the head and bronchitis (q.v.). A hot mustard fout-bath, warm drinks, and hot-water bottles in the hed, the patient being put between blankets, are the immediate remedies for a chill. See Cold.

CHILLI. The dried pod of the capsicurn plant is used in making curries, chutneys, and in pickling. In the green state it is eaten as a pickle. Chilli vinegar is used as a relish with tish. To make it 75 fresh chillies are used to $1 \frac{1}{2}$ pints of vinegar, the vinegar being boiled and, when cold, poured over the chillies. The whole must be tightly corked and left for two or three weeks, when it will be ready for use.

CHIMNEY. In building a new house it is well to remember how much the chimneys will influence its appearance, both at close view and at a distance when they become perhaps the most important detail of outline against the sky.

British architects are again taking an interest in chimneys and are not only designing them so scientifically in small houses that ugly pots and cowls are unnecessary to make the chimneys draw properly, but also with such an eye to decorative value that they may be now, as in Tudor times, ornaments which enhance the whole building. Elizabethan architects made such a feature of chimneys that they frequently designed them as part of the outer walls; the bases of such chimneys, when reproduced in modern houscs, make provision in the interiors for inglenooks

Colour of brick used for the stacks is considered carefully. Dark red bricks may be selected for chimneys on a stone-tiled roof a lighter shade of red on dark red tiles, and mellow tints for the plain brick chimneys suitable for thatched rools.

Ornamental brickwork was also used with discretion in Tudor times. It is shown as adapted to a modern small house on the beautiful chimneys in Fig. 1. A good outline on a gabled roof is also achieved by bringing three chimneys into one stacl;, as in Fig. 2, while a round chimney is a charming architectural feature in Fig. 3, where the brickwork is enriched with spiral stringing composed of projecting bricks.

Smoky Chimneys. An insufficient supply of air to the fire is the cause of many a smoky chimney; it is discovered by opening a door or window, which is effective in curing the


Chimney. 1. Ornamental brickwork, typical of the Tudor period, used witn goojerfect on tne chimneys of a modern house. 2. Three chimneys brought into one stack. 3. Spiral atringing an a ronnd chimney

smoke nuisance by introducing a curient of cold air. Remedies in such cases are to fit the ventilating bricks near the cciling and through an outside wall to the open air. Another method is to lit a ventilating llue under the lloor and terininating in a grating, provided with a regulating shutter, in the hearth or near to the fireplace.
The real troulile prolanbly lies in the chimney itself or in the stove. The chimmey may be choked with soot and broken pieces of mortar that have got lomse and fallen down, and the services of the chimney-sweep are required. When the stove allows cold nir to work into the thue or chimney it causes a down-draught Being heavier than air, the amoke can only tre carried out through the chimney if the diaught caused by the hented air rising in the chimney is strong enough to carry it allay. Therefore any cxcess of cold air must be stopped

## Eliminating a Down Drausht

The means for cloing this include attention to the pointing of the joints in the lorickwork, as the chimney must be nirtight except for the openings at the lop, and bottom. Treatment of the chimney in the region around the tireplace may include the partial lricking "p of the llue, reducing the actual opening to a space not larger than 9 in . square. If this is done, and the new brickifork is so arranged that the Hue makes an ensy turn and does not go stiaight up, it will almost always effect a cure.
The most fiequent cause of smoky chimnoys is the shortness of the chimney stack. lixtending the height of a chinmey raises it nbove the level of the surrounding roofs, a very important matter, as a roof sets up eddy currenta in the air which neaty alwiry have a tendency to blow down a chimney. A second adiantage of a taller chimney is the extra drauglit it causes. This is due partly to the added height and paitly to the restricted dianeter of its opening. Ill manner of shapes of pots have heen devised, but none aic entirely effective, although the lousre and lent-top pots, as well ns some of the revolving cowls, have substantial claims to success. iWhen a considerable height-say, $f$ or 7 ft .-is udded to a chimney, and a galvanised iron lallhov or pot of that character is used, it is just na well to provide some light iron stay rorls to prevent its leing blown array in a gale.

When every experlient in the "ay of ex lending the height of the chimney has proved a failure, attention must be given to the stove and its surround The ordinary cast-iron register stove may not be fitting perfectly airtight, to the bickwork at lhe back, and any lcaks must be made good with cement or fireelay Kitchen ranges are prone to this trouble as after lengthy use the mortar may have failed: when the brickwork is no longer a tight fit up to and around the stove hack, it may he remedied in the samo way.

## How to Deal with a Larse Flue

Large opell ranges can only be treated effectively ly making n hlower of metal or glass to restrict the opening. Dog grates and the old-fashioned open fires with a luge chimney shaft are very diflicult indeed is corrcct. Perhaps the neatest method is to enclose the chimmey opening with an iron plate having a small hole through it to accom. modate an ornamental linod or honnet. A separate sont door must lie litterl to allow the chimney to be cleaned
It is a legal offence to allow a chimey to cutch lire. Various tientments are prescribed for deuling with a cliimney on fire The simpleat and most effectivo is to close all doors and windows and to stop up the top of the chimmey by means of wet sacks, bricks, or anything handy that can he preased into service. If the bottom of the chimney can he closed, this also has a retarding effect on the fire. It is customary to throw salt in large quantities on the lire in the grate or down thic chinncy from the top, while a patent ex tinguisher inay be used when it can he brought to hear directly upon the fire in the chimney.

The heat way to prevent $\pi$ fire in the chim. ney is to keep the fire itself in moderation, to have the chimmey swept at frequent intervals, and to avoid the buming of Inrge quantities of paper that may lie carried up the flue and set fire to the sont.
Chimney Sweeping. When a visit from the sweep is thought necessary, certain preliminaries are desirable. Megin by removing and putting a way all white covers in the room. Take everything off the mantelpiece, as the sweep will need it clear to fix his black curtain. Sweep the hearth and grate perfectly frec of all ashes and cinclers, and spread a thick layer of nevspapers all around the fireplace. 'T'lic housewife knows from oxperience that some aweeps are ticly workers, and if such a man is coming no other preparations are necessary. But in the casc of an untried man, it is advisable to take down white curtains and to cover all fumiture with dust sheets.
While sweeping is in progress go outsicle and see that the brushes go right up the climney and are visible alove it. Fiome sweeps aio careless a bout brushing right up, and neglect of this means that soot will fall later When the sireep has gone take a hearthiruali and sweep out from the lower part of the chimney, just ahove the grate, the loose soot which falls from ahove and collects there Then put the room in ordei Again. Sce Firc.

## Chimney Bellfower. See Campanula

CHIMNEY PIECE. Since the chimncy piece enihraces the whole protective st ructure round a fireplace, from floor to cciling, its. decorative treatment is $\pi$ matter of importance. One has to remenilser, in this connexion, that the grate is always an int egrial part of the chimney piece, and that one cannot deaign or alter the latter without considering the former.

There are ways of converting a Victorian ohimney piecc into n modern one without great expiense. The marhle shelf can be painted after the surface lins heen well rubled down nnd finished off with a final coat of eggshell enamel. But this leaves the claborate supports atill visible, and on the whole the more eflective $\begin{aligned} \text { ransformation can be brought }\end{aligned}$ alout by encasing the entire structure in woor. lext the grate has to be dealt with. The straight up and down lines of the wand encaacment cali for a rectangular instead of a hoiseshoe shape, and this can be got by placing it piece of shect iron, cut in the centre to the reguired form, across the opening, finished off by a plain moulding. Copper can le usod instead of sheet iron with tine cffect when dark oak is selected for the casing, or another ide: is stainless steel, with $n$ surround of black marble and curb in place of a fender. The removal of the hars of the fireplace and the substi. tution of a barless grate will complete the work

Where it is a matter of creating, not merely adapting, a clumney picce, there are certain general principles which should govern the choice of $n$ design. In the first place, the size and character of the room should dictate the nature of this feature. In a small room the mantelshelf can be entirely dispensed with or restricted to 3 or 4 in . in width-suflicient perliaps, to carry a pair of good candleaticks and one good piece of pottery or china It should always le remembered that there is nothing more diaturbing to the ensemble of a chimney piece than a mantel crowled with


Cbimney Piece.
Old oak chimney piece beautifully carved and built to match a Jacobean panelled room

Courtesy of fill is Reloate
ormaments. When brichs are used the colour and design of the bricksork is of sufficient interest to hold the eye without disturbing detail alove. The illustration of a modern brick fireplace suitable for a hall shows perfection of treat. ment. A mirror in an antique gilt frame or a good oil paint. ing, cither landscape or a lower piecc, inset as a panel can be usefully introduced in cases where space and sur roundings permit.

If the house owner should be fortunate enough to possess a hall or a living room with an inglenook, there is unusual scope for artistic treatment. Nothing lonks letter than a surround of good bricks at the sicles and on the chimney breast. These should harmonise with the hearth, of whichsince an open dog grate generally takes the place of the shut-in fireplace-a good deal will be scen. Tiles require careful solection. They look well in Chinese or hlue delft designs in small fireplaces, and with amusing figures on them are a bright touch for the nursery chimncy piece designed without a mantelshelf, the tiles being carried up to the frieze. Lustre tiles in harmonious colourings, with hearth and kerb to tone, are also suitable lor a Hat treatment.

The more architectural the chimney piecc, the less need for overloading it with extraneons ornaments. For a panelled room the beautiful treatment of the Jacohean chimney piece illustrated gives some idea of richness combined with simplicity. The Tudor arch of the fireplace made in nood, but In rger ones are in marble. can also he adapted, in a room where Adam atyle lireplaces arc adapted for rooms panelling is not introduced, to $n$ simple overmantel treatment of a plaster relief in a line design.

Chimney pieces in the 18 th century werc delicntely carved in low relief or inlaid with the central interest of the rooms. Some were colourd maibles. See Bow II are.

## China and China Collecting

## The Quest and Care of Old and Modern Pieces

Other entrics to be consulted include Crockery; Faienc:; Pottery and those on the various kinds of china, c.g., Chelsca; Crown Derhy; Sẻvres, cte.

Modern china is so good decoratively that, decoration nud colouring fiom Nankin poree whet her required for ornament or use, many lain to modern Copenhagen. Others, again, people prefer it to old pieces for their homes, as they can select it to liring out an exact note of colour desired in a room. There is also not the same worry over breakages. On the other hand, china collecting is an interesting hohby when the amateur does not think that any list of old china, however indifiement. is better worth huying and hoarding than a beautiful piece of modern work.

Old English chinn, if porcelain be meant. covers a period of about a century prior to the Great Exhibition of 1851. But many collectors roam farther afield, and regard all the products of the kiln, in every age and place, as fit objects for study More thrifty and practical lovers of old china, content to explore patiently the byways which still exist, may in time nccumulate quite desirable and instructive possessions. Some may specialise in memorial ware recalling historic personages and events. Others may concentrate on bluc-and-white, tracing the course of


Chimney Piece. Typical Adam style chimney piece, barmonising courlexy of conullit tife with classical decorative schemes, as in the onc above. The Idam brothers employed Italian cruftsmen to work on marble mantelpieces
c.
faience, painted on the enamel in emulation of the achievements of Chinese ceramic artists. It is distinguishable from true china by the lark hue of the hody, often perceptible beneath the mughnesses of the base.

It was the use loy mediernl Chinese potters of fusible felspathic rock, similar to chinastone, in conjunction with infusible china clay, that led to the invention of true porcelain This is conted or glazed with a mixture of the felspar and lime, the whole being fired at a high temperature. It is vitrcous and resonant. breaks with a shell-like fracture and camot be seratched by steel. The secret of this haril porcelain was discovered in Europe 200 years ago at Dresden; in England its production was practically confined to Plymouth and Bristol

The old Seves ware on the other hand, was a soft paste porcelain, employing artificial fusible frits, having a granular fracture, and a surface that crumbles under the file. This was the parent of Bow and Chelsea. A great advance was made in England lyy introducing hone-ash. When this was used with a mixture of chinastone and china clay, without the old soft-paste frits, there resulted the bone porcelain, of which, since about 1800, the best linglish china wares have licen made
An intermediate form, called stoneware. is partially vitrified hy hard tiring, and when thin may lie semi-translucent. Its main defect is a tendency to crack with sualden changes of temperature. It was produced in the 17th century by John Dwight at Fulhan Out of it developed Staffordshire salt glaze, and afterwards Werlgwood black basalts and jasper ware. W'ith these fabrics may be classed ionstone china, semi-porcelain, opague china. and other efforts to secure a durable material withont incurring tho risk and cost of intense liring.
In the 19th century the Creat Exhibition of 185 I served ns a turning joint Parian or ungla\%ed statuary porcelain had just been invented, Nintons had reproduced Della Kohbia and P'alissy ware, and Irish iridescent porcelain was being made at lBellcek. To the previous half-century belong many of the ald heirlooms treasured in present-day homes. including examples bearing the famons names of Spode and Copeland, Havenport and Adams, Conlport, Swansea, and the llintons, not to speak of the new wares introduced by factorica established long before, such as Iongton Hall. where Stationlshire porcelain originated
Old Chelsea and Bow. To the 18th century belong many landmarks in the progress of the ait But among all the productions of that age lovers of old china are the fondest of Chelsea warc. liecause of its charm and historic appical. Owing to its remoteness fiom our own day it is not abundant, and the homes of Chelseal and Bow china are no more.

Some 18 th century factorics, notably Worcester, Derlyy. Wedgwood, and Sévies, are still active. No European ware earlier than the French soft-paste of the end of the 17th century ranks as porcelain. Such fabrica as Greek vases, Rhodian howls, Samian ware, Persinn glass-glazed dishes, ancient Egypitian faience, and neolithic pottery, wre a collector's or student's separate studies.

Large quantities of inexpensive porcelain are turned out in present day China and Japan for the export market, some of which arc effective. Examples of the great periods of oriental porcelain, from the Sung and Ming dynastics to Kang hisi and the 18 th century emperors, together with Arita porcelaincommonly called Imari ware-and other fabrics of Japan, tend to become rare and costly.

China Marks. The various devices used by potters for identifying work, whether it he porcelain, stoneware, or earthenware, are
 1751-69. 8. Chelsea-Derby, 1769-80. 9. Crown Derby, 1780-1815. 10. Bloor, 1815-39. 11. Derby, modern. 12. Chinese ${ }^{8}$-charaoter mark 1723-36. 13 and 14. Plymouth, 1788-72. 15 and 16. Bristol, 1770-77. 17, 18, 18. Worcester. 1751-83. 20. Cbinese dedicatory mark meaning 23. Séves, 1754 24. Dresden-Meissen 17ia 25 Cone

26 Japancse labric mark, Imari ware, 1800 usually painted, stamped, or incised upon the have become discoloured by hard water can base before the final firing. They may be cleansed by rubhing fine emery-paper over denote the place of manufacture, such as the stains, and afterwards washing them with Swansea, the master potter, suoh as Spode, the workman or decorator, such as G. T. for George Tinworth, or the date, as in some periods of Sevrcs.
On Chinesc porcelain the datemarks usually consist of two charactess, meaning period made, together with two for the emperor's name, making a four-character mark. Sometimes two othery, denoting the dynasty, are added, thus forming a sixcharacter mark Japanese wares differ from Chinese in usually having potters' marks, which are sometimes dated, and nssociated with armorial hearings.
Much old work was unmarked. while, on the other hand. the presence of a standard mark on certain pieces may be actually proof of their being lakes There arc marks of indication, apart from trade devices, which connoisscurs regard as surer tests. Such are the grain of the surface, the tint and imperfections of the glaze, the roughnesses on the base, the glassy moons seen in Chelsea ware before 1757, or the substance itaelf, as revealed by fractures.

Often undecorated pieces, after being produced in a famous factory, have been sent clsew here, either by their makers or by dealers, to be decorated and tinished, and in such cases the marks, original or copicd, have led to much uncertainty. Thus Chelsea imported genuine hodies from China for completion, and Siveres biscuit pieces were at one time sent to Coalport for the same purpose.

How to Wash. In washing china, plenty of hot watcr. space, and clean, dry towels are essential For ordinary household china a good sonp powder should be used in a large howl of hot water If the china is greasy, $n$ handful of soda should be thrown into the water The water should be changed as soon as it becomes cool and cloudy or greasy. Alter washing rinse the china in clean water.
The washing-up bowl must not be crowded with articles, as this leads to ohippings and cracks. A dish-mop on a stick is the most suitable appliance for washing plates and dishes. A dishcluth that is used in the hand is better for cups and small articles A rubber scraper is useful for greasy dishes.

In the washing of china to which value is att nched, a folded towel or thick, clean duster ahould be placed at the bottom of the bowl to protect the articles from the risk of getting clipped or cracked Neither sodn nor soap powder containing soda should be used when there is gilt or much red colouring on the china, as the action of the soda is sometimes injurious to such ornamentation. A few drops of
ammonia or a dessert spoonful of borax should be used instead. If the chinn is badly stained a little powdered fuller's earth should be applied on a cloth. For sufety the lewest possible articles should be placed at one lime in the bowl A small log's hair paint brush may be used to clean raised ornament or porcelain figures. Such aiticles should not be allowed to become really dirty, and should be rinsed after being washed, and then drained and dried. Tea stains can be removed from ohina cups by being rubbed with crushed salt on the dish. cloth. Flower bowls and toilet jugs that
trong soda-and water In putting awny china in the cupboard, sancers and plates should be stacked in separate piles that are not too high. Cups and jugs, when not hung on hooks, should have the handles facing outwards in order to avoid accidents.

Packing of China. When packing china no piecc should be in direct contact with any other, or with the walls of the packing case, and the packing material should be resilient and shock-absorbent. There must not be any gaps in the packing material, which should fill all spaces between the china. These requirements are met by the use of snwdust, old crumpled newspapers, straw or felt. Complete the work by filling in all gaps with more paper and atraw, and have a layer on top at least 2 in thick. Finally nail or screw on the lid. Give the box a good shake to ascertain if the contents are safc. If a rattling or clinking sound is heard, it will show that some of the china has been displaced, and this will necessitate repacking.
When packing china or any other articles for removal, it is well to remember that the removal contractor will not accept responsi. bility for anything that is not packed by his own men.
CHINA ASTER. One of the easient Howers for amateurs to grow, the China aster is a universal favourite in all gardens. Seedlings miay be raised outside in April, but stronger plants are obtained by sowing in a frame or greenhouse in February or March, always provided damping off is avoided. The seedlings


Cbina Aster. Bowl of double blossoms of various colours, purple to pink and white Courlesh of Sulton \& Sons. Led
 pink $\begin{aligned} & \text { Rose. } \\ & \text { monthly or China rose }\end{aligned}$ makes a good hedge. See Rose
ure planted out of doors in May. Great care must be taken not to over-water the small plants. There are many types and varicties of the annual aster with single or double flowers. The prim double blooms of the Victoria aster are still popular for exhibition and bedding, but for decorative effect and for cutting the Ostrich Plume, anemone Howered and Comet varieties are superior. The singlc Chinn aster is also charming. In each type there ate varieties of ruse, purple, mauve, socalled scarlet and other shades. If sown in May in the open, potted in mid.Sept., three in an 8 in. pot, and placed in a cuol greenhouse, Victoria and other dwarf types will bloom throughout the autumn

Asters attacked by the black-leg diseasc, whioh turns the base of the stem black, should be uprooted and burnt. If this trouble has been experienced grow the plants on a fresh site, lime the soil and spray them with liver of sulphur, 1 oz in 2 gallons of water.

CHINA ROSE. The popular name China rose is given to Rosa Indica sempertlorens, or the monthly rose, so called because of the continuity of bloom. In mild districts, if planted against a sunny wall, the old pink monthly rose will bloom more or less all the year. China roses do well in beds in a sunny plare: they should be pruncd lighitly. The best varieties are Armosa, pink; Comtessodu Cayla, reddiah yellow; Laurette Mesaimy, rose and vellow; White Pet, white. The variety Fell e nberg, which is rosered, is more vigorous and

CHINA TEA. There are about a dozen varieties of China tea, divided into two classes -green and black. It is paler in colour and less highly flavoured than Indian and Ceylon teas, and not infrequently it has n perfumed taste and aroma. It may generally be described ns being a delicate, fragrant variety of tea. It is sometimes medically advised for people with weaker digestions. See Tca.

CHINCHILLA: The Fur. The fur of the ohinchilla, which is soft and thick, from to light grey in colour, darkly mottled on the back, and slinding into dusky white below. As the chinchilla is becoming extinct and the skins are very small, they are very valuable. Becnuse of its fragile nature, combined with its bad wearing qualities, chinchilla ranks amongat the most expensive of furs. Sce Fur.
CHINE. When trimming the brond piece of bone at the end of a loin of nutton or ribs of beel or pork, the butcher is fre. quently asked to chine


1 and 7 British Museum; 3.6 and 8, Victoria \& Ałbert Museam; 2, courlestl of Royal Crown Derby Porcelain Co., Ltd.
it, or saw off the chine-Lone it should be noted that, as this piece ol hone will have been weighed in and charged for, it should be delivered with the joint for use in the stockpot or stew

A chine of pork is a favourite joint for roast ing: it is the piece between the head and shoulder, and should be carefully jointed before cooking. Or, if liked, the chine may he slightly salted, boiled, and sent to table with a pease pudding and some green vegetable. It needs to be cooked slowly in plenty of water and skimmed thoroughly to rid it of any superfluous fat. Chine of pork should be salted for a few days before it is cooked

CHINE. Satins, taffetas, ribbons, and also cotton materials are described as chind when printed in a blurred and shadowy-coloured design. The printing is done upon the warph, or lengthwise, threads before the cloth is woven. The weft threads are not printed, and they half conceal the design, tone down the colouring, and account for the softncso of effect

CHINESE STYLE : In Furniture. The threc ornamental features used in Chinese furniture are the cloud form, the dragon and the fret. All three may occur on the same piece of furniture the commonest is the cloud form, and it may be found practically alone in phairs, settces, and joes tables. To the unpractised eye the cloud form looks nore like a conventional spiral suggested by the smail whell. The dragon and the fret, much conventionalised, are more easily recognized in forms approximating io those their names would suggest Chinese fumiture is commonly made of darli rosewood prolished to a patina resembling hone.

The Chinese atyle in English furniture became popular in England when Thomas Chippendale took it up and exploited it with his Chinese Chippendale furniture, examples of which are rare and valunhle This furniture contains what to English people appear as more typically Chincse features than those alrcady mentioned, many of them oltained from architecture The principal one is the pagoda form, which Chippendale and other cabinet makers of his day employed in curved chair and settec backs, cabinets, beds, and wardrobes


Chinese Sigle. Lacquered and gilt bedstead in the form of a paroda : Englisb, c. 1760
Victoria \& Albert Museum, S. Keusington
 then, but quite frequently being applied by glue to the solid. Occasionally a conventional rendering of the dragon's head will be seen carved on the terminals of chair arms.

Nluch of the so-called Chineso furniture used in England in the late 17 th and 18th centuries was made of lacquered panels im ported into Holland and England and made up into cabinets on earved and gilt or silvered stands This style had much intuence on that of Chippendale (q.v.). See Decoration.

CHINTZ. Being a glazed cotton material, printed in several colours, usually 31 in . in width, and dust-resistant, chintz is suitable for bedroom upholstery. It may be used for linings for langing wardrobes, and ottomans. Old English designs are best in this fabrie with its suggestion of coolness and cleanliness.

Being a stiff material, chintz requires much minnipulation in upholstery work, especially when making loose covers. Careful planning is therefore advisable before starting to cut it out. Instend of gathering or folding the surplus material into pleats, as in the case of thin cretonne, a dart should be made by cutting awny the material where any fullness occurs and sewing the edges into a fine point.

In laundering chintz it is advisable to add bran water to the first washing water. Bran water is made by boiling for about half an hour $\frac{1}{2}$ pint of hran (placed in a muslin bag) in a quart of water. This addition helps to stiffen the material and to revive the colours of the pattern. Chintz should be starched in boiling. water starch. See Upholstery.
CHIONODOXA (Glory of the Snow). A pretty spring flowering bulb suitable for planting in the rock garden or in grass. Luciliae, blue and white, and sardensis, blue, are the chief sorts. The bulbs should be set 2 in deep in September. Pron Cio"-no-düksa.


CHIP CARVING. This art, which is done with a sharp-pointed knife, has nothing whatever to do with the shaping of the article, the pattern consisting of simple $V$-shaped grooves or excavalions cut in the surface just as lettering or figures niay be eut in a flat surface of stone. Designs, which are usually geometrical, are produced in this way in order to ornament what would otherwise he plain surfaces.

Examples of various cuts alo illustrated in Fig. 2. Before commencing on actual worli it is hest to practise on waste pieces of wood Draw pencil lines and try to follow them accur ately with the knife or with a chiscl. Is scen in Fig. 2 , the $V$-shaped trench may have square ends, sloping down at the same angle as the sides, or may curve or narrow up to a point at the ends. In other cases the excnvation may be a small triangle with its three sides sloping to a point at the bottom. A number of these are gencrally cut in a series forming straight lines of the pattern. Examples are shown in Fig. 1.

Nore elaborate forms of chip carving are shown in Fig. 3. The method is the same in detail, but the complexity of the design is increased. Two trenches side by side may have only a ridge between, corrosponding with a single line on the surface, or there may be a flat hetween them necessitating lwo linps in drawing the pattern.

After the desion has been draun on the "ood the lines are followed with the knife sloping. so that when at the correct depth the edge of the knife is midway between the surface lines. First one side is cut, and then the slope of the tool is reversed for cutting the other Instead of reversing the knifo it is often more convenient to turn the work round. In a long trench the chip can he removed when the
second side has been incised, but in the case of a triangle, or square end of course, a third incision is necessary to release the chip.
Matcrial for chip carving should be evenly grained, quite free from kinots or splits, and soft enough to cut easily without imposing too giest $\pi$ strain on the hand while manipulating the knife Lime and American whitewood are both excellent for the purpose: they are light in colour, pleasant to handle. and the white wood is particularly amemable to treatment with water stoin. Articles adapted for ohip carving include wall bracketa, medicine and other cabinets, and occasional tables: the tumeiy departinent of any large store is a hnppy hunting ground for suitable subjects Similar articles are also available with a design ready traced upon them. Varieties of chip carving knives are shown in Fig. 4, the one most commonly employed heing that which is bent in relation to the handle

A straight cut may rult with the grain on across it or diagonally, and in either casm the knife can travel along it in the direction which suits the grain. In following a curved line it may be necessary to reverse the direction of cutting once or twice to avoid tearing up the grain In a diagonal cut the linife muat trave one way on one side of the trelich and come back the opposite way on the other.

The bread board shown in Fig. 5 is a simplu example of chip-carving and may be made by any woodworker. It measures 1 ft. 2 in over all, and should be cut from $\frac{3}{3} \mathrm{in}$. or 1 in material, sycanore or becch heing suitable. The full size design may be set out from the particulars given at Fig. (f, the main lines running to the centre as shown. It is Iransferied to the wond by meane of carbon paper The principal lines should be veined. The cige should be finished with a pronounced chamfer Sec l'retwork; Woodcarving

CHIPPENDALE STYLE. Thomas Chiゃ pendale, a cabinet maker, who died in 177!), gave his name to a style of furniture which has lieen generally admired for its beauty of design. Gentine specimens command very ligh prices, while good imitations are valued One authority lins laid down the following useful hints for recognizing Chippendale


Cbippendale Style. Mahopany banging shelves showing influence of Chinese design. made c. 1750-60. Right, characteristic fref patterns used in lurniture decoration

Hu permission of the Dircelor, Vieloria \& Alher

furniture: "Chippendale furniture is made tahles, basin slands, wine cooleis, mirror most frequently entirely of mahogany with frames, writing-tables, brackets, wardrobes, carved enrichment and no inlay. Its construc- bureaux, secretaires, tallboys, candle stands, tion is sturdy but its omamentation often exceedingly light and fragile. Most of it shows skilful exploitation of curvilinear forms. Fretted or pierecd ornamentalion is common, and in general the atyle of the decoration follows Lonis XV' models. In colour old Chippendale furniture is inclined to brown, often hecoming decp chocolate with an almost metallic-looking patina It is never a hot red.'

The following articles are found in old Chip pendale: chairs, stools, setters, commodes, dining tables, side tables, hodkcases, card


Chippendale Style Left, portion of mahorany book case, showing use of fret. Above, typical armebair with cabriole lers and claw and ball feet
Courtixy of llarlug \& Gilloni, 1.1,l
clock cases, olina cabinets, lire screens, tei caldics, bedstends, and chests of drawers.
la far as can lie ascertained, Chippendale never made a sidehoard, as uc underatand the term, and evell his side tables rarely have a drawer in them. Spanish mahogany, which was carefully selected, was used by him for most of his pieces, but some of his designs were carried out in carved and gilt wood. Chippen. dale's chairs and tables had square or cabriole legs, the latter not infrequently terminating in a claw and hall foot. Foliage and scralls, t. Tophies of musical instruments, and frat work carved out of the solid wood and cut separ-ately-not applied, as was the custom with reproductions-are some of the fentures which characterise his cabinets. Mirror framed were divided into compartments by acrolls. Rigures and animals were introduced

Chinese Chippendale. Ifter the middle of the 18th century Chipmendale varied his furniture designs to fall into line with the prevailing Chinese mode. We have the lattice work backs of cliairs, pagodas on tops of bonkcuses and cabinets, fretioork of Eastern patterns. and other details which give the style to Chineac Chippendale

Later in the century French designs came into fashion, and Chippendale's work accoid ingly became more rococo. We have the interlaced riband-liacked chairs sometimes with a free treatment of the lover's knot ornament, and generally scrolls and foliage were carved with a lighter hand See Antiques; Chair: Chinese Style: Table, etc; also illus. p. 163

CHIPS : A Potato Dish. The secret of making chips lies in having the fat so hot that a hlue vapour rises from the pan, and in well draining the potatoes beforc frying After peeling the potatoes wash them well in cold water, as this washes awny the starch and prevents the chips aticking together in the pan. Slice the potatoes lengthwise. Wipe them dry with a clean cloth, then put them in a wire baskel, plunging the latter into a saucepan containing sufficient hot fat to cover the potntoes. Fry them until they are orisp and lightly browned, turning occasionally to make sure that hoth sides are cooked

wide, the most useful s being $\frac{f}{f}, \frac{3}{4}, \frac{1}{2}, ~\{$, and $t$ in and $1 f$ in. wide A variety of the same class is a long. thin paring chiscl (Fig. 2), intended for paring or cutting across the grain and working in deep holes Both are rectangular in section, and are also made with hevelled edges.
Mortise chisels (Fig. 1) are extra strong. and made from $\frac{1}{6}$ in. to $\frac{1}{2}$ in. in width, for cutting mortises. 1 drawer-lock chisel. indispensable for culting recesses for drawer locks, is an all-stecl double-ended tool.

Good chisels should be clean and straight, all bright parta of uniform colour and texture, and the bevelled end straight and evenly ground. The carver shape of handle shown in Figs 3 and 4 is smooth in contour, and generally made of boxwond. The plain beechwood or ash handles, as in Fig. 2, are larger in diameter, and give n good grip. Mortise chisel handles are more tapered

Before a chisel can be used it must be sharpened or set. This is done by first grinding the bevel to a uniformly flat surface and square at the end. When grinding a chisel the grindstone should be turned to-
cqually. Lift out the basket, and drain the potatoes in this for a minute before turning them on to a soft paper so that they may finishi draining. See Potato.

CEIIROPODY The treatment of the feet in order to keep them healthy and confortable is a very important detail of the toilet, and the instruments employed for the purpose nust be scrupulously clean. Scissors, files, scalpels, etc., should be placed in boiling water and then soaked in a solution of disinfectant.

The toe-nails should be kept well trimmed, but they ought not to be cut too short. They must not be cut in a curve like finger-nails, but straight ; if cut down at the corners they develop a tendency to grow in at the sides. which is injurious and painful. If an ingrowing toe-nail makes its appenrance, $n$ notch should be cut in the free edge of the nail. As the toe-nail grows this notch will fill up, and the pressure of the nail at the side of the toe will be relieved.

If the sport at which the nail is growing in is very painful, a little piece of cotton-wool that has been dipped in boric powder should be gently pressed under the nail. This nust be renewed daily, and will raise the nail so that the edge does not cut into the tlesh. See Bunion; Corn ; Foot. Pron. Chi rop'ody.

CEISEL: How to Use. In woodwork chisels are most important among the cutting tools. Those known as firmer chisels (Figs. 3 and 4) are most genernlly employed, and are sold in eleven sizes, from ${ }_{1}^{1} \mathrm{i}$ in. to $1 \frac{1}{2} \mathrm{in}$.
wards the operator. The chisel should he held firmly and squarely on the stone near enough to the top edge of the latter to allow the tool to be in a nearly horizontal position, with the bevel lying flat upon it. Holding the tool two low, so that the handle points downwards, will cause the water from the stone to run on the hands of the operator. The chisel should be constantly moved across the edge of the stone to wear the Intter evenly. It is then rubbed along the face of a good-sized oilstone, at a slightly steeper angle than that of the bevel (Fig. 7) This produces a shorter


Cbisel. Fir. 8. Enlarred view of the cutting edge when corrictly set, showing the smaller bevel lormed by rubbing the edge on ollstone hat on its back few strokes on and rubhing it off (Fig. 8). A few strokes on both sides, putting on little pressure, will result in a perfectly clean and sharp edge. Chisels must be maintained in this state by rubbing on the oilstone from time to time as they become dull or blunt.

The quality of work done with a chisel depends upon the correct handling of the toolHowever good a chisel or sharp the edge, no
satisfactory work can be done unless the fiandle is properly held Gencrally speaking a chisel should be used with both hands. The right grasps the liandle and directs the course of the tool, and also supplies the energy for its propulsion (Figs. 5 and 6). The left is used to grusp the blade near to the cutting part further to control and direct the cut. By far the greatest amount of work is done in one of four ways. These are: chiselling with the grain of the wood, paring across the grain, paring acrass the end grain and at right angles, and by oblique cutting partly ncross and partly with the grain.
In chiselling with the grain the tool is held at a small angle and simply propelled forwards, laking care not to let it dig in, by making judicious use of the left hand In paring horizontally across the grain, work from one side of the job towards the centrc: reverse the job and work from the other side, and linally clean up the surface flat and tiue, making diagonal cuts to nid in the Hattening. Test the work with a square at frequent intervals.
When paring across the end grain the tool is held upright and the cutting edge applied near the end and side of the wood, starting the cut with a slight side-tilt on the chisel, and bringing it up straight as the cut proceeds. The right shoulder should be elose to the top of the chisel handle, and the whole strength of the arni, shoulder, and liack put into the cut. One shonld never attempt to cut off too much at a time; repented light strokes produce better results. In oblique paring always work downhill-that is, cut with and across the grain. Do not attempt to cut against or up the grain, as the result will be ragged work and splita in the wood.

The not of using the chisel is only acquired by practice, and the amateur is advised to begin with simple johs, such as the shaping of a hexngonal pieco of unod, say 6 in . across the flate and 1 in. thick. If accurately chiselled to shape, and square and true on all its faces, this will be ample evidence that he has passed his novitiate. See Amateur Carpentry; Bench; Wond Carving, etc.

CHIVE : Its Culture and Use. The plant grows in a thick cluster of small bulbs with grass-like, hollow leaves. If an old clump is pulled to pieces in spring, and the separate plants are set $n$ few inches apart in a line in n fairly fertile soil, freali clumps are soon formed Where no old clumps are available, seed should he procured and sown, as if for


Cbive. A plant of chives, valued for its milld onion flavorr in salads and soups
onions (q.v.). The clumps reguire to be renewed about every third year. The leaves are cut close to the ground occasionally in order to ensure a full supply of young ones
Use In Cookery. The chive is a very useful varicty of the onion tribe Though small, it lias an exceedingly powerful Havour and should be used in cookery with caution The young leaves are often minced, and when freshly cut the flavour is delicate and forms an important inyredient in French salads They are also used as a pot-herb, and chive sance is much liked with roast meat or grills

To make this sauce, put a gill of fresh breadcrumbs into a saucepan with 2 oz. butter. Cook them over the fire until a pale gold, when $\frac{d}{d}$ pint stock and 3 tablespoonfuls tinely minced chives should lee added. Stir while it boils for 5 min ., season it with salt, pepper and a tiny dust of grated nutmeg, and it is ready to serve.

CHLORAL or Chloral Hydrate. On account of its soothing effect on the nerves and power of inducing sleep, chloral or chloral hydrate is often prescribed. Nevertheless, it exercises a depressing effect on the heart, and must be used with the greatest caution: if taken for any length of time it may result in a chloral habit that will be very difficult to shake off. It should not be taken by anyone suffering from kidney disease, and never except on a physician's prescription

CHIORODYNE. For relieving pain chlorodyne is a proprietary remedy very commonly used. It is useful in colic either with or without diarrhoes, and when this appears to be due to indigestible food a dose of castor oil should be given at the same time. It may also help an irritable dry cough. It should not be given to infants or children without medical advice. The symptoms of poisoning are those of opiun, and the treatment is the same. See Poisoning.
CHLOROFORM. This drug is widely used in medicine on account of its properties of inducing loss of consciousness and preventing pain and shock during surgical operations or in childbirth.

The compound tincture of chloroform and morphine is somewhat similar to chlorodyne, and is used in the same way. The dose is from 5 to 15 minims. Chloroform water is a pleasant diluent for other medicines, as it has a somewhat pungent odour. The dose is fluid oz.
Chloroform liniment is frequently used as A BC liniment, which is a mixture of the liniments of aconite, belladonna, and chloroform. This may be rubbed on the part, or it may be applied on lint covererl over with gutta-percha tissue. It may be used in muscular rheumatism or in neuralgia

Spirit of chloroform may be used in flatulent dyspepsia, and may be comlined for this purpose with a third of a teaspoonful of bicarbonate of soda dissolved in a little water. It is also used in cough mixtures. A single dose is from 30 to 40 minims; a repeater dose is from 5 to 20

CHLOROSIS. Women and girls who follow indoor occupations are liable, under certain conditions, to suffer from chlorosis, which is a form of anaemia and is also known as green sickness. The patient becomes breathless on exertion, as in climbing stairs The complexion may not sliow any marked change, but more frequently it has a greenish tinge. Constipation and digestive troubles are common. Examination of the blood shows a large diminution of its colouring matter, haemonglobin. The treatment consists in the administration of iron, a convenient form heing freshly made Blaud's pills, increasing from one to three, thrice daily, and frequent doses of Epsom salts. See Anarinia.

## Chocolate Making at home

## Recipes for Some Popular Varieties of Confections

Other articles dealing with Sweer-making include Fudge: Swests; Toffee. See also Cocoa; Decoration; Ieing; Sugar, cte

With additional cocoa-butter and fine sugar carefully incorprated cocoa becomes chocolate. Without the sugar it is known as unswectened block cocon, of which only the best should be used. Table cocoa must not be used for swectmaking.

Although impossible to make first-rate chocolnte without machinery, a good eating chocolate may le propared as follows. Put 1 lb . of unswectenerl block cocos in a small pan and place this inside another containing water. Slowly melt the cocoa over gentle heat, stiring well, and taking care that no svater comes over. Arld 1 lb . icing sugar, stir while this melts, and then thoroughly mix the two together. Run in 4 oz . melted cocoabutter, and beat the mixture vigorously
The contents must not be allowed to rise above blood-heat. Remove the pan from the warm water, add essence to taste, vanilla, kirsch, maraschino, etc, and keep stirring and beating till the chocolate becomes almost solid. Allow it to stand for several hours, then remelt it as required, never letting it get much over $88^{\circ} \mathrm{F}$. or $31^{\circ} \mathrm{C}$.
If the chocolate is to be poured into tin moulds, these must be warmed to be of the same temperature as the chocolate, and should be clean and lorightly polished to get nice glassy sweets. Once moulded, the chocolate should be cooled as rapidly as possible: otherwise it will be spotted and dull in appearance

Milk chocolate is prepared as ordinary chocolate, but with the addition of 4 oz . full-cream milk powder to the amount mentioned above

Harel nuts, shelled, blanched, and well roasted in the oven, are used for nut chocolate. The hazels, while still slightly warm, should
be stirred through the chocolate just lemore pouring, which in this case should be as nearly as possible at its setting point.
I great variety of chocolates are prepared by dipping sweets, known as centres, in a specially prepared chocolate. These centres, which inay be either of a hard or soft nature, are made of fondlant, variously coloured and flavoured, and also of fruit paste, caramel, nougat, marzipan, and nther inixtures. Effective decorations can be devised from angelica, artificially coloured nuts and sugars, and crystallised flowers.

The prepared chocoflate required for dipping is known as couverture, and it has to be melted down with the greatest care, for therein lies the secret of success. The correct temperature, too, when once attained, nust be preserved throughout. With too hot a couverture, the sweets becone grey; if too cold, the couverture is muddy, the dipping slow and tedinus, the coating heavy, and the finished sweet of unattractive appearance.

In dipping centres, wire forks or loops should be used. The pan with the chocolate, set in another contnining warm water, should he in front of the dipper, with the centres on the left and highly glazed papers or brightly polished tins, on which to place the finished sweets, on the right. The centre is dropped into the chocolate with the left hand, and picked up with the fork in the right; the fork is tapped on the side of the pan to spread the coating evenly and remove any surplus, then drawn along the side to prevent "feet" on the sweets, and the covered centie laid on the paper or tin, Unless to be otherwise decorated, each sweet is ornamented with n twirl or line.


Cbocolate Confectionery making. 1. The cream or other centre is dipped in liquid chocolate, and then as in 2, placed on tin to be decorated with a whirl, made, as in 3, with a little chocolate twisted round with a sweet fork. 4. In making a trofete the chocolate and whipped cream are mixed; the sweet is then rolled in the bands and dipped in chocolate powder
made with the fork as the dipped centre is laid on the paper. All manner of centres may be dipped thus.

After each of the centres has lieen dipped, the chocolate in the pan should he well stirred otherwise therc will he layers at different temperatures and the swcets will be streaky Couverture which runs very freely is too warm. It should set almost immedintely the sweet is placed on the paper and show a gloss. The dipping sloould be done in a dry room, with a temperature of about $\mathrm{f}_{\mathrm{j}}{ }^{\circ} \mathbf{F}$ Only the best cocoa-butter should lie used.
Almond centics are propined hy shelling $\frac{1}{2} \mathrm{lb}$. swect almonds and putting them on a baking-tin in the oven until they are slightly browned. When they are quite cold, dip, them in couverture, and leave them on an oiled tin to harden.

Chocolate truffes are rich, soft chocolate centres dipperl ip grained chocolate or dark, unsweetened chocolate powder. For each ounce of chocolate allow one talilespoonful of cream and a teaspoonful of coffec or vanilla essence. Nould the trufles with two terspoons and toss thein in the grained chocolate until they are coated; linish by placing them in fancy sweet cases.

Nougat centres are prepared by putting ( $\mathbf{o z}$. strained honey and 2 oz. glucose into a small pan, and setting the latter inside another containing hot nater. Stir the inixture till it is quite hot. In another pan hoil 1 lh lump sugar with $\frac{1}{2}$ pint water, and also a pinch of cream of tartar, to $\because 90^{\circ} \mathrm{F}$. While this is boiling beat up the whites of three eggs to a stiff snow, which should just be ready when the sugar reaches the requisite degree. Add the boiling sugar to the egg whites, stirring vigorously all the time

Next add the honcy and glucose, place all together in a double hoiler (one large pan inside another will (lo), and keep on heating gently and stirring vigorously till it becomes quite stiff. Idd a few blanched almonds and ghacé cherries, warmed and cut up, and pour the whole into $n$ tin or wooden firme lined with wafer paper. Cover it with wafer paper, place a honrd on the top, then a heavy weight: let it remain thus for 24 hours, then cut it up.

Orange crea $\quad$ II centiea are made by adding to the grated ind and juice of a carcfully sclected, deep coloured orange
sufficient icing sugar to make a stift paste Idd to this a $\frac{1}{2}$ teaspoonful of citric acid dissolved in a few drops of "ater, and mix all well logether. Form the inixture into small balls, or other shapes, and dip them.
To prepare Turkish delight centres, dissolve very slowly together 1 oz . of ground gelatine, 4 oz . of glucose, 1 lb . of honey, the juice of one lemon, and a full $\frac{1}{2}$ pint of warm water. Bring these carefully to the boil, stirring all the time, and boil for 10 min . Flavour and colour the mixture according to taste, and put it out into bright tins, rinsed out with cold water. When cold cut it up into squares.

Marzipan equares are made by dividing I Ih. of warmed almond-paste into three parts. leaving one white, and colouring the others pale ycllow and pink. Flavour the white with vanilla, the yellow with lemon, and the pink with rose or raspleerry. Roll them into sheels, and lay one above another. Cut them up into aguares and set them out to dry before dipping
Fruit Centres. To prepare Iruit-paste centres, bring to the boil a little apricot jam, stirring it all the time. lemove it from the


Chocolate Cake, covered with chocolate icing and decorated with pistachio and other nuts
gas or lire, inix in an equal quantity of tinely cut preserved pineapple, and drop the mixture with a spoon in small drops on some glazed paper. When these are set, stick them together in pairs with stiff jam or jelly, and allow them to dry thoroughly.
Chocolate fruit dominoes can he made by finely chopping a cupful of shelled walnuts, halif a cupful of ligs, and the same quantity of stoned dnten, and adding to thiem the grated rind of an orange, a tablespoonful of orange juice, and a square of melted, unsweetened chocolate. Tum the mixture on to n hoard sprinkled with powdered sugar, and roll it out to one-third of an inch in thiciness. Cut the paste into the shape of dominoes, using a sharp knife : coat these thinly with melted chocolate, and decorate with small pieces of hlanched almonds.

The ingredients required to mako chocolate caramels are $\$ 11$. chocolate (scraped fine), I cupful brown sugar. 2 cupfuls Sreacle, I cupfu
inilk, and I piece butter the size of an egg Boil these in a porcelain saucepan, stirring all the time, till the candy hardens when droppell into water. This sliould take about hour Stir in I tablespoonful of vanilin extract when the saucepan has been taken off the fire and the mixture has stopped bubbling. Pour in n aliallow, oiled tin : Icave candy to set and marl: into squares.

CHOCOLATE : The Beverage. When pussible, this should he made with a French chocolatière, which, by reason of a small heater device that passes through its lid, enables the chocolate to be casily whisked while cooking. A good drinking cliocolnte can be made by grating two large bars of plain cliocolate into a pan, and adding to them 1 heaped tablespoonful of white augar and a teaspoonful of the hest comflour or arrowroot. Nix these ingredients smoothly with a breakfastenpful of water, and let the whole boil gently for 5 min Then stir in I breakfastcupful of milk, bring it to the boil and serve it in cups, alding, if liked, a spoonful of whipped cream on the top of each. See Cocoa

CHOCOLATE BISCUIT. These are ex cellent for afternoon ten To preparc them, dissolve 2 oz grated chocolate in a small tablespmonful of water. Put 2 oz. margarine in n hasin, work it up with n wooden spoon, and add 3 oz castor sugat, beating the mixture to the consistency of cream. Mix in the dissolved chocolate, beat in an egg, then add the vanilla and lastly if oz. sifted llour, stirted in lightly Tum the mixture on to a lloured board, and toll it out into a thin sheet. Cut it into shapes, and bake these oll a gieased tin in a moderate oven for 12 to 15 min .

CHOCOLATE CAKE. First of all \& 16 cach of butter and castor sugar are creanlied together. Then the volks of $\geq$ eggs are beaten in, 3 oz . each of grated cliocolate and lour. and $\frac{1}{2}$ teaspoonful of laking powder


Chocolate Cream Mould. set in an ornamental shape and turned out in a glass dish
adder, and tirally the whites of the 2 eggs heaten to a froth. The mixture is haked in a moderate oven for 1 hour and may he covered with chocolate icing if desired, top and sides sprinkled with chopped nuts and centre decorated with pistachio nuts.

## CHOCOLATE CREAM MOULD,

favourite party sweet is made from $1 \frac{1}{2}$ oz. grated chncolate, 2 oz. sugar, $\frac{1}{2}$ oz. gelatine, and $\frac{1}{2}$ pint of slightly whipped cream. Put the gelatinc into a saucepan with enough water to melt it, and add the chocolate and sugar, together with a little milk. stirring the whole till dissolved. Whip the crean slightly, mix it with the rest of the ingredients, after they have cocoled alightly, and put all into a wet mould to set.

CHOCOLATE ECLAIR. These iced cakes are made with $\frac{1}{2}$ pint water, 3 eggs, 4 oz . flour, 1 oz . sugar, 2 oz . margarine, a pinch of salt, a little whipped cream and anme glacé icing. Put the watcr, salt, sugar, and margarinc into a saucepan over thie fire, and, when thicy hoil, add the llour. Stir the nisture until it beconies
a soft paste and leaves the sides of the saucepan. Then take the pan from the fire, and add the eggs separately, beating each in well. With a forcing tube lay the paste out in shapes measuring about 4 in . long on an ungreased baking-tin. Bake these for 20 min. in a moderate oven, and when they are cold split them open at the side, and fill them with whipped creain sweetened and flavoured with vanilla. Ice the top of the éclairs with glacé icing This quantity is sufficient for about ien éclairs.

CHOCOLATE ICING. In making a simple chocolate icing, $\frac{1}{2} \mathrm{lb}$. icing sugar and 3 oz . grated chocolate are mixed together with 2 tableapoonfuls of hot water or milk. A ylacé for fancy cakes requires more sugar. Cook 2 oz. grated vanilla chocolate in $\&$ pint of water in a pan, then add 1 lb . icing sugar with 3 tableapoonfuls warm water. The nixture should be poured warm over the cakes

CHOCOLATE PUDDING. A baked pudding requires 1 pint milk, 3 cggs, 2 tablespoonfuls each grated chocolate and castor sugar, a few drops vanilla, and 1 oz . cornflour l'ut the grated chocolate in a saucepan with f pint of the milk, and boil the two together until they form a smooth paste. Then mix the cornHour with 2 tablespoonfuls of the cold milk, and add it, with the rest of the milk, to the chocolate, and stir the whole till it loils. Draw the pan to the side of the fire and beat up the 3 yolks of eggs and stir them into the cooled mixture, flavouring with the vanilla. Pour the whole into a buttered pie-dish, bake $\frac{1}{2}$ hour, and then beat up the whites of 2 eggs to a stiff froth. Add half the sugar lightly, and heap it over the top of the pudding, sprinkling the rest of the sugar over all. Bake the pudding very slowly.

CHOCOLATE ROLL. Cream together 3 oz . each sugar and hutter, and aieve together $f$ lb. Ilour and 1 teaspoonful haking powder.


Cbocolate Roll. An attractive $S$ wiss roll for alterRon tea covered with chocolate

To the former mixture add 3 eggs, beating each in separately, and lastly fold in the flour and haking powder, together with a little milk if required. Pour the mixture into a shallow greased tin and cook for 10 min . in hot oven.

In the meantime, put $\{\mathrm{lb}$. jam into a saucepan to warm, and when the sponge is ready, sprend it with the jam, and roll it up immediately. When the cake is cool, ice it uith chocolate butter prepared with $\ddagger \mathrm{lb}$. butter, 9 oz. icing angar, 2 oz. grated chocolate, 2 tablespoonfuls milk, and a little vanilla Havouring. Cream the sugar and butter, and add the chocolate (dissolved in the milk) and a few dmps of vanilla. Pour the icing into an icing bag and force it fmo a shell-shaped icing tube in straight lines from olle end of the roll to the other.

CHOKE This is an electrical apparatus consisting of an inductive winding which offers a path of high imperiance to the flow of alternating currents, the impedance or A.C. resistance increasing with the frequency.

High-frequency chokes, as used in wireless receiving apparatus consist of a great number of turns of fine wire, wound so as to have a bow distributed or self-capacity : they may be employed for coupling purposes in high-frequency amplifiers or in circuits of the capacity reaction type Special heavy duty high-irequency chokes are sometimes used in mains eliminators to isolate the receiver from stray high-írequency currente, which may produce diatortion and other troubles

A good H.F. choke may be constructed by taking a 1 in . diameter ebonite former having six slota, each slut being $\frac{1}{b}$ in wide and $\frac{1}{2}$ in deep. These slots should be spaced $\frac{1}{1}$ in. apart and filled with No. 36 S.S.C. copper wire.

Low-frequency chokes have an irun or nickel alloy core, and are employed in lowfrequency magnifiers, and alan for smonthing purposes in minins units. A suitable value for an output filter, or smoothing choke, is 20 ) henries at normal working currents, and the winding should have a D.C resistance not exceeding 500 ohms. See Eliminator : Filter, Inductance ; Impedance : Reaction.

CHORING. One of the commonest causes of choking is when a fish bone gets stuck in the throat or when a morsel of food goes down the wrong way. Artificial teeth may get fixed at the back of the throat or in the gullet, obst ructing the air passages, and fragments of child ren's toys have been a source of danger.

Unless the patient is unconscious he should be made to kneel on a chair with the head downward and the body weight supported on the hands on the floor. In this position he should attempt to cough the obstruction out of the windpipe, while at the asme time he should be given a fou smart blows between the shoulder blailes. If these means are notsufficient to remove the obstruction, the mouth should be prizel open by some hard object thrust between the back teeth, such as the handle of a spoon guarded by a handkerchief Then someone should thrust his forefinger well to the back of the throat as far as possible, and sweep it across the base of the tongue in an attempt to dislodge the obstruction. If there is any difficulty in affording relief, the doctor should be sent for at once. Artificial respiration may be necessary if breathing has ceased. See Artificial Respiration : Asphyxia.

CHOP : How to Cook. The accepted meaning of achop is a small cut of mutton, lamb, pork, or veal taken from the luin. When cut from the tail end it is known as a chump chop. Chopa cut from a very fat loin are westeful, and as the price is high a good butcher will trim them carefully. They are beat grilled or broiled. Lamb chops are cooked a, those of mutton: they are more delicate in flavour, but should be well done, while many people prefer a mutton chop. slightly underdone See Grilling: Mutton

CHOPPER. Two types of ohopper are in general use-the long, nariow pattern used for chopping wood, and a broader-bladed kind for chopping meat. A French kitchen knife, however, with its fine point and deep hilt, is better than the straightblacled knife, and two or three of theae are most desirable implements to have in the kitchen.

All that a chopper requires to keep it in good order is an occasional grinding. The edge can be kept in good trim


Chopper. Above is shown the broad-bladed implement used for chopping meat: below, the narrow pattern employed for wood chopping
by whetting it on an wilstone slip. A wripe over with an oily rag prevents the blade going rusty : a loon mund the handle makea the chopper easy to hang up.

The correct method of chopping meat intu small pieces is to hold the point of the chopper or knife firmly down on the ohopping-hoard with the left hand. and with the right work the handle up and down. now and then collecting together and tuming over the tood being chopped with the left hand, thus ensuring speed. See Parsley: Suet

CHOPPING BOARD. Desirable qualities in a ohopping board are rigidity, solidity. a smooth surface, and toughness to resist wear. It should, therefore, be made of " solid piece of hardwond, such as heech, birch, or maple. Convenient sizes are 14 in long, 12 in . wide, and 2 in or more in thicknese Four holes, about $i$ in diameter, drilled near the corners on the under side of the block and filled with ordinary bottle corks, leaving $\frac{1}{1}$ in protruding, ensure the board resting firmly and, by providing a certain amount of resiliency, facilitate the chopping.

Chorea. This is the medical name of the complaint known as St Vitus's Dance (q.v.).

CHOW CHOW. A clever and kind. hearted dog, devoted to his owners and endearing himself to their children, the chow is


Chow Chow. Cbampion of the Chinese breed ol dog
a spirited gurdian of tho house and a distinct ornament to it. With his handsome cont of dark red, black, vellow, white, or blue, he wears a fur ruff around his neck, and the plume that serves for a tail is ourled far over his hack. His small, pointed ears are carried stifly erect, his dark eyes are almond shaped, muzzle broad, and tongue blue-black. His weight is about 40 lb ; that of his mate a few pounds less See Dog.

CEOOWDER. Cod or fresh hadidock may be used, if lb. heing cut up into small pieces witin $f \mathrm{lb}$. each of peeled onions and potatocs, cut in $\frac{1}{2}$. cubes Trim and cut 3 oz. of pickled pork into the same sized pieces, and fry the pork and onions until they are a light brown. Put potatocs. fish, onions and pork in a casserole in layers, adding 2 sliced tomatoes, and seasoning and powdered herher hetween each layer. Putato should be on the upl.

Pour in 1 pint of stock, cover it and simmer for 20 min .

Heat $\frac{1}{2}$ pint of milk and break into it three watet llowers extending the full width of the front biscuits lant these stand for 3 min Stir int, the chowder. boil it once. and serve it in the casserule.

CHRISTENING. This term is used, osperially by certain Nonconformist budies, for the religious rite more generally known as haptism.

Christening Robe. The usual length is $4 t$ in.. and 3 yards of double width nuterial is sufficient Ancfiective robe can be made by utilising a piece of Brussels or Honitun lace in pancl form from the yoke to the edge of skirt. Tiny tucks and insertion finish the rest of the skirt A benutiful gown can be made with solf.cmbroidery- $\Omega$ finc spray of

## Christmas and its Merrymaking

## Preparation of Seasonable Fare and Suitable Decorations

Further information will be found in such articles as Artificial Flowers: Cracker. Sce also Children's Parly and entries on Card Tricks: Coniuring

Preparations for Christmas are a serious or joyous matter according to the spirit in which they are tackled It is far better to give simpler presents, fare, decorations and general entertainment than to attempt expensive elaboration, which will not make for happiness owing to strainel nerves or over-taxed resources.
Most children love assisting with anything to do with Christmas festivities; also they like preparing presents, secret alopping and doing up their prorels. In the latter connexion the continental hathit of packing up gifte in special coloured and patterned papers, with tinsel or hollysprigged ribbons and attractive reasonable labels and seals, is one which delights children. and thesc little extra bits of de coration cost only a few pence. Purcels sent out or arriving in Christmas wrappinge with merry labels b earing the instruction "Not to be opened til! Decen. ber $25, "$ are much more exciting than drab brown paper packages

The modern chilat is apt to be incredulous of Santa Claus and of Futher Christmas himself hut is willing to do a little makeI elieve for the ocrasion. Therefore, in many houscholds on Christmas Eve, whensmall people have given up the futile effort to lie awake in il the arrival of Santa Claus, the stocking is filled and Christinas gifts are placed on the table by the bedside. This also has the advantage of keeping children busy until the elders are prepared to start the day; whereas, if the gifts arc to be placed on the breakfast table, the whole house is astir before dawn. It is usunl, especially where there are children, to have the Christinas dinner served in the middle of the day. 'This has advantages when evening refieshments have been cleverly plamed to take the form of a helpyourself supper of ready-prepared dishes, as it allows the staff to have the cvening off with their friends. If the Christmas party is a family gathering, prohably after dinner games suitable to all siges will be included in the programme. Everyone enjoys a few conjuring tricks, if the host is able to do a sliort series of these. In addition it is well that $n$ fow records of propular dance successes should be forthco:ning for the gramophone.

The Christmas menu may be simplified to grapefruit. consommé, flavoured and coloured by tomato and served in cups, roast turkeychosen with due consideration for the size of the party-atuffed with cheatnuts in the body and sausage ment in the crop, accompanied hy cranberty sance, celery, of salal and linked potatoes, and followed by those essential featurcs of a Clirist mas dinnei, plum pudding, mince pies and special dessert It is often found better to carve the turkey in the kitchen beforeland, arranging it nicely on a dish to the kept hot until scrved. Some. times roast goose is preferred to turkey. If not too fat, garnish the goose with chipolata sausnges and serve with rpple sauce

The table should be charmingly laid and decorated with as much colour in the schenc an taste permits. The big howl of Iruit, surrounded by acsarlet or silvered candles. in glass or silver candlesticks, and by smaller sweet dishes with brilliantly coloured crackers inter. apersed, can be recommended where Howers are where Howers are
frosted Christ mana hard to obtain. A small frosted Christman
tree on a centre piece of silver paper, outlined with holly leaves, or a snow man guarding a big bundle of crackers may lic liked. If a tablecloth is urad it should be a festive one, or mats of lace are always right, or an embroidered runner is suitable for a long, narrow table. Place cards and menu holders carried out in seasonable designs add a finish. ing touch of gaiety.

Christmas Decorations. Some people like to decorate their houses throughout, others are content with an arrangement of evergreens in dining room or hall and sprigs of holly for the table.

With many decorations ahout great care should be taken to sec that there is no danger from the fire or any candles. The latter should only be used for the table or high up on a chimney piece out of possible danger of heing knocked over. Wall decors-


Christmas. Fig. 4. Wall decoration of paper-covered hoops joined by coains. Fis. 5. Tuese are held up at intervals by wands topped by big brusbes made of strifs of coloured paper


On the apex of the trec the Angel of Pence is symbolised as a fairy doll, with glittering crown and wings and sprcading galuze akirta. A pretty touch is to let strands of tinsel fringing fa! np. parently from the doll's hands to festoon the hranches. The girls generally dras lots for the fairy doll at the cnd of the proceerlings Large toys and presents, if to be given at the same time, should be placed at the base of the tree. The tree should be lighled up a few minutes before the children are ndmitted, and all other lights turned off. In many houses it is kepit until New Year's Five, when it is lighted up again about a quarter of an hour before midnight (o) welcome the New Year.

## CHRISTMAS CARDS.

 There are not many households that do not send out and receive a few Christmasto form the neck, and keep the twist tight The loose end of the paper will form the body Having cut a atrip of paper, 2 in . wide and 4 in . long, the elastic way of the paper, $t$ wist it up very tightly to form a rope. With a stiletto or sharp-pointed scissors make a hole through the body just liclow the neck. If the rope of paper is inserted into the hole at one side and twisted. it will pass right through and form the arms The legs are made similarly from a strip of paper the same width and ahout 5 in. long, and are run through the body 1 in. below the arms. 'The doll is then made ns in Fig. 6, rendy lor dreasing.

For the skirt, cut lengths, 9 in. by 4 in ., of two colours of the crinkled paper. Paste the ends of each together and put one of the rings so made inside the other. Slit the top of both narrowly to a depth of about $\}$ in. to form the fringe, then alip in the little figure and gather the skirt closely and evenly round it, so that the base of the fringe comes just below the arms. Bind it round firmly with a doubled strip of paper about $\ddagger$ in. wide to make the belt. Press the fringe down so that the under colour ahows, and stretch out the bottom of the skirt to its fullest extent. The top skirt should now be cut up nearly to the waist, into strips $\frac{1}{2}$ in. wide. All that is needed to complete the ligure is n bow of narmw paper pasted on the head and the face inked in. Such little figures made without lege ean be mounted on sticks.
Christmas Tree. For the children the most exciting decoration is often a Christmas tree. Sometimes this is of cut out painted plywood set into an imitation plywood tub. Toys, etc., are hung on the tree by means of tiny screwed. in hooks, and the tree is set flat against the will. It obviates mess, but is rather a poor njology for the regulation fir

With any candle-lighted Christmas tree there is risk of fire, for which reason a long pole with a sponge at the end should be kept ready with a pail of water to extinguish the candles as they burn down. Because of this risk, many people prefer the tree lighted with coloured electric bulbs.

A fir tree standing about 6 ft . high takes two persons several hours to trim effectively. Ornaments mado from silver, gold, and coloured paper should fill up odd spaces and trim the tub, or whatever the tree is placed in. Special shining ornaments are sold by the dozen and can be wired on the branclies effec tively, with chocolate animals in silver paper, baskets of swcets, little dolls, niniature fumiture. cruckers, and light worden toys.
cards. They are often elaborate and heautiful, but the personal card with printed namo and address of sender, either specially designed or chosen from stock patterns, is increasingly popular. Miniature calendars are also frequently used. If the envelopes are left unscalerl, Christinas cards can be posted at printed paper rates.
CHRISTMAS PUDDING. The basin in which a plum pudding is biled must be quite dry and well greased. Fill it up well and tightly with the pudding mixture, and tie down over it a sealded and floured pudding. cloth, leaving a fold to allow for swelling.

A pudding for six or more persons requires boiling for at lenst 8 hours. Small ones require less in proportion, 3-4 hours sufticing for a 1 lb . pudding; but, in any ease, long boiling does no harm. If several puddinga are to be cooked in the same sauccpan, put them into boiling water at intervals of a minute, so that the water is not cooled too much, and replenish with boiling water as it boils awny. Puddings can be made months before use and stored in a cool, dry place; to re-heat them let them stand in boiling water for 2 hours or more.
The following is a recipe for a gond rich pudding. Mix well together 4 oz . Hour, 3 lb . breaderumbs, $n$ small teaspionful salt. $\frac{1}{2}$ lh.


Cbristmas pudding turned out ready to serve and decorated with DJwdered surar and a sprig of holly
chopped beef suet. and a flat emspoonful all spice Stone $\mid \mathrm{lb}$. raisins or use $\hat{d} \mathrm{lb}$. of seeded wash and piok over carefully $\} \mathrm{lb}$. each of currants and sultanas and atir them into the Hour, ctc Add 3 oz ench of candied orange and lornore peel and $\mid$ oz citron, cut into thin strips, 2 oz. ruughly chopped siveot nimonds and, if desircd, 2 nz glace cherries Mlix in alan ] Ib. moist sugar, and the grated rind and juice of $\frac{1}{2}$ a lemon. Beat up 3 egge, and mix "ith them 2 dablespuonfula rum, 1 tiablespoonful brandy, and 4 tablespoonfula ale or stout Pour this liquid on to the other ingredients. and the more thoronghly it is atirred the tetter. Lenve it for about an hour, and it is then ready to be put in the basin and boiled. This will make a pudding which will be large enough for 10-12 persons.

Hor a plainer puddings ehop 1 lb . of beef auet very fincly. Clcan and pick over $\frac{1}{2}$ thench of curriants and sultanas, nad stune and chop roughly $\frac{1 b}{}$ baisins. Mix them in a larga bisin with $\frac{1}{2}$ th noist sugar, $\frac{1}{} \mathrm{lb}$. Ilour, $\frac{1}{2} \mathrm{lh}$ breaderumbs. a little salt and a saltspoonful


Cbristmas Rose. Cluster of fowers and leaves
of Eelleborus niger
of allapice. Ped and core $\{\mathrm{lb}$. apples and chop them tinely, or put them thmugh the mincer. Blanch anil shred $1 \frac{1}{2}$ oz. sweet almonds, and cut 2 oz mixed peel into thin strips. Add these to the other ingredients, with the grated rind and juice of $\frac{d}{}$ an orange and $\frac{1}{2}$ a lemon, and mix well in. Beat up 3 egge, strain them on to the other ingredients, and mix. Ald $\ddagger \mathrm{pt}$. of stout, and enough milk to matio the mixture drop from the spoon. Let it stand for an hour, then put into basins, tie down, and boil. If mude into one pudding, this will be enough for 10-12 persons.

To serve n Christmas pudding, turn it out on a very hot dish and pour over it brandy sauce, or hand round brindy butter separately. Alternatively, jour a little brandy over the pudding just before bringing it to tablc, and set it alight. Decornte it with a sprig of holly. Ready-made puddings are sold by most hrocers and provision dealers, and all they require is $n$ few hours' immersion in hot water. See Brandy Butter; Brandy Sauce.

CHRISTMAS ROSE. Helleborus niger, commonly called Christmas rose, is n nember of the buttercup family. It is $n$ hardy perennial which thrives in partial shade in deep sandy lonmy soil. When transplanting becomes necessary it should be done in July; the clumps ought to be broken into several moderate-sized pieces. The finest varicty is named altifolius (maximus). The blooms are protected by covering thom with a handlight.

## Chrysanthemums and Their Culture

## The Characteristics of Many Different Varieties

In addition to the entries on Aster und other favourite flowers, consule general appropriate articles as Borders; Greenhouse, etc. ; also gardening notes under headings of the various months, c.g. April

Few llowors equal the chrysanthemum in will bloom freely in early nutumn. During popularity, for even in small gardens beautiful the summer months the soil between the diaplays of bloum can be obtained with very little trouble during the monthe of September, Octuber and November. It will llourish in beds and borders, but still more under glass, where the flowering period is prolonged into winter. so that it is practically the last of the great plants to bloom. No plant better withstands impurities in the air, and consequently the chrysanthemum is successfully oultivated in town gardens.
There are many types of chrysanthemum: some of them are suitable for cultivation uut of doors, others in pots under glass Among them are several hardy border perennials, e.g. the shasta daisy or hardy marguerite (varieties of chrysanthemums maximum and (cucanthemum) which bear large white bloums on long stems in summer, and the moon daisy (chryanthemum uliginosums), a tall plant with greenish-white fowers in September Japanese, incurved, decorative aud single Hlowered ohrysanthemums are gmwn in pots to supply blooms under glase in autumn and winter. Early or border chrysanthemums flower out of donns from August to October. Annual chrysanthemums, of which seeds are sown out of doors in March, llower in summer.
The horder chrysanthemum is hardy in all except cold districts, is easily managed and hlooms profusely in late suminer and autumn. It is a llower for every garden. Present-day varieties are innumerahle, and every yenr fresh ones are introduced: they bear double or single blooms in crimson, rose, yellow, jink. orange, bronze, and many other shadea of colour.

A start should be made by purchasing small plants in May and setting them out at 18 in. apart in a sunny place. Ortinary soil which has been well dug suits them; some clecayed stable manure and a scattering of bonemeal should be mixed in. In á fort night's time the top of each plant should be pinched off to make it branch out; the fresh shonts should le stopped again in June, but not after that month or the blossoming season will be too late. This treatment will ensure the development of well branched planta that
 plants should be hoed frequently, and it will be necessary to stake the planta securely in order to prevent the shoots being broken or becoming misshapen.

Although most of the plants will pass through an ordinary winter safely, especially if covered with old ashes, it is wise to lift a fow of them, cut down the stems, and set them in boxes of soil in a cold frame; in early spring fresh shoots will grow, and thesc are used an cuttings to increase the stock. They whould be severed slighitly below the soil surfíce, trimmed just beneath a joint, and inserted in jots or boses of sandy soil in the frame. If the latter is kept closerl and the soil moistened occasionally the outtings will form roots in 3 or 4 weeks. They will be ready to plant out of doors M May,
Border
Border chrysanthemuma may be left out of doors undisturbed for two or cven three years if large plants bearing an abundance of bloom are wanted.

The following are some of the best varieties. llowering in August September
Afterglow, terra-cotta : Charlotte Harley, crinnNon: Cranford, yellow: Crimson Circle, redl: dimald Dame, yellow ; Oumen Gold. Yellow ; Mme. Deskranges. White: Miss Matfie. yellow; Mrs. Thnope. ned: Suracen, amler: Shlrley Bronze, bmize jellow.

Flowering in September
Ansirante. chentnit criman: Crituson Muric Masse, Enrly Buttercup, yellow: Fen Purlalenne, roar minne G Gaichers Crimsoll. Oolden Gowcher, sellow: horace martin. yello" J. Mcalpine, rome pink; Lealic, yellow: Mure. M Marse, Mac-minue ; yellow: R.A. Ronta, white : Septeniber White.

## Flowering in October

Bébr Blanc, white: Betty Spirk, rowe pink Chambagne, red ; Cranford Yellow, Dramoll. bronte Ethel Harvey, yellow; 1a Garannc, reddlah ralmion Pink Spray, plak.
Single-flowered chrysunthemums which bloom out of doors in early autumn are

Delieo, plnk: Domen Woolman, vellowish: E:arly Mary Riding Hond, redf : Shirlev crlmison: Snow storm. Whltc: :Vichr of Shtrley. íronza


Left to right : Japanese "Mrs. George Monro"; anemone-flowered "Aphrodite "; a aother Japanese varlety.

Raising Specimen Blooms. For the oulture of large hlooms the plants, grown in pots under glass, should be out down immediately the llowers have faderl, and the shoots growing through the soil will form the cuttings for new stock. Place the cuttings round the edges of pots containing a mixture of sandy loam, first dropping a pinoh of silver sand into each hole. Put them under a handlight or propayator in a greenhouse temperature of $50^{\circ} \mathrm{F}$

Well-inown growers who specialise in the chrysanthemum may be relied upon to supply excellent young plants in the spring. They must be given plenty of air, and they must not be grown in a temperature higher than $50^{\circ}$. Their proper place is in an airy house close to the light. A 3 -in. pot may be used, and the compost should consist of four parts loam, two parts leaf-mould or well-rotted manure. and one part silver sand

It is a good plan to make the potting soil fairly moist, and it is then unneccssary to water the plants for a day or tivo. By the beginning of April the plants will be well rooted, and should be put into 6 -in. prots, the compost being rougher and a trifle heavier The newly potted planta should be put back in the frame and kept fairly close for a day or two until the roots have begun to push out into the new material: but the pota must not be crowded. When the planta are again grow. ing well give them a sheltered position in the garden, and do not allow to become dry.
The final potting, which is clone in Juno, is a detail of importance. Flower-pots, 9 in. iride, are suitable for most varieties. The compost should consist of pieces of loan (old turf) twóthirds, well decaved manure one-


Chrysanthemam. Double variety of border plant
thirl with a scattering of sand and onished brick, and a sprinkling of superphospliate of lime or special chrysanthemun eertiliser. 'The compost must be made firm with a woodeu rammer and a space of about 1 in . left at the top when potting is finished. The best position for the plants is on a sunny gravel wulk. Each plant must le staked.

Different varieties need different treatment in respect of stopping and taking the buds. Often the chrysanthemum produces a flower bud in May: this, which is known as the i,reak hud, perishes and fresh shoots which will form the branches grow from beneath it. If this break bud does not form, the top of the plant must be pinched off to cause the development of other shoots. Usually not more than two or three of these are allowed to grow.

In August each one will bear a flower bud which is called the first crown. If the variety produces its best blooms from first orown buds, these нге "taken" by remoring the small shoots that grow bencath them.
If, however, the variety yields its best blooms from second crown buds, one of the small shoots beneath cach first crown bud is allowed to grow; the bud itself will perish. Each of the new shoots will, in due course. produce a flower-bud-t he second crown

Amateurs will get the best results from most varieties by stopping the plants in April or


Chryganthemum. Diagrams illustrating the method of raising from outtings. 1. Poor, and 2, good cuttings. 3 and 4. Incorrect and correct places to make cuttings. 5. Potting a cutting; $a$, hole made by dibber: $b$, outting inserted with sand at $c$, $\theta$. Section of cold frame with cuttings in pots
standing on $a$, sawdust or ghre; $b$, slited cinders. 7. Rooted cutting in small dot. 8. Later potting. 8. Rammer used in poting. 10. Dibber
possible in Noven. hot Add 102 . flour mixed with melted butter ber or December. By to the liquid, and continue simmering unti stopping the shonts the snuce has thickened. The fish is served frequently well. in the casserole and garnished with little branched plants are sippets of toast. ohtained Stopping should not be done after June. The yhoots must be ataked and tied with great care. The final potting is done in June.

There are soine beautiful singleflowered varieties wihich bloom under glass in lateautumn: they need the same treatment as the decoratives. A fow of tho best are enumerated below:
Ceddic Muson. crimaon: Exinouth P'Ink Pusilier, hright crinusn: Godfrey's Trlumbh, yel low: Mary Richarilan. terra cotta: I'hyllia Comper yellow: Nanlown Ruading.

May, and taking the first crown buds in Auguat. If the shoots beneath the second crown buds are allowed to grow they will subsequently bear buds which are called terminals because they terminate the season's growth. Amateurs who grow for large blooms should consult the chrysanthemum catalogues which give the correct bud to take for each variety.

When the buds are developing the plants must be fed once a week alternately with weak soot water and with one of the special chrysan. themum fertilisers used according to the directions supplied. Towards the end of September the plants are placed under glass where the hlooms will open from November. onwards. The glass house must be ventilnted very freely in mild weather.

The Japanese varieties are grown to provide the largest blooms : not more than from one to three are left on ench plant. The following are first-rate varietien

Dawn of Day, reddish vellow: Duchess of York, rose-purple: Helena Maraerison, nink Indy Talbot, primroac : Loulsa Porkett, white : Majestic Edith Cavell , maronze yellow Michn. reddiah bronze roae: Mrs. K. C. Pulling, yellow ; Peace, yellow Princesa Mary, yellow: Queen Mary, white: T. W. Pockett, silvery pink, very large: Vlacount Chinda. yellow: W. Turner, illite : W. Ligby, ycllow.

Many new varietien are introduced each уеar.
Incurved varieties which need similar treatment to the Japanese are now little grown except for exhibition. A few of the beat are
Buttercup, yellow: C. H. Curtia, yellow ; Lady ranbel, blush; Ondine, white tinged witll green

Decorative chrysanthemums are splendid Howers for amateurs: they are douhle and of medium size. One plant will produce six or more blooms. The plants should be stopped in April or in June, the firat crown buds being "taken." They can be planted out of doors for the summer and carefilly lifted and repotted in September, though they do better if grown in pots throughout the season. They bloom under glass in late autumn. A few attractive varieties are
Aldyth, crimson ; Baldcock's Crimson: Blunche Poltevine, whlte: Cisshury PInk; Denember Gold, jellow: Dr. Finguchard, rose plnk: Exinouth Crimson, H. W. Thorpe, white; Jesn Pattison, copper salmon: Mmic. E. IRoger. greenish; Mra. R. F. Felton, crlinson; R. H. Pearson. yellow Wellington Wack, primrose.
These varieties can be grown to form large apecimen plants, each bearing from 40 blooms upwards. Cuttings should be taken as early as

Other types of chryaninthemum are the pon pon, anemone-flowered, and thread-petalled. The latest novelty is the cascade chrysan themum, which is of somewhat drooping growth, bears small single llowers and misies a most decorative pot plant.

Aphis or tly attacks chrysanthemums, but can be destroyed by using one of the numerous proprietary insecticides. Earwigs maydamagethe huds; they should be trapped in small flowerpots filled with hav and placed, invertêd. on the chrysunthemum stioks; the traps must be shaken over hot water every morning.
Rust and mildew are plant diseases which may dainage chrysinthemums. On the first sign of infection the plants should be spraycd with liver of sulplıur, 1 oz. in 2 gallons of water. The leaf mining maggot often disfigures the leaves by boring. Maggats can he deatroyed by pinching the affected parts of the leaf between the finger and thumb.

CBUBB: The Fish. Casserole cooking is


Cbuck. Figs. 1-2. Showing construction of taper screw and prong chuck

CHUCK : Its Uses. In its simplest form this is a body piece adapted to screw on to the spindle of a lathe or mandrel nose, as it is termed. Projecting from the end of the body is a tapered and coarse-threaded screw, on to which is screwed the piece of wood to be turned; such a tool is known as a screw chuck (Fig 1). When the work is long, like a baluster rail, and is supported at the ot her end by the tailstock, n prong ohuck (Fig. 2) is the proper tool to use.
A drill chuck has movahle jaws actuated by a screwed part of the body, a usual and chenp pattern like that illustrated in Fig. 3 being commonly found on hand drills, braces, and small drilling machines

A useful and inexpensive variety of chuck. known as a dog chuck, is shown in Fig. 4. The work is held by the short set screws; the posts, or doge, in which they turn can lie inserted in any of the holes in the borly or faceplate. Such a chuck can be used on " simple lathe, and will also le found of service for holding work under a drilling machine, or while otherwise working upon it.
A popular chuck for amateur une is a thrce jaw self-centring scroll chuck (Fig. if). This tool automatically centres the work. Two sets of jaws enable a wide range of interna or external work to he hield very securely
Chucks should always bo kept clean and free from chips. especially the working parts. threads before screwing the chuck on to the mandrel nose, no any chips or dirt in the threads will make it jam or run out of truth. See Centre: Lathe; Mandrel; Metal Turning;

## Vood Tuming.

CHURN : For Making Butter. One of the simpleat churns consists of a glass jar or vessel with a nickel-plated screw cap, and a wooden beater actuated by means of bevel the best way with this freshwater fish, which gears and a crank hundle. It is readily somewhat resembles a carp. The fish abould be washed in vinegar and water and thell sliced: 2 or 3 small onions are sliced and fried in butter, and 1 pint fish stuck added. vith a rlessertspoonful of mixell herbs and seasoning. The fish is allowed to simmer in this for 1 hour, then lifted out, and kept

cleaned and requires little attention heyond occasiona! oiling of the gears and spindle.

The barrel type of chum consints of a solid hardwood fraine provided with roller or other bearings, on which is supported a steel shaft rotated by a crank handle. A hardwood barrel with a remov. able lid at one end is attached to the shaft, and is rotated

end-over-end crank handle isturned The method of fitting and securing the lid is of importance in this class of churn. In some, a num lier of screw clamps are used to press the lid home in another, $n$ cam actuation is used to hold the lid in posi tion. Some harrel churns are supplied without a dash or benter; others have various forms of patent devices, such as the diaphragm.

Churns should be kept in a condition of scrupulaus cleanliness. and preferably in a cool and equable temperature. There is virtually nothing to go wrong or to require special attention in a good churn. Sce Butter.

CHUTNEY: The Condiment. Taken as a relish with hot or cold meat dishes. chutney is an Indian condiment, of which there are many varictien, such an Bomhay, Madras. and mango chutneys. The ingredients include raisins or mangoces, cayenne pepper, ginger, spices, and lemon. Several kinds of chutney can be inade at home with applea, tomatoen, marrows, etc., recipes for these being given under their separate headings.

## Cicatrix. See Scar.

CIDER : How to Make. The apples should be gathered in dry weather, of as even a degree of ripeness as possible, but just before they are quite ripe. Decayed, damaged, or worm-eaten apples must he rernoved and the atalks picked olf. Keep the apples about 14 days in a dry, well-ventilated place, and make the cider in cool weather. The making is done in three processes, the apples are crushed to a pulp or pomace, the juice squeezed out, and linally fermented.

For crushing, take a very atrong, ironhooped tub, about 18 in . in diameter, put in enough apples to cover the bottom, and pulp them by means of a heavy hardwood bruiser, not unlike that used hy a strect pavior. Pound a few apples at a time, and see that the bottom of the tuh is well supported on the ground so as not to risk splitting it. The pulp should le continually removed from the tub as crushing proceeds.

For pressing, a strong huireloth or coarse canvas sheet-a cloth called netting shading is the best-3 to 4 ft square is used. The pulp is spread evenly over ahout 18 in . square in the middle, and when alrout 3 ins deep the sides of the cloth are folded over the pulp; then another cloth is placed on top of this and more pulp packed in that. In this way, a cheese, as it is called, is huilt up, the number of canvas sheets depending on the size of the press.
The simplest form of press consists of two linged hoards, the pressing leverage on top being obtained by using a soout pole; this is a erude way of pressing, but has been used hy cottagers. Wooden presses are made very like those used for copying letters; so long ns the bare iron does not come in contact with the apple juice, the latter might serve as presses for a small cheese. The press has to atund in a tray or tuh to catch the juice, and from this tray or tuh the juice is run into a cask.

If one man pounds the apples while another does the pressing they can between them make


Churn. Left, showing and-over-end diaphragm churn romed in order to show the dash or beater
remor Courlesu of Thomas Bradford \& Co. . l.ld

10 to 11 gallons a dav, and this amount will take ahout 180 lb . of apples, or less with a good press. It is not ahoolutely essential that the pulp should lie pressed the same day as it is made; some keep it 24 hours, as it is raid to improve the vield: but there is danger of vinegar acid forming by too long exposure to the air and. in any case, the extra yield is doubtful.
As a rule apple juice is left to ilself to ferment, the yeasts present on the akin at crushing being suflicient, as in the case of the grape ; but in small fermentations it is usual to start the fermentation with a little brewers' yeast. This is advisable, because it can never lie foretold how long apple juice will take to ferment; sometimes fermentation is complete in 10 days, sometimes not under six weeks.

Having collected. say. 10 gallons in a cask, inix 2 oz . fresh brewers yenst with $\because \mathbf{o z}$. honey and 1 oz. Hour, place it in a muslin hag, and suspend the lagg in the cask liy a piece of string. The cask must be supporterl on a stand so that a tub can be placed undemeath to collect the veasty frolh which works out of the bunghole, and the cask must be topped-up) occasionally to keep it full and allow the scum to overflow

As fermentation ceases and the cider shows signs of clearing. it is runs slowly and carefully into n clean cask. which is then bunged down and kept in a cellar at a temperature between 50 and $60^{c} \mathrm{~F}$. If the fermentation is very tumultuous, or if the cider is required sweet. the Iransferring to another cask (called racking) should take place earlier and lx repated tivo or three times, avoiding neration as much as possible. This tencla to stop fermentation and prevent the cider getting torn thin. 'Ihe rate of fermentation should be watched hy using a saccharometer and the casks should be treated with a sulphur matoh after cleaning. Sce Apple.

Cider Cup. To make cider cup, wlice 2 in . of cucumber very thinly, and put the pieces in a jug, together with I oz. cartor angar and a sprig of mint, pouring over them half wineglass. ful of alierry and a guart of cider. Then add 2 bottles of soda-water. Cover the jug, place it in ice or in a very cold place, and leave it for alout 2 hours. Then strain out the mint and cucumber, and the beverage is ready for use.

CIGAR: Choice and Varieties. It is not prossible to judge a cigar by the outside. The outside wrapper is very often made of tine leaf, and the inside filler of wheap leaf, or of scraps of leaf an! stalk rolled up together The only way to judge the filler of the cigar hefore smoking it is to cut through the cigar lengthwise. But if the cigar comes from a factory with a famous name, one can assume that the inside is of the samc puality as the outside. Then the proint to look for is an
oiliness or glisteningness of the wrapper. Spouts on the leaf are causod either by sunburn, or insect-bites on the leaf. They suggest by appearance that the cigar is not first rate hut, actually, they do not affect its amoking qualities at all.
If you place a cigar to your car and erackle it. all that it tella you is whether the cigar in very dry or not. and the crackiling may split the leaf! Some people prefer their cigars very dry, but the majority like them of medium dryncas. The smell of a cigar is a partial indication of its smoking quality : but a cigat which smells good does not necessurily smoke gorid.
As to the ash, if this remains firm for a long time while the cigar is heing amoked, it meana that the filler is comprised of long leaves, neatly arranged and rolled. It indicatea care in inanufacture, but is not a guarante of well-matured leaf. When the ash of a cigar is Hicked off, the point ahould be sharp and bright, not ragged and dull. A sharp and bright point indicates a well-matured leaf

Keeping Cigars. The proper keeping of cigurs is important. Choice tohacco leaf is extremely sensitive to atmosphere, and to odous in the atmosphere, and will readily absurb them and affect its own taste. Paint, for instance, and especialiy wet paint, will ruin any cigar or tobacco placed nenr it. Salt sen-nir will completely spoil n fine cigar. 'Therefor cigary inust be kept in airtight hoxes. Cedar-wood is the best matcrial for the box.

If cigars ares subjected to sudden heat they thmo off their natural moisture and essential nils which give the character and bouquet to the cigar. In appearance the cigar is not changed: fout in smoking quality it has becume very different. That is why cigars have to he kept at a fairly even, medium, and dry temperature in order to retain their condition. The best tempernture is between $60^{\circ}$ and $65^{\circ}$ Fahrenhcit. A fine cigar should be c:arefully lightexl-lighted all mund, so that it will hurn evenly and not raggedly. When cigars burn down one side first it is usually due to carcleas lighting.
The shape of acigar is a matter of individual fancy. Many people prefer the torpedo sliape ass a matter of appearance, of of comfort in holding the cigar between the lips; but in the shaping of such a cigar much good lasf hay to cut away to waste, and this makes the cigar expensive in proportion to the amount of leaf it contains. A straight shapie avoids this waste of cutting, and many of the linest Havanes ane mude in that form

CIGAR CASE. The cases which are made to hold it few cigars for carrying in the pocket are usually either of tewher or of metal. the former being lighter and, generally speating, more earvicuable, while in a metal case the cigas are more effectuslly protected from getting crushed or broken. Some leather cases have the edges reinforced with melal, and ot hers are padied to make them stiffer and less llexible. The most useful type in leather is made in two portions, one part containing the cigars, the other sliding down over the first, rand so making the case practically airtight. Nince this case does not require to he folded, the leather used can be much stronger, and a double thickness on either side lessens the risk of crushiag and overheating the cigars.

A metal case affords coinplete protection, hesides heing airtight. 'I'he chief diandvantages are the size and weight. The lightest type is fitted with grooves to take three or four cigars. The hollowing ont of the gronves makes for lightness, keeps the cigars separate, and so prevents the outer leaf from being damaged. A very small case is made to talie a single cigar. Aluminium is of little use for a cigar case, as it is a good heat conductor,
and may spoil the aroma of the cigars in a very short time. The ideal case is of silver, a metal which is lighter and harder than gold

CIGARETTE. The main varieties of cigarette are Virginian, made from blendings of leaf from Virginia and Carolina; Turkish and Egyptian, manufactured from leaf grown in Asia Minor and Greece; and Havana, made from the cuttings of Cuban leaf used in the rolling of Havana cigars. Cigarettes are also made from Rhodesian tobacco. Mixtures of Virginian and Turkish are also sold, generally under the title of Turkish blend or Egyptian blend. Turkish leaf is considerably more expensive than leaf from Virginia and Carolina.
Cigarcttes, like any other form of tobacco, are easily affected and spoilt by strong odours around them. They should be kept in condition in an airtight box, preferably of cedarwond. The best cigarettes aro rolled in very fine and pure rice paper, as thin as possible, so that no taste of burning paper shall apoil the taste of the tobacco smoke. Cheap cigarettes are rolled in inferior paper, to which saltpetre or other chemical is sometimes added to make it burn quickly. Many pcople prefer a cork tip, for the reason that it prevents fragments of leaf from entering the mouth
Some smokers prefer to make their cignrettes, and this is quite simply and easily done by hand All the outfit required is some light Virginia tobacco, which is mostly used, and a small packet of ricc-paper, which is sold either with or without a gummed cdge, some smokers preferring to dispense with the gum.
Cigarette Holder. The variety usually offered in cigarette holders is very wide, for they are manufactured not only in gold, silver, meerschaum, amber, and ivory, but more extensively in vulcanite, horn and bone, imitation amber and other compositions, or simply of wood

Among the more expensive sorts is the plain tube of real amber of varying length, with gold rin, and the silver-mounted meerschaum with amber mouthpiece. Ivory, tortoiseshell, and mother-of-pearl holders usually have gold mounts.

Plain holders are made of horn or bone in great variety as well as in polished wood, and the cheapeat of all are of cardboard with a quill mouthpiece. Imitation meerschaum and amberctte offer another variety, and compositions figure largely in the manufacture of many others, particularly the tube or trumpetshaped kinds, which are produced in many colours. The length varies from 2 in . to 6 in., or even longer, the average being about 3 in. to $4 \frac{1}{2} \mathrm{in}$. See Tobacco.

CIGARETTE CASE. The metals em ployed in making cigarette cases include gunmetal, as well as gold, silver, and platinum. The outer surface may be plain, but is more often engraved. Silver is largely used, and many beautiful cases are made from tortoise shell. Cheaper varieties nre of nickel, white metal, or papier mâché, frequently decorated with enamiel pictures. Most cases are flat, but some, especially those made of silver, are slightly elliptical.

Cigarette cases are also made of leather, and many smokers prefer this medium, as a larger number of cigarettes can be carried in a flexible leather case than in the rigid metal one. This also allows of several kinds of cigarettes being packed into one case

CINCHONA BARK. Quinine is found in the bark of the cinchona tree, which grows in S. America and elsewhere. The oflicial dose of cinchona bark is 3 to 15 grains, and more in malaria cases. The powder form may disagree with the stomach. Common preparations are given in the following doses

[^1]The action of cinchonn is practically that of quinine. The liquid extract of red bark is rccommended for inspiring in dipsomaniacs a distaste for alcohol. See Quinine

CINDERS. The cinders from as coal fire need never be thrown away. First of all they should be sifted through a fine sieve. The fine dust that passes through can he dug into the garden soil, while the coarser cinders should be used again mixed with coal. If the fire is meraly to be kept in till necded, a shovelful of cinders will keep it going. Fine cinders make effective garden paths; they lighten a heavy soil and make excellent drainage material in garden pots, and for the garden generally. Mixed with cement, a good concrete results. In country districts where no proper drainage exists, it is useful to filter waste

Waters, such as those from the kitchen sink through cinders contained in an old perforated pail. The solid materinls, such as grease, are retained by the cinders, and after a couple of days' use the cinders should be burnt and the pnil replenished. See Ashes: Path.

CINDER SIFTER. The cinder sicve usually measures 12 in . to 15 in . in diameter, and is made with japanned metal or wooden rim and blacked iron wire bottom of fairly close mesh. A heavier inake of about 18 in to 20 in diameter has an oak rim 4 in. to 5 in . deep and a straight mesh. In a superior make the strands are separately soldered to the cross supports. Apart from their use for cinders, such sieves are service able in the garden for sifting mould, earth and gravel.

## Cinematography in the home

## Mechanism of the Camera and Projector

Other articles dealing with domestic amusements, both indoor and outdoor, include Billiards; Bowls: Conjuring; Croquet. See also Camera; Gamophone

It is only recently that the taking and showing of cinema pictures has become a fascinating hobby within the means of the private individual. Previously the weight and cost of apparatus and the expense of using it were prohibitive. These obstacles have been removed by adopting a new kind of "reversible" film of narrower width, which allows the negative taken in the camera to be converted into the positive for showing on the screen. With the standard
a great variety of short moving pictures is the secret of success and pleassure with the amateur cine camera.

Along with the introduction of 16 mm . film has come an immense simplification of the cine camera. Cranking by hand, with the necessity of mounting the camera on a stout tripod, is dispensed with Instead, the amateur's cine camera is a neat little instrument which can be carried in a sling case or
film of 35 mm . (1才in.) width. as used for the picture theatres, the making of film for showing would cost about 5d. per ft., and as 1 ft . yielda enough pictures for only one second on the screen, the making of films of one's own works out at the rate of 25 s . for one minute's performance.
The pioneers in amateur cinematography, the Kodak Co. and Messrs. Pathé, introduced film of 16 mm . and 94 mm width respectively. The former has very largely become the standard width for amateur film. A spool of 100 ft . (equivalent to 250 ft . of standard film in length of performance) may be bought or about 25 s . incluaive of development and speed conversion into the positivelopment and speeds: the


Cinematorraphy; Fif. 3. The Autokinecam" which can be used at three different speeds
speeds : the (Fig. 3), which has three
speeds: the normal of 16 pictures per
sec. ; fast ( 64 pictures) for "slow-motion"" Thus for this expenditure one can talio a film asting over 4 minutes on the acreen This may not seem very long, but it is sufficient for filming from 30 to 40 different subjects. Experience has shown that a subject or scene with plenty of movement in it will be adequately rendered in from 6 to 7 seconds on the screen. A longer period tends to be wearisome :
 contains a clockwork motor which drives the film when a button is pressed There arc many leading makes, of which Kodak, Ensign, Bell and Howell, Zeiss Ikon, Agfa and Pathé are the chief.

Fig 1 shows the lateat CineKodal, BB Junior, measuring only 7 by 43 by 21 in. Fig. 2 shows the mechanism of a Cine-Kodak by which the film is wound from one spool past the lens and back again on to another under the action of the clockwork on the far side of the camers (not shown in the photograph). Another type of instrument is the Ensign " Autokinecam " pictures on the screen, and slow (8 pictures per sec.) for comic rapid effects.

How to Use the Cine Camera. In use, the cine camera is even simpler than an ordinary hand camera The lenses with which it is fitted are of such short focus that practically everything is rendered sharp on the film. It is only for subjects very close to the


Figs. 1 2. The Cine-Kodak BB Junior, and interior shqwing film winding mesbanism Courlesy of Kodali, LLC even in the coat pocket, yet

camera-and they can he as close as 1 ft .that the focussing adjustment needs to be set. Practically every camera can be loaded with film in daylight almost as easily as a fresh apool is put into an ordinary film camera

The only thing which the amateur oinematographer has to decide for bimself is the amount of light allowed to act on each little area of film according to the subject and strength of the light. This is done by altering the aperture of the lens, for it is plain that the conditions are altogether different from those in ordinary hand camera photography where the nmount of light is chiefly regulated by the time of exposure. In a cine camera running at the normal speed of 16 pictures per sec., and fitted with the common type of shutter for covering the film whilst it is moving, the time during which each section of film receives light through the lens is 1-32nd of a socond. In taking cine pictures, " finding the exposure" is simply ascertaining the lens stop at which the film is correctly exposed in 1-32nd of a second. This is very easily done with the aid of tahles supplied with the cameras or of meters designed for the purpose. A beach scenc in summer, for example, will allow of the use of a small stop such as that marked f 16, whereas a portrait in winter will require f 3.5, which is about 20 times as fast. Most cine cameras are fitted with a lens of this great speed, allowing of pictures being taken


Fig. 6. The "Ensign Title Maker," enabling the amateur to title and arrange bis own flms Courtery of Ensign, I.ed.
jectancar to the camera usually disappointing. ine to get ns close os figures, anima possible to the moving the camera the or sports events, and to stop the camera the instant " movement" passes
out of the field of view. In taking filnis of scenes at home-one of the most fascinating branches of amateir cinematography-it is aluays of advantage to plan things in advance, devising occupations and providing accessories which leave no dead intervals.

The user of a cine camera may also be his own producer of story filnss. Some exceedingly good films of this kind have been produced by amateurs, particularly by members of the many societies formed for this purpose.

The conversion of the exposed film into the positive for projection is a somewhat complicated operation which is best left to the makers of the film. There is no secret ahout the process, but it calls for experience and appliances which few cine amateurs can ncquire As already stated, the charge for carrying out the process is included in the price of the film, nnd the leading makers of lilm have stations throughout the world where films are "processed" in a few days and returned to the user mounted on a spool ready for insertion in the projector.

In the case of some makes of film the principle adopted is to finish of the exposed film as a negative and to print a positive from it. This is not so good a system as that just mentioned, for the process of reversal from negative to positive has a refining effect on the grain of the picture, with the result that such pictures can be shown on a greater scale of magnification without any appearance of coarse grain on the screen.

The Home Cinema. Projection machines for home use are now made in most convenient form for showing a moving picture of size from 3 to 10 ft . width simply by connecting the apparatus to an electric lamp-holder. The current provides the light and also the power for driving the film through the machine. In Fig. 4, which represents the Kodascope Model C, are seen the two spools, the motor and, on left, the casing containing the lamp. Fig. 5 shows a nother excellent projector, the Ensign "Silent Sixteen," also taking a spool of 400 ft . of film, sufficing for a performance of over 15 minutes. The owner of one of these little machines is not limited to showing his own films, for the Kodak Co. and other firms maintain a library from which films of all descriptions, including reproductions of famons films, may be hired for a small sum. It should be mentioned that all the film of 16 mm . width is made on so-called "safety" or "nonflam" base, viz, of aceto-cellulose instead of the highly combustible nitro-cellulose used for standard film. Nitro-film is material which burats into a blaze at the touch of a flame.

Accto-filin, while by no means incombustible, burns slowly, being rather lcss inflammable than a corresponding band of paper.

As the amateur cinematographer becomes proficient he will be anxious to edit and title his films or try his hand at the making of cartoon films. This work is greatly simplified by an apparatus such as the Ensign Title Mnker (Fig. 6), which is n kind of portable studio, litted with stage for the arrangement of letters and drawings, and with lamps for illumination. The cinc camera is put in place on the top and photographs the subjectniatter displayed below. The short lengths of title film so made are inserted in the longer films to which they refer by cutting the latter and joining the new piece with some celluloid cement

Moving pictures in natural colours can also be taken This is the lntest development of amateur cinematograply, and is known as Kodacolor. A special film is supplied for the process, viz., one with a nicroscopically tine lens pattern embossed on the back. It is used in a Cine-Kodak litted with a lens of extreme aperture ( f 1.9 .) and a three-colour filter (Fig. 7). Suhjects are photographed in the usual way except that sunshine is absolutely necessary. The exposed film is "processed " by the Kodak Co, and is then sliown


Fig. 7. Loading a Cline-Kodak with special flm for colour picture
Courtesy of Kodali, I.14
on the acreen by nid of an ordinary Kodascope fitted with a three-colour filter similar to that used on the camera. Most admirable moving pictures in the full colours of Nature are produced by this remarkable process, the practice of which is entirely simple though the method ly which the colours are obtained is highly complicated.

CINERARIA. This is one of the showiest of all greenhouse flowers, and is in full beauty in spring nad carly summer. There are largellowered and small-flowered varieties in innumernble hright colours. The latter, of which there are star-flowered and cactus-flowered types, are very decorative: they form plants 2 ft . or so high which bear a profusion of bloom. The large-flowered sorts hear one large head of bloom and grow about 12 in . high. I new type, intermediate between the two other types, has now been raised.

Cinerarias are grown from sceds sown in May in pots or pans of light sifted soil in greenhouse or frame: the plants will flower the following year and are thrown away nfter the blooms are over, a fresh supply of
plants being raised annually. When large pictorial methods of denoting the various enough to handle, the seedlings are put in parts are used. Some of the chief symbols are 3 -in. pots and later on into pots 5 in wide. During the summer months they should be grown in a cold ahady frame, the pots being set on ashes.: They must have cool moist conditions. In September they are hrought into the greenhouse : a temperature of $45^{\circ}$ to $50^{\circ}$ is high enough. If large plants are wanted repotting into $6-\mathrm{in}$. or 7 -in. pots should le done in February.

A suitable soil compost consists of loam two-thirds, leaf-mould and decayed manure one-third, with a free sprinkling of sand. The plants must be kept frec from greenfly by fumigating occasionally, or by using an insecticide.

CINNAMON. The bark of a tropical tree, cinnamon is used he a condiment and stimulates digestion. Cinnamon water in tablespoonful doses half an hour after meals is sometimes used in flatulent indigestion; or compound cinnamon powder might be used in doses of 10-40 grains. The dose of the hark is 10 : 30 grains, and the powdered bark has been suggeated as a prophylactic in Corinan
measles and ineasles, ohildren exposed to infection being given as much as will lie on a sixpence or a shilling with the morning and evening meals. The dose of cinnamon oil is $\frac{1}{2}$ to 3 minims. It may be used, dropped on sugar, in catarrh and influenza. It is also used as an application for toothache and for warts.

Cinnamon sugar is uselul in the litchen. Put 4 sticks or rolls of cinnamion in a mortar with $\frac{1}{2} \mathrm{lb}$. loaf sugar. Pound them linely and rul) them through a coarse hair-sicve. Put the powder into a hottle and keep it tightly corked. Use it for adding to cakes, etc.

CINNAMON BUN. These are made with $\frac{1}{2} \mathrm{lb}$. flour, $\frac{1}{2} \mathrm{lb}$. barley flour, 2 teaspoonfuly cream of tartar, 1 teaspoonful bicarbonate of soda, 3 oz sugar, 2 tablespoonfula molasses, 3 oz margarine, 2 teaspoonfuls grome cinnamon, and 1 gill milk. Mix together all the dry ingredients. Melt the margarine and the molasses, warm the milk, and blend the soda with a little extra milk. Add it to the milk and mix the whole to a atiff dough. Shape the buns quickly and then bake them in a hot oven for 20 minutes. This should make from 15 to 20 buns.

CINNAMON CAKE. Iced or plain, this makes a ohange for afternoon tea. To prepare it, beat up 2 oz butter with $\ddagger \mathrm{Ib}$. sifted sugar, and when the two are well creamed, ada to them a little less than 6 oz . flour, \& teaspoonful baking-powder, 2 beaten eggs, $\frac{1}{2}$ gill milk, 2 good saltapoonfula each of powdered cinnamon and nutmeg, and a pinch of salt. Turn the mixture into a well.greased tin and bake for about $?$ hour in moderate oven.

## Cinquefoil. See Potentilla.

CIRCUIT. In electricity this is the path traversed by the electric current. If the positive and negative terminals of a galvanic battery or accumulator be connected by a wire, a circuit is formed, the current Howing from one terminal through the wire, back to the other terminal, and through the battery. See Battery; Bell; Burglar Alarm; Dpnamo ; Electric Lighting.

CIRCUIT DIAGRAM. This is a graphic representation of the internal or external connexions of a wireless receiver or other electrical apparatus, in which symbolic rather than

hown in the illustration. See Wiring.
CIRCULATION : Of the Blood. In the human body the blood flows continuously in a circle, being purified at one stage of the journey and then redistributed.

From the limbs, head, chest and abdomen it finda its way into the right upper chamber (right auricle) of the heart. When the heart beats, the walls of this chamber. contract down, forcing the blood through a valve into the right lower chamber or ventricle. This ventricle has thick muscular walls, and when it in its turn contracts, the blood is forced into the pulmonary aitery and reaches a network of thin-walled little vessels, called capillarics, threaded nmongst the air cells of the lungs. Through the walls of these tiny vessels, or capillaries, there is an interchange of gases betwcen the hlood and the air in the aircells of the lungs, carhonic acid gas passing out and oxygen passing in.

The purified blood is collected into the pulmonary veins and carried to the left upper chamber of the heart (left auricle). Here, again, at the start of the heart beat, the blood passes through another valve, flowing into the left lower chamiler or left ventricle of the heart. The walls of this chamber are very thick, and when they contract the blood is forced into the main distributing artery, the aorta, and reaches every portion of the body. The farther it goes from the heart the smaller become the branches of thic arteries through which the blood passes, until finally it enters into the minute capillaries. The blood is then collected into veins which constantly increase in size and finally empty their contents into the right upper chainber of the heart.

The main bulk of the blood of the body is thus constantly moving through the circle. The blood of the walls of the intestines, however, after it has absorlied certain of the products of digestion, nutriment, etc., is carried by the portal vein to the liver. Here it passes again through capillaries, giving up certain oif its constituents, and being collected again into a large vein, which in turn carries it to the right auricle or upper chamber in order to begin a new cyole.


Impairment of the circulation may be general, and may be due to heart; lung, or kidney disease, or to anaemia amongst other conditions; or it may be local, as in piles, or chilblains, or Raynaud's disease The person who always complains of cold hands and feet should keep his bowels ireely regular, and take plenty of plain food, including fats. He should take open-air exercise. and should massage the affected parts. A sufficiency of woollen clothing should be worn. See Heart.: Lung.

CRRCUMCISION. Wherever in infancy the foreskin is notably long, and cannot be retracted easily and thoroughly, circumcision should be periorined. The operation is a minor one, and can be performed by the doctor in the baby's home. If this is not done, the secretions of the glands become dried and foul, causing local irritation, which may lead to other troubles

CIRRHOSIS. Whenever the special tissues of an organ, such as the liver, kidney, or lung, are, as a result of disease, replaced by ordinary fibrous tissue, the condition is described at cirrhosis. Cirrhosis of the kidneys is the condition present in the small red kidney of Bright's disease (q.v.). Cirrhosis of the liver is a common result of prolonger over-indulgence in alcohol, or may be due to infectiçus diseases.

Nausea in the mornings, diminished a ppetite, a sour taste in the mouth, and a pallor of the skin, together with a gradual loss of energy and perhaps loss of weight, are the syniptoms usually lirst noted in cirrhosis of the liver. The veins over the abdomen become engorged with blood and show through the skin as noticeable blue lines. Fluid eacapes from the overcharged veins and collects in the abdomen, setting up dropay. The patient has difficulty in breathing, through the pressure of the fluid in the abdomen pressing upwards against the diaphragm.

No treatment will bring a cirrhosed liver back to its norinal healthy state, but much can be done to retard the advance of the disease. The first step is to give up alcohol in any shape or form. The diet must be reduced to the simplest and most easily digestible form. Milk diluted with alkaline waters, vegetables, custards, etc., should be prominent in the diet, while heavy meats and all rioh, highly spiced foods should be avoided. Plenty of plain water or inineral water may be drunk bet ween meals, so long as there is no evidence of Huid in the abrlomen. Constipation must be avoided.
Diarrhoen is often troublesome; but as much of the surplus Huid in the system is in this way got rid of, it should not be checked unleas excessive, and not without advice. The following mixture is useful for the purpose

## Carbomate of calcinn <br> Dhosphate of calcinn Carlonate of blsmuth

Mix thoroughly and inkc one teagnogit every three hourn, until the diarrhoea is checiked. See Constipation; Diarrhoea.
CISTERN : In the House. As receptacles for water, cisterns arc generally of galvanised iron, rectangular in form and open on the top. Usual stock sizes vary from 2 ft. in length, 16 in. wide and 15 in . deep, having a capacity of 20 gallons, to the 1,000 gallon tanks measuring some 9 ft . by 5 ft . by 3 ft 6 in . A durable cistern should be made of 16 gauge or 14 gauge steel plate, with closely riveted corners, and have strengthening angles at all corners and edges

When fitting up a cistern it is vell to bear in inind the very considerable weight of the water and to provide ample support. The cistern should always be placed as near to a wall as possible, if resting on the ceiling joists, and, further to distribute the load, should rest ujon stout bearers of wood at least 4 in . by

2 in and extending lor 18 in or so on each side of the cistern See Ball Cock; Bath; Centra' Heating: Water Supply

Cistus. Thia is a name of hardy and halfliardy peicnnial shrubs also known as rock roses See Rock Rose.

CITRATE OF MAGNESIA. Eitcr. vescent citrate of magnesia is a pleasant laxative and cooling medicine in doses of 1 to 3 drams. A solution of manesium citrate, with the saine properties, can also he obtained, the dose being $5 \cdot 10$ fluid oz. See Aperient.

CITRIC ACID. Obtnined from the juices of fruits such as the lemon, citric acid in the proportion of about $\frac{1}{2}$ teaspoonful to 2 tablespoonfuls of water makics a solution about as atrong as lemon juice. The dose of citric acid is 5 to 20 grains A wenk solution increases the llow of saliva, and so is often useful in allaying thirst in fever cases. Sodium citrate is frequently added to the cow's milk given to hand fed infants, in the proportion of 1 grain to the oz. Tablets containing 5 or 10 grains miay be obtained for the purpose.

Effervescing drinks are made with citrio ncid, such as the following. In half tumbler of water dissolve 20 grains citric acid; in another tumbier half full of water dissolve 30 grains hicarlonate of potash. Pour the two half tumblers of liquid into one large tumbler and stir

A good home-made heverage may be prepared hy boiling the peel of a lemon in a saucepan containing $\}$ pint water and $\$$ ib sugar. When these have hoiled for 4 or 5 min , pour on $\frac{1}{\mathrm{oz}}$. citric acid, adding the juice of a lemon when the drink is almost cold. Pour a tableaponnful in a tumbler and till up with plain water or soda water.

CITRON: The Fruit. The fruit of the citron trec resembles a large lemon, with much the same flavour and medicinal qualities. Ser Candied Peel: lemon.

Citron: The Wood. This is sometimes used by cabinct makers, and is that of the sandarac tree. See Wood.
Clamp. The word is largely used to describe the various forms of cramps used in many trades. See Cramp.
CLAP BOARD. This name is frequently applied to a featheredged board used ns a westher boarding It is also given to an inferior quality of onk inuported from Norway. white coloured streaks distinguishing it from wainsent oak. Both materials are inexpen. sive. See Board; Wood.

CLAPPED BREAD. Also called clapbread. this is much made in Lancashire and Cheshire. Two wooden sponus and a girdle, or griddle, are the utensils required, and if a girdle is unobtainable a thick baling sheet must be suhstituted.
To make it, put about six tablespoonfuls of oatmeal in a basin with a small teaspoonful of salt. Nix these well, and add suflicient cold water to make a stiff paste, but it should not he dry enough to crumble. Shake a little ontmeal on the board, turn the paste on to it and oat it out with the two wooden spoons as thinly as possible. It is this patting or clap)ping that gives the bread its name, also its characteristic shortness. Dredge the paste with more meal if it sticks, and put the girdle on the fire to heat whilst the making is in pragress The cakes should be about the size of a breakfast plate.

When ready, dust the girdles thinly with oatmeal and carefully slip on a cake, one or nore according to the size of the girdle. Bake them on the top of the fire until they are erisp, turning them nccasionally. They may be served hot and buttered, or cold. They keep in dry tins, but need to he reheated. At first it is wise to mix only sufficient for one cake, ns the meal dries so rapidly.

CLARET. A great proportion of the wine drunk as clarct is but vin ordinaire, or the secondary winc of the country, for the prime growths fall far short of the demand. All clarets need a full six months in hottle hefore they are lit to drink Fine clarcts will mature in bottle for 30 or 40 years. When maturing. the wine should be kept at an even temperature of (i) ${ }^{\circ} \mathrm{F}$., and not exposed to sunlight. Claret will not keep sound for more than 6 or 8 hours after heing opened It should bedrunk at the temperature of a comfortably warmed room $\left(65^{\circ}\right.$ to $70^{\circ}$ ). The best way is to $\mu$ ince the wine on the dining room siclehoard or mantelpicce for an hour hefore meals, and then decant. At n formal dinner-party, where several wines are given, claret is served with the entrées or roast See Wine.
Claret Cup. The following is a recipe for claret cup. Take a bottle of claret, a tumbler of sherry, a hottle of soda or seltzer water, the peel of a lemon, a slice of cucumber, and sugar toraste. These should be mixed tngether, and served iced in a glass jug or bowl.
CLARIFYING. Any pieces of fat left over from ment or hacon, or the fat that is skimmed from the surface of stock, can be clarified and utilised in various ways. Pieces of fat should be cut small and placed in an iron or steel saucepan with suflicient cold water to cover them. slowly brought to the boil, and simmered until they look dry and shrivelled. The liquid is then strained into a jar or basin, and when cold will be a firm white cakc of fat.
The fat skimmed from the stock-pot should be covered with boiling water and left to cool. Any impuritios can he scraped away from the underneath of the fat when it has solidified Cold water should bo poured over dripping left in the tin in which meat has heen haked: when the fat has set it should be lifted and the water poured away. Fat that has been used several times for deep frying can be clarified by being poured while hot into a basin containing cold water, well stirred and left tos solidify. Cooked or uncooked fats may he clarified and are best kept asparate.


Clarinet on Barnew sysum

CLARINET. Generally made of coculs wood. the c:larinet comprises live paits : the mouthpicec, the socket, the upper joint (lingered by the left hand), the lower joint (fingered by the right hand). and the bell. The twhe is pierced with holes stopped by the fingers, and is litted with keys which alfect other holcs The number of the keys varies; it is usually 13, but with the Boehm system this is considerably.increascd. The compass is over three octaves, and is divided into three registers, ench completely chromatic.
The reed should be of medium strength; if too Hexible or too stiff, the tonc will be either weak or harsh. Fix it carefully on the flat side of the mouthpiece of the lignture. Place the two joints together, with the fingerholes in a straight line, and add successively the socket, the mouthpicce, and the bell. Behind the lower joint is a projecting rest, under which the right thumb is placed, so its to support the instrument.
The following is the basic fingering of the clarinet, and it should be committed to memory before trying to produce a sound.

Right hand. Iat finger works keys 9 and 12 and atops hole 4; 2nd fluger ftops hole b; 3rid llnger works key b, and stops hole 6 ; 4th finger works keys 3 and 4 .
Leit hand. 1at finker works key 11 and atops hole 1: Und fluger works key 10 and atops hole 2: 3 ril finger works key 8 and stops hole 3 ; th finger warks keys 7 , 1 and 2: thumb stope the liole at the back of the upper joint.

To play, draw the lower lip over the tecth so as to obviate their contact with the reed, put a hout half of the mouthpiece in the mouth, the reed gently touching the lower lip, and then draw the upper lip round the mouthpiece, in order that no breath may escape. Take the breath through the nostrils or through the sidns of the mouth, but on no account through the instrument. Press the tongue against the upper teeth and pronounce the word "too." which will cause the breath to pass hetween the red and the mouthpiece Keep the pressure of hicath stendy. To get different sounds, sturly the table of fingering given in your instruction book, where also will be found excreises for the production of tone.
An inherent defoct in the instrument is that
many notes


Clarkia. Single mauve variety
of this showy bardy annual are diflicult to get in t.unc. Correct intonation can only be acquired by steady, welí. directed practice in controlling the lireath. After use, with a soft duster re. move from the interior any moisture caused by the condensation of the brenth. See Bassoon.
CLARKIA. A showy liardy annual of which seeds are sown out of doors in MarchApril where the planta are to bloom from July onwards. There are two types: elegans, which grows 2 feet high and prodinces charming decorative flower aprays, and pulchella, whioh is ahorter and more graceful. Each type is represented hy varicties of rose, purple, salmon and other colours.

CLARY. The leaves of this aromatic plant of the aage family are sometimes used for flavouring soups and for seasoning, and the llowers for llavouring fermented drinks. The lower leaves are laige, rough, erimped, toothed, and grey-green in colour. The claumy, quadrangular flower-stem rises abouk 2 f1. high, and bears pale blue or lilac flowers in small clusters. The plant is jerennial by nature, but is best treated as $\pi$ biennial. The seed ahould be sown thinly in spring, and the plants set out about 18 in. apart when $3-4$ in high. The first leaves will be ready for picking late in summer. Its use has alinost vanishet, hut in oldworld or historical plant collections it cannot be ignored.

CLASP NAIL. Used for general woodwork, the clasp nail is of cut steel from 1 in . to $(\mathbf{i} \mathrm{in}$. long. Its shape is shown in the illustration. A smaller type, the wrought clasp nail, with the head and ear's in the form of a harb, has considerable drawing power, holds firmly, nud is difficult to withdraw. Clasp naila should be driven in with the wide part of the nail the same way as tlie grain of the wood.


CLAUSTROPHOBIA. A condition of uneasiness and apprehension is experiensed by certain people when they are in closed spaces Known as claustropliobin, it is one of the effects of neurasthenia (q.v.), and may be contrasted with agoraphobia, the term used for fear of open spaces

Clavicle. Sce Collarbone.
CLAW AND BALL. In furniture this term is used for the terminations found in many chair and table legs of the early part of the 1811, contury. The way in which the claw grips the ball varies, and much of the intorest and value of the pieces lies in the skill with which the nondelling is executod. It is gener ally associated with the introduction of mahogany into the cabinct making trade, and is almost always found in this wood. See Cahriole leg: Chair; Chippendale; 'Table.

CLAWFOOT. This is $n$ deformity of the foot in which there is a minrked increaso in the hollow of the sole. The tries are also hent backwards towards the instep, nnd as a result of those changes the foot is inuch shortened. The condition often begins in early life, and should be thought of where a child is awkivard on its feet and tonds to stumble.

The trentment recommended is persever


Claw Hammer. Illustration showing method of holding when
ingly to bend up the foot several times on three or fourocensions ench day, till the angle in front of the ankle is less than a right angle Care should betasen that alongenough boot is pro vided, and this should have a bar nbout $\frac{1}{2}$ in thick placed boneath the tread, to hrow tho front of the ont up. See Font.
CLAW HAMMER. This is $n$ hammer with a claw-shaped tail for extracting nails. 'Tho ordinary cheap kind has a malleable cast head, and is only adapted for very light work. The Kent or Canterbury is of solid steel, with forged sirle straps; a medium size weighing 1 lb . is suitable for household use.

CLAY: As a Soil. Clay soil is difficult to cultivate because in continued wet weather it becomes sudden and in prolonged dry weather it cracks. Yet most trees, shrubs and hardy plants llourish in well tilled clay soil

The best way to lighten clay and render it friahle is to dig it deeply in the lato autumn, and leive the surface rough so that the winter frusts and moisture can percolate and disintograte it. Clay land is greatly improved by adding hurnt soil, lime, leaf-mould, sand, sifted coal ashes, wood ashos, mad grit, old potting soil and strawy inamure.

Clay is sometimes considered as heing dangerous to build upon ; but except on unsuitable or improperly drained sitos a clity soil is quite satisfactory if the foundations are taken deep enough to he beyond atmospheric action. The whole area beneath the house should be covered with six inches of coment concrete. The great thing to avoid on a clay soil is waterlogged ground.

CLAYTONIA. These pretty little plants of the Puralane family are low in habit and suitable for the rock garden. Sibirica, rose.
and virginica, white. are readily grown from vear's growth Varieties when need this
seed sown in spring. Thcy thrive in shado in kind of pruning are seed sown in spring. They thrive in shado in ordinary soil, if not stiff, but loans and leaf. mould suit them well Othar species are camliniana and perfoliata, the latter an annual. Claytonia is sometimes described variously as the Cuban spinach and the Chinese chickweed, though it is related to neither

CLEAR COLE. Before distempering wood or plaster the pores are first filled with a conting of medium strength size to which a litule whiting has been added. This is called clear cole. See Distemper; Plastering.

CLEAT : For Fastening. A cleat is used for securing $a$ cord or line by twisting it nbout its projecting horns. It is uscful for many purposes in the hoine. such ins holding a fanlight or greenhouse skiylight cord Cleats measuro from $2 \frac{2}{2}$ to 6 in. long, and are simply screwad in prosition They are made of cast irnn, superio varietics in malleable iron. the best are of cust briass, burnished and lacquered or olcctro-plated.
CLEFT PALATE. This is a congenilal deformity in which the mof of the month shows a cleft down the centre. It may be associnted with hare-lip. The only treatment is an operation, which may he perfurmed between the third and sixth months after birth, though some surgeons prefer to wait till between the second and third years
CLEMATIS. One of the Inveliest of hardy climbing plants, represented in gardens by many species and varictios. If a carcful selection is made, one or another will provide bloom from May until September.

The successful inanagoment of clematis depends chiefly on correct preparation of the soil and pruning. As clemntis is long-lived, it is worth while naking a hole 2 ft "ide and 18 in. deep for esch plant: woll decayed manure and a f́ree scattering of nortar rubble should be mixed with the excavated soil before it is returned to fill the hole. Clematis is grown in pots by nurserymen and may be planted at any time of tho yoar, though early autumn and spring are the best seasons. If the roots are inatted together they should be soaked in water to remove the soil: the roots can then he disentingled to some oxtont and spread cut at planting time. Although the clematis loves the sunshine, the base of the plant should be placed among other low. growing planta.

There are several types ur groups of clematis, and they need different pruning. Those varieties belonging to tho Jackınanni and viticella g oups should be cut down in Fehruary to within ahout 10 in . of the base of the previous summer's growth; they bloom from July onwards on fresh shoots of the current


Clematis. Flowers of this very decorative

Ascotilensia, lavender blue: Comitesse de Buuchand, old rose, very beautlful: Gipsy Quen purple: Jackinanii, purple (and nil othire Jackmanli variepurnic Mme E. Andrish; Lady. Betty Balfour reddialh vinlet. Mra. Cholmonilcley, llatit bluc: redar viniet Mra. Chomnnicley. Noht blue Ville de Lyon. carmine red
Large flowered varieties of the other groups, which hloom in May and Junc. need quite different proning. It is sufficient to look over the plants in Fobruaiy and to cut oul weak, useless shonts to give more runm to the others, especially those of the previous year's growth. Jong, straggling shoots should be shoriened, but there must be no severe cutting back, or they will blomin sparsoly. Some of the chict varietios needing this trealment are
Beanty of Worcester, violet Wue: Crinison Klng, crimson; double; Fairy Queen, pale ficali nink: Henryi, cream white. Edvard V1I vlolet: Iady Nevill. lavender Rrey': Indy Nortliclifie. Invender blue: Luxuaturn. purple blue : Marcel Moser, Hauve shade; Nolly Moser, male mave : Tlic Queen lavender.
There are some vigomus and beautiful linds of smallflowored clematis All are rampant. and sonn cover a large anca It is impossible to prune them systematically. but they ought to be thinned out occasionally after llowering to get rid of old. worn-out and weakly shnots. Clematis montana brars white flowers in May: flammula, which is ill full beanty in August, has sweet acented Ilowers; vitalha. Traveller's Joy or Old Man's Beard, exceptionally ranipant, bears white flowers in summer followed by decorative fruits in nutumn

Clematis tangutica bears sinall yellow llowors in September: indivisa, white flowers in spring, is tender and suitable only for the greenhouse; recta is a bush clematis which bears white thowors in summer: heracleafolia is of somowhat shrubby grow'th and bears small blue towers in suminer

The casiest way to increase clematio is by layering the shoots in July Cuttings may be inserted in sandy soil in a frame in Septem her. Most of the planta sold by nurserymen are grafted on clematis vitalba

A disease which causes the surlden collapse of the plant sometimes attacks clematis. If all the stcms arc cut down, fresl) growth may spring up from the hase . it it dies not. nothing further can be done See Climbing Plant.

CLERGYMAN'S THROAT. Chronic in. Hammation of the tissues at the back of the throat, and perhaps of the vocal chords, is commonly caused by over use or improper use of tho voice In this condition, whish is termed clergyman's 'hroat. the lining at the back is covored with little elevations varying in size from a pin head to a peat, or even larger in some cases. The irritation is aggravated by a dry cuugh, and the voice gradually becomes woak and husky.
In treatment, any defect of the general health should be remodied. If the granules at the hack of the thruat are prominent thoy should be destroyod by galvano-cautery. Tho voice must be rested. The following gargle maly be usod four or five timos a day.

> Tincture of krameria
> Tincture of myrrh
> Compound tincture of lavender
> Water to make

ETLE. Several species of click beetle are found in gardens, and, though as beetles they are harmless, the femnles Iny eggs from which are hatched the garden pests known as wireworms (q.v.).

CLIMBING PLANT or Climber. The raised from seeds sown in March, and potted in uses of climbing, trailing, and rambling plants a inixture of loam and sand, with some well in the garden and greenhouse are manifold. rotted manure. The roots can be divided In the open air they are loved by the gardener, after flowering. A winter temperature of $45^{\circ}$ though not by tho architect, and their vogue increases as new houses are built everywhere.

Among the scveral self-clinging climbing plants the best are Ampelopsis Veitchii, with small leaves which colour brilliantly in winter, Hydrangea petiolaris, and the ivy, of which there are many varieties with green or variegated leaves. Rose, clematis, honeysuckle, jasmine wistaria, ornamental vine, prasion flower (for sunny walls), Cotoneaster horizontalis, Ceanothus veitchianus and the firethorn


Climbing Plant. Fig. 1. Trainers made of scantling
stratched vertically. wire
Figs.
24. stratched vertically. Firs. 24.
Diagrams for making tralners
 (pyracantha)
are some of the are some of the
chief hardy climbing plants and shrubs.

Before planting, it is necessary to prepare the site thoroughly by making a large hole and filling it with manured soil: climbing plants on a "all must be watered freely in very sunny weather. Certain annuals make food climbing plants for trellises. Chief among

50 in . naterial. The shaw las or material is merely doubled across to bring the two edges together, and one set of selvedges are caught together at a point about a foot from the fold to form a hood, which hangs down the back, and shapes the neck sufficiently to make the cloak sit on the shoulders. The top front corners are turned back to form revers, and each point, as well as the hood, can be finished with a tassel. The fronts of the garment inay be fastened with a clasp, or, in the case of a shawl with a surplus of material, the fronts are draped across and held in place by the hand.
them are canary creeper, climbing nasturtium, ornamental gourd, Japanese hop and sweet peas. Secds are sown under glass in March, the seedlings being planted out in May, or seeds may be sown out of doors in April.

Favourite climbing plants for the greenhouse are abutilon, fuchaia, heliotrope, Clematis indivisa, the scarlet trumpet honeysuckle (Lonicera sempervirens), roses, lapageria, Cobaea scandens, hougainvillea and Cassia corymbosa. See Arch; Clematis; Fuchsia; Pergola; Trellis.

Clinical Thermometer. See Temperaturc; Thernometer.

CLINKER: Its Uses. A hard, rocklike residuum is obtained under the name of clinker from gasworks, briokyards, and other places where furnaces arc in operation. It is cheap, and has many applications, especially for making garden paths and for inferior grades of concrete.

In large lumps clinker may be used for rock gardens; its black colour can be altered to some extent by coating it with cement wash. The finer grades, when sifted through a sieve, make a good aggregate for cement partitioning blocks intended for subsequent facing.

The clinker from brickiyards being very thoroughly burnt is generally fine, and makes "good path for a garden when laid to a depth of 3 in . to 4 in . and thoroughly consolidated with water and a heavy garden roller. A heavy clay soil can be lightened considerably by an admixture of fine clinker, but it must be used sparingly. A shovelful per square yard is sufficient. See Brick; Cement; Concrete.

CLIVIA : A Greenhouse Plant. Belong. ing to the amaryllis order, clivia is an evergreen, Howering plant, with reddish-yellow blooms in the spring. It is a greenhouse plant, and is than 30 hours. It was common for such clocks to have an hour hand only. These clocks werc of brass and the earlier ones had thickly gilt dials. I decorative feature wns the fretted ornament surrounding the clock above the dial, often contuining a conventional rendering of the orest of the owner, and at the botton the maker's naine. One of the earliest makers was Willian Bowyer, who in 1642 presented a great chamber clock to the Clocknakers' Company.

An ider of the size of these early English clocks may le gathered from the diameter of the dial. which was from 3 in to 5 in ., though larger examples are known, up to $7 \frac{1}{2}$ in. The bigger dials often projected each


A wide circular cloak, out without a join and known as a cavalier cloak, is attached to each shoulder with a buckle of elaborate ornament It has much fullness, which may be drawn across the front and over the left shoulder, and allowed to hang in folds down the hack.

CLOCHE : In the Garden. Cloches are domed covers of thick glass, very useful in the garden, especially in French gardening, where they arc used to cover lettuces, cauliflowers, and other plants which are grown under the system of intensive culturc. See Bell Glass.

## Clocks: For Use and Ornament

Choosing Them and Keeping Them in Good Order

## Subsidiary articles to the one below deal with Alarm Clock; Cuckoo Clock; Grandfather

 Clock. See also Watch
## Chamber clocks, as the early 17th century side of the frame or structural body of the

 examples were called when clocks first began to clocks. Thesc lantern clocks continued to appear in English houses, were often referred be made for quite 100 years. A wooden to as lantern or bird-cage clocks. They had hood was commonly used over the bell to no prendulum, as it was not introduced until protect the works from dust.about 1658 . A bell on the top was struck with
a hammer ns the hours progressed, and, after Clocks by Thomas Tompion (1638-1713) are , after the most desirable acquisitions, from the


Adam style clock, with carved firure of Time with bis scythe and surmounted by a vase painted with classical subjecta hop, with a sign of the Dial and Thipec Crowns, was in Fleet Street at the west top corner of what is now Whitefriars Street.

Toinpion was the chief watch and clockmaker of the time of Charles 11. Fine examples of his clocks are to he scen in the Pump Room, Bath. the British Muscum, and Windsor Castle. His name and date are usually on the dials of the clocks hemade. Two other great clockmakers of the Tompion period are Daniel Quare and Joseph Knibb. During the reigns of William and Mary and Quecn Anne, when walnut succeeded oak for clock cases, twisted or corkscrew columns were often seen at the corners each aide of the dial, supporting a horizontal moulding,
sometimes finished with a pediment. When mahogany became comparatively common in the first quarter of the 18th century, it was employed largely and walnut discarded.
Clock cases were made during the reign of George III in rosewood, chestnut, kingwood, pear, and other woods, while ebony, tulip, amboyna, and satinwood werc used effectively for inlaying. Bracket or pedestal clocks ware simply ohamber clocks with enriched wooden cases. French clocks of this period were heautifully decorated often in the Buhl style with delicate inlays of metal and tortoiseshell.
The imposition of a tax upon users of clocks and watches in 1797 resulted in the making of what are known as Act of Parliament clocks. They were used by inn-keepers, who, anticipating the probability of their customers being without watches, put up such clocks in their public rooms. They were, for the most part, very plain, and had a large dial of wood, painted hlack, with gilt figures, the face covered by a glass. They were hung on the wall, and had an extension below to give cufficient room for the movement of a seconds pendulum. The Act was so obnoxious that it was repealed in April, 1798.
The 18th century bracket clocks, with improvements in mechanism, are reproduced freely. Now that mantelshelves are often absent or so narrow that they do not admit of a large clock, the brackets solve the problem of accommodation. The cumbrous 19th century models in marble have given place to small lacquer-framed clocks with clearly marked dials and strut supports at back, or glass framed clocks.

## Mechanism. Figs. I

 and 2 illustrate n type of English clock which is known as a fuzec and chain pendulum timepiece This varicty is the most generally used where a timekecper pure and simple is required. The plates or frames, A, Fig. 1, usually made of brass, are held to gether by four brass pillars, pivoted between which is the barrel, B, Figs. 1 and 2. Inside of this is coiled the mainspring, the outer end of which is hooked on to the rim of the barrel, and the inner hooked to the arbor, C Figs. 1 and 2. This is pivoted betwcen the two caps of the barrel so that the barrel is free to turn; the arhor is also pivoted between the frames, with one end coming through. This end is squared, and fitted on the square is a ratchet wheel, D, Fig. 1, into which fits a click, E, Fig. 1, to prevent it running back. Round the barrel is wound the chain, F, Figs. 1 and 2 , one end hooked to the rim of the barrel and the other to the largest end of the fuzee, G, Fig. 1.

The winding is done from the fuzee, which is which when the fuzec is wound full ol chain is pivoted through and kcycd on to the main- drawn into action and catches the hook at wheel, H, Fig 1, but can only turn one way, the end of the furee, thus preventing its being as between the fuzee and the mainwheel there wound any farther.
is a click and ratchet. The arbor which
The motive power is transmitted from the carries the fuzee extends through the p!ates, mainwhec to the centre pinion, JJ Fig. 1, and the end is squared to fit the key or winder When it is wound, the flizee is turned, and the chain begins to wind round the spira grooves. The other end of the chain, being hooked to the barrel, will pull the harrel round, incidentally coiling up the mainspring which then has a natura! tendency to uncoil itself Thus it pulls the barrel hack again and with it the chain. Since the fuzee is held by the ratchet, it cannot go hack. It therefore puls the mainwheel with it. and thus arises the motive power that keeps the clocl: going.
The fuzee is a spirally groved pulley of varying diameter. Its object is to convert the varying force of the mainspring into a constant pressure on the train of wheels. Working on the small end of the fuzec is what is known as the stopwork, J, Fig 2.
 which carries the hands. Fixed to the centre pinion is the centre wheel. K, Fig 1: which in turn gears into the third pinion $L_{\text {, }}$ Fig. 1. Fixed to this is another wheel, the third wheel, M, Fig 2, which again gears into the escapc pinion, N, Figs. 1 and 2, to which is attached the cscapo wheel, O. Fige 1 and 2. From here the power is transmitted through the pallets, $P$, Figs. I and 2, by the way of the crutch. R, Fig. 2, to the pendulum. S. Figs. 1 and 2.

The pendulum controls the timekecping. If it is raised from the point where it is at rest and then released it will, by the force of gravity, fall back to that point, and the momentum it gains in descen' will carry it as far up the other side. If it were not for other factors, viz, the resistance of the air and the friction of the suspending spring a pendulum would go on vibrating indefinitely. The motive power supplied by the clock should only be sufficient to make up to the pendulum what it loses through this cause.

The escapement is the point where onergy stored up by the mainspring escapes at regular intervals. The stcel pallets swing with the pendulum and alternately release and catch a tooth of the escape wheel. They are sc shaped that the forward movement of the escape wheel imparts to the pendulum by way of the crutch the amount of energy required to keep it vibrating
The length of the pendulum used govern. the ratio of the wheels and pinions necessary to show true time. The centre pinion carrie the wheel to which the minute hand is attached by means of a sleeve over the extending part of the contre pinion, pinned down friction tight by means of a spring behind the wheel to allow the hands to he moved forward or backwarl This is the minute pipe (T, Fig 1). Geared into this is another wheel of the same size and number, U, Fig. 1, which in turn is geared into the hour wheel, V, lig. 1 , at a ratio of 12 to 1. To the hour wheel socket, W, Fig. 1, is attached the hour hand; thus the minute hand travels round 12 times while the hour hand travels once. Thus the clock mechanism by way of the dial and hands indicates the number of vibrations the pendu lum makes, and so, by the length of the penduluin and the ratio of the wheels the hands are made to register the time.
Striking Clocks. The fuzee and chain striking clock, as far as the timekeeping mechanism is concerned, is exactly the sume as the timepiece. For the striking train it will be seen that an additional barrel and fuzee and train of wheels are used : the work. ing of the barrel and fuzee has already been explained. The mainwheel in this casc, $A$, Fig. 3, gears into a pinion, B, Fig. 3, carrying a wheel which is called the pinwheel, C. Fig. 3 : driven into the web, and at right angles to the wheel are eight pins set at equal distances : it is these pins which raise the hammer, D, Fig. 3, to strike. This wheel gears again into the pallet pinion. E. Fig. 3, at a ratio o
eight to one: thus for each blow of the hammer this pinion turns once.

Attached to this pinion is another wheel, Fi, Fig. 3, which in turn gears into the warning pinion, $G$, Fig. 3, at a ratio of 7,8 . nr $?$ to 1 , according to the speed the clock has to strike. On this pinion is fixed the warn. ing wheel, H , Fig. 3, which in turn works into the pinion

hour. This is a double arm lever which. when lifted by the pin in the minute "heel, in turn lifts the rack hook, 0 , Figs. 3 and 4. hy means of a pin on the end. Attacherl to the extending portion of the pallet pinion which comes through the plate is the gathering pallet, P, Figs. 3 and 4, which is usually squared on and pinned across. When the striking train is at rest it tocks on a pin in the rack, R, Figs. 3 and 4.
As the hour or half-hour approaches the pin in the minute wheel gradually lifts thic lever, N, Figs. is and 4, which in turn lifts the rack hook. In doing this the rack is now. free to fall. aided by a spring, S, Figs. 3 and 4, working on a smiall exten. sion of the rack. In falling. the rack arm pin falls on to one of the steps of the snail. When the rack has fallen, the gathering pallet, and with it the train, would be free to turn, but the train is held in cheok by what is known as the warning, that is, an extension of the lifting piecc passing through a slot in the plate, $T$, l'ig. 4, and catching a pin in the rim of the warning wheel, H, Fig. 3. When the clock reaches the hour or half-hour the pin in the minuto wheel reaches the end of the lifting piece, which then falls into its original position and clear of the warning pin and the rack hook.
Now the train is free to move the gathering pallet, turning once to every blow struck. On the gathoring pallet is a smiall nib which as it turns gathers up one tooth of the rack, the rack hook by reason of its shape and position riding out and falling again behind the succeeding tooth. This is repeated until all the teetil are gathered up, whon the gathering pallet will come to rest on the pin, $R$, thus again iocking the train. So the number of blows struck depends on the step in the snail on to which the rack arm falls. At the halfhour only one blow is struck. This is done by means of the first tooth in the rack being out shorter than the rest and the pin in the minute wheel for lifting for the half. hour being placed nearer the centre of the wheel. When it lifts it is only far enough to let go the first tooth of the rack, and therefore the clock will only strike
 forward or backward turns a wheel and moves up or down a small alide which lengthens or shortens the pendulum.

Pendulum Clocks. When a pendulum clock atops, and. although it has been wound up and restarted, stops again almost immediately, the trouble is nearly alunys due to unsym. inetry of beat. This is easily detected: if the beat is unsym. metrical the intervals between the sounds of successive ticks are alternately a longer and shorter time, instead of being all equal. The simplest remedy is to place a small parl of paper or the point of a wedge under the right

French Strikiag Clocks. Theso are choaper than the English fuzce clocks, and on account of their small compass they can be ohered in a large variety of cases. Here the fuzee and chain are not used, the mainwhed and spring harrel being all in one, A, Figs. i)

Fig. 3. Sicie and front viem al English striking clock

1. W. Benson, L/d
and 6. and the winding is done from the barrel arbor. This necessitates an extra wheel and pinion between the mainwheel and centre pinion on one sido and between the mainwheel and pinion on the other, B, Fig. 5. The working of the other parts is fundamentally the same, except that the striking work is locked in a different manner. The gathering pallet in this case has no tail to it, the locking of the train being done by the rack hook, which is fixed to $H$ dotent, C. Figs. 5 and 6, pivoted betwoen the plates with an extending arm which catches on a pin in the pallet wheel, D, Fig. 6.

This kind of clock is also fitted with what is known as a Brocot regulation. that is, a shaft kinown as a Brocot regulation. that is, a shaft
passed from the front of the dial to the $13 r$
Clock. Figs. 1 and 2. Front Clock. Figs. 1 and 2 . Front and back Fiews of the works timeplece
carrying the Hy, J, Fig. 3. The fly acts as a sort of governor when the striking train is in motion. It will be seen that while the striking train is in motion it will keep lifting and dropping tho hammer, which in its fall strike the gong or bell. The mechan
Screwed to the hour socket is a disk with 12 steps, called a snail, J.J, Figs. 3 and 4, each succeeding step being nearer the centre ; this is what regulates the number of blows to be struck. Close by this and working on a stud is the rack, K, Fig. 4, on the outer edge of which is cut a series of inverted ratchet teeih. The distance of these apart in proportion to the distance from the centres tending from the working centre of the rack is a lever called the rack arm, L, Figs. 3 and 4. In the end of this and at right angles is a pin; when the rack comes into action it falls on to the snail, and accoryling to the step it falls on, it allows a corresponding number of the rack teeth to come into operation.
To set the striking clock in motion the minute wheel, M, ligs. 3 and 4, has two pins; as this wheel turns once an hour,
one of these pins will come into contact with the lifting picce, N, Figs. 3 and 4. every half-
or werlge han been put under tho wrong aide o the clock case; it should he put. under the other side and the procedure repeated.

In some kinds of clocks the works are en closed in a drum-shaped metal case of the same diameter as the clock face, this metal case heing s tight fit in the outer ornamental case but not being fixed immorably therein In clocks of this type the beat may be adjusted by turning the inner case in the outer case by small smount.

In the case of a clock not provided with the special facility described, it is still possible to avoid tho unsightly appearance of the wedge, but the process is one of some delicacy. In many good class clocks the crutch or part which is alotted to receive the pendulum rod is a tight fit on the pallet spindle but is not fixed immornbly. Consequently the crutch can be rotated by a minuto amount

Fir. 5. Front and side viek of a French striking clock
relative to the pallets about the common axis. The procedure is similar to that used in the wedgo method. A small adjustinent is tried, and the clock re-started; if there is improvement but not yet equality of bent, more adjustment is required in the same direction, while if the first adjustment has made things worse, then the second adjustment should be made in the opposite direction.

In other clocks the crutch may be $n$ wire which is firmly fixed to the pallet axis; in such $\Omega$ caso the crutch can bo slightly bent with the pliers to one side or the other till the clock is in " beat." It is not genernlly advisable for the amateur to attempt the curo of other troubles in pendulum clooks, or of any trouble arising in bolance-wheel clocks; these are rnthor mattors for the expert.

Regulating a Clock. In the ense of a pendulum clock, the pendulum hob is usually held in its place on the pendulum rod by a nut underneath the bob. To make the clock run faster, the nut is screwed up a littlo, so that the bob is a little higher up the rod. Some pendulum clocks have a small square peg at the top of the clock face, with the letters $S$ and $F$ on either side of it. Such a clock can be regulated without stopping it, the procedure for making it run fuster being to turn the peg with a key towards the letter $F$, and vice rersa.

The regulator of a balance-wheel clock is a sinall pointer at the back of the clock, which can be moved by hand over a graduated are towards $F$ to make the clock go faster or towards $S$ to make it go slower. In clocks of French manufacture the letters $\mathbf{S}$ and $F$ anc repliced by R and A respectively. The balance is $\Omega$ small wheel with a bar across the centre connecting opposite sides of the rim. It is very delicately adjusted and is pivoted in plain
conical boarings
forwards by the the action of a fine-spring, called winds spring in one movement the whee the spring; the second movensent is caused by the impulse of the spring to regain its normal tension. The regulation of the bal. ance requires great care and the pin should be moved very graslually.
When setting a clook, if the clock either strikea or has an alarm, the hands must not he moved backivards, but instend must be inoved forwards neaily 12 linurs. Moving the hands backwarls is permissible for other clasaes of clocks. The case of a clock should nevor be left open nny longer than is absolutely nocrrsary for winding, etc., or elso dust will get into the worlis. If a pendulum clock is moved otherwise than with the grentest care it will to stopped, and may dovelop an unsymmetrical beat. All members of a household should thorefore avoid accidentally moving such a clock, and intentional moving in order to dust behind it should be forbidden.

CLOCK GOLF. The game of clock golf can be played in any garden when there is room to chalk out a circle of $\mathbf{4}$ to $\mathbf{6} \mathbf{y d}$. dinmeter. which is then marked with figures placed exactly as on the face
 striking clock
shown in the diagram, not in the contre, but nearer to some of the figures than to others.

If there are only four players, the game can be one pair ugainst the other; if mone, each person scores for himself or herself. A golf ball is placed on the figure $I$, and the first player, armed with a putter or any other golf club, endeavours to get the ball into the hole in as few strokes as possible. When he has succeeded, the next player takes his turn, and so on until all have played. The player who succeeds in the fowest stmkes wins the hole. The ball is then moved to the figure II, and the game proceeda as before. When all the playera have played from each figure on the clock face, tho game is scored by holes as in ordinary golf

CLOG. Footwear with wooden soles and leather or fabric uppers, known as clogs, is used for a variety of purposes and in many industries. The Eng lish clog should not be confused with the continental sabot, for whereas the former is a wooden.


Clock Golf. How the numbers may be marked on the grass to be at unequal
soled bont or shoe. the latter is merely a block of wood, shaped and hollowed to admit the inot. The wood for the soles of a clog is usually cither beech, ash, or alder. The first. being a closc-grained wood, is less liable to swell and split when sonked: it is therefore invariably used in occupations which entail much standing about in wet piaces.
Clogs are more comfortable for garden work and on the allotment than boots. The ironshod soles never wear out, and when in course of time the uppers become perished and craclied, they can be renewed nt home. Ner clog uppers can be obtained at most leather and grindery shops. The clog upper is nailed round the outer edge of the sole in a rebate of about $\frac{1}{5}$ in. To affix $n$ new upper, first rernove the welting or thin strip of leather which is used to hide the join betwcen the sole and upper. If this is done with care, the welting may be fit to use again. After all the naile aro removed the new upper should be light! $y$ attached with a fow tacis, nnd the old welting or a new strip cut to the same size, put intc place and freely nailed See Boot Repairing.

CLOSET. Originally the name given the a small private room, the idea of privacy has been retained in the present use of the word for an earth oloset, chemical closet, or water closet. The portable chemical closet is convenient for indoor use where a water closet is not available, and is specially adapted for the onravan, bont or temporary building. See Earth Closet : Sanitation: Water Closet

CLOT : Of Blood. The solidified state of the blood when it coagulates constitutes it clot. This is composed of a network of fine atrands of fibrin. in which the blond corpuscles are enmeshed, the red blood corpuscles giving it a red colour. At first the clot includes the whole blood, but the serum is gradually squeezed out and the olot contracts.

When .bleeding occurs inwardly the clot softens and disappears; if not, its place is taken by new fibrous or scar tissue. When a clot forms in the heart or blood vessels during life it is called $n$ thrombus, and the process thrombosis. A clot of blood on the brain may mean that thrombosis has taken place. See Coagulation; Embolism: Thrombosis.

CLOTH. In all woven cloths two sets of thread, crossing at right anglos are interlaced with eisch other. Compound oloths can be woven with more than two sets, but not with less. Knitted cinths are madc by forming a thrend or threads into a succession of loops joinod to one another. Animal, vegetable, and mineral materials are employed. Wool, hair, and silk appear in the first group; cotton. linen, jutc, hemp, ramie, and artificial silk in the second; cloths woren from asbestos, spun glass, and metal wire come into the third.

Widths are limited only by the widths of the machines. Velvets are made as narrow as 16 or 18 in . : trouserings and handwoven tweeds are 27-28 in.; most cretonnes and many linings are 31 in . : dress serges are often 40 to 44 in. : inrious upholstery cloths are made in [0 in:, and the nominal width of many wool cloths is 54 in

Added width sn oftell masns a saving of length in cutting-out that a large proportion of goods are inado in broader sizes. Narrow width is an ambiguous term usually implying 27-29 in. and double width 50-58 in. It is much better to specify the breadth in inches for clearness.

Cloth for Govornment service use is tested by specia: machinery, which applies tension, note being takell to the pound pressure at
which breakage occurs. The ordinary test for wearing power is by the thumbs; when a cloth is so strong that the thumbs cannot be pressed through it, though tightly held and strength exerted, it is considerer satisfactory.
Yarns and Weaves. Worsted can be distinguished from woollen by noting whether the yarn fibres are parallel or bunched criss. cross. Combed cotton may be told from carded cotton by the evenness in the length of the fibro recovered. Linen differs from cotton in the much greater length of the individual fibres. Spun silk can be told from raw or thrown silk by the fact that the one is made like worsted, from a large number of detached fibres, where the other is made by twisting more or less tightly together a few fibres of virtually endless length. This process does not afford final proof, but is informative so far as it goes.

Another point to be noted in examining detached threads is whet her the yarn is tightly or loosely twisted. Tight twisting is favourable to wear, but makes the cloth harder and may militate against its graceful draping or the brightness of its appearance. Tight twisting is sometimes resorted to because the fibro is too short and poor for use otherwise. Hence it follows that cloths which feel very hard and substantial do not always wear well.
Double or two-fold threads are preferred to single for wear. and from a length of the yarn it is easy to tell by rolling one end between the fingers, while holding the other end, whether the thread is single or not. Singlestrand yarn disintegrates forthwith into fibre, whereas two-fold splits into two individual threads.
Woven cloth, being composed of two sets of thread, is firmer and stronger the more efficiently these two are bound together. They are never more securely interlaced than in the plain weave seen in handkerchiefs. Cloths are made to feel thicker for being woven in twill or step formation. Their surface is made smootherand more lustrous bysatin weaving, in which the thread, after passing under one of the opposing set of threads once, passes over the next five, six, or more. Under given conditions firm and good-wearing cloths can be made in these and in more fancy weaves, but it is not an advantage to the wear that there should be long unbound floats of thread lying on the surface. Woven cloth, on account of its structure, is firmer and less liable to stretch than knitted cloth. Knitted fabrics arc used where elasticity is specially required. Cloths are knitted also when stockinette or jersey is in fashionable demand. See Braid: Sergo ; Tapestry ; Tweed; Weaving.

CLOTR BALL. This is a compressed tablet. chiefly composed of precipitated chalk and magnesia, used for cleaning white and coloured fabrics, sucde shoes, handbags, gloves, hats, etc. It can be obtained in white and in many different tints.

The white cloth ball is particularly useful in cloaning white furs, white satin shoes, and so on. The coloured balls are used for cleaning coloured nap cloths, coloured shnes, velours, hats, and velvet fabrics, pile carpots and rugs.

The methods for cleaning white and coloured fabrics is as follows. Brush well with a stiff clothes-brush, and free from dust as much as possible. The cloth ball is then rubbed vigorously into the nap or pile. Care should be taken that a good deposit of the cloth ball is rubbed into every part of the article, as noglected parts will spoil the effect of the cleaning. Fabrics should be fulded carefully with the treated surface on the inside, and put 'sway in a dry, warm place for at least 24 hours.

Shoes and other articles that cannot be folded should be covered to keep free from dust, and put into a warm place for a similar period. At the end of this tinue the cloth ball
powder should be shaken and brushed out. and the article will be found to be almost completely restored to its original freshness and colour. In the case of articles that have been allowed to become very much soiled, a second application of the cloth ball may be necessary.

In suide shoes and suèdc goods generally, the nap in wear has a tendency to be rubbed down, and the article presents a shiny surface.

This is particularly noticeable in shoes and handbags, the rubbed parts presenting a greasy, black appearance. If such is the case. procure a piece of fine sandpaper and gently rub against the nap until the surface is restored. Then apply the cloth ball in the manner alneady described. To avoid an uneven appearance, the sandpaper should be applied to the whole of the shoe upper, extra attention being paid to the soiled parts. See Fur ; Suede.

## Clothes and Their Treatment

## Care that Makes for Economy and Good Appearance

This artice'e tells how both men and women can keep their clothes in good condition. See also entries on Darning Mending; Pressing, and articles on Boot; Hat, etc.

It is not always realized that a sma!! income does not preclude anyone from leing turned out well groomed, since appearance depends less upon the extent of the wardrobe than the care taken of it. The chief enemies of woollen garments being clust, damp, and moth, it fol lows that no clothing should be put away for any considerable period without a thorough airing. If clothes are brushed thoroughly once a weok, there is no fear that they wil become a prey to moth. If it is necessary to pack clothes up for a lengthy period, either in a wardrobe or a trunk or other receptacle, there is nothing more suitable as a wrapper than a newspaper, the smell of which is particu larly obnoxious to the moths that infest clothes.

Cloth is highly susceptible to the effects of heat and damp. When a man has worn a suit of clothes all day, and particularly if covered by an overcoat, it cannot fail to be somewhat creased, especially in the arms of the coat and the legs of the trousers. If these garmenta are carelessly thrown on a chair, they will assume permanent wrinkles instead of temporary ones. The chief damage is done during the first few hours after removal, so it should be a rule always to place the coat on a suithanger with a lower rail over which to place the trousers neatly folded. A trouser-press is a help, as by its aid trousers can be kept in good condition and their life prolonged.

When clothes become soiled they should be sent to a good cleaner, who will tailor-press them before sending them home.

## Renovations by the Tailor

Early attention should be paid to any sign of wear at vulnerable points, e.g. bottoms of trousers and cuffs of sleeves. If the damage is severe, take the garment at once to a tailor, who will present a new wearing surface by shortening the sleeve or trouser leg by a fraction of an inch.
Hats should be kept well brushed. Nothing is so damaging to them as dust, which eats its way into the felt, and speedily renders the hat too shabby to wear.

Neckties need careful treatment. Silk is a material which gives the greatest resistance to creasing, but silk ties are not composed entirely of that fabric. There is an interlining of swansdown, horsehair, wool, canvas, or some uther material, and this interlining either becomes displaced or distorted through being re-tied day after day in exactly the same position. The only remedy is to have several ties in use. and to wear them in succession placing them for a rest in a tie press or smooth. ing them out as much as possible after a period of wear.

Underwear should be changed frequently for airing, but not necessarily washed so fre quently. These remarks inny also be applied to socks and stockings-and it may perhaps be added that keeping the twe nails cut short prevents frequent darning. The practice of carrying loose change in the trouser pocket, or a heavy bunch of keys, speedily wears a hole in the under-garment. The stuffing of all sorts of articles in the pockets of the outer
garments should also be avoidel, as nothing contributes more to loss of shape. Boots and shoes, innmediately they are taken off, should be put on boot trees. Here also the rule of having more than one pair in wear is highly to be commended. Where the heels have a tendency to wear on one side more than the other, the addition of a rubber tip will be effective. If a man follows the policy of constantly changing all the articles ne wears, of keeping his garments well brushed, and of placing them in the best position after wear to recover the shape, he should save many pounds a year, and present a better appearance.

Hints for Women. A woman who cultivates neatness generally manages to look welldressed, however little time or money she may have to spend.

Directly an outdoor costume is taken off it should be brushed, unless wet or muddy, and hung on a coat or suit-hanger. Wet mud stains must first be allowed to dry, and a solution of soap bark from the chemist may be used to sponge any stain that the brush fails to remove. Damp clothing must be carefully hung up to dry, otherwise it will present a hopeless mass of creases next day. It may be necessary after being caught in a very heavy rain to send the garment to a tailor to be properly pressed.

Fragile dresses inay be covered by a muslin bag when hung in the wardrobe on a silk covered hanger. For long dresses a useful hanger is made from an ondinary coat-hanger, the metal hook being removed, the hanger slightly padded, covered with ruched ribbon inverted and suspended at either end by a cord. The dress is simply laid over the concave padded rail.

At the end of a season washable frocks and underskirts may be rough dried to free thein from starch before being folded and put away. Most housewives provide themselves with overalls, which protect the dress when attending to household duties.
Hats should be brushed each time they are taken off. and if kept on the shelves of the cupboard or wardrobe, ought to be covered with tissue paper. Boots and shoes retain their shape better if kept on trees when not in use, or they can be stuffed with paper. A cupboard is the best place to keep footwear, or, failing that, a small packing case can be improvised with a shelf and a cretonne curtain covering. An umbrella will last longer if when wet it is left open and laid down, resting on the handle; if the moisture is well shaken out it will soon dry.

Underelothing should be kept in a drawer and covered with blue tissue paper or muslin. All clothing should be periodically overhauled and mended neatly when necessary.

Small Renovations. In spite of proper care wear and tear are bound to have their effect eventually, and there comes a time when some form of renovation is necessary. Coats grow shiny; collars begin to look greasy and stained, and garments require pressing.
To remove shine from a black coat rub the latter gently with some fine sandpaper, after-
wards sponging it with a solution of common washing blue and water. Press the coat while it is still clamp, but if it requires freshening, first brush it and clean it with benzine. afterwards sponging it with a quart of water containing a table spmonful of aminonia. Coat collars are best renovated with a mixture comprising 1 pint benzine, $\underset{t}{t}$ dram chloroform, and 1 dram alcohol. Apply this with a soft rag, or, as an alternative, rub the collar with a cloth dipped in ammonia.
A common thing which ruins the look of a pair of trousers is bag. giness at the knees. This is caused, to a large extent, by sitting, and ordinary pressing will not remove it. It is possible to remedy it in the following simple manner.

Place the trousers flat on a rable (in the same way as indicated in Fig. 2 of illustrations of how to fold a lounge suit) and danip the knces alightly with a moist cloth. Then place the left hand tirmly just above the knee so as to hold it in position, and with the right hand take hold of the back of the trouser leg. about midway hetween the knee and the hottom of the leg, and pull haid towarda the bottom. Transfer the right hand to a similar grip in the font of the leg, and again pull downward. It will be found that this entirely remores the bagginess frmm the knee. Each trouser leg should be treated separately The trousers can then be pressed in the usual way, if desired.

Never use a light-coloured cloth in pressing dark clothes, since the white lint invariably leaves an inipression which is difficult to remove. Do not rub, as in imning, but lay the iron on gently and nove it alowly over the garment. When clothing has hecome nildewerl, put the affected part in a bowl of buttermilk and it will come out like new. In the case of a fabric on which there are acid stains, it is best to apply ammonia. If this is done without delay the effect of the acid will bo neutralised, the material prevented from rotting, and the colour saverl.

Clothos which are made of light materials can be cleaned with a cloth ball (q.v.). Perspiration stains should be treated as early as possible by soaking the affeoted part in cold water for 15 min ., then aprinkling it with lemon juice and leaving it for a few minutes hefore rinaing it in clean water. If the firat treatment is not successful, repeat the process, taking care not to leave the lemon juice on too long, as this might affect the dye in coloured materials

CLOTHES BRUSH. In the best sorts the fine. springy quality of the bristle is easily noticeable. In a common brush the bristle will either be aoft or cut short to produce greater atifincss. If preferred, a brush can be obtained with the end portion of the back set with short, stiff knots of bristle which are useful in removing hard deposits of mud.

In a hat brush atifiness is not an essential. A clothes brush and a hat brush of the squareback shape, with screw eyes to liang on $n$ polished board, make a hall set, and are leas obtrusive than the more elaborate ones with hevelled mirror, hosider the fact that fibre, which is extensively used with bristle in making common clothes brushes, is often found to be a component part of such hall sets. Pibre is detrimental to good cloth, and the knota of this mixture are usually punched into


How to Fold a Lounge Suit. 1. Fold tronsers, button to button at top and seam to aeam in leg. 2. Place fiat on table. 3. Fold vest, with lining inside and fronts ontside. 4. Place vest on top of trousers. 5. Fold jacket, nushing out tops of aleeves. 6. Place on table, with sleeves straight, and fold over untre 8 Foid rrousers over as far as porsible and are crease in lezs. 9. Turn tod of coat over as far as bottom of tronsers will allow Courlestl of My Valet. Lid
the holes: this can be detected by the absence of a separate glued and screved veneer back. The fibre mixture will not last in wear: the bristle is poor, the fibre soon wears off, and the polish on the back quickly dulls, so that this brush is soon rendered almost useless.

A good brush should have stiff hriatle of fair length, a well-filled stock and a separato back. The back should be secured by brass scresw and finished by polishing. See Brush.

CLOTHES HORSE. A clothes horse is usually made with two folds of equal size, but sometimes with three or four, thic latter being cumberanme to handle. A more compuct form is to make it in three folds, the centic one wide and each of the wing folds half the width of the centre fold, so that the whole closes that into two widths only. The uprights should finish $1 \frac{1}{2}$ in. by $1 \frac{1}{8}$ in. each, to be mortised right through for the spaced rails to enter. These can be tenoned to enter right through and be double wedged. When fitted up they can be well anndpapered and left with the natural surface, the rails heing slightly rounded on top odges. The folds are hinged together with strong webbing, with two hinges above and two below to each pair of meeting uprights.
The dimonsions may vary according to requirements. A size of 3 ft .6 in. high may bc 2 ft .3 in . wide, each fold being, thercfore,

$16 \frac{1}{2}$ in. A 4 ft . size can be 3 ft . wide when closed, and a 4 ft . 6 in . size 3 ft .4 in . wide, all with three rails to the fold. Larger sizes of the article may have four or more rails. See Airer.
CLOTHES LINE. When clothes are hung up to dry they are suspended from lines which may be made of hemp, jute, or galvanised iron stranded wire. The hemp lincs are generally put up in 18 to 20 yd. lengths with a ring at each end. Galvanised wire lines aro made in two thicknessos, the No. 11 gauge and a much stouter line, known as No. 8 gauge, and generally in 50 or 100 ft . coils
Tho lines are supported by wooden posts. $2 \frac{1}{2}$ to 3 in. square and 8 ft . long. The upper end has wooden pegs for attaching the lines on all four faces; tho lower end has a fillct $A$ to support the post as it rests in the wooden socket 13 (Fig. 1.). The latter should be tarred and buried in the ground, preferably in a lump of concrete built mund it as a foundation. With this arrangement the posta can readily be lifted out of the sockets and stored away when not in use.

The rocket rhown in Fig. 2 is made of cast imn; it is sunk into the ground and hedded in concrete. The posts used for this socket should have tapered ends to fit tightly into the hole in the socket. However carefully the rockets are fixed, the post is seldom rigid: it is a good plan to provide a hook low down on an adjacent wall, or screwed into a wooden post driven into the gmund, and to attach one end of the line to this hook, then twisting it around the post. The line thus acts as a guy or stay and keeps the post rigid. (See Fig. 3.)

When a wall or the side of the housc is available it is beat to fix a hook or an eye-bolt
securely into the brickwork and to provide a pulley for the line. A clothes line should always be brought indoors when not in use. It is unsightly, and exposure to wet rots the rope. Frequently in towns, and occasionally even in the country, the line should be clesnsed in hot anda and water, otherwise it will colloct smuts and leave dirty marks on the clean linen. Fine, light clothes lines, which fold up very small and are easily set up in an ordinary room, with small pegs to suit, are sold for travellers and women who live in bachelor flats, and are a help in the laundering of light articlos. See Airer: Cord.
CLOTERSS MOTR. This tiny winged insect of the moth family is most injurious to clothos, particularly furs and woollens. Before dying in early autumn it lays its minute flat eggas in such materials, on which the larvee foed when they omerge in the spring. The chief times for the housewife's vigilance are August and September, when the eggs are laid, and the spring, when they hatch. The spring and autumn household cleanings, with their attendant turning out of every drawor and cupboard, protect against moth as well as clearing away dirt and lumber. Thore is little risk of moths attacking clothes which are in constant use. The things that need watching are woollen cloths, curtains, blankets, eiderdowns, and furs which, not being in usc, are stored away during the summer months.
Preventlves and Remedles. The contents of all drawers and wardrobes should be turned out periodically, and every item oxamined for moth marks. All should be well shaken in the open air, and if possible hung out of doors for \& few hours Furs should be hung over the line and well beaten with a light cane before being paoked away.
Pockets in overcoats and wintor wraps not in use should be turned inside out and brushed froe from fluff, and then filled with small broken pieces of a cigar box or cedar chips : moths object to the smell of cedar. Clothing stored in newspapers, linen and other materials with a cold surface is seldom harmed, since moths avoid all substances of a chilly nature, because they are unfit for hatching. The only precaution needed is that the edges of the paper must be pasted together, and the linen sewn so that no moth can enter.
Apart from their dislike of cold substances, moths have a distinct aversion to certain odours, such as tohacco, Russian leather,


Clothes Pog. Types in commor ase: top, Amencan: centro, spring-grip: and sandal-wood. Two other odours which is undoubtedly supe score the American type keep away moths ane those of naphthe and lavender, and both should be ineely used among stored things. Naphtha balls can be bought by the pound and placed one or two in drawer corners and in the folds of blankets, etc. Clothes stored on hangers in a cupboard should have a little muslin bag containing either lavender or a couple of naphtha balls suspended from each hanger.
When it is suspected that moths are in an article of clothing that will lond itself to steam treatment, wrap it in a clean damp towel, put it in the oven with the gas turned low, and steam out the grubs. If the garment is too large for the oven, place it under a damp towel, and press it with a rather hot iron.

When moths have actually been detected in furs or clothes, brush the latter with a whisk broom saturated with formaldehyde solution. 'Trunks should also be treated with this


Clothes Line. Pis. 1. Post with four wooden Dege and aill, $A$, for insorting into the 800 ket athown at B. Fig. 2 Oant lion sooket bedded in concrete. Fig. 8. Method of keeping post rigid
Fig. 1
solution, and afterwards left in the fresh air for a few hours A good substitcto for formaldehyde oonsists of 3 tablespoonfuls of turpentine added to 3 quarts of cold water. This may also bo used for rubbing on floors under carpets and rugs whioh have been attacked by moths.
CLOTEISS PEG. Probably the best is the American, turned from a piece of beech or other hardwood, and the V-shaped slot or jaws, formed by sawing away the material to the shape substantially as shown in the illustration. Thoy are readily produced from dowel-rod, turned to shape with chisel and gouge. A two-part block, hollowed in the centre to reoeive the peg, is used to support it in a vioc while sawing out the slot.

Another type of clothes leg, known as the gipsy, is made from odd bits of wood whittled with a l:nife and the two pioces secured with a narrow band of tinplate. The patent pegs furnished with spring grip aro small in size but scarcely so durable as the American type; they are more suited for indoor use. Clothes pegs should hold tightly, and never get rusty, or otherwise they are liable to damage the clothes. On this score the American type to rust, no joints to give way, and the long tapering slot, together with the natural springiness of the material, gives it a secure and powerful grip.

CLOTTED CREAM. In the preparation of clotted cream it is desirable to use rich milk, but this is not essential. Whole milk, warm from the cow, is strained into setting pans. The pans most suitable for the purpose hold abcut 6 to 8 quarts of milk, and measure 15 in . across the top, 7 in . in depth, and 11 in . across the bottom, being somewhat deaper than the usual. The pans of milk are left undisturbed in a cool dairy for the cream to rise. In summer 12 hours or less is the time allowed, but in winter 24 hours is usual.

Scalding is then carried out by placing the pans on a hot-water stove, and allowing steam to play under them until they have attained a temperature of $175^{\circ}$ to $185^{\circ} \mathrm{F}$. in not less than

20 min ., when they are removed, and allowed to cool naturally in a cellar or other cold position. The scalding should not bo done too quickly, or the cream is rendered greasy. The heating may be carried out by placing the pans on a kitchen range or hob, but the hot-water method is preferable.

When the scalded milk and cream are coldin warm weather the cooling should bo donc quickly-the cream may be taken off in a thick clotted condition, and is ready for use. The cream is generally sold by the lb., and 1 IL of cream may be obtained from $1 \frac{1}{2}$ gal. or less of Jersey milk; nearly 2 gal. of Shorthorn milk may be required to produce the same quantity. See Cream; Milk.

CLOUD GRASS. The popular name of cloud grass is given to a hardy annual group ol grasses callod Agrostis, which are very uscful, when dried, for the purpose of room decoration.

CLOUT NAIL. Having a broad liead, relatively large in diameter to the shank, the clout nail is useful for fixing such material as zinc shects, roofing felt, or for any purpose where the material to be fastened is comparatively thin or fragile. Various patterns are illustrated. Blue-wire clout nails are made from $\frac{1}{2} \mathrm{in}$. to $1 \frac{1}{2}$ in. long: wrought clout nails, fine (that is, thin) or strong (stout), are from $\frac{1}{2}$ in. to lo in. in ength. See Nail.

CLOVE. The dried buds of an


Fiastern plant are

Clout or Broad-headed Nail. Let to right ane wrought ; ctrons wrought; counter-annk: blue-wire videly used both in mcdicine and in cookery under the name of cloves Their most valuable constituent is oil of cloves, of which the dose given by doctors varies from $\frac{1}{2}$ to 3 minims. Applied outwardly it has a stimulant effect on the skin, producing heat and redness. When applied to a cavity in a decayed toot/h il ofton relieves tho pain of toothache.

Taken internally, oil of cloves causes an increased flow of saliva in the mouth. In the stomach the normal movements are stimu. lated, and there is an increased flow of gastric juice. Oil of cloves increases the appetite and improves the digestion ; it is often prescribed in cases of indigestion with flatulency.

For culinary purposes cloves form a valuable spice, sold whole or in powder form ; they have a strong aromatic odour, and a hot, spicc-like Havour. A clove should not float horizontally


Clove Eitoh. Diagram illustrating turns of rope round a beam when placed in water: if it does it shows that the cssen. tial oil has been extracted.

Two or three cloves added to apple while it is stewing or put into an apple pie will improve the flavour. Tinc. ture of cloves is used for flavouring mulled wine. It can be prepared at home by dissolving $\frac{1}{\frac{1}{2}} \mathrm{oz}$. fresh oil of cloves in $\frac{1}{2}$ pint rectified spirits of wine.

CLOVE BITCE. This is a simple method of attaching a rope to an object without the use of a knot. The illustration shows how the fastening is made, the two turns being brought
close together after they are formed. The security of this bitch depends Inrgely on the fact thint the ropo bends over itself.

CLOVER. The name is applied to various grases belonging to the genus trifolium, of which the red clover, cow grass, zigzag clover, and woorland clover are the best sorts for pasturage. The different clover grasses are usually inc!uded in any mixture of seed for lawns, or ot her turfy stretches for the purposes of tennis, croquet, or bowls. The shamrock is commonly said to be one of the clovers, trifolium minus

CLUB FOOT. Paralysis and the contrac. tion of scar tissuc after an injury are the commonest causes of club foot, which is a permanent malformation of the foot or ankle. The deformity miny be present at birth or it may be the result of accident or disense, and there are four varieties. In the first of these, Talipes equinus, the heel does not reach to the ground, the patient's weight falling on the ball of the foot. The opposite condition in found in the second kind, Talipes calcaneus, the heel alone touching the ground, while the toes and the front part of the font are lifted up. In Talipen valgus and Talipes varus the outer and inner sides respectively of the foot are turned upwards so that the patient walks on the inner or outer side. Sec Foot

CLUB ROOT. In enbbages and other greens this is a most troublesome disenso. It causes great loss and infects the soil, attacks the mots and canses the plants to rot. It attacks other members of the snme family (crucifcrae), e.g. turnip, wallflower, charlook and the shephord's purse weed. The best treatment is to lime the land heavily and not to grow susceptible crops on infested land for three years. Anbury and finger and toe are other names for this disease.

CLUMBER SPANIEL. Bnth in disposition and appearance the Clumber differs materially from the rest of the npaniel family He is heavily built, weighing from 55 to 6.5 lb ., slow but an excellent game-finder ; not being beadstrong, he is easily broken. His white coat is relieved with lemon markings, and his square, massire head and deep flew's give him


Clumber Spaniel, a henvily built breed of sporting dog a dignified look. The stout legs are, of coursc, short, and his back is pow. erful. T'be breed originated at Clumber Housc, near Work: sop, Notting hamshire, the seat of the dukes of Newcastle. See Dog.

CLUMPS. For a large party of people clumps is a good ganie, but it should not be attempted with less than 10 . The players divide into two parties, which occupy opposite ends of the room. Each camp ohooses a representative from the other, and the two representatives go out of the room together and decide upon some object-no matter how obscure-which is to be guessed by the others. They might, for example, choose the largest diamond found in the Kimberley onines in a given year. On their return each representative goes to the hostile camp: the one chosen from enmp A goes to camp B and vice versa.

It is then the business of the respective camps to find out by close questioning what object has been chosen. To these questions only "Yes" or "No" may be given as answers. The camp which first arrives at the correct solution wins the round and retains the representative, as well as its oun member, who returis from the losing camp Nec Children's Party: Evening Paity

## The Clutch on Motor Vehicles

## Its Working Principles Described and Illustrated

This is one of the articles in this work that deal with the mechanlsm of motor vehicles, others including Brake and Gear. See also Motor Car; Motor Cycle

The clutch is employed as a friction-gripping device by which the engine is enabled gradually to take up the drive through the gear box to the back axle. It is necessary to disengage the engine from the transmission before making any change of gear; as well to enable $a$ vehiole to come to rest without having to stop the engine; also to allow the engine to run before the vehicle gets under wny.

The importance of the part played by the clutch and tho need of keeping it in good order cannot bo over-estimated. Should the clutch get dirty and stick up, it will be impos. siblo to engage the low gear without consider. able noise and consequent damage to the gear teeth when starting away from rest. The clutch may fail to engage properly, or it may suddenly take up the drive, thereby throwing severe strains upon the transmission. As a result, gear wheels may bo stripped, tho cardan ahaft twisted, universal joints broken, or the differential gear damaged.

Single-plate Clutch. This clutch, which has largely taken the place of the cono typc, is ype, is tapered end of the crankshaft. B. and the
 in upkeep, and has the great advantage that its speed quickly falls when rlisconnecterl. The principal parts are shown extended in Fig. 1. The plate G, which is bolted to the flywheel rim A, carries all the clutch elements. The parta are thus enclosed in but do not touch the Hywheel recess. The driving memher is a plate, I), having a number of radial saw cuts which afforl Hexibility ; the
splined centre engages the end of the clutch shaft, E, on which it may slide slightly end wise. The plate $D$ is held between a fabric disk, $J$, riveted to the pressure plate. $K$, and a similar disk on the plate $G$ (not shown).
Studs, L, screwed into the pressure plate project through holes in the fixed plate, G. and pressure is applied by means of springs, $\mathbf{H}$. fitted on the studs outside plate $G$ and held fast by the nuts $M$, which permit of adjustment. The parts are normally held together by the springs. When the clutch pedal is depressed the inner ends of the three levers. N , are forced towarls the flywheel by means of the ball thrust race, $O$, the rear end of which is engaged by the clutch fork. The adjustable screws $T$, in the outer ends of the levers $N$, engage the pins $P$, and thus forec the pressure plate away from the fixed plate ${ }_{2}$ leaving tho driven member, $D$, free.

Fig. 2 shows a Clyno single-plate clutch in section. It is enclosed in a casing formed between extensions of the gear box and engine casings. The flywhecl is keved on to the
driven member is mountal on the forward splined end of the clutch shaft. The rea end of the latter extends into the gear box and carries the firat driving gear-wheel. C. Pressure is applied by means of the six helical springs $H$, mounted on the ends of tension bolts. When declutching. the ball thrust race is moved towards the flywheel by $n$
clutch fork mounted on the clutch operating spind le, R.
The adjustable screws, T, and the adjustable collars which retain the clutch springs $H$, should be left as set by the makers. If some alteration should hecome necessary, it is essential that the same number of turns be given to each end, so that even pressure is maintained over the whole face of the olutch In the case of the screws, T, a clearance of at least inch must be left between the shoulder on the front cover of the gear box and the rear end of the sliding member which houses the ball thrust. This is to ensure that the full pressure of the springs is utilised, and that the pressure plate, $G$, is not held off by the thrust race abutting ngainst the gear box cover.

Multiple-disk Clutch. In this typea number of disks are connected alternately to driving and driven members, and aro forced together by springs. In this way high powers can bo transmitted through a clutch of relatively small overall dimensions.

Fig. 3 is a section through a Buick clutch. Five thin metal driving plates, $D$, have rings of friction inaterial riveted to them on each side, these rings engaging five alternate metal. driven disks, E. When the clutch pedal is depressed the plates separate, and there is no driving connexion between crankshaft, ${ }^{\text {B }}$, and clutch shaft. $F$. When the perdal is released the plates are bmught together by the clutch spring, $G$, and the resulting friction between alternating plates causes the clutch to rotate as a whole, transmitting the tomue.
On the outer edges of the driving clutch plates, $D$, are teet $h$ which engage corresponding tecth in a recess in the rear side of the llywhecl, A. There is sufficient fresdom of movoment to allow the disks to move endwise sufficiently to free them from contact with the alternate driven disks. The inner edges of the driven disks have similar serrations which engage corresponding teeth on $n$ driven member, J, connected by splines to the clutch shaft, $F$. The forward end of the clutch shaft is spigoted in the rear end of the crankshaft. B, by means of a small hall bearing.

At its rear enll the cavity in the flywhed is closed by a plate, $H$, bolted to the flywheel. The central dished part of this plate forms an abutment for the spring $G$. The other end of the spring forces the rear clutch release plate, K, awny from the flywhecl. This plate is connected by lolts, M, to the front release plate, $\mathbf{N}$. When the clutch pelal is depressed the two release plates are moved towards the Hywhecl, the pressure heing applied through a thrust bearing. The clutch plates then separate, and thus there is no driving connexion between crankshaft and gear box primary shaft.
The clutch will not wark properly unless the connexion to the pedal is correctly ad. justed If the pedal when the clutch is released strikes the fontboard before the clutch is fully engaged, an adjustment must he made to ensure a clearance of $\frac{t}{d}$ inch.
The Morris olutch (Fig. 4) is n multiple-disk olutch running in oil. There are four driving surfaces, comprising the rear foce of the flywhecl, A, bnth faces of a flonting disk, C, and the forionrl face of the pressure plate, $N$. 'Three driving pins, $P$, pass through flywheel, foating plate, and pressure plate, which all motate with the engine. The driving pressure for the clutch conies from springs mounted on the driving pins outside the pressure plate. The driven surfaces are a double line of cork insets in two stcel plates, one of which is shown separately in the diagram. The plates ara mounted on a tonthed driving hub keyed on the clutch shaft or the primary diving shaft. F, of the gear box.


Clutoh. Two examples of clutches used on motor cycles. Fig. 5. Sturmey-Aroher countershaft clatch.
Fig. 6 (right). Type with cork insets in the driving digks

The clutch is disengagerl by the tork (not shown) moving the thrust bearing, $E$, and pressum plate, $N$, away from the flywbeel, thus compressing the aprings and relioving the pressure on the cork insets.
The steel driven plates move slightly endwise on the tonthed hub. Wear on the tecth of the huh will interfere with this novement. and it may be difficult to release the clutch; if this occurs the toothed hub should he replaced. The cork consolidates a good deal under pressure during the first few thousand miles running of a new car, but subsequently little further yield may be expected. The yielding allows the pressure plate to move nearer the lywheel, with a corresponding movement in the clutch pedal casing, which will come nearer the foothoard when the clutch is disengaged. If the pedal touches the footboard the full pressure of the springs is not available, and the olutch may slip. Adjustment should be made to allow at least $\frac{1}{2}$ inch clearance between pedal and footlmard when the clutch is engaged.
Motor Cycle Clutches. The clutch on a motor cycle is usually combined with the chain sprocket wheel driven by a chain from the ongine, and also with the sprocket pinion, which is connected to the road wheel. In the multiple disk Sturmoy-Archer counterahaft clutch (Fig. 5), the chain wheel. A, geared to the engine drives the first motion shaft. B, of the gear box through a pack of driving and driven disks with interposed fibre rings: the main driven member, C, which is keyed to the end of the shaft, B, carrios the three driven disks, D ; several coilcd springs supported on pins, $E$, clamp the disks between the driven meinber, C , nnd the outer driven disk, $D$.
Another type (Fig. 6) employs cork insets $(G)$ in the driving disks, which rotate with the chain wheel, $A$. The driven disks rotato with a driven member. H , having a splined connexion with the shaft, J. The coiled spring, K, forces the disks into engagement.
CLYDESDALE TERRIER, Of the several brceds of Scotlish terriers the smallest is the Clydesdale. Its coat is long, fine and silky, with a high gloss, and there is no undercoat. A parting runs along the middle of the back and head, and from this the coat falls in two perfectly straight and even curtains to the ground, hiding the short legs and the dark, sharp eyes. The small ears stand erect almost on the top of the head, their lang fringes covering the sides of the head. The geneml colour is an unmixed briglit steel blue; but head, legs. and paws are a clear golden tan, and the tail is dark blue or black. The weight is a bout 18 lb . Sce Vog ; Terricr.

COACHMAN. A coachman is a man who drives horses for an employer, the word being usually restricted to one engaged by a private employer. Boing $n$ male servant, his employer must takic out a licence for him; this costs in Grent 13ritain 15s. a year. Coachmen usually woar some lind of livery, those in the employ of persons of rank wearing the livery with armorial bearings of the family. See Chaufteur . Driving: Horse; Insurance.

COAGULATION. The change from a fluid to a more or less solicl state, as seen in the olotting of blond, the curdling of milk, and the hardening of white of cgg by heat, is termed congulation. Blood congulates when it is shed, and whon it is received in a vessel the following sequence of events is ensily obsersed. The process begins on the surface of the blood, which in about 2 or 3 minutes begins to stiffen and hocome jelly-like. This takes place throughout all the blood, and is complete in from 10 to 15 minutes. Then a pale straw coloured fluid oozes out from the clot, until in an hour or two the clot, which has become smaller and harler, is Hoating in the fluid.

Clotting is due to the formation of is substance known as fibrin ferment by the injured cells and the leucocytes. In the presence of salts of lime this ferment throws the solid substance of the clot out of solution. If blood when it comes from an opened blond ressel did not undergo this change, which plugs the npening, we should be in danger of bleeding to denth from the slightest wound, as is the case in haemophilia, where the process is delayed beyond the normal time.
In addition to heemophilia the blood is long in clotting in haemorrhagio purpurn, pernicious anammia, and jaundice. In these conditions slight bruises may produce considorable bleoding under the skin, and bleeding occurs in nlarming quantity from wounds or mucous membranes. See Clot ; Milk.
COAL. Conl is made up of a combustible portion, which is chiclly carbon, and an incombustible portion, which is mineral matter and constitutes the ash. Of all kinds of coal the richest in carbon is antliracite, which contains !o) per cent. Harcler and heavier than ordinary coal, it burns with practically no flame nor amoke, giving out an intense heat and leaving little ash. It is not very suitable for ordinary grates and should be burnt in specially constructed stoves. An anthracite stove is very uscful in a hall or library, and once it is started it nceds practically no attention beyond being replenished every 12 hours or so.
Soft or bituminous conl is sold under such names as W'allsend, silkstone, selected, Derby or Nottingham brights, household and kitehen. A coal that gives excellent rosults in the kitchen range may not be good for the drawing room, and on that account two varicties of coal may be used in larger homes.
Cobbles and nuts are intended mainly for kitchen use. The terms refer to size rather than to quality, cobbles representing pieces between 6 in and 4 in . and nuts between 4 in . and 2 in. If a separate coal fired boiler is used in connexion with a central heating installation. hard steam conl is to be preferred to $\boldsymbol{n}$ soft one.


Clydesdale. Specimen of the small Scottish terriep

Dross or coal dust in a bugbear to the house holder, and cvery effort should be made to prevent its accumulation in the cellar. When is big lump of coal has to be broken it should be placed on the Hoor of the coal cellar and not allowed to rest upon the other coal; in this way a clean break can be made.

When a fresh supply is got in it should not be dumped on top of any sinall coal and dust remaining. This should be scraped to one side, and it should be a rule to use some of it cvery day along with the larger lumps. A good fire can often be kept burning for a long time without attention if banked up with small stuff.

The dust can also be formed into solid blocks or briquettes with the aid of a little Portland ceinent and water, a vessel such as a flower-pot being used as a mould. The briquettes and oroids (egg-shaped cakes) obtrinable at the shops are inade of small coal compressed with pitch as a binding material. See Anthracito; Cooker ; Range.

COAL BOX. For a drawing room the helmet-shaped box in brass, or a circular box of pierced steel or brass-the selection of metal being dependent on the other accessories of the hearth-with an iron lining and supported on fect, is always suitable. The latter with a lid is often vase-shaped in the Adam style of decoration, but is also seen in rather a heavier typo


Coal Boz. An attractive and useful example which can be tilted forward when used Courtesy of Waring and Clllow, Lid
of box without a lid. The iron cauldron and the wooden tub, strongthened with bands of copper and a separate lining, both look well with a brick hearth. Wooden hoxes of the oldfashioned type with hinged and sloping lids are best in plain designs. Square-toppled coal cabinets with drop fronts and removable liners, which tilt forwaid when the front is opened, are sometimes liked, as the top forms a convenient small table surface.

For a dignified fircplace, or with an aakpanelled chimney piece, nothing could be more suitable than the metal hox illustrated. See Chimney.

COALBROOKDALE. Old chinn bearing this name was produced at the Shropshire vil. lage of Coalport in Conlbrookidale. Those pieces which are marked CI), CBD, CDale, or the full word, are called Coalhrookdale, to distinguish them from those bearing the later Coalport marks. One of the characteristics of the dalesmen potters was to produce carcful copies of Sevres, Chelses and other wares. These were either unstamped or bore copied marks: when such pieces are traced to their real makers, they rank as Coalbrookdale. See China; Coalport.

COAL BUNKER. In llats and small houses a coal bunker is frequently built into some odd corner. It must be made strong enough to withstand the frequent introduction

and removal of the coal. For this purpose hoards are fitted into grooves or a channel at the front of the bunker (A, B, Fig. 4). These are removed one by one as the coal is consumed

In modern flats wherc the coal cellar is often simply a cupbnard beneath the stairs, it is the cause of much grit and dirt getting scattered about. This can be remedied to some extent by building a rough partition with stout hoards about a foot away from the door, as in Fig. 1. In front of this place a wire grid or woven wire mat, so that when handling the coal most of the dust will fall on to this grid, pass, through it, and be kept from littering the house.
Where circumstances permit, a gond plan is to construct a hopper, as illustrated in Fig. 2, provided with an exterior door sliding in strong gmoves, shown in section, Fig. 3.
The upper part of the front of the bunker may be provided with a hinged Hap or with removable boards having runners similar to those at the bottom. This provides for the introduction of the coal, which can be withdrawn liy opening the door at the hottom and allowing the coal to fall out directly into the coal scuttle. A stout poker will be found convenient for raking the coal should it show any tendency to jain in the hole.

COAL CELLAR. A coal cellar in small houses is often an excavation beneath the floor, approached by $\Omega$ flight of steps; the coal is delivered through a shoot covered by a circular iron plate, protected against intruders hy a chain or bar. Such cellars are liable to be flooded during heavy rain or liy the overHowing of a gully or drain. This can be dealt with by raising the height of the curb and providing more suitable channels for the overHow water to drain away.

A cellar that is not wanted as a store for coal can be converted into a useful room, provided that it is dry and there is sullicient height to move about. The walls may bo covered with old or cheap linolemm, with the back of it facing the room, as it is damp-proof and durable. Nail this to the walls and decorate it by panelling with narrow wooden strips. The ceiling is covered with beaver boards nailed to the joists, and panelled in any way desired. The lino can be painted. rose Du Barri, turquoise and

Coal Cellar. Method of converting a coal cellar Into a useful room



Coalport Chins. Modern plate reproducing an old deslgn Courtesy of Coalport China Co. I I.f1 apple-green grounds were especially rich, and the landscape panels neatly done. The Chinesc willow pattern, which was first imitated at Caughley, was continued at Conlport. Old Conlport was undated, and much of it un marked. See Chinn.

Coal Scuttle. See Cauldron; Coal Box.

COAL TAR. Coal tar is a black viscous liquid which is obtained after coal has bcen heated in the production of illuminating gas It contains valuable chemicals used in the manufacture of dyes, drugs, and disinfectants, and after these have been extracted it is used to protect wood, brickwork, stone and
iron, for which purpose it is mercly painted on and a!lowed to dry.

As a protective material it is videly employed in laying wood pavements and in preventing dust on roads. It would be of value in treat ing dusty spaces around the house, being sprayed or painted on the surface and then covered with sand or gravel, but it must be remembered that it has a poisonous effect on vegetation.

Coal tar soap consists of soap impregnated with a certain proportion of coal tar disinfectants, and is used for the same purposes as carboljc soap. Disinfectants inade from cơal tar are amongst the most effective that science has produced. See Disinfectant; Soap.
COARSE STUFF, A mixture of lime, sand, and hair is used in plastering under the name of coarse stuff, generally for tho first and second coats on internal surfaces. The proportions are 1 nart of lime to 3 parts clean, coarse, sharp sard, gauged by measure, not by weight. To this is added about 1 ll , by weight of long, clean ox hair to every 3 cubic ft . of the coarse stuff or, say, 3 oz. of hair to a pailful of mixture. See Ceiling; Cement; Lime ; Plaster
CUASTER HUB; The design of this hul provides a frec whdel, as well as a powerful lurake having a very sweet action: the brake

in a backward direction. This will further unserew A off B. Therefore, A will be forced tightly into the brake clutch cone F , and a further backward direction of the pedals will cause the pin $\mathbb{F}$ to operate the cam lever $\mathbf{G}$ hy means of the slot H , into which it fits, thus expanding the lorake band K against the brake drum that is a part of the hub sheli. The pin F is machined integral with the cone $E$. and is held in a stationary position by the slot H
The brake band with operating cam lever $G$ is held in position by the corer plate M, the arm of which is secured to the bottom chain stay of the bicycle by the clip $\mathbf{N}$ The brake shoe is returned to rest by the natural spring of the brake band itself. This band is formed of two metals; the outer band, which takes the wedr, is of phosphor bronze, and the inner band, which acts as the brake releaso spring, is of spring steel. The brake is immediately released by a forward movement of the pedals, which action by means of the quick pitch screw D iminediately draws the cone $A$ from the brake cone $E$. The spindle which passes through the centre of the unit carries the cone $R$, lor the ball race $P$, which is provided to take the thrust of the cone $A$ during brake application, and is adjusted in the usual way. When fitting the hub to the machinc it should be noted that this adjustment also controls the main bearings.

The proper functioning of the hub depends almost sole ly upon freedom of movement bet ween the quick pitoh screw on A andi 1 . Therefore; wash out with paraffin occasionally and lubri. cate at regular intervals, as specified by the makers. A point to remember with practically all forms of coaster hubs
Coaster Hab. Diagram showing the brinciple on which the hab is constructed is applied by back-pedalling, while the free is that the brake will be gradually wearing away wheel or coasting action is obtained by kecping the feet stationary.
To take the driving and frec wheel action first, it will be seen from A that there is no part of the mechanisin that can be said to have any resemblance to the frec wheel as commonly understood. Its mode of operation is as follows: $A$ and $B$ are the driving meenbers, and rotato as one with the chain ring; $B$ is machined integral with the chain ring seating. On $\mathbf{A}$ is secured the friction spring $\mathrm{C}_{\text {, }}$ which bears against the inside of the hub shell It follows that if $B$ is rotated in a forward direction faster than the hub shell is moving, then A , the rotation of which is being hampered by the frictional contact of the spring C , will be made to screw itself on to $B$ through the medium of the quick pitch screw $D$. The drive to the hub is taken up by the tecth shown on the face of B meshing with the corresponding teeth on the inner face of the hub shell, marked X. The harder the pedalling, the firmer will become the grip of these teeth, so ensuring there being no nossibility of slip.
The free whecl, or conster action, is practically a reversal of the foregoing, and is obtained in this way. Stop pedalling and the hub, which is still being rotated by the momentum of the licycle, will now be rotating faster than $B$. The result is that, through the medium of the spring $C$, the conc $A$ will unscrew itself along B , thereby becoming disengaged from the hub. Thus the hub is left to rotate free, whilst the cone A is left stationary with B, ultimately making a very light contact with the brake operating cone clutch F .
Operating the Brake. To operate the bratic it is only noccssary to move the predals
its frictional faces during the whole of its life ; which means that the day will come when the hub as a brake will fail to operate. To forestall this contingency, make a point of noting how far the pedals have to be reversed before tho brake operates. When this distance becomes excessive it is time to renew worn parts.
Other types of coaster show a certain amount of similarity in their design to the hub already described, i.e. the brake is applied through the medium of friction plates or by an expanding split sleeve operated by backpedalling. The coaster hub is frequently combined with a change-speed gear and a diagram of a typical huh is given in the article on thrce-speed gears. See Bicycle; Brake; Gear.

COATING : For Clothing The wool cloths used in men's suits are called in general coatings, and their variety is great. Coatings are ordinarily about 54 in . wide, and thus more economical to cut up into suits and costumes than the narrower and lighter dress stuffs. Their weights run from about 8 to 22 oz . per yard. Wool cloths materially heavier than 22 oz are over-coatings or mantlings. In single (i.e. 27 in .) width the goode are called trouserings or restings.
Coating scrges, most often plain black or hlue, are the ehief typo of plain coating; fancy coatings have check, stripe, or other patterns, usually in coloured threads. Coating is best for classical tailored suits for women. Warmer in wear than wool stuffs, coatings are also more expensive. Botany coatings are smouthest to the touch, and cost more than Cheriot or cressbred cloths. In buying
coating serges it is advisable to see that they are warranted fast dye and fully shrunk.

## See Cloth ; Serge.

COBAEA. I quicligrowing climbing plant popularly known as cups and sancers, owing to the shape of the flower. It is raised from seeds under glass in spring and is usually groim in the greenhouse. Pron. Co-bé-a.

COBBLER : The Drink. This long drink is made with almost any kind of wine or with brandy, whisky or gin. One of the best is sherry cobliler, which can the made from about $\$$ pint sherry and a teaspoonful each of sugar syrup and pineapple syrup or curaça. Ice well, and stir up. Strain into a tumbler which has been filled with broken ice and serve with straws: Champagne or moselle cobbler is made with one glass of champagne or moselle in a large tumbler, a spot of old brandy, a slice of lemoll, and sugar if desired. Finally fill up the tumbler with crushed ice.

COBBLE STONE. Round coblle stones are used for paths and roadwaps, especially in the Midlands and the north of England and in Scotland. Walls of buildings are sometinies constructed with them in districts where this niaterial abounds. They make cheap and durable garden paths, as they present a dry surface under most conditions.

Cobbles are laid by first excavating the top soil and ramining until a firm base is obtnined. The stones are then set in sand or fine earth and beatan down to a tiniform surface with a beetle or ruallet. Considerable skill is needed in choosing and setting the stones and to secure a bond or stable condition by properly placing them one with the other, so that no stone lies unsupporterl. They can further be secured with a grouting of cement mortar.

COB LOAF. A white loaf of bread, shaped into a roundish form, and baked on the bottom of the oven and not in a tin, is in certain locainties called a cob loaf. See Bread.
COB NUT. A variety of the hazel-nut, cob nuts are frequently cultivated. Kentish cobs are considered specially good, leing large and well-fla voured. They should be gathered when fully ripe, but before the lightest touch causes them to drop from the bushes, and dried well in the sun. After that, in order to keep them, put them in a cool, dry place, or pack them in layers with salt in dry jars. The cob is a good dessert nut, the kernel being sweet and timm. It is larger than the hazel or Barcelona, and is rounder than the lilbert. See Filbert; Hazel Nut; Nut.

COBURG CAKE. To malie thesc little cakes, cream together 3 oz . sugar and 4 oz . butter, and add iwo beaten eggs and 1 teaspoonful golden syrup. Beat well, and then mix in 0 or. Hour, 1 small teaspmoniul haking. powder, I teaspoonful ginger, the same quantity of cinnamon, $\ddagger$ teaspoonful mixed spice, and a little milk to bind. Half fill some greascd patty tins with the mixture; bake for about 00 nin. in a moderate oven.
COCANNE : Its Uses. An alkaloid that is obtained from coca leaves, cocaine is used in medicine chiefly as a local anacsthetic. Thus it is useful in eyo work and in operations on the nose and throat and elsew here; it is of great service in dentistry. For most of these purposes it is combined with suprarenal extract. It is also used sometimes in cases of pruritua. Among other conditions which may be benefited are sea-sickness and the vomiting of pregnancy and asthma.

But its employment should be limited as far as possible to single occasions, as a craving for the drug is very casily established, and the moral and physical degradation this produced is a price which no person can afford or should be allowed to pay for the relief of any pain or discomfort whatsoever. Cocaine can only he pmenred by a patient on a doctor's
prescription, and a fresh prescription must be procured for each occasion.
In poisoning, among other symptoms there may be difficulty in hreathing and convulsions Pending the arrival of the doctor sal volatile may be given or strong coffee by the mouth. or, if necessary, by an enema

COCCIDIOSIS : The Disease. This is a discase of various animals caused by the multiplication of a very small protozoan parasite in the tissues of the intestine and liver. Animals most frequently affected are rabbits, poultry, feathered game, sheep, goats and cattle.

In the rabbit, coccidiosis may affect either the liver or the intestinal wall. The disease may take an acute or a chronic course. As a rule the acute type is seen only in young animals, which appear sleepy and dull. In the early stages of the disease they may eat and drink ravenously when roused Later they refuse food and rapidly become emaciated Not infrequently there is a profuse discharge of saliva from the mouth. Diarrhoea scts in and the animals die within a short time of the onsct of the first symptoms. Where young rabbits are dying in large numbers and the deatha are usually preceded by diarrhoea, the owner should always suspect coccidiosis as the cause and send material for micro. scopical examina. tion to the Ministry of Agriculture, from whose Leaflet No. 364, these particulars are taken In older animals the disease takes a more chronic course, and the mortality is not nearly so high.

Amongst poultry the symptoms of the disease are similar and the acute type is essentially a disease of young birds. It is commonly classed by poultry breeders as white diarrhoea, or white acour of young chickens, but not all these are due to coccidia It must be understood that coccidiosis is only one of several diseases, the most prominent symptom of which is diarrhoea

Certain workers have reported satisfactory results from the use of crude catechu. The eatechu is powdered and mixed with water in the proportions of from 10 to 15 grains to one gallon of water, and this is given to a badly infected flock in place of drinking water. In the chronic type, where catarrh is a prominent symptom, washing of the nostrils and eyes with antiseptic solutions may be of some value.

Cardinal mules to be observed if prevention of outbreaks amongst young animala is desired may be stated: (a) Use high, well drained land for young atock and take care that the land chosen is clean, that is, that it has not been soiled during the last twelve months by the faeces of animals suffering from the disease or even by any adult animals. (b) Avoid overcrowding. (c) Keep the young separate from the older stock until they are past the age of two months. (d) Kcep the foster-mothers, pens, or hutches clean. Where these are of the floorless type move them frequently. (e) See that a good supply of fresh drinking water is available, and use a type of drinking trough not likely to be sniled by faeces.

Once diagnosis has been made by means of microscopical examination, all sick animals should be segregated and their droppings hurnt. Carcasses of any animals that die must also be burnt. The pens or hutches


Cochin Fowl. Cock and ben of the partridge variety
containing the healthy animals should be disinfected thoroughly with hot water and strong cresol, or 3 per cent. aulphuric acid, every other day lime washing of the pens wite serve as woll. Where pens of the remorable type without hoors are used, they should be noved to freah ground and cleaned out cvery other day. The object of fixing this 4 S hour interval is to ensure that any parasites passed out with the facces shall not have sufficient time to enable them to reach the infective stage before the animals are again moved or the pens thoroughly disinfected. Infected pastures may be given a top dressing of quick lime, say, 6 cut. to the acre See Poultiy Rabbit. Pion. Coc-cid'-i-osis.

COCHINEAL. The red colouring mattor obtained from the cochineal insect is most valuable in the kitchen, being perfectly harm less and devoid of taste, while by its use the appearance of many fuods, such as blancmanges, stewed pears etc, can be greatly improved

COCHIN FOWL. This is one of the breeds of poultry that has come much to the fore from an exhibition standpoint but in sor doing has suffered from a utility standjoint. It is a massive bird with heavy feathering. There are several varieties, buff, partridge, black and white being the most popular. The cochin is considered by
some a gond winter layer, but its merits as a table fowl are small Sec Poultry.

Cochlioda. The name of a family of orchids with showy flowers. They need the same treatment as does the odontoglossum (q.v.).
COCK - A - LEERIE. This highly nutritious soup has its foundation in chicken stock and leeks A cheap way of making the stock is by simmering the neck, gizzard, fect and boncs of a fowl for one or two hours in salted water. To one quart of stock, which should be skimmed of all fat and strained, four leeks ahould be allowed. These are cleaned, trinmed, and cut into inch-long strips, and put into the atock, with a amall onion, carrot and turnip, grated finely. Then bring the vhole to the boil and simmer for about half an hour. Salt and pepper should be added, and if the soup is not considered thick enough, a white roux may be added. The roux is made by melting a tablesponful of margarine in a saucepan and atirring in the same quantity of flour until a smooth paste results. A little of the soup should be poured into the roux in the pan and stirred round until it is liquid, and the liquid then added to the soup-which should be brought to the boil again.

COCKATOO. A member of the parrot family, the cqckatoo is distinguished by its crest of feathers. Compared with the parrot, though equally docile and affectionate, it is an indif. ferent talker. The two species most commonly kept as pets are the great white-crested and


Cockatoo. Specimen of the sulphur
crested specles, with crest erect
the lesser, or sulphur-crested. Like the patiot, the cochatoo may be kept in a large bell cage. or it may be chained to a stand See Parrot.

COCKCHAFER GRUB. The grub of the great hrown May fly is the cockchafer grub, which is quite capable of eating through thick roots, but fortunately is rarely seen in large numbers. It is not uncommon to turn one up when forking among trees, shrubs, and herliaceous plants.

When the gruh is present in such numbers as are likely to become a danger or nuisance, it is well to dose the roots of suspected trees or shrubs with a strong solution of salt As the grubs talie three years to come to maturity, and can do quite a lot of damage during that perind, it is well to destroy them while they are young.


Cocker Spaniel. A popular animat noted for ita lively nature, and used as a sporting dos

COCKER SPANTEL. The smallest and merrient of all spaniels, this dog weighs from 20 to 25 lb . His cheery nature and bustling ways make him a universal \{avourite, either for work or as a companion. Fairly short in back, and moderately high on the legs, he is as active as could he wished. His head is cleanly chiselled, of moderate size, ears lobular long, and set on low, clothed with long, silky hair; the eyes are hazel or brown in colour, harnonising with the coat, which may be all black, black and white, or roan, brown, livet and tan, black white and tan, etc. The tail, which is said to be indicative of bluc blood, although set on low, should be carriesl in a line with the back, and when the dog is in action it will be waved incessantly to and fro. The coat of the cocker spaniel should he Hat and silky, never waved or harsh. See Dog

COCKLE. The small shell fish known re cockles are found in great abundance on many parts of the 13 ritish coasts The double shells are rounded and deeply ribled, moro like scallop than oyater shells; the fish when cooked and removed from the shells are marked yollow and red. All cockles need to be thoroughly cleaned, otherwise they are exceedingly gritty. The best way is to wash well the shells till they are free from sand; then lay the fish in cold water to cover them, and a handful of salt and oatmeal, and leave them till the next day to rid theinselves of any sand they may contain.
To open cockles, put them ill a basin and pour on to them fast-boiling water to which a little salt has been added. Repeat this if the sliells do not open easily with the point of a knife. When open talie out the fish and cook
them as desired. Cockles can be used in most ventures out of doors in the hotteat weather for recipes suitable for oysters They make excellent patties or sauce. See Oyster.
COCKROACH. Known as the black beetle, although its colour is really brown, the cockroach cannot claim any c hard-shelled beetle tribe.

Cockroaches are members of the straight-winged ( Or thoptera) order of insects. They are much flattened from above and below, which enables them to hide in crevices during the day, and the upper pair of wings are merely leathery, instead of being loorny, as in beetles In the female of the common cockroach the wings do not develon, and are represented by mere scales, and those of the male cover only half of the body. The front part of the fore body is developed into a broad shield under which the inscct hides its head. The mouth is furvery long, flexible antennac, and the Iong Deatruction.
logs are covered with strong hristles.
A nocturnal insect, $a$ house that swarms with cockroaches might appear in the daytime to he free from them but for the unpleasant odour characteristic of them. The eggs are contained in little horny purses, which are deposited in crannies; each receptacle contains 16 eggs. The conmon cock roach is an alien which came from the East There are three native species, quite small creatures which never come into houses, but the alien, used to warmer conditions, only


Cockscomb. The carious head of the cockscomb, Celosia cristata
the purpose of establishing itself in neighbour ing houses. There is a amaller and paler sprecies, known as the Croton bug (Blatella germanica), which emanates from Central Europe, and in ome places is exceedingly a hundant.

A good remedy against the cockroach is to strew its noclurnal haunts with freah alices of cucumber, which, being consumed, renders them helpless. Beetle traps which entice them to fall into beer and get drowned may also be used with success in reducing numbers; but a more deadly device is the spreading of phosphor paste on thin bread or mixing it with honey and laying it in their way. Arsenic added to potato boiled and mashed or mixed with the pulp of a roasted apple, is a certain remedy. Great caution must he observed in the use of these poisons, or food

COCKSCOMB. This is the popular name of Celosia cristata, a half-hardy annual which bears cockscomb-like hends of bloom in crimson, yellow, and other colours. It is nsually grown for the summer decoration of the greenlonuse, but may be used to fill summer flower beds. Seeds are sown in Feb ruary-March in a temperature of $50-55$ degrees, and the plants are potted finally in 5 -in. or 6 -in. pots in a rich compost. Celosia plumosa, which bears feathery heads of blonm in red and yellow. needs similar treatment.

## Cocktails and Cocktail Parties

## How to Mix Cocktails and What to Serve with Them

This is one of various articles containing suggestions for the hostess. Other entries of related interest are Bridge Party; Dinner; Luncheon. See also Hors d'Ocuvre; Sandwich

A cocktail party may be an informal gathering before dinner, usually from $6 \mathrm{p} . \mathrm{m}$ to 7 or 7.30 p.m., or sometimes such a party is given later in the evening, when varieties of refreshments accompany the cocktail tray. These may take the form of hot toast sand wiches, containing a mixture of grilled kipper and bloater (freed from bones and skin and sharpened with a squeeze of lemon juice and a little cayenne), or a slice of grilled bacon. Tiny squares of hot buttered tonst may have a apoonful of caviare or a curled anchovy placed on them ; dishes of crisp potatoes are also liked, and may be eaten with the fingers at a cocktail party Other refreshments suitable to be served on any such occasion are finger-strip sandwiches with appetising fillings such as smoked salmon or bloater creani, stuffed olives, plain biseuits buttered and spread with Gentleman's Relish, salted almonds and cheese straws. A big dish of fruit is decorative, and useful with dainty cakes, fruit punch and pineappleade to offer any guests who do not take alcoholic drinks.
Cocktail Appetisers. Although a cocktail is usually a mixed drink there are certain appetisers known under that name which may be served either at a cocktail party, or may replace hors d'oeuvre at a dinner or luncheon An oyster cocktail, which inay be put into stemıned glasses and acconıpanied by biscuits, is made with shelled oysters, and a table. spoonful of the following sauce to each glass Nix one tablespoonful lemon juice, two table. spoonfuls tomato ketchup, $n$ dash of tobasco sauce, a teaspoonful of vinegar and salt and pepper to taste. Clam cocktail can be made in in similar way, using six of the smallest clams and their liquor.

Tomato cochtails are made by placing the pulp of fresh tomatoes in a glass, flavouring with tomato sance and garnishing with chopped olives. These appetisers should be placed on ice before serving.

A piek-me-up cocktail is the prairie oyster For this two teaspoonfuls each of Worcester sauce and brandy, one teasponnful of vinegar and one of tomato ketchupare mixed together, the yolk of a fresh egg is dropped in, and a dash of red pepper added.

Many cocktails can be made easily at home A shaker, a pair of nickel receptacles. is required to mix the ingredients properly and ensure the cocktail being cold Crushed ice is required for most cocktails For an almost complete outfit the mixer needs a bottle each of dry gin, whisky. brandy, pale sherry, French and Italian vermouth, Angostura bitters, orange bitters, plain sugar syrup, orange syrup, grenadine or raspberry syrup and such ingredients as oranges, lemons egga, tinned pineapples and soda-water When scrving a dry cocktail put an olive in the glass, with a sweeter one a cherry

The following recipes are for some of the better-known cocktails: Bronx is made by tilling the shaker half-full of broken ice Add the juice of $\frac{1}{3}$ orange, $\$$ gill of dry gin, $\frac{1}{}$ gill of French vermouth and $\frac{1}{6}$ gill of Italian vermouth and mix all well together. Brandy cocktail needs threc dashes of maraschino two dashes of Angostura bitters, one dash of orange bitters and one portion of brandy. Fill up with ice and mix and strain into a cocktail glass. Gin cocktail requires three dashes of Angostura bitters, one small lunp of sugar, and one portion of gin

Favourite Recipes. For Manhattan take ] or 2 dashes of Angostura bitters, $\ddagger$ gill of whisky, $\ddagger$ gill of Italian vermouth and 2 or 3 dashes of syrup. Fill up with ice, strain into a cocktail glass and squeeze lemon pect on the top. If it is required dry, leave out the syrup and use French instead of Italian ver mouth. Martini, one of the most famous of cocktails, is best made with one dash of orange bitters, $A$ gill of vermouth and $\frac{1}{3}$ gill of dry gin. Stir it up and strain it into a cocktail glass, squeezing lemon-peel on the top.

Vermouth cocktail is made with a smal glass of French or Italian vermouth to which is added a dash or two of hitters and a piece of lemon peel Whisky sour is a wineglassful of whisky, 2 or 3 dashes of lemon juice. $\frac{f}{2}$ tablesjoonful of sugar, and a squirt of soda water or seltzer. Fill the glass with ice and strain it after stirring well.


Cocktail Party. Appetising light refreshments arranged to accompany cocktails at an evening party Courtesy of Lavteys


Cocktall. The ingredients mized in the shaker ready for vigorous shaking
Courlesy of Lauteys
Of many other cocktails the following are examples. Ale cocktail or sangaree is made by dissolving a tablesponnful of sugar in a wineglassful of water Pour this into a large tumbler and fill it up, with ale, adding a little grated nutmeg. Turf cochitail needs 2 dashes of orange bitters, 2 dashes of maraschino, 2 dashes of absinthe, $\frac{1}{4}$ gill of gin and the same quantity of French vermouth. Stir it up well in n glass half full of broken ice. Star cocktail requires 3 dashes of orange bitters, $\frac{1}{2}$ gill of apple brancly and $\underset{\&}{\&}$ gill of French vermouth, "ith 2 dashes of orange curaçao. Squeeze some lemon juice into it and add an olive.

Harvard cocktail is made from \& gill brandy and the same amount of Italian vermouth, with 2 dashes of Angostura bitters and one dash of gum syrup. It should be stirred up well in a glass half full of broken ice.

Valencia cocktail needs equal quantities of tangerine juice, apricot brandy, and dry gin, to be well sliaken and chilled.

COCOA: How to Make. Cocon is prepared from the sceds of a tropical tree. It is sold either as nibs, llake, or soluble cocon. In many so-called soluble cocons a small proportion only of cocoa is present, the remainder being made up of added sugar and starch. These ingredients, though fiarmless, necessitate boiling the mixture in order to cook the atarch and render it digestible

When making cocon allow a heaped teaspoonful of the prepared variety to $\frac{1}{2}$ pint milk or milk and water in equal proportions. Mix the cucoa with sugar to taste and a little of the milk to a smooth paste ; heat the milk and water together, and when they hoil pour them over the cocon, stirring all the time. Return the whole to the pan, boil it up, and serve it immediately. See Chocolate.

COCOA BUTTER. This is a yellowish. white fat extracted from the cocon nibs. It is somewhat hard, and has a distinct odour of chocolate. It is chiefly used for medicinal purposes or the making of chocolate.

COCOA PUDDING. To make this light sweet, sieve together 4 oz. flour, 2 tablespoonfuls cocoa, and 1 teaspoonful haking. powder, and cream together $20 \%$ each of butter and sugar. Whisk into these one wellbeaten egg and lightly fold in the flour, etc., and a little more than a gill of milk. Put the misturc into a thickly greased basin, twist a piece of greased paper over the top, and
steam it for 2 hours. To test if the pudding is conked, push a clean, warmed skewer through the centre. If on withdrawal it is as clean and bright as at first, turn the pudding out and scrve it with oustard sauce.

COCONUT. The fruit of the ooco palm is of great value looth in and out of the kitchen. The fresh nut, when opened, is used as a fond by scraping out the nutty pulp and eating it plain or with sugar and lemon juice or a sprinkling of sherry. The juice or milk is used in the preparation of curries The kernel of the nut, dried or desiccated, keeps for years in a dry place, and is used for cakes, puddings, and confectionery.

COCONUT BISCUIT. Prepare these by mixing 4 oz. desiccated coconut, 2 oz. Hour. 3 oz . granulated or castor sugar, and 1 oz . cornflour. Bent up an egg, mix it with these ingredients, and then prour in sufficient milk to form the whole into a dry paste. Turn the mixture on to a slightly floured hoard, roll it out till it is about $\ddagger \mathrm{in}$. thick, dust it with sugar, and then cut it into rounds the size of ordinary biscuits. Place these on a greased haking-sheet and bake them in a hot oven for 10 or 15 min . These biscuits are better if baked the day after they are prepared.

COCONUT CAKE. From the recipe here givén a light coconut cake may be mads. porvided always that the ingredients are thoroughly beaten. Sieve ? lb. flour with " level teaspoonfuls baking-powder. Put 6 oz. cach butter and eastor sugar into a warmed basin, beat with a wooden spoon to a soft white cream, and work in 3 or 4 eggs, whisked to a froth. Now add the flour lightly, folding rather than stirring it in. Now mix in a teacupful of desiccated cuconut and $\mathbf{t}$ tablespoonfuls of milk. Pour the mixture into a paper-lined tin and bake the cake in a moderately hot oven for about $1 \frac{1}{2}$ hours. A pretty finish is given by coating the top of the catie when cold with a little glacé icing and sprinkling coconut and ohopped pistrachio nuts on the top.

Small coconut cakes are made by creaming together 3 oz. margarine and $\& \mathrm{Ib}$. granulated sugar and heating in an egg. In a separate basin sieve ! lly. llour and I teaspoonful baking-powder, add $\ddagger \mathrm{lh}$. desiccated coconut, and then stir these into the sugar, eto., together with $\frac{1}{2}$ gill or more of milk and a few Irops of vanilla llavouring. Put the mixture into small greased cake-tins and bake them in a hot oven for about 20 min .

COCONUT CREAM. To prepare mix 3 oz . ground rice to a smonth paste with $\frac{1}{2}$ gill milk. Put what remains from 2 pints of mill:


Coconut Cream. Party sweet favoured with coconut and ornamented with glace cherries
into a aaucepan, together with $1 \frac{1}{2}$ oz. margarine or butter and 2 oz. white sugar, and when these are boiling pour them on to the rice paste. Return it to the saucepan and bring it again to the boil, keeping it well stirred Then add 2 oz. desiccated coconut, cook the whole slowly for 8 or 10 min ., and draw it away from the fire before adding a little almond or vanilla Havouring, $\frac{1}{2}$ gill cream, and 1 oz. quartered glace cherries. Mix all these ingredienta together, then pour them into a glass dish and leave them to cool. Before serving decorate the top with some more glacé cherries.

COCONUT DROP. These cakes are prepared from d lb desiccated coconut, 6 oz . castor sugar, 3 eggs, and a little almond flavouring. Whisk the sugar and eggs togetimer for about 12 min . or until the mixture becomes thick and free from streaks; then sprinkle in the coconut and heat the whole thoroughly for a few ininutes heforc adding the flavouring. Grease a baking-tin, take a deseertspoonful of the inixture at a time and drop it on to the tin. Cook the drops in a moderately hot oven for about 10 to 15 min ., cool them on a sieve, and sprinkle with castor sugar.

COCONUT FIBRE. Made from the coans fibrons covering of the nut or fruit of the coco palm, coconut fibrc has niany uses in the home. It is employed in horticulture, and occasionally as a packing material, sometimes as the fibrous constituent of plaster ormaments. Its principal domestic applications are in the form of matting, rugs and carpets. The material is made in different widths and obtainable in many colours, patterned and plain.


Coconut Biscuit. Small, round biscuits. very attractive for afternoon tea

For hard wear on rough or uneven surfaces it has many advantages. It conforms readily to unequal surfaces, and is not seriously affected by damp. A tendenoy to roll up at the corners is checked by a drugget pin if on a wooden floor, or by a screw driven into a rawlplug in a solid tloor. A counteraunk brass screw and washer to suit is the best arrangenient under these conditions.

Periodical shaking and beating are essential, hut in addition the matting can be washed and scrubbed to remove dirt and stains.

The fibre of the coconut is a useful medium in which to grow such bulbs as lyacinths, tulips, narcissus, snowdrops and crocuses in howls. When making up a fibre bowl, a layer of charcoal should always he placed at the louttom of the receptacle, and the fibre muat not be knotted or luınpy. See lBegonia; Bulb; Hyacinth; Mat.

COCONUT OIL. The oil obtained from coconut, which in appearanco resembles a white solidified fat, melts at a comparatively low temperature. Coconut oil is used in the manufacture of margarine, for whioh purpose it undergoes a process that deprives it of its taste. Large quantities are used in the manufacture of sonp, $n$ variety known as marine soap giving a lather with sea water: the soap is the basis of a shampoo for the hair. See Hair ; Shampoo.

COCONUT PUDDING. Pieces of stale hread may be used in the making of a gand baked coconut pudding. P'repare it by cooking 3 gills mills and ! Ib. desiccated cocomut in a saucepan over the lire for a few minutea When the milk looils sprinkle intu it 2 or. lireaderumbs, and add also $1 \frac{1}{2}$ oz. margarine and 3 oz. white sugar. Mix all together thoroughly, then draw the pan to the side of the grate. Separate the yolk from the whito of an egg and stir the former into the mille, etc. ; acid a few drops of ratalia llavouring and then fold in the white of egg, previous! y whisked 10 a still froth. Tum the whole into
a grcased pie-dish and bake in a moderately hot oven for a bout 3 s min , or until the pudding is golden brown. It should be served in the dish in which it is cooked.

COCONUT PYRAMID. When possible, these cakes should be mired the day before they are baked Prepare them by mixing $\frac{1}{2}$ th


Coconut Pgramid. Cone-shaped cakes made with
desiccated coconnt. very popular with children
deaiccated coconut with $\ddagger \mathrm{lb}$ granulated sugar, adding a benten egg, a little vanilla flavouring, and enough water to make the coconut and sugar adhere when pressed together. Form tablespoonfuls of this mixture into pyramids, place them on rice paper in a baking-tin, and bake them in a copl oven until they are firm and lightly browned. A few drops of cochineal may be added to the mixture.
C.O.D. Recognized abbreviation for cash on delivery, a method by which the Post Office collects money for gonds acnt through the post The amount collected must not exceed $\mathbf{1 4 0}$. The charge is 4 d for parcels worth 10s. and under, then it rises to 3d. for those up to $£ 1$, to 8 d . for those up to $£ 2$, and to 10 d for those up to $£ 5$. Beyond this there is an additional 2 d . for each Ej or less. If the parcel is sent by rail the charge is $\mathbf{3 d}$. more.
An incoming cash on delivery parcel is delivered by the postman in the ordinary way (except that. if the trade charge exceeds $£ 5$, the parcel is kept at the Post Office to be called for, notice of its arrival being sent to the addressee). The postman is striotly forbidden to give up a casli on delivery parcel, or to open it at the request of the addressee, or to allow the addreasee to open it until the trade charge and any other charges due have heen paid A delivery fee of 4 d ., in addition to the anount of the trade charge, is collected from the addressee of a cash on delivery parcel received from a place abroad. The amount of the trade charge collected is remitted to the sender of the parcel without deduction. No receipt is given for a trade charge. When the trade charge has been collected, the Post Office undertakes the responsihility for the due remittance of the amount to the sender of the parcel ; and a trade charge, once collected, is in no circumatances refunded to the addressee.
This service does not apply to the Irish Frce State. There is, however, a reciprocal service betwcen Great Britain and various parts of the British Empire and certain loreign countries.

COD: How to Cook. A highly nutritious fish, cod is at its best from November to March. The liver contains valuable products, and can be cooked separately from the fish; from it is obtained the well-known oil. Cod's roo is also made into a separate dish. The liead and shoulder of cod are the parts most in demand, but from the thin tail end suitably sized steaks for frying are obtained.
To boil cod, the fish is washed and placed in a deep fish kettle containing warm salted water, with a tablespoonful of vinegar added. It is then brought to the boil and allowed to simmer gently for about 30 min . The fish is served with parsley, egg, anchory or caper
sauce, or melted butter, and garnished with slices of lemon
A method of baking a cod steak is the following: Wash and dry the fish, trim off the fins, and tie the steak in shape. Dip it in Hour, brush it over with beaten egg, cover it with breadcrumbs, and then put it in a greased firepronf dish. Mix together 2 tablespoonfuls breadcrumbs, 2 oz . chopped suet, 1 dessertspoonful ohopped parsley, and a teaspoonful ohopped herbs. Season this mixture, heap it on the stoak, lay a piece of greased paper over the top, and bake it from 15 to 20 min Serve it in the lint dish with anchovy or other fish sance poured round.
To fry cod steaks, wash and dry the fish, coat it on both sides with Hour that has been scasoned with salt and pepper. Fry it in hot fat until it is light brown in colour, then turn and fry it on the other aide. Cod sleaks can also be dipped in batter or coated with egg and breadcrumbs before being fricd. The steaks should be garnished with slices of lemon and served with parsley, egg, or anchovy sauce.
Cod Recipes. Cod can alan be stuffed and haked. Make a veal stuffing and press somc into the middle of the fish through an incision Close the incision with skewers, and place the fish in a casserole with 2 tablcspoonfuls of dripping and the same quantity of stock or water. Baste it frequently and bake it in a morlcrate oven for about an hour. Serve it with parslcy, egg, anchovy, or tomato sauce.
Creaniod cod is another way of cooking this fish. To prepare it, the cod should be placed in warm water and slowly brought to the


Devilled cod cutlets, an appetising way of preparing the fish with 1 oz. margarine cut into small pieces on the top, and bake them in a moderately hot oven for about 15 min .
Salt Cod. If possible, leare salt cod to anak overnight in tepid water and change the latter two or threc times. To boil it, put it into a saucepan containing enough warm milk and water-mixed in any quantities-to cover it. Boil up slowly, and once it has reached boiling point, let it simmer for $\frac{z}{}$ hour or more. When thornughly cooked, drain the fish, and then flake it on a prepared dish, pouring over it about $\frac{1}{2}$ pint of parsloy sauce.
Salt cod is excellent for breakfast if shinned. cut into convenient-sized pieccs, and then fried in bacon fat to which a little butter has heen added. If liked, a few slices of bacon may be served with it (See Fish Pie.)
Cod's Roe. To cook a hard ree, wash it, tie it' in a piece of butter muslin, drop it into a saucepan of warm salted water, and cook it for about $\}$ hour. Then let it get cold, cut it into slices about 1 in . thick and fry them a golden brown in hot fat. If preferred, the slices could first be dipped in frying batter or coated with egg and breadcrumbs. In either case it should be served very hot. A soft roe could be fried in the same way, but would not neod the preliminary boiling.

To serve cod's roe on tonst as a breakfast dish, cut up $\$ \mathrm{lb}$., either hard or soft, into small pieces Put them in a saucepan with 2 oz. butter, 3 to 4 tablespoonfuls milk, a well-beaten egg, seasoning; add a little chopped parsley, and stir the whole over the fire till it thickens. Then add a fow drops of lomon juice. Spread the roe snuce over buttercd toast. See Dunning.
CODICIL. A will may be altered by 8 short additional docu ment, called a codicil. It should begin: "Thin is a codicil to my will dated (here give dute of will)," and should then brielly set out alteration or addition boil, when the atock should be strained off and requirol; thus: "In place of the sum of $£ 100$ reserved. Arld about 1 oz butter to the fish, bequeathed in my will to George Robinson, together with a pint of milk or fish stock, and bring all to the hoil. The corl is then taken out, the honce removed, and the Haked fish put into the saucepan The sauce should then be thickened by the addition of 2 tableapoonfuls of Hour made into a paste with cold milk. The contenta of the pan are stirred over gentle heat while the thickening is being added and until the inixturo is thick and creamy. Pepper, salt, and a tableaponnful of chopperl parsley should then be added, and a few minutes before serving the pan should be drawn to the side of the stove and one or two well-beaten eggs thoroughly stirred in.

Devillod cod is prepared by washing 3 large cod cutlets and drying them in a cloth. Put i small teacupful of cold whito sauce into a basin, whisk it until it is smooth, and then stir into it half a teasponful anchovy ossence, 1 tcespoonful mixed inustard, and 1 level tablesponnful chutney, seasoning the whole with salt and cayenne. Melt loz. margarine and brush it over the cutleta; then spread the sauce mixture thiokly on both sides, and finally coat with ? large tableapoonfula bruwn breadcrumbs. Put the cutlets on a greasod tin


Codling Math. 1. Periect insect, magaifled to show markings. 2. Caterpilling and two nupa skins, magnifled
give him $£ 150$." or as the case may be. The codicil must be signed by the testator and witnossed by two witnesses, just the same as the will was, who take no interest either under will or codicil. If there is anything but the very simplast of alterations to be made. it is better to call in a solicitor. See Executor Legacy; Will.

CODLING MOTH. Of all apple pests the codling moth is prohably the most notorious and ita attacks are not confined to the apple for pears at times suffor mither severely and the fruits of the quince and walnut inay also be damaged.
According to Leatlet No. 30, issued by the Ministry of Agriculture, the hest methods of dealing with the moth are as follow: In orchards where spraying can be practised, the trees covered with moss and loose bark should be cleaned by means of a tar-oil winter wash Tho trens should be sprayed with lead arsenate just after the petals havefallen. It will be found that there is a period of from 7-14 days during Which the calyx cup, subsequently the eye of the apple, is open, while later it closes.
The object in spraying is to force the arsenate into the calys oup, where it is retained
after the calyx closes, with the result that any codling larva which attempts to burrow through the eye of the apple is poisoned. It is useless, therefore, to spray too late, when the calyx cup is closed; but it is also necessary to wait until the blossom has completely fallen, or there is danger of poisoning the bees. One pound of lend arsennte paste should be allowed to every $20-25$ gallons of water.

In orchards where spraying is impossible the trees may be banded in June with old frayed sacking, folded paper or ropes of hay. If possible, two bands 4-6 in. Wide should be used on each tree, one just below the junction of the branches with the trunk and the other a few inches from the surface of the ground The larvac on leaving the fruit are likely to nake their cocoons in the folds of the sacking or in the hay, and the bands must therefore be burnt in the autumn.

Ill fallen fruit should be picked up and disposed of in such a way as to kill any larvae inside. All rubbish near the trees sliould be cleared away and burnt. See Apple; Pear.

COD LIVER OIL. Whether in its natural purified state or in the form of an emulsion, the oil extracted from the liver of the codfish provides a valuable nutritive tonic for invalids and particularly for consumptives and rickety children. It is a useful addition to the diet when one is working at high pressure; and persons suffering from chronic bronchitis will derive benefit from it. It is rich in the fat soluble vitamin $A$, which is so important in uutritional efficiency, its absence from a diet leading to the development of rickets and other conditions.
Cod liver oil is often prescribed with iron, as in the following tonic mixture, for a rundown thin child and for children developing tubercular glands in the neck. The dose is 1 to 2 teaspoonfuls three times a day after meals.


Mixtures of cod liver oil, malt, and iron such as the following are also useful tonics to be taken during the convalescence after any severe and lowering illness: The dose for n child of 6 to 10 year's is $\ddagger$ to 1 teaspoonful three times a day after meals.
$\begin{array}{lllllllll}\text { Codd liver oll } & .: & . & . . & . . & .- & . . & 1 & 07 . \\ \text { Extract of malt }\end{array}$

COELOGYNE. This has been described as the amateur's orchid, for it is one of the easiest to grow. The imported plants should be placed in a warm bed of moss and sprinkled with tepid wrater in the greenhouse, until the pseudo-bulbs have swollen to their normal size. They should then be placed in welldrained pans containing a mixture of loam and peat, with a little crushed charcoal, and treated as ordinary heated greenhouse subjects for winter flowering. C. cristata and its varieties propagate readily by division of roots. The Howers of C. cristata are white with yellow crest on the lip. Those of C. pandurata are green and black, a striking combination. There are other species and varieties. See Orchid. Pron. Coe-log'y-ne.

COFFEE. Coffee is a general stimulant and promotes the activity of the brain and the beart. It is refreshing when one is fatigued, and, like tea, its beneficial effects are more lasting than those of alcohol. In cases of heart discase and in prolonged depressing febrile diseases, e.g. pneumonia and enteric, coffee, either black or with milk, is a useful addition to the dietary.

How to Roast. In making coffee, if the best results are to be obtained, the berries should be freshly roasted nnd gmund. If a coffee roaster is not available use an ordinary
enamelled frying-pan. Melt just enough butter in the pan to moisten the berries, and turn them frequently over n smokeless fire or moderate gas stove until they become rich hrown in colour. It is a good plan to roast them in relays, passing them to the coffec mill at once, and making the coffee as soon nfterwards as possible. If any of the berries turn black during the roasting process, take them out of the pan without delay. One of the strongest and most serviceable kinds of coffice mill is made of cast iron, and fitted with a funnel-shaped top, into which the beans are poured. The grinding action is controlled by means of an iron handle, which, when turned, causes the ground coffee to fall into a tin or basin placed immediately beneath the mill.

When using a coffee mill, make certain that the coffee is being finely ground, otherwise its full strength will not be extracted. If the coffee a ppears conrse, it is generally a sign that the mill requires readjusting.

A French method of coffec-making consists of allowing 1 tablespoonful of coffee to $\frac{1}{2}$ pint of water, pressing the coffee down in the percolator or cafetiere ; pouring on $\frac{8}{4}$ pint of boiling water and slowly adding as many coffee-cups of watcr as are required. Should the coffee-pot be made of silver, scald it out twice before pouring in the coffee, and if the latter has to stand for some little time before being used, keep the pot in a bowl of boiling water.

Flavour can be improved if the amount to be used is put in a cup, covered by a saucer, and placed in the oven for a few moments to warm; also by adding a pinch of salt to the made coffee. Reheated coffee loses its flavour. To make the grounds settle in the pot a little coffee should be poured into a cup and then poured back in the pot. This should be done several times.

Coffee is drunk either white or black-that is, with or without milk. Black coffec should be strong and may le served only with sugar after dinner. Never use cold milk for white coffee.
Iced Coffee. A method of making iced coffee consists of putting 4 heaped tablespoonfuls coffee into a quart of boiling water, boiling them in a pan over the fire, then removing the pan for a few seconds, replacing it again and reboiling the whole. Repent this process 2 or 3 times, then let the coffee stand for 5 or 10 min . before straining it. Put 4 oz. castor sugar and $\frac{1}{2}$ pint milk into a pan over the fire, stir these until the sugar has dissolved, and then bring them almost to the boil. Add these to the coffec, and leave the mix. ture to cool. When it is quite cold, add $\frac{1}{2}$ pint cream and a few drops of vanilla essence, putting the jug in an ice cave or in a vessel which is well packed round with ice.

Coffee-making Machines. There are many varieties of coffee-making machines in most of which the same principle is employed of straining the freshly ground coffee through boiling water. In a cafetidre the necesmary quantity of coffee is placed in an upper part which
forms a strainer. Boiling water is then poured in, which passey through and is impregnated by the coffee, and percolates through the strainer into the lower part.
In some of these coffee-making machincs there are two vessels, an upper and a lower, on the same principle. In others the upper vessel is of glass and the container is made of hrass with a small spout: when the coffee has passed into the container the latter can be removed for use as a coffee-pot.

In another class of machine a glass globe is used, and in this the filtered coffer is hea ted by means of a small spirit lamp. The coffec is placed in an upper glass vessel and peroolater into n hoiler or lower glass vessel, circulation being effected by a central connecting pipe These machines are generally arranged so that When the coffec is ready for service the upper vesse! is removed, and the lower glass globe, complete with the stand and handle, acts as a cotfee-pot.

Figs. 2 and 3 show a cafetière with its com ponent parts. As the materinl of which these are made is fireproof, they can be left to simmer over a gentle heat and thus extract the best of the flavour from the coffee.

Coffee Service. In silver or plate the 18th century designs for the three-piece coffee services have not been improved upon. Benutiful among those are the octagonal stylo with ebony, fine wicker, or stained green ivory hnndles to coffee port and jug, and monlded bases; the penr-shaped, plainbodiod pattern with ornamentation round the edge of lid and foot with round sugar basin and the vase-shapes copied from old Shefficld plate examples in Adam styles.

For after-dinner use coffec cups in one of the many old English designs look best with this description of service, while the conventional patterns, the plain coloured chins rimmod with hack, the all-black except for gold or coloured


Coffee-making Machine. 1. Cona coffee-making machine. 2. Caletidere in Arenfool ware, and, 3 , its component parts 1. Courtesy Cona Colled Machine Co.. Hidd
be used. In earthenware, coffee pots and milk jugs are sold to match most of the good stock patterns, and are made in various sizes suitable for breakfast use Sce Breakfast.
COffee Cream sandwich. Mako this in a mund, shallow, हुeased cake-tin lined with greased paper. Whisk the yolks of 3 eggs with $\ddagger \mathrm{lb}$. castor sugar for 15 min Mix together f b. Hour and 1 level teaspnonful of baking-powder. then sieve and add them to the yolks and sugar. Whisk the whites to a stiff froth, fold them lightly into the othor ingredients, and add milk if required. Put the mixture into tho prepared tin and bake it in a bot oven for about 20 min . When cold split


Coflee Cream Sandwicb, a dainty and delicious cake lor afternoon tea
the cake in half, and prepare some ioing with $\ddagger \mathrm{lb}$ butter, 1 oz. chopped walnuts, 9 oz icing sugar, and 2 dessertspoonfuls coffcc essence (obtainable at any gmecery store) Beat the butter and sugar to a cream, add the flavouring, and then put $i$ of the icing aside. To the remaining $\$$ add the chopped walnuts, then spread this on top of the lower half of the cake, replace the top half, and leave it to get firm. Spread the outside of tho cake with 3 tablespoonfuls of apricot jam, and aprinklo over this 3 oz of chopped walnuts. Decorate the top with the remainder of the icing, forced through an icing tube into a docorative pattern.
COFFEE ECLAIR. These finger-shaped cakes are marle in the anme way as chocolate eclairs, except that they are coated with coffee icing. See Chocolate Eclair.

COFFEE ICING. To prepare coffee icing, put 2 oz . fresh butter into $\Omega$ basin and beat it to a soft cream with $\pi$ wooden spoon. Then add $\ddagger \mathrm{lb}$ sieved icing sugar and heat the two ingredients together until the mixture looks like whipped cream. Gradually add about l dessertapoonful of coffec essence. A forcing-hag and pipe should be employed to apply the icing on cakes.

An excellent coffee glacé icing whioh must, however, bo used immediately after making. can be prepared from ${ }^{3} \mathrm{lb}$ icing augar, $1 f$ tablespoonfuls strong coffice and the same quantity of hot water. Mix all these ingredients well together, and warm the whole.

COFFEE MÉLANGE. Cut a pint packet of vanilla jelly into amall pieces and pour over them a pint of hot-not boiling-milk Stir the mixture occasionally until the jelly is thoroughly dissolverl. Let it become almost cold, then add 2 large tablesponnfuls of coffee essence. If the jelly is not sufficiently sweetened, add extra sugar dissolved in a little hot milk. Pour the whole into a wetted mould. and when it begins to thicken atir in a thinly sliced banana and a fow slices of tinned apricots, peaches, or pears. When the inould is set, turn it out on to a glass dish, and serve it with whipped creans.

Cognac. The French brandy known as cognac is distilled from the vines of the Charentes. See Brandy.

Coil. Sec Inductance Coil.

## Coins: Their Collection and Arrangement

## With Instructions on Making a Display Cabinet for the Specimens

Other collecting hobbies described in this Encyclopedia include Birds' Eggs; Butterfly; China ; Stamps. Sec also Brass; Pewter; and Amateur Carpentry

The enrliest known coins are those of Greece. with only an obverse design, the reverse showing the impress of the punch or vice which held the ingot steady for the coiner's hammer. These date back 700 years b.c., and are supposed to have been struck in the Greck colonies in Asia Minor, which were more or less under tribute to Lydia No earlier coins are extant of ancient Egypt, Babylon, or Assyrim, and the original Jewish shokel was only a weight. So the Greek coinages. from the period stated to about the 3rd century A.D., form the first division in numismatics

The next important division is that of tho Roman coinages, starting nearly 400 years B.C., with large coins cast in bronze, and ending with the fall of Rome in the 5th century ad., although the Jatin language on Byzantine coins was continued unlil the llth century, when it was finally diaplaced by Greek. A third division of numismatics is concerned with Oriental coinages distinguished by Eastern languages on the specimens and comprehending Persian, Arabian, Afghan. Indian, Chinesc, and Japancse coins
The later coinages of the Western world, can be divided into two periods: (1) from the three sections is a magnificently varied range Carlovingian coinage in the 8th century, when for specimens. A complete series of types of
 2. Roman, brass cain, Vespasian. A.D. 70-79. 3. Isle of man, copper penny, 1758. 4. Spanish, silver 7. Bengal, copper balf anna, 1835. In each case the obverse of the coin is shown either above or to
the Roman denarius became a denier or penny to the rise of the U.S.A. ; (2) the ultra-modern coinages of the democratic era down to the present day
Among foreign coins of the former period is the silver thaler, daler, or dollar, coined in Germany about the time when Spain was under (ierman domination. This coin was subsequently introduced by the Spaniards into the Indies and Americar as a piece-of-cight. the Spanish sixpence, or royal, or real, beino then equal to one-eighth of a Spanish dollar The modern American silver dollar is thus the lineal descendant of the piece-of-oight.
British Coins, As regards British coins, the custons lins been adopted of placing the head of each sovereign in a direction opposite to that of the previous one. Thus the head of George $V$ faces the reverse way from that of Edward VII, as can be scen from a glance at any of the coins issued during their reigns.
British coins may be divided into three sections: (a) coins issued in Great Britain by regal authority, (b) tokens issued in Great Britain by private authority, (c) coins and tokens of Britain Overscas. In these
 the leit of the reverse

Engliah pennies, in bronze and copmer, is First make the quite a fascinating start for a small collection coin trays thembefore developing a larger one. Begin with selves. This can be the bronze penny of King George $V$, already done by obtaining lescribed. The penny of Edward VII has from any masterDE $S$ for the designer's initials, meaning de Saulles, and the legend on the obverse whows, for the first time, the monarchical title BRITT: OMN: REX-King of All the Britains.

There are two types of Qucen Victoria's pennies in bronze and onc in copper. The later bronze, which wis coined from 1895 to the end of the reign, depicts the crowned queen in her widowhood, with IND : IMP : (Empress of India), added to the royal title. The carlier bronze type, 1860 to 1894, pictures a younger queen, and the crown is not expressed, while on the reverse a lighthouse and a ship are in the device.

Penny Coinage. Preceding the bronze coinage was the larger Victorian penny in copper, from 1839 to 1860 , with the date on the obverse, under the head of the queen as she appeared in her girlhood, and the exergue on the reverse bears the rose, shamrock. and thistle. The 1860 penny is very rare

The copper pennies of Willians IV and George IV differ very little in style from those of the queen's first issue. Prior to them was the George III penny of 1806 and 1807. And when the George III penny of 1797, with its raised rims for the legends and with the date on the reverse, is reached, one has got to the first copper penny issued by royal authority in England. The copper pennies circulated in England during the token period were mostly those issued by private authority, and a collector needs grat judgement in selecting specimens Between the years 1811 and 1815 these pennies were coined in at least 70 different types all over England and Wales. Each of the genuine specimens usually indicates clearly the name and locality of the issuer.

The beautiful Anglesey pennies were issued by the Parys Mines Company in 1787-91; but most of the other socalled pennies dated in the latter part of the 18th century are either private medals made by collectors, or imitation tokens place of coing during the 18th centary


Coin Collecting. Obverse and reverse of the Anglesey Penny, one of the best designed copper tokens issued in the tray. The pivot
 of tho bit must go right through the tray, but on Cabinet Making, which will be found on when the circle has been sunk ahout $\frac{1}{\frac{1}{2}}$ in., it pages 172-3.

COIN TRICKS. One of the simplest of coin tricks is to offer to apin a penny on a coin tricks is to offer to apin a penny on a
smooth table, from which the cloth has been removed, and to tell, when blindfolded, whether it has come down head or tail. The secret is a very simple onc. On the extreme edge of the penny a smail notch is made with n penknife, so that a tiny piece of the metal projects. This projection is so small as not to be noticed. When the coin is spun it will settle on the unnotched side with the usiral long, steady, even whirr.

If it settles on the notelicd side, however, the time of settling is only about half the other, and the sound, instead of gradually becoming fainter until it ceases, ends suddenly. The difference in the two sounds is rarely detected by those who do not know the trick
The simpler the principle of a trick the more made by dealers for sale to collectors. The at each end of the trav, thus leaving a difficult often is its detection. The following rare book of plates by Pye, of Birmingham, projection which runs in a groove formed in published in 1801, is a good guide to the genuine tokens of the time.
There are copper pennies issued earlier still, in the 17th century-such as Prockter's Lancaster penny of 1671 , with the Stanley crest of an eagle and a child; Sytton's Blackfriars penny of the same ycar, with the figure of a friar ; and Taylor's penny, issued at Settle in Yorkshire in 1668. When onc has included all these with the other types sketched a fairly complete collection of English copper and bronze pennies will have been obtained. Then the halfpennies in copper and bronze can be tackled and the farthings, and the silver pennies that reach from Charles II right away back to the time of Offa of Mercia. The rest can follow later.
Clean dirty coins with oil of turpentine and a badger-hair brush, but do not rub them so as to takc off the tarnish of age.

Making a Coin Cabinet. The simple cabinet shown in Figs. 1-5 is quite easy to construct, and the home worker will find nany helpful lints in the article on Birds' Egg Cabinet, which will be found on pages 102-103.
the end wall of the cabinet
(Fig. 5). The completed tray is shown in Fig. 4.
The cabinet itself may be made to the dimensions required, the number of trays being suited to the collector's present or future needs. The cabinet illus. trated accommodates fourtecn trays; a larger one might have the trays arranged in two tiers on the lines of the Birds' Egg Cabinet. The Methods of construction may be gleaned from the last named article, and from the one
 Announce to the audience any member can take a handful of coins and that you will say whether the number is odd or even

Asl: himito place lis coins in a hat. and announce that you will, even when hbindfolded, add a handful of coins from your own pocket so that the total will be odd if the number of his coins is even, and even if the number of coins is odd. When you have dropped in your coins ask him whether the numlier ho chose was odd or even, and it will be found that the total in the bat is always the reverse. The trick depends simply upon the pe:former dropping into the hal
nn odd number of coins. The principle in voived in this coin trick is the simple one that the sum of an even and an odd number is odd and of two odd numbers even.

The following which will keep guessing for a
trick is one an audience very long
and maslied Cold remains of potatocs and cabbages fricd together are in some places called hy the same name.

## COLCHICUM. Another name for meadow

 saffron or autumn crocus See Mendow SaffronIn medicine colchicum, a drug obtained from its sceds and crowns, is used to relieve the pains of gout. The wine of colchicum is the preparation commonly chosen, and is combincd as a rule with an alkali and with Epsom salts. The dose is $10-30$ minims. The active principle colchicine is sometimes used instead. Colchicum shanded only be used by the orders of a doctor.

COLD: Prevention and Cure. This is an acute infection producing sore throat, a "stuffed" head, and Inter a f́ree discharge from the nose, headache, signs of feverishness. and possibly bronchitis. Close contact with $n$ person sulfering from a cold, as in a room, a railway compartment or the inside of a bus, is almost certain to produce infection. In addi tion, sources of irritation may be present in the nose or a chronic irritated condition of the throat and the hack of the nasal passages may be kept up by constipation, dyspepsia, pyrrhoca, the ahuse of alcohol or tolincco. If the colds are frequent and there is no evident cause of irritation, advice should be taken ahout vaccine treatment.

The tendency to cold may be lessened by hardening oneself against the chilling effects of changes of 1 cm . perature. This can be done by exercise in the open air and by keeping rooms thoroughly ventilated. The windows of thic bedroom should be widely open at night The morning tul is very useful, but if it is not taken a good substitute is to douche thoroughly the neck and shou!. ders with cold water and a sponge. The underclothing should be of wool or, for those who can afford it, silk.

Treatment. In treatment of the condition it is wise to consider whet her the cold is not the lreginning of such or inlluenza, as in such a cose the patient should keep to bed, as also be should do if he is particularly feverish even from a common cold. In any case a hot mustard foot hath at night is a good thing, with some hot whisky and lemon, and perhaps 5 grains of Dover's pouder. Headache nay be relieved by 10 grains of aspirin. If the patient pershould be caieful about exposure on the following day, should the go out.

Ammoniated tinc. ture of quinine is often taken at this time in tablets or a mixture, such as this: ammoniated
tincture of quinine, 6 drains; tincture of orange, 3 drains; glycerin, 4 drans; chloroform water to 6 oz . Take a table. spoonful in water four times daily Cinnamon essence and spirit of camphor nre also used, about 15 drops of either on sugar. Carbolised smelling salts may be inlialed, or pinol, elicalyptus, or menthol. The oils may be inhaled from the bottle, dropped on $n$ handkerchief, or from stenming water. If the thront is sore a gargle of stecl drops, 20 minims to 1 oz . water, or a weak antiseptic solution, e.g. permanganate of potash, should be used.

The diet sliould be light and rasity digested. If the bowels are constipated give 2 grains of calomel, followed by 2 drams of Epsom salts in the morning. When the cold has passed off, Eanton's syrup in $\frac{1}{2}$ dram doses, or the compound syrup of hypophosphites in dram doses, could le taken for a weck or two. See Catarrlı; Cod Liver Oil; Cough! Friar's Balsam, etc.

COLD CHISEL. The name cold chisel is applied to all kinds of metal cutting and chipping chisels, which are used for cutting cold metal, but have other applications in the house. The cheapest and commonest type is a round steel bar llattened and sharpened at one ond Such a tool is only fit for use as a case opener, or for breaking down old brickwork.

Those which are of real use to the home worker are the flat chipping chisels, in three sizes, 6 in. long by 3 in. wide, 8 in. long by 3 in. wide, and 18 in . long by 1 in wide The lirst are for small work in brass, copper, or thin slieet-iron. The intermediate sizo is for such jols as cutting sheet-iron and chipping olf the projecting ends of bolts The large size is for cutting ratickivork and all kinds of demolition work A (i) in. cross cut, a 5 in. diamond point, and $\pi 4 \mathrm{in}$. half-1ound will all be found worth their trifling cost.

The chisels must lse kept sharp by or smokelcss fuels, such as coalite, are made at a much lower temperature than gasworks coke, and therefore contain a larger percentage of the volatile matter of the original coal. The result is that they ignite more easily than ordinary coke and produce a more checrful fire, while giving off little or no amoke. Sec Brecze Block; Conl.

COLANDER . One of the most useful articles in the kitchen equipment, the colander is a perforated Lowl through which vegetables arc drained so that they will be frec of moisture when dished up. See Baking.

COLCANNON This consists of potatoes and cabbage boiled together


Colander made of aluminlum, with perforated presser Staines Kitchen Equipment Co., Lid.


Cold Chisel. 1. Rannd-ended chisel for cutting corrugated fron 2. Ordinary type of cold chisel ; and, 3 , grinding the cutting edges. For very finc work they can be sharpened on an oilstone in the same way as carpenters chiscls. Bricklayers' chisels are ground rather finer and thinner than those for metal cutting. A round-ended chisel is handy for cutting corrugated iron. The diamondpoint chisels are useful for chipping lines on metal and squaring up comers, and the halfround for chipping out screws or bolts that have broken off in their holes, and for shaping curved surfaces. A wise precantion is to giind off the ragged ends that form on the head of the chisel after use. See Chisel.

COLD CREAM. As a toilet requisite cold cream is used for softening and cooling the skin after sunburn, as a cleansing cream, to relieve harshness of the skin, etc. It may be obtained by asking a chemist for the official ointment of rose water The usual foundations for cold cream are either white vaseline, benzoated lard or white wax. See Beanty Culture : Skin.

COLD FRAME. Frames as used by gardeners for the growth and protection of certain plants and fruits are known as liot or cold, according to whether they arc heated or not. See Cucumber; Frame
COLD MEAT: Useful Hints. The re mains of different kinds of meat can sometimes advantageously be made up together. For instance, veal is improved if conmbined for a made-up dish with a little cold ham or bacon mutton and rabbit comhine well, and poultry combines with ham or veal. An underdone joint can be rebeated and served in the same way as a freshly baked joint if it is covered with mashed potatoes and placed for hall an hour in a quick oven Beef stands being recooked better than any ot her meat, and veal can be made into gooil entrée dishes Boiled rice is served with mince and curries, and sippets of toast are arranged round dishes of hashed meat

A joint of meat can be used down to the last The bones should he scraped of all the meat that remains, and this should be minced. Soak some slices of bread in cold inilk and let then stand for an hour. Whisk the bread and add the mince and scason well. This misture can be used to stulf tomatoes, to fill scooped-out haked potatoes, to add to omelettes and serambled eggs. The hones should then be put in the stock-pot and used for soup. The bones of poultry or game can be devilled
Savoury Puddings. Cold beef or mutton can be utilised for savoury meat puddings A liatter is made from potatoes, boiled, then rubbed through a colander, and beaten well with two eggs, a dessertspoonful of butter, and aufficient nilk to make them into a batter consistency This jotato batter should be spread on a baking-dish and a ices of meat placed over. These are covered with a !aver of batter and the dish is baked for about an hour
A steamed pudding is made in the following way. Soak pieces of stale bread in milk and strain from the liquid. Beat up the bread with an egg and a dessertapoonful of butter and stir over gentle heat until the mixture stiffens. Allow it to cool. Add seasoning, a sprinkling of mixed herbs, and a spoonful each of tomato ketchup and mushroom ketchup. Add the meat, ininced finely, and mix we! Turn into a buttered hasin and stean for about two hours. Serve with thick, broun gravy.

A pie is made from cold meat, macaroni, and pastry. A pie-dish should be lined ivith pastry and filled with a mixture of minced meat, cooked macaroni, and seasoning. Pour over a little white sauce and cover with pastry. Bake in a moderate oven for 45 min

Another form of savoury pie is made by mincing the meat, sensoning it well, and placing it in a pie-dish with gravy or stock Fry one or two onions and ahout four tomatoes, and cover the mince with alternate layers of onions and tomatoes. Cover the dish with mashed potatoes roughed up with a fork. Bake until the potatoes are nicely browned. See Casserole ; Cornish Pasty; Rissole; Stew.

COLD PACK. Cover the bed with a waterproof sheet and over this lay one or two blankets. Wring a sheet out of cold water and spread it on the bed. Lay the patient atripped on this, and wrap it round him, quickly folding it around each leg separately and leaving the arms free. Then cover the patient with a couple of hlankets and tuck them in about him. The pack may last 15 inin. to an hour, and may be repeated several times a day. It is used in cases where the temperature remains obstinately high.

## Cold Storage. See Refrigerator.

COLE. The local name of cole is applied to several members of the brassica or cabbage family, including kale, cottager's-kale, curly kale, horecole, kohl-rahi, and other greenstuffe. Sce Cabbage ; Curly Kale, etc

COLEUS. This gicenlouse plant is grown or the sake of its brightly coloured leaves in the greenhouse in summer. It is usually


Coleus. Briphtly coloured foliage of one of the varieties of the handsome rreenhouse plant
treated as a half-haidy annual and raised fresh each year from seeds sown in warmth in February. Coleus can also be increased by cuttings taken from the old plants in spring or summer. Coleus thyrsoideus, which bears hlue flowers in winter, is increased by cuttings inserted in a propagating case in early apring.

COLEWORT. This useful little autumn cabhage is raised from secds sown out of doors in May; the seedlings should be $t$ hinned to 10 in . apart, not transplanted. The rosette colewort and hardy green varietie are groun: the former is the favourite


Colewort. Specimen of the rosette colewort, an excellent little autumn cabbare

COLIC : Its Causes and Cure. The prominent symptoms of colic are scvere griping pains over the centre of the abdomen, with Hatulence, distension of the ahdomen, and either constipation or diarrioea. Fating overripe or unripe fruit, n chill, or neglect to keep the bowels regular, are the clief causes of the ailment. Acute indigestion from any source inay be accompanied by the pains.
Where indigestible food is known to have been taken, from one to two tablespoonfuls of castor oil should be given to clear out the intestine. To check the pain, 10 to 15 drops of tincture of opium may be mixed with the oil. Locally, a hot-water bottle applied to the
abdomen while the patient lies on his side in lied is helpful in getting rid of the Hatulence and relieves the pain. The diet should be entirely milky until the attack lias subsided, and afterwards for a time the total'ainount of food taken should he reduced, and all indigestible articles as woll as coarse vegetables should be forbidden. When flatulence is ar prominent symptom, this misture is useful, taking the $\frac{1}{6}$ part threc times a day

> Tincture of kinger
> Aromatic apirits of ammonia
> Spirit of chloroform
> cinuawon-water
> 1 dram
2 drams

When the cause of the colic is not clear, or if there is vomiting or the patient looks ill, opening medicine should not be given without medical advice. An enema will be safer.

With infants and children severe colic may bo brought on by such widely differing causes as improper feeding, want of cleanliness in the feeding bottles, sudden changes in the temperature, or exposure to chill. The patient should be kept thoroughly warm by being wrapped in blankets with a protected hot-water bag at the feet. A turpentine stupe, made by spinkling a cloth wrung out in very hot water with a few drops of turpentine and placed over the abdomen, usually cases the pain. Tenspoonfuls of hot water may be given.
Colic in an infant may be taken as a surc sign that something is wrong with its fecding mixtures. The milk may be too rich. and when diluted with whey or harley water all tendency to colic may pass off

COLITIS : Its Treatment. Inflammation of the colon, the large intestine, is termed colitis, and is of three chief types, namely. simple, mucous, and ulcerative.

The first of these comes on suddenly with severe pain in the abdomen, diarrhoen, perhaps vomiting, cramp in the calves, sometinies slight fever, and considerable mental and physical depression. Generally the attack is comparatively mild, but occasionally the diarrhoea is severc and exhausting. The treatment is to put the patient to bed hetween hot blankets and apply hot-water bottles or hot poultices to the abdomen. The patient should he kepit on a milk diet chiefly while the attack lasta. The milk is lest taken cold and should be sipped. Whey, milk, and isinglass, or white of egg beaten up, may also be given. To check the diarrhoca, give three minimi doses of strong spirit of camphor every 10 min . for an hour. In mucous or membranous colitis, large shreds or pieces of membrane may be passed by the bowel, and there may he much pain, with symptoms of indigestion and constipation with flatulence. The disease is a very chmonic onc, and associated with hysteria or neurasthenia, but there may be a tumour or other condition obstructing the bowel. It is therefore desirable that the patient should be overhanled by a physician at the start.
Ulcerative colitis is inflammation of the bowel combined with the presence of ulcers, some of these cascs being really dysentery. The symptoms are first collicky pains in thic abdomen, with attacks of severe diarrhoca often alternating with periods of constipation. Blood and some mucus are commonly passed. Vomiting is often very severe. Keep the patient in bed, apply cloths wrung out of hot water to the alidomen, and send immediately for the doctor. See Dysentery.

COLLAR : How to Stitch. Collars, unless of lace or net, are mostly cut in doulile material, and if made in heavy material for outdoor garments should be interlined with canyas.

In the case of a roll-over collar, the outer or under section is slightly smaller than the inner section, and in any collar the canvas interlining should be slighitly smaller than the material outer section.
To make a collar of this heavier type, tack the canvas to the wrong side of the outer
wection and catoh the material edges over to the canvas; then hem the collar over the neck of the coat, unless it is one of the long roll shape. In this case the neck edge of the collar is left unneatened, and the neck odge of the coat hemmed over it. Finally the linen is covered with the inner section of material. or with satin, velvet, etc.

Soft collars are more simply made. They may be atrengthened by an interlining, if necessary. To malje one, join the edges on the wrong side, leaving the neck edge, turn over, and, if the collar is detachable, sew a narrow binding along the side left ojren. See Crochet; Linen, etc

COLLARBONE or Clavicle. The collarbone mans from the shoulder to the top of the breastbone. It is frequently fractured,


Collarbone. Dingram showing a Iracture of the clavicle in children as well as adults, and this is unually due to a fall on the shoulder or the out. Atretched hand. It may also be dis. located at either extre. mity, inore commonly at the shouifler In fracture the whole shonlder ap. pears flat. tened, the arm is held close to the side, and the patient usually supports the ellow of the injured arm in the palni of his other hand. In order to relicve the tension the sufferer frequently hends his head towards the injured side.
linat aid consists in placing a considerable pad in the armpit on the injured side, and then supporting the limb with $n$ greater arm sling, except that bere the lower end, instead of being laid over the injured 3houlder, is passed through the armpit below the pad, and the two ende are knotted be. hind. The elbow is drawn well forward, and is held there by the point of the bandage, which is brought round it and pinned off. A narrow fold bandage is then tied round the hody and the affected arm just alove the elbow, with the object of levering the shonlder outward. Apart from aps. paratus, the patient may be kept Hat on his back on a hard mattress without a pillow, till seen by the doctor. Some deformity usually remains after mont frac. tures of the collarbone. See Bund. age; Finat Aid.

COLLAR BOX. Collar boxes, which may be obtained or made in a variety of shapes,


Collar. Diarram showing bow Collar. Diarram showing how and revers of a coat rectangular, square or circular, are made of leather, or some kind of wood. A suit. able size for a rectangular box is Ift 6 in. by $10 \frac{1}{2}$ in. by 41 in., but these nersure. ments may be

For a really nice article hardwood bhould be selected. Mahogany, if chosen, will look well all plain with a full polish, or may be inlaid with satinwood banding, hox, holly, and ebony lines, or a little coloured inlay in centre only. Walnut takes a waxed finish well, and may have inlaid ebony lines, or a little grey. wood with ebony lines may be introduced in tahlet form. Oak may be either fumigated or full-polished after staining to a nut-brown colour, if to be kept plain. Rosewood may carry mahogany, satin wood, and eloony inlay.

Making a stait with the hox frame, this will take two pieces 1 ft .4 in . by 3 in ., and two pieces $9 \frac{1}{\mathrm{f}} \mathrm{in}$. lyy $3_{4}^{3} \mathrm{in}$., the material used finishing If in thick. In best style they can $^{\text {in }}$ be secret-dovetailed together, or may be lap. dovetailed together. In a simpler way the sides inay be housed into front and back
(Fig 3), or, again, they may be mitre-halved together and stiffened by the neatest possible rounderl and glued slip in the angle. The botton may le $\{\mathrm{in}$. thickness, cut to a size to project $t$ in. all round, this portion being rounded and the bottom screwed up to under edge of sides with small brass screws. For the moulded effects shown at Fig. 2, a ${ }^{3}$ in. section can be mitred round a flush-finished botton. If the inoulded front of box is preferred, a $\frac{3}{B}$ in. section kept as flat as possible can be mitred round, glued, and panel-pinned on. The lower length of mould beading upon the bottom will be cut sufficiently wide to finish flush.
The lid, if to be jointed up, may be tongued together to finish 1 ft .6 in . by $10 \frac{1}{2}$ in by $\frac{3}{8}$ in thick. As shown at Fig. 1, it is in two parts, opening out left and right, the projection being a little more over sides than at front or back. The edges may br kept square, but will he intproved by thumb moulding, or to an ovolo or ogee section. The lids are hinged on with brass butts (Fig. 2). The face treatment of lid in Fig. 1 may be either an inlaid line or banding ; but if something better is preferred, Fig. 5 may serve as a suggestion, showing an inlaid line round, with broken key comers, and a central wreath inlaid equal!. each side of the meeting edges of lids. Such a wreath could have the stem in brown and leaves in green, with berries in red, and the knotted riblion in blue.

The inlaid front (Fig. 1) might also be made in colours to match the wreath. Ar, alternative treatment for the front is seen at Fig. 2. and on a birch or satinwood ground such detail could the painted in oil colour, mixed with gold size, which is quick drying in its action and useful to those who are clever with the brush. The interior fitting of Fig. 2, with three long and three square divisions, will be handy for gloves, ties, handkerchiefs, mufflers, etc., hut does not provide for collars, and is for a smaller-sized box, which might then be made 6 in . deep and fitted with a lift-out tray.
The arrangement indicated at Fig. 4 works out very usefully, and is comprehensive The lining can be of $\frac{1}{8} \mathrm{in}$. thickness, cleaned up and V-grooved together and polished. The circular portion can be of knifeout veneer steumed or soaked in hot water and carefully bent and glued round a cone of at least 6 in. diameter, suchas a straight. sided llower-pot, or even the do inestic cake tin. This part could also be made of stout bendable cardboard (t и o layers of $\frac{1}{10}$ in. thick will do), glued together and covered with thin silk, the remainder of the interior leing finished to match.

In a smaller box a single lid only may be desired, and, in an endeavour to make it look as well as possible, treat. ment may follow the method sug. gested at Fig. 6. This shows
quadrant comers to a cross-banded surround, and the panel quartered up in oak, walnut, mahogany, or satinwood. The central device, neatly lined in, also affords a chance for careful quartered filling. All four sides can be finished as at Fig. 7 The amall brass ball feet can be screwed into blocks glued under the bottom, and will add lightness to the general effect.

COLLECTING. The collecting of articles which are rare or noteworthy for their age or beauty, or both, is a hobby which is greatly increasing in popularity. Many make collections of china or furniture, while other articles collected include books, brass ware, coins, etchings, glass, miniatures, and silver Another class of collectors go to nature and make collections of beetles or birds' eggs or butterflies. Some of the collections, e.g china and birds' eggs, are often kept in special cabinets See Antiques; Birds' Eggs; Brass; Butterfly; Cabinet; Chair; Coins; Glass, etc.

COLLEGE CREAM. Make some cheese pastry, a few hours before it is required, using 2 oz each of Hour and butter, 1 oz. cheese, the yolk of an egg, and a little salt and cayenne Mix the cheese and flour, then lightly rub in the butter; season the mixture well, and add the beaten yolk of egg and enough water to inake a stiff paste. Roll it out $\frac{1}{2}$ in. thick and stamp it into rounds with a sherry glass. Bake these carefully for ahout 8 to 10 min in a moderate oven, and let them cool Whip onc gill of cream till it just hangs on the whisk, acld 2 table spoonfuls grated Parmesan cheese, and scason the mixture with salt and cayenne. Then heap it up on the cold cheese biscuits.

COLLEGE PUDDING. Mix $\frac{1}{2} \mathrm{lb}$. fresh white breadcrumbs with 3 oz sugar, 3 oz . chopped suet, 3 oz. sultanas, or currants and sultanas mixed, $\frac{1}{2}$ oz. chopped pecl, a good dust of powdercd spice, and a small saltspronful of salt. Beat an egg to a froth, add it to 1 gill of milk, and stir it well into all the other ingredients Turn the mixture into a thickly greased pudding basin, twist a piece of greased paper over the top, and steam the pudding for $3 \frac{1}{2}$ hours. Then turn it out and serve it with sweet melted butter sauce If liked, chopped raisins, dates or


Colles Fracture. Diagram showing the displacement of the broken portion of the radius immediately above the wrist
sometimes too, in establishments that are ton small to set off his fine proportions

The collie is 22 in to 24 in high at the shoulders, with a weight between 45 lb and 65 lb . The head is flat, wide between the small, semi-erect ears, tapering to the eyes and thence to the always black nose. The long, dense coat is harsh to the touch, but beneath it is a soft, furry undercoat. The conspicuous feature of the collie is the heavy mane, continued as a frill over the shoulders. The muscular legs are all well feathered, as is the long tuil, usually carried low. See Dog.

COLLINSIA. This is a pretty, easily grown hardy annual, 10 inches high Seeds arc sown out of doors in March-April, where the plants are to bloom in summer. Favourite sorta are bicolor, lilac rose and white, and candidissima, white

COLLODION. When it is wished to apread a protective film over an injured skin surface collodion is often used by doctors. When it is applied the contained ether rapidly evaporates, leaving a smooth, glistening, hard, transparent surface, which prevents germs and other substances from reaching the wound Collodion should not be used to cover a dirty or a dis charging wound New skin can be used in the same way as collodion. Collodium callosum is a preparation which may be used for dissolving warts or corns, and salicylic collodion can be used for the same purpose

COLLOMIA. This showy hardy annual, about 10 inches high, is grown from seeds sown out of doors in spring where the plants will bloom in summer Collomia coccinea is chiefly grown: it bears red llowers

COLLOPS: How to Cook. Take 1 ll . raw lean topside of beef, or good steak, and mince it finely by hand, as a mincing-machine cuts it too small. Remove any fat or skin, replacing some of the former after chopping it finely Melt about $1 \frac{1}{2} \mathrm{oz}$ good becf dripping or butter in a saucepan, and fry in it 3 teaspoonfuls of very finely. olopped onion. Stir in $\frac{1}{2}$ oz. Hour and then the beef
Stir it over a moderately sharp heat till the leeef changes from red to a brownish tint, then pour in $\underset{d}{d}$ pint stock Stir over a gentle heat until tho figa can be used instead of the fruit named. gravy thickens, then add $\Omega$ dust of seasoning COLLES FRACTURE. This is a fracture and simmer it all till the meat is tenderof the lower end of the radius just above the probably for about 30 min . If it hoils the wrist It is onc of the commonest fractures, especially among clderly women, and is usually caused by falling on the hand with the arm outstretched Unless properly treated it may cause permanent deformity of the wrist and some loss of movement in the joint.

First aid consists in taking two splints reaching from the elbow to the finger-tips and padding them. The forearm is bent to a right angle at the elbow with the thumb pointing upwards, and the splints are applied on the back and front of the forearm. A narrowfold triangular bandage or a handkerchief is used to fix the splints just in front of the elbow and another to fix them at the wrist In applying the latter the middle is placed over the outer splint just above the thumb, the ends are crossed over the inner splint, brought forward below the thumb, and tied over the outer splint. The forearm is then supported by a greater arm sling Probably some degree of shock will be present, and should be treated. See Bandage : Fracture.

COLLIE. Though the collie belongs chiefly to the farm, he is not infrequently compelled to put up with a more domestic existence;
meat will be leathery and tasteless. Add 2 oz.


Collie. Champion rougl collie, a splendid example of the breed


Collingia Lilac and white flowers of Collinsia bicolor, a hardy annual
breadcrumbs a few minutes before serving, to absorb the grease Serve the collops with a border of sippets of toast, or croûtons.

Mutton collops nay be made with about 1 ib cooked mutton Cut it into rounds, about $\frac{1}{8}$ in thick and 2 in in diameter. Chop, one small onion and inix with it $\frac{1}{2}$ teaspoonful powdered herbs, a pinch of powdered mace and salt and pepper. Spread this mixture on one side of each collop and let them stand for about an hour, in order to flavour them. After that time fry them quickly in a sancepan in about 2 oz . of clean dripping, turning them with the savoury mixture downward.
Then take them out of the saucepan and into it stir 2 teaspoonfuls of flour, browning this carefully Any fat not absorbed by the Hour should be poured off. Stir in $\frac{1}{2}$ pint of good stock and allow it to boil. Simmer the sauce for 10 min ., attending to the skimming and seasoning, and strain it round the collops after arranging them neatly on a hot dish. This is sufficient for three or four persons.

COLLYRIUM. An eye lotion which is termed a collyrium may consist of solutions of boracic acid, zine sulphate, permanganatc of potash, and other antiseptics. The solution should be warm and may be applied by a swab of cotton wool or an eye-bath; or a few dropis may be put into the eye. The following would serve if mixed with an equal quantity of warm water : Boracic acid, 20 giains, and dis. tilled water, 1 oz ; or boracic acid, 15 grains, zinc sulphate, 1 grain, distilled water 1 oz

COLOCYNTH. Colocynth is a fruit also known as bitter apple. It is a drastic cathartic, but in small doses it is fre'quently given in aperient pills. It may bo used as colocynth pill or the colocynth and hyoscyamus pil!, the dose of each heing 4 to 8 grains Hamilton's pill resembles the latter. in its medicinal action.

## Colour Schemes for the home

## How to Achieve Pleasing Effects in the Various Rooms

Other articles in this Encyclopedia dealing with this sublece Include Decoration; Drawing Room; Nurscry; etc. Secalso Carpet; Curtain; Cushion

The primary colours are red, yellow, and blue, whioh in combination give black, if they are exactly balanced The secondary colours ennsigt of a mixture of two primary colours, varying according to the proportion of each. A mixture of red and yellow gives orange Yellow and blue give green; blue and red purple.
There are innumerable tones in these colours, according to the proportion in which the two primary colours are mixed. The purples will vary from the red purple of the Orleans plum, through amethyst to the mauve of wistaria Similarly with orange and with green. Tertiary coloura are compounded of two secondary colours.
Complementary colours are those which complete one another, i.e. the pigments when mixed with one another make black. Thus red is the complement of green, yellow is the enmplement of purple. and blue the comple. ment of orange. The various shades of grey are, if the grey is pure, broken down from black by the addition of white. Mixtures of the various secondary colours give a range of greys.

Harmonious Effects. Where moms open out of the same hall it is well to remember that the hall should form a kind of bridge between them. A grey hall, with rooms opening out of it, in which a range of colours from pinks (pink is only insipid when badly selected), reddish purples and blues are well blended and contrasted, makea a charming interior for those who have old china and Persian rugs for purposes of decoration and relief. A hall with black and white tiled floor, black paint and grey walls, will allow of vivid touches of colour in curtains, etc., which notes of colour are re. peated in the rooms opening off it Another device is to choose the same colour for the carpets or flooring throughout-brown, for example, and to build up harmonious colour schemes on that.

Each room will then have $n$ dominant colour. The dominant colour is the one which drawsimmediate attention, and not necessarily that which covers the largest surface. In a lounge, for instance, the carpet of which was a bmwn pile, the upholatery brown and fawn velvet and walls primrose yellow, the dominant note was atruck by a book table in vermilion and gold lacquer, the same note of red being picked up in the appliqué design on the curtains, the frame of a large mirror, and one cushion. In a small room the dominant colour note may be provided by a painting or the tiles of the fireplace.

## Psycholorical Elfect of Colours

In selecting harmonious schemes it should alan be borne in mind that blues, purples, and greys are soothing, orange and red stimulating, light warm pinks and also yellows give an effert of sunshine in dark rooms. Green should only be employed in sunny nooms, as it absorbs instead of reflecting the light. These remarks apply to large surfaces treated with these colours, as practically any colour can be utilised merely as colour accents in right rela. tion to various achemes; a cool scheme requiring certain warmer notes to prevent it from being depressing, a warm scheme requiring to be toned down by a neutral shade to prevent it from being either garish or irritating. It may also be noted that no colour is successfully uset unless the right materials are selected for its expression. Thus certain shades are beautiful in glossy surfaced fabric, which are oppressive or dull in a mat surfaced one : while in every colour the range of shades make it possible for certain combinations-
say green and purple-to be either harmonious or crude and unplensant.

Colour Details. Blue is an instance of a colour the use of which is sometimes misunderstond. Wedgwood is a beautiful shade to combine with purples and also with pinks which have a tinge of mauve in their composition. In pale shades Wergwond blue can be used in a sunny room for the walls and also for the ceiling. It is charming with ivory paint or with grey woodwork picked out with lines of metallio silver paint. The tulip colourings (except red) are exquisite against this shade of blue as a background. Greenish blues are useful as sharply defined decorative notes. Turquoise blue tiles or kingfisher blue for cushions may be heautiful points of interest in a neutral scheme.

Grey is a dignified colour for walls, but is depressing if carried over the ceiling. For a bedroom, grey, black and coral pinks are a good choice. In a sunny room the walls could be grey, paint black, and the furnishing fabrics could introduce the pinks with discretion, avoiding too much warmth: or for a mom with a north aspect, walls and ceiling could be distempered a yellowish pink, which gives a beautiful sunny effect, and the grey introduced into the furnishing details with a patterncd cretonne in grey, deeper pink, yellow and black. For this scheme the woodwork could be painted grey with akirting board, window frame and architrave of the door in black or a deeper shade of grey.

Backgrounds lor Oak and Walnut
Yellowish pink is also excellent with browns, and may be most successfully used for a ceiling in a scheme in which brown panelling and oak parquet Hooring are employed. Rose pink is good with dainty furniture, especially with panel mouldings and woodwork in ivory paint. Pinks are auccessful in distempers, and the gradations of colourings are excellent in this medium.

Light apple green is right for walls in a room with walnut furniture in the style of Queen Anne, the woodwork and mouldings picked out in gold and the ceiling enriched with a dull gold paper. Pinky-mauve and plum colour are the notes to emphasise in colour accessories with such a green. Malachite green is a good choice for woodwork with apricot tinted walla, and mauve shades introduced into loose covers or curtains.

Red definitely needs most careful treatment. In a sunny room indiscreet use would be most irritating : even in a room with a cold aspect bright red is only right for a colour note. A claret ahade may be beautiful in rich materials for upholatery, especially for winter use in a room with stone coloured walls.

Orange and brown are a good combination with cream or golden yellows. Such a scheme will pmbably require cooling with the judicious use of green or blue. A yellowish orange is best with lighter browns, and a reddish orange with very dark browns. Mahogany has so much red in it that it is better with a yellowish orange-suggesting the colour seen in Sheraton inlaid furniture. Black is too violent a contrast to be used in a mass with orange, but is valuable as a colour accent, as for example in a cretonne or other patterned fabric into which yellowish-pink, soft blues and mauve may also be well introduced.

Uses of Colour. Defects in the shapes of rooms can be to some extent correcterd by the proper use of colour. The ceiling may be washed in a paler shade toning into the walls
if the room is a low one. Pale grey on walls and a cloudy blue for a ceiling also give height. A box-like room, too high for its breadth, can be made to appear lower by having the ceiling painted with a design in colours or by being trented with a colour darker in tone than the walls or carpet of the room. With ivory panelled walla, cobalt blue is a fine ceiling colour, used either plain, slatted with ivory lincrusta or wood, or painted with an effect of clouds or stars

Glowing sunshine can be simulated in a dark mom by a wall paper which graduates upwards from deep orange-yellow to palest primrose, with paintwork in umber scumbled over a gold undercoat and then varnished. Happy schemes-particularly for bedroomsmay be evolved by taking a flower as a pattern for each room. A bronze chrysanthemum, anemones in varying shades, or a delicately tinted iris would help to build up beautiful colourings for which it would be possible to select patterned chintzes, cretonnes, or linens in the respective floral designs. Sometimes when walls and carpets are treated in neutral shades, such as biscuit, grey or stone, more variations are possible in the colour schemes of the various rooms by having a winter set of curtains and covers in strong contrast to those in use in the summer.

Aids to Selection. Before deciding on colours for a decorative acheme a good iden is to lay out on a table a number of small samples of shades of paints, distempers, etc., and also of colours approximating the ideas for furnishing fabrics. Bearing in mind the exigencies of existing carpets and furniture, place the colours fancied next to each other, altering the various shades until the harmonious effect required is obtained. Then paste those decided upon for each room, grouped together on a piece of white paper and a workable guide is evolved. Such a method has been used for the schemes illustrated in our colour plate, which serve as examples of combinations of colour and may suggest many variations of treatment

The Dining Room. A pleasing effect is given to this room by the use of harmonious and varying shades of browns enriched by the beautiful wine colour of the damask curtains and brightened by a golden paper, the golden note repeated in the silk net of the glasy curtains. The ceiling and frieze could be washed a deep oream colour. This scheme would be equally good with mahogany, walnut, or oak furniture. Colour accents for flowers, cushions for the settee (upholstered in brown velvet) and china would be yellows, soft pinks and mauves. Lampshades could be amber silk lined with pink. The chairs are upholstered in brown leather to tone with the wood selected. The foundation of this scheme was a Persian patterned carpet combining the wine, golden and brown colours repeated in the furniture and decoration.
The Lounge Hall. Brown is the connecting link between the lounge hall and the dining room. Imitation brown leather paper is selected for the wall treatment with a studded beading in brown and gold. A wide frieze could lighten this treatment in a pale sharde of pinkish stone, which colour would be also used for the ceiling. The brown and gold striped velvet curtains give a rich effect. and blue is introduced into the artificial silk tapestry with black and gold, making a beautiful colour contrast to the burnt orange of the carpet with it a parquet surround. The blue would be accented again in pottery, while the carpet would blend with the colours of a brick fireplace.

The Sitting Room. In this bright sitting. room black, brown, and a suggestion of orange carry on the harmonious scheme from the lounge hall. Walls and ceiling are a clear yellow, not too intense to contrast happily

(3) brown leather for
(6) Gold wallpaper.

 $\begin{aligned} & \text { Sitting Room, (i) Yellow walls and ceiling. } \\ & \text { green curtains appliquéd and lined (4) Covers of printed linen. (3) Malachite }\end{aligned}$

To (5) Camel pile carpet. (6) parquet surround. $\begin{gathered}\text { Bedroom. (1) Blue carpet patterned rose. (2) Slub silk rep in shot blue, grey } \\ \text { and rose for upholstery. (3) Silk tafteta curtains. (4) Painted woodwork. }\end{gathered}$ Bedroom. (I) Blue carpet patterned rose. (2) Slub silk rep in shot blue, grey
and rose for upholstery. (3) Silk taffeta curtains. (4) Painted woodwork. Colour photographs from materials supplied by Waring \& Gillow, Ltd.

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with the malachite green of the moire cur. tains These are enhanced by hlack satin borders and appliqued on pelinet and curtains. The loose covers are in printed linen, introducing orange, mauve, green and black and pijed with black, while a camel coloured pile carpet on the liglit toned parquet surround binds the scheme pleasantly together: The malachite green note could be einphasised again in an enamelled book table, or in a settee upholstered in damaski of that colour and without a lonse cover, or in the woodwork of a floor atandard lamp.

The Bedroom. The scheme suggested for a bedroom utilises grey for the woodwork of walls and furniture. The carpet has a blue ground patterned with rose and touches of vellow, while the curtains are of soft rose taffeta. The upholatery and hedspread are in shot slub rep and artificial silk respectively, blending the tones of blue, grey and rose. The walls would be a paler shade of grey than the woodwork, and the ceiling washed with a faint rose pink. Any cretonne covers or accessorics, such as china or shades, would emphasise the rose pinks with touches of clear yellow and blue.

Colour achemes for the nursery will be found under that beading, where various methods of suitable treatment will be discussed hoth for day and night nurseries

COLOUR BLINDNESS. The commonest variety of colour blindness is that in which the person is unable to distinguish red and green. He confuses these colours with grey, yellow, and blue. This form of colour blindness is very important, as it disqualifies n man from service on the sea or on a railway, when duties involve the recognition of these culours. People who arc blind to vio!et confuse purple, red, and orange. The test may be performed by placing skeins of wool of varying shades of different colours before the person being examined, and asking him to match samples, usually light green, pink, and red.

Acquired colour blindness may be due to poisoning by alcoliol or tobacco, or both, or to atrophy of the optic nerve. A rough test of the tobacco form used to be to ask the patient to distinguish between a half-sovereign and a sixpence, which he had difficulty in doing from the colour. There is no cure for the congenital complaint, but sometling may be done for the acquired form. Treatment of the poisoning cases must include, of course, the giving up of the drugs a bsolutely.
Colour blindness may vary from a slight difficulty about one colour combination up to inability to see anything but shades of black and white, but this latter condition is rare. The abnormality is commonest among men, and is usually congenital.

## Colour Photography for the Amateur

## How to Obtain Naturalistic Results on Transparencies

## Other articles in this work for the amateur photographer include Camera; Dark Room; Developing;

Exposure, as well as the main article on Photography
Consiclerable progress has been made the plate, the focussing screen of the camera recently in processes for producing photographs (prints on paper) in natural colours, but these methods are still much too compli cated for the average amateur, since they involve the preparation of three separate prints (red, yellow and blue) and the combination of these three in exact register There ane, however, several processes which are almost as easy as ordinary photography: The results differ from those of the latter in being transparencies on glass which are vieved by holding them up to the light, or may be shown on a screen by means of an optical lantem.

In these processes a special kind of plate is used, viz. one having a coating of cxtremely small transparent dots, red, blue and green in colour, made so that the mixture does not show any colour at all. On this coating is a sensitive emulsion similar to that used for ordinary photography, and when the photograph is taken on this latter (through the coating of coloured dots), the result of special treatment is a picture in all the colours of the subject photographed.

Two makes of plate are sold for this process, vi7. Autochrome (French) and Agla (German). Exoept that the solutions for development, etc., are different the manipulation is the same in each case. These special plates are not rapid enough as a rule for use with the caniera held in the hand. The camera must be used on a tripod, and the lens must lse fitted with a vellow filter. adapted to the particular plate Unless this filter is employed the pictures will be almost entirely blue Also. the plate must be exposed in the camers with its glass side facing the lens and with the coated or enulsion side backed up with a piece of black card to protect it from damage. For this reason it is necessary to use the wooden book-form pattern of plate-holder, each taking two plates; the single metal plate holders supplied for many folding plate cameras are not suitable, because there is not room in them for the backing card. and also the sensitive surface is liable to be scratched One other alteration is needed. In order to allow for the reversed position of
must be removed from its frame and replaced with the plain or unground side facing the lens
The special colour plates differ from others in being sensitive to all colours, including red They must not he handled by the usual red dark-room light, but by one of deep green (screens are supplied by the respective makers), or by touch in complete darkness, as can easily he done with a little practice.

The subjects which are best suited for colour transparencies are those fairly near to the camera, e.g. portrnits and figure studies, garden and woodland scenes : open views, in which the colours are subdued by distance, are less satisfactory. In bright sunlight the exposure ranges from $\frac{1}{1}$ to 1 sec when using a lens stop marked 18 . By using a lens aperture of f4.5 the exposure may be as short as $1 / 8$ or $1 / 10$ of a second, or even $1 / 30$ sec. in specially good light as on sen heaches. The hest results as regards brilliancy and purity of colours are always obtained by using the larger apertures of lens such as 44.5 to $\mathrm{f6}$; with apertures of fll and smaller there is a tendency towards dullness of the colours.

Special Development. The development of a colour plate is nltogether different from that in ordinary black-and-white photography. The pioture is first developed as a negative, which is then dissolved away in a "reversing" bath. This leaves an invisible positive image, which is brought to full dopth by a second application of the developer. The wholc process takes less than 10 minutes, and it is best to finish off each plate hefore starting to develop the next. The special developing solutions are supplied by makers of the respective plates.

When developing the plate in the darkroom, it should be placed in the dish, and the developer poured over it, as far as possible from the dim green light. \fter about 10 sece. it may be brought near to the light for an instant to note the progress of development. O" the average, development will be complete in ahout three minutes. The solution is then poured off, and n gentle stream of water from the tap allowed to run over the plate for not longer than a minute. The water is drained off,
and the plate well covered with revarsing solution consisting o! about 4.5 gr . of potassium bichromate dissolved in $200 \%$ of water with addition of if drams of strong sulphuric acid After about 1 ininute the white light can be turned on, and the back of the plate examined every now and then for disappearance of the black negative image When this has taken place-in about. (wo minutes-the colours will be visible though somewhat frebly The plate is now rinsed in water as before for half a minute and in full daylight is placed in the same developer as first used. This brings up the colour picture in full vigour and brilliance, and it only remains to give a final rinse in water for about two minutes and to put the plate aside to dry.

The surface of a colour transparency, either Agfa or Autochrome, is exceedingly delicato when wet. The plate should on no account be touched with the fingers during manipulation : it should be kept in the dish throughout the process and the solutions and wash water poured off and on. Even when dry, the surlace is easily damaged, and it is well to vanvish it, but only with the varnish sold for the purpose. It is then hound up with a plain piece of glass by means of gumined atrips of paper For viewing, it is best kept in one of the folding frames, sold for the purpose. which give an enhanced effect due to the reflection of the picture in a mirror.

A variation of the colour plates described above has recently been re-introduced ns the Finlay. In this process a separate laking screen of minute red, green and hlue elements is used close against the sensitive plate when photographing the zuliject. The negative is developed in the ordinary way and from $t$ is printed a positive on glass, which is hound un with a similar colour screen al the colours of the subject being thus reproduced Tho advantages of this system are that shorter camera exposures can be given and that as many colour transparencies as desired may be madc from the original negntive.

COLTSFOOT. The variegated form of coltsfoot, Tussilago farfara, is useful as an edging in shady positions or ningled with clumps of ferns, and is not objectionable if kept well in hand: but other forms are treated as weeds. Tussilagn fragrans (Petasites fragrans), which is the winter holiot rope, grows 12 inches high and bears fragrant purplish

## Howera in winter.

COLUMBINE. This is the popular name of nquilegia, one of the loveliest of hardy garden flowers. The new long-spurred varieties in many charming colours are far superior to the old short-spurred ones. Columbines thrive in ordinary soil, in sunshine or partial shade : they are grown from seeds sown in a box of soil in a frame in March-April, the scedlings being


Columbine. Flowers of the long-spurred columbine.
beautiful bardy garden bower
Plioto. Sulton \& Sons
planted out of doors in summer, preferably where they are to remain. The final planting may, however, he donc in October. After two, or possibly three, years the plants generally lose vigour and a fresh lot should be raised from seed Several columhines are suitable for well drained loamy soil in the rock garden, e.g. alpina, blue, coerulea, blue and white, and glandulosa, hlue and white.

COLZA OIL. Colza, or rapeseed, oil is the commercial name for oil obtained from brassica seeds Its chief use is for illumination
Them are many qualities of colza oil. and colour is the best indication of value. the more highly refined oils being of a very pale golden shade. as distinct from the dark brown colour of the crude pro duct. The illumin ating power of colza is not so greant as that of paraflin or petroleum, but in practice it is found more economical, being slower in burning.

Care sliould he taken to keep the oil in a clean vessel. as even amall par ticles of foreign matter will cnuse the wick of the lamp to hecome clogged, and when this occury the wick should be removed and cleansed, and a small lump of common salt put into the reservoir of the hamp. This will attract and hold foreign particles and prevent them reaching the wick. Should water become mixed with the oil it is removed by placing strips of gelatine to absorb it. The gelatine is not solvent in oil, and may be taken out. dried, and used again for a similar purpose.

COMA. Deep unconsciousness from which the patient cannot be aroused nccurs in cases of severe head injuries, in apoplexy and heat stroke, in uraemia and diabetes, from poisons circulating in the blood, in narcotic poisoning. as from opium, alcohol, coal-gas. etc., after epileptic fits, and in many other conditions. Coma vigil is the name given to a condition which sometimes occurs in typhoid and typhus fevers. and in the typhoid state when the patient lies with his eyes half open and keeps on muttering to himself hut is unconscious.

First-aid for persons found comatuse is to send for the doctor, loosen tight clothing, place the patient's head in the position in which his breathing appears to be easiest, take careful charge of any hottle or other receptacle which may have contained poison, and keep the patient warm. In heat atmke he should be moved to a cool. shady spot and douched with cold water. See Delirium: Sunstroke

COMB : For the Hair. Dressing combs should not be too cheap, or the teeth will break readily : also roughness in finish irritates the scalp. The teeth should lee of two different sizes. coarse at one end and fine at the other, and the comb should be discarded as sonn as it becomes damaged. Many people who wash their brushes regularly are careless about their combs, which nced periodical attention just as much. Special comb cleansers, consisting of an arrangement of threads which enter between the teeth and clear out the dirt collected at the roots of them, can be bought.

Real tortoiseshell combs, though most pleasant to use on account of their superior finish and smootliness, arc expensive and need careful handling as they are easily broken


Tooth combs, which have very fine teeth set close together, are useful for cleansing the scalps of children. and must he kept serupuhously clean.

COMFORTER: For the Baby. The chicl danger of the comforter is that it is linhle to be asiled, and so infected with microbes, which produce indigestion and sometimes diarrhoen, intiammation of the mouth, and other diseases Also, the comiforter tends to spoil the shinpe of the mouth, and very ofton deforms the palate. with the result that the air passages of the nose are narrowed and the child becomes n mouth hreather A mother who gives a comforter to her baby (q.v.) may quiet the child for the time lreing, but the baby too often has to pay heavy pemalties.
COMMODE. This word is used for a small sideboard. In another कのnse it means a box used for holding a chamber utensil and ilso $a$ seating arrangement of that kind suitable for invalids. Of the sideboard known as the commode there exist very beautiful oxamples, some being associated with the name and work of Buhl. The finest were made towards the end of the 17 th century in mahogany and in pine, often with inarquetry of hrass, ehony. mother-of-pearl, ctc. In England commodes were made by the Adam brothers and their successors. Some of them are of satinwood, semicircular in shope, and are beautifully ornamented with medallions painted by ltalian artists. See Buhl: Sidebonrd.
all alternating into $\Omega$ continuous current. Commutators are found on any continuous current or direct current generator, or on any motor intended for use on a continuous curient. See l)ynamo: Motor.

COMPASSES. These are mathematical instruments used for drawing circles, or arcs of circles. Varintions of this instrument arc the chalk compasses used by teachers in achools and by scene painters and others, also the wing comprases employed in carpentry and for metal work The Lancashire wing compasses, shown in Fig. 1, are provided with a quadrant or wing, and a thumb-screw which is tightened up to hold the legs rigid.
The compasses used in mechanical drawing are made in numerous patterns, priced from a few pence upwards. The amateur drauglitsman will be wise to purchase a good quality instrument of moderate cost. Compasses with solid points should he rejected in favour of those with needle points. These have needles held in a clamp, and make only a very small hole in the diawing paper; if damaged the needles are easily replaced.

Essential features are rigidity, freedom of action at the joint, and all detachable parts secured with is clamping screw acting between t wo jaws and holding the removable part as in a vice. Other requirements are a knee joint above the pen or pencil point, Fig. 4, and some means of adjusting the needle, as in all grod drawing work the needle and the pen or pencil point must he vertical when drawing the lines. These characteristics are shown in the 6 in . compass illustrated in Fig. 2, with pen and pencil and divider points. Spring bow compasses, as shown in Fig. 3, are excellent for small work and to be preferred for cireles up to $1 \ddagger \mathrm{in}$ diameter.

Beam comprases are used for drawing large radius circles, such as occur in surveyor's work or in laying out a garden plan. A typical set, pictured in Fig. 5, consists of a jointerl metal heam 24 in. long in four sections, with pen and pencil pointa, two steel points, and $\pi$ shouldered necdle point. See Dividers: Dıawing.

## COMMUTATOR.

The device known as a commutator forms part of an electric generator or motor, and is designed to convert


Compasses. Fig. 1. Lancashire wing compasses in use. Fig. 2. Six-in. compasses with pencil point. Fig. 3. Spring bow compasses with pen point ; below, divider point. Fig. 4. How compasses should be beld, with needle-point and pencil both upright. Fig. 5. Beam compass, used for circle; of large radius

COMPASS SAW. For curved shapes the compass saw is invaluable. It is stronger than the keyhole saw, but can often be used when lock fitting or on any internal sawing where the curves are not too sharp.

When sawing a curved shape always take

Compass Saw, a tool used for cutting curved shapes, and on internal sawing
care to keep the saw blade at right angles $t$ (" the face of the work, unless a bevelled edge is the objective. Work with a steady snwing stroke, avoiding heavy pressure on the teeth. or the saw will wander away from the line.

COMPENSATION : In Law. This term is sometinies used by laymen as synonymous with damages. but in fact the two nie generally different. The word compensation is rightly applied to the money payable by an employer to a servant who has been injured by an accident arising out of and in the course of the employment It is also used in its proper sense to describe the amount that must be paid to anyone whose land or building is compulsorily acquired by a public authority, with powers conferred by Act of Parliament to take property. See Accidents; Employer's Liability.
COMPLEXION - Its Care. This depends primnrily on the state of the health. Some women naturally have a white, clear skin of a soft and delicate texture. Those who have not should pay attention first to digestion, for a sallow skin is often due to dyspepsin. An unnatural pallor inay be due to anacmin or a poor circulation.
Those whose complexions are muddy or of too high a colour should carefully consider their diet, avoiding rich and highly seasoned dishes. Over-feeding is one of the commonest causes of skin blemishes and greasiness. Women with greasy skins have need of a goud cleansing cream and a lotion which will stimulate the circulation, remove the grease from the surface of the sebaccous glands and leave the pores frec.
Women with sensitive akins often find their complexions affected by sudden changes of temperature. Such skins are usually of the dry type, and require very pure emollients. and only mild astringents. The use of ice or $\Omega$ strong astringent to close the pores after washing is dangerous for this type of complexion, as such drastic trentment of ten results in amall broken veins.
When washing the face, suft, warm water is necessary. If suap is used it must be of a pure superfatted variety and should be thoroughly sponged off befone drying. The final sponge should be with cold water. Soap should only be used once a day, at bedtime; nfter drying, the complexion will be improved by the use of a good massage cream, in order to maintain the skin in a healthy condition and keep its transparent look. See Beauty Culture: Face; Powder; Skin: Soap-

COMPO : For Building. This is a mortar composed of Portland cement and sand, or a mortar containing a proportion of Portland cement in addition to the usual mixture of lime and sand. A sound compo mortar for general house building purposes should contain : one part by mensure of grey lime (measured before being slaked) and one part by measure of Portland cement to seven phrts by measure of clean sharp sand.
Owing to the extreme difference in the time taken by lime and cement in setting, specia precautions have to be used in the mixing and using of compo. The lime and sand should be nixod and made up as mortar in
advanen in order tu onsure thiat no hot ie. innslikiad, particles of lime remain to expan:l in the linishod work

The propurtion of coment is only adrled just before tha compo mortar is required for use Thres pailfuly of lime mortar nre takenf from the heap and to them one pailful of cement is added nnd well worked into, the mass with a shovel if necessnry a little water is added. The compo mortar muat be naed immediately alter mixing
A wall laid in oompo mortar hardens and dries quickly and attains a grent proportion of its final strength very much somer than n wall built with lime mortar The shrinkage of the joints is not so grent as with lime mortar alune. See Brick: Cement; Mortar; Plaster.

COMPOST: For Plants. This is the term applied to mixtures of soils used in the gardon, or for potting purposes in frames or hot-houses Compost may consist of two, three, or more of various ingredients neceasary for the successful culture of the plants which are to derive their nourishment from it Loam (pieces of old turf) forms the basis of nearly all potting composts. Other ingrodients. such as leaf-mould, peat, and sand are added in proportions varying according to the needs of the plants.

COMPÓTE : In Cookery. This word is usually underatood to mean a carcfully prepared dish of fruits stewed with syrup. but in a few instancos it is applied to a rich variety of stew, such as a compote of pigeons or of plovers

The secret of making good compotes lies in stewing such fruits as gooseberries, cherries, and currants in a casserole in the oven lefore using them. Dried fruits can he used if, after washing, they are soaked overnight and then stewed in the water in which they were soaked.
An excellent compote syrup is made with $\frac{1}{2}$ pint water and $\frac{1}{2} \mathrm{lb}$. good white sugar Put these in a saucepan, let the sugar dissolve by the side of the fire, then boil it without a lid for about 10 inin., skimming it well, or until it forms a good thread when is little of it is taken hetween the thuinb and firat finger. To this syrup add any llavouring wished, such as lemon-juice or grated lemon-rind. If a glass of some liqueur-kirsch. inaraschino, etc., or vanilla or n!mond essence. Pour the syrup over the fruit, and allow it to cool

COMPRESS. Folded lint or other inaterial applied firmly as a pard to prevent hleedirg or inllamma tion is termed a compress, and may be applied either wet or dry. For open wounds boracic lint should be used or the lint should be wrung out of anti septic solutions.

For a black eye the compress may be cold. preferably iced. A spirit compress is made by lightly wringing the lint out of a lution consisting of methy lated spirit 3 parts, and water 2 parts, and may be applied to a bruise. It should be
 ore general cultivation. for the sake of its sweet tone, its casy mnnipulation, and its portability; but unfortunately iss reputation sulfers by reason of the chenp German variety, which is a much inferior instrument, both in tone and range. playing only in the key in which it is set, and possessing a very simple modulation. In this colleertina the lieys produce different sunds. according as the bellows are presesad in or drawn out. See Accordion.


Concertina. Tbree principal parts of tue iostrument: left to right, reeds: bellows : keyboard. TOD left, interior view of keyboard

## Concrete and its Preparation

How it is Applied to Structural and Ornamental Work
Other articles which describe building materials and processes include Brick: Bungalow ; Cement Cottage; House; Lime; Mortar; Wall

The material called concrete is a mixture tions, the aggregate may pass through a 2 in of lime or Portland cement, called the matrix, mesh sievo: for floors, the largeat pieces with small pieces of stone, broken brick, gravel or other hand suhstances, known as the aggregate. together with sufficient clean sand to fill in the interstices between the aggregate. the whole moistened and consalidated with water. It can readily be prepared by an annateur, and used for foundations, Hoors. walls and other parts of buildings.

When cast to shape in a wooden mould it makes almirable ornsmental figures, garien scats, steps, imitation crazy or stone pavings, and numerous other items. The difference between lime soncrete and cement concreto is that lime forms the malrix in the former case, and Portland cement in the latter. The emateur will generally find it beat to use Portland cement, and the following hints are hased on that assumption.
Good concrete must be homngenoous, dense, fire-rcsisting and strong, qualities attained ty using suitahle aggregates. For density, the cement must entirely surround every particle of aggregate and sand, and till the spaces between them to form a solid mass. This can be ensured by proper mixing, and by ramming and tamping the mixture when it has bcen placed in position. This ramming consolidates the concrete, and should on no account be omitted for foundation work or where greatest strength is nceded
Suitahle proportions of aggregate and cement for building uses are ne follows

## Cement

Clenn sharp sand
Foundations
River ballast or gravel
Flmors
roment
an
bruñeu brick


## Cement <br> sand

Brokeu brick furnace cllnker of braken atone
'Ihis is for walls when cast between ein:tifitiing or boards so erected as to form a cavity, which is then filled with concrete
partition Slams
Cement
Coke breeze
or
Sement
Brokeu cunker or grailte
This is for partition slabs mardo in moulds. All proportions are by bulk, or measured with a pail and not by weight.

Theso materials will be mixed as follows. Place a large boand or boards on the ground to form a solid platform. At one end of this place the aggregate. then add the sand, and put the cement on the top, making the heap conical in shape. Turn it over with a shovel to the other end, making another conical heap, and then back again. Then add water from a watercan with a rose head, and turn the material over again twice, in a moist condition. Remove it in a wheelbnrrow to the place where it is wanted, and gently tip the mass into the trench or mould, doing this carefully to avoid separating the large from the small pieces. Then ram and consolidate the conorete and work it 10 as level a surface as possible. This causes a considerable shrinkrge in the bulk, and suffi. cient extra material must be mixed in the dry state to compensate for this, at least 30 per cent. more dry material being needed to fill a given space with well consolidated wet concrete.
The size of the pieces composing the aggregate varies according to the work; for founda.
should pass is $\}$ in mesh For tine castings the aggregate should pass a $\frac{d}{} \mathrm{in}$. mesh. Coke breeze and fine clinker used for partition slabs should pass a in. mesh. Granolithic concrote for the surface of floors and liearths, etc. should be composed of 2 parts cement. with 5 parts of fine granite chippingg or tine lime. stone chippinga. The amaleur will find that colie breeze, gravel (generally culled "ballast "), or bioken brick are the beat aggregates to use. but on no account must garden mould or any other soft material he employed.

Conorete blacks for building walls and partitions are often made in machinos built for the purpose, and when any considernble number of blocks are needed it is an cconomy to purchase or hire such a machine: but an efficient substitute consists simply of four stout pieces of hoard of correct height. supported by pegs driven into the ground. These sides should rest upon a woorlen bnas (Fig. 1). The concrele is shovelled in. rainmed, and
levellod off with i trowel, and left to sot for a quarter of an hour. By uaing four such moulds the work of block-making may proceed unintermptedly. The woolen sides are removed and the block lifted by the hottom board and set on one side to dry off. Stack the blocks so that the air can circulate between them, and to avoid their adliering to one another place pieces of newspaper between them. This class of block should be allowed to dry off thomughly before it is used. and will he improved by storing for $\Omega$ month or so. The concrete should only be made sinfliciently wet to hold together: too much water is detrimental as it brings the cement to the surface. A better mould for making a breezo block is shown in Higa. 2 and 3
Concrete lintels, door pusts, window-sills, fencing pusts, and similar details are generally cast in a wooden box or mould, and should have a stout iron bar embedded in the centre. The sides of the box are screwed or bolted to the enda to facilitate their removal. The same principles nre applied to the constmetion of plinths and cornices, the strength of concrete heing greatly increased by embolding ion rods, expanded metal, or even stout chicken-run wire, an elementary type of ferroconcrete construction.
The construction of $n$ simple building, such as n garage or atorehouse, is well within the


Concrete. Fig. 1. Simple mould for breeze block. Fig. 2. Breeze in a mould. Fig. 3. Mould knocked Fig. 5. Casting a qualn block. Fig. 6. Partition wall of breeze blocks; gooln block used for bonding
capacity of an amatcur. The procedure will be governed by local conditions and personal requirements, but any one of the following methoda can he applied. The ground is marked out, excavaterl. and the trenches filled with

walls can then be enceted, with coke brecze or ballast ne the aggregate used for making the conerete hlocks, the work being
carried out as il using bricks. except that cross bonding is effected with galvanised iron wall-ties built in as the work proceeds.
Another method is to use hollow block cast in a mould made for the purpose, as in lig. \& The construction of these moulds is quite simple, and all dimensinns can be taken from the diagram, Fig. 7. W'ith this class of hlock wall-ties are not needed. Partition walls can he built in by using quoin blocks cast for that purpose, as shown at $A$ in Fig. 5, using the same mould box, $C$, with the core. $B$. The former or core is shown in Fig. 7, at the top left hand corner. These blocks can also be used in conjunction with the llat coke breeze blocks and the quoin blocks The mothod of bonding a wall made of coke lreeze blocks is shown in Fig. i, which also indicates the use of guoin blocks in making a return wall.
Still another method is to erect shuttering composed of stout wood boards with battens nailed to the back. These are held upright by simple struts. The gap left between the two sets of shuttering determines tho thickness of the wall, and is filled in by shovelling in the moist concrote and ramming it down hard and sulid. When the concretc has set the shuttering is removed and re-erected finther along for the wall. Frequent use of the plumb rule and the line will ensure the wall being straight.

The following are essentinls to all satisfac tory concrete building work. Use only the hest cemont; see that clean sand is used-it must be free from clay or earthy material ; if it is not it must bo washed by putting the sand in a trough and, while gently stirring tho materia!, letting water run through it. This will overtlow at one end and carry away the particlos of dirt. The sand used nust be coarse and gradod-that is, soine coarse and some fine. The aggregate minst be clean and graded, some to be larger and some smaller. generally ranging from $\frac{8}{3}$ in downwards for amall work, walla, and floors. Concrete must not be applied to existing dry work, as in the form of dry foundations. The latter must always be saturated with water before the concrete is laid.

## Concussion. See Brain.

CONDENSED MILK. Sold in tins, either sweetened or unsweetened, condensed milk will keep for any length of time, and can be used, diluted with water, for all purposes for which milk is required. It is made by fresh milk being boiled and evaporated until almost all the water has been drawn out. Sugar is added as a preservative, and, in the best makes, no chemical preservatives are used. When required for use as fresh milk it should be diluted with water in the proportion of 4 or 5 parts of water to one part of condensed milk.

Condensed milk that is frce from chemicals to powiler. See Allspice: Curry: Ginger is considered to he a valuable food for infants and a good substitute for mother's milk, being used in proportions that vary with the constitution nnd age of the child. As little as $\ddagger$ teaspoonful to 1 tableapoonful of water is recommended for a newly-born infant. The proportion is inoreased as the child grows older For infants' food the water must le ; Peplarder : Salt, ctc
CONDUIT : For Electricity. An electrical conduit is an outer casing or covering in which the insulated conductor or wiro is inserted in order to protect it from injury. and alao to ald to the electrical efficiency.
Stcel conduit is made from welded steel pipe of various sizes, enamelled inside and out.

Connexions are made by screwing the pipe on to sockets or other littings in much the same way as gas pipity. In other systems the pipes push into aockets formed in the littings, and arc sometimes secured by means of a clip. Standard fittings for use with this material include bends and angles for turning corners, junction boxes for conncxions and liranches, inspect ion hoxes with removable lids for access to interior. The system is the only one that can safely he embedded in plaster or out of way locations.
When installing such $\Omega$ conduit system the whole of the pipes, complete with junction boxes, bends, and so forth, are fixcd up in place, and then the electric conductors or wires are drawn into the tubes, using a thin steel wirc pushed through the tubes froin a junction hox or inspection hos, and attached to the wires to be pulled in. All wires that have to go through a particular acction of conduit must be pulled through logether. The conduit must le clectrically continuous, and properly earthed to a !arge copier platc huried in the ground, or by a wire connecting the conduit to the water-supply pipes, hut never to gas pipes. See Electricity

CONEFLOWER. This is the populur name of rudbeckia, a vigorous linrdy perennial which bears yellow flowers in late summer and autumn. It thrives in ordinary soil, inay be planted in autumin or spring, and is easily increased ly division of the clumps in March. The best are : californicn, 6 ft., Golden Glow, double, $6-7$ ft., and speciosa (Newmanni), $\boldsymbol{\geq}$ ft. Rudbeckia (echinacea) purpurea, grows 3 ft . high and heurs reddish flowers

CONFECTIONERY. This word is used for sweetmeats, and for cakes, rolls, tarts, and fancy pastry generally. See Cake; Chocolate : Pastry ; Sweets, etc.
CONFETTI. Thesc are tiny circles of coloured paper. They are used at fancy dress balls and camivals, and at weddings, being thrown in handfuls at the bride and bridegroom as they emerge from church or set out for the honeymoon. For this purpose it is more suitable than rice.

Confetti can be purchased so cheaply that not many people will trouble to inake it for thenselves, though it can be done simply enough by folding sheets of thin coloured paper across several times, and cutting half. circles out of the folded edges.

CONFIRMATION. In tho Church of England and the Roman Catholic Church confirmation is the ceremony by which a person becomes a full member of the church, and is allowed to partake of communion. The person then for himself or herself confirms the promises made by the godparents when he or she was baptized. The Church of Rome regards confirmation as a sacrament, but the Church of England does not It can only he administered by a bishop, and candidates are usually lect ween 14 and 18 yenrs of age.

Those wishing to bo conlirmed should apply to a clergyman or priest. Confirmations usually take place early in the year, in order that the conlirmed can partake of the sacrament for the first time on Easter Day. In most parishes classes for young men and classes for young women are arranged, and therein instruction is given hy the clergy in the principles of the church. Special arrangements are made for older penple, the main point being that the person prescinted to the bishop must have
satisfied a clergyman that he or she is fit to receive the rite. The publio schools usually make their own arrangements for confirmation, boys being confirmed in the sohool chapel.

Confirmation services are held at stated times. A centre is ohosen by the bishop, and at that church the candidates from the neighbouring parishes are required to present themselves. It is usual for girls to be dressed in white. At the service the bishop places his hand upon the head of each candidate as he or she kneels before him, and says over each a short prayer.
The Confirmation Cap. To make a confirma tion cap, t of a yard of material 27 or more inches wide is required, and the edges should be hemstitched. Three narrow tucks are placed at one end, and two short ends of ribbon lastened to the ends of the tucks on the wrong side of the cap. These tie in the nape of the neck, holding the cap tightly over the brows.

CONGER EEL : How to Cook. This fish is at its best for eating in September and November. The flesh, being coarse, requires thorough cooking, but is highly nutritious When small, it may be cooked in the same way as a fresh-water eel, but if large it is best cooked like cod. Conger eel can be boiled in a fish kettle in enough hot water to cover it. and a teaspoonful of vinegar. After being brought to the boil it is allowed to simmer until the flesh falls away from the bone. It is served with parsley sauce To fry conger eel, it should be dried, cut in slices, and sprinkled with flour. It is then dipped in beaten egg rolled in breadcrumbs, and fried in hot fat. It oan be served with any fish sauce.
Another way of preparing conger eel is to let it stand for over an hour in a dish contain. ing 3 tablespoonfuls of vinepar, $\frac{1}{2}$ tablespoonful of chopped onion and a sprinkling of pepper and salt. Then stuff it with veal forcemeat, bind it up with a piece of tape, and bake it for about 1 hour on a wellgreased tin, basting it frequently. When it is ready, remove the tape, and serve the fish on a hot dish, with anchovy or other sauce strained round. See Eel.
CONGESTION : How to Avoid. This means an abnormal filling of the bloodvessels with blood. Active congestion occurs when such filling is a result of the dilatation of the arteries. This form of congestion is the first stage of inflammation, but it can be deliberately produced in the superficial parts in order to draw off the excess of blood from a congested, deeper organ.

Acute congestion of the lungs may arise from breathing irritating vapours, e.g. poison gas, or from bathing when overheated or drinking large quantitiea of cold liquid. (See Lung.)

Passive congestion occurs when the blood lingers overlong in the vessels. The blood in this case is dark or venous in character. In efficient pumping by a diseased or exhausted heart is a commion cause. It inay also be due to obstruction of veins, e.g. in pregnancy or from wearing tight garters or to the veins becoming varicose. Dropsy occurs and the legs swell. Relief is afforded by reclining at intervals with the legs somewhat elevated; in pregnancy a properly fitted abelominal belt, and in varicose veins elastic bandages, will reduce the tendency to passive congestion when one has to be up and about.

CONJUGAL RIGETS. By English law when one spouse has left the ot her and refuses to return to matrimonial life without lawful excuse, the other may bring a suit in the divorce court for restitution of conjugal rights. The one who sues must be ready and willing to resume cohabitation, and thus it is usual for him or her (generally it is the wife) to write a letter inviting the other to return.

There are very few excuses that are lawful excuses for not returning; but a wifo may
refuse to return to a husband who has treated her cruelly; and a husband may refuse to return to wife who has made unfounded charges of horrible oonduct against him. A good excuse would be that the other spouse was suffering from a certain disease, or that it was otherwise dangerous to cohabit with him (or her). Matrimonial infidelity is a good excuse If the respondent disobeys the order. he (or she) cannot after the time allowed is up come along and say "I anm now willing to come back." Disobedience to the order is equivalent to legal desertion, and the petitioner is entitled to alimony. See Desertion: Husband; Separation.
CONJUNCTIVITIS. This complaint is an inflammation of the delicate membrane which covers the white of the eye and lines the eyelids. It may result from a blow, a speck of dust, or the action of microbes. As most cases of conjunctivitis are very catching, the greatest care should be taken that the patient's sponges, towels or bed-linen are not used by anyone else.

In the acute catarrhal form of conjunctivitis the whole eye is bloodshot. There may be swelling with burning, itching, and a sensation of sand or grit in the eye. There is a sticky discharge, and the patient generally complains that his eyelids are stuck together in the morning. Pain and inability to look at a bright light may become markel and the discharge may become mattery. The eye should be bathed every half-hour with
a 10 grain to the ounce solution of warm boracic lotion.

There is also the chronic catarrhal form Here the white of the eye is constantly more or less bloodshot, and there may be inflammation of the edges of the lids and a slight amount of discharge collecting in crusts in the inner corner of the eye It ought to be determined at once whether or not the patient requires glasses. If he does, and his vision is corrected. a long step may be taken towards curing the condition. A lotion that often gives excellent results consists of boracic acid 5 gr ., zinc sulphate 1 gr ., distilled water 1 oz .

Infection with the micro-organism of gonorrhoea results in a form of conjunctivitis known in infants as ophthalmia neonatorum, and said to be responsible for 30 per cent. of the cases of blindness in Great Britain. A contagious form is trachoma or granular lids. chiefly affecting the lining of the upper eyelid. Membranous conjunctivitis is frequently a symptom of diphtheria. Medical advice should be obtained at once.

Spring catarrh is a condition which affects chiefly boys and young men, giving them a pale, sleepy look. Reddish grey elevations form on either side of the cornea or clear part of the eye, and granulations on the under surfaces of the lids which have a pavement appearance. Signs of irritation, itching, intolerance of light and glueing of the lids in the morning are the result. Recourse may be had to radium therapy. See Eyc.

## CONJURING: SOME SIMPLE TRICKS

## Useful Information for the Amateur Entertainer

## See also Card Tricks; Children's Party ; and the many entries on Indonr and outdoor games that form the recreation section of this work

The conjurer should never tell an audience what is going to be done. For example, if a coin is to disappear magically, call attention to it by holding it up, and after the disappearance has been accomplished, it can be safely stated that a touch of the magic wand on the hand which apparently holds the coin will cause it to disappear.

A great many of the most puzzling effects are produced by simple means. If a trick has been well received, resist all requests to repeat it before the same audience, unless the performer has the knowledge whioh will enable him to bring about the same result by a different method. Never perform any trick in public until it has been thoroughly rehearsed. In practising sleights do so before a mirror, and endeavour to deceive yourself.

One of the most difficult branches of conjuring to acquire is the patter, or description of the problem to be presented. If a humorous style suits the personality of the performer, adopt it, but be careful that the jokes are really witty and appropriate. A story is sometimes useful to illustrate the trick. Others inay find a mysterious atylo more suitable Whatever is chosen, it nust be rehearsed


The Pasi. 1. Little finger of left hand is inserted betwoen halves of paok remaning angers resting on top,
then presiod into fort of boft tham, top half being tifted by loft yitto finger
continually until the performer is capable of exhibiting the trick without hesitating in his patter. It is not easy to do one thing while talking about something else.

The Magic Wand. The conjurer should provide himself with a magic wand. This is essential, as it is quite possible to have a small ball, a coin, or other article concealed in the hand if a magic wand is also held in the same hand. A small table is also a very uscful accessory, especially if a servante is included. This latter is a shelf hidden behind the table which will receive any small article dropped on it.

Palming a Coin. In order to palm a coin, take a half-cown, or, if the hand is small, a two shilling piece, and place it on the tips of the second and thind fingers of the right hand. Hold the left hand open, palm upwards, and pretend to place the coin into the left hand. As the right hand approaches the left. bend the fingers, pressing the coin into the palm of the right hand, slightly coutract the hand, and if the coin has been placed in the correct position the fleshy portion of the paln will hold it firmly. A few experiments will readily show the best position suited to the individual performer.
As the right hand reaches the left. closo the latter as if it contained the coil. During these moves the ejes of the performer must follow the supposed position of the coin, and on no * account must a glance be directed towarda the right hand. If the wand is used. it can now be picked up in the right hand,
which will help to conceal the fact that the coin is therc.

As the disappearance of the coin is now an accomplished fact, state openly that by the aid of the magic wand it is possible to make the coin disappear Suiting the action to the worl, touch the back of the left hand with the wand, or wave the wand round the hand. and demonstrate that the coin has magically flown by slowly opening the hand When palming a coin, endenvour to hold the hand naturally, so that it looks to the audience as if it concenled nothing. Practise this sleight in finnt of a mirror, and before attempting to palm the coin actually place it in the left hand and study corefully the movements, especinlly the position of the empty right hand, then endeavour to imitiate these novements when palming the coin.

Tricks with Cards. Curd tricks may be described as a special branch of onnjuring The essential sleights which must be learnt are the force, the top and bottom change, and the pass, and until these are mastered no really effective card tricks ane possible.

The sleight called the force only becomes successful by experience and practice. It is used when it is desired that a certain card shall be selected. Hive the card at the bottom of the pack. Insert the little finger half way down the pack so that the pass may be made. As the performer approaches the onc on whom he wishes to force the card, the pass is made which brings the lower half of the pack to the top, with the selected card at the bottom of this position. Fan out the cards as they are offered and keep them moving towards the right, and just as the person puts out his hand to talie a card, the fingers of the performer's right hand push forward the desired card


Conjuring. Forcing a card. The card to be forced A. is pusbed slightly out of the fanned-out pack

There are two chicf changes, one where a card held in the right hand tatica the place of the top card of the pack, which is held in the left hand. This is known as the top change. The second, designated the hottom change, is effected by changing a card held in the right hand for one on the top of the pack, but instead of the card taking its place on the top of the pack it is put at the bottom. To make the firat change, hold the pack in the left hand with the thumb across the pack and the fingers underneath.
The card which is to be changed held between the thumb and first finger of the right hand While attontion is drawn to this card the thumb of the left hand pushes the ton card forward to the right nbout $\frac{1}{2}$ in. Making a smart half-turn to the left, the right hand meets the left, which is adranced, and the top carl is recured with the first and second fingers of the right hand, and at the eame time the thunb of the right hand pushes the card that is to be changed on to the top of the pack.
In the recond method, the card in the right hand is held by the first and second finger's only. As the liands rench each other, the
fingers of the left hand are opened to receivc the card and at the same time the top anrd is pushed forward nind secured by the first finger and thumb of the right.

The piass is one of the most important moves in card conjuring, and consists of a sleight which trans. poses the top and bottom halves of a pack Making the pasa can be accomplished with one hand only. but for all practical purposes the double. handed pass is prefer. able

The pack is hold in the left hand in the position usual for deal. ing, the thomb being on top and the four fingers at the opposite side. Lift half the pack, and iusert the little finger of the left hand at the break so made. The other three ing the ball on the back of the right hand, the
fingers should now rest on the top, of the palm being towards the audience. pack so that if the little finger is straightened out the upper half of the pack will be lifted to a vertical position

The right hand now grasps the lower half of the pack by the edges of the carrls, the thumb heing at the lower end of the pack and the first three fingers at the top end. Pressing the lower half pack into the fork of the left thumb, it is pivoted upwards, and at the aame time the little finger of the left hand raises the top half. As soon as the lower half can pass the top half, the pack is closed up and the pass is completed. When making the pass it is best to make a backward move of the hand, which will cover to a certain extent the various moves.

Handkerchief Tricks. Therc arc many pretty illusions with silli handkerchiefs which are always popular. A simple production and disappearance of a liandlkerchief can be brought about as follows. A small hollow rubber ball about $1 \frac{1}{2} \mathrm{in}$. in dianeter is necessary, which is piopared in the following manner : A hole about $\frac{1}{2} \mathrm{in}$. in dinmeter is cut in the ball and the piece removed. Opposite the hole two small holes are bored, through which a piece of thin catgut or Hesh-colour silk is tied. The loop formed should be long enough to allow the ball to rest on the back of the hand when suspended from the thumb. To produce a handlicrchief with this simple apparatus, it is only necessary to push a thin silk handkerchief into the rubber ball, suspend.

Showing the left hand also empty, make a half-turn to the right and bring both hands together, and under cover of the fingers of the left hand get the ball between the palms. A turn to the left is now taken, and with an up-and-down motion of the hands the handkerchief is slowly produced at the tips of the fingers. The handkerchicf is now held in the left hand and the ball, which up to the present has been suspended from the thumb, is disposed of on the servante. To malie the handkerchicf disappear the several actions mentioned above are reversed

CONSEQUENCES: An Indoor Game. This can be played indnors by any number of people. Each is given a slip of paper and is pencil, and is asked to write down an adjective applicable to a man This done, cach slip of paper is folded over, conccaling the writing, and is handed to the player on the left. Next comes a man's name, and the slips are once more passed on These are followed by another adjective, this time applicable to a woman, and a woman's name : the name of some place or public building : a remark made by the man: and a remark made by the woman: what the consequence was, and what the world said

As most plavers will follow out their own train of thouglit in writing these answers, and ns each answer will conic on a different slip of prper, the results when read out at the end are often both amusing and surprising

## The CONSERVATORY AND ITS CONTENTS

## The Gardener's Duties Simply Ezplained

Throughout this work articles on the flowers cultivated in the conservatory will he found, e.g. Begonia: Geranium : Orchid Sec also Greenhouse and th: constructional articles, e.g. Brick
For the house of small propmertions there is decorntion are grown in tlower pots, but if no more delightful adjunet than is well-planned there is room for a border of anil certain conservatory, opening, perhaps, from the drawing room by glass doors. Position is a matter of importance, and a conser vatory with a southern or south-western aspect is more favourably placed than onc huilt to the north or east side of the house: but whatever the position, many advantages will be ohtained by artificial heating during winter.
A conservatory may be deseribed as a glasshouse in which plants in Hower, previously grown in a groenhouse, are arranged for effect. Must of the plants used in conservatory
kinds, e.g camellia, acacin, abutilon, fuchsia and heliotrope may be planted there

By cultivating a suitable selcetion of plants, in pots and planted out in the borders, it is possible to keep, the conservatory attiactive the whole year tound, providing it is heated sufficiently to maintain a minimum winter teinporature of 50-5: degrees

Usually there is a bed of soil in the centre. where the vigorous plants and shrubs are grown, and staging for pot plauts at cach sule It is an advantage to have the piths paved or
tiled, for they can be kept clean with the minimum of labour. Certain plants may be grown even beneath the staging: the most popular for this purpose are the green-leaved and variegated-leaved tradescantia, a creeping plant. and Begonia rex.


Certain plants grown in baskets suspended from the roof are most decorative, and add to the attractiveness of the display. Some of the chief sorts are:
Drooping varleties of tuberous begonla, asparagus sprengerl, begonla gloire de Lorralne, campanula sophylla, blue and its white variety alha. the rat (lachenalla), fuchsia, lobella tenuoir, oxalis tlor bunda, ivy loaved pelargonlum, tradescantia, tho variegated stonecrop) (sedum sarmentosum varie gatium) and sonic of the ferns-nephrolepis, davallia and asplenium bulbiferum.

The Management. With regard to the management of a conservatory, the following suggestions will be found useful. When the temperature by day, as a general rule, exceeds 65 deg., ventilation must be given. During cold or frosty periods of weather the temperature should be kept at about 55 deg., this being done by the aid of artificial heat. During the winter months the ventilators should be closed about $2 p . \mathrm{m}$. during the summer they should remain open till about. 5 p.m.

Shading from hot sunshine is most essential, and this may be accomplished liy one of the

An attractive edging to the staging for pot plants adds considerably to the charm of the conservatory. Two favourite plants for this purpose are isolepis gracilis, which is of droop. ing grasslike growth, and panicum variegatum, with narrow green-and-white leaves. These may either be grown in pots or plańted in a narrow border of soil contained in a zinc trough alongside the edge of the staging. Herniaria glabra, a creeping plant, with tiny green leaves, also makes a neat edging.

Climbing plants improve the appearance of a conservatory, and a careful selection will provide flowers throughout many months of the year. It is a mistake to train vigorous sorts on a trellis fixed beneath the glass roof, for they cast too much shade on the plants on the staging beneath The less vigorous kinds are to be preferred for this purpose, for instance, roses in variety, abutilon, fuchsia, and the blue plumbago capensis, all of which lose their leaves in autumn. The conservatory pillars ought to be covered with climbing plants; a choice may be made from hibbertia dentata, yellow, cestrum elegans, rose, asparagus plumosus, smilax, heliotrope, ivyleaved geranium, the yellow acacia baileyana, the yellow jasminum primulinum, the scarlet honeysuckle (lonicera sempervirens), the blue and white passion flowers, and the gorgeous orange and red streptosolen Jamesoni.
Vigorous climbing plants suitable only for training beneath the roof-glass of a large conservatory are the white clematis, indivisa, cobaea scandens, solanum jasminoides (which has white flowers), the rosy mauve bougainvillea glabra, and the yellow cassia corymbosa.
The lapageria, with rose or white blooms, is a charming climbing plant for the shady side of a greenhouse, and the night-flowering cactus (cereus triangularis) is worth growing, but it must have a sunny place.

Plants grown for the sake of their orna. mental leaves are invaluable in the conserva. tory. Chief among them arc :

Coleus, dracaena. green-leaved and variegated Indla rubber plant (ficus elastica), grevillea robusta, palins (cocos weddellana, geonoma gracllis, kentlia palims (cocos weddeliana, geenoma graclis, kentia
belmmreana), araucarla excelsa, ferna, asparagus Bprengerl and plumosus, sinilaz, aspidlistra, cyperus sprengerl and plumosus, sinilaz aspidistra, cyperus
alternuollus, eucalyptus and ophiopogoii varlegntum, with green and yellow leaves.


Conservatory with semi-octagonal ond oxporing a large aurface to the sun. Top, left, conservatory poreh outride a Freach window Courtesy of Boulion \& Paul. Lid.
summer-cloud preparations sold by seedsmen, or preferably by movable roller blinds. Watering is another important item, and each morning sufficient should be given to inoisten the soil, using water of the same temperature as the air inside the house. In addition, it may be noted that clcanliness and method are as essential in the conservatory as in the greenhouse.
During hot summer days it may be found necessary to give water both morning and evening, but in the event of a plant drooping by reason of dry roots, do not water in the usual way, but stand the pot in a vessel for 10 min . to ensurc equal moisture of the whole of the soil. During winter sponge foliage plants with milk and water. Keep all dead blomns and foliage removed, and fumigate occasionally to destroy pests. If stimulants are necessary, use one of the excellent chemical manures on the market, strictly according to the maker's instructions.

When properly conducted, a conservatory should be a source of interest and charm all the ycar round, and its possibilities, in conjunction with garden and greenhouse will be apparent froun the following hints, which describe the


Fig. 8


Fig. 1


Coneervatory. Piga. 1-5. Diagrams showing
seotions of mouldod and propared timbers naed in bailding a conserratory is buimas a comservatory

plants which are most suitable for the con. servatory in the various months of the year.

For January, early tulips, Dutch and Roman hyacinths, daffodils, freesias, winter flowering begonias, cyclamens and azaleas are suitable, as also are cinerarias and Chinese primulas. The same flowers are suitable for February. For March a succession of most of those mentioned for January will be found best, together with spiraeas, primulas, heaths, clivias and carnations. The same remarks apply to the succeeding month, April.

In May the showy herbaceous calceolarias are in full beauty together with amaryllis, Dutch and Spanish irises and annuals raised from seeds sown in September. Throughout the summer months there will be bloom from tuberous begonia, gloxinia, achimenes, geranium, heliotrope, fuchsia and many others. In autumn reliance must be placed chiefly on chrysanthemum, Scarborough lily, nerine, lilium auratum and other lilies. These will be followed by early bulbs, Chinese primulas and cyclamen, uinter cherry, winter begonias and carnations.

Bullding a Conservatory. W'hatever the dimensions of a conservatory, it should be free from any suggestion of heavincss. It generally has means for heating, for regulating temperature, and controlling the annount of light. A water supply is desirable, and for the benefit of the plants a conservatory should be built facing the south.

The usual construction comprises a brick or tiled floor, set in cement mortar, with a fall to one corner where a trapped gully communicating with an adjacent drain enables any surface water to be disposed of. The surrounding walls are made of brickwork to a height of about 18 in . The walls and roof are composed chiefly of glass, carried in wood or metal framing. The latter is more durable, but requires frequent painting owing to the dampness of the atmosphere in the conservatory. The roof should be constructed with throated or channelled bars to act as gutters. This to a large extent overcomes the objectionable effect of a dripping roof. Fig. 5 shows a standard form of machine-moulded wood bar made for conservatory and greenhouse purposes.
Elaborate conservatories are frequently made with large panes of glass, cut to ornamental slapes and framed accorclingly. The amateur would do well to obtain horticultural glass, which is sold by the 100 sq. ft., in widths and lengths such as 10 in . by 8 in ., 100 sq. ft. being quite sufficient glass nominally to cover an area equal to 10 ft . long by 10 ft . high.
The framing is readily constructed by using greenhouse bars for the windows A section is shown in Fig. 4, and this wood can be obtained in various widths and thicknesses. Windows to open will be framed up and provided with a strong framework to which
they may be hung, generally from the top. A top and bottom framing should then be constructed, supported by upright corner posts ahout 3 in. square. The most convenient method is to make up the sides and ends in sections and bolt them together, then erect a ridge hoard and fix the glazing hars to it. A proper wooden ridging is made for this purpose, and a section of it is given in Fig. 1; other figures illustrate the regulation sills and end plates, all of which are obtainable from any timber yard.
A water supply is generally ohtainable either by means of a rublier hose pipe that can be connected when required to the nearest water taj, or preferably by rumning a $\frac{3}{3} \mathrm{in}$. iron pipe to the water main or of her adjacent water-supply pipe. In some districts the water company may charge an extra rate if this is done.
Means for heating may le a simple oil lamp and some hot-air pipes. I similar arrangement with hot-water pipes, or a regular hotwater circulating system, can be installed with a separate greenhouse type of hoiler. A gas heater circulator with electric or thermostatic controls is a boon in changeable weather. It can be left burning all night, and any sudden drop in temperature will cause the controls to operate and so turn up the gas supply, and lieep it up until the desired temperature has been attained
Console. A console is a projection resembling a bracket (q.v.) used to support a cornice, or to hold busts, vases or figures.

CONSOLE TABLE. A console table is a table supported by brackets, or upon legs not unlike hrackets in form, and made to stand against a wall. Some of these tables. Which were chiefly made in France in the 17th and 18 th centuries, have the supports elaborately carved, and are beautifilly adorned with representations of fruits, flowers, scrolls, etc. Some were gilded and covered with a marble slab. The chief woods used for them were rosewood and mahogany.
Consommé. This clear soupl is made from meat, vegetable, or bone stock. See Soup.

CONSTANTIA. This district of Cape Colony is noted for the excellent quality of its red wine, the best produced in $\mathbb{S}$. Africa. Constantia as applied to wine is a territorial description like Beaunc. Most of the South African wines, with the exception of the one called Constantia, aro named after their Eumpean prototypes. See Wine

CONSTIPATION. This may be due to discase, general or local, hut apart from discase the condition is more often induced by individual habits and cuatoms. The movements of the bowels are induced by the presence of a certain amount of indigestible matcrial and of Huid. Modern methods of preparing and cooking food tend to eliminate indigestible constituents, the result being that the bowel is deprived of n normal stimulus. Then, some jeople take too little liquid, and what they drink may be tea aufficiently atrong to have an astringent effect. An active out-of-doors life has a stimulating effect on the muscles of the bowel and on the inuscles of the abdominal wall, which contribute powerfully to the emptying of the bovel. This stimulus is reduced in those of sedentary occupations and habits.

The taking of food has the effect of producing movement along the alimentary tract, and with the inajority of people this, coming on after breakfast, leads to $n$ habit of relieving the bowels then. Many men find tlint a pipe of tobaceo is a further help. But the particular time does not matter so much as the habit of soliciting an action of the bowels at the same time every day, as they can be trained to act regularly. The bowels may not move for two
or three days without apparent ill-effect, but generally there is discomfort in the abdomen and a heaviness in the head, or even headache. If the condition is not relieved, the local discomfort hecomes greater, perhaps accompanied by colicky pains, the appetite falls. the tongue is furred, and the spirits are depressed and the temper is irritable. If the constipation is chronic, the absorption of poison from the bowels may lead to a large number of bodily and mental infirmities
In addition to the importance of regular liabits stuck should be taken of the diet, and this can be made morc effective by the addition of fruit and vegetables. either cooked or raw, and by the use of wholemeal bread and oatmeal porrilge. Syrup and molasses will be found helpful, and amongst fruits marmalade and stewed prunes are especially useful. Many find that a glass of water first thing in the morning and at bedtime keeps them right. Strong tea, because of the tannic acid it contains, is bad. Milk, especially hoiled, is particularly constipating, and the same applies to red wines.

## Value of Exercise and Massase

Exercises, especially those which bring the abdominal muscles into play, are useful, and should include as inuch open-air activity as possible. Massage of the abdominal muscles may be resorted to. This may be clone by hand, hut a heavy ball, say about 5 lb . weight, rolled round the abdomen from the right groin up and across and then down to the left groin is found effective by many A useful ball may be made by filling a chamois leather bag with swati shot.
Should there be any difficulty in getting the bowels to move, a small eneina, $\frac{1}{2}$ pint of cold or warm water or 2 drams of glycerin injected into the bowel, or a glycerin or soap suppository, should be employed. It may be necessary, however, to resort to drugs. Under the beading Aperient a list is given of a number of common preparations, with the dose prescribed.
During the first year of life the bowels usually move two or three times a day; in the next year twice, and thereafter once. Infants at the breast should be restricted to their regular times of feeding, and should not be put to the breast, merely to pacify them, outaide thesc times Constipation may be due to a lack of fat or sugar in the diet, however the infant is fed, and an increase of these should he tried, fat in the form of fresh crean, a teaspoonful once or twice a day, bcing given. If the constipation is urgent an injection into the rectum of a few ounces of warn water to which a little soap has been added, or a teaspoonful of glycerin, will be the quickest way to give relief.
To train the bou'els into normal regularity when once constipation has become the habit, nothing gives better results in infants and young children than cascain. To a halfteaspoonful of sugar and water add 5 to 10 drops of the liquid extract of cascara, and give it to the child last thing at night; or t wice this dose of the aromatic syrilp of cascara may be given. The dose may be decreased or increased if necessary. When the requisite amount has been determined by experience, let the child have this dose nightly for two or three weeks, and then gradually reduco the amount, finally withholding it altogether. See Aperient ; Cascara.

CONSUMPTION. This is the conmon name for tubercular disense of the lungs (pulmonary phthisis) or of the bowels. The word denotes the wasting of the body in tuberculosis. The cause of the disease is always the tubercle bacillus that was discovered by Koch. This minute organism may enter the system and settle in the lungs through a person partaking of meat that is
tuberculeus, or milk, or even through a wound in the skin. The coinmoncst source of infection is from breathing germs floating in the air. The expectoration of a consumptive may be laden with millions of such germs, and when it dries on the ground or the Hoor the gerins may live for months. Clinging to dust particles, they are carried about the atmosohere, and can infect other people. Sunlight, however, possesses a powerful effect in destroying their activities.
'Tuberculosis is still one of our commonest and most deadly disenses. Since 1913 it has been notifinble. It is estimated that about one-screnth of the human race dies from tuberculosis in one form or another. It is possible that the infection takes place chiefly in childhood, when unheaithy tonsils and adenoids are rife, and when the resistance to the passage of bacilli in milk through the intestines is relatively low. Some children are born with a low resistance to tuberculosis; but a large number of cases in which the dis. ease appears to be inherited are really instances of direct infection from an affected parent.

When the tubercle bacillus invades and devclops in the lung there is a new growth of cells which solidifies the part of the lung nfiected. These masses of cells, known as tubercles, may be sufficiently numerous this to solidify a considerable area and destroy the lung tissuc there. The cells comimonly become converted into checsy matter, which softens and is coughed up. A cavity is left with ulcerated walls, and blood vessels are opencd up or burst causing haemorrhages. which may be large. These cavities are liable to become infected with the microbes of putrefaction, and this adds greatly to the poisoning which is already being caused by the tubercular microbes and is the cnuse of the foul sputum brought up. The disease tends to spread and destroy the adjoining healthy long. In some cases, however, repair processes come into operation, new fibrous tissue forms, the discase is walled off, and a cure resulte, with a sear in the lung.

Tuberculosis of the lungs may show many variations of forin. It may occur as a part of a general hlood poisoning by tubercle bacilli, in which symptoms indicative of the in volvement of other organs besides the lungs are present, e.g. meningitis. This occurs most frequently in children, and is usually rapidly fatal. There is also tho acute infection of tho lungs, known as galloping consumption, in which the condition may resentble pneumonia (q.v.) or broncho-pneumonia. The latter is common in infancy, and may follow measles, whonping cough or simple bronchitis. These forms may prove fatal in $\Omega$ few weeks or may pass into chronic tuberculosis of the lungs. This is the commonest form of the diseasc. and usually comes on insidiously.

## Sirnificance of a Persistent Coush

Persistent slight cough with no expectoration at all at the start may be the earliest sign. later there may be streaks of blond in the expectoration. A doctor should then be consulted. Ready fatigue, $\Omega$ tendency to sweat at night in bed, and a slight afternoon rise in temperature aro other early symptoms

The spread of consumption is faroured by herding people together in amall houses and in workshops, and by insufficient or improper food. But even if accommodation is restricted the clanger can be minimised by Hooding the premises with air and light With regard to food, it has been pointed out that the decline in consumption during tl:e last 50 vears coincides with the importation of foreign meat into this country, with an increase and cheapening of protein food. It is of great importance that patients, and especially children, recovering from acute
diseases, particularly measles, whooping cough. and broncho-pneumonia, should be closely watohed throughout their convalescence, as the seeds of consumption are often sown then. It is obvious that grave dnnger lies in allowing people to spit on the strects. in public places or vehicles, or elsewhere. at large

Every lime an advanced consumptive speaks, coughs, or sneezes, he exposes those about him to the possibility of infection.
Persons who suffer from tuberculosis should carry a sputum flask or cup, which can be obtained from any chemist or hospital that treats lung diseases. A few drops of some disinfectant are carried in thesc Hasks, and in using them care should be taken that nll the sputum goes inside. If any is left on the orifice it dries and is scattered as dust, and this is the danger that lies in using a handkerchief.
To protect the rest of his household the consumptive should have his own table cutlery, plates, serviettes, etc., and no one else ought ever to use his towels or slecp in the same room with him. The habit of washing the hands before touching food should be inculcated and practised. The consumptive's handkerchiefs, pillow slips, etc., should be soaked for some hours in a solution of carbolic acid ( 1 part of carbolic to 20 parts of water) or some other disinfectant before being sent to the wash. The person who has to look after the rooms of a consumptive should always wear a light muffler covering the nose and mouth when sweeping, and utilise wet tea lenves to prevent dust. Instend of sweeping or dusting, cleaning should bc done when possible with a damp cloth, which can be wrung out from time to time in a disinfecting solution

Treatment. The treatment depends on thic stage of the disense. Broadly speaking, if the patient has an evening temperature above $100^{\circ}$, he should be kept in bed. On the other hand, he may be put to exercises or graduated work, particularly when the disease tends to become quicscent. The treatment must be closely supervised by the doctor at all stages, but the intelligent cooperation of the patient and his friends is neccssary. Essential constituenta of the diet are raw meat and eggs. Smoking is likely to be harmful. Alcohol, with the exception of beer or light red wine, should not be taken except under a doctor's orders.
The minximum of fresh air, both day and night, is required at all stages. If a shelter with a well-boarded damp-proof floor can be arrnnged in the gnrden, the patient should begin by sleeping out of doors on fine nights. Alter a few nights he will find that he is perfectly comfortable, even when the warthcr gets colder. The effects of fresh air arc often very noticeable. The hectic Hush, the pallor, the irritating cough, and the tendency to night sweats often immediately pass off. If the patient cannot slcep in the open, his bedrnom should be as simple and bare as possible. The bed should be placed near the open window: Draughts will be avoided by having the window widely open night and day.
The most useful of all medicines in consumption is cod liver oil (q.v.). Other drugs frequently used are creosote, guaiacol oarbonate, and arsenic. Treatment by injections of preparations of gold have given good results. Preventive measures include the ndministration of Calmette's tuberculin during the first week of life.
Intestinal Consumption. Consumption of the bowels is common in young children, and the tubercle bacillus may cause ulceration of the bowels, and may settle in the glands renning along the spinal column at the back of the abdomen. This a bdominal tuberculosis is verv frequently associated with the disease
on the lungs or elscwhere. In the great majority of oases it is due to the infection by the type of tubercle bacillus found in cattle and conveyed in unboiled cow's milk. Fresh air and sunlight are essential. If possible the child should be taken to the country or the seaside. Complete rest is necessary, but when the child's condition warrants it, this should be on a bed out of doors, or in a long pernmbulator or invalid carriage. With regard to diet, here also raw meat and eggs arc indispensable. Cod liver oil will be useful. One way to give it is to rub it gently into the abdominal wall, or apply it there and cover over with : Hannel binder, when the movements of the child will rub it in.

CONTAGION: How to Avoid. In. fectious diseases may be acquired by direct contact with a person suffering from such a disease, from liandling cluthing or other articles which have been in contact with him, from infected air, water or milk, or other food, or in some cases, the diseaso may be through the agency of insects.

In public places of refreshment, during a rush of business, the glasses, cups and other dishes would appear often to be wa.shed in a perfunctory manner, and it may be wiser to go thirsty than drink out of a glass which has possibly just been used by one whose month is in an infectious state. The use of a hairbrush which is at the disposal of all and sundry involves a risk, at the least, of dandruff, and possibly of ringworm. The same applies to laying onc's head on the cushions of a public conveyance. Anthrax has been acquired from shaving brushes implorted from abroad and when a new one is purchased it should he soaked in a disinfecting solution. Various disorders are propagated by air ; for example, a common cold, influenza, measles, tuberculosis, ctc. In such diserses as consumption where there is much expectoration a sputum Hask should be rigorously employed.

There is always a risk of infection through unprotected cuts or sores on the hands. When one has come into contact with a possibly infected person in any way a free usc of soap and water, and preferably also of an antiseptic solution, such as permanganate of potash, should never be neglected. A neasure of protection more or less effectual is afforded by vaccination against smallpox, by inoculation against enteric fever, ett., and by vaccines against colds, influenza, and other disenses. See Disinfection: Fover: Fly, etc.
CONTAGIOUS DISEASE. Disease that is passed from one person to another by contuct is termed contagious disense. The person passing the diseasc inay be one actually suffering fmom it or he may be a carrier : that is to say, that although he maly be quite well in himself he carries disease-producing miorobes about his body. This may be because he has at one time had the disease, hut not necessarily, as pcople are found with the microbes of such diseases as diphtheria and cerebro-spinnl fever in an active form, although they might not have shown the aymptoms of the disease or, at any ratc, have att racted any attention.
The contact may be of an intimatc character, ns in ringworm and other diseases; but, on the other hand, clothing which has been worn by infected persons, e.g. smallpox or scarlet feyer, may be conveyed hundreds of miles away and infect other people.
In Great Britain the law requires the notifieation of certain of these diseases, smallpox, scnrlet fever, diphtheria, enteris fever, etc., to the medical officer of health, and, if necessity arises, other diseases, such as measles and whooping cough, may be added to the list. In addition to others, pneumonia, malaria, tuberculosis, dysentery, spotted fever, and Encephalitis lethargica a re notifiable.

The advantage of notification is that means can be talien at once to isolnte patients and those who have been in contact with them. See Disinfection; Fly; Notification: Quarantine; Vaccine, etc.

CONTRACT: The Legal Sense. I contract is an agreement enforceable at law It requires an offer and acceptance of that offer ; valuable consideration; and an inten. tion that the agreement shinll be a legal onc ; thus, if one offers to receive a man to dinner in a friendly way, and he agrees to come, it is not a contract. Offer and acceptance may be by word or conduct. An acceptance of an offer is not an acceptance unless it ís unconditional. Thus, if one man offers to sell another something for $£: 0$, and the other replies that he will take it subject to 5 per cent. discount for cash, he has not accepted the offer and there is no contract. A contract by post is complete and binding on both parties the moment a letter accepting ye offer is posted.
In offer can be cancelled at any time before it is accepted, unless something has been paid for it to be kept open. Thus, if a man asks a tradesman to kieep open till Monday at 12 noon an offer to sell him a dress at a certain pricc, and the tradesman agrees, he can nevertheless cancel his offier before 12 on Monday. But if even a penny has been paid to keep the offer open till that time the tradesman must keep it open. An offer is open for a reasomabise time, unless a definite time is specified; and after a reasonable time has elapsed it is automatically cancelled without further notico.
Acceptance must be expressed whether in words or by an act. Thus, a letter says, "You can have the sealskin coat you saw for £.50, and if I do not hear from youl I shall send it to your." The person to whom such an offer is made is not bound to answer ; and if he does not, and the coat is sent, he is not bound to takc it. Of course, if he keeps it, he must pay the $£ 50$.
A few contracts require to be evidenced by writing. The writing may be signed at the time, or may be contained in subsequent correspondence so long ns all the terms of the contract are shown. The following arc contracts that must be in writing :
Contracts for the anle of land or any interest thercin. within a yeur from the day they are made, e.R.a contract to nongage a governes for o year, tlic servico to hegin two days lience.
Contracts in consideratlon of inarringe- Dot a promise to marry ; but such a contract as this, " If youl will marry me, (or my son or my daubliter), will give you $\varepsilon 1001$."
Contracts of glinrantec.
(Contracts for the sale of pooils at a price of $£ 10$ or over. But If anything has been paid for or Ons goods or part of them or bind the bargain, or the accepted by the buyer, there is no need for writing.

Although in other cases writing is not necessary, it is always bettor to have the terms of a contract of any importance in writing. One should sit down and write a letter, "Confirming our conversation of to-day's date," and set out all the terms agreed on as clearly as one can.
The consideration for a contract required by English (but not Scots) law may be a payment or a promise to pay ; doing something or promising to do something. And the payment or the act done need not be for the benelit of the person who makes the coatract. Thus, if A chooses to say to B, "If you will give Jones a job as your gardener, I will give you a ton of coal," and B gives Jones the job, A must give B the coal or pay him the value thereof. See Agreements.

CONTRACT BRIDGE. This form of the game of bridge differs in one or two ways from auction bridge. The chief difference is that when a side has won a game it is vulnerable,
and its bonuses and penalticy arc increased Another difference is that players score be low the line, or towards a gaine, only for tricks which they have contracted for and made Points for excess tricks are scored above the line. Likewise the score for a slam oan only be made if it has been bid for.
In contract bridge the values of the different suits are as follows:


The players begin by bidding for the lear $\hat{a}^{g}$ in auction bridge and they play out the Cards with the leader's partner, or thiri hand, laying his cands down on the table and taking no further part in the game. Onc hundred points acorcd below the line make a game. All other points are scored above the line and therefore do not count towards game. Calla can be doubled and redoubled as at auction bridge.
Above the line the score is made by honours, slans and bonuses of several kinds. Honours are only declared when four or five are in one hand. Four honours in one hand is 100 pointa : five in one hand is 150 points. With a call of no trumps four aces in one hand count 150 points. Small slam counts 500 points and great slam 1,000 points. A rubber won in two games counts 700 points; if it takes three games 500 points. For tricks taken in excess of the number bid 50 point per trick are scored. In case the contract is not fulfilled the opponents of the bidding side count 50 points per trick. If a call is doubled and the bidding side wins they count $j 0$ points for fulfilling the contract. If it is redoubled they count 100 points.
Vulnerablity. The above pointa arc made during the first game. After that one side, having won a game, becomes vulnerable, and for it, but not for its opponents, some of the penalties and bonuses are increased. For exainple, the vulnerable side counts 780 points for small slam and 1,500 points for grand slam. If a call is doubled the vulnerable side obtains 100 points for fulfilling its contract and 200 points if the oall is redoubled. Alsn if doubled the vulnerable side receives 200 points per trick and 400 points if redoubled. for all tricks made in excess of the contract.
The vulnerable side's penalties are corre spondingly increased. If a call is undoubled it loses 100 points for the first trick contracted for but lost and 200 for each subsequent trick. If the call is doubled the vulnerable side will Inse 200 points for the first trick, and 400 for each other trick lost.
Revoking. Tho penalties for revoking at contract bridge are two tricks for the first revoke. Thesc are taken at the end of the play from the score of the revoking side and addel to the tricks of the other side. They arc figured as if actually won in play. Sub sequent revokes in the same hands are penalised 100 points carh and scored in the honours column. See Bridge.

CONTUSION. Any injury inflicted on the tissues by a blow from a blunt body or instrument which does not break the skin is termed a contusion. The soft tissue below the skin is torn, and bleeding takes place from its vessels. The prit is swollen, hot, and painful, and discoloration usually follows. The treatment consists of reat and the appli cation of cold cloths. See Bruisc.

CONVALESCENCE. The period follow. ing recovery from a disease, but before the restoration of normal health, is known as convalescence. In acute febrile disorders this usually dates from the final drop in the temperature, but the patient is left with debilitated tissues and organs. This condition is the effect of the fever and the poisons in the blood which were responsible for its production

In the casc of discases, the brunt of which falls on particular organs, there arc gross lesions to le recovered from, e.g. ulcers in the bowel in cnteric fever and more or less consolidated lung in pneumonia. The patient's digestive powers and his capacity for exertion are therefore reduced, perhaps very much reduced. He may himself be conscious of this and amenable to necessary restrictions imposed by the dootor, but sometimes he may be impatient, thinking that he is better than he really is. The doctor's instructions must nevertheless le carried out, and on the part of the uurse firmoness and tact will be called for

In changing from slop; to ordinary diet there should be a progressive introduction of articles of fund which nake greater demands on the digestion, and to begin with there should be a number of smull meals, given at regular times. Variety should be ained at, and the cooking and serving sliould be as attractive as possible. The nurse and not the pationt should decide what food is suitable.
Food for Convalescents. To facilitate the composition of the daily menn the follow. ing suitable foods may be named, it being understonl that those first mentioned are intended to be the sole diet in the first days of convalcacence, though they may be continued throughout; but those in the latter part of the list are not sclected until after fou or five days of uninterrupted progress. All pastries should be avoided.
Mlik, alone or with soda or potash water, Benger's foni, Allenbury' Diet No. 3, beef tea, atrong hock soup, eqR illp, thin armowroot made with milk, te: Culf's-foo
chicken eot jelly, chicken jelly, mutton broth chickult, plain sponge cakes, mallk jelly, junket.
Ont flour porridge revalenta, good milk pudding and custards, egag ponched or noft boiled, atcamed flish (whiting, sole. plaice or haddock) with milk sance.

Camlinower with white rauce, spinach, fripe or sweetbreals, chickell or rablit, bmked apple witli cream, a little freslı fruit.
Ronst mutton or the eyc of $n$ tender mutton chop, boiled mealy potato.
In convalesoenco from enteric fever the craving for solid food may be very attong, hut should be resisted until the doctor gives his permission, as rupture of the bowel through a partially healed ulecr has been a not infrequent sequal to an evasion of his orders. At the same time it must be ever present in the minds of patient, nurse, and friends that while the pace must be regulated, steady progress towards recovery is expected.

CONVOLVULUS. Alternative name for bindweed. There are perennial and annual bindwreeds : two of them, Convolvulus arvensis and sepium, are most troublesome weeds. Creorum is a clarming rock garden plant


Convolvalus. The climbing annual convolvulus, a bowy summer flower
with grey leaves and pink flowers, it nceds well-drained soil and a sunny place, and is hardy only in mild districts. Among the annual forms of convolvulus are several showy half. hardy plants. They are raised from sceds sown under glase in March, the seedlings being planted out of doors in May. Seeds may also be sown out of doors in April Convolvulus major, a climbing plant, and minor, of low growth, have flowers in many showy colours-pale blue, crimson, purple and rose. Other llowers often called convolvulus are known botanically as ipomoea. The loveliest of these is Ipomoen rubro-cocrules which bears large bluc Howers and is best grown in the greenhouse from seeds sown in spring. Coccines has bright red flowels.
CONVULSIONS: Cause and Cure. In infants and young children convulsions arc most often duc to teething, indigestion, worms, rickets, or the onsct of acute fevers. In grown people the commonest causes are epilepsy, hysteria, uraemia, poisoning, chronic alcohol sm, pregnancy, and brain tmmour or injury. The rolling of the eycs, jerliy movements of the limbs and head, with twitching of the muscles and grinding of the teeth cannot be mistaken Consciousness is lost, except in strychnine poisoning, where the mind remains clear, and in hysteria unconsciolsness is more apparent than real

If an infant is attacked the doctor should at once be sent for The infant must be placed in a warm bath, and a succession of cold cloths applied to the head. The duration of the bath will be 5 to 10 min . In adults the convulsion will probably come on suddenly, and the patient falls down if he is on bis fcet at the time. No attempt should be madc forcibly to prevent the movements, but these may bo controlled sufficiently to prevent the patient from injuring himself, and if necessary ho should he moved out of the way of danger A pillow of a folded cont should be placed below the head and shoulders, and any tight clothing about the neck or waist should be lonsened To protect the tongue, which is often bitten, cork or a piece of wood, or the handle of a pocketknife well guarded by wrapping a handker. chief round it, should be thrust between the back teeth.

CONY. The old name of the rabbit is now used chiefly for its fur when employed for wearing purposes. Ordinary cony skins come in vast numbers from Australia, and white rabbit pelta either from Normandy and other parts of France or from China

Cony is usually treated to imitate one of the more costly furs. Thus white rabbit figures as ermine, and when dyed as chinchilla, beaver or electric sealskin. White rabbit furs, if first stripped of their linings and wadding, will wash beautifully in a lather of warm soapy water They should be shaken out well and hung in the open air to dry. See Fur.
COOK. Except where there is a housekeeper the cook is the head woman servant She is responsiblc for the cleanliness of the kitchen premises, though in larger households ahe takes no actual share in the work of cleaning. The dining room meals are her chief concern. She is often expected to arrange $\pi 4$ well as cook then, and probably has a kitcheh maid to do the rough work and help with the preparation of the food.
In smaller households where there is neither kitchen maid nor scullery maid, she is usually expected to do a certain amount of cleaning and housework as well; she is then responsib!e for the kitchen premises herself, and may occasionally be expected to look after the hall and dining room in the early morning. If this is to be included in her work it should be mentioned when she is engaged. A cook can command higher wages than any other maid. mervant. See Chef ; Servant,

## Cookers: GAS, Electric and OIl

## The Best Examples of the Three Types Described and Ilustrated

For further information sec Boiler; Kitelen; Oven; Range. The entries Electricity; Gas may also be consulted with advaniage

Apart from the ordinary kitchen range, to he used for the former purpose a separate which may he maic to burn coal, coke, woorl or houschold rubbish, cookers are constructed to consume three main types of fuel: gas, electricity and oil. For this reason they are dealt with here unier these threc headinge. It should be remembered, however. that the liitchen range usually performs four separate and distinct functions. The first of these is cooking, twasting, heating Hat-irons. It heats the litelien and heats water, usually by means of a boiler situated at the back of the tire-box, for usc either in the scullery, lavatory or linthroom, or for warming the house by means of hot water or stean radiators. It also consumes household rubbish.

When the three types of fuel are used, these functions are performed separately, and it may he necessary when replacing a kitchener to divide up these four functions among the various fuels available. For instance, if gas, coke and electricity are available, a good method is to cook by means of gas or electricity, and to central-heat with coke. The choice is influenced by the two main factore of labour-saving and convenience, as opposed to the cost of installing and running the various systems.

Wherc clectricity is already installed, gas is generally available. Most gas or electricity companies will, if desired, hire out a cooker, and some companics supply cookers on hirepurchase terms, payments for these being made over one or three years.

In considering cost, it may be taken that where the cost per unit of electricity is not more than one-tenth that of the gas therm (e.g. Id. per unit and 10 d . per therm), electric cooking is as cheap as gas cooking. An addvantage in the usc of electricity is that the heat can be produced in the exact apot where it is required. In a saucepan or kettle the heating coil can he placed in the middle of the liquid. A cheaper ratc is allowed for electricity for cooking and heating than for lighting, and where clectricity is


Cooker. Fig. 1. Enamelled gas cooker with back plate and rack for dishes, etc. Fig. 2. Gas cooker for a larger establishment. The oven, thermostatically controlled, is e!evated. and bas a plate-warming compartment beneath it

Fig. 3 shows another type of elevated cooker, in which the plate-warming chamber is above the oven. The ventilating canopy in this case is inade of wired glass in a framework of stainless steel. The flue from the oven has an outlct under the houd, this being the lawer of the two gratings shown, the stcam and all vapour from the oven passing away into the chimney through the upper grating. If the oven llue were taken direct into the chimney there might be a risk of down draught which would interfere with the proper working of the oven.

Sinaller types of cookers also are obtainable with ovens litted with thermostatic contiol.


Cooker. Fig. 3. Elevated gas cooker with platewarming compartment above the oven

If the oven hecomes too hot, the gas antomatically goes down: should the heat begin to cool off helow the desired temperature, the gas goes up again to keep the heat just right. A chart is supplied with the cooker, hy which the oven is regulated. The buttom of the oven is closed in by a hase-plate upon which low. temperature cooking-milk puddings, casseroles, etc.-may bc carricd on while the other items of the moal are cooking above. Gas is economised by having only onc bumer in the oven instead of two, and by the fact that the Hue outlet is at the lottom instead of at the top of the oven, by which arrangement the heat is retained for a songer time.
In some makes of cuokers the boiling burners are so designed that they do not bccome clogged, neither will flames he extinguished lyy liquids boiling over. Each burner is fitted with regulators to ensure an even heat spreading over the bottom of the cooling utensil. There are also metal disks to provide a firm rest for small sauccpans on the hot-plate.

Hints on Cleaning. Little and often should be the motto for cleaning all gas cookers. The oven, plate-rack, stand, trays, etc, should be all washed every day if possible. but at least once a week. The burners, in particular, cannot lie expected to give their highest efticiency and economy unless they are kept scrupulously clean. Hor this reason, all burners and

required for baking, roasting, etc. It is liest to get the oven up to the required tem.

Cooker : how to keep a gas cooker clean. Fig. 4. Grids and burners being scoured with hot water and soda. Fir. 5. Removing grease with a special praparation

Unless of rustless steel, the hright asteel parts should be cleaned every day with finc emery cloth, and the hot-plate grids with a rag moistened with turpentine and then wiped with a dry cloth.

Unless the unpolished parts of the outside of the cooker aro enamelled, they should be eleanel with blacklead daily. If the stove is not going to be used for some time. these parts should be thoroughly washed and dried, then coverel with grease. Before using the cooker the grease must be whahed off again with hot water and soda. When using a gas cooker always turn out the gas immediately it is no longer needed, and never allow Hames to llare up the sides of pots.

HInts on Using. The proper way to heat up a gas oven is to turn the gav half on, light it. and leave the door closed for two or three minutes. Then turn the gas full on for about 10 min , after which the oven will have attained its full heat, and the door should be left open for a ininute or two to allow all the stean formed to eacape. The oven will then be ready to givo out the steady. Wry hent


Cooker. Fig. 8. Small electric cooker which may be stood upon a table or special stand

Courlesy of Belliny \& $C o$
perature to start with, and then lower the gas to maintain this. Never turn on the oven gas without first opening the oven door Always have a lighted minteh ready hefore turning on the gas. especially for the oven burncr. Don't heal the oven up specially for one or two smail dishes: make good use of it on baking days. As soon as cooking is completed. the oven should be wiped out with a damp oloth. A bowl full of water placed in the ovenimmediately after cooking is linisherl and the gas has lieen turned out will provide hot water for washing up with. out extra cost.
Never uso a solid shelf in the oven, ex cepting as a deflector to throw down the heat on to the top of the forl being cooked (for browning purposes), ns a solid shelf effec. tively prevents the heat from rising to the food on the shelf above. With all ordinary gas cookers


Fig. 8. Horizontal electric cooker, with an extra plate-warming compartment above the oven Courtesy of Belling \& Co
control as the thermostatic for gas cookers is obtainable in the more expenaive electric models, by means of an automatically operating time switch. Electric cookers arn casily movable, so that they can be placeal where required, and are made in various sizes to suit the reguirements of the household.
For the very sinall kitchen, or the hachelor flat, there is a little cooker specially designed, which may either be stood on a table, as in our illustration, Fig. 6, or on a stand available at a small extra cost. It has an all-metal enclosed boiler-griller plate (3.hent) which the hottest portion of the oven is at the hottom. Stenmers with several compartments over one
burner, instead of several pans, each on a dif. ferent burner. should loe employed for this work.

## Electric Cookers

 It may be as well to state that with a properly installed electrio cooker there is no danger whatever of shock. Elec tricity, properly used, is such a con. venient form of providing heat, without fumes. smoke or smell that it mesns cooking under ideal conditions. The heat is always constant and there is saving in weight and value of the foorls cooked by this method.Generally speat ing there is a cheap rate available of about Id. per unit for cooking purposes, plus a small atanding charge based on the rates of tho house or whatever the system of the town may happen to be. Most supply companics will install a cooker on simplo hire terms, the hire including cost of wiring and fixing.
The heat can be perfectly regulated and controlled in a satisfactory electric cooker. Each part, oven, grill, or hoiling plate, is in four burners. Fig. 9 shows an efficient type of the larger models independently switchel. cooker for family use with three hurners, one T'emperature indicators ensure scientifically being a giant burner for rapid boiling. There is accurate results. Somewhat similar oven a wick adjusting apparatus, and a giass door to


Cooker. Fig. 9. Oil cooker with three burners and having a glass door to the oven Courtesy of Anylo-American Oll Co., Led.
the oven which obviates the necessity of opening the door to see how haking progresses. 'The cabinet top posserses a plate rack. The double walled chimneys concentrate the heat where it is required. The wicks should be thoroughly cleaned nt least once a week by raising them even with the top of wiok tubes and seraping the carbon from the top of the wick with a cleaning tool provided with tho stove. Tho wick is then turned down and the screv top removed and any dirt cleansed from the inner wick tube, the screw top then being replaced. It requircs from three to five ninutes for the flame to reach full height after lighting. The flame should be a clear blue colour and extend above the top of the grate.
The pressure type of oil stove (lig. 10) burns paraffin without a wick. This type of burner first vaporises the oil by ejecting it under pressure thmugh a small heated nozzle, then mixes it with air, and finally burns it in n rose. not unlike a modern high efticiency gan burnor. This type of stove is suitable for camping


Cooker. Fig. 10. Pressure type of oil cooking stove. hicb burns paraffin withoot a wick
or for use where baking is not required. It can be furnished with accessories for toasting, etc. A similar stove may be obtained with only one burner. A small oven on legs might be arlded.
A comparison of the working costs can be made by assuming that each burnef, when full on, will use from a quarter to half a pint of paraffin per hour. The pressure type of burner is undoubtedly very economical, but has two main disadvantages. One is the neccesity of heating up the burner with methylated spirits for a few minutes before lighting the stove, and the other is that of having to pump up the pressure from time to time while the stove is working.
The chief cause of all working troubles with oil corkers is dirt. Dirt cnuses smell, smoke, clogging, and many other ills which accom-
pany such slight details as allowing carbon deposits to form on nozzles, etc.

A good wrinkle with a pressure cooker is from time to time to open the valvo after the pressure has been pumped up, but before the burner has been heated. This will force n thin stream of oil through the nozzlo and air injector, and carry noway any small particlea of dirt or carbon deposit.

COOKIE. These caker are prepared by creaming 5 oz of butter and $B \mathrm{oz}$ of sugar. Into these bent an egg, then stir in 3 gill milk, finally sicving in $\$ 1 \mathrm{l}$. flour and 1 teaspoonful baking-powder. Roll out the mixture thinly, adding nore flour if necessary, and then form it into rounds. Bake the cookies in a fairly hot oven until they are golden brown

COOKING BOX. When long and gentle cooking is required a cooking box will be found useful, the fond being brought to the boil before being placed in the box. To make $n$ cooking box, line a packing-case or angar box with tivo or three thicknesses of newspaper, covering the latter witl flannel or the type of felting used under atair carpets. Nail this on neatly, and line the lid in the same manner. Make some balls of newapaper, pack then tightly into the bottom of the box to a depth of 3 in ., and place the saucepan or casserole on top of then, packing it round with more newspaper halls so that, when it is lifted out, a nest is formed. Should there be mons for two sauce. pans, stand both on the layer of paper, but put a thick padding of paper balls between the two. The cushion or cushions placed over the top can be made of Hannel or felting stuffed with paper tom into amall slireds. See Haybox.

COOLING : OF Rooms. In temperate climates n few simple precautions sullice to keep a room cool on the hotteat day. Most important of all is the outside blind, which need not necessarily be a sunblind on nn iron frame, though that is the most convenient. Any dark blind which comes outside the window pane answers the purpose by preventing the radiation of the aun on the glass.

Windows should be shut during the heat of the day and the outside hlind pulled down. They may lie opened agnin when the heat of the sun has abated, the blinda being then pulled up, provided that the sun no longer shines on that particular window. Where a window may safely be left open all night this should le done, par ticularly passage and landing win. dows, which ensure a current of air through the entire house.

Electric fans are of assistance in oirculating air and so keeping rooms and passages cool. In rooms with tiled or stone floors, such ns sculleries, dairies, and old-fashioned kitchens, a little water may be sprinkled on the

floor with a "atering.can to cool the air by evaporation. Hyposulphite of sodn has a cooling effect when it is dissolving, and some crystals moistened in a dish may be placed on the window ledge and the window pushed up a few inches See Ventilation.

COOP. A coop is a wooden structure, with hars in front, and is used to house a hen and her hrood until the latter are weaned. The bars are so arranged that the chickens can have free ingress and egress to an attached run without the hen. The main cssentials in a good coop are durability, security against inclement weather and rats, etc., together with ample ventilation without draughts. When rats are troublesone, a floor is necessary : but, when.


Coop. Uselal and elfective type of ben coop instractons for making which nre given in the text
ever possible, n coop should be located on short grass and inoved to fresly ground from time to time.
A coop is quite easily made at home, and the design here given has proved satisfactorv either as a sitting coop or as the first home for
the hen and ohicks: it has been devised for use in conjunction with a small portable chicken run
Made in sections to bolt togetlier, it can be diamnntled and packed away during the winter months. The dimensions are given in the accompanying drawings
The lirst thing to do is to make up the front (Fig. 1) and back (Fig. 2) frames from deal $1 \frac{1}{2}$ in. square, the comers being mortised and tenoned and well serewed Five of in. diameter holes are drilled through the front frame and the iron hars driven through the four outer holes. The central hole is used for a movable rod, which prevents the hen escaping, but gives complete freedon for the young chicks.
The door or cover (Fig. 3) is made from $\frac{5}{1}$ in. tongued and grooved matchboard, has a batten across the centre, and three 1 in . diameter holes at the top for ventilation. This fits into the front framework, and is kept in place by two turn buttons. The back frame is covered on the outside with in. T. and G. matchboard. The two sides (Fig. 5) are made up from sinilar material nailed to battens 2 in wide and $\{$ in. thick at top and bottom. These must be made up in pairs so that the battens are on the outside. The roof (Fig 4) consists of four lengthis of weather-board, preferably moulded and rebsited as shown. It is nailed to the $1 f$ in. by 1 in . battens, which are at auch a diatance apart as will just olasp the sides.

The coop is assembled by drilling $\ddagger$ in diameter holes in the tivo side pieces, near the front and hack at $\bar{i} \mathrm{in}$. frotn the edges, corresponding holes being made through the framework of the front and back. The-front and back are then bolted in place, and the ronf put on top and sccured to the sides with two stout brass acrews on each side, passing through the roof hattens and those on the side pieces. A hole is dilled through the roof to permit the passage of the novahle rod. The resulting coop is shown in the photograph. The best finish is a coating of creosote inside and out ; this is a good preservative and an efficient insecticide. See Chicken; Poultry.

COPAIBA. An oily resin obtained from the bark of a S. American tree contains n medicinal oil which has been extensively em. ployed in the treatinent of gonorrhoea. It has also been found helpful in chronic bronchitis. The dose of copaiba is $\frac{1}{2}$ to 1 Huid dram, and that of the oil is 5 to 20 minims. The oil may be taken in capsules or in mucilage of acacia, prescription consisting of copaiba 2 drams, mucilage of acacia 2 oz , pepper-mint-water 8 oz . The dose is $\geq$ tablespoonfuls 3 times daily after food. Pron. Co-pā'ba.

COPAL VARNISH. This hard clear varnish is usually employed in finishing carriage hodies, and hecause of its durability and brilliance is suitable for all outdoor work, or for indoor work subject to lined wear. Varnish made from the darker tinted copal is in no way inferior to the lighter grades, but it fetches a lower price because its usefulness is more restricted. Colourless varnish can be used for covering very delicate colours, hut the deeper coloured variety is only suitable for such pur. poses as vamishing wall-paper or for dark woodwork where the yellow tinge will not mar the body colour.

Oil should on no account be added to varnish, or it will be found almost inpossible to get it to dry. Thinning should be aocomplished with turpentinc. The varnish should be stored in dry airtight vessels. See Varnish.

COPENEAGEN WARE. The hard porcelain produced at the Royal Copenhagen factory stands in the front rank of technical precision and decorative excellencc. Employing a high percentage of pure Swedish crystal. lised felspar, combined with fine china clay which is obtained from Cornwall and elsewhere, it yields a singularly limpid white ware.

Copenhagen ware dates back to 1772 . Its a plain Inthe is available shect copper can be most characteristic designs, in cool, underglaze blues, greys and greens, are sometimes based upon the virilc motives of Scandinavian art, sonetimes suffused with Japanase fecling. and these are imitated by Japanese potters themselves. Besides dinner and tea services, there are charming figures of birds, fishes, and the like, both in white biscuit and in sublued tints, together with reproductions of 'Thorwaldsen figures and reliefs. The mark is a triple wavy line in under. glaze bluc. See China
COPPER: The Metal. Although displaced to a great extent by aluminium for cooking utensils, copper is still used for preserving pans, kettles and moulds, while for other household purposes, such as accessorica for the fireplace, and for appliances such as geysers, boilers and clectric fittings, it is n satisfactory metal. Extremely ductile, malleable and tenacious, it is the best known conductor of heat and electricity. It possesses a heautiful oolour, and if suitably chosen for decorative objects may enhance a room.

For culinary purposes the drawhack to its use, besides thi initial expense of copper articles, is that acids on its surface form poisonous salts. To obviate this, cooking vessels should be tinned on the inside, as tin does not form salts, nor is it acted upon by weak acids or other substances met with in articles of food. Utensils such as kettles and coffec percolators aro satisfactory in copper ; they rarely need retinning, as there is nothing in their ordinary uae to wear the lining. It is an economy to have a tinned iron kettle with a copper bottom.

If kept scrupulously clean and well dried after washing there is no danger in using unlined copper preserving pans and moulds. If allowed to remain dirty or moist the two chief poisonous anlts which might form are verdigris and copper carbonate. The first is formed by the nction of vinegar on this metal, the second on wet copper ly the action of carhon dioxide, always present to some extent in the air.

Cleaning Methods. Decorative articles or those partly decorative and partly utilitarian. like fireirons, knockers, coal scuttles, etc., are usually covered with a lacquer when new, chielly composed of shellac, coloured, and dissolved in alcohol. This solution is painted on to the article and preventa tarnishing and oxidisation. As long as the lacquer remaina, no cleaning is necessary. Any good metol polish that does not corrode can be used for articles not employed for culinary purposes, e.g. hot pipes and geysers.
Cooking utensils require special care in cleaning. Scouring with silver aand and soap is an excellent method. When the copper has been well rinsed and dried, a brilliant polish can be obtained by rubhing over a little paste made of whitening and water. Bath brick moistened with water and soap or any other gritty cleaning powder can also be used for cleaning.

The Manlpulation of Copper. One or two practical hints may be serviceable to the amateur craftsman who desires to undertako work in copper, for it has peculiarities that render it easy to work in some ways and more difficult in others. It is ensily bent, curved, or beaten to any desired shape or bent to acute angles without fear of cracking. For ornamental purposes it is embossed and worked up into plaques and decorative pancls. When


Copenharen Ware. Vase with Dattern
spun into circular forms, such ns Hower-bowls. But the metal is difficult to machine, is it is liable to tear: drilling and sawing are more troublesome than with brass Copper atheres to and clogs the cutting edges of tools, and it is therefore necessary to use a lubricant, either milk or tallow or a mixture of lard, oil, and turpentine. To file coppor without tearing the surface French chalk should be employed is a lubricant.
Do not use copper for bearings or on working surlaces, as it is difficult to kcep it from scizing, and it would speedily wear away. Copper wire is useful for binding metal fittings to hose pipes, for the fistening of rods and cance, and any purpose where a secure joint is needed more durable than one made with string. A difficulty sometimes is the selcction of a suitable gauge of metal for a particular jol. In general copper pipes are artisfactory in Nos 18 or 16 gauge ; shect copper for spinning in No. 22 gauge: for benten inelal work about No. 24 to No. 20 gauges will be found to answer very well.

Copper nails and rooves are used for making joints between the planks of small boats. and call be used for other purposes where an imn or steel nail would be objectionable on account of rusting, th for lead flushings or gutters. Small oopper rivets and washers, or burrs, are invaluable for making riveter joints in sheet metal, and are avnilable in convenient sizes at most ironmongers. Thin sheets of copper can he pierced by sawing with n fine metal. outting fret-saw, by punching, or by cutting with very keen cold chisels.

Sometimes the amateur is confronted with a danaged piece of copper, such as a cracked pipe. In general the best method of repair is by silver soldering or brazing. To solder copper with ondinary soft solder, it is firat necessary to tin the surfaces to lhe united When hard or silver solder is used the burax is generally applied to the joint, and the silver soliler melterl by means of n blow pipe (q.v.), heat being applied until the solder has Howed properly ints, the joint. The brazing of copper requires care, as the melting-points of the copper and the spelter are very nearly alike. lior all ordinary small pipe joints, auch ns those found in motor velicles or in hotwater inslallations, silver soldering is prefernble to bra\%ing.

How to Bend Copper Pipes
The bending of small copper pipes can often be satisfactorily carried out with the hands alonc, eapecially if the copper be soft or well annealed. If the bends are very sharp it will be desirable to grasp the pipe between two pieces of wood held in the vice, and tight enough to hold the pipe, but not so tight as to crush it. The object is to prevent the tube from buckling or fiattening. The pipe can then be pullerl into shape by slipping a larger-size pific over the outside where it is desired to keep it straight. This localises the pressure and whereabouts of the bend. Pipes about $\underline{d}$ in. diameter and upwaids are gencrally bent in a pipe-bending inachine, or are filled with sand, which must be rammed hard and the ends securely plugged

Tho annealing of copper for amateur use is a very simple matter ; merely lieat the copper to $\Omega$ uniform dull red heat and immediately plunge it into cold water, and leave it to cool. If any hollow work has to be anncaled, take special care to avoid the escaping steam.

COPPER: The Boiler. A washliouse or larger camera with a good lens and a ground boiler, generally made of galvanised iron, is known as the copper, and the best sorts are in fact made of copper. There are two types: found generally in older housos: the other. prints from larger negatives. Roll film the portable type, con. sista of a metal exterior that supports the inner pan or copper. The hottom part is adapted to receive a gas burner, n high-pressure oil hurner, or an ordinary conl or wood fire. Some patterns have removable pans, a draw-off tap and n steam escape pipe connected to the flue pipe
'fo instal a portable copper the only fitting necessary is to provide a good, solid, fireproof base, and to see that no part of the copper is near any woodwork or inflammable material. The smoke box terminates in a socket, into which is fitted the castron or sheet-iron stove pipe, which is preferably taken directly out to the air by breaking through the brickworls of the wall, and then fitting a canister elbow with an inspection door in it, and carrying the stove pipe upwards to above the level of the ronf and terminat in $n$ cone cow
The inside of a copper should be thoroughly washed and dried, and any signs of rust carefully guarded against. If greasy, it can be cleancd with parafin and soft soap, then acoured, and af terwards rinsed with hot water. Coppers should be filled hefore the fire is lighted, and emptied after the latter has been put out. Coke and cinders, being cheaper than conl, we frequently used as substitutes for the latter in copper fires. See Laundry

COPPER NUCLEINATE. The organic preparation of copper known as copper nncleinate is made by combining its oxide with nuoleol, $n$ substance obtained from veral. It is $n$ fine powder and 5 to 10 per cent solutions have been found useful in various forms of oonjunctivitis (q.v.), for example, trachoma or granular ophthalmia This preparation is known also as cuprol

COPPER SULPHATE. In medicine copper sulphate is sometimes used externally as a caustic or internally as an astringent or is an emetic. As an astringent the dose is 1 to 2 gr . and 5 to 10 gr . as an emetic. It is a uscful emetic in narcotic poisoning and in acule phosphorus poisoning. As blue stone it is used in reducing "proud flesh." In styes, after pulling out the affected eyelashes the parts may be bathed with a 1 per cent solution every hour or oftener. The hathes will grow again in the course of time.

Poisoning by copper suljhate produces vomiting, abdominal pain and more or less shock. The doctor should be sent for. The vomiting should be encouraged by copious draughts of tepid water. White of egg or rich milk should be given after the stomach has heen thoroughly emplied. Rest in hed, with warmth to the feet, and stimulation by table. spoonfuls of hot strong coffee comprise the rest.

COPYING: In Photography. In copy ing pictures, photographs, engravings, nad printed matter, it is necessary to uso $n \frac{1}{2}$-plate

rgements from the negative, which will and the best results will be obtained with backed plates.

Very short focus lenses arc unsatisfactory for this work; but the longer the focus of the lens the greater must be the extension of the camera bellows

The print to be copied must be fixed in ni ahsolutely vertical position and the camern pointed squarely at it. therwise some portion of it will not he sharply in focus. The original may be pinned to a door or wall. A good work. ing arrangement is illus. trated in Fig. 1.

The best arrangement or regular work is to liave the camera in a lixed position, square to the easel, the easel itself heing supported on runners so that it may be moved backward and forward in line with the camera, according to the size of the original to be ocussing is then done opied. The rina

The lighting is of the greatest importance. Light must be evenly distributed over the whole subject. Perhaps the best is obtained out of doors on a north wall (not in the sunlight). Indoors, $\Omega$ room with a good north window will serve if care be taken that the camera itself cuts no light from the object.

Artificial light is sntisfactory if properly arranged and controlled. Two lights of equal strength, placed on either side of the copying hoard and shielded from the camera lens (Fig. :2, 4 and 13), or one strong light immediately above the centre of the camera (Fig. ㄴ, C) may be used. Electric light is easily arranged with sufficient flex. Mag. nesium ribhon is one of the best artiticial illuminants. Two pieces can be burnt simul. (aneously, as at I) and E (Fig. 2), or one, centrally, as at F (Fig. 2).

An excellent way of using magnesium is 1.0 erect a screen of tissue paper, with the camera lens projecting through, and burn about a foot of ribbon behind it, moving it about during the exposure.

Jo test evenness of illumination when two lights ate used, place a pencil in front of each light. The shadows ouglit to be of equal depth. If on looking at the original through the focussing screen or over the top of the
 the object being copied
camera any reflection of the light from the surface of the original is seen, the light must be diffused by mean: of tissuc paper, or a thin handkerchief held in front of each light. Altering the position of the lights will also reduce the trouble.
Panchromatic Plates. If the picture to lie copied contains much colour (especially reds, browns, yellows, or greens), colour sensitive or panchromatic plates must be used in conjunction with a light filter in front of the lens. Similarly, if an old print has brown stains (foxing), or an old photograph is yellow and faded, much the best results will be obtained by using panchromatic plates and a light filter. An old photograph should first be cleaned by rubbing with cotton-wool, part of the aged appearance being due to dirt. Exposure in copying is largely a matter of trial and error, but, in general, there is little risk of over-exposure. Out of doors an exposure meter can be used. Indoors, near a good north-lighted window, at mid-day in bright weather, using $\Omega$ stop of $\mathbf{f} \mathbf{l 6}$, ordinary medium speed plates, from $\frac{1}{2}$ to 1 min . would probably be sufficient.

With artificial light from 2 min . to 2 hours may be required. It is best to waste a plate at first on a trial exposure. Drawing out the slide about $f$, a minimum estimated exposure of, say, 5 min . with a strong light may be given. Exposing each successive $\ddagger$ of the plate for double time, i.e. starting with 5 min . and then giving 10,20 and 40 , the correct exposure can be judged after the plate is developed and printed. Therenfter, if the same lights and the same plates are used and the same distance kept between camern and copying hoard, no difficulty will arise. If it is necessary to make copies in different sizes, reference should be made to tables of relative exposures in a photographic text-book. It is particularly desirable to keep to the use of one kind of plate in copying work to olstain uniform resulta. See Blue Print; Panchromatic; Photography.

COPYING INK. A special ink is used to copy lettera by pressing them upon damp tissue paper. This copying ink is best made by evaporating 10 volumes of ink until reduced to 6 , and adding 4 volumes of glycerin. Sugar cancly dissolved in the ink may be used in place of glycerin. Ink for copying pads or heclographs is made by dissolving methylviolet aniline dye $10 \%$., in a mixture of water: 7 oz ., and methylated spirit 1 oz . See Ink.

CORAL: For Wearing. The value of coral, which is fashioned into many pretty articles of jewelry, depends upon its colour and upon the high polish which its close, hard texture permits it to takc. It varies from a deep red to a delicate rose or tlesh tint, and sometimes a milk-white variety is obtainable Coral is essentially suited for children's orna. ments. A string of pink coral beads is a favourite olpistening gift from gorlparents to a baby girl.

CORAL SPOT.
No fungus is more plentiful on cleadtwigs and dead branches and more familiar to every gardener than the
coral spot It is abundant and conspicuous in damp weather on dead branches of elm, lime, poplar, sycamore and many other trees, and is always to be noted plentifully on old pea-sticks, particularly hazel, in autumn and winter. The coral spot fungus may be recog. nized by the small pink or flesh-coloured warts which are thickly scattered over the surface of the dead and dying branches. The warts are spore-pustules, which consist of fungus filaments bearing masses of spores.
On fruit trees coral spot is particularly common on red and black currant and goose leerry, but it also attacks apples and pears. The fungus gains entrance in two ways, viz., through dead branches and through wounds All dead shoots and branches should therefore be removed during pruning and care taken that no snags which will die back are left. Injury to bushes should also be avoided, whether in pruning or in cultivation with the hoe. Wounded surfaces should be protected by tar. Discased branches should be cut clean out, taking care to cut back to healthy wood and to protect the wound.
Accumulations of dead wood and sticks should never be allowed in an nichard. On such débris fungi of all sorts flourish, and millions of spores are liberated and blown amongst the trees. The better the sanitary condition of the orchard, the less the chances of infection by fungus parasites. This information is taken from Leaflet 115, issucd by the Ministry of Agriculture. See Apple; Black Currant: Gooseberry: Peas: Red Currant, etc.

CORBEL: In Architecture. This term is now used of any masonry built in tiers outwards from the piane. Even the upper storey of a house that overhangs a lower storey may be said to be corbelled. In modern building, however, the term is chietly employed in connexion with purely omamental features, generally stonework, but sometimes timber, on the exterior of a house, and is rarely seen except on structures of some pretensions. In the latter a corbel support for an oriel window sometimes affords effective relief to the façade of a house.
In brickwork corbelling is a method of laying bricks where onc or more courses project above the others. Corbelling reduces the stability of the wall, unless compensated by a leam or floor joist, spanning the space between two walls. See Brick.

CORD : How to Purchase. Wholesaie, the cheapest way to buy cord is in a 50 yd . hank. The poorer quality cord is used for clothes lines, which should to well washed heiore use, to prevent the clothes from getting soiled. The better quality cords are used as sash cords, blind cords, for hanging pictures and binding cushions. Thich cord is necessary for window sashes, and for this purpose a speetial kind is sold. Linen blind cord has two qualities. It can be purchased in white, green, crimson and brown. Upholstery and cushion cord is sold by the yard in any colour. Fancy cords of twisted silk and silk mixtures are used in fancywork and upholstery. Piping cord is used in gauging cushions and to cover seams in dresses, etc See lirer; Blinds; Clothes Line; Picture; String.

CORDON : For Fruit Trees. These are invaluable for small gardens, for they take up little room and produce first-clas fruits There are both upright and horizontal cordons. The single-stemmed upright cordon is chietly grown, though each tree may be trained with two or three stems. The horizontal cordon, which is very useful for planting alongside a garden path, has a stem about $12 \mathrm{in}$. one long branch, trained horizontally, on cach side. Single-stemmed upright cordons may be planted at 18 in . apart, those with two or three branches must obviously be placed farther
from each other. Instead of being perpendicular, the branches are often trained at an angle of 50 degrees to prevent the growth becoming vigorous at the top and weak at the base


Apples and pears are chietly grown as cordons. Plums do not riourish in this form. Gooseberries and red and white currants do well as cordons. The trees niay be trainerl against a trellis in the open border or on a wall. Cordons must be hard pruned or they will soon cease to be cordons. The side shoots which grow in summer are pruned to within about six leaves of the hase in late July, and these shoots are again shortened in winter, lea ving only two or three buds. As the trees age the fruit spurs will becone large, and a few of them ought to be cut back every year. Summer growth at the top of the cordon is pruncd by about two-thirds every winter until the tree has reached the desired height. It must then be treated in the same way as the side shoots. Vigorous varietics of apple and pear are not so suitable to grow as cordons as those of inoderate vigour. See Apple.

COREOPSIS. The annual and perennial coreopsis are very free-flowering hardy plants ; they yield a wealth of long-stemmed ilowers in summer. The best of the perennials are grandiflora and auriculata superba, botlı having yellow flowers: they are, however, not long-lived, and it is usual to treat them as biennials and raise a fresh lot of plants each year. Seeds are sown out of doors in June to provide plants that will flower the following year. The seedlings aro set in their final position in October. The annual forms of


Corespsis. Golden-
$\mathrm{y} 0110 \%$ flowers or Coreopsis grandillora
coreopsis are sown out of doors in March-April, where they will bloom from July onwards: tinctoria, yellow, atrosanguinea, dark red, and Drummondii, yellow, are some of the best.

## Corer. See Apple Corer.

CORIANDER. Flourishing in light, warm, sandy soil, coriander is a hardy annual which produces white flowers on stems $1 \frac{1}{2}$ to 2 ft . ligh in June. As it soon runs to sced, those who want a continuous supply should sow at intervals from March onwards, and thin to about 9 in. apart. Coriander is almost exclu. sively grown for the sceds, which are used in the manufacture of liqueurs such as kümmel.

It is also used in medicine, the dried ripe fruit being an aromatic and carminative. It yields an oil, of which the dose is $\frac{1}{2}$ to 3 minims. This is used in some of the preparations of rhubarb and senna to prevent griping

Coriander is also used for flavouring confectionery, and forms one of the chief ingredients in the making of curry powder. The leaves may be used in salads.

CORK : For the Home. The light, porous bark of the cork-oak has numerous applications in industry, and is chiefly found in the domestic sphere in the form of stoppers for bottles, floats for fishing-lines, and cork mats For the latter purpose it is prepared as a composition. Cork linoleum is an instance of its use in industry. The amateur can repair cracks and bad places in cork linolcum by using a pasto composed of finely powidered cork and shicllac varnish or hot beeswax This is pressed into the cracks and smoothed off with an iron bar, warmed to prevent the shellac chilling too quickly Colouring pigments may be added
A cork that is a little too large for the bottle may be made to fit by rolling the cork on the floor and pressing upon it with the sole of the boot. When a cork lecomes lodged in the neck of a bottle an effective way of loosening it is to hold the neck before a fire, or to wrap it up tightly in a thick piece of cloth which has been previously heated. This will have the effect of expanding the glass slightly, and the cork will then come out readily.
Cleaning Hints. Instead of throwing away old corks it is worth while to colleot them in a box, because of their practical value as cleaning agents. A cork dipped in paraftin is effective in removing rust from metal and stains from lamp-glasses and hearth-tiles, while disfiguring marks on polished wood and also on wall paper and window-panes will often yield to treatment with a dry cork. Stains on aluminium and enamelled saucepans can be removed by means of a cork dipped in salt, and kitchen knives, together with any cutlery not made of stainless steel, are best treated wit $h$ a moistened cork rubhod along a bar of houschold soap. Burnt marks on plates can be removed by means of a cork dipped in a little dainp saii ; spots on linoleum disappear when mbbed with a cork repeatedly dipped in benzine or petrol See Bottle ; Bung ; Cramp ; Linoleum ; Mat.
CORKSCREW. The ordinary corkscrew made with a wooden handle and a twisted wire worm or screw docs not always get a suflciently powerful grip on the cork, and sometimes pulls out, lenving the cork in the bottle Another type of all-metal corkscrew has n cast inetal handle with ears at the side to provide a powerful hold.
Many kinds of selfextracting corkscrews have been evolved. In one characteristic type the worm is driven into the cork by turning the handle at the top. This drives the care down until it engages with the top of the bottle. Further rotation of the handle draws the cork out of the bottle, this being accomplished by the screwed shank of the worm itself, which winds its way up the cage, bringing the cork with it.

In the absence of a proper corkserew a cork can often be drawn ly screwing a stout wond
screw into it and grasping the head with a pair baking powder, 1 well-beaten egg, and 1 tableof pincers. Another method is to insert two knife blades between the cork and the neck of the bottle and on opposite sides of the cork By grasping both knife handles with a cloth the cork may be removed with a screwing motion. See Bottla.

CORE SOLE. These inner soles are usually inade of compressed granulated cork, covered with felt, and are used either to secure increased warmth for the feet in cold weather or to fill footwear which is slightly larger than required. The comfort attendant upon wearing cork soles can be increased by fixing them to the soles of the boots with dextrine paste.

Cork soles can be manipulated to afford soine relicf from the tortures of an enlarged toe joint or a callus on the sole of the foot. Remove the stocking and moisten the affected joint or the hardened skin so that when placed upon the cork sole their exact position will be clearly indicated. With a sharp pocket-knife cut away the part o' the sock inarked, slanting the knife so that the edge of the cut will slope outwards. Sockets will thus be formed that will relieve all pressure upon the affected parts.

A common fault in walking, namely, treading over the heel, can be cured by a cork half sole cut as follows. Procure a piece of cork it to $\frac{1}{} \mathrm{in}$. thick, as long as from the heel to the ball of the foot and half as wide as the tread With a sharp, knife cut this on one cdge to the sliape of the foot. This should be pasted into the boot with dextrine on the sids which is usually trodden down. See Boot.

CORN : Elow to Remove. Pressure or prolonged rubbing on the toes or soles of the feet causes thickening of the skin into painful circular swellings with a core or oye in the centro. These are hard corns, but where the feet perspire frecly soft corns may develop. Tight boots are a common cause of trouble, and beforo anything can be done thicy must be exchanged for boots that fit casily and so relieve the pressure. Ridges, creases, or lumps inside boots may be responsible for corns, and in such cases the boots should be sent to the shoemaker for attention. Often a pair of cork soles is of assistance.

Corns are removed either by cutting or by applying a plaster or solvent of which salicylic acid is generally the base. It may he used in the form of salicylic collodion, collodium callosum, or salicylic plaster $10-40^{\circ}$ per cent. The collodions are painted on and allowed to dry. If the plaster is used, a piece sufficient to cover the com is applied and kept in position by a strip of adhesive plaster. These preparations may be left on for 4 or 5 days, when the softened skin is peeled off, and another application made if required. If necessary, the foot may be soaked in hot water to get the dressing off.
The removal of corns with a razor or knife requires some skill and care. If bleeding occurs an antiseptic dressing should be applied to prevent poisoning of the wound. For soft corns socks with separate compartments for each toe, similar to gloves, may be worn or pads of cotton-wool may be placed between the toes during the day. The thickened skin should be removed by applying a salicylic plaster, or a little piece of felt with a central hole to fit over the corn may be used to separate the toes, the hole in the centre being filled with powdered salicylic acid, The skin between the toes should be frequently washed and carefully dried and painted once a day with spirit of camphor. A zinc powder may then be clusted on. See Bunion; Chiropody; Foot.

CORNCARE . These cakes are of American origin and are made of the best yellow maize meal. Mix together 1 breakfastcupful each of maize meal and milk, quarter of a cupful sugar, half a teaspoonful salt, 3 level teaspoonfuls
baking powder, 1 well-beaten egg, and 1 table-
spoonful warmed butter. Blend all these very thoroughly and spread the mixture in greased tins until they are lalf full. baking them in a liot oven.

CORN COB. These green cobs should be cooked quickly after they are cut, as they soon deteriorate. Remove the husks and strip off every thread of the silky fibre. Take some of the cleanest of the liusks, wrap thesc round the cobs, and tie them in place. Lay the cobs in boiling, slightly salted water to cover them, and cook them quickly for about 10 min . after the water reboils. When nearly cooked, try one of the kernels to see if the raw taste is destroyed; if so, drain them at once from the water, or the kernels harden and lose Havour Then remove all the outer husks and serve the cobs on a hot dish with oiled butter, seasoned with cayenne and salt. When eating the corn, score each row of kernels through with the point of a sharp knife, pressing out the centre of the grains with the teeth or the knife, and leaving only the indigestible hulls on the cob.

Another way to prepare the green cob is to make it into fritters or rissoles Grate or chop the grain finely, allowing to every breakfastcupful $2 \mathrm{eggs}, 1$ dessertspoonful of melted butter, twice that amount of milk, and about a tablespoonful of flour. Beat the eggs well, and while still beating them slowly drop in the grated corn. Season the mixture, then add the inelted butter and the milk, and bind the whole with the flour. Form it into round flat cakes, and fry them in hot fat. This dish should be served very hot. The unripe grains of the corn cob are roasted to make pop-corn, while hominy, maize meal and cornflour are all products of the ripened ear. See Cornflour ; Hominy ; Maize.

CORNED BEBFP. A round of beef is required, and this must be pickled and then slowly simmered. To pickle the beef, 2 quarts water to $\frac{1}{2} \mathrm{lb}$. coinmon salt, 3 oz brown sugar, and $\frac{1}{2}$ oz saltpetre must be used. These ingredients should be boiled together for 10 min . and then skimmed and strained. When the liquor is cold the meat should be immersed in it and allowed to remain for about 10 daya. The use of an earthenware vessel is advisable for this process. After the 10 days' iminersion, the beef should be boiled up with sufficient warm water to cover it, simmered gently for $2-3$ hours, and lifted out when cooked. See Beef.

CORNER CUPBOARD. The comer cupboard is a cupboard made to fit in the comer of a room. It originated in the 18 th century, and soon became a decorative piece of furniture. It was made of oak and mahogany, and some had a glass and some a solid front. Ma yy were inlaid with ebony, box and satin.
wood. Instructions for making a hanging corner cupboard in the Chippendale style are given in the article cupboard (q.v.).

A corner cupboard as shown in Fig. 1 is of service in utilising space that would otherwise be lost. and often furnishes an awkward blank. It can be tastefully handled without elaborate construction, and whether finished with a straight or bow front, should not set up) undue difficulties. The height from ground to table top is 3 ft . and depth on angle back to front is put at 1 ft . 6 in ., which will give a width over front of 2 ft . 1 in . These sizes can. of course, be altered slightly to meet individual requirements.

The style of the cupboard would agree with Chippendale furniture Bow-fronted oupboaid of the earlier period, and either wainut or
mahogany would be a suitable wood to use. Uak, stained to a nut-brown colour and with panels bevelled, would achiere a good result. The cupboard can also be made of birch, Amcrican whitewood or pine, painted to a green, vermilion or blue-black colour and decorated with a Chinese design in gold lacquer work. The cupboard can, of course, be constructed to size in several slightly varying ways, and it is rather with the lighter and cheaper method that these details and notes are offered, the enlarged sketch of cabinet front (Fig. 2) giving an alternative finish to Fig. 1.

The top (A, Fig. 3)


Fig. 2 Alernative deriga for the bowtroated oupboar 1
can be of $\frac{1}{8}$ in. thickness (or oven $\not t$ in hardwood if of picked wood, sound and dry) glued up of narrow boards with the grain reversed, to cut 1 ft . $7 \frac{1}{2} \mathrm{in}$. by 1 ft . $7 \frac{1}{\frac{2}{2}} \mathrm{in}$. on the angle. The frame front (B) is finished hollow mould, as indicated, to a curved line showing 3 in . to 4 in . projection in centre, and the top (A) will follow this line with $t \mathrm{in}$. projection beyond it. The piece will be finished $\frac{2}{8}$ in. thick, making (with the top) $1 \frac{1}{8}$ in. thick. It has a mortise cut in


Carnar Capboard. Fige 8-12. Diagrams ahowing how to make the coruer cupboard illustrated alote
by $\frac{3}{3}$ in net will allow for paring to shape. The angle battens ( C ) are rebated into each other in the corner at back and halved into $B$ at front, the mortise being cut through hoth. Pieces 1 ft .6 in by 3 in. by $\frac{7}{6} \mathrm{in}$. net will answer for these; they are set in $\frac{1}{} \mathrm{in}$. from angle edges of top (A). The inner lining of top (D) can be of $\frac{3}{8}$ or $\ddagger$ in. thickness, cut to finish flush with angle edges of $C$, but set in sufficiently under B to serve as a stop for the doors to close against when hinged. The bottom frame ( E ) can be put together in a similar manner of material about $1 \frac{1}{2}$ in. thick, the bottom ( $F$ ) being glued and panel pinned down to serve as a stop for doors in line with D above. The upright ( $G$ ) tinishes 23 in . by $\bar{k}$ in., or in pine had best be made up to $1 \frac{1}{8} \mathrm{in}$. thickness, with $f$ in. hardwood facing. A length of 3 ft will include joints and paring.

The angle sides ( H ) of $\frac{3}{5}$ in. or $£$ in. thickness, tongued or butted together, can be nailed into rebate top and bottom or can be grooved in. The part plan (Fig. 5) refers to the above and indicates, in the wall angle, an upright (J) tenoned top and bottom in similar fashion to $G$, of material $1 \frac{1}{2}$ in. by $1 \frac{1}{2} \mathrm{in}$. or so.

The doors, as lig. 2, with llush fronts to finish in line with uprights ( $G$ ), are made up on a framing in the manner indicated by Fig. 11 Two uprights $1 \frac{1}{8} \mathrm{in}$. wide, and three rails, say, 2 in . wide, are halved and acrewed together. The rails can be cut to shape from the solid, or laminated on a template to finish $\frac{8}{8}$ in. thick in oak or other hardwood, and ? in in pine. They are then faced with stout three ply or $\ddagger$ in hardwood boards, which require to have the meeting edges alightly bevelled to olitain a good joint.

## Details of Door Construction

The material used should be thoroughly well seasoned, and the surface of door can be veneered. The angle of bevelling is easily ascertained from the working drawing by a pencilled line connceting the set-out of meeting edges with the centre from which the front curve is struck. The doors are hung on uprights with fancy plate hinges of the Queen Anne type, or a form of strap hinge could be adopted. In the design illustrated at Fig. 1, $\Omega$ three-beaded fillet, to finish with $\frac{1}{k}$ in. projection beyond face of doors, is fitted to the meeting elges in centre, size being $\frac{3}{8}$ in. by \# in thick. (See detail in Fig. 12.)

A more substantial method of construction is indicated by the part plan (Fig. 4). In this way the angle sides are framed up by mortise and tenon and grooved for panels to finish llush inside, the whole being tongued into tho "prights (G) and rebated together in the wall angle. Both bottom and top are then rebated and dovetailed flush into the frames and pil. asters and afterwards screwed. A little relief, in a simple way, can be given to the uprights (G) by mounting a length of moulded flat after the manner indicated at M, Fig. 9. This also indicates the calinet as finished with a straight, instead of a shaped front, the doors being of the nsual mortise and tenon type, with panels rebated in and beaded from the back. In this case a $\frac{1}{i n}$. ovolo mould worked round the pancl opening has a neat offect. Stiles can be $1 \frac{1}{2}$ in. wide and rails 5 in. wide by $\frac{7}{z}$ in. thiok. Ball feet of the bun pattern can be fitted, cut and shaped from blocks 3 in . by 3 in. by 13 in., and screwed on.

The interior fittings consist of three shelves supported on $1 \frac{1}{2} \mathrm{in}$. by $\frac{3}{3} \mathrm{in}$. fillets, screwed and glued to the angle sides, or toothed into the uprights. The front edges of the shelves may be made to heighten the effect of the cupboard when opened by shaping them to either of the alternative lines indicated at Fig. 6. A section of upright ( $G$ ) entering top is scen at Fig. 7, and a section for built-up top with door closed at Fig. $8 . \quad$ Fig. 10 is an alternative mould for the front of the cupboard. See Cupboard; Lacquer.

CORNER DRESSER. The corner dresser shown in Fig. 1 is made in oal;, and embodies in-its detail many Jacobean features. Nearly all the joints of the under part are of the mortise and tenon type, the only awkward
 part being the juncture of the sides into the front legs (Fig. 4), for since the legs arc turned it will be obvious that the square portion at the top must not be cut away at a greater depth than the top nember of the turning.
This difficulty can be obviated by setting the job out full size, as in Fig. 3. Fig. 4 shows just how much to cut away and how the side of the leg is cut in to take the side rail. The back and the front legs are from 2 in.
under the top is glued to the carcass only, so that the screws hold the top.

The upper fortion mensures 4 it 6 in in height. No back is shown in the illustration, though this may be added if desired In that caso the ends would be rebated and the shelves recessed in a line with the rebato to take the back. The ends and the corner picces are inade from 1 in. stuff and are grooved to take the sholves, the tops heing rebated for the top. Next cut out the top. and upon this mark out the shelves to ensure their fitting accurately with the top. These shelves are tongued and grooved together at the angle, (Fig. 2), and are grooved into the corner pieces in a similar way to the ends. They also have a bovelled groove run along the top near the back, in which the plates stand.

A rail 2 in . wide is tenoned at each side at the bottom into the ends and corner pieces. When glueing together, fasten all the shelves into one end first : next into the other end. the top being put on last. The cornice moulding is glued and pinned round the top and the shaped heading fixed, as in Fig. 5, by cutting away the ends and nailing, and by screwing to the back of the moulding. The complete upper portion is not permanently fixed to the lower, but rests upon the top, secured by dowels. See Dresser.

CORNER SEAT. As a rule, a corner seat will look best with the woodwork finished to inatch the woodwork of the ronm. Thus, in some rooms it will be painted or chamelled in ivory or any colour used for the skirting and door, etc., in others it will be stained a dark brown colourand finished by wax polishing. An

squares, and the two side logs 2 in. by 1 in. These should betirst prepared toshope (the front legs being turned) and mortised and all rails cut out. The tenons of the side rails should be run right through the side legs and be wedged from the bick. When glueing together, it is advisable to glue the front first and allow it to set: then phue the two back framings and finally the siiles. It is necessary slighty to strain the rails outwards when doing this.
When dry, the drawer runners are fixed. It is impesssible to allow the drawer to take up the full width of the front, as this would mean that the drawer would have little or no depth. The difliculty is surmounted by recessing the drawer sides from the onds, as in Fig. 3, and fixing tho runners accordingly. These are dovetailed into the front rnils and sunk into the back rails and nniled or screwed. The drawer sides are duvetailed into the back in the usual way, and a doveluil is cut right across the drawer front for the front joint. After this is inade, it should be put into position and guides fixed to the lower rumners at each side. The top overhangs at the back 1 in., that it may come llush with the wall (the skirting prevents the legs from reaching the wall) and is pocket screwed from underneath. The mitred mouldings on the drawer front and those round the framework com plete the under part. Note that the moulding
impression of the finished job is given in Fig. 1. and details of construction in other diagrams. The size may be modified to suit requirements. the dimensions given being appropriate to ronms measuring about 15 by 20 ft .

The simplest way in which the amateur can make such a corner seat is by using the ordinary commercial building deal, selecting pieces that are as dry and as free from knots as possible. For the corner posts use ordinary 2 in . by 2 in . and plane it up nicely to 18 in . square, cut to length ( 4 ft .), and shape the tols by careful paring with a paring chisel. Mark out and cut the mortises for the back ratil. This can be inale from if in. $T$. and $G$. prepared tlooring 6 in. wide. When planed up it will measure ahout $1 \frac{1}{8}$ in. thick, and he


Corner Seat. Fig. 1 Old-fashioned seltee which cin be made by the hame woodwarker


The tongue must be planed off, and the edge rounded: the groove can be widened with a plough plane or chisel to accommodate the 会 in. seat back, as shown in the detail, Fig. 4.

When the two back rails have been fitted to the mortises in all the corner posts, they may be put aside and the two sides prepared from lt in. T. and G. flooring. Five pieces of $G$ in. flooring will be needed to form the end, and should be glued together, well cramped up and allowed to set. Then glue and screw on the $1 /$ in. square battens (Fig. 4).

Afterwards cut the boards to the shape required and finish off the edges by rounding thein with a spokeshave. Take care to have the projecting tongue on the wall side, as this has now to be fitted to the two outside corner posts by ploughing a groove along the face to take the tongue, as shown in Fig. 3. Glue the tongue and seeure to the comer post by long, thin screws put in from the back.

Prepare two brackets from $1 \frac{1}{f}$ in. wood, to the sizes in Figs 2 and 5, and a similar one but 15 in. long for the angle comer. Next fit a 3 in . by 1 in . bearer, by notching into the angle corner post as in Fig. (i. Mortise the bracket into it, and cut a flat on the angle face of the post to allow the bracket to seat home upon it. Take carc also to set this bearer and bracket at the same angle as the battens on the end jicces. Ilue and screw the bearer and bracket in place, and fix the top rails to the corner posts, standing the whole structure on a level surface and securing the bottom with a temporary strut. T'est the corners and sides to see that all is square, and then cut the pieces for the seat, initrcing them carcfully at the anglecorner. Glue and screw the first boards in place, then cut and fit the remainder, cramping them tightly together, after glueing the joints, and making them secure.

The seat is best made from $1 \frac{1}{}$ in. T. and $G$. Hooring, arranging the tongues to the front. If a circular corner is wanted cut and fit the pieces to make up, g'ue them in place and finish off by the spokeshave while in their proper jlace, also shave off the tongue and round the edge of the seat. The seat can be sccured with $2 \frac{1}{2} \mathrm{in}$. oval brads punched well below the surface.

Drill the dowel looles and glue the brackets in place. Then cut the back pieces from 8 in. boards or from sin. T. and G. inatchboard, and prepare the top so that it fits snugly into the groove cut in the back rails. Glue and screw the $1 \frac{1}{i n}$. square fillet to the seat and glue and jin the back boards with 1 in. oval brads.
A channel must be cut across the corner josts at the outer ends where the scat back slants across. This can best be done by marking the exact position from one of the seat back boards and then sawing and chiselling away the unwanted parts. A little detail
fitting is called for at the angle comer, as the two end boards will hasc to be cut tapering somewhat, and the edges mitred.
In order to make the corner firin they can be blocked up with wooden blocks glued in place from the back and inserted letween the post and the reat back.

CORNJR WARDROBE. The corner wardrobe as shown at Fig. 1 is enclosed with curtains and is suitable for fitting in the hall, on a landing or in a bedroom.

The fitting is shown complete at Fig. 2, and a plan with a suggested dimension at Fig. 3. The boards forming the top could be 1 in. thick, with grooved and tongued edges, cut to fit the comer. The top is nailed to the sides, which are 3 in. deep by $\frac{1}{y}$ in. thick section, rebated and nailed together at the back as at Fig. 4. The front corners of the sides are rounded, and finish abont $t$ in. in from the edge of the top. The pediment is 4 in . high by $A$ in. section, glued and nailed above the top. A piece of 1 in. moulding should be fitted along the edge, and a few glue blocks fitted between the jediment and top, as indicated in Fig. 5.

Three or four coat hooks should be fitted at each side, and a swivel hook in the middle

Pig. 1
Corner Wardrobe. Fig. 1. Useful fiment consisting of a wooden top and curtains.
of the top, as illustrated at Fig. 2. The fitting may be fixed to the wall with hanging plates, or nails may be driven through the sides into the wall, a suitable height being about 6 ft . from the ground. A pair of curtains is generally
more convenient than one, and they may be easily suspended from a wood or metal rod fitted to the edge of the top with a screw eye at one end and a hook at the other, 28 shown in Fig. 6. Brass rings sewn to the curtains a little from the top should be used. Sce Bcdroom; Wardrobe.

CORNFT : How to Play. The player holds the instrument with his left hand. fingers around the valves, while his right thumb is placed under the main tube between the first and second valves, so that he can easilv press the pistons with the first, second, and third fingers. The finger action from the knuckle-joint must be firm yet agile, and care must be taken to allow the piston to return to its norinal position, by raising the finger very slightly above its surface. Put the mouthpiece to tho centre of the mouth, the lower lip occupying two-thirds of the cup. The sound is produced by forcing breath between the tense lips, the air in the tube being thus made to vibrate. Increased pressure results in higher pitch. Breathe through the nostrils or the sides of the mouth, but not through the instrument.

It is advisable to use a plated cornet for the reason that it looks nicer, while so far as the cup is concerned, plating may obviate any trouble arising from sore lips coming into contact with brass. Should the valves work stiffly, the remedy is to unscrew the cap, take out the piston, wash it, dry it witl a soft silk handkerchief, slightly moisten it, and replace. It should never be oiled. Should grease get upon it, the lest plan is to wash it in hot water, dust it with French chalk, replace it. and work it until it moves freely. It should then be washed again in order to get rid of the chalk. A little water is the best lubricant for this purpose.

CORNFTOUR. Comflour, which is obtained from finely ground Indian corn, is used much in the same way as ordinary flour, but is better adapted for thickening sauces, sravies, and soups, as its flavour is more delicate. It is specially valuable in making blancmanges, puddings, and cakes. It should always be moistened with a little cold milk or water before being used for thickening. See Arrow. root; Blancinange.

CORNJLOUR CARE. To make these takc

fis 3 Figs. 2-6. Diagrams showing how curtains are hang and method of fixing hools o7. mar garine, 3 eggs, and a teasjoon. ful of baking powder. Beat the margarine and sugar to a creamy consis. tency. Then add the cggs, one at a time, beating each in well. Mix the flour, comflour, baking powder, and a pinch of salt together before stirring them lightly into the mar. garine, eggs, and sugar. Beat the whole light. ly but well, turn it into patty tins, and lake the cakes in a moderate oven until they are done.

CORNFLOUR MOULD. A fancy mould is used for this sweet. To prepare it, mix $1 \rho 2$ cornflour to a smooth parte with a little milk, putting what remains from a pint into a sauce-
fire, then pour it on to the cornflour; return the whole to the saucepan and bring it to the hoil. Let it simmer for 6 min , keeping it well stirred, add 2 dessertspoonfuls castor sugar, and draw the pan from the firc to cool the mixture slightly.
Beat up the yolks of 2 egga and stir them quickly into the cornflour. Cook the whole slowly at the side of the fire for $\boldsymbol{n}$ few minutes, hut do not let it boil Cool it again slightly, then add the stiflly whisked whites of egga and a few drops of vanilla. Finally, stir in $\ddagger$ oz. leaf gelatine dissolved in $\frac{t}{2}$ gill of hot water, and pour the whole into a wet mould. Turn it out when set.

CORNFLOUR PUDDING. Blend 2 oz cornflour, 1 tablespuonful custard powder. and $a$ pinch of salt, with a little cold milk. Put what remains from a quart of milk into a saucepan with $\Omega$ thin strip of lemon peel and bring it to the bmil. Pour this on to the cornfiour mixture, stirring the whole well ; return all to the saucepan, and boil it for 8 min ., stirring all the time. If the mixture is too thick, add a little nore milk or water. Then put in 1 oz . sugar and n few drops of any Havouring essence, and pour the whole into two soup plates previously rinsed in cold water. When the mixture is cold and set, warm a little jam, put the contents of one soup plate on to a glass dish, spread the jam over, and then put the other portion of the pudding on top. Sprinkic ohopped nuts over it when dished.

CORNFLOWER (Centauren cyanus). This favourite hardy annual bears blue, white or rose-coloured flowers. The best results are


Cornthower. Fiowers of Centaurea montana, popularly called the perennial cornflower
obtained by sowing seeds out of doors in early Neptember. The final thinning of the seedlings should be done in spring; the plants left to hoom ought to be $10-12 \mathrm{in}$. apart. Seeds may also be sown out of dours in spring to provide Howers from July onwards. Centaurea mon fana, sometimes called the perennial corn Hower, grows 2 feet high and hears summer tlowers of various colours. It lives on from vear to year and is increased by division in nuturnn or spring

CORNICE : Of the House. A cornice is an ornamental moulding applied to the upper purts of the walls. Modern cornices are frequently used as decoration without practical significance, and may be minde in several different materials, such as stone, brick, stucco, Portland and other artificial cements. In
cabinet and other work, the moulded top, as of a wardrobe, is also known as a cornice.

Cornices for the ceilinge of ronms are com posed of plaster and cement. They are sometimes produced by casting in moulds and screwed to wood grounds fixed in the building. Plaster cornices are, however, usually run on the work itself. The backing for the cornice is first built in briok or stone roughly haclied to the shape of the moulding, or is constructed in wood with rough brackets, lathed ns if for a ceiling

In fire-resisting construction, steel lathing is used, and is secured to bars bent to the required shape. The pricking-up or rendering coat is trowelled on as in ordinary plastering. The second coat is applied thickly, and the mouldings are formed by dragging a template cut out of zinc on wooden guides already nailed in position. The final coat in internal work is generally inade of gauged stuff. composed of one part of fine stuff, lime putty, and washed sand in equal proportions, to one part of plaster of Paris. This is a quiok setting mixture, and the plasterer only applies as much as he can finish at one operation

The guide rails of the template ensure a good joint at the commencement of the next length of run. Plaster of Paris is soluble in excess of water, and where used in external work must be protected by several good conts of oil paint. Where backings of cornices are built of brick, the greatest care must be taken to ensure that their connexion with the wall is thoroughly sound in every way.

Where two walls meet at cither an external or internal angle the cornice on these walls meets in a mitre line. A mitre mould is sometimes employed, but the angles are, as a rule, made by hand, and are mainly worked with the joint rulc, the smaller members and those at the top and bottom being first worked, and the larger nembers rulerl in afterwards. See Adam Style; Cappinga : Ceiling ; Moulding ; Picture ; Plastering.

CORNISH HEATH. This is a benutiful Hpecies of English heather, found wild in Cornwall. Its botanical name is Erica vagans. The small pinkish mause flowers come out in August and September. The plant forins very neat close clumps, from 6-12 in. high, and is extremely useful for edgings to Hower gardens. See Heather:

CORNISH PASTY. A plain short-pastry is needed, and the meat is best when uncooked; but cold cooked meats can also be used up in this way To two amall potntocs and half an onion 8 oz. meat are allowed, all cut small, mixed together with seasoning, a sprinkling of mixed herbs, and a tablespoonful of gravy When the paste is made, it should be rolled out and cut into rounds. A portion of meat and vegetables is laid in the centre of one half of the mund of pastry, and the other half is foldel over, the edges being moistened and pressed together. The top of the scallop must be pricked twice with $n$ fork to let the stenm escape. The pastios are then baked in a moderate oven for about half hour.

A sweet Cornish pasty can be made by placing a large spooaful of jam on the pastry instead of meat. Slit the top covering once or twice with the blade of $\Omega$ knife. In this way the jam escapes when it boils up in the baking. without spoiling the appearance of the pasty. In Cornwall the custom is to pour the cream through the slits in the pasty cover as soon as the pasties are cold


Cornish Pasty, Dish of light pastry turnovers which can be made with meat of jam

CORNISH SPLITS. Sieve $\frac{1}{2} \mathrm{lb}$. flour, and rub well into it $1 \frac{1}{2}$ a\%. Inrd. Then ridd a teaspoonful cream of tartar, a level dessert. spoonful sugar, a pinch of salt. and mix well together. Disanolve half a teaspuonful hicarhonate of surla in $\ddagger$ pt. milk, or sour mills if is is arnilable. Pour this over the other ingredients and mix quickly to a dough. Turn it on to a floured board and roll it very lightly and quickly to $n$ thickness of abont 1 in Cut it into rounds with a pastry cutter about the size of the top of a tumbler. put them on n floured baking sheet, and hake in a moderate oven until browncd. When these little acones are cold, split then in halves. Spreal cach half thickly with jam, and put on the tup of each a large diab of clotted cream

CORONILLA. These herbacenus perennials and shrubs, which bear pea-shaped flowers in summer, need well drained soil and $n$


Coronilla. The pink-flowered Coronilla varia
place in the sunshine. The chief favourite is Coronilla glauca, which has yellow flowery; it is commonly grown as a pot plant in the greenhouse but is hardy in mild districta. Cappadocica, which is of trailing growth and bears yellow blooms in late summer, is grown in the rock garden. Emerus is a leaf-losing shrub, 4 fect high. with yellow Howers in spring ; varia has pinkish blooms in summer nad grows 2 feet high. 'The shrubby coronillas are increased by cuttings placed in sandy soil in a frame in August, the others by seeds sown under glass in sprilig.

Corpulence. See Obesity.
Corridor. Sce Hall ; Landing.
CORROSIVE. A pison which destroys tissues with which it comes into contret is a corrosive. Included in this class are the following: Strong mineral acids, such ins sulphuric acid (ail of vitriol), nitrio acid (aqua fortis), hydrochloric acid (spirit of salt); strong alkalies, such as caustic soda; carbolic noid and creosote; strong solutions of oxalic citric and tartarie acids; chlorides of zinc, tin, antimony, and mercury (corrosive sublimate).

When swallowed the substance will havenstrong acid, alkaline, metallic, or sweetish,
pungent taste, according to its nature, the but there are many qualities on the marke last being suggestive of carbolic acid and creosote. There is also an intense burning pain in the mouth, gullet and stomach, and shortly over the whole abdomen The patient vomits, and there is also purging. Difficulty of breathing may occur from damage to the larynx. The patient may quickly show signs of cullapse There will be signs of burning on the lips and adjoining skin, and in the mouth in the shape of white, yellow, or black patches, and signs may also be found on the clothing.
Treatment consists in giving an appropriate antidnte moderately diluted with water, warm fomentations to the abdomen for the pain and to the throat for the difficulty in breathing, and warmth for the collapse. A doctor should be summoned. See Antidote; Poisoning.

## CORROSIVE SUBLIMATE. This is

 another name for bichloride of mercury. It is used, dissolved in water, to form antiseptic lotions: 1 in 1,000 to sterilise the hands before operating or dressing a wound, 1 in $4,000-$ 8,000 for washing out wounds, 1 in 10,000 for an eye or ear lotion. Coloured tablets are sold which tint the water and prevent ite being mistaken for and drunk as plain water ; and they also make it easy to prepare lotions of any desired strength. Metal instrumente should not be put into these lotions, otherwise they are blackened and destroyed. Solutions 1 in 10,000 to 1 in 1,000 may be used for disinfecting linenThe drug is very poisonous, and if taken has a strong metallic taste, and produces a burning sensation in the throat and gullet, severe vomiting and purging, perhape difficulty of breathing, and pain, though this may be absent. The lips and tongue are white and shrivelled. In the end there may be coma or convulsions. Pending the arrival of a doctor, whites of eggs and milk may be given. The patient should be kept warm in bed, in which are placed hot-water bottles, and if breathing is difficult hot fomentations should be applied to the throst

CORRUGATHD IRON. This useful material is made from sheets of iron, by a machine which bends it into a series of parallel ridges or corrugations, thus greatly increasing the effective strength of the material. As generally used for domestic work, the iron is galvanised to render it rust-proof;


When comparing prices be certain of the gauge or thickness of the shcets: a few pence more expended at the outset will often suve pounds in the long run.
A medium gauge is known as No. 24. a light or thin sheet as No. 26, and a heavy as No. 22 gange. The sheets measure 2 ft .3 in . wicle, and are generally stocked from 4 ft . to 8 ft . in length: 9 ft . and 10 ft . lengthe are obtainable to order, although for long spans of over 8 ft . it is generally preferable to use two shorter sheets and to overlap them at the joint.
The approximate weight of a No. 26 gauge sheet is 2 lb . per foot run, a 6 ft . length thus weighing 12 lb . The 24 gauge sheets go a little under 3 lb . per foot run, a 6 ft . sheet weighing 17 lb ., an 8 ft . sheet 23 lb . In conjunction with corrugated iron, it is well to use a few sundries made for the purpose. These comprise galvanised rillge capping, to finish a span ronf at the top or ridge: galvanised nails and washers for fastening the iron sheets to the rafters; and, when required, galvanised shuting to collect the rain water. together with the ncedful stop ends, angles, brackets, and outlet pieces for use with the shuting.

Corrugated iron is admirable for outbuildings, stables, and other erections. The objections to its use for dwelling-houses include lack of durability as compared with tiles or slates, the noise it makes in a heavy rain, and a peculiarity known as sweating. It is also cold in winter and hot in summer, unless special precautions be taken when designing and building the roof. Against these objections are the advantages of cheapness, lightness, and ease of erection. Durability can be gained by repeated and regular coating with preservative paints. When the iron is laid over a boarded and felted roof, with an air gap, the objections of noise and sweating are largely eliminated. This material is satisfactory, when properly applied, as a roof covering for bungalows, etc.
When laying corrugated iron always reckon that a sheet only covers a width of 2 ft ., as the odd 3 in . has to be lapped over the top and edge of the next sheet. Always endeavour to use the iron in its stock length, as it is difficult to cut. The best way to do this is to cut it lengthways with stout tinman's shears or snips. To cut across the corrugations, use the proper kind of chisel, and cut the iron by laying it flat on a solid support, with a hollowed block of lead immediately beneath the chisel. An alternative method is to saw it across with an old hand saw, exactly as if cutting a picce of wood, using plenty of oil as lubricant.
When covering a roof, if the length of the sheet is sufficient to reach from ridge to eaves in one piece, work from the ridge downwards. If two or more sheets are needed, begin by planning out the best arrangement by placing one sheet at the eaves, with its proper projection, temporarily fix another sheet from the ridge, and fill in the gaps by overlapping equally on each sheet above and below. Then fix the sheet next above the eaves course, follow this with the next above, and so on, finishing at the ridge.

It is generally Dreta Section Fig. 2 Brackel more convenient to lay the shcets from eaves to ridge and

Corrugated Iron. Fig. 1.
shoets are fastened to joirts and bolted together. Fis. \& The ond of a building with rooing in progrese
then the next set from ridge to eaves. When three such sets have been laid, fix those on the other side of the roof, if a span roof, then fix the ridge capping. Then do the next
sets, and so on to the other end of the roof. l3y these means it is easier to get at the shects than by laying the whole caves course first. Use a line stretched taut to keep the courses level, especially at the eaves, unless the roof has been boarded, when the line is not needed.

The proper way of fixing corrugated iron is to drive the nails or screws through the ridge and not in the trough of the material, the object being to keep the nail as far as possible out of the water, which naturally runs down in the troughs or hollows. The

corydalis. Porn-like leaves and yollow howers of this hardy perennial plant. 800 below
scantlings needed to carry the iron, as well as questions of the arrangement of the roof, if it is to be boarded or felted, must be decided according to the nature of the building and the purpose for which it is required. See Galvanised Iron ; Roof.

CORUNDUM: An Abrasive. This is a natural aluminium oxide. The finely coloured transparent varieties include such stones as rubies and sapphires, while the impure and coarse forms are known as eniery. Corundunt is used as an abrasive: it is extremely hard, and fractures in such a way as to ensure sharp cutting points, hence its value and extensive use. It is chiefly found in the home in the form of emery powder or knife powder
India oil stones are made of pure corundum in three grades,-fine, medium, and coarse. They are excellent for sharpening tools and the grades are often found in combination on the same stone. See Emery Powder: Grindstone.
CORYDALIS (Fumitory). These hardy perennial plants, $10-12$ inches high, with graceful, somewhat fern-like leaves are suitable for the rock or wall garden. Most of them will flourish in the shade. They like well drained light soil. The commonest is lutea, which has a long flowering season and will thrive in any odd corner. Cheilanthifolia, nobilis, thalictrifolia and Wilsoni are ot her attractive sorts : all bear yellow flowers in summer. A distinct group of corydalis has tuberous roots: two of the best are scouleri, with rose purple blooms in May, and tubeross with purplish flowers in March and April: these may be propagated by detaching small tubers in autumin or by seeds sown in spring in a frame. The fibrous rooted kinds inentioned above are increased by dividing the old plants in autumn or by sowing seeds in spring. See illus. above.

CORYLOPSIS. These Chinese and Japanese spring- flowering slarubs are nearly related to the witch hazels. They need peaty or leafy soil. One of the best is Corylopsis pauciflora,
which bears fragrant yellow Howers in spring. These shrubs are not very hardy and the young shoots and Howers arc liable to be damaged hy frost unless in a sheltered spot.

COSMETIC. A cosmetic is a preparation used for beautifying the akin and the hair. Among them are face creams, hair oils and similar compounds. See Beanty Culture: Beeswax; Face; Hand: Skin; Soap.

## Cots and How they are Made

## Considerations Affecting the Health and Comfort of the Child

The reader may consult the articles Baby; Child; while Nursery; Pcranibulator; Ventilation are other related subjects. See also Bedstead; Coverlet

The average cot for a child measures blankets and an eiderdown complete the 4 ft . by 2 ft . 6 in ., but if spacc is no object, bedding and can lic adapted to temperature.
it is a great advantage to select one measuring 4 ft . 6 in . by 3 ft . The child can sleep in it comfortably up to the age of 5 or 6 years. The cot made of hardwood is to be recommended rather than the iron cot. If the child falls against wooden bars, the injury is stight compared to a similar fall against iron; alao wooden cots can always be obtained in a folding pattern, and can be conveniently carried from room to room, and if they have to be travelled, the charge for freight is comparatively light.

The hars should be perpendicular, and ton close together to allow the child to push its head through. The height of the sides should be sufficiently great to prevent the energetic two-year-old practising his fondness for climbing. It should be possible to let down at least one side of the cot to within 2 in . of the mattress level.

A good hair mattress is strongly advised. It is twice the price of a wool one the same size, but it never goes into lumps and hollows, and is far more sanitary, and can always he re-made and cleancd. Hair pillows are also procurable, and have the advantage of being less heating for the head; hut they are not necessities, and a well-stuffed fenther pillow in a strong case of white drill can be sufely used. Sheets should be avoided in a young child's cot. A mackintosh, an old hlanket, or a thick cotton blanket are hest for it to lie upon. One or two light but warm upper

Many of the hetter-made cots are raised upon legs from the Hoor, so that there is no back-breaking work for the mother or nurse when baby has to be lifted in and out of his bed. These cots are also procurable in a folding form, so that they have a double advantage, especially for families who are accustomed to travel. In the case of a child who sleeps out of doors throughout the summer, the cot can be mounted on rubber-tired wheel castors and fitted with an all-enveloping curtain, arranged by means of a canopy pole and support. Mosquito nets on supports can also be fitted as extra attachments.

Fig. I shows an easily-made child's cot. As indicated the cot is made up of frames. three of which are fixed and one made to lower, and thus give convenient access to the lerdding. A set of castors can be fitted to facilitate change of position; but, as the whole thing is light, it can easily be lifted from place to place. The size for a small, ordinary size cot is 4 ft . by 2 ft ., and the height 3 ft . 6 in . For an older child the next size would be 4 ft . 6 in . by 2 ft .3 in ., after which it would probably prove more economical to construct a form of cot bedstead. Beech, birch, satin walnut, American whitewond, yellow pinc, sjuruce, andred deal are all suitable woods that can be pressed into service. Finish can then lie by staining, or in white enamel.
A commencement may he made with the two ends. The posts are of material $1 \frac{1}{2} \mathrm{in}$. by $1 \frac{1}{2}$ in. spuare, planed and cleaned up to 18 hy 13, and should le
 mortised for the rails as they occur. The tops of the posts can in the aimplest manner he linished by rounding over as at Pig. 3, or, if a lathe is at hand, the upper 2 in. can he turned to a ball linish as at Figa. 1 and 2. Some working turncrs keep in stock $n$ sopply of such turned tinials, and $n$ set-with dowelscan be purchased for a small sum. In alternative method of finish, which is nlso serviceable for the fix. ing of a cot-net, is that at Fig. \&, whilst a neat tinish is afforded hy the fitting of 23 in . hy -? in hy $\frac{z}{} \mathrm{in}$ caps with the upier edges nicely romided as at Fig. 1. These are hest fixed by a short tenon on prosts, although they can
be dowelled and pancl-pinned to prevent twisting out of the squarc if preferred
The mortises for the upper rail should start 3 in from the upper end of post, and the lower end rail can be ift 4 in up from bottom The cot may be framed together on all four sides at the seat, but being intended to have one side pivoted to let down, it is mortised on one side-only to the posts ahove the seat rail The position for pivot holes in posts is about 1 ft . 6 in . ahove ground

Panels and Bars. The top end rails, which are shaped as at Fig. 2, call be finished from pieces 2 ft. by $3\{\mathrm{in}$. by 1 in . They can he tenoned or dowelled to posts, and should also be shallow-mottised on under edges to receive the hars and centre panels. The panels (Fig. 2) are $3 \frac{1}{2}$ in. wide, with a small fret-cut opening in the upper part loy way of relief. A scratch bead may also be cut $\frac{1}{8} \mathrm{in}$. from length erlges with neat effect. The hars can finish $\frac{7}{k}$ in. by $\mathrm{g}_{8} \mathrm{in}$. thick, and, inclucling joints, arc 2 ft .1 in. long. It is possible to use $\frac{3}{3}$ in dowel sticks for the bars instead of the square section. provided they are nicely cleaned up The lower end rails linish $2 \frac{1}{2}$ in wide, and are dowelled or tenoned to posts and mortised for housing the bars and pancls.
The top side rails finish $1 \frac{1}{2} \mathrm{in}$. by 1 in . net thick (two lengt hs of 4 ft ., allowing a tritle for fitting and joints, are requiled), and each rail is mortised on under edge to receive 10 bars Instead of the mortises, a groove may be ploughed the length of the rail, and slips of equal length be packed between each har in the groove The ends of the top rail intended to lower should be banded or ferruled with sheet hrass a lull 1 in wide as a prosision againat splitting. As this rail, when up, is kept in position hy a brass screweye and chain attachment, tenons are re. quired. 'Ihe nttachment con sists of a nut sunk in the rail and kept there by a brasaplate


Cot. Fir. 9. Support for canopy or mosquito netting screwed onl, the eye being tapped to fit the nut, and a length of hrass chain fastened thercto to hook on to a clip
The lower rails are also $1 \frac{1}{2} \mathrm{in}$. by 1 in . net, and are mortised for bars in the same way and, on the fixed side, have tenons cut io enter posts. The loose end, as indicated at Fig. 4, is handed and pivoted into posts, a brass screw with the head filed off answering well for the purpose. The bars can be entered into the rails to their full thickness; or, again, hardwond dowels can he employed closer together. These latter may be spaced with fretcut pianels hetwcen, a suggestion for the latter being given at Fig. 5.
The seat rails can finish $2 \frac{1}{2}$ in. wide by 1 in. or $\frac{7}{6}$ in. thick if tenoned to posts and pinned; or, as is sometimes done, dowelled and stiffenerl with hrass or iron angle brackets to be screwed to angles formed by under side of rails and posts. Wire spring mattresses on iron fraines are made specially for cots, and if one of these is used the whole structure will be rigid and comfortable for the child.
Sliding Side to Cot. As an alternative the side may be fitted to slide up and down a stcel or nickelled rod, or a length of hardwood dowel could he substituted at a pinch. Figs. 7 and 8 will make the arıangement clear. The rod (B) can either be hrazed or biveted into the cup, or may simply rest in it. The rofl is capped at top and held by eyes (C) attached
(1) pusts as indicated, both rails of side being bored for the rod to pass easily through. When up, the sides can be kept secure by the clevice indicated at $\dot{A}$. It consists of a rod with a clubbed end, and a bolt liandle in centre normally pointing towards the ground, the whole being attached to under edge of lower (seat rail of cot side by means of cyer. The clubbed end rests upon a metal box, as at Fig 8, and this bearing keeps the cot side up in position. To lower the cot side, the handle is grasped und raised outwardly, which disengages the club from the box and allows the side to slide down the rod, stopping upon the screw-eye.

In another type of fitting two catches screwed to the posts are made to engage with the lower rail of the cot side. A net of niokelled fittings for the rock garden or border edging for this may be purchased for a few shillings from a furnishing ironmonger.

A support for a mosquito netting or a canopy is often added to a child's cot. It may be made from two pieces of $1 f$ in. by $t$ in.

## CotTAges: ALTERING AND FURNISHING

## Advice on the Improvement of a Small Country Property

Other useful informatlon will be found in the articlea Architecture and House. See also the entries on Casement ; Damp; Floor; Plumbing; Sanitation; and those on Chair ; Curtain Dreaser and other furnishings

When buying a cottage with a piece of land attached, inquiry should be made into, such matters as sanitation, water supply, and rights of way. An otherwise desirable plot inay be rendered unsuitable by the existence of a footpath or right of way across it, whilo the proximity of a cowshed, with its manure heap, is likely to be an obstacle to many

If there is a well on the property the water should be analysed to be sure it is fit to drink, or if it can be made so by not too expensive filtration methods. Sanitary arrangements in most cases will probably be of a rather primitive character, which will have to be altered or replaced by the new owner either at the instance of the local authoritice or for hygienic reasons. A good earth closet should not be condemned as, under approved conditions, it may be more efficient than a water-borne system. Where water supply is inadequate chemical cloeets are also worth considering. They are approved by the medical authorities and very efficient if carefully used.
The possibilities of renovation nust be kept in mind, as very often a dwelling w th communicating rooms can be converted with little expense into a convenient home, especially when the owner is able to undertake much of the work with his own hands. Eco. nomical methods are essential, but the very nature of the building demands plain work, with simple furnishings. The essentials of satisfactory restoration or the addition of now work calls for an adherence to the local traditions of building.

Altering an Old Cottage. The first thing is to decide upon the scope of the alterations, the location of additional windows or the enlargement of those existing. The whole of the exterior should then be gone over, replacing any missing tiles, repairing a stonc mof, or renewing the thatch, as the case may be. Get up into the roof, inspect the rafters, snd if any of them show distinct signs of failure these should be relieved by fixing a flitch plato or an extra rafter, laid alongside.

Then give attention to the walls. Brick. work may need re-pointing, but do this carefully. A struck joint will probably look best, and it is not necessary to remove all vestiges of moss and lichen, as they add to the charm of the exterior. Oak timbering shoull be treated with boiled linseed oil well brushed into the surface: two or three applications may be needed to reatore the lark culour se90ciated with old work. Any inconsp


Cottage. Plans showing how a terrace cottage can be improved at a minimam of expense. The apper plan showe the ground floor before convertion ; the lower, after the improvements have been made which might be set alight by the heat from the flue-pipe. Any room not provided with a fireplace should have a ventilating air brick or other device arranged in the upper part of one wall, or a small grating over the door.

Old doors will often be found deficient at the bottom or ill-fitting in the framework. Effective remedies are to cut away the badly damaged parts, work a feather on the end, and fit a new piece. New duor stoppings make a marked difference tu the comfort of a room if they are fitted clusel. to an old door that has warped and does not shut tightly. Worn threshulds are easily restored by cutting away the worn parts and making a new oak tread, which can be secured with well countersunk brass screws. Floors may need patching or renewal. A worn brick or the floor can be greatly
mproved by taking up the old bricks or tiles, re-levelling the soil, and re-setting the bricks or tiles in cement mortar but with the worn sides downwarlls: the original under-sides of the tiles will probably be found to be in perfect condition
The Water Supply. The provision of $n$ bathroom larder, and improved facilitiea for water supply depend almost entirely upon individual requirements, but one point must be mentioned in connexion with the erection of a water-tank or cistern in the roof This must be very carefully considered and before commencing work it is necessary to make sure that the pipe lines can be laid correctly, and that the cistern is not placed in the middle of the ceiling ralters. A small tank of 50 gallons eapacity may easily weigh $t$ ton when filled, and the ceiling rafters will not support such a weight. The cistern had best be placed over a wall, or in some place where adequate support is obtainable. The great object in modernising a small dwelling should be to retain the charm of the country cottage while providing all the essential modern conveniences
How to Furnish. The necessary repairs and renovations completed, the charm of the cottage can be added to by suitahle interior decoration and furnishing The keynote should the simplicity.

The type of cottage that one may wish to furnish may vary fmm an old half-timbered one with thatched mof, inglenook, etc., to a plain brick building with sash windows and Victorian fireplace. The furnishing of the former type is comparatively easy. Every possible use is made of the special features, and care taken that the furniture should go with its surroundings.
for example, the charm of a room with oak beams would be enhanced with old dark wood cottage furniture. If this is not available, inexpensive reproductions can be obtained in oak, walnut or birch colour ; or wood may be left unstained and wax polished where there are no dark oak beams to set the decorative scheme.
The roons of most cottages are small, the doors narrow, and the ceilings lowpitched, so pieces of heavy furniture that would suit a house of moderate size would look too large and take up too much of the limited space a vailable.
Unless two cottages have been knocked into one, thus providing more accommodation, the arrangement of the rooms must be well thought out. Sometimes the living room has a dining recess, the room having been enlarged by taking in the old kitchen and converting the
scullery into a more modern kitchenette Thus a dining room and sitting room are obtained. the former sonetimes combin ing with the hall sis the fiont dour opens directly into it and the stainease may ead out of it to the first tloor. Such : plan has an informal and at the same timu decorative effect if the woodwork is of oak and an old lan tern is hung from a wall bracket to light the staircase angle. The sitting room naty contain two or three useful pieces of furni ture, a few comfort able chairs, a good table, shelves for hooks, window seat. and an upholstered settee or divan

If the window cur. tains, valances and chair covers are made of some figured fabric like chintz or cretonne, the wall should be rough surface plaster, distempered with some self-colour or papered with plain paper. An unpatterned wall surface gives $n$ greater iden of space, so is emin. ently suited to small rooms. Even moro important, the gay colours and design of furnishing fabrics show to perfection against a plain back. ground.

Occasionally cottages used for short holidays In small, low pitched rooms wall ornaments and week-ends only are furnished with un- should be used with discretion. An antique wanted picces from nother house. A cottage warining pan, a few picces of pottery, an can be made attractive under such conditions arrangement of llowers on a shelf to break the if attention is paid to colour and details. To wall line are more restful than odd pictures supplement oddments, the amateur or village or crowded effects. carpenter can make such things as inglenooks. window seats and other useful pieces.


Cottage. Plans showing how alterations can be made to improve a detachej cottage. Top plan, ground floor belore alterations. Centre, ground foor after improvement. Bottom, first floor, showing in broken lines suggested alterations


Cottage. Left, igpical English thatched cottage. Right, L-shaped living-room. The dining recess is in the amaller portion bepond the fireplace : it bolds a refectory table and sir chairs and has a serving batch. The armehair is covered in a printed linen and the curtalns are of gaily checked gingham

Left-hand photo, courlesy of Our Homes of Gardens
damp allows a certain amount of moisture to percolate thmugh it. For this reason aroid the use of tight-fitting linoleun or other covering which excludes access of fresh air Uncven surfaies, such as worn brick os flagged stone Hoors, soon cause holes and cracks to appear in the linoleum, and any dampnesa on the under surface would tend to rot the cork Coconut matting is excellent on such floors Strips can be used for pasagges, and mata and small carpets in coloured fibre can be bought very cheaply. The advantage of fibre is that air can rendily pass through it to the bricks. and any moisture that is absorbed by the matting helps to lengthen its life.

The living-room with dark beams lends itself to stone-coloured, or cream distempered, or painted walls. In nolth rooms warmer tones could he used with advantnge; buff, apricot or primruse yellow are suitable. The woodwork would probably be finished to match the timbering, though lighter colours are effective for window woodworl, unless the windows are Intticed. A suggestion for a sunny room is cream-coloured plastered walls, oak-coloured paint, short curtains with the valance fixed to a pelmet board. A window seat with upholstered cushions could be covered, and all other hangings niade from a cretonne in which blues, yellows, greys and soft reds mingle.

A preduminant nute of blue harmonises well with brick tiling on the Hoor or a brick fire. place Striped woven rugs or a small oriental carpet may be used Oak or other hardwood atairs merely require to be stripped and wax polished Those made of white wood and having painted sidea can be made attractive by having plain or bordered hnir stair-carpeting laid. Light coloured walla are essential if the stnircase should be dark or narrow
The furnishing of the bedrooms should be simple, cheap painted furniture is suitable. in the absence of better pieces. If space is limited, make a dressing table from a trinngular shelf placed across one corner. If a bathroom has been introduced during alterations it is rarely necessary to have washstands.

A cupboard with fitted drawers at the bottom answers as a wardrobe This should be placed against a dry inside wall Corner fitments with curtains are useful for hanging clothes If the lloor buards are in good condition, linoleum or cork carpet can be used with rugs, or square of fibre or hair carpet. In order that the exterior of the cottage may be as charming as the inside, the curtains of all windows that can be viewed at the same time should be of, or lined with. the same colour

Cottage Pie. This is made from cold minced meat and potatocs, and is also known as shepherd's pie (4.v.)

COTTER: A Wedge. A wedge-shaped piece of metal, known as is cotter, is adapted to draw up the joint between a shaft and a crank, or other part of a machine. A familiar application is the cotter pin in the crank of a bicycle (q.v.). Essential requirements in fitting such cotter pins are, that the pin shall fit accurately in the hole drilled in the crank, and that the Hat surface on the cotter is correctly shaped to bear on the flat formed on the shaft. Both surfaces should be in contact over as large an area as possible. It is tightened up by a nut and washer

COTTON. Not only are clothes, furnishing fabrics, and sewing materials obtained from cotton, but the seed on which the cotton fibre is found is rich in oil, and this is pressed out and used to make soap, margarine, and so on The lint adhering to the seed after the min part of the fibre has been removed forms a base for making guncotton, collodion, and nrtificial silk, and is frequently made into cheap cotton wadding. The residue of seed remaining after expressing the oil forms a cake which is videly used and highly valued as cattle food

The superior cotton fibres are silky and anft, wherens some are harah and wiry. The longer and silkier are naturally the most expensive, and from them the finest threads and most delicate cloths are made. The very best cotton spun into the finest yarn fetches a far higher price than silk
Cotton Fabrics. Tent and sailcluths are generally cottons, and so are nainsooks and cambrics. The lawns, sheetings and shirtings once universally made of linen are now generally cotton, which also replaces wool in fannnelettes and even in blankets it takes the place of silk in mercerised linings and embroideries, in velrets and umbrella cloths. Cotton reps, damasks. tapiestries, and cretonnes cover furniture, and cotton rugs and mats are used on Hoors. Lisle or hard-twisted, superior cotton thread makes stockings; and cotton fabric. with a suede finish, is used to make gloves Raincoats are often cotton, as are curtains. tape, lace, imitation leathers, bandages Much twine and cord, containers like Hour bngs, and most of the webs for braces and belts are cotton Motor tires are made upon a foundation of the very best cotton : electrical wires are insulated with cotton, and nearly all clothes are sewn together with it.

Uses and Defects. Cotton is blended with woollen materials that would otherwise be too poor for use, in order to lend strength to the whole and not necessarily for cheapness Fairly expensive cloths used in place of fannel are rendered practically unshrinknble and better wearing for being made of a blend of fine cotton and tine wool. It is now possible to dye cotton with more fastness than any minterial Cotton can be lent the apprearance of silk, as seen in the mercerised cottons employed for so many purposes By being woven in olen cellulaitexture, or bushed like Hannelette, or made with a loop surface like Turkish towelling. or with a smooth pile like velvet, it is made an efficient non-conductor of heat and thus warm to wear.

The defects of cotton vary, and in general it does not hear washing as often as linen Cutton damask table-cloths and napkins are more fluffy and less firm than linen The short fibre comes away as lint, as is seen in using cotton dusters or glasaclothas. Used as dress material, cotton shows creases more than wool or silk, for it lacks resiliency

A simple nid moderately effective process to reduce the inflammability of cotton is to steep the article in $\frac{1}{2} \mathrm{lb}$. alum, $\frac{1}{2} \mathrm{lb}$ phosphate of ammonia, dissolved in one gallon of water. As the deposit of these salts left upon the fabrio produces the Hame-proofing effect, the articles must not be wrung too heavily and should be hung to dry. Cotton gonds are easily scorched in ironing or in drying too close to a fire, and such heat enfeebles the fibre-and shortens the life of the cloth

Sewing Cotton. A fine quality of raw cotton is required, and a uniformity of thickness for the yarn from which sewing cotton is made. It is important for neat and atrong needlework to use sewing cotton of the proper thickness. No. 50 is a good average for general sewing, with 60 or even 70 for fine work such as babies' garments, 40 for strong calicoes and 30 for such johs as securing buttons on which there is considerable pull.

A convenient way of storing recls of cotton, which take up too much room in the workbox. is to string them on a long loop of string, and hang them from a hook or nail. The loop can easily be taken down nnd laid on the worktable when sewing is in progress, and every colour and thickness will then be handy. Mercerised sewing-cotton is dipped in a solution which gives it a silky appearance. It is useful for stitching mercerized and mixed cotton and silk fabrics. See Laundry ; Mending; Sewing Machine.

COTTON THISTLE (Onopordon). A very fine and vigorous growing biennial plant, the cotton thistle is suitable for shrubberies. The stems are covered with whitish hairs, and the heads of flowers are thistle-like in form and purple in colour. The hest sorts are acanthium (known as the Scotch thistle) and bracteatum, which grow 6 feet or more high.

COTTON WOOL. Cotton wool is used for affording protection from cold and injury and for absorbing discharges It can he oh tained medicated with horic acid, salicylic acid, iodoform, etc. For dressings the absorbent variety should be used

Cotton wool is sometimes used to plug the ears, e.g. in bathing and after syringing. Care should be taken to prevent the plug from slipping into the ear by making it sufficiently large and not pushing it in too far. When the ear is discharging, a plug miny be dangerous, as it may imprison the discharge : so if this is at all free it is snfer to place a prad of cotton wool over the ear hole and keep it in position by a handage. or sticking-plaster

A piece of absorbent cotton wool is a good thing to use as a sponge in dressing wounds, etc. It is soft and comfortable. and can be burnt. afterwards.

Thick pads of cotton wool nlay be used in conjunction with camphorated oil to cure colds on the chest The oil should be rubbed on the ohest just before the patient retires for the night, and a pad of cotton wool placed over it. The pad may be held in position by means of a bandage, but the Intter must not be too tight, otherwise it will interfere with the patient's breathing. The most useful form of cotton wool for this purpose is gangee tissue, which may be shaperl to form a jacket

COUCH. Originally meaning any article or spot used for resting or slecping on, a couch is now usually a synonym for a sofa See Chesterfield: Settce: Nofa

COUCH GRASS. One of the worst of garden weeds, its hotanical name is Agropyrum repens It spreads alarningly by meairs of its creeping rootatock and can be exterminated only by digging out the ronts

COUGH. A cough is nature's method of clearing the air passages of material which should be got rid of, whether it has been intro duced from without or heen formed in the lungs or air passages themselves. If anything we are swallowing goes the wrong way we at once cough and prevent its entrance into the trachea. What happens is that in response to the irritation produced by the substance on the lining of the entrance to the larynx, we take $n$ deep breath and the vocal corils are closed. We then make to breathe out strongly, the vocal cords Hy aphrt, and the air is expelled with force and suddenness, sweeping the offending material in front of it. The irritation has stimulated a centre in the medulla oblongatn, the part of the brain which is con tinuous below with the spinal cord, and this sets the expiratory muscles in motion.

Frequently the centre is stimulated by irritation, occurring it various parts, when thereis nothing to be brought away, and the cough serves no useful purpose This is spoken of as a dry cough, and it may be due to irritation from adenoids, or a long uvula, to inflammatory mischief in the air passages or-elsewhere in the organs of respirntion, to tumours of the Iarynx, and other causes. It is the cough of dry catarch which is often so troublesome in elderly people. Irritation of the Inrynx pro duces a croupy, hoarse, or brassy cough. This occurs in lary ngitis, diphtheria, aneurism of the chest, and other conditions.

A paroxysm of coughing may occur from persistent or severe irritation, but when it terminates in a crowing sound produced by a longdrawn intake of the breath it usually means
whooping-cough. Winter cough is that due to a chronic bronchitis, which improves in fine weather and grows worse or only appears when the weather becomes cold and damp. A stomach cough may occur, but it is much more uncommon than is supposed, and a persistent cough should not be accepted as merely a stomach cough without consulting a doctor, as it may he due to early consumption. Cough is merely a symptom, and its treatment should be directed to its cause. See Bronchitis: Cold Consumption Whooping Cough, etc.

Cough Lozenge. Numierous lozenges for relieving coughs can he obtained from chemists but for a siniple and slight cough a lozenge can be made at home, if desired, from syrup of horehound The syrup can be made from the atems and leaves of the horehound plant steeped for several hours in cold water. Allow $\frac{1}{2} \mathrm{oz}$ of horehound to a cupful of water. The syrup can also be obtained from a chemist

Boil up the liquid with 2 lb of demerara sugar and 2 tablespoonfuls of vinegar until the syrup sets when dropped into a cup of cold water Add $\frac{1}{2}$ a tenspionful of carbonate of soda, and boil up again until, when a little is dropped into water, it sets and is britile Pour it out on to a buttered tin to set, mark it out in squares with a knife, and, when cold, snap off as marked and wrap each piece in waxed paper Store them in an airtight tin Ordinary treacle toffee has a soothing effect

Cough Mixture. Cough is merely a symp lom of a large number of different complaints, and in the case of any particular complaint a drug which is useful at one stage may be harmful at another It is unwisc, therefore, to take medicine for a cough without knowing what the cough is due to, and to persist with a cough mixture because it has benefited some hody else's cough. In the case of a cough which comes on each year in cold, damp weather, the winter cough, the following may prove useful: Chloride of ammonium, 2 drams: compound tincture of camphor, 4 drams liguid extract of liquorice, ? diams ; spirit ol chloroforin, 2. drams; infusion of senega, to (ioz. The close is a tablespoonful thrice daily, in a little water, after food. Sep Bronchitis
COUNTERBORE. This tool consists of a central peg, or pilot, and a larger diameter eutting piart, rotated in $n$ lathe or drill press


Tue rool is fed into the work until the desired clepth has been attained. A goorl counterbore should le capable of turning out a neatly finished hole or recess having square comers, such as are required for the reception of $a$ screw head that has to be sunli below the surface of the surrounding metal, as illustrated The same result is obtained in woolwork by using an nuger bit, drilling out the larger diameter hole first and following with the smaller onc, otherwise there would be no material to guide the auger, unless the small hole be temporarily plugged for the purpose.
COUNTER IRRITANT. a counter irritant is an agent which produces redness and irritation of the skin. The idea is to bring an abundance of blood to the akin veasels, with a view to relieving congestion of deeper structures or organs. Counter-irritants include mbefacients which redden, e.g. acetic acid, solution of ammonia, liniment of camphor and ammonia, liniment of capsicum, mustard,
iodine; vesicants which blister, e.g. cantharides or Spanish fy ; and pustulants which produce pustules (hlisters containing matter). e.g. Junar caustic and croton oil.

It should be remembered that substances of the first class, if used too strong or too long, may blister, while those in the other class may be used sufficiently diluted to produce redness only. In applying counter irritation for the relief of an underlying condition, better results may be achieved if it is applied rather at a little distance than just over the seat of the pain. See Plaster.

Counterpoise. See Earth
COUNTERSHAFT. A countershaft is used in connexion with belt-driven machinery. It is a short shaft mounted in suitab e bearingr and equipped with pulleva
The counter. shaft is driven hy a belt from thie main orline shaft, and another belt transmits the drive from the countershaft to the machine. As usually arranged, a striking gear is provided to move the helt from the driving pulley on to one of equal size, situated next to it, called the loose pulley, as it is free to revolve on the countershaft itself. A typical countershaft that is suitable for an amateur's turning lathe is illustrated above See Aniateur Carpentry Gear: Lathe.

COUNTERSINK : A Brace Bit The name of countersink is applied to $n$ type of brace bit used to form a conical-shaped recesa in wood or metal, etc., whereby the head of a screw or rivet can be let in flush with the surfuce. See Bit.

COUNTESS PUDDING. A good steamed pudding is made ly greasing a mould with hutter, and arranging 2 oz quartered glacé cherries and the same quantity of quartered stoned raisins in the hottom of it. Now line the sides with some thin strips of plain madeira or almond cake. Ahout $\frac{1}{}$ Ih. cake should suffice. Mix any left over with 4 oz . crushed macaroons, 2 lightly heaten egga, and $\frac{1}{2}$ pint milk. Fill the mould with the mixture, tie a buttered paper over it, and stcan it for about $\}$ hour. Turn it out to serve.

COURSE : At Meals. For the ordinary luncheon two course's, either an egg dish, fish or meat and a sweet, are the rule, but the menu miny be supplemented by a soup, or


Counterbore. The tool used in metal work. and diakram showing counter bored recess for a bolt bead cheese course For dinner it is usual to plan a mical of four courses, stretching to five or six for special occasions. In small house holds, soup or fish, entrée or joint, swcets and savoury, are generally enough. serving melon, grape fruit or hors d'oeuvre instead of soup for a change, or including fish and onlitting the savoury.
When entertaining, a poultry or game course can be introduced after the entrée, or this can be varied by a vegetable, such as asparagus. salsify or seakale, served as a separate course It is not usual now to serve an ice as well as sweets, but the former frequently takes the place of the latter at either a luncheon or dinner party. At a small dinner dessert may be omitted, especially when some kind of fruit ce or salad forms the sweet course.
For a more ceremonious dinner party the (ull list of courses would le-melon or hors d'ocuvre, soup, lish, entréc, joint, poultry or game, siveets or ice. savoury, dessert. The entréc should be completc with nny neccssary vegetable in one dish. but potatoes and one or
two vegetables are served with the joint and salad with game or poultry On rare occasions a sorbet-a punch ice-is served bee ween joint and game, and small Russian ciguettes may be handed round with this course For H supper hot soup may be scrved, but otherwise the term usually signifies a cold meal with meats, sweets and sa vouries either on the table or sideboard, and no formal courses See Dinner ; Luncheon.

COURT PLASTER. This is a mixture of isinglass, glycerin and alcohol spread on silk. It is used to bring the edges of a cut together and to protect it.

COVER : For Furniture. Loose covers of chintz cretonne etc., afford jrotection for furniture, and are also useful for bringing


Countershaft for use with belt-driven machinery odd chairs into a harmonious colour scheme or for placing over worn chairs or settees. These should be clcansed thoroughty hefore the neiv covers are put on. An armehair should br rubled with stale bread, and il this lails to remove the marks. benzoline will probably lo successful. This is best applied out of doorn benzoline heing highly inflammable

A plain rep fabric or onc with a small pattern can be chosen for a cover because it is easily fitted, but if a distinet pattern is selected for decorative value care must be taken to sod: that it is correctly placed. Hang the fahric wrong side out over the chair, so that any pins uscd in fitting can remain until the cover is sewn. Allow at least 1 in . all round for the hem at the hottonn, and, when fitiing, tuck the material well in at the back of the seat Since the covers are not to be tight fitting, a certnin amount of fullness should he allowed at the back and front, and plenty of material used for tucking in at the sides, where if possible, all joins should lie arranged.

If necessary pieces should he let in at the Iront of the arms. Having fitted the chair, cut the materials to the required shape. remove the fabric, and the cover is ready to be sown up. In doing this lenve the necessary opening at the back, make a false hem for the buttons, and an inside flap for the buttonhole. The seams and lining edges of the furniture should be piped. Use strong cotton for the sewing, and oversew each corner firmly. Turn up the hem and thread a tape through it from end to end The tape will draw the cover neatly round the frame, and can be hidden by a flounce reaching to the floor. For a chesterfield or large settee douhle width material ahout 50 in . wide is best. See Cretonne: Dccoration.

COVERLET. This is another ward for bedspread or cot cover. A waterproof or a fabric cover of an ornamental nature for the perambulator is also called a coverlet
I cosy cot cover is worked with blue and cream double knitting wool, and besides being very warm will outwear any of the woven variety. The necessary materials are 1 lh . of douhle-knitting wool in blue for the centre, 6 oz of cream for the border, and a bonc crochet hook, No. 8 These produce a cover measuring $49 \mathrm{in}$. long by 39 in . wide, but the size can le varied.
Begin by making 134 chain, and work the first row thus: Treble in the 5 th ohain from the hook, then treble in each chain to the end of the line. Make 2 chain, turn, and in the sccond row miss the first stitch over which the 2 chain stands, as this will represent one double crochet. Then double-crochet in ench trehle to the end of the row, taking up the back loops only Make 3 chain, turn, and commence the third row by misaing the first double chain

Do one treble in each stitch to the end of the line, taking up the back loop only: the last treble will he worked in the top of the 2 chain. Make 2 chain, turn, and then repeat the second and thind rows alternately 53 more times.

For the horder, use the cream wool, and work all round thus: Do 2 treble uniler the side of the trebles on the left side of the cover, and 1 trcble in the double ornchet: then across the ends there will be 1 treble in each stitoh. At the corners put 2 treble, 2 cha in. and 2 treble right in tho cornermost stitch. In fol. lowing rows there will be 1 treble on each stitch, and 2 treble. 2 ehnin, 2 treble under the 2 chain for the corner. There are 11 border rows in the model illustrated, the order being 5 cream, 3 blue, and 3 cream.

Cot or perambulator covers mny be made in linen or wool blanket cloth. The former may be embroidered and hemstitched in a contrasting colour, the latter bound with antin ribbon and either worked in coloured wools or suitable designs appliqué. See Appliqué: Bedspread: Quilt.
COVERT COATING. This is a tailor's cloth in neutral shades, heavier than the similar-looking gabardine cloth, and the front edges of coats and raincoats made from it are less inclined to roll at the flap. Made both in worsted and woollen cloth, it shows a steep and pronounced screw twill, and the colouring is uavally mised light nnd dark in the same thrcad.

Gond covert coating wears well, hut has been imitated in light and cheap makes, although these are more usually called gabardines.

COWHEEL. Boiled cowheel is a nutritious dish. To prepare it, wash the heel thoroughly. and boil it for $1-3$ hours in sufficient milk and water to cover it. The milk and water may be mixed in any proportions. Add one large sliced onion and a little salt, and when the meat is cooked take it out and keep it hot Thicken the liquor with flour, using 1 oz to cvery pint of liquid, and mixing the flour thinly with cold milk before adding it. Stir the sauce till it boils, then ndd I tenspoonful chopped pirsley and reasoning, which should include a fow drops lemon juice and a light dust grated nutmeg. Arrange the pieces of the heel on a hot dish, pour over the sauce. and border with toast sippets.

An excellent family broth is made by divid. ing one boiled cowheel into quarters and putting it in a saucepan with 3 pinta cold water and a small teaspoonful salt. Bring to boiling point, skim it well, and add 1 oz . each of carrot, turnip, onion and celery cut into dice. Int the soup boil for about 1 hour, or until the ment alips off the bones. Then take nut the ment and bones, cut some of the best pieces into dice nnd put them back into the soup with 1 o7. rice. Boil tho broth again until the rice is thick, then season the whole carefully, adding a tablespoonful of chopped paraley and $\Omega$ dash of lemon juice. Serve the soup with toast cut into dice. If $\Omega$ cowheel which has not had the preliminary boiling is used, it will require 3 or 4 hourg' cooking before the ment leaves the bones.

COWPOX or Vaccinia. This is a mild, contagious disease of the cow in which vesicles or blisters appear on the udders and teats. The lymph obtained from these vesicles, calves being used for the purpose, is the


Coverlet for a baby's cot, made altes the pattern plven in this article
material used for vaccina tion against smallpos. It does this by producing vaccinia in the human subject There are strong grounds for believing that human smallpox and cowpox arc the same diserse, or, at any rate, that hoth diseases have had the same origin, that is, from one type of micro-orgnnism whinse progeny show differences according as their trans inission has been thmugh man or cattle See Small. pox: Vaccination.

COWSLIP. The popular name of Primula veris. This is n well-known wild tlower, common in meadows and open wondland. It does not succed well under cultiva. tion, though it is the parent of the auriculas and other spring flowering favourites.
COX'S ORANGE PIPPIN. This apple is the finest llavoured in cultivation. The fruits are at their best in November and December It is self-sterile and does not fruit well unless it is planted among other frec-blossoming varieties. e.g. Worcester Pearmain See Applo.


Cos's Orange Pipuin. a rood dessert apple
CRAB: How to Prepare. It is of the greatest importance that $a$ crab should be perfectly fresh and in good condition. It should be heavy in comparison to its size, with large claws, and the shell free from white incrustrations, these denoting that the fish is agod and probably stringy. Crabs are at their best from May to August, but. like other shellfish, with the exception of oysters, are far from being digestible, and should be eaten sparingly and never given to invalids. A crab when bought at a shop is already boiled.
To dreas a crab break off the large and small claws, remove tho underneath portion and all the flesh from the shell, also the little bag near the head. usually full of sand, and throw away all bone and the lang grevish pieces termed dead man's fingers. The tleah is of two kinds, some firm and white, the rest soft and dark. Separate the former into shreds with a fork, also the ment from the claws after cracking them. Mix the dark soft meat with about 2 tablespoonfuls each of fresh breadcrumbs and oil and vinegar, and seasoning to tasto Scason the shredded white meat, but keep separate from the remainder

Wash and dry the empty shell, chipping ofl the under portion up to the faint line which serves as a guide Fill the shell with the two mixtures, arranging them alternately. so that they nppear in dark and light stripes, herping thein higher in the middle than at the sides lecorate with lines of finely ehopped parsley. and force a little butter round the edge with a forcing bag and pipe. Place the crab on a fancy paper or on a bed of fresh aalad

For a quickly made savoury dish, prepare some rounds of crisp, neatly trimmed buttered torst, and keep them hot. Melt 3 teaspoonfula of hutter in a chafing dish, stir into it I tablespoonful of flour and then $\frac{1}{2} \mathrm{pt}$ of milk Stir these until they thicken, then add the ment from a medium-sized orah. seasoning it with cayenne, salt, chopped parsley, 2 tea. spoonfuls of Worcester saucc and l oz of grated Parmesan cheese Heap this mixture on the toast and serve hot.
Potted crab is a good fish paste Remove all meat from the shell and pound it, adding salt. cayenne, mustard. and vinegar to taste. With a wooden sponn rub it through $n$ hair sieve, and press it into sminll pots. which must be clean and dry Bake slowly for 30 min. and then leave them until cold. Pour on the top of each pat melted mutton fat, to the depth of about $\frac{1}{d}$ in., taking care not to move the pots until the fat has set and hardened

Crab Croquettes. An excellont fish course is made by pounding the flesh of a crab to a smonth paste, and adding half the quantity of fine breadcrumbs, with ennugh melted butter to bind the mixture. Season it with lemon juice, pepper and salt, and malie it into small rissoles Coat them with beaten cgg, moll them in breadcrumbs, and then fry them to a light brown.
Crab Pie. Crab pie or partan pie, as it is called in Scotland, can be made as follows: lick all the meat out of a freshly boiled crab. mixing dark and white meat together with a sessoning of salt, cayenne, oil, and rinegar. If the mixture is too soft, work in a few bread crumbs, put the whole back into the shell. strew it over with crumbs and grated chcesc, mixed in equal parts, and bake it in a quick oven until lightly hrowned. Serve the pie hot, with thin slices of brown bread-andbutter, cayenne, and sprigs of prepared

## watercress

CRAB APPLE. The common wild crab (Pyrus malus) is used as a stock on which to graft standard npple trees, and thus serves a very useful purpoise in gardens. There are many ornamental crabs valued for their hlossoms or fruits or hath The Siberian crab (Pyrus baccata) inakes a large tree which is beautiful when in bloom in spring and itsfruitsmake oxoellent jelly. 'The crabs named John Downie, Dartinouth and Transparent bear handsome Iruits of decorative value. Ругия ярес tabilis, floribunda, Schiedeckeri and Eleyi are grown for the sake of their cxquisite spring blowsoms. All four are hardy. and thrive in ordinary snil.


Crab Apple. Cluster of fruit

Crab Apple Jelly. Aiter being washed and stalked, but not pared or cored or flavour will be lost, the fruit should be out in halves with a plated knife. Put 3 lb . thus prepared. in a pan with sufficient cold water to float themprobably about 3 pints. The thinly pared rind of I lemon is added and the fruit bniled gently until soft, but not in a mash. The juice is strained through a jelly bag or tammy-cloth. the fruit being pressed gently but not aqucezed or the jelly will be cloudy.

After rinsing out the pan the juice is put hack into it, with 3 pint of gond white sugar to each pint of juice, and the jelly boiled quickly with the lid of the pan. It must be well skimmed all the time, and $\Omega$ few of the pips may be pecled and stirred in. When a small partion of the jelly sets firmly on a plate. it is ready to be poured off into clean. dry pots These should be securely covered and stored in a cool, dry place.

CRACKER : For Christmas. This lıarmless induor firework mny be a tiny honbon of ordinary sloape in a brightly coloured paper covering, or one of the ginnt variety, either bolster or fancy shaped, to be suspended from the ceiling at a Christmas party and containing all sorts of toys and trinkets. Fancy crackers are quickly trimmed with amall dolls, holly or Hower sprays, etc. Centre picces can he ensily made by using $n$ gilded or silvered basket decorated with coloured berries and tinsel ribhon and filling it with pretty crackers, or the crackers may be suspended in a toy aeroplane. By the addition of some little arnament or flower the simplest crachers can be tranaformed into decorntive ones. The tiny bonbons may be used to surround a Christmas cake, placed upright and held in position with a ribhon until the cake is cut and the crackers distributed nmong the guesta See Christmas.

CRACKLE WARE. This term js applied to Chinese and Japanese pottery whose surface is covered, partly or wholly, with a network of fine cracks. They vary in size from tiny meshes like fish-roe and pigskin up to ostrichegg effects, and the still wider fissures called ice-cracks. One form resembles trout scales.

Crackle is produced intentionally by the unequal contraction of the body, and sliould not be confused with the accidental crazing of the glaze seen in some European ware, both old and new. Black inks or red ochres, some times hoth, are rubbed in to make the lines prominent. The oldest pieces, which are Sung ware, go back nearly 1,000 years, and a good apple-green, turquoise or celadon crackle is highly prized.

CRADLE. Tho cradle is a very old piece of furniture, but the oldest existing examples probably date from the 16 th sentury. In the 18th century, following the French example, some were made in very claborate atyles, being panelled or carved and inlaid, but the ordinary type were of plain onk or other wood. In the 19th century iron cradles were introduced, but these soon gave way to wicker ones. Cane is also sometimes used, but the oradle itself has dianppeared in favour of the cot in many nurseries.

It is never wise to put much lace on a cradle. Narrow Valenciennes eased on to the muslin covering is permissible, hut the better trimming is to frill the material itself.

A usual type of oradle is ahout 2 ft . long. 14 in broad, 6 in. to 12 in . high. The oradle may have $\Omega$ hood over one end as in the bassinet type, or a canopy formed from some light and porous fabric, preferahly muslin, and lined with a darker piece of the same material; the object being to provide the requisite shade and yet allow free ventilation. When in use the oradle must be kept scrupulously clean, and free from any rough edges or projections which are likely to disturb the rest of the the infant. See Baby ; Cot.

In surgery the term cradle is given th an appliance which protects an injured limb in bed See Bed Cradle

CRAMBO : How to Play. Crambo is n goond game for ndu!ts, and is suitable for any gaines party. Ench player is given two slips of paper, distinguished from each other in some way. On one of these he writes any noun that occurs to him, and on the other a question He then folds each paper over and hands it to the person in charge. The nouns are put into one bowl and the questions are put into another. When they have been well shaken up they are handed round once more, each person taking a noun and a question. His task then is to write n verse answoring the question and including the noun.

A time limit should be ret, and when it has expired the papers on which the verses have been written should be collected and the results read aloud. Dumb Cramho (q.v.) is an entirely different game.

CRAMP. The commonest form of crainp, which is a local painful spasm of a muscle, occurs in the calf at night, when one wakes suddenly with an excruciating knife-like pain, and finds the calf like a hard ball. The pain may pass off after $\Omega$ moment or two as suddenly ns it appeared. Gouty or rheumatio tendencies, exposure to cold or damp, and over-fatigue are the commonest causes.

Cramp is not unconmon in pregnancy from pressure on the nerves supplying the legs. It is also a symptom of the neuritis produced by chronic alcoholism. There is a form of cramp which is caused amongst other things by excessive tohacco smoking. After walking a short distance cramp ncours in the calves: this passes off in a short time, hut recurs when a short distance has again been covered: so that in taking a walk it is necessary to make frequent halts.

In treating oramp, rub the part vigorously with the open hand, alternating this with masage with the fingers. When the acute spasm has passed off rub in well any household liniment, wrapping the part immediately afterwards in cotton-wool to prevent chilling. People subject to muscular oramp will find the following liniment of the greatest service:

Chloral hydrate
Menthol
Camphor
$\begin{array}{ll}1 \\ 1 & 07 . \\ 1 & =\end{array}$
The liniment should be mixed well in a mortar until of a syrupy consistence, and used externally, rubhing in well. Where the tendency to crainp at night is associated with flatulent indigestion, it will be found helpful if a teaspoonful of sal volatilo in a little water is taken nt bedtime.

Stomach cramp is a common symptom in indigestion. The pain may he the result of sudden distension of the bowel with gasce caused by ahnormal firmentation of the contained food, or the spasm may be due to irritation of the nerves supplying the stomach and intestiner Apply a hot-water bottle and give bicarhonate of sodn and carminatives See Colic: Muscle.

Cramp in Poultry. Craınp is a complaint to which both chickens and duoklings are subject. It generally nffects the legs, causing the hird to squat down helplessly, and is usually hrought on by damp surroundings. The condition is sometimes liable to be con fused with leg weakness.

The only cures for cramp are warmth and friction to restnre the circulation Rubhing the legs freely with cmbrocation, provided the bird is kept in a warm place while under treatment, will generally effect a cure. See Poultry

CRAMP: The Tool. The tool named n cramp is used for tightening the joint between two pieces of wood or other material, and it frequently forms an integral part of a small machine such as a minoing machine, which can thus be readily attached to n tnble. It is sometimes called a clamp.

Ordinary woodworkers' cramps are made in a very light pattern, comprising a light steel bar bent to shape, and onc leg acrewed and fitted with a clamping screw. A superior pattern called the G-cramp is made of solid cast metal, and wi!l last for years, especially if fitted with n clamping acrew having a squaresectioned thread. Such cramps are made to hold from 2 in . to 12 in . in width Parallel cramps are made with two hard steel jaws, which are drawn together by two hand screws. They are very useful for small metal work of all kinds, and will hold work up to $1 \frac{1}{4} \mathrm{in}$ in thickncss. Corner cramps are used to hold the two parts of a picture-frame or other mitred work while the joint is being fastened Sometimes four of these cramps are used with a tensioning bar between them, and adapted cspecially for picture-framing With all types it is desirable to interpose wood between the work and the jaws, to avoid bruising the surface.

Sash cramps or bar cramps consist of a long steel bar ahout 1$\}$ in. deep and $t$ in. thick from 24 to 48 in long. At one end is a strong upright with a square-thread oramp screw which pushes a sliding jow along the bar. A movable jaw is arranged to be fixed by menns of $n$ stcel pin to any desired position on the bar, and by this means all classes of work can readily be held, up to the capacity of the oramp. It is of grent use to the amateur who


Cramp: parious types used for special purposes. 1. G-cramp, with square thread acrew. 2. Tool makers' parallel cramp. 3. Corner cramp. 4. Bench-cramp. 5. Sash oramp
undertakes the construction of doors, cabinets, and other large work.
A bench cramp is useful to carvers and other woodworkers, as by its aid the work is held down on the bench. The tool comprises a circular bar that is inserted into a hole bored in the bench top. The cramp screw presses the long bar tightly on to the work, which is thus securely held in position. See Glue ; Picture.

CRANBERRY. Those who have a moist site with peaty soil may grow cranberries, but they are very rarely cultivated in gardens

The plant is a slender, wiry, trailing shrub, with small red acid berries. It grows wild in England and Wales and in Scotland. Its botanical name is Vaccinium oxycoccos. The whortleberry and bilberry are closely related to the cranberry See Bilberry.
How to Cook. To stew cranberries, put in a stewpan 1 lb well-picked fruit, just enough water to cover it, and at least $\frac{8}{} \mathrm{lb}$. sugar. Let it simmer slowly until soft. Stewed cranberries are best served cold with custard or junket. To relieve the acidity apples are often stewed with them in the proportion of $\frac{1}{} \mathrm{lb}$ apples to 1 lb . cranberries.

Cranberries make appetising condiments for meat and poultry dishes. A good chutney is prepared by putting 2 quarts of the pickled berries into a pan with $3 \frac{1}{2} \mathrm{lb}$. white sugar, 1 lb . stoned, coarsely chopped raisins, the thinly pared and finely chopped rinds of 2 oranges, and $\frac{1}{8} \mathrm{lb}$. chopped onions. Add $\frac{1}{2}$ pint good vinegar, the strained juice of the oranges, $\frac{1}{\frac{1}{2}} \mathrm{oz}$ mustard seed, and a level teaspoonful each of yround ginger, powdered cloves, and cinnamon, and a little salt and pepper. This is boiled until it is thick, and is then bottled.

Cranberry Jelly. Cranberries are excellent ns a jelly to vary red currant jelly with venison, roast mutton or jugged hare. Taking 3 lb . of the fruit, pick over and wash the berries, put them into the preserving pan with 3 pints cold water, and let them boil until soft and broken.

Strain off the juice through a fine hair sien. or through a jelly bag, pressing, but not rub. bing down the fruit, or the sparkling clearness of the jelly will be spoilt. Add 1 lb . loaf sugar to each pint of juice, and boil it without the lid until it jellies on being tested on a plate. It can then be poured into jars and stored. It keeps some months without deteriorating.

Cranberry Sauce. A sauce which is specially good with turkey, though it may well be used with other poultry, is simply made by simmering a pint of cranberries in a gill of water until they are soft, and adding 3 oz . of white sugar and a glass of port wine. The liquid is then re-boiled, seasoned, and strained ready to use.

CRANE FLY. The larvae or grubs of the large, awkward, long-legged ty known familiarly as Daddy Long Legs are very destructive of all kinds of garden orops. These pests are, however, chiefly found in gardens which have been recently converted from grass or waste land, or where the grass and weeds have been a bundant the previous summer. Sods of turl buried in the ground will attract them. Whern the grubs are numerous an application of semirefined naphthalene at the rate of 2 to 21 oz per sq. yd. is worth a trial. The naphthalene should be worked into the soil, after which a thorough watering is advisable. This should not be used on seed beds just about to be sown. See illus. above.

CRANE'S BILL. This is a popular name given to the hardy geranium. This is quite a distinct plant from the geranium (really. pelargonium) used in suminer flower beds. See Geranium ; Pelargonium.

CRANK. This is a bent axis in any form of machinery, and is used as a driving or driven means of transmitting power by radial motion. To name but a few common forins, therc is the pedal crank of the bicycle, the


Crane Fly or Daddy Long Loge. A. Male. B. Pemale. C. Larva. D. Papa caso. 8oe below By dermiasion of Minta. os stationery OAtice and the
starting handle of a car, the crankshaft of any engine. In fact, any form of leverage working through a radial motion by means of an off-set arm becomes a crank.
CRANECASE. In its widest sense this term relates to the cavity in which works the crankshaft. and very often the camahaft, the timing geara and the oil pump of an internal counbuation engine auch as that employed in the motor car. This cavity is included between the sump at the lower part and the casting forming the upper part of the crankcase.

In many modern motor car engines this casting is integral with the cylinders and the flywheel housing, as well as with the upper part of the crankshaft bearings. The upper part of the crankcase and the parts with which it is associated form one of the largeat and most complicated components on a car. In aome oases the crankcasc is mase of aluminium and the cylinders form an independent casting bolted thereto. This method of construction does not, however, produce such a rigid engine.

The crankcase or cavity contains, in addition to the parts mentioned above, the following: magneto driving shaft, dynamo driving shaft, oil ducta or pipes, oil filter, and in certain cases the troughs for the dippers on the big.end bearinga.

The crankcase casting is provided with seatings for the electrical units, timing gear cover, fan bracket, water circulating pump, and other minor parta. It is also formed with bearer arms by means of which it may be bolted to the car frame, or with seatinga to which such arms may be secured.

In some engines the gear box is bolted up to the flywheel housing of to an intermediate casting or clutch casing. and the Hywheeel housing oarries bearinga or attach. ments for the clutch, brake. and accelerator jedal hearings.

When the crankcase is of aluminium, studa are alwaya firmily screwed into the metal for the aftachment of other parts. Set bolts are never used, as the sorewing in and out would dainage the aoft aluminium. Studs must never be allowed to work lonse, as the threarl in the hole would soon be dest roved.
All vil-retaining joints should be made with thick brow'n paper coated on butle sides with gold size. or with a suitable juinting compound. When the (:n-acting faces are roughly finished.


Crassula. Flower heads of the
or one of thens, such as the sump is made of flexible sheet metal a cork washer or gaaket may be used.
In motor cycle practice a crankcase is usually divided through the centre, i.e. verti. cally instead of longitudinally. In all other respects the principle is virtually the same, cxcept that the one-piece casting, meaning the cylinder and top half of crankcase in one. is not emploved See Gasket; Lubrication.

CRANKSHAFT. The crankshaft is one ot the oldest methods employed for mechanically converting power developed by a reciprocating motion into a rotary force, and as used in internal combustion engine practice differs only in accordance with the needs of the design of the engine. As commonly employod, there are the throws or cranks, according to the number of connecting rods and the main journals.

The crankshafts of modern internal combustion engines show considerable variety both in the number of cranks combincd in one shaft and in the brrangements of the cranks and main bearing journals.

In nearly all cases the crankshaft is designed to run in anti-friction bearings, which are of the split type formed of brass or phosphor bronze shclls, lined with white metal ; in fact. practically identical to the big-end bealing. The perfect rotary balance of a crankshaft ulways receives careful attention, because with this lies to a great oxtent the perfectly sinooth running of the engine. See Big-End: Internal Comburtion Engine; Motor Car.

CRAPE : A Dress Material. Crispness and a crinkled surface characterise all crapes and form the justification for the namc. In the manufacture of such fabrics the threads are twisted so much beforehand that when they aro woven they do not naturally lio straighi. and this feature is seen alike in wool. cotton and silk crajues
Black silk crapres used for mourning are inade more crisp by being treated with shellac, and as this is not a gum soluble in water it tends to remain. The stiffness of such crapes returns if the fabric after wetting is dried before the fire. Waterproof crape should be asked for. In wool or cotton crépes, as used for summer and indoor dress, the original character returns after washing. although cotton crapes should not be ironed. Siee Crêpe-de-Chinc : Mourning.

CRASE : A Linen. Originally a rough linen imported from Russia and used for kitchen towelling, crash has now a wider range of meaning. Coarsc fabrics of various collpositions sell under the name, including rough linen towelling, dress and household linens, unbleached or in fancy colours. See Linen.

CRASSULA. Plants of the genus crassula pupularly known as thick leaf, require greenhomme treatment. All the specien may be success. fully grown in a compost of two parts loam, one part leaf-mould, and a sprinkling of sand, with some broken brick ur mortar rubble. Propagation is by cuttings of the tops dibbled into sandy soil, under glass, which strike more readily if laid out to dry before being inserted They need a sunny, airy greenhouse and little water in winter. It is usual to shorten the shonts which have Howered in late sum. iner, and to re-pot in spring. The best species are : coccinea, scarlet, 18 in., a summer bloomer ; jasminea. white, I ft., spring bloomer; and actea, 1 ft., white, at its bost in September.

CRATE Crates are marle both of wicker size. whichithorbstheorsyon, and the drawing to the falls or levels of the path, and and of wond, and their main use is for holding goods that are sent away by rail or mad. China. cruckery, glass and similar wares are usually packed in crates for transportation Crates made of slata of wood are largely used for conveying pnultry, rabbite and other domeatic animals by rail, as they are for bicycles. perambulators and certain articles of furniture.

CRAWFISH. This crustacean is a species of rock lolister common round the British coast It is larger than the lobster and is conked in much the same way The Heah. however, is coamer and the llavour inferior though it is often substituted for lobster in salads It is totally difierent from the crayfish
CRAYFISE. The small Ireshwater crayfish found in the rivers of Great Britain is of a delicate flavour and is highly esteemed as an article of food. Quanti ties of crayfish hre imported into Great Britain from the Continent the home sup ply being limi ted They are usually boiled before being put on the market; where this has not been done they should be plunged in boiling fish stock for a bout 10 minutes.
Soup made with river crayfish is considered a great
delicacy A quart of fish stock will be
Crayosu. tue dencarety navoured
Crayosu. sue dencarely navoured required with 18 crayfish. Remove the gut from the centre fin of the tail of each, shell the fish, and pound the shells and half the tailmeat with 2 oz butter and 2 boned anchovies wiped frce from brine. Put this pounded mixture into a saucepin and atir it with a wooden sponon over the fire until it is hot ; add 2 oz . washed rice and fry the whole for 5 min . during which it must not be allowed to colour even slightly.

Add the fish stock and a small onion atuck with 2 cloves: allow these to simmer until the rice is soft. stirring frequently. Soak the soft part of a French roll in milk and add it before rubbing the soup through a hair sieve Reboil the soup, finur in gill crenm, 1 tea. spoonful lemon juice, and some seasoning. finally adding the remainder of the meat from the tatils, cut into dice. Serve the soup with cmūtons or sippets of hot crisp toast. See Mayonnaise.

CRAYON: How to Use. The variously coloured pencils made of chalk or pipeclay and used for drawing purposes are known as crayons. In addition to the use made of them by artista, etc., they form popular presents for children, especially when accompanied by uncoloured picture books.
Cheap crayons should not bo given to children. since they are apt to melt quickly in a warm hand and are a source of real danger if placed in the mouth. Crayon drawings made on paper which is not specially prepared for the purpose easily become sinudged. They may, however, be fixed by washing the paper with a strung solution of isinglass. When it is dry, the drawing may be made upon it, after which it shnuld be inverted and held horizontally over steam. The steam melts the
thus becomes fixed. This process may be repented saveral times while the drawing is being made the effect being increased on each occasion.
CRAZY PAVING. The name of crazy paving is applied to stone paths, compored of random or odd-shaped pieces roughly fitted tngether to preserve a generally straight line at the edges of the path. Crazy paving is not reat ricted tu paths. but has many applications as a pasing for courtyards, the surmund to the base of a sundial, and for terraces and other orna. mental features in the garden


Crazy Paving Fis. 1. Section of path snowng how the Hags are set in sand on a foundation of rubble and large stones to ensure proper drainage
The materials are often in any hollow places a few rough agricultural drain pipes widl prevent ponls of water forming on the pathway. In miany cases the drain pipes can be so disposed that the rain water is directed towarda the Hower bed or other Incation where it will be beneficial
The laying of the stoncs can next be com- obtainable from housebreakers, or rom a menced, and it is worth while to surt roughly stone quarry, while old paving stones are over the materials and assemble the pieces excellent for the purpuse when they are in groups according to size The stones vary available Thay generally arrive sumewhat in thickness. size and shape. Fur the edge of broken, which is no detriment, as the suc the path use the straighteat edge of the stone cess of the crazy paving depends upon and commence by laying a lied of asand upon irregularity. No two stones are alike in which to sot the stunos The atones are set form or size, but the whole must be so upon the sand by moving them abuut slightly arranged that the boundarics of the pavement and bedding them in using a truwel to maniare in regular lines. It is not sufficient to lay pulate the sand, and a heetle or heavy rammer the pieces of stone directly upon the ground to leat down the stone. Eivery atune must lie firmly without ien.
 dency to rocking or movement. wtherwise it will never settle. lay the the outer edges of the path first and then fill in the centre, but complete the whole width of the path as the work jiroceeds.

When finushed the path should present a level surlace. any irregularities in thicknese of atunes may be compensated by idding more and underneath to make up for any deficiency in thickness. The stones are sometimes set in cement mortar
a properly drained subsoil and a suit able lied for the stones are easential.
The proper method of constructing such $\Omega$ path or paved area is firat to marli out the site, using pegs and the garden line to define the bnun. daries. The turf and soft top soil are removed to a depth of at least 6 in., and more on a very light soil. The earth is well rolled or rammed, and broken brick, gravel or other ballast or hard core laid down and covered with a layer of finer but rough material, so as to provide drainage for rain wuter. Regard must be paid


Crazy Paving Fik. 2. Irregularly shaned flags worked Into a path and linking up divisions of a large garden. Fig. 3. Crazy naviny in a small town garden, the old stones torming an ideal background for Howers thronghout the year
2. R. Neal \& Sons, Wandsworth: 3. Humplirely \& Vera Joct
especially when it is deased to prevent the growth of grass and tlowerets be. tween the stones. In this case the cement mortar is laid upon the sand and the surface of the stones brushed over with cement slurry completely to fill all crevices The path should be washed later on. so that the natural colour of the atones is revealed.
An edging of brickwork forma a pleasing finish to a large area of crazy paving. An alternative method is to set larger stonew directly upon the grass. when a Japanese ot stepping-atone type of path is wantod To do this the turf is cut away to the shape of the slone, which is then bedded on sand laid directly upon the earth
A reasonabile estimate is that a ton of stone will cover anything between six and ten square yards of crazy paving. See Cement : Concrete: Path: Wall

CREAM: Its Food Value. Cream consists of the fatty globules of milk in which are contained the carbonaceous portion constituting the principal food value. It has heen found, on analysis, to contain 74.0 parts water, 2.5 protein, 18.5 fat. 4.5 carbohydrates, 5 ash. All the nutriment contained in cod-liver oil is contained in cream. and invalids and children for whom the former is recommended find in cream a perfect substitute which is much pleasanter to the palate. Consumptives benefit from a diet in which cream has a liberal part. and it is much given to other kinds of invalid.

Cream is separated from milk for commercial purpsses by mechanical separaturs. To separate it at home without mechanical aids, simply allow the milk to stand from 8 to 10 hours. The fatty glubules, which contain the cream, are lighter than the other constituents of the milk, and they thus rise to the surface, where they combine and are skimmed off. The milk should be fresh and immediately placed in a wide, shallow vessel and left th stand in an even temperature of about $52^{\circ} \mathrm{F}$. in summer and $60^{\circ}$ in winter.

Double cream is obtained by allowing the milk to stand for 24 hours before being skimmed. The vessel in which the milk is placed should on no account be covered so that the air is excluded, but with a piece of muslin in orter to protect from dust ot Hies.


Cream Jug. Antique ozamples in silver. 1. \& and 4. Lussed and piain jnge, somp. igte cteorze 1 end easly Ceorge II. 2. Ornamented with beading, clasaical period, late 18th cent. 5. Creamewer, dated 1801


Cream Bun. Plate of these lught cream pastries covered with coftee icing and crystallised fowers

Creain can be kept fresh lor two days if it is just brought to boiling-point without being alluwed actually to boil. If sugar is anded. it will keep in a cool place for about 36 hours. It can be obtarned in hermetically sealed tins, and in this form should keep for a considerable time. Once the tin is opened, however, the cream should be emptied into a basin or jug and used immediately

Whipped creain goes further and is used for many sweets. A little sugar, wine, or Havouring can be added before creant is whipped, if desired. The cream should be poured into a cold basin and whipped with an egg whisk in a cuol place or in a current of air. so that cold air can be incorporated into the cream to make it light and atiff. Care must be taken that it is not over-whipped. or it will turn into butter. As soon as the cream autheres to the whisk it has been sufficiently whipped.

In addition to its chief use for the vily substance that forms on milk, the word creain has several other meanings, all, however, derived from the prime one and all implying some form of excellence. It is used for cosmetics. such as face cream, and for certain mixtures for cleaning boots; also for various preparations in which chocolate is the inain ingredient, and for other sweetmeats. See Butter; Clotted Cream : lce : Nilk; Trifle, etc.

CREAM BUN. These cakes are also known as cream puffis. To make them, melt 2 oz . butter in a saucepan, adding half pint hot water, and let the two boil. Take the pan off the fire and beat in 4 oz . dried and sieved Hour. Add a few grains of salt and, with a worden spoon, beat the mixture briskly until all lumps have disappeared: then put the pan over a slow fire and stir the mixture until it can be rolled about without sticking. If overcooked the butter will noze out. and the panada, as the mixture ts termed, will be spoilt. When cooked let it cool, and beat in 2 whole eggs and 1 extra yolk, adding each egg separately and working it in. Add vanilla essence and castor sugar to taste.

To form the cakes use a forcing bag with a plain pipe, but if this
 courlesy of Spink \& Son, Lid.
is nut available use 2 deasertapronts, lurcing or shaping small round heaps of the mixture on to a greased baking sheet and leaving a space of 2 in between each cake. Bake them in a moderately slow uven for about 30 to 4.5 min When cooked they should be light, hollow. and biscuit-coloured.
When cold cut each cake open down one side, and fill in whipped sweetened cream The buns when culd arc cuated with chicolate or coffee icing and sprinkled with crystallised tlowers. See leing.

CREAM CHEESE. While must dairics have their own methods of making cream cheeses from either double cream, containing 50 per cent. of fat, or from thin creain, thickened with rennct hefore drainage takes place. the fullowing method is a simple one for making about six $i$ Ib cheeses from a quart of crean. The cream should be cooled to $65^{c} \mathrm{~F}$. and a drop of rennet, together with a little starter, should be added immediately the cream is cooled. This starter may be cither a pure culture of lactic acid bacteria used by most cheesemakers, or it may be a little clean sour milk. On no account should the cream be soured naturally, as the Havour depends on its freshness. The cream is then left for 8 to 12 hours before draining. Salt may be added at the same time as the rennet, one teaspoonful to a quart of cream being ample.

The cream is drained in fine longcloth spread over a wooden form, which is provided with a loose buard which can be weightod to press out superfluous moisture. The longcloth is thrown over the form and pressed down to the level of the table on which it atands and the cream then poured in to the depth of $1 \frac{1}{\mathrm{l}} \mathrm{in}$. covering the inner area of the forin. Drainage must be gentle at first, or the mesh of the cluth gets filled with cream. The cluth should be opened once after the first half-hour and scraped down, when the cream should be reweighted with a 14 lb . weight. The oream should be ready to mould in 3 or 4 hours. The cheese is filled into small moulds lined with parchment paper. A wooden knife should be used. On removal from the mould the separate cream cheeses are wrapped in muslin. See Cheese.

CREAM JELLY. Prepare half a pint of claret or raspberry jelly, using twice as much gelatine as usual, or, if preferred, use a l-pint packet of jelly, and prepare it as directed on the packet, but using only half the stated a mount of water. Put half a pint of gond cream into a basin, whisk it until it thickens, but not sufficiently to make it hang on the whisk. Then whisk it gradually int, the warm, but not hot jelly, adding any extra colouring or Havouring desired. Continue to whisk the whole gently until it is on the verge of setting, then pour it into a mould that has been rinsed out with cold water. Ieave it until it sets, then dip the mould into hot water and alip the jelly out on to a dish. It may be decurated by putting round the cream a border of chopped sweet jelly, of a contrasting coluur.

CREAM JUG. The carlicst cream jugs known to collectors are silver ones, having a bellied bottom and straight neck, no lip and simple bow handle. Thev arc sometimos found in sets of three small uncs and one somewhat larger. Early in the 18th century the short luw-bellied jug with a small lip and bow hendle came into use. These jugs stond on a ring foot, but soon they were made with three cast fect, and this type became popular. The body was decorated with chasing, and as other elaborations were intruduced the lip became an elongated spout, and for the bow a shaper handle was substituted. The three fect were replaced by a round foot and a short stem, as is seen in two of the illustrations.

Late in the 18th century, owing to the classical style of decoration in vogue, a less ornate pattern was again adopted. The foot and stem were left, but an oval helmet-shaped body came into fashion Severity of outline and restrained beaded or reeded ornnment were retained. but jugs with fuller bodies and short nesks were made. Another style is one in which the foot and part of the body are cut off. Many of these are graceful pieces of work, and many beautiful modern cream jugs are reproductions of 18 th century designs. Cream jugs are also obtainable in glass and in chinn to match services.

CREAM OF TARTAR. This is the common naine for the bi-tartrate of potassium. Two to six teaspoonfuls in orange marmalade is sometimes used as a purgative. The Inperial drink, a favourite household remedy for slight fever, may be male by adding $n$ teaspoonful of creum of tartar a little sugar. and a quarter of a lemon to a pint of boiling water. 'Ihis tends to keep the kidneys active.

CRECHE. A crèche is a daily boarding estahlishment for infants and young children under school age The standard varies according to the income of the parents who wish to have their children cared for during the hours they are unable to lonk after them.

The mother leaves her child or children at the creche early in the morning, and pays 2 d or 3d. per child. In many cases she alao brings the food it requires for the day. If an infant is breast-fed, arrangements are made for the mother to call in the dinner-hour The chil dren are cared for by the creche attendants, and frequently bathed and washed, superintended and fed until the muther or guardian calls for them at ahout 5 o'clock. They are given as much fresh air as possible, amused and trained in orderly ways Most large cities have crèches in their midst, and infornia tion about them can usually be oltained from the local infant welfare centic
CREDIT : The Legal Aspect. Credit is a matter of agreement. If a lady orders goods and makes no agreement that she is to have credit, the law implies that she is to pay for them on delivery. She should, of course, be allowed an opportunity to examine them before paying. If slie wants credit she nust agrec with the tradesman that she is to have it, and agree how long the credit is to be. Once it is agreed that credit shall be given, the seller of the goods cannot go back on it and demand cash on delivery ; neither can he demand payment before the period agreed upon has expired. Thus if the lady buys on the lat Jan, upon the terms of a nonth's oredit, she has until Feb. Ist in which to pay, and cannot be sued for the money until Feb. 2nd

The word credit is used by bankers for the money or other reserve which a person has in the bank. In bookkeeping the credit side of the account is the one where payments are entered See Accounts; Banking.

CREEPER. A term correctly applied to rigorous selfeclinging plants like ivy which are used to cover walls. It is applied to many climhing plants. See Canary Crecper : Clematis: Climbing I'lant: Wistaria, etc.

CREEPING JENNY. This is a good trailing plant and useful alike for window boxes. rockeries and hanging baskets. It thrives in shade and bears yellow llowers in summer. The golden-leaved variety, aurea, is attractive. It is easily propagated by detach. ing rooted pieces

CREEPING SAILOR. The common name of creeping sailor is given to Saxifraga sarmentosa, $n$ pretty creeping plant, which is also known as inother of thousands (q.v.). It may be grown in pots suspended in room, window or greenhouse.

CREMATION. When it is desired to liave a body cremated, the best course is to telephone or telegraph to one of the cremation companies, who will at once send a repre sentative or give instructions as to what steps should he taken I special form of application will be supplied, and this must be filled up and signed by an executor or a near relative of the deceased. Ansong other things the applicant must state that decensed had expressed no objection to being cremated, and whether any near relative of the deceased objects to the proposed ciemation: if so, on what grounds

Procedure and Regulations Two medica certificates are needed One is filled up by the medical man who attended the deceased in the last illness, and who has seen and identified the body. The recond certificate may only be given by a medical practitioner of not less than five years standing who holds one of certain specified appointnients, such as medical officer of health, police surgeon. physician or surgeon to a public general hospital containing not less than 50 beds, or has been appointed specially for the purpose. The registrar's certificate of death must also the produced for inspection by the medical referee of the cremation company When the medical referee of the cremation company is satisfied that all the requirements of the Act have been complied with, he authorises the superintendent of the crematorium to cremate the remains
Any form of religious service may he conducted before the actual incineration Friends may see the coflin placed in the chamber, but are not permitted to witness the burning The ashes are placed in an urn, which may be deposited in a chapel or buried in a grave or handed over to the fiends.

The following is a list of the crematoria in Great Britain, with the addresses to which application sliould lee mande

## Londnn

Golder: B Gren
Hemion Phen: 23, Nottinglinm Place, W
Whe Abney rark cemetcry Co.. Stoke
Little Ifford:
Weat Norwood: 58, Temple Chambers Temple
Wokling Birminglum Bradinard Briptol Brigliton Edinburgh Edinburgh Glasgov: Hull Ipawich Laysis Lpireater Id-crpnol Naticherter Not tingham Pon' yprlidd Shellield

## See l)eath: Funeral

CREME DE MENTHE. This is a flea. sant and wholesome liqucur made from peppermint It is of light green colour, and


Creeping Jenny. Leaves and goluen dowers of tuis spreading, trailing plant
the best brands are highly matcomed an digestives It should be served after luncheon or dinner in liqueur glasses A lavourite methor, eapecially in hot weather, is to serve it trapué, i.c. with crushed ice, when it should be drunk through a straw

Crème de Menthe Square. Take 1 lb of granulated sugar, I teaspoonful peppermint essence, I gill water, I sheet gelatine, and a little gicen vegetable colouring Dissolve the gelatine in half the water in a saucepan, and boil it for 2 or 3 min . Place the sugar with the remainder of the water in another saucepan, and bring it slowly to the boil Take it off the fire, and when it is slightly cool add the dissolved gelatine, stirring all the time

Then add the peppermint essence and vegetable colouring to taste After it has atood for $10-15-\mathrm{min}$., strain it into a llat tin that has been rinsed out with water When quite cold it may be unmoulded by dipping the tin into a basin of warm water Cut the mixture into rounds or spuares, or any other shape desired, and roll the picces in icing sugar. Leave them in the sugar lor a day or two, then shake it off, and pack the sweets in boxes between layers of waxed pajer,
CREOSOTE. An oily and transparent liquid with a strong penetrating odour, creosote is obtained by lieating wood or coal tar, and has a strong antiseptic action: it is less caustic than carbolic acid and is very much less poisonous
Apart from its use in medicine for certain cases of indigestion and for treatino painful teeth, it is employed for croosoting timber, and is of value in the household and garden in preventing wood from rotting Fences are preserved from decay by painting them with creosote, which penetrates the wond and keeps away insects. In the building ol pergolas or garden houses, those portions of the timber which are to be buried in the ground should be treated with creosote Inside the house. plain furniture and lloors can also be so protected, but the penetrating smell is against its use for this purpose. A good disinfectant powder is obtained by mixing one part of creosote with four parts of slakied lime See Disinfectant.

CREPE-DE-CHINE. Originally made in China and imitated in France, crépe-de-Chinc is now produced in all the silk weaving centres. Its characteristic appearance arises from the use of hard-twisted silk which is woven without removal of the natural gum that forms ahout a third of the weight of raw silk This gum is removed after weaving and the threads exhibit a new fullncss and lustre The cloth is dyed after weaving

What are called schappe crỏpes-de-Chine are made wholly or in part of spunsilk and are generally firmer and more clothy than those made from raw silk In addition to the self-coloured fabrics selling under this name there are striped sorts. largely of Englisli make. especially suitable for shirt-hlouses and washing dresses This is onc of the most suitable silks for wear next the skin, and can be ensily Inundered at home in a lather of majp Hakes and hot water, allowed to grow tepid before using. Squeeze and knead the garments gently in the lather, rubbing only when it is absolutely necessary Wring them thoroughly, then rinse them into two howls of warm and one of cold water, adding a tahlespoonful of vinegar to the lust. In the case of white crope-de- Chine, n little hlue may te substituted for the vinegar

Coloured cripe-de-Chine should be ironed as anon as possible after washing, othemvise the colours may bun. Ironing is best done by Inying the material right side $1 p$ on an ironingboard or table smoothing it out, and covering it with a piece of muslin When nearly dry finish ironing on the garment itself

CRESOL. Often known also as oresylic acid. this is a light brown liquid which smells like tar It is a disinfentant. and is employed to make liquor creas) saponatus, which resembles lysol and is used in the same way In whooping-cough the frequency of the paroxyrms may sometimes be leasened by impregnating the air with vaporised cresol This can be done by heating a large spoon in the fire and prouring in a teaspounful of creal or the drug may be put in the lid of a tin which is fixed over a nightlight Vaporisers may also be brought lor this purpose. Cresol is round in must of the proprietary disinfectants on the market See Disinfectant.

CRESS. The term oress is popularly applied both to watereress and the cress which is eaten with tho loung leaves of the hardy annual inustard plant.

Mustard and cresa grow very easily and rapully, so that a conatant supply is always obtainable for small salad. It is a mistake to plant both at the same time, as the cress grows more slowly than mustard, and should be given a three days' start. See Salad.

CResting : On Furniture. This term is used for any ornamental detail aurmounting a piece of furniture and reaching right acmes from side to side It refers (1) a decorative addition only, not to a constructional part. Cresting may be described as a peiforated, carven and pilded, or silvered ornament superimpneed above the top moulding, such as is found on lacquer cabinets of the late 17th century In a chair a creat rail refers to a top rail which has sume ornamental character. Chairs of the time of Charles II and William and Mary have decorative crest rails.

CRFINISM. Ferbleness of mind is one of the symptoms of cretinism, a cundition originating at birth or developing at any time up to puberty, tugether with a large and perhaps protruding tongue, poor development of hair. awelling of the abdomen, or dwarfing of the body. The diseaser is due to lack of function of the thyroid gland, which is aituated in the neck junt below the Adam's apple.
Treatment consists in giving the thyroid extract to make good the deficiency from which the patient suffers, but it should only be undertaken by a dicetor

Under this treatment rapid increase in height may take place, perhaps 5 or 6 in . in as many months. Early cases receiving prompt thoriugh treatment may grow up into apparently normal individuals, though it may be neceasary to continue the treatment at intervals throughnut lifa.

CRETONNE. This cotton fabric is unglazed. and is lonmed in several widths, 31 in , 36 in ., and 50 in . It is durable and washable and its wide range of patterns and colourings and its soft appearance renders it suitable for curtains and loose covers for furniture, and upholstery. When buying it for furnishing purposes care should be exercised in the choice of the deaign in order that it may harmonive both in colour and style of pattern with the furniture and decoration of the rom. These cretonnes can be obtained in Jacobean designs, in old English flower designs, in bold geometrical patterns. or sprigged with Victorian pusies.
As tu colour, it should be remembered that deep tonee, such as orange or red, are more expensive to produce, and that falrics in these colourings must be of good quality to obtain pleasing effeots Bright culours in cheap dyes are crude.

When choosing a pattern remember that a large pattern is more costly to make up because the design must be matched in joining the material, thus occasioning mure waste than when the pattern is small. Buy rather more material for upholstery purposes than the net quantity obtained by measurement. When
making up cretonne into lonse covers take measurements and a careful plan of each piece of furniture on hand before attempting to cut the material. Where the widest part of the furniture exceeds the width of the material an oxtenaion, or piece to be added by a seam. should be placed on each side, and not on one side only

In laundering cretonne, pure curd siap, or soap not containing caustic soda, should be employed: bran-water should be added to the water the latter being tepid Cretonne should be starched in boiling-water-starch thinned down. i.e. 3 pints of water to I pint of starch. Covers for furniture can lee dry cleaned by brushing over them a thick paste made by starch and cold water See Cuver: Curtain: Upholstery

CRIBBAGE. This is a card game for iwn, three, or four persons. but it is most commonly played by two persons only, and the two-handed game is the one that is here described. There are three varieties of cribbage, the five. six, and seven card game, the latter, huwever being seldum played. The game is 61 121, or 181 points up respectively. and a special cribbage board is generally used for scoring purposes.
The full pack of 52 rards is used, and players cut for deal, the one who cuts the lowest card dealing. Ace counts as the lowest card. The cards are dealt one at a time, until five are dealt to each player, and the pack is then placed batween the players. Each rhouses two cards from his hand, which he places face downwards on the table to form the crib, a hand which belongs to each dealer in turn As this crib gives a alight advantage to the original clealer. his opponent scores three points or holes, known as three for last to equalise the advantage.
When the cards have been thrown out for the crib the non-dealer cuts the pack and the draler takes the top card of the bottom half of the cut and turns it up. This card is known as the turn-up, and is used by buth players for scoring purposes. If the card happens to be a knave the dealer scores two points, known as two for his heels.
The scoring during the play is as follows, the non-dealer leading the first card. Two points are sconed for a pair: that is, if one player puts down a card, say, a three, and his oppunent plays a three. the latter acores twn for a pair. If the player can follow again with another three, he scoros six for a pairroyal, and if his opponent is able to place down the fourth three. he scores 12 for a double pair-myal.

Three or more cards of any suit in numerical succession, as, for example, the three of diamonds, the four of hearts, and five of epades, count one for each card to the last player. Thus a player who completes a run of three counts three points. The run need not be in rogular order. Thus in the example given the four might be played, then the five, and lastly the three. If the next player can play a two or a six be scores four points for a run of four, and 80 on.
When a player plays a card which makea with the cards already expused a total of 15 pips, he scores two points, 15 two. Thus if a player plays a nine and his opponent a six the latter scores two points. Three or more cards may make up the 15. A score of 15 two und a run may be scored by the same card.

When the total of the pips on the cards approach 31, the player whose turn it is to put down a card may find that any of the cards in his hand brings the total over 31. In that case he says, "Go," and his opponent has the right of play. If the latter alau finds his cards are too high, the player of the last card scores one point for last. If either player can make the total exactly 31 he scores two points. In counting pips on the cards the knave, queen
and king count as ten. When both players "Gu" or the exact total of 31 is made, the hand terminates, and the two players, beginning with the non-dealer, show their hands and count them.

In this final count the turn up card is also reckoned as part of cach player's hand and also as part of the crib. The hands are counted for each 15 they contain, the points being reckoned for each 15 as in play. Every separate combination possible is counted. Thus a king and three fives in a hand count as eight points for 15 's, since four distinct 15 's may be made. Any pairs count as two points, any three cards alike as three fives, six points, any four 12 points. independently of the fact that these cards may already have been counted for 15's. Thus three fives count two points for 15 's and six points for a pair royal A run of three, four or five counts three, four or five points There may be three cards in a sequence and a fourth card which is a duplicate of one of the sequence cards. In that, case a double sequence is counted, that is six points, and two points for the prir. Similarly with four cards and the fifth as duplicate Three of the cards may form $n$ requence, and the remaining two be duplicates of one card, in which case a treble run of three can be scored: with six points for n pair royal.

When the three cards held by the player are all ol one suit be scores three points for a flush, and if the turn-up is also of the same suit, four points If a player holds a knave of the same suit as the turn-up, he acores an extra point known as one for his nob The dealer scores his hand after his opponent has done so, and then his crib in the above manner A flush does not count in crib unless the turn-up is also nt the same suit, and then counts five points A tlush counts in addition to any other point also scored. In throwing out cards for crib a player naturally throws from his hand such cards as are likely to be productive of scoring if it is his own crib, and non-productive if his opponent's crib.
CRICE. Sudden painful stifiness, occurring in the neck or back, is known as a crick, and is probably due to muscular spasm, though it is also suggested that it may mean rupture of a few fibres of a ligament or muscle. The treatment is gentle massage with the tips of the fingers, using warn oil, a liniment, or the following: nethyl salicylate 1 diam ; menthol 1 dram ; lanolin 3 drams: vaseline to 1 oz

CRICKOT. The cricket usually shelters around the kitchen fireplace, often excavating burrows in the mortar between the bricks; these may be made untenable by injecting carbolic acid with a fine syringe. It is a very thirsty creature : and a plate of water to which a few drops of formaldehyde has been added will kill many. It feeds on all sorts of sciaps and fragmente of lood that have been left accessible to it: a piece of bread covered with the phosphor-paste sold for

Common Crietret of
the Areside the destruction of cock. roaches will be consumed readily, with fatal results. Any of the remedies suggested under cockroach may also be tried. Crickets especially favour the large open fire. places often found in old houses.

CRICKJT. The devotee of this game, which is also played by women and girls, usually provides himself or herself with a bat, and a pair of pads to protect the legs In addition most players wear gloves to protect the knuckles and the back of the hand, and men wear boots of a special kind. The pads
and gloves can be bought in șizes, to suit the needs of the particular individual, from any sporting outfitter

The Cricket Bat. Undoubtedly the best thing to do when buying a bat is to go to a firm of repute and take the bat which suits, even if the price be the highest In taking up sereral bats, one after the other it will be found that some do not seen to balance well. some seem too heavy others too light But in nine cases out of ten one of them will feel as if it were an old friend. If on examination it seems perfect in every way, this is the best bat to take

Many batsinen liave a great objection to knots, and if there are any near the handle it is always safest to discard the bat Some hatsmen prefer a narrow grain in the wood others like a wide grain There is no royal road to success in choosing a bat, and despite their experience and skill the greatest of batsmen will occasionally find that, when they have hought their hat, it will not drive as well as a proper bat ought to do. But anyone whon has the right instinct, a little conmon sense, and knows what he wants will very seldom make a mistake

## Preservation by Oiling

Not so very many years ago cricketers who bought a new bat treated it almost with reverence. They did not think of using it until it had been well viled for a long time, and they oiled every part of it, except the handle and splico To-day good batsmen often use a loat which has just come from the maker or a sliop, and it is claimed that by a new process in the manufacture bats are hardened sufficiently for immediate use. Nevertheless, it is certain that no wood of any kind has ever heen discovered which does not deteriorate if proper attention is not paid to it. Hence batsmen, or most of them, still look carefully aftel their bats when they are not in use, and more especially during the winter montlis.

The usual way of oiling to-day is to spread linseed oil on the surface of the front of the blade with a bruslı such as is used in oil painting, from the bottom about twelve inches upwards. This is done about onee a month, and then the bat is stored upright, in a place which is neither damp nor too highly heated. The theory is that the oil penetrates right through the bat, and that thercfore there is no need to oil the back part. If in wet weather the bat gets very dirty, and the owner does not like its appearance, a little fine sandpaper before oiling will do all that is necessary.

Cricket Boots. The most expensive kind of cricket boot is made of white buckskin, but in order to turn out a smart-looking boot at a cheap price, various imitations classed as mock buck are used. There is little to dis. tinguish the real article from the imitation when made up, but most of the latter quickly stretch out of shape and wear into holes. It is better, therefore, to buy good canvas boots, as they are usually more satisfactory in wear and appearance than the mock buck.

As comfort is so essential, the seams on the inside of the boot must not be bumpy or rucked. A chrome sole usually gives longer service than a bark-tanned leather sole, and it is waterproof ; but it tends to draw the feet, and persons with hot or perspiring fect should a void chrome-soled footwear.
Cricket boots are made with and without heels. It is claimed that the heelless variety allows greater foot-flex, but this is really a matter of opinion. The cheapest and most effective cleaning material is pipeclay. In cleaning the boots should not be made too "et. This has a tendency to cause the uppers to shrink if made of canvas, and in the case of buckskin is liable to render the uppers hard and brittle.

CRINOLINE. Otiginally applied to the stiffening of horsehair and cotton or linen threads used to expand women's skirts, the word came to include the steel and whalebone boups employed for the same purpose

Crinoline used for women's hats was manu lactured from horsehair, but now artilicia! silk is largely used for this purpose

## Crochet Work: IN Varied Styles

## Simple, Double, Filet and Picot Stitches Described

For the application of this work readers should consult such entrics as Luncheon Set; Tablecloth. Associated articles are Bead; Embroidery; Lace. See also Bell Gauge

First known as Shepherd's Knitting, crochet derives its name from the French word croc, meaning honk, as it is performed with a hook of steel for fine work and bone for coarser work The first stitch is chain-stitch, generally given in directions as the foundation chain, and all crochet work must have a foundation chain.

The first loop is made with the fingers, thus: Hold the end of the thread with the thumb and forelinger of the left hand, and with the right hand pass the main thread over the end to form a loop, holding both down under the left thumb. Insert the crochet hook from right to left through this loop, and draw the thread through. Draw the loop up close, when the first chain will be made. *Pass the thread round the hook, and draw it through the chain-stitch on the hook, then repeat from * for succession of chainstitches, Fig. 1.
Single crochet or slipstitch (Fig. 2) is the same stitch under two names. It is sometimes used to join one stitch to another, such as at the end of $n$ round, when the last stitch is slipstitched to the first to join : sometimes it is em. ployed to get from one position to anot her without breaking off the cotton and restarting. To make this stitch, simply put the hook in the stitch and draw the cotton through the stitch and the loop on the hook in one action.

This stitch is employed in every form of crochet, from the finest Irish lace (where it forms a length of chain into a picot) to big garments. When working the latter in rounds instead of rows, a slipatitch joins the last stitch to the first

## Double Crochet.

 1)ouble crochet is a very useful stitch, and there are two varieties, ribbed and flat, both worked in the same manner, but the hook is placed differently at the beginning. For rihbed double crochet (Fig. 3) put the hook in the back loop of the two seen at the top of the stitch after working one row (in the first row it just goes through the chain) cotton over hook, and
 draw the wool through. wool over

Crochet. Figs. 1-7. How some of the principal stitches are made
both 100 ps at the top of the stitch, as shown in Fig 4 tor flat doulile crochet

Double treb!e (Fig 7) is similar to treble. but the cotton is put twice round the hook at the beginning. then all the loops workel off by twos Sometines long treble is olitained when the cotion is taken round the hook three and four times. but the number is generally given in the directions


word worked not repented
which part to repent.

Picot (Fig 10) is a little loop ol chain stitches formed into $n$ ring with a slipstitch and forms the background of 1rish clochet It uanally conaists of 6 chain, and slipstitch into the 5 th chain from the hook to form $\pi$ nicot A single picot loop is mater thus $\dot{7}$ chain slipstitch into 5 th chain Iroin hook 2 chanin then 1 double crochet on the founda tion to lasten down the picot loop A wulute picot tonp has 2 picots ol 5 chain with 2chain afterench
Two tormis ol cro. chet buttons are shown in the illustra. tion The materials required for making the barrel button are some ordinary crochet cotton (No. 24) and a No 5 book.

Kegin with 14 chain stitehes and work the first row as fo'lows : Misa one chain. 13 double crochet and turn with one chain For the 2nd row work 1 double crochet in

Lacets and bars (Fig 8) are used chietly to form a background Sometimes there is a row of laceta, then a row of hars ench bar spanning over a laret A lacet is 3 chain, miss 2 stitches. I douhle crochet in next stitch, 3 chain misa 2 stitches 1 treble in next atitch A har is 5 chain miss 5 stitches, 1 treble on next stitch When it aprans over a lacet it is necessary to miss the 3 chain, 1 douhle crochet, and 3 chain, and put the trehle on the treble at end of lacet. Lacets and hars are often used alternatoly along the row forming a pretty background.

Filet Crochet. Filet crochet (Fig 0) consista of groups of trehles and open apaces 'The spares ure made thus: *2 chain, miss 2 atitches, I treble on the next stitch. and reppeat from * for as many spaces as required. Where a group of treble is given, 1 treble is put into each stitch conser:utively along the row whether that atitch be a chain or treble. and these groups form the solid part of the design. the spaces being the background
Note that the treble finishing the last apace before a group is not counted in the group of trebles. because it is already counted in the last space, and if counted twice the symmetry of the design is spoiled. The actual number of trehles should be divisible hy 3. hesides the one at begonning of the group which finishes the last space or lacet, as the case may be
When working the first row of filet crochet. the first treble is put into the 8 th chain from hook to form the first space. this making 2 chain for the foundetion, 3 chain for the treble, and 2 chain for the top of the space. If the work has a treble border, then the row is turned with 3 chain, and this stands for the first treble of the following row. The treble over which this chain stands is not worked into, and when the end of $a$ row is reached always work the last stitch into the top of the 3 chain which is at beginning of previous row If there is a apace at end of row instcad. then work intothe third chain When there are directions in brackets, this portion is always worked the number of times stated immediately after the brackets. 'lake note of the


Crochet buttons made accordlag to
instructions given in tnis article
instructions given in this article
each stitch to end, but do not work into the one turning chain. The 3 rd row consists of 2 double crochet in the first stitch, and I double erochet in each of the next 12 stitches For the 4 th row do 2 double crochet in the first stitch and I douhle crochet in each of the next 13 stitches and make the foth row 1 double crorhat in ench of first 4 donble crochet, 2 double crochet in next stitch 1 double crochet in each of four more stitches, 2 double crochet in the next double crochet, and I double crochet in each of the last five double crochet The (ith and 7 th rows consist of 1 douhle crochet in each atitch, while the 8th and 9th rowa represent 2 doublc crochet in first atitch, and 1 double crochet in cacli atitch to end
The IOth row should be * I louble crochet in ench of fire double crochet 2 double crochet in sixthatitch; then repeat from * once, and work I double crochet in each remaining stitch Let the IIth row consist of 1 double crochet in each stitch, and for the 12 th row do * if double crochet, miss the seventh: then repeat from * once and work I douhle crochet in each stitch to end For the 13th and 14 th rows, miss first stitch, I double crochet in each stitch to end For the 15 th and 1 Gith rows work 1 double crochet in earh stitch and work the 1 ith row ns follows: * 4 double crochet,

larder use

CROCKERY: Its Repair. It is always easier to repair crockery if the job is taken in hand at once, as the fracture is then quite clean. There are various methode, but the simplest is to stick the parts together with one or other of the numerous patent adhesives on the market
The usual method employed is to coat the edges with the adhesive and press the parta together, holding thein in contact while the glue sets, or blucking thein up, or strapping the parts together with bands of linen or paper, which are subsequently removod when the cement has set firm
This method will generally keep the parts in contact, although it seldom results in a thoroughly satisfactory job. Fither the joints give when the article is put into service, or the thin film of glue becomes conspicuous by the coating of dust that always accumulates along the line of fracture.

When restoring a valued piece that has broken into many fragments, patience must be exercised and only two pieces joined together at a time, allowing the joints to set
hard before attempting to complete the whole piece of work. If a few tiny parts are missing they can olten be moulded in fine plaster of Paris made into a cement with liquid glue and just sufficient warm water to make the material intu a workable paste. When thoroughly dry it can be smonthed with sandpapier, and coloured to match the original work
The Use of Rivets. The most effective way of re. pairing cruckery so that it can be put into evcryday use is by riveting. For this ןiurpose a drill stock specially devised for such work is indispensable, and the gencral appearance is shown in Fig. 1. Such drills are made with a diamond joint, and are far more effective thinn using $a$ hard steel drill and diamond dust or carborundum as all abrasive. To use the drill, the spindle is twisted so that the cord is wound round the stem; when the crossbar is presser downwards the cord untwists and rotates the drill. The hand is then raised quickly and the momentum of the drill again winds the cord around the stem, so that by rugular and repeated movements of the crossbar the drill can be kept in motion. The drill is worked with the right hand, while the left hand holds the piece of erockery.


Crockery. Fis. 1. Drill stock employed lor making rivet boles in crockery and chins

Courtesy of R. Melluish de Co.. Ltd. ties, e.g. Sir IValter Scott, growing in llower-pots for the greenhousc.

The corms of autumn and winter Ylowering crocuscs are planted in July and August: they are usually planted in the rock garden among low-growing tufted plants which prevent
the bottom of the hole, otherwise they will never br flat on the surface of the china. When all is in orter the rivet is bedded ints the holes with a little plaster of Paris made into a paste with water and a trace of glue A typical repair is shown in lig. 3
CROCUS. There are three classes of crocusspring, autumn and winter Ilnwering: all are hardy. The crocus root is technic ally known as a corm. Spring crucuses are planted il) August or September. 2 in . deep: they lonk best in grass and flourish beneath large, leaf-losing trees They also do well in heds and Lorders, and may be left undisturbed indelinitely. There are several handsome large-flowered named varie-

## Croquet and the Croquet Lawn

The Rules of an Attractive Outdoor Gama
Other articles on outdoor games played in the home garden which appear in this Encyclopedia are Badminion; Bowls; Clocis Galf; Lawn Tennis

This outdoor game for four players can be
played on any level lawn that is of sufficient played on any level lawn that is of sufficient dimensions. The standard size is 35 yd . in
length by 28 yd . in width, hut a lesser space can be utilised, provided its length and breadth can be utilised, provided its length and breadth
are in the proportion of 5 to 4 . The boundarics are marked with white lines.
The implements required are mallets, one for cach player, and four balls that are coloured red, black, blue, and yellow, the mallets being usually marked on the handles to correspond. The balls should be $3 \delta_{k}^{6} \mathrm{in}$. in diameter, and weigh about 16 oz ., 164 being the maximum. Stuck into the ground are six hoops and two posts. Each hoop should stand 12 in. out of the ground and be not more than 4 in . in width across the inside.

Each of the four outer hoops are 7 yd . from the side boundary and 7 from the end of the ground nearest to then. The centre hoops are 7 yd . from each other and 14 from the houndarics on either side. The posts or pegs are in line with the centre hoops, each being 7 yd . from the boundary, and in line acmss the ground with the side hoops. The posts should he 18 in . high and $1 \frac{d}{d} \mathrm{in}$. in diameter.

Sonnetimes, however, the gane is played on it ground sct out somewhat difierently on a plan known as No. 2 or Willis setting. In this there is only one peg, not two, this being placed in the centre of the ground with the central hoops ench 7 yd. from it in a line parallel with the side hoops.
The game is played by two players in partnership against the other two. The pair using the blue and black balls always play those using the red and yellow ones. A game consista in making the balls traverse the coursc twice. once in each direction, and the pair who finish first win, i.e. both must finish before the second of their opponents does so. All the hoops must be passed through in regular order once on the outward and once on the homeward journcy, and the posts must be struck by the balls once each, one when the player is half way round and the other for the finish. The posts may be hit from any direc-


Crocus. Groun of sprink-towering crocus, whlte
the hlooms being spuilt by sail splashed up in wet weather. They make charming plants for the unheated greenhousc if grown in pots: this is really the hest way to grow the winter crocuses. Of those that bloom in autumn some of the hest are

Aaturicns, Illac-manve; hadriatienw, white: pulehelthes, lavender-blue: sativis, violet: ; and speciosus. lavender-blue. Bome of the chief whiner-flowering wochseg are chryanthus. yellow ; Inperati, palr tommasinianus, pale lavender.


Crockery. Fig. 2. Diagrams illustrating a chins rivet bent for use and the melbod by whioh it is
iuserted in the drilled boles

## Commence

 by moisten ing the drill print with oil, and then drill n slanting hole down wards into the china and about $\frac{1}{4}$ it. awny froon the edge of the fracture. The rivets are simply bent to shape from soft brass wire ahout $x_{6}$ in. diameter, a pair of flat-nosed pliers lieing handy for this work. The shape of the rivet when made is shown in Fig. 2. Some judgement is needed in placing the rivets so that the fewest number accomplish the required result. On plates and dishes the rivets are best applied to the back, where they are out of sight, but on a jug with a broken spout hero is littls chance to do more than ineert sonie of the rivets on the inside and the remainder on the outside.To insert a rivet, take care to flatten the inner surface of the wire a little so lhat it bears more effectively on the china, and sce that the legs are not too long; they should not quite reach


Crockery. Fir. 3. Bedroom ewer with side and lip mended witt riscts
tion, but the hoops can only bo passed through from the front. The players play in turn, lolowing an opponent. The usual order is blue, red, black, yellow. The game can alsa he played by two parsons, one against the other. In that case each takes two balls, playing them alternately, ns- would be the case if there were four players.

Such is the older and popular wry ol playing croquet, but many play according to rules introduced in 1914. The "either ball" law provides that as regards the single game, when it is the turn of a player to play, he may play with either hall. blue or black, or red or yellow, as the case maty be. In doubles, either player miny play the turn. Under another law, passed in 1923, the partuers suceed each other in playing any turn after each point is minde.

The game is started from balk. i.e a space behind the first hoop on the left-hand side of the ground. The tivo hoops in front of him must be taken by each player in turn. after which he crosses the ground and takes the two on the other side, but in the reverse order to the lirst two. He then makes for one and then the other of the centre hoops, after which he strikes the turning peg, which is at the end of the ground fartheat away from balk, with the ball.

The reverse journey is then bagun. The two hoops he took first arc again taken, but in the other direction, as are the two on the ot her side of the ground. He then goes to the centre, and this time, leaving the turning leg, passes in turn through the tivo hoops and finally drives his ball against the winning peg, which is the one near the balk. If, in hitting, a player drives an opponent's ball through the hoop which that player has next to negotiate, the stroke counts, and when his turn comes the opponent jplays for the next one. A player can also drive a partner's ball through a hoolp, the score counting if the hoop is the next in order of play.
The game begins with the first player diving off frombalk. If he suecceds in passing
bis ball through the first hoop he has another shot and can continue playing until he fails to score a hoop The game, however, can hardly begin in earnest until all the balls are played, so we will assume this has been done The first player then plays again. He can either drive his ball through $\Omega$ hoop or hit one of the other balls with it. In vither case, provided with the subsequent croquet strokic neither his own ball nor the ball from which croquet is being taken has been driven out of the ground, he is allowed another stroke.

If he has hit another ball this atroke must take the form of a croquet To croquet he places his own ball against the one he has struck, and hits the former. Having thus moved both, he can play his ball again and again drive it through a boop or hit another ball with it, and be can continue this as long as he is succeasful, with the important proviso that he must not croquet off the same ball twice, unless in the meantime the player has passed his own bal! through a hoop next in order or sconed a peg.

The object of the game is thereforc very much as in biliards, to use the other balls as means of scoring, and to be careful to finish with onc's upponents' balls, especially that of the opponent who will play next, in dis advantageous positions This is far more important than an extra score Formerly this was often done by wiring the ball of the opponent who plays next, i.e. leaving it lying close against a hoop on the side away from the three other balls, the hoop being thus between the next player and his objective This made a good shot almost impossible Early in the 20th century an alteration was made in the laws, and now a player whose ball is wired can remove it and play from balk, provided it was put there by an adversary

Mallets and Balls. Croquet maliets consist of two parts, the shaft and the head. For the shaft, hichory is a useful and popular wood, but some are made of malacca cane, and a few of ash and elm. The heads are made of boxwood or lignum vitae, the former having the advantage of being less brittle than the latter. Many mallets are furnished with grips to prevent the hands from slipping. These may be formed by binding the shaft with string, or fitting it with cork or rubber. Of these, cork is perhaps the best, although, like rubber, it lessens slightly the force of the stroke.

In other mallets the player relies for his grip upon the shape of the handle. Such may be octagonal, or oval, or round. The octagonal, with grooves down the side, is for most players the most satisfactory. The oval handle is

II Measurements in Yards III

unsuitable for centre play, and the round one cannot be recommended. The choice of a mallet depends very much upon the style of play adopted For side play a light implement is desirable, but for centre play a heavier one The former should not weigh more than 3 lb ; the latter may well weigh $\frac{1}{2} \mathrm{lb}$ more The length of the shaft should be about 33 in . The head should measure 9 in . and have a diameter of 3 in But whatever the style, a mallet should answer to the following requirements. It must be well balanced and the whaft nust be straight The liole in which the shaft fits into the head must be accurately bored, and the shaft must be set into the head with the grain of the wood at right angles to the head.

Formerly croquet balls were marle of wood. and were, therefore, linble to oliip, but they are now made of composition, and are thus free from that defect
Where handicapping is carried out in croquet tournaments, it is done by means of bisques. i.e extra turns which a plager can take at the conclusion of his ordinary turn The weakent players are handicapped at $1 \$$ bisques and the strongest at -3

The game is controlled by the Croquet Association, 4, Southampton Row, London, W C., and under its rules tournaments are held all over the country throughout the summer. The croquet open championships are played at Roehampton, ncar London, every yenr in July

CROQUETTE. Scraps of meat, fish or poultry can be utiiised to advantage in making croquettes, being minced and blended with various Havourings and some rich thick sauce A litile cooked ham or bacon is always a satisfactory addition Should the meat be very dark, egg and crumb the croquettes twice.
To use the remains of a cold chicken, remore the skin and bone and chnpr up enough of the flesh to make 3 lb . Mclt 2 oz . of butter in a saucepan over the fire, stir in 1 cz . of flour, and then add $\frac{1}{2}$ pint of chicken stock or milk. Stir this sauce over a slow heat until it thickens, then let it cool slighily before adding the clicken, $\ddagger \mathrm{lb}$. of cooked and chopped ham, and a teaspoonful of grated lemon rind
Mix all well, season the mixture carefully with salt, pepper, and nutmeg, and if it is ton dry add a little more stock or milk. Turn the whole on to a plate, let it cool, and then mark it into even-sized divisions, forming each into a neat shape. Rull the croquettes in Hour, brush them over with beaten egg, and cover them with breadcrumbs. Put 4 oz of fat in u frying-pan over the fire, and when a blue smoke rises from it put in the croquettes, two or three
at a time, and fry them a golden brown. Drain them on paprr, and serve garnished with Iried parsley See Crab.
CROSSBANDING. In lurniture design this is a method ol using veneered strips at the outer boundaries of the panels. It is done so that the grain rins at right angles to the constructional edges

CROSS CUT SAW. This type of saw is employed for cutting across a log or large piece of timber, or for similar heavy work
The one-man crors cut saw is adapted for single-handed use, although both hands are generally needed to push the saw Thev aro


Cross Cut Baw. Bow a two-man cross cut saw is used for catting trec trunk.
made from 3 ft to 5 ft in length, and most have a supplementary handle that can be bulted to the end of the saw blade, and are then usable by two men. The two-man cross cut saw is only usahle by two operators, each grasping an end of the saw and working in unison. Such saws are made from 4 ft . to 7 ft . in length; the handles are either bolted to the saw blade or fixed into sockets riveted to the ends of the blade
The tonth shape varies according to the nature of the work, but for general use the great American type of tooth is the best, advantages being that the set can be put on the small or peg teeth: the deep slots give freedom for the chips, and prevent troubles which would otherwise be caused by local distortion of the blade.
The teeth are sharpened and set in the usual way. In using ruch raws a regular, steady stroke is essential, about 20 to 25 strokes per minute being all that is needed. When not in use wipe the blade with a greasy rag, and hang the eaw up so that the blade does not get bent or twistell. See Saw

CROSS-EYE. This is a condition of squint or strabismus, in which both cyes are not focussed on the point looked nt. If something small is held in front of the patient's evea, say, at about 18 in., it may he readily seen that the gaze of one eye is not dirccted towards the object. If it is difficult to determine whether this is so or not, a piece of paper should be placed in front of the eye which appeara to be looking straight at the object, and the other eye may then be observed to swing into its correct position. The condition may he due to paralysis or weakness of one or more of the muscles which move the eyeball, or it may result from over-action of a muscle when some error of refraction is present. See Eye; Spectacles; Squint.

CROSS GARNET HINGE. These are extensively used for the commoner variety of doors both indoors and for external work. The ordinary type is made from pressed steel, japanned black, and from 6 in. to 24 in . long. The T-shaped end is screwed to the upright, the long part to the door. Cross garnets are casy to hang, as they are generally secreved on flush with the door and the post.

thas Garnet Binge. Patterns ol
this door hinge in common use

The Lanca shirc oross garnet type is a superior quality made of wrought imn with a wrought eye at the extremity; they areprefer:able for hervier doors. Best heavy Lan. cashire cross garnets are desirable for duors such as those on a garage or stable They are made from 12 in . to 24 in . long. The 12 in . weigh ahout $2 \& \mathrm{lb}$. per jair. the 24 in ahout 10 Ih. per pair.

In hanging a donr on ordinary cross garnets always fix the hinges to the donrpost first, block up the door wo that it is tight up against the lintel, then fix the straps of the hinge to the dour. On remuving the blucks the door will drop slightly on the hinges, and it will then swing properly. See Hinge

CROSS STITCH. Lending itself equally well to embroidery on house linen, children's gavments, sainplers and chair scats, many decorative and uscful articles are patterned in cross stitch or completely covered by this wa...t: in cottun, silk, or wool. The double stitch, employed is formed by two oblique stitches, placed one across the other and crossing each other in the centre. The top stitches in a row must always lie the ame way. In the illus. tration more than one mesh of canvas is used to enlarge the stitch. When embroidering on linen, muslin, etc., a transfer pattern marks the stitches, or the design may be carcfully drawn with a pencil.

If coarse material he used the threads can be counted, and the cross stitches worked directly on the material, if not, an auxiliary canvas may be used This should he sewn securely in position over the material, and the pattern worked into the ground material through the canvas, the threads of the latter acting as a guide to the right posi tion only, as they areafter. wards pulled away, leaving the com. pleted design behind. Suftcient margin of the can vas must be left so that the threads can be drawn out easily after wards.

This is useful when borders of simple design are worked on cushions, or for cross stitch embroidery on silk bags and pochettes.

When solid cross stitch is worked for chair seats or stool coverings, etc., the geometrical or floral design is usually worked in colours, so that it forms a contrast with the background stitches. This also applies to figure designs which can be worked by means of a transfer ironed on the canvas in the ordinary way. Canvas can be obtained on which the design is traced. See Calendar: Canvas; Sampler.

CROTON OIL. One of the most active cathartics (purgatives) used in medicine is croton oil. Usually given $\frac{1}{2}$ to 1 drop on a lump of sugar, or in a little pat of butter, croton oil is chieHy used in cases of sudden unconsciousness, paralytic stroke, etc., where it is
important to clear out the bowels without delay The hutter is placed on the back of the tongue. Internally the drug should only be used under the direction of the dnctor

CROUCH WARE. This term properly pertains $t$ the early kinds of salt-glaze stoneware made in Staffordshire. The oldest is a drub ur huff fabric. but about 1721 crisp, white salt-glaze pustery was producerl, and that is the style of Crouch ware which is usually onllected. Baing mixed with Derbyshire pipeclay, its paste was dense and well finished, at first greenish. but afterwards whiter. Salt-glaze is easentially English, and looks particularly pleasing when it is contrasted with old brassware of plain English design. See Pottery

CROUP. The chief symptom of this ailment of childhood is the peculiar hoarse trumpeting cough and difficulty in breathing In flammation ot the larynx and trachea is attended by more or less swelling of their lining mucous membrane. and the narrowing of the air passage may hesuffioient to produce a c. ויוpy cough. In false cruup, however, there is is


Crouca Ware. Luaracteristic bowl in salt-glaze ware, with aolled urnamentation, c. 1720

Should attacks follow cluse upun one another, place the child in a hot bath and sponge the head and neck at the same time with cold water See Bronchitis Kettle. Child. Rickets.
CROUSTADE. For a suvoury, small entrée or breakfast dish, croustarles of fried bread are a nice way of serving cheese and egg mixtures. tomatoes, sardines, anchovy and egg, or savoury minces To make. cut circles of stale bread, each about \& in thick and 3 in in dianieter. Mark out an inner circle with a smaller-sized cutter and fry the circles in hot dripping Take them out of the pan and drain them carefully, then remove the inner ring of bread. The croustades can be then filled with the savoury mixture See Curry. CROUTON.
Thesc thinly cut pieces of bread, variously shaped and fried in hot fat. are used for garnishing such dishes as mince, hash, ragoûts, and savoury dishes of chepse, etc., or cut into dice as an accompaniment to thick soups. When cutting eroûtons the crusts. which can be used for puddings, are renoved. When spasm of the vocal cords in addition, and servad as a bnse for a savoury crouttons are the result is the onset of such difficulty of usually termed croûtes.

The child may spring up in bed, the attack usually occurring at night. In drawing in the breath the child may make a crowing noise. Suffocation may appear to be imminent. This may go on for an hour or two, and then the child dmps into a restless slcep. Next day there is still hoarseness, but otherwise comfort may not be much interfered with. In the night there may be another seizure, but not so severe, and aftera few days recovery may be complete

Frequently there is a tendency to the recurrence of croup. To prevent this the child's throat should be examined, and if the tonsils are enlarged and adenoids present these should be removed. Further, the child should be warmly clad, with flannel underclothing, and should not be allowed to sleep in damp ronms or be exposed to cold winds. The onset of a croupy cough should be brought to the notice of the doctor

True or membranous croup, in which a membrane forms on and about the vocal cords, may be due to scalding from hot liquids or steam, or to swallowing corrosive poisons; but it is usually due to a micro-organism, in most cases the diphtheria bacillus. Certainly, apart from the scalding cases, one should always treat the case on the assumption of its being diphtheria. In this form the crowing on breathing in may precede the dyspnoer, which usually comes on gradually, though at any time it is liable suddenly to become urgent. On the occurrence of crowing the doctor should be summoned.

In spasmodic croup, or Laryngismus stridulus, which is most common during the first two years of life and is associated with rickets, the child suddenly stops breathing and the face becomes purple. Then suddenly the child succeeds in drawing in the breath, making a peculiar crowing sound. Sometimes there is only the holding of the breath without the crowing. These infants are also liable to convulsions. Recovery is usual.

Treatment consists of trying in every way to build up the general health of the child Any irregularities of diet should be scen to, constipation should be remedied, and if rickets is present the disease should be actively treated.

Crowfoot. This is an old English name for the genus ranunculus or buttercup

CROWING: In Children. It is mostly in rickety children that the ailment known as crowing occurs, a peculiar spasm in which the child suddenly has great difficuity in drawing its breath, and makes a croaking noise Frequently there is a liability to convulsions. The mother will often tell the doctor that the crowing begins whenever the cliild is crossed or excited in any way; or it may follow on waking up or being exposed to a cold draught.

For treatment sponges wrung out of hot water should be placed over the throat, and the chin should be drawn forward If the child becomes pale and ceases to make any effoit to breathe, artificial respiration ( $q, v$. ) should be carried out, the child being placed on a rug on the floor for the purpose Between the attacks the state of the digestion should be looked to.

To begin with, give $\frac{1}{d}$ to $\frac{1}{2}$ teaspoonful of confection of senna or a dose of castor oil. The physician may order bromides. If convulsions occur the child should be put in a warm bath. To prevent a return of the condition the general health should be built up. by giving the child more outdoor exercise and plenty of nourishing food, with a fair supply of fats A teaspoonful or more of some emulsion of cod liver oil, taken threc times a day after meals, is useful. See Croup.
The crowing of a cock may constitute a legal nuisance See Animals

CROWN DERBY. It is usual to regard the period of about 30 years after 1784 as preeminently the Crown Derby period.

Crown Derby includes the best undecorated biscuit ware ever made in England, comprising rustic and classical figures and groups, besides statuettes of British generals and admirals. Crown Derby Japan shows imitations of Eastern designs. The French sprig or Chantilly pattern, usually a bluc corn-Hower, sometimes edged with gold, is prized

For many lovers of old china Crown Derby means the well-known painted and gilded ware, either scen in pieces of elaborate design with decorated pedestals and sometimes with lids
and handles, or in the form of dinner and dessert services: alan in lall, squarc-based vases. enriched with blue. canary yellow, pink, or apple green grounds. and delicats. landscape scones The modern ware, started in 1877 and atyled Royal since 1890 includes reproductions of the obaracteristic decoration ol the old inodels. See China

CROWN GALL. The swellings or galls termed crown gall occur on a greal variety of herbaceous and woody plants The effects of crown gall are seen in dwarfing of growth or direct injury to roots or branches

It has been shown that the hacteria invade the plant through wounds, and that in all probability they cannot enter an uninjured surace The curved ahopes greatest care, therefore, should be exercised in not injuring the stoclis more than is necessary.

The removal of a gall from a plant doss not necessarily free the plant from the diseasc The bacteria in certain plants in any case, spread in the tissues by means of the tumour strands, nnd, if the gall is merely cut off, the disease may break out again later. On the ot her hand, if a deeper wound is made witl, the object of cutting out the whole infected area, it may injure or even kill the trec. If the galla are on the lateral roots and only a few are attacked the affected roots shoulil be cut out, hur if badly galled the trees should be burned. This information is given by the Ministry of Agritulture in Lraflet No 245

CROWN IMPERIAL (Fritillaria imperialis) This hardy bulb in spring bears chusters of drooping bell-shaped flowers on the top of $n$ stem about $2 \frac{1}{2} \mathrm{ft}$ high. The blooms are of various colours, yellow, orange, and reddish. Bulbs should he planted ${ }^{6}$ in. deep in carly autumn and left undisturbed, for they hecome established slowly. This jlant likes deep, loany soil, and does not mind slight shade. See illus. below.
CRUELTY. Whether practised on human beings or on animals. cruelty is an offence against Eng!ish law. Jersons can be prosecuted and punished if they starve or otherwise ill-treat children, while dogs, horses, and cats are likewise protected To ensure conviction a specific nct of cruelty, as defined by law, must be proved before a magis. trate Persons who suspect others of acts


Crown Imperial, a bandsome hardy, apring flowering bulb. See article above


Crown Derby. Heautilu vase made froma classical model, 17 in. high
curied shapes a lifetime, but in present day households the brush and tray have lather given place to the scoop, which combines both ill use. See Brush

CrumbScoop. The design given for a crumb scoop is purposely simple, and intencled for easy construction. in any desired metal about $\frac{1}{3^{n}}$ in. thick. Copper or brass is convenient, as the joints are readily soldered.

The scoopis made by cutting a shect of the metal scoop. lacquering. well on both sides.
th:e rim to shape on a block of hardwood. A raw hide hammer is desirable, as it does must be silver soldered and thoroughly the socket, and secured with a fine pin driven in after the final polishing and lacquering. The handle should be dyed black and wax polished. The final treatment may be by electro-plating and buffing, or by simple 1 oz . ol it in a pint of lukewarm water to which a pinch of salt has been added. Stir in sufficient flour to make a light, smooth batter, then cover it and leave it for an hour to rise. Beat the batter. leave it for about 20 min ., heat it again, and pour it into greased crumpet rings placed on a baking sheet. It must be cooked

To make crumpets without yeast, use 3 eggs to 1 it, of self-raising flour and a teacupful of milk. Stir a dessertspoonful of sugar into the flour, and make a hollun in the centre Mix the eggs with the milk, nad lightly stir these into the flour, working the whole up as quickly as possible into a light clough. Then roll it out and cut it into circles each about $\frac{1}{2}$ in. thick. Prick these with a fork and cook
rom for sweeping up crumbs fibre, horsehail (drter meals are composed of The better qualities, with all bristle linots draun into the stocks with wire, will last
保 lo the shape given in the drawings, hammering not bruise the metal. After bending, the joints cleaned and scraped. The handle socket is bent to shape round a block of iron, then silver soldered at the joint and to the crumb

The handle is cut from hardwood, fitted to

CRUMPET. If yeast is to be used, dissolve
of cruelty should, in the them on "girilc or in the oven untir they are casc of children, inform the firm and light brown in colour Serve them National Society for the toasted on both sides and buttered

CRUTCH A crutch is a stalf which may be single throughout or bifureated for part of the distance, with a concave headpiece to inke the weight of the body at the armpit It should be as light as is consistent with strength. Pressure of the hend of a crutch on the nerves in the armpit may bring on paralysis of the upper limb, crutch paralysis, the com monest result being wrist-cliop ( $q$ v.), though the whole arm may be allected A crosa-piece lor the hands, taliing somo weight off the armpit, helps to avoid this, also a spring support at the top A modilied crutch may be used which only reaches as ligh as the middle of the upper arm, which it grips by a horse-shoe metal band. There is a cross-piece for the hand, which takes the weight.

In omergency, a crutch can be extemporised by wrapping the head of a broon in a clean piece of cloth. See Artilicial Limbs; Cripple

CRYSTAL. Although this word is used to describe glass ware ol a tine quality, ical erystal is hardly evor inade into vases or other omamental and useful househoid articles, as it would he too costly it is chielly seen decoratively in the form of cut bead necklaces and has many uses in the manufacture or eye glasse. 3 lenses for hinooulars, and cameras, ctc in the casn of large cut glass or crysial ornaments, it in advisable to have small rubber or oork disks cemenced on the base to prevent dannage when the art:cle is placed on a hard surface. Cut crystal beads may be distinguished froms glass imitations by toucling one wish the lijes. Real crystal will remaill almost icy cold, whilst glass will quickly be come warm when held in the hands and tested against the lips. See Glass.

CRYSTAL DETECTOR. Certain kinds of mincral ore, when placed in contact with certain metals or other minerals, act as rectifiers or detectors of high-frequency oscillations. The crysial although still used in simple. witeless roccivers, has been largely supersedcd by the ralve detcetor which is more sensitivennd stable. Kincite and bornite, galena or
 been removed. Above, crystal of carborundum


Crystal Detector. Permanent type suowing crystals
beld in contact by springs : surrounding wax has
silicon and brass carborundum and steel are sensitive combinntions, but careful adjustment of the contact pressure is necessary to ensure maximum results Carborundum is robust, but has the disadvantage of requiring a small battery and potentiometer. Sce Detector

CRYSTALLIZED FRUIT, Cherries, slicee of orange green figs and greengages. small apricots, and lemon, chunks of pineapple, and melon may be crystallized or candied by the folloring method

First make a strong syrup by dissolving 1 lb . loaf sugar in $\frac{1}{2}$ pint water. Then boil it with the lid off the pan, and without stirring it, or the syrup granulates. When it has boiled for about 10 ntin., or reaches $245^{\circ}$ on the sugar thermoineter, test the syrup by dropping a little of it into very cold irater and taking out the little lump that forms Roll it up in the fingers and see if it will form a firm ball. If so, take the pan of the fire, add a teaspoonful of lemon juice and put the pan over another one containing boiling water to keep the syrup from candying too soon

Take the prepared fruits up on the point of a fine sliewer, or a coarse needle, and immerse each piece in the syrup. Lift them out and drain off the excess of syrup by laying then on lightly oiled or buttered trays, and dry them off in a warni, dry place. Clicrries sliould be stoned before dipping, and oranges ahould be preeled and divided into sections without breaking the inner skin, as all fruits nust be perfectly dry.
CUBIC MEASURE. This is used for measuring volume or capacity It is as follows 1,728 cubic in . $=1$ cubic ft ., 27 cubic ft . $=$ 1 cubic yard.

CUCKOO CLOCK. In the wood-frame cuckoo clock a mechanical toy bird imitates at each hour the sound of the cuckoo or a hammer strikes the hours on $n$ gong and the bird merely emphasises the time. It is actuated by weights suspended on chains. The pendulum is sometimes hung on a wire loop, which requires frequent oiling.

The striking mechanism has two hammer arbors resembling the ting-tang device in a clock that strikes the quarters. As the hour at rikes, the two hammer arbors lift up amall bellows in the clock by means of rods The brllows fall one after the other, and give a puff of wind to a pipe or reed which produces the cuckoo note The hird is frequently made with a jointed head or beak interconnected with the bellows, and so arranged that the bird makes a movement simultaneously with the sound.
The bellows may sometimes fail, due to a leatiage, which can be repaired by re-cover-


Cuckoo Clock. Mechandsm of the clock, with connexions for striking the gong, working the bellows and making the bird start from its door ducing the Iruit. hcated pit or frame with a temperature o! $60^{\circ}$ or upwards the sced will soon germinate The soil must never be allowed to get dry, nor must the at mosphere be permitted to get arid. The plants may be planted out when 6 in. high, but. except in frame culture, it is usual to transfer then to 5 in pots and to grow them on.
It is a good plan, when planting. to set them on mounds of lumpy soil. When taken out of the pots they should be planted with the ball of soil and roots entise, tahing care not to bury the ball very deeply. As the roots show through
sticking a patch over the hole. The connecting wires may be damaged or displaced, but this defect is easily remedied, either by replacing with a new part or by restoring the piece See Clock

Cuckoo Flower. The popular name of Cardamine pratensis, or Lady's Sinock (q.v.)

Cuckoo Pint. One of the popular names of the wild Arum maculatum, which is known also as Lords and Ladies and Wake IZobin

CUCKOO SPIT. The presence ol Hotly spittle-like masses on many plants in the garden is quite common in summer If the froth is blown aside, a thick. bull-headed, greenish insect is revealed It is the sos-called cucliot-spit or frog-hopper (Aphrophora spumaria) It is not vely injurious unless present in large quantitice, which is unusual. A vigorous syringing with paraflin emulsion will get rid o! it.

## Cucumbers: The Several Varieties

## Growing the Vegetable and Preparing it for the Table

## This artele descrites the cultivation, whether in the open air or in frames, of the vegetable, and gives recipes for serving it. Sec also Frame; Kitchen Garden

Although cucumbers can be raised in the cucumber It tinc soil is used and airexcluded open air, the reaults are rarcly satisfactory, and from the roots, a stem gangrene called canker they are almost invariably produced under glass in Great Britain The plant is an annual with creeping stems and tendrils. rough heart-shapicd leaves. and yellow Howers of two kinds, male and female, tho latter pro-

As it is convenient to have the voung plants in separate pots, cach seed inay be sown in a 3 in. jot with a compost well enriched with leaf-mould. In a warin house or manuiofresh soil muss be added. A flower stake part of cresylic, or liquid carbolic acid, in 4(1) supports them in the mound until they parts of water. The plantathat are ruined by reach the wires, which should be stretched the eelworms should be burnt. beneath the glass of the house at a distance of about 1 ft. from it Once on the wires the plants will makn rapid progress. The main shonts should be trained thinly on the wires.

Cucumbers require a warm, saturater ntmosphere, which can be maintained by syringing the vines and the surfaces of the house once or twice a day. Water should be used to keep the mounds moist and tepid. When the plants nee in full bearing applications of liquid manure twice a week will increase the vield and size of the fruit.

Gnod varieties are Everydav, Delicacy, Improved Telegraph nod Rochford Market.

Several fungoirl disenses attack the
commonly starts The soil sliould be drawn away and ime or sulphur rublied in

Cucumbers are often affected by a diseasn induced by the root-knot celworm The first symptoon of attack is a drooping and yellowing of the foliage, followed by the stem thecoming limp, and a collapse of the entire plant. To destroy these eelworms the soil inust be thoroughly saturated three times at intervals of a fortnight. witlı a solution of one
 Cucumber. Lett, suort, rougs-skinned variety, grown in the open air. R1\&ut. specimens faised under glass : tney are double the length of the outdoor ones

Cucumbers in Frames. It is quite practio able to grow excellent cucumbers in an ordinary frame, provided the hothed has been properly prepared, and steady bottom heat maintained. Inside the frame there should be mounds of soil consisting of loam and leafmould, one plant being placed in ench mound. The roots must be covered with freal compost from time to time. I'lanting is done in April and May. A good serviceable size will be 12 ft . long and 5 ft . wide.

Ridge cucumbers can be grown out of doors in summer by putting out the plants in May in rich soil ; in a cold, wet season they are liable to fail. Suitable varieties are King of the Ridge and Stockwood, and the gherkin for pickling purposes.

How to Cook. Cucumbers may be treated in most of the "ays suitable for marrows and aubergines, but are most popular in salads, when they are peeled and very thinly sliced. Tuin slices of cucumber are also served with cold salmon. W'hen used as an accompaniment to cold meat, they are usvally covered with vinegar, and served in $n$ glass dish. If they are to be eaten raw, cucumbers should be young and firm, and free from seeds.

Stewed cucumber, served with sauce made from the stuck in which it was boiled, malies a
gord dinner vegetable. To prepare it, pees 2 cucumbers, cut them lengthways into quarters, and, if they are old, remove the sceds Place the pieces in boiling salted water, simmering them there until they are tender then drain and heat them in a sauce prepared from 1 oz of margarine, a little cucumber stock, 1 oz. Hour, 1 tablespoonful unsweetened condensed milk, and two tablespoonfuls cow's milk


Cucamber. Diagrams illustrating the culture of the plant. 1. How seed is ombedded in sand and sown plant. 1. How seed is ambedded in sand and sown in loamy soil. 2. Seedling. 3. Stage when ready Outdoor growing. $a$, hole flled with manure; $b$, ridge of soll above manure : $c$ 。 olant. 7. Bow to plant in frame. 8. Points of laterals pinched out at X

Melt the margarine, add the llour, and blend the two ingredients well Pour in the milk gradually, with 5 or 6 tablespoonfuls of stock, atir the whole in a pan over the fire until it boils, and then simmer it for 5 minutes. Lastly, add the condensed milk and the cucumber, heat up the whole, and serve the cucumber with the sauco poured over it.

Cucumber Cassolettes A good way of using up balf a cucumber which has been left over from salad-making is to peel it thinly, cut it into 4 pieces, and carefully scoop out the centre of each. Stew these very gently until they are tender, in $\frac{1}{2}$ pint of milk and water, mixed it, any proportions, then take them out of the pan and Hake $\$ \mathrm{lb}$. cold salmon or other cooked tish. Season the Hakes well, and stuff them into the hollow pieces of cucumber. Thicken the liquor the cucumber was stewed in with $\frac{1}{2}$ oz conntlour or barley-Hour mixed with a little milk, add 2 teaspoonfuls of chopped parsley, and then pour in a little hot water in which has been melted 2 sheets of gelatine. And a squeeze of lemon juice, and pour the sauce over the cucumber cassolettes, coating them neatly, and garnishing them with cold peas. Serve cold with potato salad

A similar dish is prepared by cutting a large cucumber into rounds each about 2 in. thick, peeling these thinly, and scooping out the insides till a thickness of only $\frac{1}{2}$ in. is left. Put the rounds into boiling water with a little salt and castor sugar, boil them until tender. and then leave them to cool. When cold, fill them with a mixture composed of peas and some carrota and turnips scooped out a bout the size of a pea. Before being used for filling the vegetables should be boiled, and when cold mixed with mayonnaise sauce to which some whipped cream has been adderl.
Cumin. The plant of this name, which is brought from the Levant, contains an aromatic oil and acts as a carminntive ( $\mathrm{q} \cdot \mathrm{v}$ ).

CUP : The Drinking Vessel. One of the oldest of drinking vessels, the cup has taken a number of forms, some of these being known by speria names, such as flagon. goblet loving cup and tankard Many of these were made by English silversmiths in the 17 th and 18 th centuriea

Tumbler cups so-called berause they are shaped like a tumbler and are without handles, are found in silver and in Sheffield plate One example of the time ol Charles II is embrased with tlowers and toliage. A variant of this cup, known as a taster, is fitted with a handle, and is shallower than the tuinbler form Another variety is the wine cup, which stands on a stem and a foot.
Cups with saucers to match are made in a number of shapes and sizes. but can be divided
intu threc main categories-breaktast, tea, and cotfee cups. Most brealifast cupls hold a hout $\frac{1}{2}$ pint, while teacups hold roughly a gill They are genorally fatter and wider-mouthed than cither breakfast or coffee cils, but should not be chosen tou wide, as the wider and shallower the cup the sooner the tea will cool Cups for black coffec usually hold only 2 tableapoonfuls. Special cups for invalids are made with n spout, and with the top partially covered in to prevent the contents from spilling. See Breakfast ; China Coffee Crockery.

CUP. This is a kind of drink, made usually from claret or the lighter white wines mixed with soda water, sweetened, and with various herbs and thavourings added Recipes will be found under the headings of suitable beverages. See Cider Cup, Claret Cup Hock Cup.

## Cupboards and Their Construction

## Decorative and Usetul Pieces Described and Hussrated

Other entrics similar in scope are those dealing with Burcau; Wardrobe, cte. Sec also Corner Cupboard and the articles on Amateur Carpentry; Cabinct Making; Drawing. Other forms of cuphoard are shown under Bachelor Flat; Bedroom: Bookcase, ete.

The oldeat existing cupboards date $f \mathrm{~mm}$ the reign of Elizaheth The original cupboard, known as a court or livery cupbord, was the equivalent of the modern sideboard or buffet Such cupboards were used to assist the service of meals, and many were elaborntely carved. the lower part being simply n chest. which opened by means of two doors

Cupbrairds are divided intu two kinds, those built intu the house and those that are inovable. The built-in cupboard was used in the Queen Anne period for the display of china and porttery it had fittod shelves and sometimes dours: it was either a enmer fixture or built in each side of the chimney breast. This idea is adapted by modern architects for suitable houses, and by decorators in treating corners and recesses in rooms and halls which lend themalves to a Qucen Anne or Georgian style of furnishing.
Built-in cupbards increase in importance with space and labour-saving exigencies. Linen cupbaarls geyser cupboards. fixture cupbuards that shut off sinks, baths, wash standa and dressing tables in bachelor flats and bed sitting romms; niring cupboards which make lome laundry possible in the small Hrit. and dining room cupboards painted or panelled to fit in with the decorative scheme and made to con. tain all the table equip ment. dessert, etc., and ingredients for drinks, are cleverly introduced into recesses or form at integral part of the architect's plans for small houses.

With the exception of the corner cupbrard decorative movablo cup. boards are not much seen to day. They tend to become severcly prac tical, but are exceedingly useful to supplement landlord's fixtures when the tenancy of a flat or house is only for three years or so. The illus tration of a inodern dining room cupboard gives a useful iden for the furnishing of $n$ recess in a small ruom.

A Hanging Cuphoard. A useful and easily made cupboard, designed either


Cupboard. Beautiful old oak Court cupboard. It is of the Elizabethan period and is elaborately carved and inlaid Courlesy of M. Marris \& Sons
ns a hanging cupboard or for shelves, is shown in Fig. 1. The ends are 1 in deal, the full height of the job and 1 in. less in width (i.e 15 in .). the orld inch being taken "p by the pilasters fixed on the tace of the carcass. Theso are the same thickness as the door, so that the whole front will line up. The ends, dovetailed to take the top (Fig 3), are grooved near the bottum (Fig. 4), and the bottom shaping cut to form the feel., as seen in Figs. 1 and 2. A rebate is ronn at the inside cdge in which the hack fits. this measuring $\frac{1}{2}$ in or 3 in. for the panels.
The top and bottom are both the full width of the job. less the thickness of the back panels ; they are cut away at the front ends to take the pilasters. and will thus be Hush with the front edge of the ends. The top, 3 ft . in length, is through dovetailed, the ends of the dovetails being hidden by the cornice moulding. The length of the botton will be the inside distance between the ends, plus twice the depth of the groove in the ends. The carcass should be glued up, using nails


Cupboard. Dining room cuphoard in osk with portable table on ball castors for service. The table stands inside the cupboard
Courlcsy of Wartng a Gillow. Led
to strengthen the gronve joint and commer blocks, ns indicated in the diagram at Fig. 4.

When dry, fix the back, which consists of three panela and two muntins. the later being gronved to talie the panels. Now true up the face of the joh and fix the pilasters, these being previously cut to shnae at the bottom. They are dowelled into the ends and screwed up top and bottom, the screws being hidden by the mouldings. A corner block, rubbed under the bnttom between the pilasters and the ends, will strengthen the feet. Both mouldings should be mitred mund, and glued and pinned. The domer is mortised together with $\frac{1}{\frac{1}{2}}$ in. grooved-in panels and hinged with three butts: a turn-buckle or acrew-on lock may be used, with a stop fixed to the inside of the pilaster near the top to prevent the door from pushing in too far. Shelves or hooks may be fixed, the shelves being supported by square fillets serewed to the encls.
Kitchen and Linen Cupboards. The kitchen cupboard, which is illustrated in Figs. 5-8, is a similar type of job to that shown in Fig. 1, except that the doors fit over the carcass and an applied plinth is used. The work pinceeds as in Fig. 1, but the ends are cut off about $2 \frac{1}{2} \mathrm{in}$. short at the bottom (Fig. 8). This sketch also shows how the plinth is fixed with screws. A corner block should be rubbed at the inside of the mitre of the plinth. Three or four shelves are placed at convenient heights. supported by slips screwed to the ends.
A linen cuphoard is of similar construction, except that. in place of shelves, a series of alata running from back to front nre used to facilitate airing. Fig. 9 shows how these are constructed. Three rails meas. uring 3 in. by 1 in. are made to run fmm side to side, and to these rails the sats are screwed.


A Corner Cupboard An example is shown in pair of dividers to just the width ol the Fig. 10 Theends or backn do not fit up close opening left above the skirting Using one to the wall, but stand away 1 in ., thus allowing point as a gauge, mark the pilasters with the the pilasters to form a close fit to the walls. other, drawing the dividers along the face This is necessary in the case of the angle of the wall not being square, also to allow the pilastery to be scribed over the akirting
The top and bottom are first prepared. The top. dovefailed into the ends, as in sions being indicated in Fig 15. Made in Fig. 12, finishes at the fonnt in a line with mahogany, it embodies the characteristic the inside of the doors. the frieze being features of a swan-neck pediment with fretted fixed to this. The hottom is grooved into the backs, so that the size will be taken from the inside, adding the depth of the grooves; this also finishes to the inside of the doors. Having cut top and bottom to size, the width of the two backs is taken from them These are $\}$ in deal, screwed tugether at the corner (Fig. 12). They orcupy the full height of the job and are dovetailed and gronved When glueing, screw the backs tngether lirst, then the top, and tinally the buttom, which is nailed frum the outside; corner blocks are rubbed underneath
The pilasters are fixed to the edges of the ends with dowels; two screws may be put at the top and buttom hidden by the inouldings. The joint is alsor strengthened with comer blocks (Fig 13) These pilasters are bevelled on the inner edges, to form a true mitre with the dours. The frieze to the top is screwed to the top, the top of the pilasters being eי't. as in Fig 13, to recoive the
 ends The shaped plinth is secured in a similar way. putting corner blocks under the bottom to strengthen it. Tho three mouldings, i.e. coinice, frieze and plinth, are mitred round,
 as indicated in
Figs. 10 and 11 , and fixed with glue and pins. panel, and a geometrical arrangement of glazing The doors are framed together out of 1 in . bars. The hottom board is rehated $f$ in deep atuff and have $\frac{1}{2}$ in. grooved-in panels. The to take the sides and back pieces Tho top outer edges are bevelled at the same angle buard comes inside the side pieces, and as the pilasters. A centre door stop is fixed the cornice moulding is planted on it. behind the frieze, and screw-on bolta and locks The pediment moulding is saiwn to shape, used. Three $2 \frac{1}{2} \mathrm{in}$. butta are used for each door. carved and rehated to take the fretwork To scribe the pilasters over the skirting, panel, the whole being gluad and screwed in place the job close into the corner and set a place. It is shown in detnil in Fig. 18.


The stiles and rails, the sides and the bottom board are 1 in. thick. The a pron beneath the bottom is of $d \mathrm{in}$. atuff, mitred at corners and fixed with glue blucks. The $\frac{1}{8}$ in plywond back boardy are nailed to tup and bottom, and to rebates in side pinces The construction is made clear bpe Fig. 16. A triangular fillet supports the plyword at the angle.

Details of the cornice and door framing are illus. rated in Fig. 17.


The door stiles extend frmm top to bottom of the opening and the rails are tennned to them The glazing bars, shown in Fig. 15. are mitred at all juints. glucd together, and planted on the glass. Shelves in thick have curved fronts. and are glued and nailed to the plywoul back. The cabinet, which should he lined inside with velvet, is suspender by four mirrorplates, serewed to the back edges of the top lurard
A Recess Cupboard. A recess cuphoard is shown in Fig 19, As the walls of the recess lorm the back and sides, a framework must be erected at the Iront Having decided upon the height. make a framework as in Fig. 20 , consisting of a cross piece tenoned into two uprights of ld in. stutf, 4 in . wide. The cross piece is $6 \underline{d}$ in wide. the extra $2 \underline{d}$ in being allowed to talis the cornice noulding, which is of this width This frame is glued together, and when dry should be trued up to fit in position, the lower ends being scribed over the skirting. The fixing depends to a certain extent upon the interior nccommodation required. For the example illustrated, a series of shelves, as in Fig. 21, is intended. Battens


Cupboard. Figs. 10-13. Convenient corner cuphoard for hanging clothes, with explanatory diarrams of the nrincipal parta
or hearers are tixed at each side of the recess. at equal heights, in the position required for the shelves; also lor the top. These hearers, 2 in by 1 in., are as long as the inside depth of the cuphoard.

If the recess is of a good depth. allow the face of the frame to stand in sufficiently to permit the cumice moulding to butt into the sides of the recess. This obviates the necesaity of making a return end to the moulding. The shelves and top are of 1 in . atuff, all of equal width, and are nailed down to the bearers. To these the france is nailed. a acries of naile being also driven in along the top. The nails should be punched in.
Should the cupboard le required for hanging purposes, there being no shelves, the wrill should he plugged at intervals and the Iramework skew-nailed from the inside. Having fixed the frame, the cornice moulding is put up with pins. The duors are made from 1f in stuff, framed together and hinged to the uprights of the frame. The inner styles of the doors are relinted so that the right door will fit over the left, making the cupboard dustproof. Allowance must be made in the event of a centre carpet being on the floor. Screw on bolts are fixed to the lefthand door and a turnbuckle or lock to the other.
Kitchen Cupboard. The cuphoard at Fig. 22 conceals a full-size sink, incorporating a boot

ing dimensions. Figs. 16 and 17. Details of construction. Fig. 18. Fretwork panel in the pediment


Capboard. Fig. 19. Recess cupboard for a hedroom. Fig, 20. Details of lintel and frameroork. Fig. 21 Interior of the cupboard, showing bow the shelves are supported by bearera secured to the walls
and whoe cupboard on one side of the sink, n capacious cuphoard with shelves on the opposite side. and a handy cupboard under the sink. Four amall cuphoards are provided at the top of the cabinet, one ventilated lig a perforated zinc panel and intended as a miniature larder. The cupboard is made throughout with 6 in. by $\mathrm{in}^{\mathrm{in}}$. tongued and grooved floorboard and 2 in. by 1 in . batten, built up on the site. Approximate dimensions are given, but they may be modified where necessary to mect existing conditions. It is important to allow for adequate head mom above the sink, so that the top cupbonrds must not come ton low down. Prepare the ends first, then screw hattens to them to take the various shelves. Set up the divisions on each side of the sink, then set up the two end pieces, Fig. 23, and nail the helves into place.
Fit up the lower cupboards with shelves and boot racks as shown, then malic the doors in the usual way with ledges and braces, and hang thein on stout butt hinges. A draining rack is provided to fit into the sink opening. and when in use this is placed on either side of the cupboard top. Add a narrow moulding
to the tup, and linish by staining and varnishing, or use a coloured rnamel.
A Boot Cupboard. The bout cuphoard for a berlsitting rooms shown in Fig. 24 is made with ply wond about in thick The top honrd is cbated at each end, and the side pieces fitted into them. The cuphoard shelf is s $\Omega \mathrm{wn}$ to size, planed square on the ends. and glued and nailed between the side pieces


Cupboard. Fip. 22. Kitchen cupboard which conceals a sink and provides ample storing accommodation. Fig. 23. Showing constructional details

The whole of the back is then covered with ${ }_{s}^{1}$ in. plywoorl, glued and nailed to the edges of the shelf, top and side pieces.
The boot racks are pieces of hmom handle or similar round wooll which fit into hules lored through the side pieces. The ends of the bars are rounded off, and all are glued intoplace.


Cupboard. Fig. 24. Compact arrangemeut for holding boots and shoes,
useful for a bed-sitting room Thecuphoard dour is made up with "cup. board door moulding," obtainable readygrooved and tenoned. The panel is a piece of 36 in. ply wood. Hang the door on two amall hinges. and fit a cuphoard turn or lock. A curtain. litfed on a rod beneath the cupboard,
conceals the boots and shoes. The cupboard can be finished by staining and varnishing, or inay be treated with a bright enamel.

CUP CAKE. Rich cup oakes, flavoured with wine, brandy and cinnamon, can be made by mixing together in is basin five cupfuls of Hour, three of sugar, one of butter and one of milk, and also three well-beaten eggs, a wineglassful of wine, the same quantity

CURB. This type of fender may be defined as one without a botlom plate, usually slightly raised from the hearth and, in the case of bricl, stone, tile and marble curbs, of the ame fabric. 'The simplest form of curb is one made of stone, being just three picces of polished stone round the hearth. These are miale in standard sizcs. In some modern fireplaces the curb is mercly a flat edging to the hearth made by reversing the laying of brichs or tiles Curbs are alan obtainable in oak and in copper, brass, and steel, in antique silver finish and in chromium plated metal, the chorice having relation to the grate or nccessories See Fender; Fireplace.
CURD. Curd is the nitrogenous part of milk, the solid substance left when the whey or liquid is separated. When milk suurs, the curd coagulates by the action of the lactic acid formed in the mill:. Chepse is made from the curd. See Cheese; Junket; Milk.

CURLY KALE. An indispensable hardy green "inter vegetable. Secds are sown on a prepared bed of fine soil out of doors in A pril, the seedlings are transplanted at about 6 in. apart to give them room to develop, and are put out in June or July at 2 ft . apart where they are to remain. Curly kale is the name given to the Scotch or curled liale which has densely crisped or curled leaves. Therc are many other varieties of kale or borecole, e.g. asparagus, cottager's, sprouting, Drumhead and thousand-headed. Cottager's is an old and popular variety. In this the habit is upright and the leaves are plain. The central leaves are tinted blue or reddish purple.

All these are uscful winter vegetables and need the asme treatment as curly kale.

How to Cook. To boil it, first wash and trim the kale ridding it of any hard stalks, and then place it in a pan of boiling water. and boil it rapidly for 5 min . Then claange the water for a similar quantity of fresh boiling water, adding a pinch of couking sodia and a leaspoonful of salt to every quart. When tender, drain of the water, press the kale well and chop it up, adding it lump of butter and a little salt and pepper and mix all together, stirring them in the pian over the fire. Fill a hot vegetahle dish with the kale, cutting it across acveral times with a knife.

Curly tiale may be conked in a casserolo Wash it thoromghly in salted water, and then shred it coarsely and boil for 5 minutes hefore putting it intu an earthenwas casscrole, logether with a gill of water and a lump of fat ahout the size of a hen's egh : cover the pan and cook its contents gently. stirring then oncasionally until the greens are tender. This should take about I hour. Finally, season it with pepper and aalt and serve it in the casserole. Sce Brocculi: Kale.

CURRANT. Red and white currants will thrive in any anil that is not too heavy and damp, but black currants give of their best in a moist. heavy soil. The former bear fruit on spurs upon the old wond at the bottom of the previous year's growth. Black currants give their finest fruit on last year's wood, and thercfore too much old wood should not ber allowed.

Fresh currants of fine quality and quite ripm nasy be fmated, and in this lorm proville all altractive dessert dish Prepare them by sieving some castor sugar on in a saucer or plate, and warming it without letting it melt In the meantime, beat up the whites of 2 eggs and add to them 3 or 4 dessertspoonfuls of water. Divide it of currants into neat bunches, dip these into the ogg mixture, and then intos the enstor sugar. making sure that they are well conted. The fruit inay then be left to dry on a shect of paper. See Black: Currant: Red Currant: White Currant.

CURRANT: The Dried Fruit. Driel currants ance a small variety of raisin imported from the levant, and an ingedient in the making of many cakes and puddings, and of mincemeat. They should not be bought in large quantities, as they do not keep well. anil shosuld be placed in an airtight tin. Jo clean currants for use they should he rubbed in a drv, clean clotlı on which a little llour has been sprinkled, and shaken on to a sieve so that any salks can lie picked off, ur they may be put straight on to the sieve. a handful at a time, and two or three teasporn. fuls of llour sprinkleal over them. Then rub them with the hand so that the stallis will come off and fall through the siere. Unless


Curly Kale. A favourite hardy winter vegetable with densely crisped or curled leaves

Courtesy of Suftion .I Sons

currant and goosoberry bushes. It looke like a small butterfly, and is vellow in coluur, with a hlack patoh in the centre of the back The pest id usually bnen early in spring. and commences to eat the young leaves of the busher an they expand Somatimes a second brood of these cater pillars appears later in the season
Spraying in no uncerrain wity with paraffin emulsion is the best remedy In chronic cases it is best to remove all the soil round the bases of infected trees to a depth ot 4 in in winter time and burn it This usually
there is plenty of time in which to dry them, destroys the cocoums, which would be the currants are heat cleaned by means of tour parents of the next season's pesta. A dressinstead ol by water. tor if used while damp they will muke tbe cake or purlding heavy ing of lime to the soil is also recommended The currant clearwing moth is a similar CURRANT SAWFLY. This is an insect pest. and requires the same treatment. See pest called Nematus Ribesii which attiaks Black Currant. Guoseberry: Red Currant

# Curry: Ingredients and Flavourings 

Recipes for Meat, Chicken, Fish and Vegetable Curries

The reader interested in cookery may consult the articles Casserole; Chicken; also such entries as Bombay Duck: Chutney; Rice

If carefully prepared and nicely halanced is beat for stirring the mixture in the cassemle, with regard to Havourings. curry stimulates and curry should be eaten with a fork, or the appetite and digeation Many foods are suitable for curry dishes, including ment. poultry and rabbit. corsked or raw : also tish. vegetables and hard-boiled egga A number of ingredienta are contained in Indinn curries, the superior flavour of which is due to the use of frosh and dried spices and fruits inatead of the curry powder relied on by many British conks Some of these ingredients are obtainable nt good stores ans. for example. green ginger. turneric chillies bottled tamarinds, garlic and caffron A really good imported Indian curry powder should supply deficiencies in home conkery aided by curry piste. coconut milk or shredded coconiuta. npple (which can be subatituted for tamarinda). pickled glierkins and lemon juice Flavouring is a question of taste. hut no one flavour should be detectable in a well-halanced curry which should not be ton hot. tor sweet or ton acid.

A curry should never appear on the table with a thin gravy though there are wet and dry varieties. in the former the sance is suificient practically to corver the fond curried : in the latter it has heen absorbed during cooking by the other ingredients Boiled rice, grated coconut and chutney should be served on separate dishes with meat curries; Brmbay duck (dried fish) may also accompany these. Rice is often placed as $n$ border ot the same dish with amall quantities of fish, egg and dry ment curries Vegetable and fiah curries nay be served at lunchenn or informal supuers in individual pipkins gnrnished on the top with a spounful of chutney, a small piece of fried red herring with chopped gherkin or a olice of hard. boiled ega, surrounded by a little boiled rice Anything with curry sauce should not be touched by steel; a wooden spoon

boiling water Keep this builing briskly with the lid off for about 20 min . and atir the rice frequently When the grains are thomughly anft. turn the rice into it warmed colandler. and then pour boiling water over it. This will separate the grains When this method is employed it is unnecessary to dry the rice over the stove or in the oven It should be heaped on to a hot dish, and arranged with a fork

Meat Curries If frosh meat is used for a curry it is a good plan to fry it in butter or margarine before laying it in the curry sauce As curry is such an excellent method for doing up left-nvers ol joints etc. cooked meat is more often used for this purpose. Any of the ingredients already mentinned may be used to flavour the snuce or added to the curry whilst conking The recipes given suggest variations suitatule for the particular disb

For a curry of cold cooked veal, first prepare the asuce For this, nielt in a casserole 2 oz . butter and fry in it, withoul colouring. a large onion and a medium-sized apple, both prepared and chopped amall Strain off the fat from these and reserve them, then return the fat to the pan Add a tableaponnful of curry


Curry Croustades, which can be made either with flaked tish or with minced meat
powder mixed with a dessertapoonful of flour and let these cook gently for 12 min. Add the reserved onion and apple and stir in about a pint of white stock Let the sauce boil up and mix in a dessertsponnful of curty paste, foz. blanched and chopped almonds, $\frac{1}{}$ gill cream or inilk. the juice of hall a lemon, and seasoning to taste

Cut 1 lb . of lean cooked veal, previously freed from akin and hone, into cubes, place it in the casserole and simnier gently until thoroughly heated through, but do not allow the curry to boil Serve with cut lemon, bniled rice and chutney

A good mutton curry is prepared from the following ingredients: 1 lb . mutton cut into cubes, 2 oz. mint Havoured butter, 1 large shredded onion, 1 tableapoonful cach of curry powder and corntlour I finely minced apple, a teaspnonful each of curry paste, lemon juice and chopped gherkin, salt to taste.

Rub an aluminium frying-pan with a crust of bread flavoured with garlic. Place the mint-butter and onions and meat in the pan and fry lightly. Remove meat and onions to casserole, and gently stir into the butter in the frying.pan the curry powder and cornllour. When smootl add $\frac{3}{3}$ pint stock and salt to taste, and bring to the boil while stirring. Pour this sauce over the meat and onions in the casserule. add the other ingrodients, stir the mixture well and allow to simmer until conked. Serve in the same way as the veal curry, but without sliced lemon

Kidneys are excellent curried; either calf's or sheep's kidneys may be used, but the formor require longer cooking. Split, skin and slice neatly four kidneys and put into the casserole with I oz butter, one thinly-sliced onion, one amall chopped apple and a squceze of lemon juice.

Continue cooking for a few minutes, taking care that the whole does not burn; then stir in $\underline{b} \mathbf{~ o z}$. of rice flour, $\frac{1}{2}$ dessertaponnful of curry powder, a little chutney and seasoning. When these ingredients are thoroughly mixed, pour over them a brenkfastcuplul of stock, and stew the kidneys for $\frac{1}{2}$ hour, or until they are tender.

Betore taking the curry from the pan, add a little cream to it and serve it with a border of boiled rice-

Rabbit and Chicken Curries. To curry a rabbit, cut the flesh ints convenient sized pieces, season them to taste, and fry them lightly in a lump of butter about tivice the size of a hen'a egg. Add 3 or 4 dessertspoon. fuls of finely chopped onion, and continue conking gently for about $f$ hour. Then stir in 2 teaspoonfuls each of llour and curry powder, mixed smoothly with a little cold water. Add a bunch of mixed herbs, a dessertsponful of chutney. and $1 \frac{1}{2}$ breakfast cupfuls of stock Simmer for about it hour. or until the meat is found to be tender The bunch of herbs, of course. should be removed before serving
For curricd chicken, having cut the bird into neat joints, dust these with flour. Cut two onions into sinall pieces, slicing them down from the crown: fry these in 4 oz . of margarine or butter, then strain them and lay them aside. Add 2 tablespoonfuls of curry powder and the pieces of chicken to the butter in the pan, fry these gently for 15 or 20 min ., then ardd a smai chopped apple, the fried onions, $\Omega$ few blancherl and chopped almonds, a fow sultanas. and t pint of white stock. Pour in a teacupful of coconut milk. and add a teasponnful of curry paste: then season and cook all gently unti the liquor is thereby reduced in quantity by one third

Befure serving, catrefully remove all fat from the surface and add a dessertspoonful of lemon juice Send the dish to the table very hot with boiled rice served on a separste dish. I liked, the chicken may be removel from the casserole. placed round the heapred rice on a dish and the siluce passed through a sieve before being relieated and poured over the pieces of chicken. Any poultry or game may be curried in this way.

Fish Curries. A good curry saluce in which fish can be afterwards cooked is prepared by sprinkling a amall finely-chopperl onion with : little flour, and then frying it in $\frac{1}{2}$ oz of butter When it is light brown, add I dessertspoonful of curry powder, and continue frying for a few minutes before putting in 1 dessertspoonful rach of chopped chutney and Hour. Add it gills of veget able atoch, and atir the mixture until it boils and becomes of a creamy consistency. Then grialually add $\frac{t}{2}$ gill or less of cream or milk

Curtied prawns are made with it pint of curry sallce, using fish stock or a stock made froni hoiling the bruised prawn shells. Add 1 pint of prawns and let them simmer for a few minutes. Serve them on a hot dish with $u$ border of boiled rice. An illustration of this diah is given in the previous pige.

To curry lobster cut up the llesh into pieces of a convenient size, heat them in curry saucc and dish in the same way as curried prawns. Chutney should be served separately: Any conked white fish can be conrsely Haked and reheated in curry sauce, first simmering the latter for 10 minutes The addition of a little chopped apple and a squeeze of lemon to the cury suluce is sometimes liked.

Vegetable Curries. Any vegetables, such as small turnips, onions, carrots, pieces of cauliflower, French beans, peas, and small potatoes, may be used for a vegetable curry. First cook the vegetables until they are soft but not pulpy, and then add them to the curry sauce. Simmer for $\frac{1}{2}$ hour, add a squeeze of lemon juice and a lump of sugar, serving the curry with boiled rice.

Cooked lentils, butter, or haricot benns may be curried separately. Add I pint to sufficient heated curry sauce to cover the vegetables in the casserole. Slice in two scalded and peeled tomatoes, add a tcasponful of curry paste. and serve in individual pipking with chopired gherkins and rice

Curry Croustades. A useful way of serving up an egg and brush a little wvel eatch liaste a neat little curried dish at breakfast or supper is to place a tablespoonful of Haked fish or minced meat heated in sufficient curry sauce to llavour, but not to make too moist. in croustades. To prepare thesc, cut 2 or 3 slices of bread about 2 in . thick and stamp them out into rounds with a plain cutter the size of a wine glass, scooping out the crumb from the centre until only cases of bread remain. Let these soak in a little milk for 3 min., then beat

Cover them with breadcrumbs ind fry them it golden brown.

CURRY COMB. This form of eomt is used for grooming horses, its object being $\uparrow 1$ Ireu hem from the dirt that adheres to the siin The comb should be used first from the neck to the shoulder; the operation should then he continued downwards to the legs. ent finally along the breast and underpart of tho finally along the bre
animal Sce Horse.

## Curtains: How to Choose and Make

## Decorative and Practical Ideas for Window Treatments

## This article concludes with information ahout the fittings and other accessories of curtains. Sce American Cloth; Bay Window; Bedroom; Cascment; Colour; Drawing Room, etc.

Curtain treatments may lic simple or used with great advantage on a pelmet of thic elaborate, but they must hear a definite type; or it may be simply bound with ribbon relation to the colour scheme of the surrounding interior. Occasionally a thought should be given to the view through the window. Jade green curtains, for instance, will not look well fraining a mass of summer foliage, nor will bluish pinks, or luchsia shades of red, har monise with the view of a red brick wall A certain agrcement is also pleasant hetween the various window curtains of the bome as seen from outside. This is easily achieved. without being tied to one colour or fabric by a lining in one set, by the ground of a cretonne in another, by the pattern in a third and by the solid colour of a fourth, all introducing the same shade, which in turn should contrast happily with exterior paintwork.
Colour and Pattern. With regard to interior colour schemes, curtains should nccentuate a note in a room or afford a good contrast. Sometimes they may do both, as, for instance, when a patterned material is used which matches the loose covers, but in the case of the curtain is hordered and edged with a plain material, which is repented for the valance or pelmet; or the pattern may pick up the colours of tiles and paintwork, while the plainer material of the horder matchics the upholstery. This scheme is a pleasing treat ment for printed linen or cretonne with a rep border and is particularly attractive for an informal sitting room or a town bedroom with glass curtains of ivory net woven in square mesh. It may equally well be utilised for a French window, or a double sash window, hut in the lirst case the net curtains are hest fitted to each half of the window and held in place at the hottom hy a second mod so that they do not swing out when the windows are unfastened.

For French windows in the more formal room. the type of curtain shown in the first illustration is suitable, especially if the ceiling is low, as the long line of plain fabric with the narrow gracefully braided pelmet gives height. Such curtains would look equally well in shot artificial silk, in satin or, for a dining room, in furnishing velours or velvet. Such pelınets could he trimmed with motifs bought ready embroiderel and only requiring to be lightly sewn on, connecting the design with a braid which can be bought to match. For a mom with any Chinese lacquer furniture the pelmet could be bordered with strips of Chinese embroidery or with motifs in the dragon design. Hand-worked appliqué designs can he


Curtain. Plain satin curtaing frame the French windows of the formal
sitting room, while the braided pelmets are designed with corves to corre-
Curtain. Plain satin curtaing frame the French windows of the formal
sittirg room, while the braided pelmets are designed with curves to correspond with period furniture


For the double sash window in a town house long outcr curtains may frame lace store curtains to the sill. The advantage of the latter is that they can hide out a depressing view if necessary without ohscuring light

A good formal treatment for a large bay window is to make an outer frame by means of pelmet and long curtains of rich plain fabric These curtains are pleated on to a band so that they keep their rather narrow line Practical curtains in a contrasting colour are hung on an inner rod hent to the shape of the bay, while lace store curtains fit the windows. This treatment looks well when carried out in deep hyacinth blue for the framing curtains. pelinet and curtains bordered with silver hraid, the former having two long silver tassels that hang down over the: curtains at the outer edges: the practical curtains are of artificial talfeta shot with a lighter blue and mauve and the store curtains are an ivory shade. Whatever the colour scheme selected to suit the nom the framing curtnins should he unpatterned and of darker tone than the practical ones. Vitrage laces may he utilised instrad of store curtains for bay windows. These laces are made in panels and can be cut along t.he joins, one or more panels adjusting theinselves to the fitting of nnrrow or wide windows. Brise-hise nets can he used for casements, or for lower sashes of hedroom windows with outer curtains to the sill. Crispleffects can be olbtained by tho use of organdie mualin, self-fitted

Striped artilicial silk fabrics bring a gay note into a room otherwise neutral in tone A small dining mom, carpeted with brown, and having parchment-coloured walls and a cold north light. was transformed hy window


Curtuin Treatment to. a ball or lounge mindow whth braided and tasselled pelmet copied from an Elizabethan design
curtains in bold stripes of orange with narrower atripes of gold, blue. greell and chestnuthrown The valance was composed of two layers of scalloped material, each scallop measuring six inches acruss. The pinints thetween the scallops were well delined, the lower scallop being placed beneath the cut up point of the lop layer. This top layer was of chestnut-brown fwhich colour also lined the curtains), and the under layer of the predominating orange stripe. A sunny glow was introduced into the room with fine artificial silk net curtains in pale gold across the window Beautiful curtain fabrics for lounge or dining room can also be had in patterned damaska and tapestries. The latter need plain walls to show off their beauty

Short Curtains. For casement winclows, the frilled or pleated valance with short curtains will look well in thinner materials Valances may he box pleated on to a tape to which small rings are attached at close intervals. Hooks can then be screwed into the valance board so that the valance can be hung and not nailed to the hoard if no valance or pelmet is used the curtains inust be very neatly gathered into a heading at the top or ugly gaps may be an eyesure between curtain and rod. If the top of the curtain is firmly pleated to a depth of several inches by means of rows of stitching it will give a delightfully neat heading. Cretonne gathered valances need not be lined, but straight acalloped valances or pelmets in any matcrial require this additional support and atiff ness.
liedroom curtains are better lined it they are practical and blinds are done away with; also, with the exception of tafieta and furnish. ing satin. fabrics hang hetter when lined. short chintz, check ginghain. hordered casement cloth or coloured bolton sheeting curtains do not require lining unless it is particularly desired to darken the room at night. l'ale coloured voile or spotted muslin are dainty fabrics for glass curtains in simply furnished bedrooms.
The sccond illustration shows a charming treatment for a hall window, the diamond points of the pelmet heing trimmed with gold tasuels, while gold braid is used to make the design. Either velvet, vclours on heavy artificial silk rep would lend itself to the making of these curtains, which would look equally well in a small sitting room.

Plywood pelmets are sometimes seen with short curtains, and have cleanliness and neatness to recommend them ns well as possi bilities of decorative treatment. They can be painted the same colour as the woodwork of the room, decorated with a stencil pattern, or repeat the groundwork of cretonne curtains The edge of such a pelmet can be left straight or curves can be introduced by means of a fret saw. Painted with gold or silver metallic paint and outlincd with a colour, they are decorative in a modern room. They are right for the up-to-date kitchenette where coloured paint is to be used for woodwork, and also for the nursery with stencilleal animals or fairy

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Curtain Poles and Rods. Figs. 1-4 and 6. Common fitings for bolding one or more brass curtain rods. Fig. 5 Device for opening and cloging curtains. Figs. 7-8 Diagrams abowlag how to fitacurtain pole to a bay window
tale characters. They may combine successfully with American cloth cretonne or chintz for these rooms. The third illustration shows a curtain treatment that is particularly suitable for a bungalow window, having a painted plywood pelmet decorated with twa lines of colour

Bathroom curtains may be of brightly patterned towelling, rubberised cotton fabric or oiled silk, though washable checked or striped materials are also suitable

Details for Making. Several labour-saving devices are on the market which simplify making and washing. A heading tape can be obtained in three sizes for light, medium and heavy curtains which only requires to be machined to the back of the curtain heading and then drawn up to the width required when finished. Rings and hooks are sold with it which may be detached or fixed in a moment, while the headings can he let out

curtuins and polmet in deaigns partloularly suitable for a seaside bungalow
so that when the curtains are washed and ironed they are straight. A curtain gliding rail is also obtainable which simplifies hanging light or heavy curtains and can be supplied with a valance extension. The hooks on the heading tape fit into the rings on the rail, so that the problem of taking curtains down for cleaning or washing and putting them up again is reduced to a minimum.

Flexible and adjustable wires with rings at the ends which fix on to small hooks on the window frame are the best means for hanging lace and net glass curtains. These wires are simply threaded through a hem and, being stretched to the width of the windows, keep the top of the curtains taut.

Poles and Rods. Curtain poles averaging 1 in . or more in diameter are adnpted for large windows, doorways and openings. Curtain rods are of smaller diametcr, used generally for casement windows. The materials are hrass-cased iron tube and wooden dowel rods. the latter from $\frac{5}{16}$ to $\frac{1}{2} \mathrm{in}$. diameter, up to 6 ft . long. The patent curtain rod brackets shown in Fig. 1 may be used for supporting rods up to $\&$ in. diameter.

When it is only possible to fit the rod between the jambs of a window opening, the fitting shown in Fig. 2 is especially useful The brass fcrrule is arranged to unscrew from the base to facilitate removal of the curtain rod. This type of fitting is available for rods from $\frac{1}{2} \mathrm{in}$. to $\frac{3}{2}$ in diameter.

For fitting two curtain rods parallel tn each other, one for the curtain and the other for the valance, a double bracket fitting, as in Fig. 3, is most convenient. It is adjustable, and the inner rod can be sf in. from the window frame, while the outer rod extends another 3 in . The other ends of the rods are carried in simple projecting hrackets, as shown in Fig. 4.

All these fittings are screwed to the window frame with countersunk hrass screws The litting of curtains to a small bay window or oriel is greatly simplified by using spring wire, hought by the foot from any ironmonger, with the hooks for supporting the wire and the eyes for screwing into the ends of the spring wire. The hooks are fixed at each angle of the window frame, the spring wire prasing over them

The Valance Board. In a house with concrete walls and metal-framed casement windows, to which the usual curtain fittings cannot he acrewed in the ordinary way, the plan is to fix a valance board on hrackets screwed to the wall on the rawlplug system. Where there is no pelmet or valance hoard long curtains arc generally attached to a number of wood or brass rings, free to slide along the horizontal pole supported on brackets at the top of the window frame. The pole is provided with detachable ornamental ends large enough to keep the rings from sliding off.
In the case of a plain pole and no cords the curtains have to be pulled or jerked along by liand when opening or closing. An improvement is to have pulleys fitted to the ends of the pole and cords hanging from them and connected to the rings, so that the latter can be drawn along the pole by the cond. With a pair of curtains divided in the middle this movement must be in opposito directions, and the pulleys are arranged so that the pulling of one cord accomplishes this. The principle is indicated in Fig. 5.

This is done by using the opposite directions of travel of the cord, which goes to the far end of the pole, passes over a pulley, and comes hack. The middle two rings, $A B$, of the set are attached to the cord, so that in its travel it pulls one in one direction and the other in the opposite. The pulleys are generally fitted into slots in the pole. In other cases the pulleys are attached to the hrackets, an exaniple of which is shown in Fig. 6. For hay windows the pole must be in lengths and at angles to suit the bay. A typical cxample is shown in Fig. 7, the required dimensions being marked D. A is the pole, and C. C, the supporting brackets. The angle joints $B$ must be cut to the correct angle, which can be ascertained as follows: On a sheet of paper draw the two parallel lines, E F, G H (Fig. 8), the distance between them heing equal to the cliameter of the curtain rod. Then cut a card template to the angle of the window, as at $L^{\circ}$, and draw lines, A B, C D.

The points of intersection, marked K J, should now be joined with another line, which shows the exact angle to which to cut the ends. When cutting the rod keep the end faces perpendicular, otherwise the rod will not be flat when jointed. All trouble may be avoided by using the metal connexions made for the purpose. These screw into the ends of the pole, which in this case is out square at the ends, and mensurements are taken to the centre of the joint. Onc of these metal connexions is shown in Fig. 9.

CURVATURE OF THE SPINE. There whe several forms of curvature of the spine, to each of which a distinctive name is applied. In scoliosis, or Interal curvature, the spinal column or backbone is bent to one side; kyphosis is an increase in its main backward curve, and lordosis is an increase of the hollow at the loins. A more serious condition is angular curvature or Pott's direase. This is due to disease of the vertcbrae or to fracture.

The predisposing cause of scoliosis is weakness of the back muscles and general debility ; the curvature may be induced by habitual faulty postures or by carrying weights which overtax the strength. Examples of this are : writing at a low desk with one shoulder higher than the other; standing with the
weight on one leg carrying a weight hahitu ally on one arm, as in the case of a nursemaid This type of curvature is common in young people of about 14 years and upwards Other causes which may bring it abnut are rickets, knock-knee, empyema, unequal length of the legs, dislocation of the hip from birth, and paralysis of the muscles of the hack on one side. The advice and supervision of the doctor should be obtained Rickets, if present, must be cured, and the general health brought up to and maintained at a proper standard by fresh air, indoors as well as out, sufficient good, simple food, tepid hathing, sufficient rest and sleep, and if there is anaemia, an ron tonic.
Kyphnsis is an increase of the natural backiward arch of the spine from the neck down to the amall of the back. It may occur in rickety infants, in children with weak hack muscles, and in grown people who follow atooping occupations. If the infant is trcated for rickets and kept in a lying position, the curve will in nearly all cases disappear as he gains strength. In growing children this form
of curvature develops from the practice of stooping when writing, reading, sewing, etc Short sight is sometimes answerable for this aulty habit. The treatment is the same no for lateral curvature. Glasses should be worn when the sight is defective

In angular curvature, or Pott's disensc, tuberculosis attacks one or more of the vertebrac, as a result of which the hones as well as one or more of the cartilaginous disks be tween them soften and crumble away. The part of the hackbone above the point of disease then settles down on the part below, and bending forward results The disease may occur at any age, hut is most frequent in children. Frequently it follows a blow on the back or a strain.

In treating Pott's disease the usual measures for tuberculosis in any part of the body are to be carried out, and complete rest munt bn secured for the spine The patient's room should be airy and sunny, and he should be carried into the open air as much as possible. His diet must be abundant and nutritious See Spine.

## Cushions: Materials and Designs

## Pleasing and Colourful Aids to Comfort

Helpful information will also be found under the headings Applique; Embrnidery: Raffia; Woolwork. Sce also Drawing Room

Though cushions should always he selected with due regard to the type of room and also to the style of furniture on which they are to rest. too much cannot be expected of them as a means of decoration. In no case do a number of miscellaneous cushions look well. Even when the various colours chosen are in actual harmony with the adjacent colour scheme, the effect of too many contrasts when dotted alout the room is disturbing. When several cushions are piled on $n$ divan it is in better inste to make the foundation of the pile a couple of square pillows and a bolster to match the upholstery or lonse cover of the divan, and place on these one or two round cushions related to the others in colour by means of embroidery or applied trimming.

As too many patterns in a room should always bo avoided, when loose covers are chosen for sitting mom chairs and settee in a boldly patterned cretonne, it is often a mistake to place silk and brocade cushions on them, and the whole effect of the room will be more harmonious if the cuahions are alan made of the cretonne, piped with plain linen in a colour selected to match either carpet, curtains or woodwork. Another good scheme for cushions to be placed on $n$ Hower-patterned cretonne is to cover them with plain linen matching the ground colour of the cretonne and apply flowers cut from scraps left over from inaking the covers This treatment looks particularly well when a cretonne is chosen with a grey or pale grcen ground and having a definite pattern of mauve and pink flowers from which a neat design can be cut for the centre of a round, the corner of a square or the apex of a triangular cushion covered in plain linen. The groups of flowers are tacked on each piece to be trimmed and sown down with satin stitch A little embroidery in stem-stitch may be aulded to emphasise markings on the flowers or leaves in coloured silks to tone.

With If yards of 31 -inch material, either a round or square cushion of average size can be covered. Cut two circles, $21 \frac{1}{2}$ inches in dia. metor (a paper pattern can be out first from the cushion to be covered), or two squares of $21 \frac{1}{2}$ inches each, and also a band 4 inches deep to be set all round the sides to make the cushions mattress shape. The seams may be piped to match or with a contrasting colour. If to be appliqué or embroidered the one side of the cushion will be worked before making
up. Such cushions lend themselves to an endless variety of designs. Terry towelling makes delightful nursery cushions either patterned or in plain bright colours

Garden Cushions. Raffia cloth in the natural colour is a good covering for outdoor cushions, with a lining of satecn or other close fabric. and bias linding for the edges if munded. Simple wool or raffia embroidery can be used to trim such cushions. Hessian is another excellent covering material This coarse canvas may be stoncilled or lends itaelf to embroidery in oross-stitch; simple garclen or flower bed designs cook well and transfers are obtainahle which are quickly worked in wools. Crash cushions embrnidered with a group of circles in darning atitch are also suitable. The circles can be traced on the crash by pencilling round the inverted edges of small cups and saucers. American cloth provides a damp-proof reverse side for garden pouffes and mattress cushinns. Waterpmof cretonne cushions are obtainahle to match the coverings of deck chairs.

To brighten cane or canvas chairs for the verandah, loggia or garden, a useful and attractive cushion can be male in the form of a Japanere Inntern. This has an appliqué


Cushion. Lantern cushion for a garden ohalr. The design is applique with stem-stitch

lesign ot three little Japanseso lanterns which might be carried out in pint, green and yellow respectively, and is made of either crash or casement cloth in n contrasting colour. Two oval pieces of the material are cut 20 inches by 16 inches for the body of the cushion, and two pieces of hlack sateen for the Inp and hottom of the cushion, measuring 8f l, 3 inches ench. The threc amall lanterna nre npplied with stem-stitch, and apparently hang from a spray ensily draun on the material with pencil and also to he stemmlitched and decorated with a few little pink llowers in buttonhole-stitch

To make up the cushion these two ovals are joined together with a piping inserted, while the two black satin oblongs are placed in the middle of the long sides of the oval pieces to represent the top and hottoin of the lantern A black cord is attached by which the cushion is suspended to the back of the chair. This obvintes constant slipping when the occupant moves. Leather, dyed clamois, ir air cushions are most suitahle for use in cals, coverings heing selected to match or Ione with the upholatery

Cushions in Richer Fabrics. For the more formal type of sitting room, lounge or dining room whero the furniture is upholstered in relvet, silk rep, leather, or damask richer materinls are needed for suitahle cushions. (On a dining ronm settec with brown velvet lonse sent cushions, large round brown velvet extia cushions will look well trimmed with leather panels in a contrasting colour. Round cushions are also often particularly suitable for n window scat, as they help to reduce the apparent squareness of an old-fashinned
window. Oval and pillow. shaped satin cushions look right with 18 th century styles. Floor cushions give a luxuriously comfortahle look to the hearthrug in winter These should he large, deep and made of a suitably heavy materia' such as damask. furnishing velours or rep. Cloth inay a lso be utilised hound with gold galon and ornamented in the centre with motifs of gold hraid, as shown in Fig ?

Although cushions for rooms in period or special styles should be of rich materials they need not be costly. Setting naide for the line needlewoman the beautifully embroidered designs, there aie some effective methorls of trimming which demand no special skill For n room with lacquer pieces of furniture Chinese atrips, munds or squares of emhroidery can he used, either placed to form a patternon a plain colourel or hlack cusbion and applied by means of a narrow galon, or (as in the case of rounds and squares) laid llat in the centre of the cushion, and the silk, or other material with which the cushion is to he covered gathered round it on a gauging cond

A holster cushion shape can he hought and covered in strips of velvet, with ende either out into rounds and piped to fit the holater and tasselled ornament applied (Fig. ©), or pleated into a hunch of padded tlowers to hold the folds Gold-coloured cushions in crinkly satin have the appearance of heing tissue-covered. but are soft and do not tarnish. This satin is good trimmed with self piping on a thick cord, and coloured wooden heads devised into tassels, or into flat ornaments at three of the corners, with a large dangling one of pradied satin and beads to hang over the elge of a sofa, for the fourth.
Round, square or holster cushions covered with satin or shot taffeta are ornamental when trimmed with appliqué worh, or covered with patchwork in modern geotnetrical patterns. This wark costs nothing where there is a scrap drawer containing odd piecos of silks, satins, ribbons and tinsel brocades. The simpler the designs the better. They are cut out first piece by piece in paper, pinned on the cushion cover to judge the effect. and then cut out in the various materials. The designs may be traced by means of tracing paper or drawn frechand hefore cutting out. Figs. 3 and 4 show effective patterns which are applied by buttonhole atitch. For the former three colours should be used to malie the circle, the stitchery matching the piping. In the latter design the path should be nutlined in stem stitch.

CUSPARIA BARK. In medicine cus parin hark, which is an aromatic bitter obtained from a $S$. Americnn tree, can lic employod to increase aplictite. Two prepinations are used of which the doses are Infusion of cusparia, 1 to 2 fluid oz.; concentrate of cusparia, ! to I Huid dram.

CUSTARD. T'o make a simple boiled custard, allow 2 eggs to 1 pint milk, and use 2 dessertspoonfuls castor sugar, with Havouring to taste. Beat the eggs well and stir in the sugar. Bring the milk to the boil and then pour it gradually on to the eggs, stirring all the time. Pour all into a stone jar or a jug and put this into a pan of boiling water. Stir the custard until it thickens. Then remove it from the pan, add Havouring essence, and pour it into a bowl to cool. If lemon flavour is desired, let a little lemon rind boil with the milk.

Confectioner's custard is aontetimes used as a substitute for cream in lilling chocalate éclairs, etc. It is prepared by mixing a little more than 1 oz cornflour with $\frac{3}{3}$ pint milk, and atirring the paste in a small saucepan over the fire until it boils. Then let it simmer for several minutes, afterwards adding the yolks of 3 eggs, $\frac{1}{d}$ oz sugar, and a little vanilla essence. Cook the custard slowly, stirning it all the time, and when it thickens take it from the fire and allow it to cool

Custard Powder. A custard powder can be made at home from cornflour and riceflour These should bo mixed in equal parts, and it is essential that the ingredients should be quite dry and that they should be sieved to ensure their being free from lomps. The powder can be coloured yellow with powdered turmeric Onc tableapoonful of custard powder should be used to every pint of milk. The powder should he mixed to a sinooth paste with a little cold milk, and the remainder of the milk hrought to the bail and then poured on to the paste, atirring being continued all the time. Flavouring and sweetening are added to the mixture as the milk boils.

Steamed Custard. To prepare a steamed custard pudding, heat up 2 egge with sugar to taste, and add a pint of milk and the desired Havouring. Pour the whole into a greased basin, cover it with greased paper, and put it into a stenmer or into a pan half filled with boiling water. Let the water simmer very gently for a bout half an hour, until the pudding is set.

A good variant from plain custard pudding is provided by this recipe. Put $\frac{1}{4} \mathrm{~b}$. jam into the bottom of a greased pie-dish, and sprinkle over it a tumblerful of breadcrumbs. Pour over the whole a pint of custard made as a bove, taking care not to disturb the jam at the bottom of the dish, and bake the puddling in a moderately hot oven for 20 to 30 min .

Custard Tartlet. The pastry for these tartlets is prepared by sieving 8 oz. Hlour. adding a pinch of salt, and then rubbing in 2 oz margarine and the same quantity of lard. Add enough cold water to mix the whole to a stiff piaste. Roll it out till it is a bout $\frac{1}{f}$ in thick, then cut it into small rounds and line some deep tartlet tins with it. Line each case with a piece of greased paper and then fill it up with uncooked rice to prevent it from tising in the centre. Bake the cases for about 15 nin., or until they are lightly browned. Then take out the paper and rice, and leave the cases on a sieve to cool Make $\frac{3}{4}$ pint of


Custard Tartlet. Dlsh of these deen tarts flled with thick custard and sprinkled with nutmer
thick custard, flavour it with vanilla and leave cotton, wool, or clean linen should be used for hole with hrass bush is also sunk into each it to cool. Then put it into the cases, and grate the purpose. As soon as bleeding stops bring a little nutmeg over the top of each. A little raspberry jam may be placed in the bottom of each case before the custard.
Another variety of custard tartlet is pre pared by lining patty pans with a short crust. and three-parts filling them with custard Bake them until slightly browned and leave them to cool on a sieve. Make some sugar icing by mixing the whipped white of 1 egg with l oz. of castor sugar, spread this over the tartlets, sprinkle some more sugar on top, and then bake them slowly until the icing is crisp. These tartlets can be made still richer if a lit tle jam is put into the cases under the custard.
CUT: How to Treat. Slight clean-cut wounds, such as are made with a knife, should be cleansed by holding under a tap for a few moments, or by bathing the part with clean cold water, or, preferably, carbolic acid lotion (1 in 40) or a solution of boric acid. Lint,
the purpose. As soon as bleeding stops bring thin covering of boracic powder, a dressing of int or clean linen, and bandage. A little boric ointment may be applied, or the wound may be covered with flexible collodion, Whenever festering occurs, dress with some antiseptic, such as boric, salicylic, or cyanide gauze, after thoroughly washing with one of the above mentioned or another antiseptic lotion

A cut of any size, or a deep cut which bleeds profusely, should be covered over with a towel soaked in cold water (or, better still, a 1 in 40 solution of carbolic acid and water) while waiting the ductor's arrival. Efforts should be made to control the bleeding by applying pressure over the wound, or, if this does not succeed, on the main vessel supplying the part. If there is any delay in the doctor's arrival a tourniquet may be put on. See Bandage: Blceding: First Aid: Tourniquet. op edge of same. The finishing depth of the upper tray will be 1t in inside. of the upper drawer 1 in in. full, and lower drawer $2 f$ in. full. These receptacles should have bottoms and sides covered with green baize or a suitable cloth. If the bottom is lined first, the sides and back can be fitted with cloth-covered slips of three-ply.

For the lid, two pieces $15 \frac{1}{2} \mathrm{in}$. by $1 \ddagger \mathrm{in}$. net will be needed. and two pieces $12 \frac{1}{2}$ in. by 18 in. net for the sides. The top finishes $15 \frac{1}{\mathrm{~g}} \mathrm{in}$. by $2 \frac{1}{2}$ in by in. thick. The sides should be mitre. dovetailed together, and the top rebated in $\ddagger$ in. deep, the remaining $\frac{1}{y}$ in forming the top edge, to be ruunded or bevelled off.
The hinges should to a special kind of quadrant box hinge, as at Fig. 8. The lock is fitted to a block inside centre of front of lid, to permit the lid to close down flush with the alosed pilasters. A corresponding link plate is fitted to front rail of case. A couple of brass pin plates are also fitted to lid so that they drop

## Cutlery and the Cutlery Canteen

## Directions for Making a Useful Recaptacle

Demiled information about the various kinds of cutlery will be found under the headings Fork; Knife; Spoon, etc. See also Cabinet Making: Drawer,"erc.
Under this general name all small cutting up clean and true. For the back a piece instruments are included, such as scissors, of equal thickness to finish $15 \frac{1}{\frac{1}{2}}$ by $6 \frac{1}{2}$ in. razors, knives and carvers for fish, poultry and meat. Table cutlery sold in sets in a canteen or cutlery cabinet may, in addition to knives in two sizes, contain forks and spoons, fish and fruit knives and forks, tablespoons, gravy spoons and carvers. Sets may contain sufficient articles for twelve or six persons.
Making a Canteen. A cutlery canteen, as at Figs. 1 and 2, has much to recommend it. Fig. 1 shows the cabinet closed by means of locking pilasters, sunk handles being fitted to drawers and also to the cabinet ends for lifting


Cutlery Canteen. Figg. 1 and 2. The canteen, which in in olished wood and has a tray and open

and becks of the drewers
purposes. Fig. 2 shows the cabinet opened out including a lift-up lid with well immediately under it, and also a couple of drawers or pull-out trays.

It can be made in oak, well seasoned and sound, stained to a rich nut-brown colour an polished. An inlaid tablet of brass on the lid will heighten the finished effect.

The length of cabinet is 1 ft . $3 \frac{1}{\mathrm{f}} \mathrm{in}$. by. $12 \frac{1}{\mathrm{t}} \mathrm{in}$. wide by $8 t$ in. over all. The lift-up lid is $1 \frac{1}{4}$ in. deep outside, to be fitted as a tray for cheese knives. The upper well is $1 t$ in deep, with special fittings. The upper drawer should be allowed 17 in . deep over outside front, and the lower one $2 \frac{1}{4} \mathrm{in}$. deep. Each of the latter has special fittings for the various items to be contained in compact dozens or half-dozens.

Two sides of the case can first be got out to finish 11 in in. by $6 \frac{1}{6} \mathrm{in}$. by $f$ in. thick after planing to allow the locking pilasters to close in Hush, will project $\frac{i n}{}$ in. at front and finish $\frac{1}{\frac{1}{2}} \mathrm{in}$. thick, to fit Hush at sides and back. It should be screwed up to sides and back with brass screws.
The drawers (or pull-out trays) should be made as dust-tight as possible. Fronts had beat finish of in. thick sides and backs in. thick, mottoms $\ddagger$ in. thick, let in flush.
The fronts, sides and backs of the drawers
ane dovetailed together, each front being fitted with a sunk or flush brass handle or a cup handle. All should close in flush ready for locking the pilasters. These finish $6 t$ in
long, hinged with brass piano hinges. At in.
 will be required these parts being preferably mitre-dovetailed together, or housed and screwed or dowelled together. The front has a top rail $1 \frac{1}{2} \mathrm{in}$. by $\frac{4}{4} \mathrm{in}$. dovetailed into position for preference, but may be tenoned or dowelled instead to the sides. The upper tray bottom can be of $\downarrow \mathrm{in}$. wood cleaned up and grooved into sides and back, and the front edge rebated, glued and panel-pinned into front rail. A bearer rail under the upper drawer to finish in. thick may be continued from front to back to form a dustboard. The bottom,
into the holes in top edge of pilasters previously referred to. The fittings are slips of deal cut out with a fretsaw, then covered with cloth, using liquid glue, ordinary glue, or shoemakers' paste as an adhesive.
The lid, Fig. 3, can be fitted for 12 cheese knives, each fitting heing about $1 \frac{3}{3} \mathrm{in}$. wide by 1 in . high, and shown to larger scale at Figs. 9 and 10 . The slip will be a shade under $\frac{7}{3}$ in. high, notched out at intervals $\frac{7}{8}$ in wide by $\frac{f}{8}$ in. high, to receive the handlea. The capping can be of three-ply with a $\frac{8}{3} \mathrm{in}$. slip of same to lift up and be fastened down by clips as Fig. 3. The blades enter notches $\frac{7}{8}$ in. by $\frac{1}{\frac{1}{2}} \mathrm{in}$., as Fig. 10, the fitting being cloth-covered beforc inserting into position.

The top tray of case (Fig. 4) will have fitting.a for carving knives, steel and forks, and 12 table knives, the blades of which interlie. An enlarged detail of slips is shown at Fig. 7 for carvers and steel, the cuts being 4 in . by $t \mathrm{in}$. 3 in . by 1 in : 21 in . by $\ddagger \mathrm{in}$., and 1 in . by $\frac{1}{\mathrm{f}}$., out of slips it in. high, $\frac{1}{6}$ in. thick, with the cuts right through. The table knives can le in slips as Figs. 13 and 14, height being $1 t$ in. full and thickness $\frac{5}{8}$ in. for Fig. 13, with the cuts $\frac{2}{8} \mathrm{in}$. wide by $\frac{1}{} \mathrm{in}$. apart: and for Fig. 14 cuts are $H_{b} \mathrm{in}$. high by $\frac{1}{2}$ in and $t$ in. alternately, each cut heing $t$ in apart.

The upper drawer can be fitted for, say, 6 teaspoons, 12 dessert forks, and 12 table forks. Size for slips is $1 \frac{1}{t} \mathrm{in}$. high by ${ }_{8} \mathrm{in}$. thick. The bottom drawer would take 6 tablespoons, 12 dessertspoons, and the remaining 6 teaspoons. Slips can be $2 t \mathrm{in}$. high. A plan of drawers is seen at Figs. 5 and 6 An enlarged repeat of the slips for these items is given at Figs. 11 and 12. The locking pilasters are shown closed and open respectively in Figs. 1 and 2.


Cutlery Canteon. Details for mating the cabinet shown above. Fig. 8. Lid. Fis. 4. Top tray. Fig. S. Plan of top drawer. Fig. 8. Plan of bottom drawer. Pis. 7. 8lips for carvern. Fis. 8. Quadrant hinge for lid. Figa. 9 and 10. Fittings for hd. Mg. 11. 8lipa for dessert forks. Fig. 12. For tablespoone. Fiss. 18 and 14 (below). Slips for tahlo knives

CUTLET : How to Cook. To prepare cutlets, trim away all pieces of fat, and if there is any bone in the centre cut this away. The bone at the end must be scraped bare and fres from fat. Beat the cutlets with a wet cutlet bat or rolling-pin to make them tender and to improve the shape. They should not be more than $\frac{1}{2}$. thick. Dust with flour that has been seasoned with salt and pepper,


Cutlok. Dist of grilled matton cutlets, garnighed with green peas and decorated with paper trille in the same way as a chisel.
firmly wedging it in place. A rebate is formed by backward and forward strokes with the gauge, cutting on the forward stroke. When one face of the work has been so cut, it is turned over, and the same procedure repeated. The cutter should be ground and sharpened

CUITING-OUT. As applied to tailored clothing for men and women, cutting-out is a highly skilled trade, but the process of cutting out simple dresses, undergarments, etc., is easy with a good paper pattern to work from.
Three pairs of scissors are necessary, viz., a large, sharp pair for cutting large garments or thick cloth, a smaller pair for moderate-sized garments and silk, and also for cutting round curves, while a small pair is wanted for slots, slits, buttonholes, etc. A measuring tape is necossary for measuring the material and taking measurements of the
then coat with egg and breadcrumbe, and fry them. The cutlets can be dipped into melted butter and breadcrumbs, instead of egy. Cutlets can also be stewed in a casserole or plainly grilled.

Cutlets are usually served on a mound of mashed potatoes, the cutlets being arranged with the bones pointing in one direction and wrapped round with paper frills. Various sauces can be served with them. Veal cutlets should be garnished with slices of cut lemon. lamb aud mutton cutlets with chopped parsley. Tomatoes, grilled or made into a puréc. spinach sauté in butter, or green peas, are usually served with cutlets.
To make cutlets from the remains of cold veal, lamb, mutton, or fowl, mince the meat finely, season, add chopped parsley or any Havouring desired, and mix with the yolks of eggs until a firm mixture is obtained. Shape the mixture into cutlet form, coat with egg and breadcruinbs, and fry them. Cooked and Haked remains of fish can be treated in the same way. See Casserole: Mutton.
CUTIING GAUGE. This tool is for cutting lines on woodwork, making small rebates and for similar purposes, and serves


Cutting Gauge. How the tool is used for cutting a rebate on a piece of wood
the same purpose as a marking gauge. It consists of a steel cutter fixed to a hardwood stock or bar by means of a wedge. A sliding head moves on the bar, and is fixed at any desired position from the cutter by means of a wooden thumbecrew.
Its general form is seen in the illustration. It is used by grasping the stock with the left hand when marking out work, in the right hand when cutting a rebate. The method is to adjust the distance between the cutter and the face of the head, which determines the width of the rebate. The cutter is set to the requisite depth by loosening the wedge, pushing the ontter through the stock as far as needed, and
pattern, to compare it with the size wanted, and also for measuring any straight or crossway strips that may have to be cut for frills or trimming bands.
As a rule it is easy to determine which is the right and which is the wrong side of a material. Woollen materials are generally bought folded with selvedges together, with the right side folded inside, while longcloth and similar cotton fabrics are folded with the right side out. If materials are of single width, and therefore not folded with selvedges together when bought, the right side can generally be deternined, as it is smoother than the wrong side. The right sido of serge, gabardine, or any cloth with a fine crossway grain can be determined by holding a length down with selvedges right and left, and one cut end under the chin. If right side is outermost, the grain should run from left down towards the right.

Some materials are woven to be made up so that a certain way bengs downwards. Thus worn, it wears longer and looks better.
This up-and-down way is so pronounced in some fabrics that they have a bloom, which means that viewed from one end of the length the material shades lighter than it does when looked at from the opposite end. To determine the right way down of a material, lay it out flat on the table, and pass the palm of the hand first up one way then down the other. It should be smoother one way than the other, and should be made up into the garment so that the cloth smoothe downwards
Velvet and Velveteen. Materials which have an up-and-down shading or bloom are made up so that the dark way shades down, and the darker way can be ascertained by folding the length of material to bring the


Cattinga. Diagrams lilluatrating typical methode of treatment. 1. Geraniam, of good growth. 2. Same cutting trimmod for planting. 8. Cutting planted with and af bace. i. How to avold "damping of." a. Cutting plantod in ready for pottlageon. 6. Puchala cuttings, several of soil. S. Rooted cutting in a large pot and plunged into a boz of sheses covered with glacis. 8. Viola catting. 9. Pint cutting. 10 . How to plant root outtinga of similar plants


Cutworm. 1. Male and, 2, caterpillar of turnip moth. 3. Male of heart-and-dart moth. 4. Male yellow underwing moth
BU perniission of IIM.M. Stutioncry Ontice
of five kinds, soft-wonded, hard-wonded, heeled, root, and leaf. The first named is generally the easiest to strike.
As a rule, a soft-wonded cutting should be severed just below a joint, and should consist of the upper part of a growing, not flowering, shoot, with three or four leaves. In some cases the wood should be young, in others half-ripe, in others quite firm. In nearly all cases the best compost for soft-wonded cuttings is loam, with abont a third of leaf-mould, and enough sand to make the whole of the conipost thoroughly gritty and porous. The cutting is made firm at the base by pressing it with the blunt edge of a lead pencil passed diagonally through the soil. Cuttings strike best round the edges of a pot.

Acacia, boronia, epacris, and erica are examples of hard-wonded cuttings. On the whole they are less reliable than the softwooded. In most cases the usual favourable conditions are: small pieces of the upper parts of non-Howering shonts, a compost of peat and sand, wond fairly firm and ripe, bell-glass covering. A heel is a small strip of the older wood, about an inch long. The cutting of young wood is pulled or cut off with this strip instead of being cut clean across under a joint. Some plants root better and are less liable to damp off with than without a heel. By leaf cuttings are not meant leaves laid on the soil, but leaves with the slalk inserted. The indiarubber plant is a familiar example. They require a good deal of moist heat. Gloxinias, begonia Gloire de Lorraine, and pelargoniums generally ront when thus propagated

Evergreen shrube are increased by cuttings placed in sandy soil in a frame in August. Leaf-losing trees and shrubs are propagated by cuttings set out of doors in OctoberNovember. Certain plants, e.g. seakale, anchusa, Japanese anemone, oriental poppy, are propagated by pieces of the ront which are inserted as cuttings. See Apple; Gooseberry; Grafting; Raspberry.

CUTWORM. The larvae of the turnip moth, the heart-and dart moth, the yellow underwing and others are known as cutworms or surface caterpillars, and cause much damage to cultivated plants. As a rule cutworms spend the day in the surface layer of the soil or hidden under leaves, thick grass or stones. At night they come out and feed, some. times on the leaves of plants, but more often on their stems, both a bove and below ground, and are specially fond of the thick, fleshy parts of such crops us mangolds, turnips and


Cutworm. Potatoes damaged by the cater pillar
potatoes They also bite through the stems of plants.
Since the caterpillars are often of the same colour as the soil on or in which they live, they are not ensily seen. An examination of the crop after dark is perhaps the simplest way. They rre often epecially troublesmie on foul, weedy land, and potatoes are likely to be attacked. When crops of potatoes or mangolds have been badly attack ed it is risky to sow winter whent unless the pests have first been destroyed.

Undoubtedy the best method of dealing with cutworm-infested land is to run poultry upon it, and wherever this is possible it should have precedence over all other treatments. When young root crops are being attacked above ground, the plants may be sprayed with lead arsenate ( 1 lb . lead arsenate paste to 25 gallons water). Provided the plants are small so that the greater part of the root has yet to he made, there will be no risk of poison. ing stock when the roots are finally eaten. Lead arsenate is poisonous to man and domestic animals and must be carefully used.
In allotments hand-picking is often the most simple method of dealing with the pests, which can generally be scraped out of the


Cyclamen. The Persian cyclamen a beautifal greenbouse plant soil near the plants last attacked by means of a blunt knife or pointed stick. Theymay also be col. lected atnight when they are feeding or crawling about on the surface of the soil. These measures are advised in Leaflet No. 33 issued by the Ministry of Agriculture. See Cabbage : Potato ; etc.

CYCLAMEN : Bow to Grow. The Persian cyclamen is a valuable greenhouse fowering plant in full beauty in early spring. Handy cyclamen are low-growing plants which flourish out of doors and bear small flowers in autumn and spring.
The Persian cyclamen is raised from seeds sown in August in a well drained box of sifted compost of loam, leaf-mould and sand placed in a frame. When large enough the seedlings are placed singly in $3-\mathrm{in}$. flower pots, and when well rooted in those they are potted finally in $5-\mathrm{in}$. or $6-\mathrm{in}$. pots, in which they will bloom. During the winter months they should be kept in a greenhouse temperature of about 50 degrees. In the summer they thrive best on a bed of ashes in a cold frame; they need cool, moist conditions. From seeds sown in August the plants will bloom in the following February twelvemonth. When potting cyclamen care must be taken to keep the corm on the surface. Well drained pots are necessary, and a suitable compost for the final potting consists of loam, two-thirds, leaf-mould and decayed manure one-third, with a scattering of sand and crushed charcoal.

When cyclamens have finished flowering they should be dried off by gradually giving less water. When the leaves have fallen the soil must be kept dry and the pots placed in a sunny greenhouse or frame. Late in July the corins should be taken out of the soil, repotted in fresh compost, watered and set in a frame. They will soon start into fresh growth. These plants are long lived and may be kept for many years. They are often grown successfully as window plants. There are many varieties, with flowers in crimson, rose, salmon, and other colours.

Hardy cyclamen should be planted out of doors in well drained soil with which leafmould and mortar rubble have been mixed freely: they like slight shade. The cormis need only a slight covering of soil except those of Cyclamen ncapolitanum and africanum, which should be set an inch or so deep. Some of the chief kinds are: africanum, reddish flowers, September; coum, rose-red, April; europaeunı, rose, September; ibericum, rosered, March; neapolitanum, reddish, September; repandun (bederaefolium), reddish, spring. The corms of the autumn flowering cyclamen are planted in July-August; the others in September. Pron. Sik-la-men.

CYCLE. Both a tricycle and a bicycle are called a cycle, while cycle shed and bicycle shed are interchangeable terms. See Bicycle; Motor Cycle; Tricycle.

Cycle Car. See Three. Wheeled Car.
CYMBIDIUM. A beautiful winter and spring-flowering orchid of which innumerable new varieties have been raised in recent years The flowers, in shades of rose, buff, pink, and green on long arching spikes, are most decora tive. They are vigorous plants and are grown in pots in a mixture of loam and peat with sand. They thrive in the intermediate house in which a minimum temperature of $55-60$ degrees is maintained. Pron. Sim-bid'i-um.

CYPRESS. The cypress is a graceful evergreen conifer of which there are many species; some of them are ideal lawn trees. They flourish best in moist districts in deep loamy soil; they are less satisfactory in gardens near large towns where the air is impure, or on very chalky land. One of the chief species is Cupressus lawsoniana, of which there are many varieties, e.g. lutea and Stemartii, with yellow leaves, Silver Queen, with silvery-green leaves, and gracilis pendula of droop. ing growth Cupressus macmearpa is a beautiful quick - growing conifer and its yellow leaved variety lutea is attractive: both these are better suited to comparatively mild than cold districts. Sem. pervirens, distinct columnar growth, so conspicuous in Italian gardens, is less hardy than others.


Cypress. A favorite coniler, Cupressus lawsoniana

DAB: The Figh. This small flat fish of the flounder apeciea, scasonable all the year. is found in abundance mund the coast of Great Britain. To fry, the dab should be cleansed, well dried, and rubbed with anlt an hour or two before onoking. and dipped into egg or milk nnd bread. crumbs. It should then be garnished with fried paraley

To noil a dab sufficient wnter is needed to cover the fish, a little salt and vinegar being added About 10 min . is the time required, nod any fish sauce can be served

DACE. A fresh-water fish, resombling the roach. found in nbundance in English streams. The fleah is somewhat coarse but it can be fried or boiled.
DACHSHUND. In spite of his unprepossessing rрpesrance, the dachshund has a high reputation as a domestic pet. being affec-


Dachshand, a short-haired breed of German dog tionate in disposition, a a plendid playmate for young children, and $n$ good watchdog Al. though not used for sport in Great Britain, his German name, signifying badger-dog, indicates the purpose for which originally he wns bred.
The body of the dachshund is exceedingly long, and the legs very short. the front pair oronked. The long head tapery to the sharp muzzle. and the ample ears hang flat beaide the cheeks The tapering tail of the animal is carried with a rather low curve The type usually acen in Great Britain has a short. olose cont which may be some tint of red, black brown, or grey, or n combination of two coluurs. There are also long-hnired and roughhaired breeds See Dog.

Daddy Long Legs. This is the popular name npplied to several of the larger kinds of crane ties. Sce Crane Fly.

DADO : For Decoration. Wherc there is $\Omega$ dado there should not be a frieze is $n$ rule which holds gond in average homes, but occasionally both are seen in the case of exceptionally large and lofty rooms, or on a staircase where there exists a wide expanse of wall between the stairs and the ceiling.

The dado, which may be described as a decorated space letween a base consisting of a akirting and a moulding, may be of one of various materials. Ahout 3 ft . to 4 ft .6 in . is an ordinary depth from the floor to the dado-moulding. The dado bas a tendency to cut the height of $n$ room, especially when there is marked contrast in colour or tone between it and the rest of the walls. Prnelled wood is used in oak colour for stairense, hall and lounge, and is a saving precaution against dirty marks on light-coloured walls, where there are children. Hand-made Jnpanese embossed leather papers make $n$ substitute for auch panelling. They are good in colour, and durable, heing impervious to the action of amoke and gas.

Decoration for rooms in Adam or Queen Anne styles utilizes the dado in wooden panelling, while above the dado rail the walls are painted and mouldinge applied to simulatc the big panels of those periods.

A tiled dado is clean and labour-saving in kitchen or bathmom. See Annglypta; Decoration; Moulding.

DAFFODIL. The beat hardy spring-flowering bulb, suitable for planting in flower beds nod borders, in grass and for cultivation in pots in the greenhouse and in bowls indoors.

Forred bulbs will bloons in Jnnuary and a suecession of flowers can be maintained unlil March, when the earlics! of those out of (loors enme into blunm.
Daffortil is the popu lar name of the trimpet variety of narcissus. auch as Emperor and Empress A modern classification deacribes tell groups of narciasus The classification is based on the comparative length of the outer or perianth scgmente and that of the central part which is variously deacriled as trumpet. cup or crown according to its length. The chief olasses are ns follows:

Trumpet daffodils, in which the trumpet or cmwn is as long as or Innger than the seg. mients of the perianth Favourite yellow varieties are Emperar, Golden Spur, Laril Roberts, King Alfred and Maximis. White varietien are Madame de Gmaff, Pcter Barr, Beersheba, Alice Knights and W. P Milner. Others with white perianth and yellow trumpet (called bicolors) are Horsfieldii, Empress. Weardale Perfection and J. B. M. Camm.

Chalice Cupped or Incomparabilis: the oup or crown is not less than one-third the length, of the perianth segmenta. A few gond varieties


Daffodil. 1. Challee - copped Sir
Watkin 2. King Allied. 3. PoetiWatkin. 2. King Allited. 3. Poeti-
cus narcissus.
4.
Variety known as the Boop Petticoat dafodil
are Sir Watkin, Gloria Mundi and Blackwell.

Star. Barri or Short Cupped : the cup or crown is less than one-third the length of the perianth seginents ; the perianth


Eucharis-flowered or Leedsii: distinguished frmm the atar narcissi by having a white perianth and white or pale cup or crown. Duchess of Westminster, Mrs. Langtry, Maid of Athens, and Snowsprite are typical ones.

The remaining groups consist of varietics of Narcissus triandrus, cyclamineus (both of these are miniature kinds), jonquil, the bunch. Howered Narcissus tazetta. Poet's Narcissus and the double narcissi.

Dafiodils never look
 better than when grouped in grass; the bulbs ane planted in September. October about 3 inches deep. Suitable varietiea for this purpose arc Emperor, Empreas, Prallidus pracenx, Barrii conspicuas, Mrs. Langtry and Sir Watkin. For planting in formal flower beds Eniperor, King Alfred. Empress and innumersble others are used.
The ministure hoop patticont daffodils (bulbocodium), cyolnmenHowered (cyclamineus), triandrus, minor and minimus, are suitable for the rock garden: they need well-drained soil.

Varieties for cultivation in flower pots under glass to supply early blonms nre Golden Spur, Horsfieldii, maximus, Victoria, jonquil. IV. P. Milner and the bunch flowered or poetra varietics. The hulbs should be potted carly in September, placed under old asbes out of donss for 6 weeks and then brought under glass, a few at a time, to provido a succession of bloom.

Daffodil Pests. Two main troubles afflict daffodils. First, there is the narcissus fly, which lnys is yellow or white and the cup is coloured. eggs on the lenves in May and June, and the Among the few favourite varieties of daffodil are grubs that hatch cat out the heart of the bulbs. Barrii conspicuus, Red Bracon and Red Chief. The flies resemble small dark huinble-bees,
but being true flies have only two wings, and have no visible antennae on their heads. They should be netted on bright sunny days. The bulbs sbould be examined at lifting time, and gently pinched: if soft they should he cut open and the grub destroyed. The other diaense has been proved to he due to eelworm, which, in addition, is particularly troublesome in connexion with cucumbers and similar plants. See Bulb: Cucumber; Floiver Garden

DAHLIA. There are many types of dablia. and some are nore useful for garilen decoration than others. Those chiefly to be recominended for this purpose are the star, charin or dwarf. peony-flowered. mig. non, decorative, collar. ette. tall peonyflowered, single and some of the cactus varicties. Other typos are the show, pompon and fancy.

The tubers of tho dahlia are not hardy, therefore they must he lifterl as soon ns the tops of the plantes lave been cut down by frost and stored in it írost pronf place for the winter. They keep well in boxes of soil or sand. In April the old tubers mily be planted out. of doors; they


Lahlia. 1. Sapho, a stagle variets 3. Yeoman, cactos dablia.

2. A characteristic show dahlia. Patrol, a collarette variety

A separate room is desirable tor the washing up of the utensils, and this is arranged quite easily by putting up a thin partition.

Windows that will open can be placed on one or mnre sides of the dairy. as ample light is highly desirable. Fine wire gauze or similar material can be fixed outside the windows to keep out insects, while allowing air to circulate freely The dairy should be provided with ventilators, preferably both below and above, in the walls. The walls should be smooth, which can be accomplished by cement. ing the interior; they can be either washed down frequently. or, better still. they can provide a profusion of bloom. Finer flawers are obtained by starting the tubers into growth under glass in February and taling cuttings from the young shonts. These are inserted in pots of sandy soil : after having been hardened off in May they are planted out of doors early in June. Dahlias may also be raised from seeds sown in a heated greenhouse in January-February; they will hloom late in the summer. There are innumerable varieties of the types referred to above. and fresh ones are introduced annually. They are described in catalogues.

Dahlias need deeply dug and manured soil, a sunny position and full room for development. They must he stalied carefully, for the shonts are brittle. The best display is assured by removing many of the side shoots.

DAIRY. To fit up a small dairy is by no means a difficult matter. A building can oftell be altered to fulfil the necessary conditions, such as a shed about 15 ft . by 12 ft . It should be situated at a sulticient distance froin the cowshed, the dungheap, or other source of contamination. The aspect should be northern, if possible, as this keeps the dairy cooler during the hot weather. The entrance to the room should be from the open air, and not from the cowshed or other farm building. and the room should be used for no other purpose than for the treatment of the milk.
also the a washing-up room, and there should adapted for sterilitsink. The copper can be hole through the centre of $n$ wooden lid and


Dablia. Diagrams illustrating methods of culture. 1. Root in irame. 2. Roots drying on shelf. 3. Roots in box, kept from frost. 4. Sprouting tubers, for cuttings. 5 and $\theta$. Types of cuttings, ready for potting, as in 7. 8. Sproutin tuber. 9. Same cut to fit pot. 10. Potted cutting in frame, for rooting ol through the centre of $n$ wooden lid and out from it a number of diamond shapes to
fitting a plug in The steam Irom a properly boiling copper is sufficient to sterilize the utensils in 0 min . Pails and churns can he sterilized by inverting them over the opening in the lid, and smaller articles by placing them in a steamer, which may be improvised by using the receiver of a milk cooler or separator, placing it over the opening and covering it up with a thick cloth Alterna. tively all the utensils can be put into boiling water for several minutes.

After use, nll utensils should be rinsed, with cold water as soon as possible, thoroughly scrubbed inside and out with hot water, and then scalded or steamed and inverted on $a$ rack provided for the purpose. Floors should he washed and scrubbed with a brush, swilled with boiling water, and dried with a cloth or squecgee. See Butter: Checse: Churn Cream : Milk, etc.

DAISY. The named varicties are showy flowers lor spring heds. Rob Roy, Alice. Dresden China, and link Beauty are favour ites. For giant double daisies sow speds in June. The sedlings are put on a reserve border and planted tinally in autumn. They should be lifted and divided after Howering: the pieces are grown on a reserve lwarder during the summer. The variety popularly termed the hen-and-chickens daisy has the peculiarity of forming small Howers round a large central bloom.

DAISY CREAMS. To make these, cut a fresh Swiss roll weighing 1 lb. into slices about $\frac{1}{2}$ in thick. Prepare $\frac{1}{2}$ pint jelly in the usual way, then chop it rather fincly and put a heap of it on each slice. Whip $\&$ pint cream and mix it lightly with a stiflly-whipped white of egg. With this the jelly should be covered.


Daisy Creams, an attractive swee!
Then blanch I oz. of sweet almonds, splititins each in half lengthways. and cut 2 or 3 candicd apricots into small. thin rounds, each about the size of a threepenny piece. Soak a little angelian in warm water till it is soft. then cuc represent leaves $\mathrm{On}_{1}$ the top of each sweet put a daisy formed froin the halved almonds, using these as petals, and a round of apricot for the yellow centre. Thic angelica should bo arranged to form stallis and leaves.
DALMATIAN In certain respects the Dalmatian dog resembles a spotted pointer, and from the numerous dark spots on his white coat he has been called the plum pudding or spotted dog. He is usually very clean-built, strong, and agile, with straight lega and feet, powerful loins, deep chest, and nicely-moulded neck,
the short coss. olcek, glossy, and casily groomed. Weighing about $\overline{5} 5 \mathrm{lb}$ on the average, the Dalmatian is of medium size, and not too big for an indoor companion. He is not noisy. seldom barking when it is not his duty to do so; but if he does bark, his deep voice is an effectual warning to atrangers. In chonsing one, remem ber that the markings may be either


Dalmatian Dog, a large breed ol carriage dog, also nown as the plum pudding dos
black or liver-coloured on a brilliant white ground Experts insist upon the spots being clearly definerl, without touching one another, and in proportions they may vary from that of a sixpence to $n$ llorin They should bo pure in colour, not lareing any white hairs mixed with them The dog is bardy. easily kept in condition, and an oxcellent breed in every respect Sce Doz.

DAMAGES: The Law. Anyone who breaka a contract or who by his treapass, or nuisance, or negligence callses injury to another in person or property must pay damages in wome classes of cases, e.g. libel or slandor, the damages awarded may be punitive or exemplary: that is to say, they bear no relation to any monctary loss sustained by the person uggrieved.
The same is truc in claims for assault or breach of promise. But in most cases the damages to be awardod are such a suin as will make up to the individual the actual loss sustained by roason of the wrong or the breach of contract In the case of peraonal injuries, a man may claim what it has cost him for doctor's fees, special food, the cost of a holiday to recuperate, earnings lost, and, in addition, a fair sum for the pain and suffering he has undergone, and for any permanent injury.

When a husband, wife, child, father, or mother is killed by somebody's negligence, or otherwise, under such circurnstances that if he or she had only been injured and not killed, an action for dannages could have heen brought againat the wrongdoer, the widow, or children, or widower, or either parent, can recover damages proportionate to the pecuniary loss sustained. Nothing is allowed for injured fcelings, but only for the loss of the pecuniary benefit which the widow or other dependent actually received or might reasonably in the future expect to receive from the decensed.

A person breating a contract is liable to pay some damnges, cven though the other party has suffered no loss: but these may only be nominal-a few shillings. But the other party to the contract can also recover any pecuniary damage for any loss which was the natural and reasomable and direct result of the breach of contract. If anyonc agrees to supply goods and does not send them, the buyer is entitled In purchase them elsowhere, and if he has to pay a higher price, he can claim the difference. If a householdar orders work by a tradesman at a price, and the work is badly done, the householder is antitled to linve it put right by
another man and olaim from the lirst man as damages what he had to pay to the second See Accidente: Contract : Einployer's Liability Serrant

DAMASK : The Fabric. There are linen, cotton, silk and wool damasks, and the feature common to them all is the method of construc tion. The patterns are usually large and floral, and are formed of satin-like twills in reversed directions.

Damasks are made more for houschold and furnishing purposes than for dreas Silli damasks made for church use have stood for centuries. Victorian worsted damasks, used as winter window curtains, and tablecloths, have, in many instances, stond 50 years of wear with little barm. There are two kinds of linen table damask known as double and single damaak. The latter has the atronger weavo. Cotton damask tablecloths are innde in the same patterns na linens. but they lack firmness and brightnoss.

DAMASK ROSE. A very old type of rose, said to have been introduced into Great Britain in the 16 th century. Damask roses do well as dwaris, but are not suitable for growing as standards. They require gencmus cultivation, and all their wenk growth should be thinned out in March or April, leaving strong shoots pruned to about one-fourth their length.
Several varicties are obtainable, among the best being: Lady Curaon, large single pink; Crimson Damask, bright crimson: York and Iancaster, white, striped red: Old Rose Damask, red The Dainask rose is largely used abmad for the purposo of making attar of roses. See Rose

## Dame's Violet. See Rocket.

DAMP : Precautions Against. Excers of moisture or damp may be present in the soil, the dwelling, the atmosphere, or the clothing, and so affect health. A cold, damp climate, dwelling or workshop favours the development of theumatism and chest com. plaints, including consumption. Sitting in damp clothes predisposes to chills.
In the house damp needs to be carefully guarded agninst, and during the winter no room containing a piano or any other musical instrument, valunble pictures, or furniture that is heavily parlded, should be left long without $n$ iirc. If the drawing mom is not used daily, a fire should be lighted in it ance or twice a week. Pictures that have heen hanging on a damp wall should be taken down, the moisture wiped off with a clean duster, and then placed with their faces to the wall in $n$ warm room. Furniture or perishable articles which are being atored in a cellar should be placed on battens and should not be pushed close against a wall.

Beds left unóccupied for several days can be kept free from damp if hot-water bottles are placed between the sheets at frequent intervals This obvintes the need for removing the berdding and niring it hefore the fire. Damp in heds can be detected by placing a mimor in the bedclothes. If it remains unclouded, the bed is dry enough to he slept in. If damp cupboards are sprinkled with quicklime and then left for two or three days, the moisture will be $n$ bsorbed

Damp in Walls. The cause of damp in the house is not alwnys easy to discover at first. although the general position of the trouble will often indicate its probable source. For instance, if the wet patch is at or near the top of the room, and $n$ gutter is just outside, the gutter will probably be found to have got choked up with leaves and rubbish, thus impeding the frec flow of the water, and causing it to overHow. It may do this on the wall side of the gutter, when the dampness will appear near the top of, the room, or it may overflow on the outer side of the gutter, and
be driven by the wind on to the wall at a considerable distance away.

A nother caruse of dampness is the failure of the gutter brackets, which may work loose and sag down, or even be broken off altogether The trouble will probably disappear when the slack brackets are wedged and cemented up. or roscrewed to woodwork. Cane must be taken to see that the guttering has a sufficient and regular fall. Should n section of gutter sag bedily, it will cause a pocket in whiclı water will accumulate when a heavy rainstorm puts oxtra pressure on the gutters

Some old-fnghioned houses with curb roofs, those with a mansard roof, or a brick of masonry parapet, have inconveniently arranged internal gutterings, generally made or envered with shect lead or zinc. These oither perish with age or, more frequently, are punctured by falling matter, or the pasage of somicone wearing hobnailed hoots When dcaling with this class of gutter, always wear felt slipjers or smmething soft, such as a rubber golosh over the boots, or take care to walli on duck boarda laid down for the purpose.

Holes are very difficult to locate in auch gutters: the only thing to do is to hrush or clean all suspected parts, and persevere until the perforation is found. It can then be repaired by menns of a wiped joint, a new aection can be laid. or $n$ temporary repair effected by applying one of the many compounds sold for the purpose of rendering lealiy mofs watertight.

Damnged slates and tiles are ubvinus causes of dampness : but it does not follow that a damp place on a wall is necessarily made because a tile is missing immediately above it. A diaplaced tile may allow rain to drive in, or, worse still, to llow in by convection: it inay then drip off on to, say, a raiter, and run down the rafter for a distance of several feet before it finally drips on to the wall. Generally, however, it is the tiles at the eaves that should be auspected; all those that are damaged must be replaced, or the cracks and holes made good with cement, mortar, or slurry. The rain-water heads and downpipes may be choked with debris, and cause damp places on the rall, the plain remedy being to clear away all obstructions

Treatment of Porous Bricks. When a lonuse has been built with inferior or porous bricks, the wet may drive through the wall. The cure is by rendering with cement mortar, rough casting, or by a cont of one of the waterpronf compositions. A waterproofer known as Pudlo may be adiled to the cement used for rendering n damp wall. This preparation is mixed with the cement in the proportion of one part in twenty, in the dry state, beforo the cement is added to the sand. A preparation of emulsified paraffin was, painted or aprayed on to walls in warm, dry weather, will till up the pores, and render them impervious to damp. Sold under the name of Sprawns, this can he obtnined frmm ironinongers and buildery' merchants. It is also available for inside work. Another method is to apply two or three coats of silicate petrifying liquid to the outside wall.

Besides dampness duc to falling water and driving ritin, snother cause of tronble is found in defective damp culurses, which allow the wet to rise upwards by suction in the bricks or by convection. In addition there are purely local oauses, such as a burat waterpipe or an unexpected flood in the district. Treatment must be determined by circumstancea First ascertain that there is a damp coursc by examination of the lower courses of brickwork. If there is, nnd the defective spot can be located. it can he remedied by removing the brick course above and helow the damp course, and resetting a new onc.

All sudditional precaution in houses situnted in a damp locality is to provide adequate
surface draingge. This ensures that the land in the vicinity is relieved of all surplus water, and any chance of sodden or waterlogged ground eliminated. See Cottage: Gutter: House: Roof, etc.

DAMP COURSE. This is a layer of impermeable inaterial built into all walls to prevent the damp from rising out of the earth. Suitable materials for use comprise slates, sheet leid, asphalt, or bitumen.

In all probability slates are cheapest and best in the long run. They are purchased in convenient sizes and known is D.C. slates, generally monsuring
18 in. Iong and 9 in. wide for the ordin ary 9 in. wall. They are lais intwocourses, breaking joint and well and we 1 l
Damp proor Course
soils, but best in ground containing lime. After the trees have been shortened oncc, or perhaps twice, in their carly daya, they require practically no pruning. Propagation is generally by budding and grafting on to plum stocks. The best varieties arc the Merryweather, Bradley's King, Shropshire Prune. and Farleigh Prolific.

How to Cook. The small purple fruit im. proves with cooking. but requires plenty of sugar to be cooked with it. Sugar added after the damanns are cooked will not remove
the acidity To atew damsons, pick over and the acidity To stew damsons, pick over and
rinsc l lb, and simmer them in a stewpan with 3 heaped tablespoonfuls sugar and a breakfastcupful of water. If the damsons are first slit

bedded in cement mortar. Asphalt and with a knife they will cook more quickly. bitumen damp coursing is generally used in the form of long slieets, the end of one sheet overlapping that of the next. It should be laid on $a$ bed of cement mortar flouted off smooth, and eare taken that the inaterial is not punctured or tom while being laid. It is advisable to use only the best quality. Trarred roofing felt, which is sometimes employed as a damp coursing, is an inadequate protection for the walls of a building.

Horizontal damp courses of all kinds must be laid on walls, piers, chimmey breasts, sleeper and fender walls; they must cover the full width and be laid beneatly the lowest timbera, and at a height not excceding 12 in . nor less than 6 in. above the ground. Fig. 1 shows a simple horizontal damp) course. When the lloor level is below the ground level, three damp courses aro needed-first a damp course 6 in . above the ground level; secondly. one below the wood sleeper plates of the lowest floor, and the third is a vertical dump course connecting the others, thus preventing any possible passage of dampness (Fig. 2).

Damp courses may also be necessary in or near the top of walls to prevent rain water working downwards, as for cxainple is garden wall that abuts on the housc. Slate damp courses are laid in chimney stacks at the point where they rise above the roof, for the amme reason See Air Bricli; Architecture ; Brick; Bungalow: House; Wall, etc.

## Damper. See Range; Stove.

DAMPING-OFF. In gardening this term is commonly applied to the premature decary of seedlings, cuttings and tender plants it is caused by a fungus disease which in the main is the result of overcrowding and careless watering. Seedlings should be watered by immersing the flower pot almost to the rin for a few minutes in a veasel of water.

DAMSON : Tree and Fruit. Being very hardy, the damson thrives in bleak places, and does not suffer from strong winds to the same extent as most other cultivated fruits. It is consequently often planted on the outsides of plantations, generally as a standard.
The treatment advised for plums quite suits the damson. It succeeds in most fertile

Any stones rising to the top should be removed. The Havour will be improved if apples are mixed with them, $\frac{1}{2} \mathrm{lb}$. apples to 1 Ib. damsons.

Damsons are excellent when prepared in this manner for llans, tartlets and pics. A damson pudding is made in a similar way to other fruit puddings. Line the basin with a auet crust, and fill it with sound damsons, or damsons and apples, and sugar. Two pounds of fruit will need five tableapoonfuls of sugar and $\Omega$ teaoupful of water. Cover the basin with $\Omega$ mund of the crust, tie over it a scalded, floured pudding-cloth, and steam it for 3-3! hours.

Damson Preserves. Damsons make good preserves. The following is a recipe for making damsun jam without stones: Take 8 lb . ripe damsons, and boil them in a stewpan with a very little water until tender. Sirain them through a coarse sieve to remove the stones, and add to the pulp) 6 lb . prescrving sugar. Let the whole boil until a little of the jam will set whel dropped on a plate, then pour it into dry, warmed jars and cover at once.

The fol.


Damson. Fruit of the Farleigh Prollac. one of the best varieties
any stones that scparate from the fruit. Then add 8 lb . of sugar and continue the proceso until the jam is done.

A very rtiff jelly made with damsons is known as Damson Cheese, and caten as a preserve. To make it, pick over some sound, ripe damsons, and put them in a covered jar in a anucepan of cold water. Bring the watel to the boil, and let it boil for 2-3 hours, replenishing it with more hot water as it boils awny. When the damsons are tender. remove them from the juice and strain them through a conrse sieve to get rid of stones and skins.

Weigh the pulp, and add sugar in the proportion of $\frac{1}{2} \mathrm{lb}$. or more to every lb . of pulp. Put this, with the juice, into an enamelled pan, and let it boil fast, stirring frequently, until it becomes a stiff paste, so stiff that it will leave the pan clean when it sticks to the spoon. Have ready some shallow, buttered inoulds-odd saucers will do-and pour the cheese quickly into them. If covered with jam puper when cold it will kee! well

DANCE : How to Give. One of the most popular entertainments that a hostess can give is it dance. If a very big dance or ball is given. a large number of invitations are sent out, an elabnrate supper is offered, the floral decorations are on a grand scale, and bands provide the music for dancing.
Such a dance can only be given in a house with very large rooms, and it is generally necessary to hire a hall or assembly roonis Many hotels have a suite of moms kept for the purpose, and when a dance is given the hostess can lessen her responsibilitics by leaving the lighting, decoration and arrangeinent of the ronms to be done by the hotel.
In the hostess' own house the refreshment arrangements can be entrusted to a firm of caterers, who make a fixed charge per head and take the whole responsibility of seeing that the food, service, and general details are suitable and adequate. There are many hostesses who feel that, provided their house is lange enough. nothing is really more enjoyable than a privato dance given in a private house, and they do not mind the trouble it entails.

The largest room is sot apart for dancin: It should be complotely emptied, and where there is parquet flooring covered with rugs it is an cayy matter to roll up and put aside the latter and polish the floor until it provides a good surface for dancing. The lighting arrangements must be adequate, for the gaicty of a dance does to some extent depend on the bril. linncy of the scene. At a New Year dance a feature in the programme may be $n$ - Twilight' dance, during which lights are switched off, with the erception of coloured electric hulbe in the overgreen decorations

Besides the ruom set apart for dancing, anitable provision must be made for sitting out and for cloak-room accommodation. If people who do not dance am also asked, it is a good plan to arrange for bridge to be played in another room. There may be a band, or several musicinns; though a good gramophone is often successfully used for a small dance in a private house.

The invitations are sent out two or threc weeks beforehand, and, if the dance is very small, may take the forin of a little note. For larger dances, printed at-home cards are used, with the time the guesta are expected and the word dancing written at the bottom right-hand corner of the card. It is usual for girls only to be invited with a partner. This arrangement saves the hostess much trouble.

A Cinderella dance ends at 12 o'clock, begins at 9 , and supper would be served at 10.30 . Other dances may be carried on to the small hours of the morning. A cotillon may be introduced, but this calls on the hostess for presents or the distribution of favours. Just tefore the guesta depart it is usual to offer each a cup of hot. moup or coffce.

## Dancing : Its Fundamental Principles <br> Some Modern Ideas on-an Ancient Art

In addition to this general article, our Encyclopedia has entrics on the various dances, e.g. Fox Trot: Quick Step; Waltz. See also the preceding article on Dance

Correct hallroom dancing is one of the most and ahort-lived crazes that come and go during heneficial of pastimes, it uses the muscles in a the dancing season.
natural manter and is conducive to preserving a good figure. But the form of dancing must be correct, balance and ease of movement being essential

Formerly far fewer muscles were used, and dancing was done almost always on the ball of the foot. This last was a most injurious practice, not only because of the unnatural strain on the leg muscles, but on the big toe joint as well, causing in many cases the mal formation of the joint. Now the heel comes into play and the ankle is used naturally as in walking: in fact all motern ballroom dancing is hased on natural novement. A good teacher endeavours to make a pupil dance as naturally and comfortably as he or she walks; and to a ceitain degree adapts thic stepa, or rather the size and manner of the steps, to the hahitual walk of the pupil, providing, of course, that it is a good walk. Therefore anything in dancing that scems uncomfortable and awkward for the peraon to nerform must he wrong, whether the fault is on the side of the girl following or the man leading

Before taking up dancing it is an excellent plan for anyone to make sure that his walk is correct. The back should be straight and the stride coming from the hips; feet should be neither turned out nor in, and should be close together when one foot passes the other as close as if walking on a plank

Basic Movements. Dancing, like any other sport or pastime, has its rules, etiquette and technique, and if the basic movements are learned correctly in the beginning more complicated movenients are easily performel later. The person who has thomughly mastered the groundwork can learn a series of new steps in a quarter the time it takes a person who has never learnt the basic movements, but dances "naturally." This applies to any dance. whether it is one of the established dances such as thic waltz. and slow fox trot, or the new

The movement is always from the hips, the legs swinging like a pendulum. The girl and man should both stand erect and naturally. the girl resting her left hand along her part ner's right arm near the shoulder, the man holding her firmly, but without strain or effort. just under her left shoulder blade, his left arm held so that his hand is on a level with his ear. One of the chief faults seen in the man's hold is that he clamps his arms from shoulder to elbow to his body, instead of holding them easily in a nice straight line from the shoulder.

The Correct Hold in Dancins
The fact that one of the partners is very lall or short should make no dilference to the form of the hold. A rall man should guard against clamping a short girl or straining at a tall one He neted only alter the position of his arm from the elbow to the wrist, just raising or lower ing it a little, as the individual may need. The position of the upper part of the arm should remain the same. The actual formation made by the hands, whether the girl's or man's, is immaterial, or rather it relies, like many other things, on the individual sense of gomil taste, heing neither clumsy nor affected. The man's hand should rest on the girl's hack in a light natural position, and the girl's hand should he the same, not spreading the lingers nor yet "curling" them.
The hips of both part ners are always slightly forvard in clancing, as they respectively lead and follow from the hips, not by meane of the man squeezing and clutching with both arms and the girl hanging on with hoth hands. If this hip movement is tried it irill be seen at once that the girl must know what step is coming next, without any extra pressure of the hand on her back. The only time when this may be needed is when the man decides to do an outside step. then the icry slightest pressure with two lingers is enough to indicate this change. Thi girl must not. under any
circumstances, anticipate, but must remain supple and ready to follow. To enable her to do this ensily, the man must lead definitely and from the hips.

Poise and Balance. Balance is obtained principally by correct distribution of weight, and this is a simple walk backwards which the beginner can practise. Done correctly it will ensure accurato balance, which is more than half the secret of graceful deportment.


First Position
Second Pasition
 corresponding arm movements noted. First position beels lozether. arms outstretched at sides. Second arm extended upward Third sosition correspondink arch of other por and arm acrosa dy beel against level Fourth position : one font estended in front of other in open or crossed position. correspondina arm extended upward, other arm crosaing bods in downmard direction. Fifth position: heel to in both arms extended upward
whether in walking or dancing. Take $\Omega$ long step from the hip, the ball of the back foot meeting the floor; kcep the pressure of the iront foot on the heel whilst travelling backwards, and never let the back he el drop until the fiont foot passes it. The knees must


Dancing : the correct hold. 1. The woman's hand is placed just below the shoulder, the fingers resting naturally 2. Correct position for the man's band. 3. Hold for the tango, the partners being closer torether, the man's left band more curved and the elbow lower and closer to the side

Courlesy of Vcrllu Dancing Stullo never be stiff in dancing, but never really bent. They must be atraight and relnxel altern. ately, the travelling lcg being straight and the knee of the supporting log relaxed. Here, agair, one must remember that dancing is natural movement. and this straightening and relaxing of the knee alternately is exactly what should occur whether a person is walling in the street or running on a tennis court.

The dircction for all dances is anti-clock wise. For the comfort of others on the lloor it is corroct to travel around on the outside of the floor, and everything in dancing has been composed with the view of making all movements progressive. It is when two pcople either try to invent now steps, or the man's dancing consists of a few steps forwarils, $n$ turn, and a few steps backwards. that "crushes" occur and second lines are mado in the ballroom. Generally speaking the line of dance is oblique, the steps and combinations of steps forming a zig-zag pattern around the room; in the case of the tango these lines are curved.

Style and Rhythm. With regard to etiquette, grey, and from rod brown to pale fawn If the apart from the position of the hands, which has upper parts arc black or grey (pepper), the lega already been dealt with, good manners and the should be brown or fawn: if brown is the upper comfort of others should be the guiding rule. colour (mustard), the head should be creamy It is not etiquette to make up fancy steps if white, and the legs a shado darker than the they interfere with the progress of the others. Nor should any deviation from the occupation of correct ballroom dancing occur, for it usually means bumping into another couple. which is as bad $n$ brench of good manners as if it happened in tho street
In modern ball. room dancing the feet are always parallel, unless performing a twist, e.g. the Charleston. In this case the fcet are in a straight line with the toes, and neither foot is turned out. The rule for placing the feot in $n$ forward movement is heel first, except when two quick steps follow each other. This is contrary to the old form of dancing, which was always "point toc," and is just the same as a natural walk, which is always "heel first." The only difference between the natural walk and the modern ballmon dancing step is that the latter glides along more.
There are two ways of turning, right hand, or natural, and loft hand, or reverse. Contrary hody movement is turning the body from the hips so that the opposite hip and shoulder move forward, or back, if stepping back with the moving feet. This movement applies chiefly to slow steps, and curves are governod by that. When a foot has to move from an open-that is, feet apart-position to another ojen position it must pass close to the stationary foot on the way. This is known as brushing.
There are threo popular times for danco music, $4 / 4$, which embraces the slow foxtrot, quickstep, blues, mid-way rhythm: 3/4, which is waltz time ; and $2 / 4$ for the tango.
DANDELION. In a cultivated state the dandelion makes an excellent salad, and the improved varietics, such as large-leaved French, are grown in many large gardens. They are raised from seed sown in spring and thinned to $n$ foot apart.
In late autumn the roots may be lifted, placed in boxes of soil and forced into growth in a dark, warm place. Or the fresh spring grawth can be blanched by covering the planta with pots.
The dandelion as a weed on the lawn must be dug or spudded out, and a little salt or weedkiller dropped into the hole. One way of deatroying is to dip an iron skewer into sulphuric acid and force it into the heart of the plant. In medicine the dandelion, or taraxacunt, is sometimes used as a simple bitter and stomachic. It is also laxative. The common preparations are : extract of fresh dandelion root, dose 5 to 15 grains; liquid extract of dandelion root, dose $\frac{1}{2}$ to 2 drams: juice of dandelion root, 1 to 2 drams

DANDIE DINMONT. The affectionate and intelligent little terrier known by this name is often confused with the Aberdeen and the Skye terriers.

The head is large, the muzzle strong and the nose black. The broad-based, tapering cars hang closely to the cheelis. The legs are short, and the rather short, feathered tail with a slight curve is carried little higher than the line of the back. The hard, but not wiry, coat is about 2 in . long, and has a mixture of softer hair. On the head the hair is silliy. The colours of the terrier range from bluish black to silver

The voltage of a Daniell's cell is just over one volt. They are particularly suitable for lieavy ystals.

The porous pot is filled with a dilute solution of sulphuric acid, and the space between the glass jar and the porous pot is filled with a saturated solution of copper sulphatc. The copper sulphate solution is kept saturated by adding a number of crystals of copper sulphate; these must he added to from time to time, as thoy dissolvo when the cell is in operation. A shelf is sometimes lixed to the copper cylinder to receive the supply of copper sulphate

Although thero are systems of developing photographic films or plates in full daylight, a liark room is a necessity for photographic work.
It is quite practicable to do alnost any kind of photographic work in an ordinary room which is temporarily darkenerl. Soveral patterns of darkroom cabinet arc sold. They provide a convenient and not unsightly storage place for dishes, bottles, etc., whilst the door of the cabinet, in some models, forins a bench or table. A hathroom is most convenient for usc in this occasional way.

In fitting up an ordinary mom for photographic use any window has to be blocked up. It is best to do this so that the full light from the window can be quickly obtained if required, for there are many operations that are preferably done by daylight, and also it is then much casier to keep the room in its necessary state of cleanliness. Most windows can be fitted

and continuous work, and are em ployed for closed circuit burgiar alarm systems. When a Daniell's cell has been charged with clectrolvte the two terminals should be connected by a picco of thick copper wire so as to short circuit the cell, leaving it thus fortwelve hours or more. See Burglar Alarm

DAPHNE. ()f the hardy daphnes the favourite is the mezereon (Daphne mezcreum ). a slow-growing shrub 3 ft . or more high, which bears reddish-purplo fragrant llowers in Feb-Mar. It is suitable for the rock garden or the front of the shrubbery border. It likes soil containing lime. Daphne encorum (alpine garland flower) with fragrant, rose-coloured


Daphne mezeraum, a Daruy apectes ot tue fowering shrub which will thrive in the open
blooms, and blagayana, cream-coloured llowers. flourish in the rock garden in peaty soil; the branches of the latter should be pegged down. Daphne laurcola, spurge laurel, is an evergreen which will thrive in the shade. The height is from 3 to 4 ft . It is commonly raised from seed, and has glossy leavea and yellowish-gi cen flower in winter. Daphone indica is a favourite winter greenhouse plant with fragrant flowers.

## The Dark Room and Its Fittings

## How to Adapt or Construct a Room for Photographic Work

The processescarried out in the Dark Room are described under Developing; Enlarging; Printing, etc.
with a wooden frame covered with two thicliuesses of stout brown paper or black blind material. A few wooden wedges will prove sufficient to keep it in place.
An effective and cassly titted dark room blind can be contrived with an Acme or similar type spring roller fixed on brackicts well above the window frame (Fig. 1). Down each side of the window hinged shuttera are fitted to cxclude light at the sides whon the blind is drawn (Fig. 2). Dimensions will vary with the size of the window, but the blind should be arranged to overlap the inner shutter (Fig. 1, a) at least lit in. The blind should be made of thoroughly opaque material. such as unglazed American cloth fastened to the roller with glue. This doss not prevent the use of ordinary curtaing and blinds.
Ventilation must not be neglected. If the room has a fireplace, this will be sufficient; but
if there is none, an inlet and outlet of nir must be con trived somewhore, if only in the tup and bottom of the door Right-anglotubcpieces, like stove pipes but rather smaller, can be bought for dark room ventilation and can be fitted to the covered frame which is used to close a window.

Much lahour is saved if a water-tapsink and waste pipe can be provided: but thesc are not absolute necessitics. If water cannot be laid on, an excellent substituto is $n$ tank holding a few gallons. fixed on a stout shelf a foot or two above a sink. Such a tank, of zinc fitted with a tap, is a stock article. The sink should be shallow (about 3 or 4 in.) and of fair size, about 3 ft . by 2 ft . It is either of earthenware or of lead in a wooden casing. If a pije for carrying off the waste water cannot be arranged, a large bucket server the purpose. n rubber hose being fitted to the sink outlet. If constant How and escape of water are not available, washing of negatives or prints can be easily and readily donc in the domestio bathroons.

It is convenient to support the sink on a pair of cupboards: those sold as ordinary meat mafea answer well and serve for the keeping of dishes, tanks, etc. The sink itself should be covered with $\Omega$ rack of stout wooden slats, which forms the work bench and allows all

drippings of solutions to pass througlt and drain away. Some narrow shelving, not more than 3 in . wide, for the bottles of solutions completes the fitting of the work bench. It should be placed so that it stands on a firm support, any nails scrving to hold it upright on the wall Lighting is nost imporlant and it is economy in the long run to pay fur the best. The smail oil or candle ruby lamps sold for a shilling or two are useless 'The essential is to bave olenty of light, and that of a kind whioh is sale for the particular kind of sonsitive material. The lamp should be fairly large: the size of the safelight. which is the coloured screen of the lamp, should be about 10 by 8 in .


The most convenient form of dark room lamp is electric with a two-way switeh, by which a bulb outside the lampe can be instantly brought into operation whencrer white light is required. For bench use the lamp should be of the pattorn in which the front is vertical or slopes slightly forward. A hanging lamp in which the safelight is horizontal gives a flond of light straight down on to the work bench. This form is by far the best for the derelopment of prints. the progress of which is judged hy looking on them, not though them, as with negatives.

If gas has to be used, it is necessary to buy a Jarge lamp on account of the heat which is developed, and if the dark room is very small it is ailvisable to place the gas burner itself outside, fixing the safelight ats $\Omega$ window. The same considerations apply to an oi! lamp.

When the bathroom is used as a dark room it will be found very tiring to lean over the bath or kneel down in front of it for lengthy periods This can be avoided by arranging is hinged table over the bath at the height of a person sitting (Fig. 3). The inethods of construction aro shown clearly in the diagrams. Sizes will rary accoading to the width of the bath and the height of the table.
Malie the table of slats of wood about $\frac{1}{2} \mathrm{in}$. apart, so that spilt liquid may fall straight into the bath. If a trickle of water from the bath tap is allowed to mon thero will be no risk of staining the bath enamel with developer. Hypo has no offect on enainel. If possible, dishes sbould be kept in the bathroom, and a plate rack or slatted shelving put up to provide easy drainage and to keep them free from dust. Dust is the photographer's principal cnemy.

A Portable Dark Room. A sinall dark room, as is shown in lig. 4, made in sections so that it can be moved from place to place, is extremely useful to the amateur photographer. The door is arranged to fit into ono section, and virtually forms one wall of the building. The other sections are covered on the outside with weatherboard, and lined on the inside with 3 -ply wood.
The floor rests upon 3 in . by 2 in . floor joists, to which it is securely mailed with 2 in. oral brads. The roof is formed of $\frac{3}{4} \mathrm{in}$. matchboards, nailed to 2 in . by 2 in . rafters, and bolted to the frame of the building. It should he covered on the ontside with good waterproofed material. The window is formed opposite the door, and should be glazed with olear glass. Separate frames are made to fit over the window frame; thesc are covered with fabrio or glass of any desired cofour, and may be rebated and fitted with a panel of safelight coloured glass. These frames are held in place by turnbuttons, securely sacewed to the window framing and arranged to bear on wedge-shaped slips of hardwood fixed to the removable fraines, as shown in Fig. 5. The edges of the frame may be corered with felt, so that when the turn-buttons are twisted they bear on the wedge-shaped slips and thus close the frame
up tightly. Detnils of construction are shown in Figs 6-10 The joints are simple, being merely halved together. The door (Figs 7 and 0) is made double by first constructing an ordinary ledged and braced door, and covering the inside with ardinary 3 -ply board, having previously glued and nailed make-up pieces to the inside of the door in the inanner indicated in the drawings. A good stopping of 1 in. square stuff is requisite, and it should be faced with felt to exclude all light.

Th allow for ventilation, an air inlet is provided (Fig. 10), and slotted and so fixed that air can enter but light cannot pass.

DARK SLIDE. The old-fashioned wooden double dark alide opening like a book is now Largely displaced by the single metal sheath holding one plate. These metal slides should not be allowed to become rusty, and should always be carefully dusted out before inserting fresh plates Attention should be paid to the etrip of velvet on the top of the plate-holder which traps the light when the slide is with. drawn during exposure in the camera. If the velvet is worn or flattened, light will leak past and fog the plate; if the velvet is brushed up after unloading a slide, it will not only be kept free from dust, but will be less liable to allow light to enter.

To blacken slides when worn, wash in strong sodn water; which removes rust and grease. followed by immersion in a weak sulphuric acid solution in the proportion of 1 dram of strong sulphuric acid to I pint of water. They are then blackened by boiling in the following solution
Hyposulphite of sodn
Copper sulphate

## Water

## See Camera: Photography.

DARNING. Too heavy a mending yarn pullsand strains the material to be darned, and soon leads to further holes ; too fine $\boldsymbol{\Omega}$ one only fills the rents with twico as much labour as is necessary, and does not last long. The idea is to counterfeit the weaving of the material, first one way and then the other, till the hole is filled with closely interlaced thseads going over and under each other at tight angles.

Start on sound material well outside the edges of the hole, running the needle (threaded double for all but small repairs) in and out of the stuff in a straight line. Return as close as possible to the first line, going under the stuff where that went over, and vice versa. At the end of each line do not pull the thread tight, but leave a tiny loop, Fig. 1; this allows for the slarinking of the new thered in the wash. Continue darning up and down till well sutside tho hole on the far side and on sound atuff again. Then darn closely across at right angles, alternately under and over the original lines of atitches, Fig. 2, until the hole is completely filled. Thin places should never
be niluwed to run intu hoics. If they are darned one way only they will last for a long time

When mending a ladder stop the dropped stitch from running with a temporary stitch. An ordinary crochet hook will assist the repair. as shown ill
Fig 3 Noto that the hook drawseach line of thread through the stitch scparatcly and restores the actual pat. tern. Darning balls or eggs, over which the hole can be ytretched


Darning. Fig. 3. Mending a ladder with an ordinary crochet hook g moothly while in coursc of repair, make the work easier and less cramiping to the hand. Anything of a delicate nature should he repaired before being laundered, or the cleaning pro. cesses may make the damage much worsc.

On woollen gar.
 ments of a uniform colour a piece of canvas large enough to overlap the edges of the hole should the cut out and tacked in place on the wrong side of the material, so that the lines of the canvas run exactly parallel with those of the wear. ing. This may be coarse or fine, according to the texture of the material. The raw edges of the tear are cut away to form square, and


Fig. 4. Straipht darning stitch used in embroidery
the wool is darncel across, backwards and for wards, stitches being caught into the material, on either side. as in Figs. I and 2.


Darning. Figa. 1 and 2. Method of darning a bole, illustrated on open-mesh canvas to show gtitches

Darning Stitch. The straight darning stitcl for simple embroidery is shown in Fig. 4. The rule for straight darning is to take up half as much material as that passed over, the latter forming the length of stiteh. In fancy darning the stitchea are spaced to suit the design, as shown in Fig. 5, where the material taken up and missed is of equal length. This ligurc also shows how darning stitch can be adapted to fancy designs, with the aid of a few satin stitches for the solid part. Sec Mending; Stocking: Wool.

DART: In Dressmaking. A dart is a wedge-shaped piece of material taken up on the inner side of a garment, to remove any unneccssary fullness. It must be carefully made by taking up just the amount of material that is not required and gradıally sloping it off to the point where the dart is to finish.

DATE : The Fruit. The dessert varietics of this fruit are generally bought in boxes weighing between $\frac{1}{2} \mathrm{lb}$. and 1 lb . These dates should be a shiny, golden brown in colour, large and soft. Cooking dates are usually bought by the pound. Before using thein, the dates should be separated and washed in


Date. Dish of appetising sweets made from this fruit
tepil water. They will improve if soaked in cold water overnight.

To stew dates, split open 1 lb . of them, and remove the stoncs. Put them in a saucepan, cover with cold water, and simmer them until they ate soft. They need no sugar

Attractive swects can easily be made if some good dessert dates are split open, the stones removed, and a roll of almond paste, coloured with cochineal, etc., inserted instead. The stuffed dates should be warmed in an oven for 15 min . in order to set the paste, then allowed to cool, and put into paper cases.

A blancmange can be flavoured with chopped dutes, and this fruit also makes a good compóte. Stone 1 fl lb . dates, and put them into a clean jar containing the strained juice of a large lemon, 6 oz. sugar, and It gills Malaga. Havo ready a pan of boiling water, place the covered jar in this, and then conk its contents as slowly as possible over a very low firc, or at the side of the gas-stove. Leave it thus for an hour or more, and let it get cold before serving.
DATE PLUM. These are small yellow plunis, extremely astringent before ripe, but awect and of good flavour when ripe. In America the date plum is known as persimmon. It is used in the same way as other plums, and can be eaten raw or cooked. For jam-making, I lb. of sugar should be allowed to each lb. of fruit. See Jinn ; Plum
DATE PUDDING. Peel and chop up fincly a good-sized apple, and mix it with ? lb . of washed, stoned, and roughly-chopped dates. Make a suct crust, using about 5 oz . Hour, and roll it out fairly thin. Line a greased pudding basin with the pastry, then fill it up with alternate layers of date and crust, pastry being on the top. This pudding, which will need sten ming for 2 hours or more, should be turned out and served hot with boiled custard.
Another dato pudding is made by chopping $\$$ Ib. dates very small, and mixing them well
with 3 oz . sugar, 6 oz breadcrumbs, 4 oz flour, a little baking-powder and $n$ gond pinch of salt. Now beat up together 4 oz . of dripping or laird, I gill milk, I tablespoonful treacle, and 1 egg. Nix the wet with the dry ingrediento. and put the whole intoa greased pudding basin, so that it fills only ${ }_{3}^{\frac{2}{3}}$ of it. Twist sonic greased paper over it and steam for a good 3 hours

DATURA : The Thorn Apple. Thedatura is a half hardy annual and shrub belonging to the potato family Of the shrubs the favourites


Datura. Sweat scented Howers, leaves and prickly seed pods of the Thorn Apple
are Datura (brugmansin) suarcolens, with white, and sanguinca with red, Howers in late summer; they may be grown in tubs or large pots and placed out of doors for the summer, but nust be brought under glass in autumn. The annual daturas are raised from seeds sown in alight heat in February-March and planted out of doors in May. A few of the best are cornucopia, double floteers, purplish whito: Metel, white scented blooms; and ceratocaula. white fragrant flowers. These bloom in summer and grow 2 to 3 feet high. The common thorn apple (stramonium) has white Howers which arc followed by spiny fruits.

DAVENPORT TABLE. This type of writing table, or escritoire, is chielly associated with Victorian furniture, and consista of a deek placed upon a pedestal, below which are a set of drawers. These do not open at the front, but at the side. The desk is the same width as the pedestal, but is made to slide forward, so that a person can sit and write at it in comfort. It has a hinged lid, below which is a receptacle for papers, ctc., and in which small drawers are sometimes fitted.

In some of the pieces there is also a sliding shelf that draws out at the side and is used to hold paper, etc. These desks are usually covered with leather and have a low rail round the top to prevent the pens from falling off. See Bureau; Writing 'Table.

DAVENPORT WARE. This Staffordshire ware, including porcelain, stone china and carthenware, was produced by a family of that name at Longport for about a centiry after 1793, and usually hears the potter's surname,


Davenport Ware. Porcelain plate and sugar bowl, with delicate foral design, c. 1815. The mark, an anchor and the word Davenport, is printed in red B!! permussion of the Director. British Museum
either with an anchor or sometimes with the place-name.

The porcelain is a line bone-paste, sometimes white, cream-coloured and blue-printed Collectors usually look out for the tea and dessert services with deep blue, rose du Barry or npplegreen grounds. and attractive panels of scenic and floral subjects. There are also choicelypainted vases, and all have massive gilding on the rims, handles and feet Except for the mark, such ware is not easily distinguished from Derby or Coalport china of the same period
The willow pattern with only 25 apples on the tree is readily recognized, as the corres fonding Werlgwood, Sporle and Adams patterns have not less than 32 apples. Davenport ware has a tendency to become covered with minute surface cracks, and some of the cups appear as if tea-stained, $n$ defect which cannot be removed. See China; Staffordshire Ware.

DAY LILY (Hemerocallis). This lily is a beautiful hardy flowering plant, 2 to 3 feet high: in Junc and July it bears lily-like llowers in shades of ycllow and orange. It thrives in ordinary soil in a sunny or slightly slisdy border, and is increased by division in early nutumn. Some of the best sorts are aurantiaca, a pricot, flava, fulva and Queen of May. Although the individual blooms Inst. only for a day, the plant continues to Hower throughout severnl weeks. See Lily

DAY BED. Thesc sofas or couches were fairly common in the latter part of the 17 th and the 18 th centurics. They are reprodnced to-day for rooms furnished in period styles, but the modern day bed is in two pieces-a head piece, which is a comfortable armehair, and a foot rest-in the form of a separnte stool of the same height ns the chair
summer time begins at 2 occlock in the morning of the day after the third Saturday in April, unless that day is Easter Dry If it is, summer time begins on the day after the second Saturday in April It ends at 2 o'clock on the morning of the day after the first Saturday in October. This means that the clock is put forwand one hour on the appointed day in April and put back one hour on the appointed day in October.

The law applies to Great Britain, Northern Ireland, the Channel Islands and the Isle of Jan, hut not to the Irish Free State France and Belgium have adopted the same period of summer time.

DEAD FINGERS AND TOES. The blanching and coldness of the fingers or toes, due to disturbance of the nervous control of blood vessels, is often popularly referred to as dead fingers or tocs. The condition is an example of what is described as Raynaud's phenomenn. See Circulation of the Blood: Rrynaud's Disease.

DEADLY NIGHTSHADE. The common name for the belladonna plant is the deadly nightahade. Medicinal preparations are obtained from the leaves and the root, but the active principle, atropine, is found also in the lecries, and poisoning has resulted from eating these: they arc about the size of a small cherry, violet-black in colour, and have a swectish taste. If the patient is able to swallow while waiting for the doctor, vomiting should be induced at once by tickling the back of the throat or by an emetic. He should be given draughts of strong hot tea, and kept warm in hed with hot water bottles. See Atropine: Belladomma.

DEAD NETTLE (Lamium mactilatum). This common wild plant has purplish llowers and green and white leaves. The ycllowleaved variety aureum and puralbum, which has pinkish llowers, are sometimes giown in gardens

DEAFNESS. Injury or disease of any of the three portions into which the hearing apparatus is divided may cause deafness, or it may result from a foreign body blocking up the outer passage of the ear and in this way preventing sound waves from reaching the drum.
seat, upholstered in the same material There is usually an 18th century uuggestion in cabriole legs, curves of the chair back and upholatering fabric.

DAYLIGHT SAVING. This term is used for the system, known also as summer time, of putting formard the clock by one hour at the beginning of summer and putting it back an hour at its end. The nominal time remains the same. thus avoiding all changes in time-tables and the like.

Daylight saving was introduced into Great Britain in 1916, but it was not made permsnent until later. For some yeurs the opening and closing dates of summer timo varied. hut in 1922 uniformity was introduced. As the law now stands

Children frequently cause the latier variety of deafness by poking huttons or hard jreas, etc., into their cars. No attempt should be made to remove the foreign body by means of a hatpin. The child should be talien to the doctor, and if the foreign body is a pra or bean, no one must attempt to syringe it out. In the case of a live insect, however, is little warm oil may be put in the car.

Frequently the obstruction of the passage is due to an accumulation of ear wax. A little "arm almond or olive oil in the call overnight, and gentle syringing with a ten per cent. solution of botacic acid and warm water the next morning, may be the only trentment needed. Care should be takien not to push the point of the syringe into the ear passage. The strean should be pointed not dipectly against the drum but against the back wall of the passage, while the ear is drawn upwards and bacliwards.

If the wax does not come away eusily, never altemp! to remove it with a halpin, or otherwise, nor b!! forcible syringing. See the doctor aboul ì.
The deafness of a cold and the frequent attacks of deafness in children who suffer from
adenoids is accounted for by catarrhal swelling of the Eustachian tube which connects throat and ear. But in this latter case and alao in any condition of catarrh of the nose and throat, either acute or chronic, inflammation mav extend up the Eustachian tuhe actually into the ear itself.

Suppuration may take place and may lead to the perforation of the drum and disease and destruction of the hones connecting this with the inner ear. Here again there is deafness but much more serious than the denfness is the suppurative process going on in such close proximity to the hrain. Sometimes there is acute inflammation without suppuration, and frequently the effects of this do not clear up properly, and some degree of deafness results. The risk of this happening will be lessened by seeing the doctor at once.

In other cases is found ant increasing deaf ness due to chronic eatarrh of the middle car, in children and young persons, accompanied by an exudation, but in older people taking the form of "dry catarrh." These cases are practically always associnted with catarrh in the nose and thmat, and it is clearly of the greatest importance that adenoids and other conditions which provoke this catarrh should be early and efficiently dealt with.

Diphtheria, searlet fever, and other infectious disorders are often complicated by middle ear disease. In long-standing chronic inflammation of the middle ear, with persistent discharge, the hearing usually becomes gravely affected. In all cases of acute or chronic eatarrh or inllammation the utmost pails must be taken, under the doctor's directions. to clean up the ear.

Where there is internal car deafness, the actual nervous structures, us distinguished from the merely conducting structures of the ear, are at fault. This nerve deafness may also be due to the action of drugs, e.g. quinine, salicion, etc., and particularly in those whose cars were otherwise affected See liar

Care of the Deaf and Dumb. Where a child is born deaf, mutism, or inability to acquirc speech by ordinary methods, necessarily follows, though the vocal organs may be quite normal. This is due to the fact that all children learn to speali by imitation; the deaf child, hearing no spoken language, acquire none, and instead develops a series of natural gestures This hed in the past to silent methods of finger spelling and signing: hut the methods now employed have in view to teach the deaf to understand what is said to them by means of speech reading, or, as it is commonly called, lip-reading.

A simple and effective method of testing the hearing is the following. Place the child with its hack towards you, and step, backwards two steps, roughly about 6 ft ., then whisper some simple command or question. If the child does not respond, it is deaf or partially deaf, and the casc should be reported to the local education authority, whose duty it is to sec that the child is placed in a suitable school. either for the deaf or the hard-of-hearing The denf child is entitled to free education though if this entails removal to a residential sehool the parents may be required to contribute.

The child should be trented as nearly as possible as a normal hoy or girl. Bad habite, a shulthing gait, mouth noises, ugly grimacing and gesturing, should be checked. He should be spioken to a little more slowly than other chiliden, and his attention should be directed towards the lips. Every member of the family should try to kecp up his interest in persons, places, and things, just as though he could hear. During the last years at school there will have heen some definite trade bent in the manual instruction received, and the boys readily find occupation in carpentry, cahinet making, bakery, bootmaking, etc., while the girls
secure openings at laundry-worli, dressmaking, millinery, fancywork, etc. Usually an Aftercare Association will assist in placing the dea child, and will further continue to visit and report on its progress during the first ycars of cmployment. There is also usually an agency or mission which provides special services for

beating and breathing ceases Rigor mortis, or stiffening of the body, may come on quickly. but on the average it appears in about six hours, and lasts for ahout 24 liours.

In view of the fact that a state of trance closely resembles death, and to avoid any possibility of the person being huried alive, certain signs that life is extinet should always le looked for. A mirror held before the mouth and nose may hecome dimmed, perhaps very slightly, hut sufficient to show that breathing is taking place By using a stethoscope the doctor mav be able to hear very faint heats of the heart, or hy tying a ligature tightly round a finger he may find that the end of the finger becomes red, while on the removal of the ligature a white mark is left - thus slowing the presence of some circulation of blood
The Legal Side. Every death must be notitied to the local registrar of births and deaths within five days of the event, under a penalty not exceeding-iflo. The person to give the information to the registrar is tirst of all the nearest relative present at the death or in attendance during the last illness. If no such relatives, then any relative of the decensed living in the same registrar's subdistrict. If none, then the oceupier of the house where the death took place; and if he docs not, then every innate of the liouse is bound to sec 10 it.

One of the next things to tre done is to find out whether the deceased had made a will, and. if so, who is the executor, as the latter is the only person to look after the property and elfects of a deceased person. If there is no will, or a will but no executor named in it or the executor is dead, then the proper thing to be done is to see that letters of administration are taken out as soon as possible The administrator then becomes the propel person to take care of and distribute the property and effects.
Death puts an end to all contracts of agency, so that, for example, a widow who orders goods for herself or the household after her hushand's death, does so at her own expense, and has no claim to be reimbursed out of his estate. A banker may not honour his customer's cheque after he knows of the customer's death. Every contract depending in any way involving personal qualifications for carrying it out, comes to an end by the denth of a contracting party.

If two people are killed in the same accident, e.g. a railway collision, the younger is presumed to have survived the elder. This is sometimes important in questions of family inheritance. The death of a member of a family on whom other mem hers are depentent sometimes gives rise to a clain for damages on the part of the dependents.

Laying Out the Dead. When denth takes place under natural conditions from illness or old age, and there is no necessity for the immediate inspection of the body by a doctor or the police, certain duties should he at once performed by those in attendance

If the deceased person is already in bed such duties are siniplified, but if death has taken place in otlier than a hedroom it is hetter to sclect and prepare a hed hefore the body is laid upon it. When possible a mackintosh should be placed over the mattress, or if that is not obtainable thick brown paper or a spare piece of linoleum or American cloth. This can be covered by a clean sheet. If death has talien place in bed, it is presumed that some such provision has been made. l'illows, bolsters, water-beds, hot hottles, and any surgical appliances should be removed The body should be divested of all garments and laid quite straight, the arms to the side and the ankles tied together

A small pillow for the head can be kept it required, but it is hetter at first to use none. The head can be turned gently on one side
to allow any fluid in the mouth to escape The cyelids should be closed and kept in position by pads of wet cotton-wool, or a henvy coin. False tecth and rings should be removed, if required. A bandage or cloth should be tied under the chin around the head to keep the jaw in position until rigor mortis has set in. Cover the body and leave it, if possible, for half to one holir.

This time can be spent in clearing the room of unnecessary fittings and signs of illnesa, preparing a clean gown and sheets, and dressings if required, a basin of clean water, somp and towel. The body should then le washed and cleaned all over, and the hair brushed, parted and plaited as occasion requires. Avoid the use of pins of all kinds Small plugs of wool may be used in the ears and nostrils. Any wound or sore should be covered with n wet dressing of strong disinfectant, and a thick pad of wool bandaged sccurely over.

The deccased should then bo clothed in a shirt or gown, or if preferred wrapped in a sheet. White socks or stockings may be used on the feet and a small pillow placed under the head. Cover the body completely with a clean shect, or, alternatively, the sheet may be turned down on the bed in the usual way, and a handkerchicf used over the facc It is better to keep pads or weights over the oyes for the first 24 hours. If the body is a heavy one it is of great assistance to the undertaker if towels are laid under the shoulders, hips and fect. See Cremation: Exccutor: Funeral; Mourning; Will.

DEATH DUTIES This is $\mathfrak{n}$ collective name for the duties paid on the property left by a dead person. In the United Kingdom, since 189.4. they have consisted of the estate duty and the legacy duty. Australia, Canadn, and other parts of the British Empire raise revenue by death duties of various kinds. The payment of the death duties is the business of the executors. who are responsible for the valuation of the estate and must satisfy the inland revenuc authorities about the accuracy of their figures. See Estate Duty : Executor: Intestacy ; Legacy Duty: Will.

DEATH RATTLE. When vitality is very low fluid collects in the windpipe and bronchial tubes, and the air entering or leaving the chest in breathing, passing through this Hluid. produces a gurgling sound, popularly named the death vattle.

DEATH'S HEAD MOTH. The largest of British moths may be known by its grey. brown fore-wings mottled with yellow, the yellow hind wings crossed by a broad and a narrow dark band, and by the black-belted yellow hind-body with its central stipe of blue. Most striking is the yellowish patch on the fore-body, which has a curious resemblance, stronger in some specimens than in others, to a human skull The usually yellow-green caterpillar when fully grown is nearly 5 in . long and thicker than one's finger. It feeds chiefly upon potatohaulm, also on the ten treo and snowberty.

It does not appear in such numbers or so commonly as to constituto a menace to the potato crop, but the moth has a bad reputation as a honey stealer. In all stages the insect is so large that hand-picking is the surest means of controlling it. See Moth

DEBT: In Law. In law a debt is a sum of money which one has coniracted to pay as distinct from damages, which is a sum one

is urdered to pay for some wrongful ibct or breach of contract $A$ debt is due the moment it is contracted. but if it is to be paid on a future date, or on the happening of some event, it is not paynble until the rlate arrives or the event happened

A debt cannot be sucd for until it is both due and payable Unless there is a contract to that cffect, a creditor is not bound to go to his debtor, or to ask him for the monev ; it is the debtor's business to go to the creditor and pay him. If there is any disputc as to how much is owing, the debtor should tender in cash (not a cheque) the amount he says he owes.

A husband is very often sued for debts contracted by his wifo. If a wife contracts debts of her own, her husband is not liable for them: but if she purports to act as his agent. he will be liable in certain circumstances. Thus, if she manages his household, she has implied authority to order on his behalf such household requisites, including food and clothing for herself and the children, as are reasonably necessary, having regard to the husband's position in life.

If a husband turns his wife away, or by his cruelty or misconduct compels her to leave him, he is still, unless he makes her a reasonable allowance, lia ble to pay for board, lodging, and clothing to a reasonable extent, that is, for neccssaries. If they are seplarated owing to her misconduct he is not liable for anything.

When husband and wife are living tagether and he makes her an allowance for house keeping or for dress, she cannot pledge his credit. When a wifo has once contracted debts with a tradesinan, and the husband pays, and he afterwards puts her on a ciash allowance, he must warn the traulesman to give no more credit. It is also better to warn the local trade protection socicty, so that they can circularize their members.

An infant, that is to say in law a person uncler 21, is, as a rulc, not liable under his contracts; but an infant is liable for clebts contracted for necessaries. Thesc include food, drink, clothing, lodging, and instruction according to the infant's rank in life. Even when an infant owes $\pi$ debt for clothes (say) which are suitable to his station, the deht may not be enforcable, because the infant may plead that he was already supplicd. For instance, if an undergraduate at Oxford ordered an evening suit he would, prima facie, be liable to pay for it : bnt if he could show that he already had two evening suits in good condition, he is not liable to pay for the third. Debts can be attached. i.e. if A owes money to 13 and B owes money to $\mathrm{C}, \mathrm{C}$, being unable to get his deht paid by 13 , can apply to the court for an order coin. pelling $A$ to pay the debt to hims instead of to $B$, or such part as will satisify his claim. This is known as a garnishee order. Debts can be assigned by one person to another; but in such cases the assignment must be absolute and in writing.

DECANTER. The decanter developed from the wino llasks made in Italy in the 16 th century. In the 17 th they were inade in England, ind those of the early 18th century long tematined the standard type. In the middle of the century some decanters were made with the vine pattern of grapea


Decanter. Antigue decanters in cut glass, showing three of the mang beautiful and graceful shapes that are obtainable
and leaves, while others of about the same time belong to scts of Jacobite glass
A little later came the decanter with rings round the neck, this variety, like many of its predecessors, being of finely cut glass. Small decanters were also made to go with a set of liqueur glasses. lior them ruby coloured glass was popular in the early part of the 19th century

A decanter stand or coaster is an article sought by collectors whether made of silver or old Sheftield plate They were fashioned to hold a decanter and so prevent the wine from staining the table, and first appeared in England ahout 1770. Most of them have woolen bottoms and the sides are ornamented in various ways. Sce Glass; Sheflield Pato: Silver

DECARBONIZING. This is the term employed for the remosal of the carbon deposit which forms $0: 1$ the inside of internal combustion euginos. After a motor car or ib


Decarbonizing. Black and Decker process, in which carbon deposit is removed from the cylinder head bs means of a rotating wire brusb

Courlesy of A. Perraris. Lld
motor cyclo has been driven for a distance varying betwcen 3,000 and 3,000 miles or so, the engine will show a steady falling off in power, a tendency to overhcat and to knock on hills, chiefly due to the deposit that has been formed in the cylindor and on the piston. Such deposit is remnvable in several ways: by hand, by means of oxygen, or by a mechanical process. The deposit on the piston head can be seraped off with a blunt linife or a screwdriver. It will often be found that a deposit is formed on the piston ring groovos, and this should be carcfully removed
To remove the deposit on the cylinder head by hand is often a laborious joh. The usual tonl for the purpose is an ordinary long sereirdriver, with which the deposit is carefully chipped off. The grentest care must be taken during the wholeoperation not to scratch the nalls of the cylinder. Much of the deposit formed is due to road matter get ting throngh the carburetter, nad the fitting on of $\Omega$ new gauze will often leasen the trouble considerably. The use of the correct oil and avoid. ance of over-oiling will also go n long way to obviate carbon deposit in the engine.

If a motor car ofigine has it removable hoad it is easy to take this off, and then chip and scrape out the deposit in it, and also on tho top of the piston If the engine has not a removable hend, a simple, but not very thorough, method is to remove the valve caps: then with a straight scraper the tops of the pistons can be reached, and with a bent one the ends of the cylin. ders. Scrapers for the purpose can be purchased.

If it is decided to remove the cylinders. they should be raised bodily off the pistons, and then the block can be haid on $n$ bench nud tho deposit removed. While the pistuns are exposed, the opportunity should be takon to make certain that their rings nef free in the grooves, and that the gudgeon pins are tight. When cleaning the tops of the pistons, pieces of rag should be stuffed in the openings of the crankcase, so that the charred matter docs not fall into the latter and mix with the oil.
The oxygen process for removing carbon deposit is quicker and somotimes more effective and it obvintes the need for dismantling the cylinder. The process depends upon burn. ing the carbon away by the use of an oxygen jet.

The Black \& Decker method of decarbonizing, available at n number of garages, consists in the use of wire brushes which are rotated by a powerful high speed electric drill. This method is very much quicker than the ordinary hand scraping process, and the job of decarbonizing can be completed in a day. An
alliod process is used for cleaning the valves and guides, and reconditioning the valve seats. See Internal Combustion Engine ; Motor Car ; Motor Cycle.

DECEASED WIFE'S SISTER. Marringe with tho sister of a deceased wife is now lawful in England, ns it has been for many years in most British dominions, but a clergyman of the Church of England cannot be compelled to celebrate such a marriatge. It is also lairful for a woman to marry her deceased husband's bmother. It should be oliserved that it is still unlitwful for a man to marry the sister of a woman frum whom he has been divorced, ss) long as the divorced wife is living. The Act of Parliament logalising marriago with a deceased wife's sister came into force in 1907.

## DECEMBER

## What to do in the Garden

| inimun temper | Prunc all tree | long as the ground is free from the elfects of |
| :---: | :---: | :---: |
| recnhouse 45 | mild spells of | frost |
| Hyacinths for forclng | Train and shanc wall | Veretables |
| tibre may stlll be | trees in the desirod | Dig, trench, nnd man. |
| manted Water all plants | In sections | ure ground ireels, so |
|  | cover tio stems of | that the frost may |
| tter than moist | wall fruit, i.e. juaches, | percolate and swecten |
| Pot up seedlings | cte., with hay or strm |  |
|  |  |  |
| cuttings of fuchsia | une | m |
| pelargonilim, i.c. | forcing, | place |
| nillm | a temperature of $70^{\circ}$ 1 | Colery flants should |
| Qive as much alr | fruit in spring | luve the last carthing |
| cossible when the shado | Spray fruit troes with |  |
| temperature outs | one of the tar-oil was |  |
| house is well abo | to cicanse tho branclies | cut and atored on the |
| frcezins joint | and kill the ckgy of | concrete floor of a shed |
| Plants which luav | ts | re frost is threat. |
| been temporarily shifted | Pruno vines under |  |
| from the greenhouse to | glass by cutting back |  |
| the draviug room, for | last summer's shoots to |  |
| opmrioses of tablo and her decoration, should | within two buds of the Јиме | forced now |
| bo gprajed with tep | Plantln $x$ of all fruit | Start carly pofatocs |
| wator when thoy are replaced in the house | trees may be proceeded with in tho open air, so | undor glass in moderato heat. for manting out |
|  | Food in Seas |  |
|  | Poultry and Game | flowens; celeriac ; celery ; chervil; chicory. on- |
| Barbel ; broam ; bril |  |  |
| Carp i codi dory : cels | callz 10 (ttil 20th) | kreens : leoks |
| flounders ; gurnot: ha | capons: clickens; ducks | rooms (cultivatod) |
| licrrings: ling ; macke | (tIII 18th) ; hare's ! 1 n | onions ; parsnips ; bota. |
| el : nullet; perc | rails; larks ; partridges | toca ; ralalit ; bavoys : |
| plalce: salmon | pheasanta ; pigeons | Scotch kalo ${ }^{\text {a }}$ geakalo |
| (Dutch andl Canadian); | pintail ; plover ; ptar | winter spinacli; toma- |
| skato e smelts; solcs | gnn ; pullets : ralblt | tocs; turnlp tons; and wateleress |
| sprats itench; tur- | anipo teal , turkov. |  |
| whiting | poults; turkeys ; wid. | Fr |
| Shellfish | es | Almonds; npples; bananas;chestnuts;cran |
| bs ; crajllal | es | lerrics ; dates; thgs |
| ; mussels : onstors ; | Artichokes (globe, | flluerts; grapos ; hnzel |
| wns; 8callops; | Jnpanese and Joru- | nuts ; Icmons; medars ; |
| shrimps | salcm); bectroots | melons ; oranges ; pears : |
|  | broccoli: Brussols | pincapples ; plalms |
| Meat | sprouts ; cabbngos | (Californlan) : pome - |
| cef ; housc lamb : mut- |  | granntes; misins: rhu- |
| ton; pork; veal: venison | donns: carrots; call | Larl (forcod); walnuts |

## Notes for the Month

Decemaer 25.-Christmas Day. Quartcr Day
Deceyner 26.-Boxink Day. Bank Holidyy (not in Scotland)
December 31.-End of the year. Various licences expiro

DECIMAL SYSTEM. The decimal sys. tem of coinage and of weights and measures, naso known as the metric system, and so called because it is based upon an arbitrary unit, the motre, is one by whioh everything is reckoned in tens and multiples of ten. It has not been adopted in Grent Britain, but the traveller meets with it when he goes to France nud some other foreign countries. The franc consists of 100 centimes, and goods are weighed by the gramme and measured by the metre, as for length and breadth, and by the litre as for volume, all these being used also in multiples of ten and in divisions of ten. forexample, deca. litro, decimetic.

DECK CRAMR. This name is used for a light chair which folds up. The frame is made of crossed picces of wood, across which canvas is nailed to form the scat. Some are made with a canopy for protection from the sun and some without, but in botb cases the frame workis the same.

A chair of this kind is ensy to make. A rough idea of the finished chair is scon $n t$ Fig. 1. From


Dect Chair. Fig. 1. Folding chair canopy which can be easily made by the amatear

Fig. 3 the genoral method of construction will be clear, and the plan at Fig. 2 shows exactly how the article (without canopy) will appear when folded. These chairs are made in ash, beech, birch, and sometimes oak Any

2 scat rails (A).
2 leg rails (B)
2 support rails (C)
Croks turned rail (D)
Cross scat rail (E)
Cross turned rail (F)
Top rail ( $\mathbf{~ ( ~ ) ~}$
Cross bar (J)

| loong it. | W'ide in. | Thick in. |
| :---: | :---: | :---: |
| 34 | $1 \frac{1}{2}$ | 7 or: |
| 310 | 1. | or: |
| $19\}$ | 12 |  |
| 151 | $1{ }^{1}$ diain. |  |
| $15\}$ | 12 | 3 |
| 17 | \% diam. |  |
| 17 | 13 | 2 |
| 10 | $1\}$ | 11 |

tough wond will serve the purpose, but obviously the timber must be sound The parts required are few, and are given in the cutting list appended.

The tivo seat rails (A) are shown $17 \frac{1}{2}$. apart over all, and are joined at the ground end by a turned rail (D). At the seat end they arc joincd by the flat rail (E) The seat rails (A) are notched with, say, five notches, which adjust the lcan of the back. These notehcs must be deop, enough to take the square part of cross bar (J) witliout any chance of slipping. The leg rails (B) are 19 in apart over all. At the ground end they are joined by the tumed rail ( $F$ ), and at the top end by the flat rail (G). The leg rails are pivoted to the sent rails nt H (Figs. 2 and 3) by means of bolts. The position must be determined after the framework is made, but the bolts come approximately 12 in . from the front end of A , and 131 in . from the lower end of 13 .

Thus far it will be scen that the chair is made of two frames: the inner one consisting of $A, D$, and $E$, and the outer one $B, F$, and G. This may be followed from the plan, Fig. 2. The frames should fit closely, but sufficiently free to permit of metal washers being placed between them at the bolts.

From a glance at Fig. 2 it will be seen that the chair has a kind of third framo, consisting of the two support rails (C) and their cross bar (J). The support rails are bolted to the legs (B) about $16 \frac{1}{2} \mathrm{in}$. from the top end, and arn joined by a cross bar (J) which engages the notelics cut in the seat rails (A). The cross bar is usually turned, but with square blocks left to rest on the notches. If this plan is adopted it should be $1 \frac{1}{4}$ in square; otherwise it may be $\frac{7}{8}$ in., turned throughout.

A sketch of the usual method of bolting is given at Fig. 5. To prevent friction, the inner disk of the bolt is sunk into the wood, and the end of the bolt riveted to the disk. A thin washer is placed between the rails. The canvas selected for the sent ought to be stout and durable. It is folded over the rails ( $E$ and G) and firmly tacked (as Fig. 6). When the seat is folded (as Fig. 2) the canvas should lie practically flat, but not strnined tight.

A canopy is somewhat cumbersome and is apt to attract earwigs and other insects, but


Deck Chair. Figs. 2-7. Constructiona, diagrams showing how the various parts of the lolding chair and canopy should be joined and fited together
in bright weather it is of great advantage when reading out of cloors. If a canopy is wanted, the parts required ars thesc (Fig. 4):

|  | Long It. in. | Wide in. | Thick in. |
| :---: | :---: | :---: | :---: |
| 2 back arms (K) | 14 | 11 | 8 |
| $\because$ front arins (L) | 110 | $1 \%$ | $\stackrel{3}{6}$ |
| Back turned rod (M) | 19 | f diain. |  |
| liront turned rod (N) | 1103 | ${ }_{8}^{8}$ diam. |  |

The arms ( $K$ and $L$ ) aro holted to the leg rails ( $B$ ) about 9 in. frons the end, the method of bolting being indicated at Fig. 7. Each pair of arms is joined by a turned rod ( $M$ and $N$ ), and the canvas covering-say 6 in. deepmay be tacked on or left loose.

DECORATION : In Cookery. The appetising appearance of food is enhanced by decoration and garnishes. The former term usually denotes ornamental colour touches to the food itself, while the latter more particularly refers to accompanying fruit, vegetables, forcemeat balls, croûtons, parsley, etc., which trim the dish

To decorate hors d'oeuvres coloured savoury butters such as anchovy or maitre d'hôtel may he put through a forcer. Corallino pepper, strips of pimento, shrediled unchovies, fincly chopped parsley, ghorlins and truftles, the white of hard-boiled egg cut into shapes aud the sieved yolk are all useful for ornamenting cold savoury dishes. Olives are ilccorative whon stuffed with anchovy butter and placed on a ring of white of egg, a larger ring of beetroot and a round of brown breail and butter. Radishes nuy be cut into flower shapes, with picces of olivo to form leaves and ured to clecorate tho centre of small individual Russian or other salads. A glace cherry or a black grape is placed in the centric of a prepared grape fmit, which may also be cut into points round the calge with a sharp garnishing knife.
Soups may be given a decorative touch by using a pleasing colour contrast. Chopped pars!cy is suitalile for a tomato or white purce, chopned mint for pea soup, cooked asparagus heals or green peas for fish soups, small fancy shapes of Italian pastes or dried vegetables for clcar soups.
Even the nsual trimmings of lemon and parsley can bo tastefully placed on whole fish such as turbot or plaice served hot. The lemon should be cut into very thin half slices which overlap each other down the centrc, broad way on, and down the sides are placed so that tho semicircles mako a scalluped edge to the fish resting on a paraley border.

Decorating Cold Service Dishes. Mayonnaise of lobster or salmon lends itseif to effective dishling. The sauce inny be reddened with the nid of tomato purce or greened with vegetable colouring. A flower design enn
for galantines and pressed boel, together with vegotahles cut
into dice and stars, and butter put through a forcer.

Cold swects such os flans, trifles and fruit jellies can be decorated in much the same way as cakes, except that whipped cream maybc morelavishly usod. Besides patterns made from crystallized fruits and angelica (q.v.), crystallized flowers are a suitable decoiation in such cookery and also for chocolate and other confec. tionery. Theso flowers can be obtained at any good giocery store, and they need to be (f good quality, inferior prepara tions often being cither faded or are tor) highly coloured.
The process of crystallizing requires care and somo knowlcdge of sugar boiling, hut it is not too difficult to be done at home. IRose petals, orango fowers, lilac, cowslips and violeta may all be crystallized. A simple method is to pour over the flower or llower petals a cooled syrup made from refined sugar and water, allowing 3 lb . sugar to cach lb . llower petals. The syrup must he boiled to $230^{\circ}$. Then place the petals in a cool oven; when they

fed with flowers in icing dragces, coloured lices or comfits Almonds and pistachios sliced and formed into the petals and leaves of flowors aio attractivn. Simall cakes may sither to baked in rarjous.shaped little tins or may be cut out of a slab of Genoose, spongo or chocolate mixture, and the trimuings formed into Rursian cake. Small prortions of the Cenoesc may also be shaped, moistened with sherry, coated with marzipan and coloured to resemble such fruits as apples and peaches, with pieces of almond or angelica for stallis.

## Decoration : Ideas for the Home

## Some Aspects of the Trend of Style

For further information see the articles Ceiling; Painting; Panelling; Paperhanging. Sec also
Christmas ; Colour; and the entries on Adam Style; Chippendale Style; Qucen Anne Style, ete.

Never before this period has there heen suoh trades. Theso in turn all help to place quickly a gencral interest in attractive homes and such on the market, by the aid of inndern machinery, conscious desire to achieve good interior effostive adaptations which will he within decoration by simple means. It is in the comparatively small houses and ilats that the great movement towards practical lieauty is being quietly carried on. To-day, as in the day of Robert and James Adam, beautiful houses arc being designed-equally expressive of our time as theirs were of the 18th century. Built and decorated by noted architects, in spite of their costly nature such houses are not so far removed to-day from general appreciation as their prototypes were then. They are described and pictured in magazines and papors, while the ideas and designs originating in these buildings percolate through the brains of the army of artists and workers in the decorative
reach of the ordinary homeninker.

Sometimos old houses are reconstructed beyond recognition inside nnd out, or the nrchitect-decorator will merely get rid of offending interior features and bring all elso into a pleasing scheme by clever adaptations and innovations suitable for life to day. Again thesc uscful and beantiful ideas are handed on for inspiration to the many.

Architectural Decorations. In quite a number of the small recently built houses architects have made the choice of decorations, and even of furnishings, comparatively simple. Natural and artificial lighting has been considerch, alao the well-balanced heights of
ceilings, and loors, and the sizes and shapes of windows. Where there is a horizontal line of panelled dado it is frerpuently continued in built-in cupbords, fireplace and corner seat.

In another type of ronm with light. painted walls, hookshelves are a decoration in them selves. They are placed either side of the chimney piece in recesses, the tops of which are architecturally designed to suit the style of the furniture, and the hack of the shelves and borders of the recess painted in a colour contrast to the walls and to mateh the skirting. Such recesses, or built-in cuphoards with ginzed doors, somewhat reniniseent of (ueen Anne style, are also utilized in dining rooms to hold glass and china, and a delightfully decorative touch is given to them, especially if they are placed in dark corners, by an inside coating of silver mint, the silver note being repeated elsewhere in the room in lighting fittings. curtain trimmings, or other paintwork. In yet nnother style the architect will, with utmost severity, insist on square clfects, even refusing architraves to doors and windows and a shelf to the chimney piece, but making up for this by beauty of texture in woodwork and flooring.
A home to be lovable and livable in to day cannot be like a museum, however keen the owner is on a periol style. Un the other hand, not to awail oneself of the rich heritage of past beanty in architecture, decorntion and furnishing designs is to be either lacking in culture, or an extremist in the craze for startling novelty at all costs. Strictly period rooms become alosurd when provision has to be inade for the wireless, the gramophone, the radiator, or even the telephone and electric lighting fixtures, while there is something too unfriendly to most homcloving people in the room of squared lines, the elimination of all gracious movahle furniture, and in substitutes reminiscent of ship's cabins and saloons.

Texiure as Decorative Patterns. Apart from extremes, one of the pleasantost things about the various materials now Iargely employed in decoration is that they can form beautiful backgrounds for genuine ald furniture, for reproductions, for Oriental pieces and for morlern chairs and tables. There is already a hreaking away from startling colour schemes-except on rare occasions when the furniture demands it, in the extra sitting ronm where experiments are interrsting, and in otherwise glonmy halls, where such decorations may be cheery and inviting nold do not "eary the inmates of a house as they might in a living-room in constant use. Another exception is when brilliant "nll paintings are expcuted by a mural artist, but suchadecora. tive trentincut is necessarily rare in the ordinary home.

Colour for decorntions should he pure and beautiful. The trend is away from fierce con trasts or primary huesexcept here and there


Decoration. In this room the wallpaper has a woven texture eflect and its pale colour forms a harmonious background to the applied tree motlfs and border colour lormsa harmonious background to the applied tree motlfs and bord
strips. Pictures are neither necessary nor degirable in a room so decorated Courlasy of sauteraon of Co


Panel effect obtained upon a gold-flecked wallpaper by an applied decoration of delphinjums. The borders are outlined in gold and should ave plain wall space on either side. All paint work is in solt blue Courlesu of Sanderson \& Co. and Thomas $H$ allis $\&$ Co.. Lid
ns colour notes- walls: or again the gratin of a wood is and towards delicate copied hy means of paint or reproduced in bendings, tone in wallpaper designs. Surfaces are not merely tonceffeots in Hatly covered, but interestingly broken up by woven fabrics, patterns founded on texture.
marbled, inottled. grained, blurred texture effects in paint, wondwork, plaster, wallpapers and lloorings. Pale colours are usual, but white is no longer considered helpful in the decoration of ceilings, friezes or woodwork. Rough surfaces, which respond to the play of light and shade, arc seell above pine panclling, stripped and wased. Where walls are painted, a subtle colour pattern is sometimes obtained hy an under. cont of $a$ deeper shade than that eventually required, and over this two thin coats of white paint, which in turn is rublied down to let the original colour show through at the odges of panclsand on mouldings. Marble texture is imitated, or two shades of a neutral tone arc stippled, to give varicty to the

Motifs and Pilasters. Wallpapers, too, have advanced in practical use and beanty, and are now olitainable in really washable varieties. For those who do not wish for the expense of painted wallw, there is the choice of a patterned paper in one of the simple rest ful designs. using a paler shade of the ground colour with which to distemper the ceiling; or n paper in a mottled. flecked or woven texture effect may be selected in a cream or pale shade with an applied lecoration as ahown in the lirst illustiation. This tree motif is stuok on wherever ornament is needed, the border strips forming a further colour contrast which yet blends the skirting to the wallpaper. Such decoration obviates the use of pictures. It is also exceedingly satisfactory for a small staircase treatment and can be applied to a mottled paper of pale amber tint with the happiest effect, the woodwork being painted in a lighter brown than the border strips. This style can be associated with modern or with lacquer pieces of furniture.
The other illustration shows a panel, or pilaster. which can be placed to create interest wherc desired. The styling, or strips, with which such panels are bordered is obtainnble with an outline of gold to emphnsise a gold. llecked wallpaper suitable for the decoration of a charming sitting room with paintwork in the softest shade of delphinium blue. These pilasters are also designed with other tall flowers, such as foxgloves. Plain wall space is essential on either side of such $n$ decoration, which should not be overdone-two pilasters in a amall room may be sufficient. Applied decorations can also be obtained which are cut out to form central sprays for simulated panels, or groups as skirting or frieze borders.

Notif sprnys for corners of walls and extending over the ceiling corners may also be used with decurative effect, but discration is necessary in blending the whole scheme of the room harmoniously, or such ornamentation may be disturbing rather than pleasing.

DEED: In Law. A deed is a dooument which is senled and delivered by the person or persons exccuting it. A deed is necessary for a lease of upwards of threc years; for a conveyance of land; and for a contract or promise made without valunble consideration. By valuable consideration is meant money or money's worth, and future but not existing marriage-marringe is always reckoned valuable consideration. If a husband desires to settle nnything on his wifo after marringe, it should always be done by deed.

The sealing of a deed is generally dono by $\Omega$ wafer or piece of sealing-wax being affixed to the paper or parchment, the maker of tho deed touching it with his finger; but this, though advisable, is not nccessary.

In addition to sealing, $\Omega$ deed requires dolivery beforn it becomes operative. lly delivery is meant that the maker of the deed parts with it unconditionally. So that if any. one signs and seals a deed purporting to sell his housc, and hands it to his solicitor, not to be parted with by him until ho gets tho moncy, there is no effective dolivery of the deed ; it is only delivered when the solicitor hands it over to the purchaser or his ngent in exchange for the money. See Agreement.

DEEREOUND. The deerhound is a member of the greyhound family, resembling the coursing dog in general lincs, but of more


Deerinound. "Noel of Ruritauia," a Hae specimen of this gracesal breed of dag
robust build, and standing several inches higher. The cont is shaggy, harsh and wiry, the length being about 3 or 4 in . A soft, woolly cont is undesirable. A dark blue-grey is preferred, but also recognized are dark and light greys, brindle, yellow and sandy-red or red-fawn. White often appeapy on the ohest or toes, but it is not liked, and $\Omega$ whito blazo on the head or a white collar would disqualify in the show ring.

The front legs must be perfectly straight, hind legs well bent, with grent length fromit hip to hock, vory dcep chest, and a well-arched loin. The neck should be long and shoulders sloping. Deerhounds are somewhat delicate as puppies, but when once through distemper they are hardy. A dog measures from 28 in . to 30 in. at the shoulders, bitches bcing usually about 2 or 3 in. less. See Dog.

DEFORMITY. A departuro from the normal shape or position affecting the body, or any part of it, is a deformity, e.g. dwarfism, spinal curvature, club foot, wry neck, fingers in excess of the usual number, hammer tocs, cte. Deformities may be congenital, or may be acquired in the course of life through injury or disease. In addition to unsightliness, most doformities intorfere to a varying extent with the proper function or use of the
part. Various methods of treatment may be adopted according to the nature of the casc, including operations, the use of an apparatus, csercises of nll sorts, massage, eloctricity, etc. See Artificial Jimbs; Clıb Fout: Hammer Toc, etc.

DELAINE. Originally called mousseline delaine, or wool muslin, delaine is not invari. ably all voul. The weave is plain, the fabric is crisp to the touch, and usually bears a printed design somewhat like a cotton voile. The crispness is the outcome of $n$ ohemical process whioh makes the fabric nearly unshrinkable.
Good delaine wenrs well, and does not ensily soil ; it oreases less and is warmer than cotton. Used as casement curtains, it requires washing less often than cotton.

Delaine requires careful washing if it is to retain its softness Launder in tho samo way as flannels, and in order to brighten up the colour add a little ammonia to the last rinsing water. Iron dolaine while slightly damp.

DELFT WARE. As introduced at the Dutch town of that name in the 17th century, Delft waro wis a soft-prste faience with a tin-onamol surfice which skilfully imitated the effect of Chinese porcelain before it was successfully reproduced in true glazed hard. paste ohina at Dresden. The secret of real Delft is the tin-enamel, usually painterl in blue on tho whito surface while still soft. Its vogue lasted to the end of the 18th century, when it was displiced by the technical improvements of tho Stafordshire potters.

Tho carliest pieces, in red olay, had biblical and rustic scenes in blue, or bluc and purpla Some oxcellent work was produced on a yollow or palc-brown body, enamelled in rich colours, with polychrome imitations of Japanese designs. Old Delft is recognizable by its smooth onamel, which seldom crazed, whereas modern Dutch tiles are ordinary glazed earthenware. Among more than 150 marks, mostly initials, dates and other devices, only one shows the place-name.
Tho manufacture of enamelled Delft became popular in England early in the 18th century, beforo porcelain was attempted. The first in the field was Lambeth, whose fabrio was harder, coarser, and with a more opaque enamol than Dutch. From this it can be distinguished by its being decorated after firing the onamel, by its roas tingo, and by its slight glaze.
The Delft ware whioh started Inter at Bristol often has a bluish-green tingo in the thin cnamol. Chinesc imitations were favoured styles, and fireplaces werc adorned with pairs of dog and out pictures, each of nine tilcs. Liverpool later still produced Delft ware. See Faience ; Lambeth Ware: Liverpool Pottery.


Delft. Dish of Datch earthen arare, Orieuial design, dating from the 18th century
rieloria and alberl Muscum

DELFRIUM, The state of montal excite. ment occurring in ncuto febrile disorders, ag. pricumonia and other conditions, is known as delirium. Tho onset may be sudden, or to begin with the patient may talk in his sleep and may be somewhat confused when he wakes. Ho fancies he sces strange things about the room. If spoken to he may answer apparently rationally, but aimost at once he wishes to talk of his fears and fancies All this time he is tossing restlossly, and may attempt to get out of bed, and too often such patients hare mannged to throw themselves out of a window. Ho may imagine that soncoone in attendance on him is an onemy who is attempting to do him an injury, as by putting poison in his food. This state may go on for some days, and then tho patient begins to sleep and may wake up moro rationsi.
Children who are fovered become delirious very easily, but this noed oconsion no unduo alarm. l)eiirium may come on after severe injuries in healthy people quite apart from any addiction to alcohol. It begins after about 48 hours and is usually associnted with septio poisoning. Poisoning with belladonna and similar drugs almost always produces this condition Acute delirium, or Bell's mania, is a form which affects women mainly, and a family history of insanity is comnon.

Tho treatment will be supervised by the dootor. The room should be kept well nired, darkened, and as quiet as possible. The patient must be constantly watched, lest he do harm to himsclf or anyone elso. Sponging with warm water, a pack, or, when practicnble, a warm bath, are useful soothing measures. The forehend may be bathed with vinegar and water, or an ice bag may be applied to the head. A sleeping draught may be necessary. The diet should be fluid

Sometimes active delirium passes into what is known ns tho typhoid state, and this nlso occurs apart from previous active delirium at the end of any severe illness when the vital powers are sinking low. The patient lies with tho oyes half open and kceps muttering to himsolf. The fingers are constantly picking at the bed-clothos, and he may make movenuents in the nir as if he were attempting to catel imaginary flies. The tonguo is dry and covered with brown fur. Here tho wholo ain is to maintain the patient's strength. Nourishment, in liquid form, must be given at short intervals night and day. The sick-room nust be aired, but it should also be warm, and hat wator bottles must be used if necessary, cspecially in the early hours of the morning.
DELIRIUM TREMENS. This is an acute temporary insanity devoloping in the habitual drinker. The common symptoms aro delusions of a suspioious and fearsome character. Thero is $\Omega$ constant babbling or shouting, $a$ trembling of the hand and tongue, and inability to sleep. Tho pationt struggles violently with his attendants, and frequently resists all attempts to feed him. Occasionally there is fever, the pulse is weak, and finally the patient may pass into a state of dangerous exhiustion.

Every effort must be mado to make him sleep. He should be kept flat on his bed, if necessary by straps or long bath towels, tying down his armes and legs to the sides of tho bed. Unremitting observation and care are cssential, us if left to hitnself the patient may commit sticide, or do some aot of violenco to another person. He must be carefully guarded from ohill and exposure, and his strength kept up by giving every two hours smail smounts of strong soups, meat broths, and milk. Chloral or some other iypnotio may be required to induce sleep; but suoh a remedy will only be used by the doctor's direction. An ittack of delirium tremens usually passes off in from two to thrce days under appropriate reatment.

DELPHINIUM (Perennial Larkspur). The delphinium is one of the most beautiful of all hardy herbacenus perennials. Tho plants grow from 3 to 6 feet, or more. high, and bear tall spires of bloom in shades of lavender, blue, purple $\quad$ nd mauve. They should be plantod in autumn or in spring in deeply dun and wel manured soil and left undisturbed for In an y years. If an increased stock is ro. quired it is better to raise secdlings from seeds sown in frime or greenhouse in March than to disturb old plants. Or the voung shoots may be taken off in spring, when
 this handsome border plant about 3 inches high, for insertion as cuttings in pots of sandy soil under a propagating case in frame or greenhousa. IVhen well cleveloped, delphiniums make a magnificent show and are in full beauty in Junc. An annual top.dressing of manure in spring is bencficial. When the young shoots are pushing through tho soil in spring they are apt to ve eaten by slugs. A laycr of ashes placod round about thent affords protection from thesc jests.

There are two chief types of delphinium, tho tall, vigorous varieties, and those of the belladonna type, which arc of branching, slender growth and 3 to 4 feet high. Beautifvi varicties of the latter arc Cipri. sky bluc : Lamartine, purple-bluc: Mocrheini, white, and grindiGorum, light blue.

Varictics of tho vigorous tall-growing delphinium aro innumerable and overy year fresh oncs are introduced. The following are particularly finc: Blue Boy, bluc; Millicent Blackmoro, light blue and mauve; Mrs. Townley Parker, blue and whito; Sir Douglas Haig, dark blue and purplo; Rov. E. Lascelles, dark biue and white; Noir Ferguson. light blue, mauve and rose.

The annual delphiniuns, popularly called larkspur, is raised froin sceds sown out of doors in March-April wherc the plants arc to bloom in summer. They reach a height of 2 to 3 fect and have flowers of various colours. One of the most beautiful is the msc-pink varicty. See Border

DELTA METAL. The alloy known as delta metal, and noted for its strength and toughness, consists mainly of copper and zinc with some iron and tin. It can be cast, drawn, or rolled, and can be forged at a dull red heat. When finished it takes a high polish, and does not tarnish so rendily as brass, nor is it so susceptible to verdigris. Delta metal is used in the manufacture of certain types of wire rope. When drawn to various sections or extruded, it is suitable for ornamental mould. ings found on shop fronts.

DELUSION. In every form of mental unsoundness delusions may be present, arising chiefly from inability to correct the imagination by what should be the normal
judgement. The person drifting into delusional insanity is often at first very suspicious, touchy, and eccentric.
Although delusions are of infinite varicty, they roughly group themselves into two classes-delusions of persecution and delusions of exaltation. To tho former class belong those of the person who thinks that other people are conspiring to injure him. A man in this state is often very clangerous, for ho may attack anyone whom he suspects. In delusions of exaltation a person has extraordinary ideas of his own greatness. He may believe himself to be a prophct, a king, the greatest orator, poct, military genius, ctc., in the world. Very uften these delusions of exaltation follow delusions of persecution.

In the case of old people making their wills, it is often a matter of great importance to decide whether they aro influenced by delusions; for a man may belicer that ho is made of glass, and yet make his will with sound judgement. But if ho suffers from insane delusions with regard to the conduct of his relatives or the amount of his property, his will is likely to bo faulty. See Insanity.

DEMULCENT. White of egg, honey, starch, glycerin, gelatinc, liquorice, olive oil, arc oxamples of demulcents used in medicine. Their object is to protect and thus lessen irritation of mucous membranes; so in corrosive and irritant poisoning thin arrowroot or gruel, white of egg, or olive oil is giren frecly. See Gelatine ; Honcy ; Starch.

DENTIFRICE. A proparation for cleaning the tecth may be in the form of powder, paste, or liquid. In tho first of the following recipes for a powder the carbolic acid should be mixed with a little of the kaolin in a mortar before adding the other ingredients. It is necessary to sift the powder through a fine sieve. Tho antiscptic tooth paste is made into a pasto with as much as may be required of a mixture of glyecrin 4 oz . and water 1 oz .

## Carnolic

Kaolin, of oz. ; infusorial carth, 2 oz. ; quillaia extract, 1 draun ; carbolic acid, 2 drams.

## Saponaceots

 Powdered white soan ${ }^{1} 102$. ; powdered orris root,2 oz.. ; precipitatell chalk, 5 oz..; rose geratiun oil, 10 drops.

Antiselptic Tootil Paste
Prectitated clalk, 5 oz. ; powdered soan, 5 oz., drops; wintergreen oil, 20 drops.

## Itiquid Devtifuice:

Quilluia bark, 4 oz. ; glycerin, 3 oz.; alcohol, 5 ou.; carbollc acld, i dram; ; rose geranium oil, 10 drops; clove oil, 10 drops ; cassia oil, 10 drops; tincture of rlatany, $1 \frac{1}{3} \mathrm{oz}$. ; rose water, $1 \jmath^{\prime}$ pints.

The quillaia bark, glycerin and alcohol are shaken together occasionally for 4 days and then the other ingredients aro added. Theso aro again shaken occasionally for a period of 4 days, and then the liquid is filtered through absorbent paper. A few drops of the liquid dentifrice on a wet toothbrush is used night and morning. See Artificial Tceth; Tceth.

DENTIL. Dentils are the small toothlike omaments found in furnituro fashioned by Chippendale, Hepplewhite, Sheraton, and their imitators. Sometimes cach tooth is cut away in the centre, thus leaving a raised or filleted edge, and less frequently there are dentils which are deeply undercut. One of the most frequent blemishes found on pieces of furnituro of the late 18 th century is the absence of $\Omega$ few of these dentils, which have been knockerl off through careless handling.

DEODORANT : Its Uses. Substances which mask or absurb foul odours are termed deodorants. Examples are smoke from brown paper or tobacco; perfumes like eau de Cologne; oil of eucalyptus and thymol; hydrogen peroxide, wood charcoal, potassium permanganate and chloride of lime.
Intiseptic; Disinfectant.

DEPILATORY. A preparation that is used for removing superfluous hair is known as a depilatory.

Barium sulphide is the active principie of most of the depilatories on the market. The following is a simple prescription, cheap and readily made up

## faritim stilphide <br> Orris root

Make a little into a pasto with water and apply to the hairy parts. Leave on for 5 min ., or until the skin begins to tingle slightly, then scrape off with a bone knife and wash the part with cold water. Dry, and apply a little boracio ointment or cold cream to the skin.
The treatment may be repented from time to time as the hairs grow again. The paste should not be left on longer than 5 min ., and it should not be persisted with if it causes irritation of the skin. With shaving, it shares the disadvantage of possibly making the hairs grow stronger and stiffer. See Elcctrolysis; Hair.

DEPOSIT : Of Money. A deposit is a sum of money placed in a bank with the intention that it shall remain there for some time. This distinguishes it from money put into a current account. Banks give receipts for money taken on deposit and pay interest on it, generally 1 per cent. below bank rate Money placed on deposit cannot be drawn out by cheque, nor usually without notice being given. In another sense a deposit is a sum of moncy paid down when a contract is made to show that the purchaser is in earnest and as a guarantee that ho will carry out his sharo of the undertaking. It may tako the form of 5 or 10 per cent. on the amount of the purchase moncy. Sce Banking: Contract. Savings Bank.

DERBYSHIRE NECK. This name is sometimes used for tho complaint isnown as goitre. It was believed to be specially prevalent in that county, and was duc to the peculiar properties of the water. Sec Goitre.

DERMATITIS : A Skin Affection. The general narue of dermatitis is used to denote any inflammation of the skin. The area affected may be reddened, swollen, hot and painful, as is the face after severe sunburn; but in other cases moro or less numerous papules appear. Thesc may be small, like pimples, or considerably larger; or blisters may be found, a small blister being known as a vesicle and a large onc as a bulla. If a vesiclo is filled with pus or matter it is described as a pustulc. After the skin has been reddencd, with or a part from the formation of papules, it may become scaly. if resicles or pustules are present they will dry up as crusts or scabs. Itching may possibly accompany any of these changes.

Some forms of inflammation are given dis. tinctive names. A chronic inflammation with papules covered by silvery scales is known as psoriasis. Grouped vesicles such as often occur at the corner of the mouth with a bad cold constitutc herpes, and inflammation which is characterised by large bullac is styled pemphigus. Eczema is an inflammation of the skin in which the skin is reddened and in which papules, vesicles, and pustules may all appear.

The term dermatitis is used in spealing of inflammation when it has been produced by a definite known agent. This may be heat, light, X-rays, cold, drugs taken inwardly, c.g. bromides, iodides or arsenic. It may be due to the action of poisonous plants, e.g. some primulas or poisonous ivy when they come into contact with the skin, or the landling of irritating substances in the course of many occupa. tions, as by paraffin workers, stcel grinders, etc.

Other forms of the condition are dermatitis exfoliation, in which the skin all over the body throws off crops of large and small scales; dermatitis herpetiformis, so called
because ita inHlammatory manifestations tend to be grouped like the vesicles in herpes; and seborrbocio dermatitis, in which rounded reddish or salmon-pink scaly patohes appear on the back, chest, face or elscwhere. It is associated with dandruff. Much may be done by scrupulous cleanliness to prevent the occupa tional form of the disease. Unless the case is very slight the doctor should be consulted In slight cases zinc ointment may be useful See Eczema; Skin.

DESENSITIZER. Just as curtain aniline dyes increase the sensitiveness of the emulsion of the photographic plate, so it has been found that others, in particular phenosafranine, decrease its sensitiveness to light. Solutions suoh as desensitol. prepared by the Ilford Plato Co., make it possible to develop the most. sensitive negative by ordinary candle light. The negative is placed for 2 min . in a desensitizing bath, consisting of 1 part of desensitol to 50 parts of water, and no light except the ordinary safe dark room light should be allowed to fall on the negative. If it be a panchromatic plate no light of any kind is permissible. After the 2 min . immersion ordinary weak white light, such as a candle or a strong yellow light, can be used throughout the process of development. It should not be exposed to daylight or a strong artificial white light.
The desensitizer stains the negative a deep red, but this is got rid of by increasing thic period of washing, a faint pinky stain does no harm to the negative beyond increasing the time in printing Any difficulty in getting rid of the red stain can be overcome by the addition of an acetic acid and alum clearing solution to the fixing bath.
Phenosafranine dyes stain the fingers rather badly if care is not taken; but pinacryptol green, which serves exactly the same purpose, is free from this defect, and stains neither plate nor hand. It is obtainable in the solid form, 1 gramme being diasolved in 500 c.c. of hot water. For use one part of this concentrated solution is added to 10 parts of water. Negatives can cither be immersed in this desensitizer before developing or it can be added to the developer; the negatives in the latter casc being shielded from light by covering the dish during the first minute of development. See Developing.

DESERTION: In Law. In England, desertion for two years is one of the grounds for a judicial separation. In Scotland either husband or wife may have a divorce for desertion. If a wifo is descrted at all, she is entitled to an order from the magistrates for maintenance. A husband who goes abroad temporarily on lawful business, or state service, though absent for two years, is not guilty of desertion, because it must be proved that he has descrted -i.e. abandoned-his wife, and not merely that he has been absent from her, which absence may have been duo to business or some other perfectly legitimate reason.
A father who deserts his children can be summoned for not maintaining them, provided they are under 16 years of age or are, by reason of infirmity, whether mental or bodily, incapable of maintaining themselves. See Child Cruelty ; Divorce; Separation Order.

DESICCATION. This inanufacturing pro. cess is applied to articles of food to render them suitable for storage. All moisture being extracted. the articles are considerably reduced in bulk. Desiccated coconut is the commonest commodity thus produced.

DESE. In its origin a desk is a tablc for writing on, some being flat and others sloping. While the plain form was retained for use in schools, something more elaborate was introduced into the home. A drawer was added, and there are some fine examples in which the table with a single drawer beneath it is supported by carved legs or columns. Some
beautilul pieces of this type were made in Buhl work From this the familiar writing-table was evolved, the pedestals or supports being formed by drawers, one upon another, on either side, leaving a space for the knces between.

The bureau is one form of clesk, while another is the roll-top desk, the idea of which originated in France in the 18th century The bureau du roi, which has been described as the finest piece of furniture in existence, is of this type. It was made for Inuis XV by several of the greatest artists and designers of the day, and is now in the Louvrc. See Burcau: Writing Table

DESPATCE BOX. A despatch box is made of tin or sheet steel, and usually contains separate compartments for stationery and a lift-out tray, beneath which is a space for storage of important documents. The best qualities are litted with a reliable lever lock, and have a rolled edge reinforcel-with an iron or steel bar and a strongly fitted bottom. The lid in particular should be stiff and ridged.

Another type of despatch box is strongly made of leather, and usually fitted with an ink. well, blotting-pad, spaces for pens and pencils, and divisions for paper and envelopes. These are more appropriatc when travclling or for personal usc.
DESSERT: How to Serve. The last course at dinner is often omitted when the meal concludes with a sweet of the fruit salad or ice type, but where a savoury is included in the menu, dessert usually follows.

In winter, when flowers are scarce and expensive, fresh fruit in ornamental dishes of pottery, china, glass or silver, or in gilt baskets, forms a charming table decoration. A centre piece can be arranged with mandarins and ordinary oranges (supplies from West Indies and South Africa are sweetest), pale, shiny, yellow Newtown pippins, a few brilliantly crimson apples for contrast, russet winter pears, and bunches of black and white grapes.
In addition, for the ordinary dessert, a dish containing either pulled figs, almonds and raisins, crystallized fruits, or French plums or dates with walnut or maraipan stuffing, and one of nuts, with two sinaller dishes of chocolates and fancy sweets, would bo sufficient : but for a larger party a pineapple and a dish of South African cherries might be added. Ginger preserved in syrup is best served in its own jar. Salted almonds, which may be bought ready prepared in bottles, are always popular, so also are a fow small silver dishes of marrons glacés and other bonbons.
In summer the more juicy fruits should be arranged in separate dishes. Strawberries may form a complete course. Removo the calyz from each berry, pile them in shallow bowls and serve them with cream and sugar.
Dessert Servlces. The charm of this course is greatly aided by attractive ware. A service usually consists of six or 12 plates and three or five fruit dishes. In old china it is often highly decorated, Coalport, Worcester and Crown Derby services being unexcelled

The old green-leaf service-vine or lotus is the usual pattern-can often be picked up more or less complete at a bric-d-brac shop, and has a decorative value with its malachite green on a polished table. Venetian glass services are beautiful and costly, and there are other glass varieties in plain crystal, coloured or gilt patterned at more moderate prices. Italian fruit-painted pottery has a gay appearance, and there are many good varietic.s of English china and semi-porcelain fruit sets.
Dessert sets of knives and forks can be ob. tained with twisted pearl handles, plain or filigree encased. Green-stained ivory and silver gilt alse make $\pi$ good handle, also black, silver mounted. A dersert set comprises a dozen pairs. Sez Cutlery; Silver: Spoon: Table

DESTRUCTOR. A lurnace which is used by a district for burning up its refuse is known as a clestructor. The refuse burns itself; the heat provided may be used for generating steam, and the ashes, which are known as clinker, have various uses. Small destructors may be used in the homc, but their power of consuming refuse is very much less than the largo ones, and in any case the kitchen fire is usually able to burn up domestic refuse. In the caso of a large house and garden, a small destructor in the grounds is of value to deal with the garden waste and all house refuse as well. See Refuse.

DETECTOR. In a wircless receiver this is the device which effects separation of the high and low frequency components of the oscillations picked up by the acrial. Either a valve or crystal may be employerl. but both devices provide an easy path to earth for the high frequency component, while the low frequency component is made to operate a sound reproducer diroctly-e.g. 'phones-or indirectly via a low frequency magnifier, e.g. a loud-speaker The crystal. ulthough simple and ecunomical, is comparatively unstable, whereas the threc-electrule valve or triode is both stable and sensitive.

Among the various methods of valve detection are leaky or cumulative grid, anode or lower bend, power grid. and diode rectifica. tion. A leaky grid detector utilizes a fixed condenser laving a value of $0001-0003 \mathrm{mid}$., and a grid leak, one end of which is usually connectod to a point in the circuit at prositive potential in respect to earth. In the case of an anode bend detector, a negative potential of $1 \frac{1}{2}$ volts or more is applied to the grid of the valve, and a grid leak and condenser may or may not be employed

A power grid detector is a special form of distortionless grid leak rectifier, the method entailing the use of an anode voltage of the order of 200 volts or more, and a medium or low impedance valve.

The diode detector as a distortionless rectifier is highly efficient, but owing to its insensitivity is usually only employed in designs in which fanltless reproduction is essential. See Carricr Wave: Crystal Detector: Grid Leak : lmpedance ; Oscillation: Valve.

DEUTZIA. This is a beautiful hardy flowering shrub which needs a sheltered position because it starts into growth early and is liable to be cut by frost. Deutzias thrive in ordinary well-tilled soil and benefit by being top-dressed with manure annually in spring. They are pruned by thinning out the oldest shoots as soon as the flowers have faded. A few of the beat are gracilis, scabra, crenata and corymbosa, all having white


Deatsia. Mowering spray of D. crenata, a hardy shrab

Howers. Sevcral note. "lorthy large. Ilu wered sorts have been raised: some of the best are candidissima, magnifica. and Pride of Rochester. Deutzia gracilis is a favourite shrubforforc. ing: if potted in early autumn and placed in a hcated greenhouse in December it will be in full bloom in the springtime.

DEVELOPER: In Photography. So fir as all ordinary plates and films are concerned the selection of a devcloper is principally a matter of convenience Any good standard developer, used correctly, will give similar printing results Some stain the negative, others give a good black-looking negative, but so long as development has been properly carricd out the result in print or enlargement will not vary to an appreciable degrec
Generally the amatcur will do best to follow the inaliens' instructions given on the box of plates, or with the films, which will entail the purchase of developing powders in packet form (or tablets), ready weighed and in correct proportions for dissolving in water. It is, however, always more economical to buy in bulk and prepare a portion as and whon required. If it is in powder form (amidal, pyrogallic acid, metol, hydroquinone) accurate acales nnd weights are needed. If it is bought as a single solution (azol, certinal, kodol, molinal), or in two solutions (metol-hydro quinone, pyro-soda), which have to be made up with water, liquid measures only are required, a small one measuring in drams or cubic centimetres for the developer, and a larger one measuring up to 8 or 10 Huid oz. for the water.

It is a sound plan to select a developer and adhcre to it. Uniform results cannot he cxpected and failures must be increased if the
 develapers or other photorraphic chemicals
amatour repeatedly changes his developer Many practised photographers use nothing but amidol, keep it in powder form and make it up freshly when required. It is an excellent non-staining developing agent, giving soft negatives, and particularly suitable for bromide and gaslight papers. Pyro-soda, being a staining devoloper, can be used only for negatives Metol-hydroquinone devclopers have a slight tendency to stain if not correctly used, hut are Inrgely employed for gaslight papers

In dissolving powders, tablet developers or other photographic chemicals, useful methods to adopt are shown in ligs. 1 ind 2. As the solution is formed it falls and frcsh water is continually coming into contact with the powder until the solution is complete. The method shown in Fig. 2 is particularly suitable for the solution of amidol, pyro and metol, filtration being effected at the same time. These dovelopers are not easily soluble, and if undissolved particles are permitted in the dish bad sponts will occur in the negatives If solution is not complete at first the fluid can be passed through a second time. Filter pajer, folded as a funnel, can be used instead of cotton-wonl.

Once a developing solution is made up it must he used and not kept. Stale developer is certain to give bad results. About 10 oz . of solution is necossary to develop six 1 plates at one time, and if a further batch of plates is to be developed fresh solution must be used. Amidol, metol and pyrogallic acid must be kept in well-stoppered bottles and not exposed to the air longer than is necessary, to avoid deterioration. See Amidol; Hydroquinone: Metol ; Pyrogallic Acid; Pyro-soda.

## Developing Photo Plates and Films

## Methods which Give the Amateur the Best Results

Characteristics and uses of the more important developers are discussed under their own headings, e.g. Amidol: Metol, etc. Associated articles are Fixing; Photography; Washing

Developing is purely a chemical process and thercfore precision and absolute cleanliness are required, but the systems which have been evolved make it a matter of easo and simplicity. Negatives or films may be developicd by one of three methods : by observation, by factors. and by time and temperature.

By the first method each exposure is developed separately in a dish, observing the progress of development by means of $\Omega$ red or other actinically safo light, and judging the point at which development should he stopped. To develop plates or flat films by this method, take the plate from the dark slide or sheath (taking particular care not to) touch the sensitive surface with the fingers) and lay it film side (creamy surface) upwards in the dish; next pour on the developing solution in an even swcep so as to cover the whole surface of the plate as cuenly and as quickly as possible. Then rock the dish very gently so that the solution is kept moving over the plate. Care is also taken to see that air hubbles do not cling to the cmulsion surface of the plate, since they will cause round holes in the finished negative.

After 3 or 4 min the progress of development is observed by holding the negative up to the red light and looking through it for a second or so It must be viewerl by transmitted light in this way, since in most cases it will appear black in the dish, and all sign of the image will have disippeared sonie time before development is complete.

This method is one that requires $n$ good deal of experience, and moreover suffers from tho disadvantage that with modern fast plates and filins the necessary exposure to red light is liable to cause fogging. It cannot he used at all with panchromntic plater, which are specially sonsitive to red light, unless a desensitizing solution is used. If development is likely to he slow, cover the developing dish with a pieco of cardboard. The edges of the plate which have been covered by the edges ol the dark slide should be clear glass when fixed. If they are at all grcy the plate has been fogged, the reason probably being undue exposure to the dark room light.
If a flat (not roll) film is to be developed by the observation mothod in a dish, fist fill the developing clish with clean water and immerse the flat film until it becomes thoroughly wet on hoth sides and fairly limp, then pour off the water and apply the cevcloping solution as is done for plates.
If a roll film is to be developed in the hand and in a llat dish do not attempt to cut it up hefore devoloping, but devolop the whole strip at one time fill a fairly deep developing dish with devoloper, say, to $\Omega$ dopth of 1 to 2 in . then unwind the film from the spool, crast aside

the black paper covering and thoroughly wet t in the basin of cold water.
After allowing the film to soak for about a minute take the two extreme ends of the film. one in each hand. so that the filnı hangs in the form of a loop, like the letter U . Take the film from the water and pass it to and fro through the developer in the dish, raising one hand and lowering the other, keeping up the see-saw movement so that the whole atrip of film may be acted upon by the developer. A special type of dish is made (Fig. 1).

The Factorial Method. The second and hetter method is Watlins' factorial development This consists in noting accurately the time which clapses between the flooding of the plate with developer and the first appearance of the image This time is then multiplied by a factor for the particular developer used. thus ohtaining the total time for developenent of that particular negative.

To take a single example, it is found that $a$ negative developed with nzol talies 15 scc . for the first appearance of image after the developer is poured on. The known factor for azol is 30 , and 30 by 15 sec , or 450 sec . (i.e. $7 \frac{1}{2} \mathrm{~min}$.) is the time required for complete development. As soon as the time of the applearance of the image has been noted the dish should be covered with $\Omega$ card. Factors have been worked out for practically all the devclopers on the market For instance. metol-hydroquinone, 14; amidol (2 gr. jer oz.) 18 ; pyro-sodn ( 1 gr . per oz.) 18

The factorial method only applies to correctly exposed plates. The appearance of the image is delayed in the under-cxposed plate and hastened in the over exposed plate, with the result that in the first development is carricd too far, and in the sccond it is not carricd far onough Caro must be taken that the red light used is as actinically safe as possible and the exposure of fast films to it kept to a minimum
Time and Temperature Method. The third and on the whole the soundest, mothod for the amateur is that known as development by time and temperature Makers of practically all the standard developers on the market have now published tables showing the times required for development at different temperatures of all the standard plates.
Scientilic rescarch has demonstrated that for all ordinary purposes, given a particular plate and a particular developer at a certain temperature, the time reguired for completc development cannot usefully be varied, whether exposure of the negative has heet accurately judged or not. To get good results negatives must always be properly exposed Under-erposed negatives may be intensified


Developing. Fig. 3. Kodgk tan's for developing roll flms by time and temperature without a dary room Courtesu of Kodak. Lid
and over-exposed negatives reduced if they are properly developed.
Tank Development. The time and temperature method can be used for ordinary development ol single negatives in a dish or batches, either in a devoloping lank or in a large dish, the latter generally being known as stand development In both cascs a very weak developer is used and the time of development is somewhat prolonged

A developing tank is a light-tight box in which exposed plates or films may be placed, and water and the necessary developing and fixing solutions poured in and out again without light entering. Thus the whole process of developing, fixing, and washing is possible without touching the negntives with the hands. When tanks for plates are used it is necessary to have a dark room of some kind so that the worker may transfer exposed plates from the dark slides to the tank, after which no dark room is necessary. But when tanks for roll filns are used it is possible to insert the film, unroll it, and to develop, fix and wash it without a dark room. The methods of inserting, unrolling and treating a film in a tank are very ingenious and vary according to the make of the tank. All makers of tanks, however, supply booklets giving full details

A simple type of plate tank is the Watkins (Fig. 2). Plates ane loaded horizontally into the inner portion (A). When this is done and the tank closed, the remaining operations are conducted in daylight. Points particularly requiring attention are to take the temperature of the developer before pouring it in, to agitate the solution by repeated shakings, or by pouring the developer out and in again, and, above all, to keep the tank rigorously clean. The slightcst trace of hypo during development is liable to cause stains. The Kodak developing tank for roll films (Figs. 3 and 4) consists of a wooden box in which the exposed film is unwound from a spool carrier (B, Fig. 4) by rotating the handle, C , the light-tight lid of the box being, of course, in place. I light-tight apron, $A$, is at the same time wound over it so that when the exposed film is completely wound off the spnol holder it is rolled up inside the apron. The box is then opened, the crank and handle, $C$, withdrawn, and the celluloid apron with its enclosed film removed. The circular tank (Fig. 3) having been previously filled with. developer; the apron and film are inserted. The corrugations on the edge of the
apron (A, Fig. 4) permit the free entrance of developer but not of light. Time of development varies according to temperature, tables for this purpose being supplied with the Kodak tank developer.

Another type of roll film tank is the Carbine (Fig. 5). The spool in the holder, $A$, is inserted in the tank previously filled with developer. The lid is put on with the long plunger, $B$, withdrawn. Next, the plunger is pushod down, extending the film. During development the solution is agitated by pressing the rubber ball, C.

Stand Development of Plates. For stand development of glass negatives or fint films a large dish is required to take six or more nega. tives lying flat on the bottom of the diah The negatives are unloaded from the dark slides (preferably in the dark), the developer having been prepared in a large jug beforehand. Make up plenty of solution so that the negatives are well covered, pour it over the negatives without delay, counting the seconds from the moment that the negatives are wetted.

When all the developer has been poured into the dish make sure that none of the negatives liave been disturbed or are overlaying one another. and cover the dish with a card or piece of board; take the total of the seconds counted during these operations and, turning on or going to the


Developing. Fig. 4. Sectional olew of box employed with Kodak fllm tank for wrapping alm in light-proof apron before inserting in developing tank. Fig. 5. Carbine daylight developing tank for roll allms Courlesy of Koalali, Led. and E゙nsion, Lid.
light, note the time when development began (i.c. when the negatives were first wetted) and the time when, according to the table for the developer used and temperature of the solution, development will be completed.

As in any case the devcloper in the dish will acquire the temperature of the ronn before development is complete, have it ready half an hour or so before it is required and test its temperature just before use.
This will be found a particularly useful method for developing panchromatic plates where no red light can be used at all, and in most cases total darkness is essen. tial. A very little practice is required to gain confi. dence in handling the negatives in the rark. It is only necessary to have everything conveniently to hand on the bench.
In most cases the tables for time development by the time and temperature method given by the makers of developers and plates are oalculated for what is known as " normal contrast." This produces a negative which, if it has been properly exposed, gives a print on


Devon Ware : characteristic example. Aller Vale jus with motto
gaslight paper which Las the amount of contrast of light and shade most suitable for the amateur's ordinary snapshots. If the negatives are to be used for enlarging, or if they are portraits, shorter time is needcd for development. All that is necessary in the second case is to deduct 25 p.c We thus get what is known as a thin negative. In gencral, developers work hest at a temperature between $60^{\circ}$ and $70^{\circ} \mathrm{F}$. Hydroquinone hardly acts at all below $60^{\circ} \mathrm{F}$.

In all photographio work, but particularly in developing, absolute cleanlincss of dishes and measures is of the greatest imporiance. Always wash out dishes thoroughly immediately after use; never leave them until the following morning. It is best to keep scparate dishes for developer and fixer. Also, after washing a dish, rinse it with a solution of spirits of salts, which can be kept and used repeatedly. By care in these directions mysterious stains and markings can be avoided
DEVILLING: In Cookery. The name is given to a method of coohing in which cayenne pepper or hot spices are used. Tho legs of a cooked turkey or chicken arc very suitable for devilling. They are first soaked in a sance prepared from equal quantitics of Worccster sauce, vinegar and melted butter, to whioh is added enough mustard, cayenne and salt to make the sauce hot and appetising. After being soaked well in the sauce the legs are fricd and servel hot with toast.

To ןrepare devilled game the remains of it cooked bird should be cut into neat joints, rubbed over with margarine, aprinkled with salt and cayenne, and then grilled lightly. A sance is prepared from one inblespoonful vincgar, one sliallot, one dessertspoonful each tomato saluceand margarine, a pinch of cayenne, and a leacupful stock or gravy. The vinegar is brought to the boil with the cayenne and the finely chopped sliallot. and the other ingredients added with the exception of the inargarine. Bring the whole to the boil again, talie the sauce from the fire and stir in the margatine. The sance is then poured round the game, which is served on rounds of toast.
Devilled Savouries. Fried and boned sardines dipped in this satuce and served on crontons of fried bread make a good savoury. Finely chopped ham may be used for tho same purpose with a little devilled snuce.

Good after-linner savouries are also preparel by mixing $\frac{1}{2}$ oz. butter with a small pinch of cajenne pepper, $\frac{1}{2}$ teaspuonful made mustard, and a teaspoonful curry paste. Spread the mixture on onc side only on some dry, unswectened, finger-shaped biscuits, dredge them well with grated cheese, and then cook them on a baking-sheet in a sharp oven or under the grill. When lightly browned they are ready for serving

DEVON WARE. The potterics in Devon. shirc are the nutcomo of the art movement which set in during the late.Viotorian age. On the south coast Watcombe ware, made ncar Torquay, includes green and straw pieces, and barbotine designs of marine objects. ${ }^{\text {a }}$ Aller Vale is noted for its motto warc, brown inside and yellow outside, besides a crocus pattern, and the simple and dignified Sandringham ware.

North Devon clays are used at Barnstaple for the favourite Barum ware, which onmprises simple shapes treated with bold coloured. slip designs, or with applied mouldings, such as clragons and sea creatures. A variation made at Fremington
possesses an iridescent glaze of local creation. This may be had in fruit dishes, puzzle jugs and other forms. See Pottery.
DEWBERRY. A variety of bramble or blackberry is the dewberry, which grows abundantly in the woods and hedgerows of England. The fruit, large and glaucous back with a pleasant acid taste, can be used for the same purposes as blackberries. See Black berry.

DEXTRINE : Its Adhesive Uses. Known nlso as British gum, dextrino is prepared by heating starch that has been previously moistened with dilute acids. The chief use of dextrine is in the manufacture of textiles, but it is an adhesive which finds favour with photographers for mounting purposes A snitablop mountant is made by heating 2 oz of white dextrine with $\mathbf{0} \mathbf{~ o z}$. of boiling water until it is dissolved, thon allowing it to become nearly cold and stirring in an ounco of methylated spirit to act as a preservative. Sce Mounting.
DIABETES. There are two varieties of diabetes, in both of which the pratient passes constantly large amounts of urine. Diabetea mellitus, generally referred to simply as diabetes, is characterized by rapid wasting and the passing of sugar in the urine in the form of glucose, and complete recovery is rare. In diabetes insipidus thore is no such passing of sugar, and it is mostly children and young adults who are affected.

Men arc more likely to develop diabetes mellitus than women, and it is commonest in middle life. A tendency to fatness in youth, a highly nervous disposition, a too strenuous business life, an undue fondness for the good things of the table, have all been suggested as predisposing causes of diabetes.

There is a close connoxion between the health and activity of groups of colls in the pancreas or sweetbreal and the symptoms of this dise:se. These cells secretc and pour into the blood a substance to which the name insulin has been given, and its function appears to be to ensure the buming up of sugar in the body. The injection of insulin into patients who are suffering from diabetes has been followed by the disappearance of sugar from the urine and marked improvement in the general condition.

Advice on Diet. The basis of diabetic treatment is to reatrict carbohydrates (atarch and sugar) in the diet, and sometimes also the proteins (lean meat, etc.), as sugar may be formed from them. What must be done in any particular case is to find out the amount of carhohydrate which the pationt can take without sugar appearing ; in other words, the sugar tolerance. One method is to put the patient on a diet of meat, eggs, green vegetables, and a linsited allowance of carbohydrate say, 4 oz . of breakl. It is known how much sugar is produced by this allowance, and if the sugar appenring is less, it shows thint there is some tolerance. If the amount is taken without tho appearanse of eugar, it is gradually increased. This increnso is also made possible by the daily use of insulin, the requisite number of units being injecter under the skin, usunlly before the morning and evening meals. Insulin has proved of immense value in cases of diabetic comil, a condition of blood poisoning commonly callerl acidosis, which resulta from tho perverted body chemistry.

The diet should be as varied as possible. The following may be given: Clear soup, ter and coffee (without milk or sugar), sodn water, unsweetened lemon drinks, bread and biscuits made with almond, gluten or bran, cucuinbers, celery (sparingly), tomatues, asparagus (the green pirt), and nll green vegetables, all kinds of fish and shellfish (excent cod's liver), all meats
(excopt liver), and poultry, milk (very moderately), eggs and butter, and all acid fruita, particularly oranges, currants and sour berries.

The following may not be given: Bread of all kinds, rice, tapioca, potatoes, beets, turnips. vegetable marrows, parsnips, artichokes, all malted liquors including beer. ale, stout, sweet wines and sweetened be vcragcs. Saccharin tabloids or powder may be used in order to sweeten tea, coffee, and lemonade, etc., and may also take the place of sugar n cooked dishes.
DIACHYLON PLASTER. This is a lead plaster, used to give support and protection to the skin and superficial tissues over which it is applied and so promote hoaling. It may thus be used for bruises and sprains. It enters into most other plasters. e.g. resin or adhesive plaster. Alixed with an equal amount of vaselinc it forms diachylon ointment, which is employed in eczema
DLAMONDS: How to Choose. When selecting diamond jewelry, the soundest investment is to purchase good quality stoncs. Blue-white stones of fino quality always have a good market value, no matter what their size may be, but large stones which are not of good colnur and which have flaws in them are never really good investments, no matter how advantageuusly they may have been aequired.

The sotting of diamonds requires apecial consideration. The stone should be set in platinum, but on account of the high cost it is usual for the setting to be of platinum, backed with a mount, either of white or ordinary 18 -carat gold. The most effective diamonds are round in shape and deep: but in higher-priced ornaments oblong. shaped or pearl-shaped brilliants are used which, if blue-white and without litws, aro extremely valuable.
Methods of Cleaning. Tho simplest way to keep diamonils clean is to brush them lightly with warm water with a little soap or soda added, and thon to dry out the moisture from the back of the stones by means of cotton wool, which can bo easily fixed on some pointed article, such as an orange stick usod for manicuring. Annther way is to brush the back and front of the stones with a soft brush and a little gin or whisky, aftor which thore is no necessity to dry the stones, as the spirit is quickly absorbod.

Dianthus. Botanical name of the carna tion, pink and sweet william. They are all described under those headings.

DIAPER. Little more than a name for a woven design, dinper at one time inplied linen cloth with a diamond or lozenge pattern. Linen and cotton tablechoths, napkins, and towels woven in small geometrical designs, alternately bright and dull, aro callod diaper indiscriminately, and are made in all qualitics of material.

In furniture design diaper is the repeating pattern in which the repeat is small in comparison with the space occupied. It is not applied to anything repeated on a largo scale. Diaper is frequently seen in marquetry on furniture of the later part of the 18th century.

DLAPHORETICS. These are substances that are used to incronsc perspiration. One purpose of sweating is to lessen tho temperature of the body and keep it at its normal level. If, then, we increase perspiration in fevers, we benefit the patient by reducing the fever. Another purpose of sweating is to get rid of the waste products, and when the kidneys are inactive, as in Bright's disease, increased swating will relieve the strain on the kidneys and remove from tho blood subatances where retention is dangerous.

The simplest means of inducing perspiration is to wrap the patient in hot hlankets giving him at the same tume plain water to drink. A very hot bath followed by hall an hour in bed with plenty of bedelothoy. will usually bring un profuso perspiration. Turkish or Rusaian baths or Iry hot air bath or bot vapour batha are very ellicient means of inducing perspiration

Amnng the most uselal diaphorctic drugs aro the solution of ammonium acplate. dose 2-8 drams, and sweet spirits of nitre. dese 15-60 minims Duper'q powder, a combination of opium and ipecacuanha is much used as a diaphoretic. At the beginning of a foverish cold an otherwise healthy adult may take 5 grains at bedtime, washing it down with a glass of hot lemonade or hot whisky and water. Within a short time profuse perspiration will set in, and care should be taken that the patient does not throw off his bedclothes and contract a fresh chill in the night. See Bath : Perspiration

## Diaphragm. See Stop

DIARREOEA. The commonest callses of diarrhoes or looseness of the bowels are the ingestion of poisonous substances or unsuitable food, chill and fright or excitement. The condition may occur as a symptom in the course of some specific disense. nuch as cholera. typhoid or dysentery. Colicky pains, rumblings in the intestines, a coated, furred tongue, great thirst. and more or less weakness and collapse are the chief symptoms.
Where the attack has come on suddenly and unsuitable food is probably the cause, a $\frac{1}{2}$ oz or 1 oz . of castor oil, or a smaller dose in the case of children, may be given at once. If this does not produce speerly improvement, or the pain is scvere, the patient should be put to bed between warm blankets with a hot-water bag or fomentations on the a bdomen. and the doctor should bo sent for The diet should be milk, to which an equal amount of soda water or lime water may be adiled. In hot aummer weather the milk should be boiled. As the attack gradually passes off arrowroot and smooth milk puddings may be nided. then parched eggs, stoamed lish, leading up to ordinary diet : but precautions should be taken for some time to kcep out things like tough, stringy meat, fruit skins and similar indigestible substancos.
Chronic diarrhoca may follow an attack of acute diarrhoea or may result from chronic indigeation, disease of the pancreas, or from chronic ulceration of the intestinal lining, as in tuberculosis. The physician should be called in, as it is only by a skilled examination that a correct diagnosis can the made

The Complaint in Children. Diarrhoea in infancy may take the form of infantile cholera or of simple acute diarrhoca The latter is commonest in the summer months, and is usurlly due to indigeation brought on by improper or excessive feeding It may also follow chill or a sudden change in the weather. If the child is feverish from any cause, e.g. teething, diarrhoes is a common accompaniment.

In a mild case of simple acute diarrhoen, carcful protection from chill or from overheating, a cutting down of the amount of milk and diluting it further, perhaps with barley wnter, and a teaspoonful of castor oil comprise the treatment. In all cases of chronic diarrhoea medical advice is urgently cssential. The child should be kopt comfortably warm and carefully protecterl from all chill or exposure.

Infantile cholera, a very fatal form of diarrhoea, occurring during hot weather, affects children mostly in the first two years of life, chicfly those who are hand-fed and brought up in squalid surroundings. It is duo to germs in the milk which is impure or has
been kept tro long. A noteworthy symptom is loss of elasticity in the skin of the abdomen, and there is viouent sicknoss and diarrhnea with a tempern ture rising to $102^{\circ}$ to $10 t^{\circ} \mathrm{F}$., and dropping perhaps to $08^{\circ}$ with extrome prostration.
Preventive mensures are of the utmost importance. At the beginning of any hot spell. nore than ordinary precautions should be taken over the baby's food. Its bottles and nipples should be thoroughly scalded after each fecding, the milk should be perfectly fresh, and should be stcrilized. All milk should be kept in tightly closed receptacles in a conl place, and it is better to buy half the daily quantity needed morning and evening than the whole day's supply at once. The use of a baby's comforter is highly dangerous.
The baby should be seen by the doctor as soon as possible. but in the mcantime a pack inay be used. A towel or piece of sheeting is wrung out of cold water and wrapped mund the child from the arinpits downwards. Then a blanket is wrapped round and the baby is tucked up in its cot. Till vomiting has censed only cooled boiled water should be given; but after that albumen or whey is allowed. If signs of collapse appear. put the child in a hot bnth and give it a very little weak brandy.

DIBEER. This small gardening instru ment is used for planting potatoes, builus, groen crops, eto. The most useful form is the handle of a disused spade cut down to about 12 or 15 in . The point should be shod with imn as it keeps cleaner, works easier and laste longer. If not shod, the point should le charred with fire and then rubbed down with sandpaper. A foot-driven dibber is sometimes used for planting potatocs, but it is not recommended hy the beat authoritiee. See Cabhage : Chryanthemum; Dafforlil.

DICE. Dice are used in several games of chance for instance, backgammon: also in the class of games known as race games. They arc small piecers of ivory or wood, each having six equal sides. On cach side are dote, or pips, 1, 2, 3. 4, 5 and 6 in number respectively, these being arranged so that those on opposite sides shall together total 7. Thus 3 is opposite 4 and 1 is opposite 6 .
The dice, generally two but sometimes more in number, are thrown by the players in turn, either from the hand or from a dice bux. and the player receives the numbers that are uppermost as the dice lio on the table. Dice can be made by cutting pieces of wood into the neoessary shape and marking them with ink to make the dots. Great oare should be taken that the pieces are cut quite evenly ; otherwise tho dice will be unreliable and should not be used. See Backgammon.
DEE. Tho word die is applicd to various tools. The die used to stamp an address upon notepaper is known as an embossing die, being engraved with the let ters to be embossed on the paper. It is fised in a cast-iron frame, having a hand lever at the upper part which when depreseed forces the die down on to the paper. The paper is placed upon a counter. part having corresponding letters raieed on its surface. Dics for cutting screw threads are dealt with in the articlc Stocks and Dies. See Screw Plate.
DIELECTRIC. This is the non-conductor or insulating substance which separates the plates of a condenser. The actual capacity of a condenscr depends upon the nature of tho dielectric, i.e upon the dielectric constant, which for air is one, while for mica it may vary from 4 to 8 (according to the type of mica used). 'Thus the capacity of a condenser having a inica dielectric might bo as much as eight times that of a similar condenser eniploying air as the dielectric. See Capacity; Condenser.

## Diet: Its Scientific Principles

## Cardinal Rules Governing the Nutrition of the Body

The correct balance of the constituents of a dietary is discussed here. Particular aspects of the sublect are treated under such headings as Egg; Milk; while information on special diets required in disease will be found in the articles Consumption; Diabetes: etc. See also Digestion; Eating: Food
'l'he easentials of a proper diet are that t. should provide for growth and for the replacement of waste, that it should furnish the heat and energy required by the body, and that it should furnish also a measure of stimulation to metabolism and to the functions of the alimentary tract. An analysis of fondstuffs shows that they are made up of certain constituents, namely, proteins or nitrogenous substances, carbohydrates, fats. salts, vitamins and water.

The protcins, of which white of egg and lean meat are examples, are the tissue-builder and make good the loss of tissue due to the wear and tear of living: they also go to the making of the sccretions of the body. A growing person requires a liberal allowance of proteins. Thesc substances are contained in Hesh, fish and fowl and also in wheat and other vegetable foods, but those of animal origin have in addition a certain dynamic quality which explains the oraring for animal food in cold climates, and the lessened inclination for it among dwellers in tempernte climes during the hotter weather. Protcins also furnish a certain amount of heat and encrgy, but tho proper sources of most of our requirements of theac are carbohydrates and fata.

## Calorie the Unit of Enersy

The amount of heat, and incidentally of energy, as heat and energy arc convertible into one another, furnished to the body by fixed amounta of protein, fat and carbohydrate can be estimated by burning them outside the body. The amount of heat is calculated according to a unit known as a calorie, or, as is usual when dealing with foodstuffs, a large, or kilogramme, calorie.
A calorie, or small caloric, is the quantity of heat required to raise the temperature of 1 gramme of water through $1^{\circ} \mathrm{C}$. ; a large caloric, that required to raise the temperature of 1 kilogramine, or 1 litre, of water also through $1^{\circ} \mathrm{C}$. In what follows, when the erm caloric is used it is the large calorie that is meant.

It has been found then that 1 gramme of either protein or carbohydrate produces 4 calories, while the same amount of fat produces 9 calories. The excellence of fat as a source of heat is apparent, and, for a reason to be mentioned hereafter when treating of vitamins, fat is an essential part of any diet. It might appear then, that fat might be used altogether in place of carbohydrate, but this is not so; the body cannot burn up fat properly unless in the presence of a relatively large amount of carbohydrate. Otherwise poisonous sub. stances accumulate in the blood. The optimum balance differs, however, with circumstances. In cold climates and in cold weather an increase of fat is indicated.
From experiments it has been found that the number of calories expended and required in tho 24 hours by various classes of persons are as follows:

| Man dolng hard inuscular work <br> Man dolug moderato muscular | $\mathbf{4 , 0 0 0}$ calorles |
| :--- | :--- | :--- | :--- |
| work. |  |

Different opinions have been expressed regarding the relative proportions of tho three food constituents which should be represented in the diet. Two scales which have been suggested as suitable for a man
doing light muscular work, that is, requiring 3,000 calories, are as followe :

| Proteln | Carbohydrate | Fat | Actual Calorle |
| :---: | :---: | :---: | :---: |
|  |  |  | value |
| 120 granmea | 500 xrammes | 50 grammes | 3,007 |
| 100 | 350 | 100 | 3,000 |

The salts in foodstuffis include those of iron, calcium, magnesium, sodium and potassium, and are necesarary in tissuo building or, in various rays, in the chemical processos which go on in tho body.

Even should a diet be corrccted, however, in all the particulars mentioned up to this point, it will not be a good diet. unless the foods included contain certain subatances known as nercesory fond factore or vitamins. Screral of these vitamins have been recognized. namely, threo which are soluble in fat, but not in water, and known respectively as $A, 1$ ) and F, and three which are soluble in water and known as B, B2 and C.

Fat soluble A prevents xerophthalnion, D prevents rickets, and E has been shown to be neccasary to reproduction in rats fed on an artificial diet in which A and D were present: the absence of rater-soluble $B$ leads to beriberi, and it is thercfore also known as the nntineuritio vitamin: B2 preventa pellagra; while tho absence of water-soluble C leads to scurvy and it is therefore called the anti-scorbutic vitamin. It is probable that ill-delined discases nccurring in those who feed on artiticial foods is cxplained by vitamin starvation.

In the following table the vitamin content of various foods is set out :

| Foodstull | $\underset{\text { Fat }}{\substack{\text { Foluble } \\ \text { S }}}$ | Water Soluble I | Winter Soluble C |
| :---: | :---: | :---: | :---: |
| Milk | + + | - | + |
| Hutter . | $t+t$ | - | - |
| Cream | + + | - | $+9$ |
| Figa yolk | + + | + + | - |
| Beef fat |  | - |  |
| Mitton fat.. | + | - |  |
| Lard .. . | - | - |  |
| l'ork .. . . | - | - |  |
| White flah . . . | - | - |  |
| licrring .. .. | - | - | - |
| Cod-llver oll ... | $t++$ | - | - |
|  | + | - | - |
| Vegctabic olls . | + | - | - |
| Wheat (wholc graln) | + | + + | - |
| White flour. . . . | + | + | - |
| Polished rice . | - | - | - |
| Fresh Prult (especially orange, lemon, grape frult, tomato) | - | - | t- + + |
| Nuts .. $\quad .$. | - | $t+t$ |  |
| Qreen (ravi) vegetables | + + | - | $t+t$ |
| Green vegctables |  |  |  |
| (cooked for a short time |  | - |  |
| Potato . . . . . |  | + | + + |
| Swede turnij) | - |  | $++$ |
| Yeast .. . | - | $t+$ + | + |

Foods which contain vitamin A generally contain $D$ also, and the statements in the first column above, regarding the presence and richness of vitamin A, may be taken as applying equally to vitamin $D$. Therc is very little vitamin $\mathbf{D}$ in green vegetables, however and conversely the body fat of fish contains no vitamin $A$ but a fair proportion of vitamin D, so that herrings, for example, may be used as a source of the latter. What is said about
vitamin B above appliea more or lesa to vitamin B2, but mill, which does not contain the former contuins the latter, and this also ocours in lean meat. fish, cheese and eggs.
Other characteristics of a good diet remain to he considered. It must excite the digestive functions and must contain a sufficient amount of indigestible material, or, ns it is called, roughage, to stimulate the muscular movements of the gut and so promote regularity in the action of the bowels.
Appetite and digestion are improved by variety in the diet and by good cooking. Foods which require chewing are helpful because they allow time for the action of saliva, and the act of chewing stimulates the flow of gastric juice. Moreover, it should be recognized that chewing crisp food, suoh as an apple, is n natural method of clennsing the teeth. Roughage is supplied chiefly by the cellulose contitincd in vegetables and fruits
An excessive diet strains the digestive and exeretory apparatus of the body, leading to indigestion and auto-intoxication. Some of the excess is laid down as fat, and a flabby obesity is also the common result of an excessive consumption of carbohydrates, another result being Hatulent indigeation. In some diseases adjustment of the diet is the most important part of the trentment.
After a perann has passed middle ago his dietary ahould be reviewed frequently and the quantity should diminish pari-passal with his output of work ns the yenrs go on. For old age ford must be simple and easily digested and na the body heat is less easily maintained, it should contain an adequate amount of fats and carbohydrates.
DIFFERENTIAL GEAR. The dificential, or balance, gear as now used in a motor car is always inoorporated in the live axle. The differential is employed so that the relative movement of the back wheels shall be capable of self-adjustment to the needs of the moment. When tho vehicle is turning a corner it will be ohvious that the wheel on the inside of the curve is travelling much slower than the outside whicel.
Two Designs of the Gear. There are two designs of differential genrs employed, viz. the bevel and spur pinion types. The betterknown and more easily understood is the bevel. First of all it has to be remembered that the road wheels control the diferential.
In the diagram, A is the crown whecl driven by the bevel pinion B. The crown wheel A is mounted solid with the differential case $\mathbf{C}$, which rotates on the same centres, hut independently of the axle-shafts $\mathbf{D}$ and $\mathbf{E}$ The differential case C carrics the bearing pin $\mathbf{F}$, on which the two smal! bevel pinions $G$ are mounted. These pinions are capnble of independent rotation, but are both in mesh with the large bevel pinions mounted solid on the axle shafts D and E. Therefore, so long as the axle shafts $D$ and $E$ are rotating at an squal apeed (owing to the car travelling in a atraight line) there will be no movement of the pinions G , the whole rotnting as though solid through the medium of the crown wheel $A$, which is a part of the differential case $\mathbf{C}$.
Now, assume that the car is travelling to the right of the page and an is turning to the right. During this movement of the car the road wheel that is a part of the sxle shaft D will have to make a greater number of revolutions, ns it is on the outside of the curve, than the road wheel that is a part of the axle shaft $E$. and is on the inside of the ourve. To allow of this movement, it will be obvious that the two small hevels $G$ will be turned through the medium of the large bevel pinion on the axle shnft D , in the direction of the two curved arrows shown in the small dingram. thereby allowing the rolative differences of
speed between the two aslo sha!ts $D$ and $E$ to take place.

The two small hevel pinions $G$ are in reality a compensating coupling hetween the axle shafta $D$ and $E$, their novement being governed

solely by the variations of speed between the two road wheels. In all other respects they act ay the driving medium to the axle shafts so long as the road whecls are in contact with the ground

If, however, one of the wheels should be lifted free of the ground, and the crown wheel A rotated, then the small pinions $G$ will be freo to rotate, and by so doing will reverse the direction of rontation of the wheel that is lifted free, the other wheel remaining stationary On high-powered vehicles three or four of the amall pinions $\mathbf{G}$ arc employed. Sec Genr ; Notor Car:

DIGESTER : Use in Cooking. Strong iron boilers used for making soups, etc., are known as digesters They have lids which screw down tightly so as to confine nll the steam, and by this means the water miny be heated several degrees higher than boiling point. So that the vessel will not burst, the lid is fitted with a safety valve by which the hent of the steam can be regulated. Meat cooked in thesc boilers may be entirely dissolved and honcs reduced to jelly.
A specinl type of digester allows the steam to eacrpe through the valve on the lid, and for this reason should be ouly three parta filled with water. When cooking begins, it should be placed near a slow fire and its contents allowed to simmer for 8-10 hours. The soup should then be strained through a hair sieve or colander, put back into the digester, vegetables and seasoning added, and the whole boiled for 1-2 hours. Digesters of this kind vary in capacity from 4 quarts to 10 gallons. Sucepan and stewpan digesters mave on the same principles hold from 1-8 quarts. To olean digesters, wash them in hot water to which a little sodia has been alded, and then scrub them inside and out. Finally rinse them and dry them with a clean cloth. The digester has heen largely superseded by the casserole, at least as far as stews are concerned. See Casserole; Soup; Stockpot.
DIGESTION: Its Functions. The food that we eat would fail of its purpose wero it not altered into products suitable for the nourishment of every part of our hodies These products are carried in the blood and must, thercfore, be soluble. The process of alteration is known as digestion. The changes involved are many and complicated, but all are supervised, without conscious cffort, by the nervous system, which has filaments at every point of the canal, 30 ft . long, traversed by the food.

In the mouth, digestion of starchy foods is begun by the salivn, while movements of oheek and tongue aid the teeth in crushing the food into a anft muncled mass or bolus.

Swallowing is hegun by the tongue pushing bnck the bolus into the grasp of the muscles surrounding the throat. These pass it quickly over the air passage, which is pmetected by a small hap called the epiglottis. The musclea of the cesophagus next puah the food into the stomnch.
The stomach is a rensitive muscular tuhe changing frequently in shape and position. Its lining produces gastrio juice, which renders the food acid and digests to a lange extent the meaty portion of the diet. The formation of gast ic juices is increased when one sees food nnd when chewing takes plice, ns well as at the time of its arrival in the stomach. Hence the inportance of food being cooked in an appetizing way and attractively served.
An ordinary meal remains for some four hours in the stomach and is then pressed out. in a liquid atate. into the upper end of the small intestine, or duodenum A short distance down, a duct brings to it the secretions of the liver and pancreas. The fluid formed by the liver is called bile, and this is an importaut agent in digesting fatty foode The pancreatio juice acts on starehy or farinaceous suhstances and also causes further disintegration of meat products
The long coils of the small intestine lie in many lonps packed in the central part of the abdomen, and the absorption of feeding. stuffs mainly occurs while the food is heing propelled by regular waves of contraction. called peristalsis, along the seven yards of these coils:
In addition to the digestive juices mentioned above, there is a secretion from multitudinous amall glands which dot the lining memhrane of this tube. This secretion aids digcstion and makes the food alkaline. The lining mem brane is also onrrugated into transverse rilges, so that an extensivo surface is presented to the digesting food and its rate of flow delayed. All over the surface occur minute pinjections whioh have inside them a network of bloodveasels and lactenls. These villi, being bathed in digested food, suck ont from it the nourish. ment which serves to renovate all parts of the borly. The special function of the Incteal vessels is to collect the digested fats. These are carricd into the thoracio duct, which dischargea them into the great veins near the heart.
The contents of the small intestine pass into the large intestine, at the commencement of which is situated the vermiform appendix. This is the worm-like hlind pouch so well known as the site of appendicitis. The largo intestine is provided with many mucous glands, and single lymphoid glands which probably serve to drain off deleterious substances. It incasures a bout 2 yards in length and terminates in the rectum, where the undigested remmants of fond and the remaina of digesting tluids collect until voided. Regularity in passing the excretions should bo taught in infanoy. If such errors as insuff. cient exercise, unduc restriction of drinking water and the use of tight clothing are avoided, the linhit will remain regular provided the diet is reasonable in quantity and quality. See Dict: Indigostion.

DIGESTIVE. A substance which rein. forces the digestive juices of the body, and therefore is useful in dyspepsia and digestive weakness generally, is termed $n$ digestive. The digestive may be given inwardly to he of rasistance in the process going on in the alimentary tract, or, as in the peptonizing of milk, etc., it is added to the food and allowed to act for a certain time before this is taken.

Some digent the proteins, like lcan meat and white of egg, c.g. pepsin. This ferment, dose jo to 10 grains, may be given in powder, pill, crohet, or tablet, or in liquid form as the glycerin of pepsin. dose 1 to 2 drams, and in this case is usually combined with $\Omega$ little dilute hydrochloric acid. I'ancreatio solution,


Digging. Pigs. 1-12. Diagrams illustrating effective ways of digging a kitchen garden. Figs. 1-4. Double digging. Figs. 6-10. Single dirging. Pig. 11. Emergency digging, 12. How to dig a large plo:
dose 1 to $\because$ drams, contains trypsin, which is a protein digentant, and also a ferment which digests starch.
Bencer's food cont:lins whesten flour, with the addition of the digestive ferments of pancreatic juice, which convert its contained starch into sugar, while tho milk used in the preparation of the food is partially peptoni\%ed. The rood as prepared can be giaded to the patient's digestive powers by allowing a longer or shorter time for the action of the ferments, hefore finally stopping this by bring. ing the food to the boil
Among other digestives of starch, mention may be suade of taka-diastase, obtainable in capsules, dose 1 to 5 grains, and extract of mult, dose 1 to 4 drams. The latter may be useful in dyspepsia in children in a dose of a easpoonful thrioe daily.
DIGGING. The successful management of plants depends chiefly on deep oultivation of the soil by digging and trenching. 'Trenching cultivates tho soil three spits (a spit is the depth of soil removed by the spado when thrust straight down) : (louble digging cultivates it two spits, and in ordinary digging the surface only is turned over.

The way to dig a piece of cultivated ground is to take out a trench 2 ft . deep across one end of the plot and to place the soil at the opposite end of the plot. The bottom of the trench is forked over and garden rofuse or strawy manure is mixed in. The top layer of the next 2 ft . strip of ground is then placed in the bottom of the first trench and stable or farmyard manure, if available, is forked into it. The second layer of soil is placed on top of it. thus filling the first and opening the second trench. And so the work is continued until the end of the plot is reached, when the soil excavated from the first trench is used to fill the last one. This method of cultivation is sufficient for general purposes ; those who grow produce for exhibition sometimes trench the ground three spits deep; manure is placed in the second spit of soil and rough garden refuse, or coarse inanure, in the bottom of the trench.
A different practice is followed when dealing with fresh lind-that is land which has not
been previously cultivated ns a garden. If it is covered with turf this should be stripped off about 3 in . deep and stacked for a year. It may then be dug into the ground. A 2 ft . wide trench is dug across one end of the plot and the soil taken out is placed at the end as already described. But the next detail is different, becausc it is essential that the top soil and subsoil be kept in the same respective positions.

This is assured by taking off the top spit from the second 2 ft . strip of ground and placing it also at the opposite end of the plot. Thus the first trench is empty and the second trench is half empty. The subsoil from the second trench is then placed in the bottom of the first trench and the top soil from the next strip of ground is put on it. Thus the first trench is full, the second is empty, and the third is half empty. The method keeps the subsoil and the top soil in the same positions ns they were before. In subsequent years their positions may be reversed by adopting the ordinary metzod of trenching as already described.

The Diagrams Explained. The accompanying diagrams picture three inethods of digging. Figs. 1 to 4 cover what is known as double digging, which, although entailing much hard work, ensures perfect preparation of the soil. Commence by taking out a trench two spits deep and carry the soil to the spot where digging will end. Break up the subsoil A, transfer the top aoil $B$ on to this, and then lift the second spit C on top. Fig. 2 shows the resulting position. Now break up the subsoil at the bottom of the new trench, dig down the top soil $E$ to second place, and again transfer the second spit to the surface Continue the operation in this order until the whole plot is completely dug.

The position at the end of the first digging is show $n$ in Fig. 3; the subsoil A is broken and loosened, the good top soil has taken the place of the original second spit, while the whole of the second spit has been brought to the surface for weathering. This first digging is done during the autuinn. In spring the second digging is carried out in precisely the same manner, which restores the freshened under-
spit to its original position and brings the old top spit to the surface again. The soil taken from the first trench is used to fill the vacant trench left at the end.

Figs. 5 to 10 show a single digging method which will be found highly satisfactory when time cannot be devoted to double digging Take out a trench one spit deep, as in Fig. 5. follow with another half the width (Fig. 6), and conclude by breaking up the bottom spit, as in Fig. 7. Dig over the second spit D, as in Fig. 8, and then loosen the bottom spit E. Now lift the top soil F on to D (Fig. 9), which refills and completes the first trench (Fig. 10.) The operation is continued in the same manner -that is to say, the next portion of undug second spit is put above the broken bottom spit, the next top spit carried to the surface. and so on. Fill the last hole with the soil taken from the original trench.

Another method, easier still. is shown in Fig. 11. Simply take out a trench one spit deep and break up and manure the soil beneath. Dig the next top spit on to this, continuing as directed by the arrows in the sketch.

An excellent way to dig a large surface methodically and regularly is to divide the plot into three sections, as pictured in Fig 12. Commence by taking out a trench at $A$, and deposit the soil at A A. Step backwards and transfer $B$ into trench $A$, and work down to $C$, as directed by the arrows. An empty trench will consequently result at $C$, and into this dig the soil from i). Then face the open trench at $D$, and continue until you have an open trench at $F$. Now face this trench, and dig on in the same order until the end of the plot is reached. An open trench, of course, results at $G$, and into this place the soil A A from the original trench See Garden; Spade.
DIGITALIS. This powerful and useful drug is obtained from the foxglove. Its chief action is to slow the beat of the heart and to increase blood pressurc. It is often used when the blood pressure is low, and is of value in cases of heart disease and dropsy. But when taken over a period it may accumulate in the body and lead to poisoning. The first symptoms are palpitation and unevenness of the heart beat. In severe cascs the patient turns livid, with shortness of breath, and should be put to bed at once, avoiding all exertion until the doctor arrives. Strong hot tea, diluted spirits, or sal volatile should he given. When poisoning is due to an overdoso, an emetic must be given to start with, and vomiting encouraged by draughts of tepid water: See Foxglove; Heart. Pron. Dij'i-tã-lis.

DILAPDDATIONS. This is a subject of increased importance to the householder owing to the high cost of labour and the consequent necessity of doing his own renovating wherever possible.

In purchasing a house, due regar! should be paid to those parts which are likely to prove vulnerable from the standpoint of dilapidations. Externally, these may be summed up, as the brickwork and the roof. $\mathrm{R}_{\mathrm{f}}$-pointing brickwork that has perhaps becone unsound enough to be no longer weatherproof, owing to percolation of the mortar, the bricks themselves, or both, is an expensive business, and can hardly be tackled by anybody not possessing practical knowledge of building; nor is the repliscing of slates or tiles any leas an expert's job.
Internally, however, there are certain dilapidations which can be put right without much trouble. Papering and painting are among them. Other dilapidations likely to call for attention more frequently than the walls or woorlwork are those of door handles, electric or other bells, the stained parts of floors, the catohes of windows, painted metal baths, etc. These are comparatively small matters which can be dealt with as occasion
demands. The major dilapidations involving papering and painting lose much of their formidableness if they are taken in hand gradually and systematically See lBuilding : Cottage; Lease : Repnirs.
DILL. Aromatic herb with finely divided toliage resembling fennel, but of much smalles growth. It mny be raised from sced sown in spring, the plants being thinned to about 1 ft. apart. The laves are used for flavouring soups and sauces, and the seed for distilling oil of dill and for making the carminative known as dill water.
Dill Water. For infants and children a useful corminative is found in dill water, which is prepared from the dried seed of the
plant. The dose is 1 to 2 fluid oz; for children, a teaspoonful. For Hatulence and hiccough an infant may be given half a teasporonful with a little pinch of bicarbonate of soda sulded.

DIMORPHOTHECA (Nsmuqunland daisy or star of the veldt). This is a bcautiful hardy annual hearing daisy-like llowers in orange, yellow, salmon, apricot, and blush. The sceds are sown out of doors in April where the plants are to bloom in suminor they like a sunny position and well drained soil Star of the veldt also makes a good pot plant for the greenhouse. Sceds are sown thinly in 5 inch pots of soil and the seedlings are thinned out, not transplanted.

## The Dining Room and its Furnishing

## Practical Suggestions for Small and Large Houses

The entries on the various pieces of furniture should be consulted, e.g. Chair: Sideboard; Table. See also Alcove; Carpet; Colour; Cupboard; Curtain; Decoration, ect.; while attention is drawn to the article Dinner

In recently-built houses the position of the dining room is generally decided with due regard to aspect Under other circumstances, where choice is possible, a window facing cast is a desirable feature in the room selected as a dining room, in order to get the advantage of any sunshine at breakfast time.
The ideal arrangement in a detached house is a corner mom with a window facing south and another east, especially if possessing French casements opening on to a veranda or loggia so that the dining room may be practically oxtended in the summer hy meals being taken outside. A uscful piese of furniture for this is a threo-tiered service trolley, obtainable with a locking device, which when released allows the three tiers to swing into a level position, forming $n$ table at which several people can be seated comfortably for a meal, the trolley being loaded with requirementa and easily wheeled from the kitchen. thus frilitating service.

Dining Room. Fig. 1. Room in Spanish style, this note belng atruck in the tiled floor, distinctive table equipment. nail-studded leather chnirs and wrought fron sconces


Aids to Service. The most practical con. sideration in connexion with the dining ronm is service with the kitchen. In the ambll house, where the room is next to the kitchen and one maid is kept. a service hatch saves many footsteps in the day. It may be arranged, as shown in the third illustration, with a china cuphoard to balance it on the other side of the oak Welsh dresser. In this case the hatch in itself forms a useful place for storing china and glass. On the lower shelf on the dining room side glass is kept, while china is stored on the
glazed upper portion on the kitchen side.

A service feature in some of the smaller modern dining moms is a built-in sideboard with a hatch forming its upper part which


Fir. 2. Small dining room in Empirestyle. The prevailing tones in this roomare sbades of rrey, deep coral pink and black, with farniture in accord with the period
on the kitchen side, are simply obtained by the use of browns anc is part of the dresser. shades of cream to orange. The frieze and When the cutlery ceiling could be distempered a creanis. and china liave been apricot. Dinner services should always be uashed up they are chosen with regard to the decorative scheme placed on shelves of the dining room. accessible from tho dining mom side so on the litchen side, are simply obtainal by the use of browns an
that they are ready for laying the next meal.
Sometinies the service hatch looks like a small wall cupboand which, when opened in the dining room, reveals circular trays, revolved when necessary on a central pivot.

For dining rooms which are not on the same lloor as the kitchen, a small service lift cithes worked by eloctricity or hand-power with pulley ropes, is the only method of obviating the necessity of loaded trays. Such lifts can be installed without muoh difficulty if the dining room is directly above the kitchen and there are no reatrictions to preclude it. For the long corridor in a flat or house between kitchen and dining room the tiered service wagon is practically a necessity.

In the larger type of dining room, a good arrangement is for a liatch to open into a small pantry, which amounts to a cut-ofi lobby separating the kitchen from the dining room. Such a pantry should be well ventilated, and fitted with shelves and a sink.

Attractive Schemes. Styles in decoration and furnishing for rlining rooms are so many that choice is almost bewidering when confronted with this problem in a fresh home The type of house, size of room and question of expense will all he decisive factors. If $n$ houso has been fairly recently dosigned it will probably he equipped with a built in side. board. Should cuphoards and a window seat also have been added, the fooring be laid parquet and the walls panelled, the furnishing question merely resolves itself into suitable table and chairs, with well designed carpet and curtains in such n room beautiful effects
effect is oftell used tor the walls. A room in Spanish style is shown in Fig. 1. The nail. studded leather upholstered chairs, wrought imon sconces, and table setting stress the Spanish note. A dining ronm inspired by this schome could have tiles in black and grey marble rubher flooring, salmon pink tinted plaster walls and curtains in velvet of a dark olive green.
Extreme styles in turnishing include a dining table with a heavy pexdestal instead of legs, and chairs with steel tubes instend of woodwork and cane upholstery More uni versally admired are charming rooms with a suggestion of period setting like that seen in Fig. 2, with its simple yet formal Empire style. The ropes and huge tassel instead of a pelmet are a happy thought. as they exclude no light, while the treatinent of the chimney picco is in perfect taste
Such a furnishing would be suitable tor a simaller dining room in a llat and vould be one of which the inmates would not tirc. The colour of the wall paper could be in two shades of grey, a black note for the medallions and playues, the pantwork in the deeper grey scuinbled over a silver powder undercont and tinished with egrshell gloss varnish. The line of moulding between ceiling and walls would be in black. which would be repented for the curds and tasels. while the curtains brighten the colour scheme with deep coral pink, a paler shade heing used to distemper the ceiling.

Fig. 3 also shows a scheme of furnishing suitable for a small room, but of less formal type with ite gate-legged cak talile, Welsh diesser and rush sented chairs. An onk chest and brick fireplace would complete the scheme which would be pleasant carried out in a golden ainber shade of water paint for the valls, with a paler shinde for ceiling. a Wilton enrpet in Persian design and curtains of shot fabric suitably hlending the colours of the carpet.

In lig. 4 is illustrated a good arrange ment for tho tiny bungalow dining room, or a hall dining mom, sometimes met with in a small flat. The simple oak stools are enriched with mamon coloured velvet cusbions. liaving gold tassels at the corners; the golden note could he picked up in the brass candlesticks and the Ianternshaped lighting fitting. The iralls of the room and ceiling could be dis. tempered a pinkish stone with frieze moulding of light brown to match the weathered oak colour of door and furniture. The carpet wrould be of natural baircond. For the winter there would be curtains of maroon velours.

## Dining Tables, Practical and Pleasing With Details about the Construction of Expanding Tables

Further articles in this work deal with other types of gable, e.g. Bed Table: Console Table: Table Writing Table. See too Billiard Table; Sideboard. The craftsman should consult the entrics Amateur Carfentry; Cabinet Making; Joint, cte.

The iirst dining table was just an ordinary table put to this use, square and solid, and quite plain Dining tables soon became more elaborate articles of furniture, made to harmonize with the other pieces in the rnom. They were of nak, mahogany, cedar or chestnut. but the cheaper wonds snon came into use.


Making a Table. Of all the various ty pes of extending tables, the draw table (Fig. 1) is stilt in many reapects the best. It is simple in action, durable and absolutely rigid, and has passed the test of time. as is amply proved hy the inspection of the old 16 th century draiv tables. Their only disadvantage compared with the telescopic type is that whereas the latter can be oxtended to over four times its normal length. the draw type will only open to nearly double the length However. this is ample for ordinary purposes
Differing from other types, the legs and underframing remain stationary. While the eaves or extentions arc contained under the main top and aro pulled out at each end when required, being supported by bearers tupering townads their extrenities These bearers are screwed to the extensions and fit into notches cut in the end rails of the table. W'hen pulled out the effect is to raise the extensions up to the height of the main top, which is lonse, forming a flush join The top. linwever. can-


Dining Table. Extending table made in the Adam style. Above. lett. circular table in Chippendale style with claw and ba!] feet Courlesy of wh initeley. r.ed

At the end of the 8th century the dining table was, as a rule extremely well made. The usual type in the best houses wrs one supporter upon pillans and claws, four claws to each pillar, and run ning upon brass castors. By this time the idea of the expanding table had been evolverl, ind patents for this werc taken out before 1800
Then came the expinding table woiked by not be lifted off or moved sidellsys, its it is means of a long screw. By turning this the kept in position by guides To close the table, tablo can be opened out and loose lenves the main top is lifterl to allow the extensions inserted theroin, thus, if necessary, doubling to pass undernenth. the length of the original table. In the 19th century a circular or oval expanding table wis introduced into the English dining room.


Dining Room. Fig. 3. Design for a small room with light walls and oak furniture. There is a chlna cuphoard and service batch on either side of the dressar. Fig. 4. Charming arrangement where apace is limited Fig 3. courtes॥ ol Our Homes \& Gardens

Success lies in the corrcct making of the beirers, and it is advisable to set these out full size before commencing the job The legs are cut from 4 in. squares and are mortised to take the rails, the tenons of which should be as long as powsiblo to obtain the maximum strength. They are also pinnerl. Note that at one end the notches for the bearery occur inmediatcly againat the legr, so that the width of the tenon willonly be from the bottom of the notch to the bottom of the rail (Fig. 3). A grooved moulding is worked on the rails, though this may be omitted if desired: the samo applies to the lower rails or stretchers Having tumed the legs, the table may be glued together ; the underframing does not differ from that of an ordinary tahle except that allowance is made in the height for the thickness of two tops.

Below the main top and between the two extensions is now fixed a centro cross picce (Fig. 2). This measures in length just the width of the top; it is 1 ft . wirle, and the same thickness as the top. Tivo slots are cut, as in Fig. 4. to take the two top guides; the cross pioce is screwed to the rails. The top and two extensions are now made as in Figs. 5 and 6. The 1 in . framing is mitred and tongued at the corners, with two centre cross rails tenoned between and having $\frac{3}{} \mathrm{in}$. panels tongued and gronved between them ; panels are not glued.

When the framing is glued together, the whole should be trued up and thicknessed.
making sure that it is perfectly straight and flat and out, of winding. Two packing pieces are then fixcd to the centre panel at the sides so as to obtain extra thickness for the two top guides which are stub-tenoned underneath. These guides are $3 \frac{1}{2}$ in deep with slots cut near the bottom into which stops are fitted after the top is put in position, thus preventing any possibility of the top being lifted right off.
The bescers are cut from $1 \frac{1}{2} \mathrm{in}$. stuff, 2 in thick, and tapered at one end. Fig. 2 shows where taper commences. As the top is 1 in . thick, it will be required to taper the bearers $l$ in. so that the extensions will be raised just this amount The taper commences about $\mathcal{Z}$ in. in front of the inner edge of the extension, so that when open the main tnp will rest upon the same surface as the extension. (In the middle, of course, the top is supported by the centre cross piece.)
The notches are now cut in the end raila of the tahle, so positioned that the bearers at one end will fit just inside those at the other end ; in depth they are cut just the thickness of the bearcrs at that point when the table is olnsed. The bearers are now screwed to the

extensions and the whole job is assembled. Guides are fixed as in Fig 4: these are deep enough to take the cmos picces, which are screwed on to prevent the extensions from being lifted up. Apart from this they take no actual strain, the whole weight being divided between the end rails and the centre cross piece (Fig. 2). Stops are fitted to the underside of the bearers to prevent them from being pulled right out. When the movement is tested,
the table should be tried to see that when onened the whole top


Fig.



Fig. 2

Mortises for


Dining Table. Pigs. 1-6. Dieful dram table und working diagrams ahowing how it can be made


Dining Table. Figs. 7-11. Circular teleacoplc table and díagrams showing the conatruction of the various parta. Figs. 12-13. Showing how the table is extended to an oval and tow the leaves are dowelled
is in a straight line; also that the extensions bed right down firmly without any give in any of the corners. A good lubricant for the bearers is ordinary candle grease

A Telescopic Table. Fig. 7 is an example of the telescopic table. To open, it is simply pulled out at each end and $n$ loose leaf inserted in the centre. In this cass the legs move with the top, there leing two rails at each side, kept rigid by a tongue.

A table of this description could, by the addition of extra rails or slides, be made to extend oonsiderably, being operated by means of a revolving screw.

The legs are made out of 4 in mahogany, and are marked out for the mortises, allowance being made in the height for the castors. It aliould he noticed that in the one pair of legs the mortises are set nearer to the middle to take the inner rails (Fig. 12). The mortises are $\frac{5}{4}$ in. wide and should meet; the legs are then marked out to shape and tapered accordingly. The end and outer rails are 4 in by $1 \frac{1}{2} \mathrm{in}$, and the inner rails 3 in . by $1 \frac{1}{\mathrm{in}}$. The reason for the latter being 1 in . lass in width will be obvious from Figs. 8 and 9, since the cross rail fastened to the onter rails will have to pass under them.

The tenons of all the rails are marked out and cut, and-it will he observed that thoae of the inner and outer rails occur at one end only, the other ends being cut off square. The grooves in the rails are gauged from the top edges and ploughed to a depth of $\frac{1}{1}$ in. : they are $\mathcal{J}^{3}$ in wide. The tongue is then glued into the groove of the inner rails and allowed thoroughly to set. All rails and tongues should be of hardwood, which is essential for all work of this kind.
At a distance of $1 \frac{1}{2} \mathrm{in}$. from the square ends of the rails cross rails are dovetailed under
neath (Fig. 10). It is essential that these cross rails should be marked out to the eract length, as one pair of rails must fit just inside the other, forming two sets of exactly parallel rails (Figs. 11 and 12). The dovetails are supplemented with screws.

The various parts are now glued up, each pair of legs with its accompanying rails forming a complete set. When dry the two parts are fitted into each other and two stope screwed to the top of the lower cross rail (Fig. 11). When fixing these, allowance must be made for the table to open about 1 in. more than is required when the leaf is put in, as this is fitted with short dowels (Fig. 13). The moulding is then glued to the outer rails, as indicated in Fig 10.

For the top thoroughly seasoned timber must be used; it will be necessary to joint this, the shape being cut afterwards. The best way to mark this out is to use a thin lath
with a pin driven through near one end to use as a centre, and revolve the lath round this, holding a pencil at the other end. The two fixed tops are pooket-screwed to the rails, as in Fig. 10. Short dowels are glued into one side, and fit into corresponding holes at the other (Fig. 13). The leaf is also dowelled at one side, and with holes at the other, so that it will always be put in the same position whatever size of table is required.

Having screwed the top on, the joint is planed level with a trying plane: the leaf is also put in and levelled. The ends of the leaf are quite straight, and form a continuous line with the semicircular shape of the fixed tops. The edge is rounded off, as in Fig. 10. while the leaf is in, thus ensuring their coinciding. Candle grease is a good lubricant to use should the slides run stifify; oil or any other liquid tends to expand the wood, thus making them run more tightly, which may perhaps cause them to jam.

## DINNER AND DINNER PARTY

## Suggestions that Housewife and Hostess will Appreciate

## The reader may with advantage consult the article Table and the entriea on the various dishes mentioned in the contribution below. See also Dining Room; Service Wagon

The home dinner need not be elaborate, and the dishes may contain very simple ingredients; but the cooking should be good, the hot food served really hot, and the table should be attractively laid.

The meal should be served punctually. In many homes the dining room has to serve several purposes besides its use at mealtimes, and will need a little tidying and readjustment before it is ready for the family dinner. During the winter the fire should be made up and the hearth swept before the table is laid, and the windows opened to ventilate the room.
Menus should be as varied as possible, and the likes and dislikes of the members of the family considered. A good arrangement when a three-course meal is taken is to have soup. grapefruit or melon, followed by a joint, savoury or dessert, three evenings of the weak. and fish, entrée, or a vegetable dish such as asparagus or salsify, and a sweet on the alternate evenings.
For evenings when the cook is out, or time for the preparation of dinner is short, soup can be prepared, a meat pie or stew that only needs re-heating left ready, and a cold sweet made in the morning.
The Sunday evening dinner usually becomes in reality supper. Soup may be the first course, and cold meat or a pie can be served with an inviting salad or sliced beetroot and hot potatoes baked in their skins; or a mayonnaise is generally liked in summer. In winter a casserole meat dish is more suitable than cold food, and a tart or steamed pudding can soon be warmed up, while a cold extrs sweet can be prepared and served in the event of unexpected guests, and also additional dessert.
Such arrangements serve for an informal dinner with one or two guests, but the formal dinner party needs careful planning.

Dinner Party Etiquette. Dullness should be guarded against by inviting the right persons to meet, in the case of a small party, or by arranging the table, in the case of a large party, so as to bring together the people who are likely to have subjects of conversation in common. Another important factor of success is to give a well-cooked and wellchosen dinner; also to see that any wines to be drunk are good of their kind, and the service smooth and efficient.

In England, in large towns, the time of invitation varies between 8 and 8.45 ; in the country, between 7.30 and 8 ; about 10 minutes' grace being allowed for the guests to collect in the drawing room. Men on
arrival leave their coats and hats in the hall or in a cloak-room ; women are taken by a maid to a bedroom to remove their wraps. The host and hostess receive the gueats in the drawing room, where they are announced by a servant. Cocktails are usually offered.

At a ceromonious party all the arrangements of guests at the dinner table, and the order of preoedence into the dining room, are carefully worked out beforehand according to rank and importance. When dinner is announced the host offers his right arm to the most important woman present and takes her into the dining room. The hostess pairs off the other guests in the order of their social precedence, with the erception of the most important man present, who goes in last with her. The host places the woman he takes in on his right at the bottom of the table, the woman of second social importance being on his left. He stands until the guests are seated. The hostess sits at the top of table, with the man who has taken her in on her left.
At large parties it is quite usual to put a card with the name of a guest in each place, but where this is not done the host would tell each couple as they entered the dining room where they should sit. The necessary carving of joint, game, or poultry is done bv a servant, unless the host prefers to do it, other dishes being handed round, from which the guests help themselves. The guests on either side of the host are served first, and then straight along, or round, the table to each guest in turn, finishing with the host.

If champagne is to be drunk, it is first offered after the fish, the same rule applying to claret or light white wines, and any of these would be drunk until the savoury. At dessert it is oustomary to place decanters containing port, sherry and claret in front of the host. If a cloth is used, it is generally removed for dessert, and in any case peppers, salts, eto., pieces of bread, crumbs and glasses are cleared away, and fresh wineglasses are placed with the dessert plates and finger-bowls. After dessert is on the table, the servants withdraw.
At the end of dinner the hostess bows to the most important woman guest and rises. This is the signal for the women to leave the dining room, the hostess going out last. Coffee is served with liqueurs and cigarettes in the drawing room and dining room. At less formal parties coffee may be served before the women leave the dining room; otherwise the men join them in the drawing room in about a quarter of an hour. In town houses, when the regular staff is not large it is sometimes supplemented by engaging skilled assist-
ance. There are able women who specialize in cooking for dinner parties at a moderate fee. and private waiters can be obtained.

To give a successful party the hostess must not be worried over the dinner while it is in progress. It is better to think out a small menu of well-chosen dishes, comprising a soup, fish course, entrée, game or poultry, cold sweets and savoury, within the scope of her resources, than to attempt a banquet, which may be spoilt.
Dlnner Service. A well laid table is essential to entertaining and the charm of thia is enhanced by a good dinner service. These are usually made for twelve or six persons, and can be had at moderate prices in earthenware or semi-porcelain. The regulation servico for 12 persons starts with three sets of plates-meat. pudding, and choese, two or three dishes, two vegetable dishes with covers, and either a sauce-boat or sauce tureen with cover and stand. To this may be added 12 fish plates, soup plates, and a tureen with dish and cover. In small households and when entertaining the last item is often dispensed with, soup being served directly from the kitchen into plates, speoial cups or sets of bowls.
As with a breakfast service, the stock pattern may be reoommended, with the sug. gestion, where economy of space has to be considered, of choosing the same pattern for breakfast and dinner service. In any case thought must be given to colouring and style to ensure harmony with the room or any coloured glass that may be intended for use with the service.
For better services, modern Wedgwood and Coalport china are in perfeot taste and are decorated with many of the old designs.

DIPETEISRIA. The bacillus known as the Klebs-Loeffler is the germ of diphtheria, and the most striking local symptom of the disease is the formation of a greyish-white or yellow membrane on mucous surfaces, most frequently at the back of the throat and tonsils. The disease is highly contagious Germs may be found in the throats of apparently healthy people, and in some the microbe is not virulent, but in others it is, and they are diphtheria carriers.
The disease may begin with chilliness and other signs of fever, the tempersture being raised 2 or 3 degrees. Next day the throat is sore. angry and red, and some hours later there is a grey or yellowish patch on the tonsils or the back of the throat. Frequently there bs no complaint of sore throat, and diphtheria may exist for several days without its prosence being suspected. Parents would probably save much trouble if they would make a practice of looking at the throats of young children when they are "off colour."

The earlier the anti-loxin is given the better. If given on the first day, the dimease is almosi alvoays cut short. The prospects become rapidly worse. however, the longer serum treatment is delayed.
On the first suspicion of diphtheria the patient should be isolated, preferably in a large top-Hoor room with plenty of fresh air. One person only, who is to look after the case throughout, should be allowed to visit him. Clothing should be put to soak in a disinfect. ing solution before removal from the room.

It is important throughout the disease and sometimes well into convalescence to keep the child constantly lying down in bed, as there is always a risk of heart failure occurring. After the second week paralysis of various muscles may set in. If it affects the soft palate there is a regurgitation through the nose of any fluid the child may be drinking ; if of accommodation, near objects such as print cannot be seen distinctly ; if of the limbs, there is weakness in using them.

Cleansing the throst is not neoessary after anti-toxin has been given unless there is
foetor, when the throat may be swabbed or sprayed with buracic lotion. If the child struggles against swabbing it is better to discontinue it rather than riak exhaustion. The nurse ahould wear a inask or protect the eyes with gnggles. and if any mucus is spluttered on ber fice it should be washed off with an antiseptic Intion Swabs of cotton wool should be used tor wiping the face and cleansing the nose They slinuid be burnt at once If a croupy cough develnps, a bronchitis licttle (q.v.) should be used. To relieve the pain and swelling in the throat, hot applications may be applied to the neck, or cloths wrung out in iced water The diet ahould be entirely liquid, milk und bmoths, and as much water as the patient wishes. Steel drops or tincture of perchloride of iron is a useful medicine in doses of 3 to 5 minims.

The patient is not allowed out of isolation till 3 weeks after the throat is normal in appearance, and not till 2 swab tests at 3 days' interval are negative. I'ersons who have been in contact with cares should be in quarantine for a week, and each day the throat should be inspected for evidence of the disease. "Carriers" must have their throats disin. fected. By inoculations into the skin, in the Schick teat. it can be determined whether or not a person is very liable to contract the disease. Proteotive innculations can be given to those who show little or no resistance. See Disinfection ; Notification

DIPPING FORK. A two-pronged fork that is known among manufacturing confectioners as a dipping fork is considered essential for sweet-making purposes. It is used for lifting out centres which have been dipped in chncolate or some other coating mixture and placing them aside to dry. Dipping forks can be obtained at amall cost from nny ironmonger's. See Chocolate
DIPSOMANIA. Periodical attacke of an uncontrollable craving for alcohol, coming on at intervals of a few weeks to a year, and due to hereditary influences, are the symptoms of dipsomania. Between the attacks the victim has no desirc for alcohol and may even dislike it. An alteration may be noticed in the patient just before he is overwhelmerldifferences in his behaviour, sleeplessness, and loss of appetite After having taken a certain amount a distaste miay arise, ind the drinking stops, or retching and vomiting may come on and determine the attack, or he may drink himself into delirium tiemens.

Aprmorphine, by producing nausea or sickness, may be successful in preventing or cutting short the attack. Capsicum and cinchona have been suggested as a useful substitute for alcohol in relieving the craving, as in the following mixture: Tincture of capsicum, $1 \frac{1}{2}$ drams : fluid extract of anchona, 2 drams; syrup of ginger $\frac{1}{2} \mathrm{oz}$; chloroform water to 6 oz . Take a tablespoonful, when necessary, in a wineglassful of water. When employed by experts, hypnotism has been most successful in some cases in combating the craving and preventing attacks. See Delirium 'Tremens.

DIRECT CURRENT. This is an electrio current which fows round a circuit in one direction, as distinct from alternating current (q.v.), which is constantly changing its direction. See Electricity.

DIRECTOIRE : The Style. This style of furniture originated in France at the time of the Directory (1795-99). It was based on a study of Greek ideas, and its artista used in the main the constructional lines of Louis XVI furniture. The ornaments, however, were discarded and griffons, caryatides, honeysuckles and other classical figures were sub. stituted. After Napoleon's return from Egypt the sphinx and other Egyptian decorations were introduced. During the period marquetry
was no longer in demand but chased bronze mounts in ormolu weno the principal mode of decoration Carving was mainly used in gilded imitation of ormolu work. Mouldings were comparatively little in favour The Directhire was succeeded by the Empire style See Empire Style.

DISBUDDING. This means the removal of surplus shoots or Hower buds so that those left on the plant shall have full room for de. velopment. Dishud. ding is an important detail in to e cultivation of peach and nectarine trees and vines, for miany more shoots grow than are needed "Taking" the buds of ohrysan themums grown to provide large blooms meane disbudding or removing the small shoots which appear beneath the flower buds ín August Disbudding is practised on carnations, roses and other Howers grown for exhibition; nany


Disbudding. Diagrams indicating where this operation is carried ou: on typica nlants. 1. Rose. 2. Danlia. 3. Carnation. 4. Tomato. 5. Chrganthemum $B_{y}$ apecial ariangement with amateur Gardening of the flower buds
are taken off in order to ensure that those left shall furnish large blossoms.

DISH : In Various Wares. Dishes with covers for entrées are made in silver and Sheftield plate. Plain or cut-glass dishes are used for serving dessert. trifles. jellies, etc while earthenware and china dishes are included in dinner services or may be purchased separately in many atock patterns and in plain kitchen ware. Fireproof dishes are to be had in glass, china and earthenware with covers to match.

Dish Cover. The heavy silver or plated covery of the Victorian ern are seldom seen now on account of the cleaning involved Plain electro-plated covers arc used for joints, fish or poultry dishes when necessary.

The well-gquipped kitchen has a supply of wire-mesh dish covers. These should be used to cover all kinds of fresh food, cooked remains of dishes, and anything which might be dis. turbed by Hies, bectles, mice, or other vermin. After being wushed in warm, soapy water they ahould be shaken and dried. and then placed over the rack above the range to dry thoroughly. See Entrée; Fireproof Ware: Washing-up.

DISH : In Photography. Dishes for photographie work must be kept sorupulously (i.e. chemically) clean. If a trace of fixing solution is left behind in a dish which is afterwards used for developing, mysterious stains will appear on the negatives or prints being developed. The best plan is to kecp each dish for one purpose only.

Dishes should be thoroughly washed out immediately after use, and not allowed to stand all night with the stale developing solution in them. After washing they should be rinsed out with a strong solution of spirits of salt (hydrochloric acid). This need not be thrown away, but can be used repeatedly. Earthenware or china dishes are easier to keep
clean than enamelled iron dishes, which are liable to chip ; but the latter aro lese expensive In either case it is well to see that they have llat bottoms. Curved dishes repuire more solution, and plates and paper do not lie well in them. See Developing.
DISINFECTANT. Disinfectants are agents used for destroying the germy of disease and so preventing the occurrence and spread of illness. Thesc germs may be present in the air in furniture, in clothing. and a variety of means may have to be employed to secure disinfection. Sunlight and fresh air kill most germs, while plenty of soap and water is one of the cheapest and most efficient methods to prevent their growth. Polluted water may be made safe for drinking if bailed for 10 min Infected articles of no value should be burnt.
Chemical disinfectants include carbolic acid, corrusive sublimate (perchloride of mercury! biniodide of mercury, lysol and other substances derived from coal tar, permanganate of potash, etc. Formalin is a liquid with a strong. irritating odour. It is usually used in $n$ strength of one part to 20 parts of water. Lime is a good disinfectant, employed when diseased animals are buried. a thick layer of the lime being made to surround the carcass
Linen may be disinfected in many ways Exposure to steam for a lengthened period, repeated boiling, or boiling in soap and water and then exposing the linen to tho sunshine for several days, are some effective methods. A good means of disinfecting is to soak the linen for an hour in a solution of carbolio acid, using one pint of prepared carbolio to 20 parto of water. See Carbolic Acid: Formalin.

## DISINFECTION: Of the House. After

 an infectious illness it is necessary to have a house or a room disinfected. The problem is much simplified if the room has been previously prepared for the reception of such a patient. The carpet will have been replaced by one ortwo light ruga, heavy hangings by washable curtains. Unnecessary furniture and all books and pictures will have been removed. The only books allowed should be such as can afterwarda be burnt
In the sick ronm sputum and nasal diacharges are beat collected in paper and burnt in the fire. Infective faeces and urine should be received in a bed pan containing anme carbolic or a coal tar disinfectant. Enough solution ahould be added to cover, and the mass broken up and allowed to stand for two hours before being put into the w.c. or buried. Lime or bleaching powder may alao be used. Before and after attending to a case of illncss. the attendant should wash her hands and then soak them for half a minute in a coal tar disinfectant solution.
To disinfect a room all articles of little value should be burned. Metallic substances should be removed from the mom and washed over with a disinfectant. Furniture ahould be drawn away from the walls, cupboarda and ilrawera opened. If possible the wallpaper should be stripped or rubbed down with breadcrumbs. The ronm is then sealed by placing gummed paper over the window-frame and over the fireplace, after blocking the chimney with paper.
Sulphur is easiest to use as a fumigant, and for every 1,000 cubic ft . of space 4 l . of roll sulphur should be used, or it can be obtained in the form of sulphur candles. The walls and floor should be well sprinkled with water, as sulphur vapour is only active in the presence of moisture. The sulphur is placed on a shovel, preferably at some height above the Hoor, moistened with methylated spirit and ignited. The door is then closed and the margina of the door and the keyhole sealed with gummed paper. The room is left for 24 hours, when it is opened and well ventilated till the sulphur smell has disappeared, and then thoroughly scrubbed down.
The fumes of ammatic vinegar, obtained by pouring a few drops on a heated ahnvel, form a grod disinfectant in fever cases, as also dnea chloride of lime, the latter being aprinkled freely over the Hloor.
If the local authority undertakes disinfection, the sanitary inspector assumes responsibility for the treatment of the room. He will also arrange for the treatment of the inferted bedding and clothing. He may destroy infected articles and compensate the owner. There are statutory penalties for expnaing a perann suffering from a dangerous infectious disease in any public place or conveyance, for letting an infected hnuse, and for giving. selling, transmitting, lending, or exposing infected articlea. Bonks may not be taken frum a free library for use by an infected person, nor must a bonk used by an infected perain le returned to a library. Notice must be given to the sanitary authority, who will disinfect or deatrny the book. See Formalin : Fumigation, etc.
DISLOCATION. Displacement of one or more bones at a joint is the general meaning of dislocation. The ligaments which hold the bones in position are tom: the synnvial membrane or lining of the joint and the blood veasela and nerves may alan be injured.
Where great force has been applied the end of a bone may pmotrude and form a compound dislocation. Comparison with the corresponding joint on the other side of the body will show either a lump or a hollow which is abnormal. The whole joint will also awell up. Firat aid consista in sending for the doctor and putting the parts at rest by alings, cushions, and, if necessary, splints, and cold applications to relieve pain. If shock is present, warmth ahould be applied by hotwater bottles and blankets. No attempt ahould be made to reduce the dislocation. that is, to put back the bones into their normal positions.

This must be left to the doctor to perform, as unskilled efforts may aggravate the injury. Dislacation of the ankle usually occurs in combination with fracture of one of the long bones of the leg In dislocation of the elbow, the arm is fixed at an sigle. In the commonest type there is an sbnormal bony prominence at the back of the elbow. The limb should be reated in a greater arm sling. When a thumb is dislocated the arm has to be rested on a greater arm sling In dislocation of the hip, the leg is usually bent at the hip and knee, fixed at the hip, and the limh twisted so that the toes point outward. In dialncation of the jaw the mouth is open and cannot be closed This may be duc tn external violence or to opening the mouth widely as in yawning. When the diaplacement has been corrected, the patient must not open the mouth widely or there may be a recurrence.

Dislocation of the shoulder is much the commonest of all dislocations, and is usually the reault of a fall or the sudden twisting of the arm. Because there is no real cup for the joint. and on account of the wide range of movementa at the shoulder. the head of the bone may be dislocated into a number of different positions. The limb should be rested by a lesser arm sling. After one dislocation of the shoulder, the accident is liable to occur again. the patient should therefore learn the combination of movementa most likely to cause dislocation, so that he can beat avoid them. See Ankle : Bandage: Collarbone: First Aid : Shoulder.

DISSEMINATED SCLEROSIS. Disseminated or insular sclerosis is commonest in young people and has often followed acute infectious disorders. It is a chronic disease in which nervous tissue in the brain and spinal cord becomes gradually replaced by connective tissue.

Stiffiness of the legs, with perhaps slight pain and loss of power, is the first aymptom. Then the patient may notice that whenever he tries to use his fingers for any particular purpose, such as lifting a aponn or glas of water to his mouth, his hand trembles more or less violently. Any action that requires accuracy of muscle control, such as writing. becomes difficult or impossihle. As the disease advances, this condition of jerkiness, known as intention tremor, may affect the head and legs as well.

Other symptoms are staccato speech. oscillation of the eyeballs, known as nystag. mus, impairment of vision and loss of feeling, perhaps of one side of the body, defective memory and emotional excitement. There is a tendency to sudden improvement in the symptoms, rousing false hopes of recovery.

Care should be taken to protect the patient from chill and exposure, and from either mental or physical fatigue. Full doses of arsenic are frequently given. In the later stages of the disease a careful watch must be kept for the appearance of bed sures.

DISTEMPER : How to Apply. A sanitary water paint like distemper has advantages over wallpaper, as it can be perindically washed and the cost is much less. Before distempering the walls of a room they must be froe from nail holes and similar blemishes. If the ronm to be redecorated has proviously boen papered, the walls must be stripped, and any picture nails removed.

Having done this, mix some plaster of Paris with cold water to the consistency of thick cream, and with it stop all the nail holes, cracks, etc., in the surface of the plaster.

The distemper may he purchased lonse from any oil and colourman, but it is more satisfactory to purchase a well-advertised brand of washable distemper. Careful mixing is required to ensure an even texture. Three-parta fill an old hucket with cold water, and add the powder a little at a time: stir well with a stick. It is important not to sdd all the package at once. or to put the distemper in first and add the water.
The liquid should be of the consistency of whitewash when ready lor use, and the first coast should be applied evenly with a distemper brush. Make the strukes horizoncally and work the distemper well into the wall. as when painting wond. The distemper should be stirred well during use.
 $\begin{array}{ll}\text { Distemper. } \text {. How to take a full } & \text { during use. } \\ \text { brush or diatemper trom the pall. } & \text { If the ronm } \\ \text { 2. Corret was to apply distemper } & \text { is furnished } \\ \text { is by worting at arm's lengto } & \text { witha picture }\end{array}$
 contrasting colour for the frieze. It is unwise to attempt a frieze unless a picture rail is fitted, as a ragged dividing line is almost sure to result. See Colour: Cottage: House: Paint: Paperhanging: Wallpaper, etc.
DISTEMPER : In Dogs. The deadliest disease from which dogs suffer is distemper. If a young dog shows signs of ailing and is indifferent to food, he should be watched A husky cough follows a rise of temperature, and usually, but not always, there is a diacharge from the nose.

To treat a dog auffering from this disease, put the animal in a moderately warm place, well ventilated, but free from draughta, and coat him in Hannel; take an old blanket a bout the right size, and make two holes 6 or 9 in . from one end, through which the front legs are placed. Sew it up along the back, while it is all the better if the chest and sides aro further protected with ganıgee wool. Diet with nourishing slope, no solids.

If food is refused, he must have it poured down. Put the Huid in a wide-mouthed bottle. Hold the lips on one side, and on the other insert the bottle, drawing un the lips to prevent spilling. Several times daily clesnse the nostrils. and wash the gums and inside the mouth with a solution of permanganate of potash. Cleanse the eyes with warm boracio lotion. On no account get on to solid food or perinit exercise until temperature has been normal for nearly $n$ week If the case becomes serious a vet. should be called in. See Dog.

DISTLLLED WATER. Distilled water is water which has been converted into steam by bniling and then cooled and condensed into water again. It is therefore pure water, having been separated from all the solid matters, such as chalk, which ordinary water usually contains.

This water is used for making up hair washes. It should be employed for dissolving shampoo powders, as ordinary water tends to destroy the efficacy of the powder. In making up boracic lotion for inflamed eyes distilled water should always be employed. It is also used for the accumulator of a motor car. (See Accumulator.)

In photographic work the use of distilled water is highly desirable, and in the casc of
some developers it is obligatory. The purest drinking water contains traces of salts which by combining with photographic chemicals may form insoluble deposits that cause damage to negatives.

Preparing the Water. A simple means of making small quantities of distilled water, such as are required for developers and for other purposes, is provided by the kettle. The spout is inserted in a thistle funnel, obtained from a chemist or dealer in scientific apparatus, which is bent at right angles in the flame of a Bunsen or mẹthylated spirit burner. It passes through a large tin, which has a hole cut in the bottom fitted with a cork; through this a hole, just large enough to allow the tube of the thistle funnel to be pushed through, is bored with a red-hot nail. This tin is liept filled with cold water.

A bottle, or other thoroughly clean recep tacle, placed beneath the tin receives the water as it is condensed from the steam rising from the spout inserted in the mouth of the thistle funnel. Only glass tubing should be used, since impurities in rubber and metal tubing will be carried over with the steam. Sce Developing.
DISTORTION. This term when applied to a wireless receiver indicates that the received signals are not an exact counterpart of those sent out by the broadcast transmitter. Distortion may be cansed by the use of too much reaction, by an unstable high frequency amplifier or low frequency magnifier, overloading of the detector or of a low frequency valve, incorrect high tension or grid bias voltages, a run down accumulator or high tension battery, a faulty component (e.g. a grid leak), loss of emission of on of the valves, an oscillating nearby receiver, ctc.

Overloading of the output valve is a cominon trouble, and for satisfactory loud-speaker reception the high tension voltage applied to this valve should be not less than $1 \because 0$ volts. If two stager of low frequency magnification are employed, it is adrisable to use a low impedance valve of the super-power type in the last stage, and to adjust the grid bias voltago with care. Instability in the high frequency amplifier may be caused by inadequate screening or poor design; and in a low frequency magnifier by insufficient de-coupling between the valves and the high tension supply. See Amplifier; Eliminator; Grid Battery ; High Frequency; High Tension; Impedance; Low Frequenoy; Oscillation; Reaction; Valve.

DISTRAINT : The Law Of. The law regarding distraint has been modified by the Rent Restriction Acts, passed during and since the Great War. Under thein no distress may be issued for the rent of any houses to which the Acts apply without the leave of the county court. Such houses are those of which the standard rent or rateable value clocs not exceed $£ 105$ in the metropolitan police district, $£ 90$ in Scotland, and $£ 78$ clsewhere

Apart from these temporary exceptions the law allows the landlord whose rent is overdue to enter the house by himself or by a certified bailiff betwcen sunrise and sunset, seize the goods found there, with certain exceptions, and ultimately sell them to pay the rent and the expenses of the distraint. He may not break open the outer doors or windows, but he may open still more a door or window already partly open, or break open on inner door. Rent is overdue the day after it ought to be paid. All goods and chattels on the premises may be seized in distress, except the following

## Loose money

Things in the custody, by way of his trade, of a teuant who carrles on a public trade-e.g. olothes gent to a tailor to be repaired, material sent to a
dressmaker to be made ur, and the like.

Aulmals or things in actual use at the time-c.g. a sewing-nachiue which is actually being used when hie ballilf enters

Bedding (including bedsteads), and wearing apparel of the tenant aud his family, and the tenant's tools of his (or his wife's) trade to the value of $£ 5$.
Fixtures which cannot be taken aivay without to their former state. o their iormer state.
of ener angh Peris goods in satisfy the claim
Persiable goods whe could in the
This condition prevails also to-day when the landlord, having obtained the leave of the court, proceeds to distraint.

Legal Position of Lodgers. If a lodger's goods are scized, he may get them back by giving notice in writing to the landlord or bailiff. He must send a list of what he claims as his, and state that the tenant has no interest in them. Then, if the landlord refuses to return them, the lodger may at once proceed against himi in the police-court, for which purpose it is better to emp!oy a solicitor. But tho lodger must also state in. his notice what his rent is, and if he owes anything; and the landlord can then insist on the lodger paying the future rent and arrears to him. Similar protection is accorded to an under-tenant, provided he is one who pays his rent quarterly, or not more than quarterly (e.g. monthly, weekly). There is no protection for a sub. tenant (not a lodger) who pays, say, halfyearly.

If goods are seized which do not belong to the tenant, or a lodger or sub-tenant, the owner may serve a written notice on the landlord or bailiff, setting forth that the tenant has no right of property or benelicial interest in the chattels seized; and to this declaration must be appended an inventory signed by the owner. It is a misdeneanour, punishable by fine or imprisonment, to malic a false and fraudulent declaration or inventory. The Acts do not protect goods belonging to the tenant's husband or wife, nor under bill of sale, nor held under a hire-purchase agreement ; nor do they apply to goods belonging to the tenant's paitner, nor to goods stored in an office or warehouse where the owner, after a month's notice, refuses or neglects to take them away.
If a tenant fraudulently removes his goods so as to evade a distress, the landlord may follow the goods and distrain, and may even breals open doors or windors to get at them. But he must do this within 30 days of the fraudulent removal. Goods distrained on may be sold by the landlord after five clear days from the distraint. It is a criminal offence to take away goods which have been impounded, ie. distrained upon. See Rent.

DISTRICT MESSENGER. District messengers are boys who, for a fee, can be engaged to go on errands, also to act as guides.

The service is contined to the London area. Persons can employ them to take messages or parcels, and they are sent sometimes to hold a place in a theatre queue. The boys, who form an organized sorvice, wear a distinctive uniform of dark blue. The head office is 100 . St. Martin's Lane, London, W. 2.

DIURETIC. A substance which inereases the secretion of urine by the kidneys is termed a diuretic. Water. bland mineral watere, and milk are diuretics. Exannples of drugs which increase the flow of urine are sweet spirits of nitıe, 15 to 60 minims: mindererus spirit or liquor of acotate of anmonia, 2 to ( drams; and alcoholic beverages. There are also the acid tartrate, the citrate and other salts of potassium, digitalis, squill, turpentine. copaiba and drugs of its class, calomel, broom, etc. Diuretics are called for in the state of fever, and the following prescription would be useful Tho dose is $\frac{1}{2}$ to 1 tablespoonful every 3 hours

Solution of ammonium acetato .. 3 drams
Snirit of nitrous cthe
syrup.
Pepperinint water to make

At the same timo the patient is allowed to drink water, milk, and lemonade frcely. The best form of lemonade consists of Fresh lemon juice, 2 drams; cream of tartar, 1 drain boiling water, 1 jint. Pron. Di-yu-ret-ik.

DIVAN: How to Construct. As a piece of Surniture a divan is a long seat formed of a mattress on is raised structure or frame Sonetimes it is a built-in fixture with a padded and upholstered back part against the wall. or it may be a movable piece of furniture. From Turkey this seat was introduced into England about $18 \% 0$.

A method of making $\Omega$ divan is to use $a$ box spring mattress and mount it on feet, as in fig. 1. Fig. 2 shows the method of fixing these. The bottom canvas or covering is stripped off at the corners and a $2 \frac{1}{2}$ in block rubbed into the inside comer, the grain running vertically. It may also be screwod into place. Four feel are then turned (or they may be bought already turned, having a $\frac{3}{4} \mathrm{in}$. dowel), and a corresponding hole bored into the block, and the foot glued into this. When set the canvas is cut to fit round the foot and tacked back. It will be found advisable to polish the fect before fixing.
Making the Mattress. Our illustrations (Figs. 3 to 5) show methods of constructing a box mattress suitable for the divan. In Fig. 4 is indicated a method of raising the mattress on legs. These box spring mattresses usually finish about 10 in . to 12 in . high, and are based on a sort of tray frame. A sketch of such a frame is scen at Fig. 3, made out of 1 in material, the sides being about 4 in . high. blocked in the angles and well serewed.

A scries of stretcher rails is cut in Hush and screwed to under edge of sides-numbering


Divan. Fig. 1. Divan made from a box spring mattress mounted on feet. Pig. 2. Method of attaching feet Figs. 3-5. Diagrams showing construction of mattress frame and how it is sprong and stuned
even, including the two end pieces, and each about 31 in. wide. In some cases, instead of all sidee being of equal width, the head and foot sides are higher, say 7 in . wide, and the blooks are prolonged to form feet of required height. the sides being notohed or let into them and sorewed (Fig 4).

The aprings are placed on the rails and screwed to them by staples, and the tops of the springs are tied together with oord to counteraot lateral play. They are then covered with canvas, and above this the stuffing is packed to form the mattress, and also covered with canvas (Fig. 5). The whole surface is then covened with the outside ticking. whioh finishes at the bottom edges of the sides, the bottom of frame being neatly coverer with canvas.

It will be understuud from the above descrip. tion that the completed box-spring is compressible at the extreme corners in addition to the centre, or not, according to the style of frame which is adopted.

Divan Bed. A divan bed, as it is oalled (Fig 0) is one that serves the dual purpose of a seat by day and a bed by night. It can be made of a box ottoman (q.v.) and a mattress. The ottoman should have a stout wooden frame padded and covered with figared material, the box being used as a receptaole for the bedding. The lid of the box should consist of a spring mattress on whioh the loose inattress is placed The latter should be covered on the top with the same material as the ottoman, but underneath it should have an ordinary mattreas covering. The ottoman ahould be fitted with castors so that it oan be


Divan. Mg. 6. Divan bed whiob can be made
trom an oftoman and mattress. If serves the purpose of a seat during the day complesy of wrilameen Cole
moved easily. By day, with the mattress for the seat and cushions placed thereon, the pieoe will serve as a divan. See Attio: Bedroom; Bed-Sitting Room; Sofa, eto.

DIVIDERS. These are measuring instruments, with whioh the utmost precision oan be obtained from hand work. Typical dividers consist of two legs of equal length, joined together at one end, and finished with a fine point at the others.

Draughtsman's dividers are frequently fitted with a fine adjustment device, consisting of a small millod-headed screw, which, when


Dividera Use of spring dividers for cotting out woodwork turned, moves oneleg to. wards or away from the other. For marking out woodwork the ordinary black spring dividers are made from one piece of steoh, the action of the dividing legs being pro.
vided by the springincss of the metal. A long screw and a butterfly-nut provide a fine adjustinent.

Dividers are used to set out and measure a pieoe of work, acourately to determine limits and proportions of a design, and by them almost all geometrical problems can be solved. See Compasses ; Drawing.
DIVISION: In Gardening. This is the term given to the method of propagation praotised in increasing the stook of hardy herbacenus peren.
nials and a few shrubs. Plants which bloom in spring or early summer are divided in autumn : those which bloom in late summer and autumn are divided in spring. The work is carried out by lift. ing the plants, separating them into pieces each with roots attached, discarding the old inner pieces and replanting only the young outer por. tions. Nost of the favourite border plants, e.g. Michaelmas daisy, helenium, Shasta daisy, phlox. fiag iris, engeron or summer starwort, perennial sunflower, and coneflower or rudbeckia are in.


Division. Diagrams showing various mothods oi dividing. 1. How to treat perennjals, the divisions being replanted in croups, as io \& 8. Potato divisions, esoh containing en eye. 4 . Dahlie rook points of diviaion indieated by arrows. 6. Forn crown divided for roplanting. 6. Loganberty sucker, rooted and divided as shown by arrom
Hil special urrangement with Amaleur Gardenino

## creased in this way.

DVEANESS or Vertigo. Any passing attaok of giddiness is probably due to disorder of the digestion or constipation, but it may be the result of any one of a large number of causes. Chronic gastritis is very likely to be accompanied by dizziness

In these cases the patient should carefully inquire into his diet, the state of his teeth, and his habits with regard to taking food. In some cases it will be found that abstaining from liquids at meals, and taking them only between
meals, is helpful. Fats and pastry should be to either husband or wife for infidelity alone. taken moderately. Old people should eat In Scotland, adultery or desertion for four years is enough on the part of either spouse. Desertion means a wilful absence for four years or more without lawful cause. It is a lawful excuse if the husband is away on business, or, being in the servioe of the orown, is ordered abroad.
If the offended spouse, with knowledge of the offence, oontinues to have marital relations with the offender, the offence is said to be oondoned; but, if a new offence is cominitted, the old offence revives. Husband and wife must not act in collusion to get a divorce ; if they do, they lose the right to one.

At the trial, if successful, the petitioning party obtains a deoree nisi, that is, a decree which does not dissolve the marriage, but the matter comes before the Court again in about six months' time, and then, unless the King's Prootor intervenes, the deoree is made absolute and the marriage is at an end. It should be noticed that until the decree absolute is pronounced the marriage vows are still in force, and must be faithfully kept, otherwise the King's Proctor may intervene.
Sometimes husband or wife petitions for a divorce who has, on an occasion, been unfaithful to the marriage vows. In such a case, if he (or she) makes a clean breast of it to the judge, his lordship may grant the divorce notwith. standing the petitioner's own guilt. In all divorce cases it is hopeless to proceed without legal assistance. Pctitions for divorce can be heard at various arsize towns in the provinces, as well as in Lundon and Edinburgh.
Persons who have less than $\mathbf{5 5 0}$ (in some cases $£ 100$ ) and whose usual income is less than £2 (in some cases £4) a week may apply for a divorce as poor persons. In this case the costs will be very small. Application should be made to the Poor Persons Department at the Royal Courts of Justice, Strand, Londun, W.C.2, or to a local registry. See Desertion; Husband ; Marriage : Separation Order.
sparingly. Hasto at meals of ten causes digestive trouble. If necessary one may take an occasional mild aperient (q.v.). Excess of tea. alcohol or tobaooo may be responsible.

In neurasthenia dizziness is a common symptom. Treatment must be directed to the causc. People getting on in years whose arteries are becoming inelastio, find that they often suffer from dizziness. It is not wise for them to get up quickly when sitting or lying down; to empty the bladder immediately on getting out of bed in the morning: to make any sudden violent movement such as jumping on an omnibus. Excitement should be avoided as far as possible, and the food should be light and nutritious.

Ear and Eye Trouble. The ear is often a source of this trouble. Collections of hardened wax, mixed as they frequently are with hairs and dust, may for a long time be the unsuspected cause of dizziness. The wax should be removed by soaking for a night with oil and gently syringing with warm water. A running ear may be accompanied by dizzincss. In Menière's disease of the ear, dizziness is a most prominent symptom.

The eye may also be the cause of the dizziness. Errors of refraction are indeed a very common cause of a slight degree of this trouble which is cured by suitable glesses. Dizziness is associated with many serious affections, such as disease of the heart, tumours of the brain, syphilitio affection of the brain, epilepsy, etc. Much worry will be saved by a timely visit to a doctor, as in the great majority of cases the cause is one which can easily be remedied.

DOESEIN. A material muoh used for gloves, doeskin is a leather which has been degrained by the removal of the upper surface. Thicker and fuller than ordinary kid, it is less heavy than buckskin, and is obtained from the skins of rarious animals. See Glove.

## Dogs: Choosing, Training and Feeding

## With Information on Other Matters of Daily Interest to Dog Owners

This entry is supplemented by articles throughout the wort on the various breeds of dog, e.g. Airedale: Collis; Retriever: Scalyham, etc., where the illustrations of the various types appear. See slso Animals; Distemper; Kennel

At the present time between 80 and 90 soaked, stale bread or hound meal, squeezing Hifferent breeds of dog are recognized by the Kennel Club. There is thus a very large selection from which to make a choioe: but a great deal depends upon individual taste, as well as the accommodation at hand. The heavy breeds comprise the St. Bernard, Newfoundland, mastiff, Great Dane and the bull mastiff, all of which aro costly to keep and require a fair amount of exercise to keep fit and well. Any one of them will cost from 88. to 108. per week to keep, no matter how care. fully fed. The mastiff, the bull mastiff and the Great Dane are smooth-costed dogs and so give leas trouble with regard to grooming than do the St. Bernard and the Newfoundland. All are equally useful as guardians of personal property, and the Newfoundland is an excellent water dog.

Following these doge in point of size, mention must be made of the Alsatian wolf dog, Irish wolf hound, deerhound, Afghan hound, bloodhound, Old English sheep dog, elkhound, groyhound and collie. All these dogs can be trained for companionship or specifically as guards. Their cost of keep ranges from öe. to 8 s . 6 d . per week. The most popular of all is the Alsatian, if we except the greyhound and the retriever.
The retrievers and spaniels are particularly useful dogs. Porhaps the most aseful all-round dogs are the terriers, which comprise the Airedale, Bedlington, Border, Cairn, Scottish, Dendie Dinmont, West Highland White, Skye, Fox (smooth and rough), Irish, Kerry Blue, Sealyham, Bull Terrier and Manchester. Here we have a group of first-class dogs. equally gond for waterside work or for watching and companionship. The terriers cost very little to keep and make excellent friends with man. Two terriers recently introduced are the Schnauzer and Lakeland. The terriers of Scotland are all short legged, big boned and broken coated, but the bull torrier and the Manchester terrier, likewise the smooth fox terrier, ane smooth oosted. Handy little dogs are the Cairn terriers, likewise the Sealyham and Welsh terriers, but perhape the most popular are the Kerry Blues, the wire-haired Fox Torrier and the Sealyhams The Dal. matian, the collie, the ohow-chow, the bull dog, the Pekingese, the Brussels griffons, the King Charles spaniel, pugs, poodles, Pomeranians, whippets, French bull dogs, Dachshunds, Keeshonds and Samoyeds, aro admired by many people, and it is purely a matter of personal choice as to which of these may be seleoted.
Feoding. Given the ordinary standard of health and not leas than a year old, a dog should be fed onoe a day, and the best time for this purpose is between one and four p.m. If it is convenient it is a good plan to exercise the animal beforehand. Dogs differ considerably in their habits of feeding. The pet should not be spoiled by feeding it on tit bits, but should be trained to eat properly cooked fleah food, which all dogs must have in order to maintain health. Supplemental foods such as dog biscuite, boiled rice, bread, etc., are useful for giving bulk to the food, but the use of oatmeal or maize meal will sooner or later lead to the production of skin trouble. Such doga as retrievers, spaniels and collies, etc., should have one pound of flesh per day, the terriers $\frac{1}{2}$ to $\frac{7}{2} \mathrm{lb}$., whilst toy dogs $\& \mathrm{lb}$. to 2 oz., with or without bread, hound meal, etc. Dry foods are better for dogs than those of a sloppy nature, more especially old dogs, but it is generally necessary to nix the meat with

Table scraps and bones commonly form part of the domestic dog's menu, but the dog's stomach should not be mado a receptacle for the kitchen refuse. One large bone per woek may, however, be allowed for a tooth brush and to assist digestion. Dangerous bones are found in chickens, hares, rabbits and fish, and these are liable to become lodged in the back part of the mouth or throat, whilst their sharp edges may easily laccrate the gullet, perhaps with fatal results. Boiled carrots are the best vegetable of all and improve tho con. dition of some dogs. Dog biscuits in their various forms usually contain dried meat and are extensively used (either dry or soaked) as a food for dogs.

Water for Dogs. Dogs that are free drinkers generally thrive better than those that take very little water. No matter whether a dog is kept in or out of doors, it must always have a plentiful supply of fresh water. In summer all dogs drink more water than in winter, so the water trough should be refilled at least twice a day and kept in the shade. Both milk and tea are very good for dogs, the former being an excellent nutrient and the latter a mild stimulant. From 1 gill to 1 pint of milk per day will increase the weight of a debilitated dog.
Exercise. Roarl traffic renders the highway very dangerous for dogs and quite a number of people exercise their dogs on the leash only. This does not take the place of freedom, but it is better than no exercise at all. Facilities for exercising vary, and the majority of dogs can bo easily exercised, whereas greyhounds and whippets require training on hard roads in order to keep their toe nails properly worn down. Dogs that are too fat must have gradually increased exercise in order to tone up heart, lungs and muscles. Never exercise a dog behind a motor car, or at such a speed as will entail suffering. Sore feet may easily be produced by prolonged exercise, especially on flinty or sandy ground.
Tralning the Dog. The sooner the training of a puppy cominences the better, whether to be trained for work with the gun, for ratting or for some other particular purpose such as minding sheep or cattle, the guardianship of person or property, etc. Every dog must be taught to be clean in its kennel and in the house, which can be done by the force of habit and suggestion obtained and obtainable by tho repetition of exercise at frequent intorvals and by feeding the animal at the same time daily. Dogs have a desire to urinate frequently, and when two or more are kept together one or the other will suggest this act and become a nuisance, eapecially if living in the house. It is, therefore, very much better to keep them apart or in separate kennels if this can be dono. Further, allow very little liquid after 4 p.m. Puppies are, of course, nearly always urinating, so that they require to be lifted and taken into the open four or five times a day.

Every dog must be trained to follow at heel, as this constitutes the basis of obedience, and training to follow in and out of traffio is the best safeguard against accidents. This schooling may begin when the puppy is two or three months old. Put a collar on him and to this fix a check cord, say three or four yards in length, 80 that you can gradually shorten the cord as each lesson proceeds; bring the puppy closer and closer to heel at the word of command, which is "Come to heel," gradually substituting the word "heel." To prevent the
puppy from chasing other dogs, cats, fowls, etc., use the word Ware (pronounced war) thus "ware cat," etc., the frequent repetition of which will prevent the puppy from breaking away and render it free from chase. Never allow a dog to roam the streets, as this leads to most objectionable habits.

Groomlng. A healthy coat means a healthy skin, and the health of the latter depends upon a healthy constitution. The appliances necessary for keeping the coat in proper order comprise a dandy brush, or one with stout bristles, a hair glove, a chamois, a comb, and a stripping comb. This appliance has very fine and short teeth: therefore it must be used with a certain amount of caro in order to avoid abrading the akin. Pass the comb through the long, soft hair and at the same time use the fingers to remove it, so that plucking and combing run together. The shoulders, around the ears, behind the elbows and the hind quarters should receive special attontion.
When a dog comes in wet and muddy it should be allowed to go into a deep bed of straw, and when thoroughly dry should be rubbed down with a wisp of straw and the mud brushed off with a dandy brush. If a long-coated dog is not combed daily, the coat and feathering become felted and then trouble begins. A coat that is healthy has a pleasant feel, whilst the skin is soft and pliant, and free from any redness or irritation, or causes which produce the latter, such as flcas, lice, ticks, etc. Take particular care to see that the inside of the ears are kept clean by sponging them out occasionally with equal parts of hydrogen peroxide and water.
Care of the Teeth. Never neglect to makc periodical examination of the $\log ^{\prime}$ s teeth: otherwise trouble may arise, as nothing can be worse than offensive breath from a foul mouth. Incrustations upon the teeth are common and the discoloration of the latter frequently occurs during distemper, but can be minimised by cleaning the teeth with equal parts of hydrogen peroxide and watcr. Loose teeth, spongy and bleeding gums (pyorrhoea) are the precursors of digestive disturbance.
The Dog's Bath. Grooming should obviate the necessity for frequent bathing, but the bath sometimes becomes a necessity. Soap and water will cleanse the coat, but it renders the hair soft, and in course of timo destroys its texture. Under ordinary circumstances a bath at the commencement of the four seasons of the year ought to be sufficient for any dog. The proper manner to bath a dog is to wet thoroughly the back and hind quarters, under the tail, between the thighs, and on the belly (reely with warm water; then rub in the soap) with the fingers, leaving no part untouched. For adult dogs a good carbolic soap is the best. Repeat this process on the fore partthen rinse the soap out with warn water. This will kill the fleas if the work has beell properly done. A medicated bath consists of the addition of somo drugs, such as 4 oz . of Epsom salts to each gallon of water for the cure of simple skin irritation, or else 2 oz. of sulphurated potash to each gallon of hot water, but it is much better to dissolve this in a quart of boiling water and then add to bath. This last remedy is useful for destroying lice, Heas, etc., but it must be repeated at least twice weekly for threo weeks in order to render it efficient.

Administering Medicinos. Dogs, like all other animals, are liable to a variety of diseases and accidents. To give a dog medicino, either in powder, pill or liquid form, is usually, but not always, a simple enough matter to those who have had practice. The pill and the tabloid are the simplest to administer. First of all open the mouth with the left hand, take the pill between the tips of the index and second
linger of the right hand and then, with dezterity, place it on the extreme back part of the tongue, closing the mouth almost simul tancously, keeping it shut until the dog swallows. Some dogs will hold their medicine a long time ; others swallow immediately.

Powders are usually simple to give and may bo dropped on the back part of the tongue, whereas liquids require to be given slowly. To administer the latter put the fluid in a small vial and with the right hand insert the neck of the bottle into a pouch formed by the dog's cheek on the right hand side, keeping it in position by encircling the bottle neck and cheek with the fingers. Sometimes tasteless medicine can be mixed with the food, or dissolved in the drinking water, whilst a very good way to give pills and tablets is to camouflage them by sinking them into a piece of meat. Worm medicines usually require to be given on the empty stomach, or one that is partially so ; therefore adult dogs should be fasted 24 hours beforehand, but puppies need only to be kept without food from six to twelve hours. These are commonly infested with round worms, and the best remedy is santonin given in oil, say castor oil. The dose ranges from $\ddagger$ to 2 grains for puppies about one inonth old. A common medicine is areca nut in powder and the dose is 1 grain, or 2 grains for each pound weight of the dog, given in milk or mixed with butter to form a bolus.
The normal temperature of the dog may be said to be $101^{\circ} \mathrm{F}$., but slight variations up to $102^{\circ} \mathrm{F}$. are common and the temperature rises during exercise. Temperatures of $104^{\circ} \mathrm{F}$. and $105^{\circ} \mathrm{F}$. are frequent in febrile affections. The clinical thermometer is used for taking the temperature, and the right situation to ascertain the body heat of the dog is the lower end of the bowel, i.e. the rectum.

Diet In Slckness. When a dog is ill it is necessary to devotc attention to its food and feeding, in fact in severe illness everything de. pends upon attention to this matter. For instance, if a dog is troubled with vomiting. it must have small quantities of milk and soda water, keeping it entirely without water. Boiled fish, boiled tripe, malted milk, Brand's essence, Valentine's meat juice, Ovaltine, etc., should constitute the sick dog's diet and the greatest point of all is that of giving the nourishment in small quantities and often. The white of egg beaten up is excellent in stomach and bowel troubles, whilst for urinary affections barley water is best.

Diseases and Accldents. Catarrhal diseases affecting the dog are distemper, catarrb, laryngitis, bronchitis, and pneumonia. Tho commonest of these is distemper (q.v.).

Intestinal maladies coinprise worms, diarrhoea, dysentery, inflammation of the bowels or stomach and vomiting. Jaundice or the yellows is not uncommon in the dog : in fact, it has been the hound master's bane

Cutaneous affections are very common amongst dogs, more especially those which are fed on unsuitable food and lead sedentary lives. These skin complaints are known under various titles such as red mange, blotch, surfeit, eczema, etc., most of which are constitutional in their origin. In these cases professional advice is necessary.
Eye affections are fairly frequent in dogs, and comprise ophthalmia, opacity, ulceration of the cornea, and cataract. Cataract is a disease of the crystallino lens and mostly occurs in old dogs, as senile cataract. It causes partial or complete blindness. Eye troubles. like those of the ear and skin, require professional skill for their proper treatment.

Fractures and contusions are usually the result of direct violence. A fracture may be simple or compound. In the latter case there is a wound in addition to the broken bone, and this complicates matters. Very often the organs contained in the chest or belly are
contused: therefore it is necessary to take the dog to a veterinary surgeon.

Wounds. These are usually produced either through fighting or direct violence, and owners should always be careful to ascertain the extent of the injury. A wound may appear to be a slight one externally, yet considerable laceration may have occurred. First of all cut the hair off all around the wound, and soak it well with tincture of iodine, but do not wash it. The bleeding must be stopped. Wounds on the ear, especially the margin, as a rulc bleed very freely; therefore dress with iodine and fasten on a compress by means of glue or seccotine, leaving this dressing on until it drops off, unless circumstances demand other treatmont.

Poisoning. Dogs are sometimes accidentally or maliciously poisoned, and very often through rat or mouse poison, though occa. sionally by strychnine. As a rule the best plan is to give a smart emetic, for which purpose there is nothing better than ipecacuanha or antimonial wine given in doses from 1 dessertspoonful to 2 tablespoonfuls without water. The dog will usually vomit shortly afterwards.
Mother and Pupples. The normal period of gestation in the bitch is 63 days, but a fow days before or after the prescribed period for labour to occur is common. It may, however, be delayed through the death of the puppies or some other cause. If the owner has any suspicion that all is not well he should immodiately consult a vetorinary surgeon. The signs of approaching labour are restlessness, lacteal secretion, and abdominal pain. Owners should always prepare suitable accommodation for a bitch about to become a mother, and this ought to be in a quiet place. Disturb her as little as possible, but as soon as she has completed her task give her a dose of castor oil, cleanse her with soap and water, and take care to feed her generously on cooked meat and broth, boiled rice, etc. Wean the puppies when they are four weeks old, and as soon as weaned feed four times per day on milk and farinaceous food with a little minced meat. Later on feed three times per day on more solid food.

Homes for Dogs. There are several homes to which dogs can be sent, the oldest being at Battersea, London. Anyone losing "a dog in the metropolitan area should at once inform the police, and then visit the Home, where all strays are taken except those found in certain parts of north and east London; these are sent to Willesden and East Ham. Unless they are diseased they are kept for seven days, and may then be sold or destroyed. All dogs not claimed within the seven days become the absolute property of the committee. A purchaser will have to give an undertaking that the dog is not to be used either for experimental or or stage purposes.
At Shooters' Hill, London, S.E., the Blue Cross Society have kennels for dogs that must go into quarantine. The society also take charge, for a fee, of dogs when their owners go away from home, Many veterinary surgeons also take in dogs at such times.

Clubs and Shows. The chief club for dogs is the Kennel Club at 81, Piccadilly, London. W. Another is the Tailwaggers' Club in Temple Chambers, London, E.C., and, in addition, there are a number of others, some being specifically devoted to the interests of a particular breed.

The breeding of dogs is encouraged by numerous shows. Some of these are general, while others are devoted to a single breed. The chief show is Cruft's Dog Show, which is held in the Agricultural Hall, Islington, every February. It was started in 1886 for terriers only, and has now nearly 10,000 entries, these including every recognized breed of dog.

Licences for Dogs. Throughout Great Britain every person who keeps a dog over six months old must take out a licence, obtainable at any post office. This is not necessary in the case of farmers, who may keep up to two dogs to assist them on their farms, for the purpose of tending sheep or cattlc. A shecp farmer may obtain exemption for more than two dogs. Exemption must be obtained by inaking a declaration, the form for which may be obtained from the local post office. Dogs used by the blind are exempt ; so are hounds under 12 months if they belong to a master of hounds. The cost of the licence is $7 / 6$ in Great Britain and 5/. in Northern Ireland.

If any person is found in custody or charge of a dog, or the animal is found in his houso or premises, he will be deemed to be the person who keeps the dog, unless the contrary in provod. The penalty may be as high as $£ 5$ : and any excise officer or police constable is entitled to ask him to produce his licence, and he may be fined up to $£ 5$ if he does not comply with this demand within a reasonable time.
The Law About Dogs. For some purposes a dog is not property, i.e. it cannot be stolen at coinmon law, but in 1861 it was made an offence punishable by six months' imprison. ment to steal a dog.
The Ministry of Agriculture and Fisheries may make orders providing for the regulating and muzzling of dogs and keeping thein under control in any particular district, and for preacribing and regulating the seizure, detention and dispossil (including slaughter) of stray dogs and dogs not muzzled or under proper control. A local authority may, if satisfied that there is a mad dog, or one suspected of being mad, in its area, make an order placing such restrictions as they think expedient on all doge which are not under the control of any person during the period of the order. Such an order must be published prominontly. Anyone who thereafter contravenes it is lisble to a fine of 20 s . The owner of a dog alleged to be dangerous may be summoned before a magistrate's court and ordered either to keep it under proper control or to have it destroyed. Any person failing to obey such an order is liablo to a fino not exceeding 20s. a day.

Stray dogs must not be kept by the persons finding them, but must be either returned to the owner or taken to the nearest police station. If the finder wishes to keep the dog ho can obtain a certificate stating full particulars of the dog. In this case he must seep the dog in his possession for at least one month. Police officers have the right to seize dogs which appear to be stray dogs, and detain them until the owners claim them and pay the expenses. Should any stray dog so seized be wearing a collar giving the address of its owner, or should the police know who is the owner of the dog, due notice must be given to the owner in writing saying that the dog will be sold or destroyed if not claimed within seven clear days. Imported dogs may, by order made by the Ministry of Agriculture, be ordered to be detained in quarantine for a particular time. Orders of this description are commonly made when there has been an outbreak of rabies.
It is the duty of anyone possessing a dog which he suspects of being afflicted with rabies to give notice to a constable of the police area in which he resides. The constable must at once telegraph the information to the Ninistry of Agriculture and also pass the information on to an inspector of the local suthority. This inspector must promptly go to see the dog and take such steps as may be necessary in the matter, even to the destruction of the animal. Every dog which is suspected of having rabies, or of having been bitten by an animal with that disease, may be slaughtered. When there is an
outbreals of foot and mouth diseasc an order prohibiting the removal of animals may include dogs. It is illegal to use dogs as draught animals.
Damage done by dogs is the subject of a rather curious order. At common liaw the owner of a dog was not liable if it bit or worried any person or animals unless he knew that it was a vicious animal.
Later the owner wins made linble for any damago done to cattle or sheep, without proof of knowledge, and in 1928 the principle was further extended. In Grent Britain the owner of a dog is now liable for any injury done by it to poultry, just as he is for injury done to cattle, horses and shcep.
DOG: In Woodwork. Employed for temporarily holding two picces of woodwork together, a dog consists of a bar of steel bent over and pointed at each end. The ands are driven into the wood. The dog is placed so that one end is fixed into the standing part and the other end into the other pioce, so far as possible in a diagonal manner.

Many otherwise difficult jobs can be put together with dogs, such as the erection of a framed building; the first section is erected, and the next held in place with the dogs while the bolts are adjusted, the dogs being then removed.
Flooring dogs, employed when laying a flooring of boards, have two prongs formed on the end of a bar, which is tapped to take a screwed rod having a handle at one end and a pad piece at the other. The prongs grip the floor joists, and the screw is used to tighten the boards in the manner shown in the diagram, one dog at each end of the board. This ensures a good teght joint, and is of advantage when the timber is not perfectly seasoned.


Dog. Flooring dog, showing how it is used to close up floorboards

DOG CART. This is a high, open, twowheeled vehicle drawn by one horse. It has two seats, placed back to back and each holding two persons. The rear seat usually folds up, and the back footboard can be fixed up so as to enclose the body of the vehicle. This type of carriage is very suitable for persons who wish to got about the roads quickly. See Carriage: Driving.
DOG FISE. Beiunging to the species of smaller sharks found off the British Isles, the dog.fish is so named from its habit of pursuing in packs the smaller fish on which it feeds. It is dreaded by fishermen, the value of whose ceatch is frequently seriously diminished owing to the dog fish biting at the fish hanging on the line and attacling and damaging the nets.
DOG'S TOOTH VIOLET (Erythronium). These are beautiful littlo spring-flowering bulbs suitable for planting in the rock garden. They thrive best in peaty or leafy soii in slight shade. The popular name is derived from the shape of the bulb which bears some resemblance to a dog's tooth. The flowers of the common kind (dens-canis). are of various colours, rose, purplish-pink, etc. ; they are on stems


Dog's rootn Violet. Clump of Howering plants of the European species, dens-canis
6 inches or so high. The American Dog's Tooth viclets, which need a sunnier place, arc finer and more varied in colour. Some of the best are Hendersoni, pale purple; revolutum, purplish pink, and Hartwegii, ycllow. The bulbs ought to be planted in September or October about 2 inches deep.

DOGWOOD (Cornus). These are hardy shrubs or smal! trees which are valued for their flowers, omamential leaves or coloured bark. The commonest of the tlowering kinds is the cornel or Cornelian cherry (cornus mas) which grows wild in Britain : it makes a big
bush and bears a profusion of small yellow flowers in February-March Cornus Nuttallii, which bears large white flower-like bracts and autumn-tinted leaves, is very beautiful, but, being loss hardy than some others, it needs a sheltered position. Florida, mac. rophylla and liousa are others which produce attractive, pale, flower-like bracts. They need a sumny sheltered spot.

Of the dogwoods, grown for the sake of their coloured leaves, the two finest are Cornus alba Spaethii with green and yellow, and alba variegata with green and white leaves Cornus alba and stolonifera have red stems, those of flamiramea are yellow. These. which are bcautiful in winter, should be hard pruned amnually in March for the bark of the now shoots is more brightly coloured than that of the old stems. ['ropagation is by layers in summer or by cuttings inserted out of doors in autumn.

DOILY. Doilies may be round or square, and are made for dessert use of real lace, Irish crochet, hand painted gauze, oriental embroidery on muslin or silk. Lace paper doilies can be bought in varying sizes in silver and gold paper as well as in white. Their use should not be overdone. For cake plates they are not necessary, but they are a good finishing touch for serving small savourics, sandwiches and pastries. See Luncheon Set.

## Dolls and Their Homes

## With Details for Making these Fascinating Playthings

This arricle describes how to make a simple doll, a doll's house and also its furniture. For other information of a similar kind sce Christmas; Knitted Toys: also Toys and Toymaking
While freakish dolls. sophisticated dolls in stuffed doll is available, is to unpick the fancy dress and purposeful dolls, whose wired doll, remove the stuffing, iron the case to crinolines conceal a telophone or a bottle, are a smooth out creases and take the pattern matter of passing fashion for the grown up, the real toy doll retains a permanent position as a nursery favourite. It inay be of rubber or wood, or soft and cuddly of the knitted wool or plush-covered variety ; it may be made completely of wax, china or composition or have its face, arms and legs of one of these fabrics and the rest of its body of linen stuffed with horsehair or other material ; it may possess an automatic equipment for walking and speaking, a wig of real hair and almost deceptive eychrows, eyelashes and teeth, or it may be merely a sixpenny doll with no merit but the one common to any of the others, its capability of becoming the intimate friend of its possessor.

When grown beyond the stage of her lirst cuddly toys, a little girl is normally attracted by a doll dressed more or less as herself ; small boys quite often like dolls dressed as soldiers, sailors, or Red Indians. It is certain that many girls who love their dolls do not want to hother about dressing or undressing them, but young children of both sexes will frequently be interested for hours playing with a doll's house and ite furniture.

Easily Made Dolls. Printed covers for rag dolls, ready to be cut out, made up and stuffed can be hought at many toy stores. Having laid such a cover flat on the table, with sharp scissors cut round the outline, leaving a narrow margin for making up. This is turned in and if the seams are neatly oversewn on the right side stuffing can be donc as the sewing proceeds. Kipok (vegetable down) is the hest filling to use and should be well worked into the cover.

Another method, which can be used when an old bought
 of the old doll. It may not be necessary to go to the trouble of unpicking it, for if the shape is simple the pattern can be obtained by measurement. 'The old stuffing, provided it is quite clean, can be used to fill the new doll. The accompanying diagrams give ideas which can be supplemented by individual taste.

Fig. 1 shows how to cut out and place pattern on material to make a doll. For one of medium size the distance from shoulder to knee should neeasure 10 in., and across hips 4 in . The leg and foot are cut in a scparate picce, also the $\operatorname{arm}(A, C$, and $B)$. For making the body-case, holland, glazed linen, or wash-leather are suitable. When the pattern is cut out place back and front together, right side inside, and stitch all round, leaving $f$ in. turnings. Lenve the neck open for stuffing.
There are many different materials besides kapok that are suitable for stufling dolls. Brown rugging wool, provided it is clean, is a
cheap and solt filling. Flock is another to the upper leg, but instead stitch on a piece material which can be used. Sawdust and bran give a good shape to the doll when filled. Before using, care must be taken that the filling is dry; this especially applies to bran. which, if p rcked damp, soon goes mouldy and


Doll Fig. 1. Stufied doll showng how to cat out the various pleeed, The method of mating a movable joint ia thown it $D$
smells unpleasant. Fine wood wool is much employed for stuffing dolls, and is suitable for big oncs that will be subjected to hard wear. This can be bought at glass and china shops.

Whatever filling is used, it must be parked in tightly. Force it well down into the legs, using a pencil. When both legs are well filled and a good shape, machine or stitch by hand a straight line across the body; this forms the hip line (Fig. 1). Continue to fill in the samc way until the trunk is firm and a good shape. Close the neck with strong stitches placed closely together.

The lower leg and foot should next be made. When filled the leg is ready to attach to knee. The following contrivance, which is extremely simple, makes the knee move as though jointed (Fig. 1, D). Do not attach the lower leg directly
of the same material, it in. deep, from whioh the body was made around the bottom of the upper log. Sew the top of the lower leg to the outer edge of this band of material. This leaves about $\frac{?}{i} \mathrm{in}$. between the two limbs, and will allow for movement sideways as well as backwards and forwards. The arms can be entirely made of material, or the lower arm, wrist, and hand can be bought made in compo sition or plaster, and glued to the upper arm. Attach both arms to the neck.

As this particular doll is intended to be for older children who would appreciate a realistic one, it is better to buy a head, obtainable at toy shope at varied prices. The heads are provided with good shoulder pieces, which must be glued over the top of trunk and arms, thus doing away with any unsightliness where the arms join the body.
Clothing for the Dolls. Clothes for dolls may be copied from national or fancy dresses, but are more often merely reproductions on a small scale of those made for girls, babies, and, to a lesser extent, boys. Their making is therefore only an adaptation of the ordinary principles of dressmaking, knitting. etc. Usually the more nearly the doll's clothes resemble those of its prospective owner the greater pleasare will it give; and for some children the larger its wardrobe, the greater amount of interesting occupation it will supply.
Socks can bo made on fine needles, just a straight strip decreasing a little towards the end; when sewn together at the back, and pulled on to the doil's leg, they will shape themselves. Shoes may be made from old gloves and fastened on with a button and loop. A vest can be knitted or crocheted. A straight piece of knitting with stitches cast off in the centre for the neck and shoulders and picked up again to complete the back is all that is necessary. A crochoted border for the neck will allow of a ribbon or string to pull it up.
Patterns of dolls' clothes, together with detailed instructions for cutting out, etc., are



Doll's Rouse. Fis. 1. Eacily conatrueted doll's hoaso. Fig. 2. Plan. Figs. s-5. End and sectional elovationn and plan of rool Figa. 8-7. Carcass of house and detalle of roof. Figs. 8-10. Opening fronts, doorway and bey window
sometimes issued with fashion periodicals, while various books and papers dealing almost exclusively with clothing for dolls and everything pertaining to the toy are obtainable.

Dolls for Christmas trees, party favours, eto. can be dressed in cripe paper. This can be bought from most toy stores in rolls of various sizes and in a wide range of coloars. A combination of different shades is often successful.

Because of its fragile nature, crêpe paper should be sewn with care and a fine needle used. This precaution applies particularly to gathers where the thread has to be drawn up very gently.
Renovations and Repairs. Thore are certain doll's hospitals in London and the provinces to which a damaged doll can be sent for repair. New wigs can be supplied quite inexpensively, new itmbs, new eyes, and new heads. The body of a large well-made doll will stand two or even three decapitations, and be worth re-heading at intervals. It is quite possible to repair a broken doll at home provided the face is not cracked and ruined. Very often the back of the head gets orushed in. The best remedy is to stuff the head with paper or cotton wool and glue over the whole aporture a fairly large wig. The jointed limbs of dolls can often be fixed in again. In the case of a hair, wool or sawdust stuffed doll, the detached limb can be sewn on again securely.
If the body is of celluloid or composition the limb can be securely tied on with strong thread or very fino elastio. The latter is knotted through one linb, threaded through a coarse darner, and then drawn through the doll's body, and the limb on the other side attached. If the outer covering of the hair or wool or sawdust stuffed body becomes torn, a neat patch sewn over the hole prevents the doll from " bleeding to death." In the case of a cracked face, the only remedy is to melt a little wax from a candle and pour it into the crack, smoothing it first before it sets to make it look as even as possible.
The Doll's House. An inexpensive, quickly made, strong and attractive doll's house is shown at Fig. 1. Oddments and three-ply board are almost wholly employed in the construction of these houses, the whole nailed together, and the walls and roof covered with doll's-house paper.

The entire front is constructed as two large doors which open over the ends and disclose the whole interior with four roomy compartments. On the ground floor is a kitchen at the left, and at the right a lounge living-room. The first floor may be used for two bedrooms; or the right-hand half may have a partition across, making space for a bathroom. In the lower lounge there is room for a neat staircase. The roof is so built that it may be lifted off; elevations and plans shown are drawn to scale. The elevations and plan at Figs, 2, 3, and 4 will give sizes and quantity of timber. Fig. 6 shows how the skeleton framework is built. There are four corner posts (A), for which lengths of about 2 ft . by in . square will be wanted. The middle upright ( $B$ ) is the same length, but 2 in . wide by $\frac{1}{2}$ in. thick, and is rebated for the partition (C), which will be 3 -ply board. The bottom (D), ends (E), and back (F) are three-ply, nailed on. The top (not shown in this sketch) is also 3-ply, the same size as the bottom.
The 3-ply floors (G) are cut at the corners to fit the posta, and fixed to narrow mould nailed to the 3 -ply sides and partition. The right-hand floor (G) should be cut back in the middle as indicated to allow for the recessed doorway part.
The front is a pair of large doors, hinged to the posts (A), and opening from bottom to top. The left-hand door, 13 in . wide, shuts on the upright (B), which is a fixture. The right-hand door is 17 in . wide, and includes the recessed
doorway portion of the house. Thus, the righthand opening front is not flat, but has a break (Fig. 8). The fronts of the house may be of $\frac{1}{8}$ in. wood, strengthened top and bottom with battens.
Screwed to the underside of each opening front is a $\frac{1}{2}$ in. platform which carries the bay windows. This plntform is 30 in . long by 3 in . wide ; but, as it opens out with the doors, it must be cut across as at $X$ on plan (Fig. 2) At Fig. 8 are given outline persjective sketches of the left and right opening fronts as they will appear in carcass. The bay windows and doorway are not show $n$ on this sketch. The narruw break piece $(\mathrm{H})$ should be of in. wood, nailed to the main parts of the little building.

Each door should be hinged with three good butts, and the platforms should be raised about $\frac{1}{8}$ in. from the basc. The base of the house may be framed up of $\frac{1}{2}$. or $\frac{3}{8}$ in. material, halved at the corners. The front stile will be 6 in. wide ; the back stile and rails may be 2 in . A stiffening cenire rail. 2 in . wide should be added.

## How in Make the Rool

A scale plan of the roof is given at Fig. 5, and at Fig. 7 a simple method of its construction. First make a frame of $\frac{1}{2}$ in. material, 32 in. by 15 in ., to overhang 1 in . at front and sides, but flush at the back, haived at the corners, with four holes bored to enter dowels fixed in the top. From Fig. 7 it will be seen that two gable pediments and a back piece (all of in. material) are nailed to the frame. Over these the 3-ply roof may be laid.

The shapes of the three inner slopes should be cut in stiff paper to secure the correct angles. The flat back portion of roof is approximately 18 in . by 6 in ., and will take a balcony rail. The front gables may be overlaid with $\frac{1}{8} \mathrm{in}$. fretwood cut to a width of $\frac{1}{2} \mathrm{in}$. The arrangement of the strips is shown at J, Fig. 7.

The doorway has two steps, $\frac{8}{8} \mathrm{in}$. or $\frac{3}{3} \mathrm{in}$., the lower one cut back close on the left-hand hinged front (Figs. 2 and 8). The door pilasters, (K, Fig. 9), of $\frac{1}{4} \mathrm{in}$. fretwood, $10_{\downarrow}^{3} \mathrm{in}$. long by in. wide, are sur mounted by a ledge sup. ported by two shaped brackets. The ledge may have an ornamental rail as shown in Fig. 1. The door may be 8 in. by 4 in . with is in. veneer mounted on to form panels. The fanlight above will be treated as a window. The arch shown above the doorway should be of $t$ in. or $\frac{1}{8}$ in.


Doll's Furniture. Fig. I. Complete set of sitchen furniture. Fig. 2-6. Diagrama ghowing how io make the various pieces

As the arch opens with the right-hand house front, it must be made rigid at the left-hand side by glucing in a smali piece of wood to secureit in the recess. If preferred, the lower step may be cut flush with the upper one, so that the left-hand door may be made to open before the right hand one. bay windows, of $\ddagger$ in. material with three-ply roofs, the plinth (M). and moulds (N) being glued on. The upper windows are nade up of $\frac{3}{16} \mathrm{in}$. fretwood glucd on in strips. Narrow moulds are planted on above a


Fig. 2


Fig. 10 shows the
 should below. All windows To secure the effect e glass being bended in veneer may be glued to the glass as at 0 , Fig 10. The construction of the little dormer window, shown at Fig. 7, calls for no comment.
Tbe chimney stack (Fig. 7) is a block of whitewood 5 in . wide, $3 \frac{1}{2} \mathrm{in}$. high and if in thick. Above is a flat piece of $f$ in. fretwood, and three sinort lengths of 1 in . dowel rod will serve as chimney pots. For the top balustrade
 Between these, on the roof floor, are glucd strips of fretwood in. Wide, whilst the rail itself may be $f$ in. beech dowel rod with little turned balls on the post tops.

A special feature should always be made of the outside and interior decoration of a doll's house, for it is this touch of reality that appeals to the child. The exposed woodwork may be

 painted a soft cream, the stand green, and the chimney pots red. The outside walls should be covered with doll's housc redbrick paper, and the roof with blue tile paper. For the inside a great variety of miniature patterns is available.
The Furniture. If the floors have been smoothly planed, the $\gamma$ can be stained, but if rough, it is better to carpet thom all over, cutting the carpets from any odd pieces. The floor of kitchen and bathroom can be covered with linoloum, and little rugs can be made of tiny pieces of carpet in contrasting colours. Long side curtains of cretonne or casement cloth surmounted by a little frill in the same material across the top of the windows look well.

Little net or muslin half curtains can be placed across the lowest sashes.
Charming little beds can be made out of notepaper boxes, chocolate boxes, etc. arranged so that the lid of the box forms the head of the bed, and trimmed with a frill of muslin to form valances and curtain Mattresses and pillows stuffed with cotton wool, and calico sheets, are added. The bed curtains in the different rooms can be tied with different coloured ribbons and the coverlets made of ribhon to match. An eiderdown can be made by stitching up about 12 in . of 5 or 6 in. wide satin ribbon to form a bag. stuffed with a layer of wadding. The bag is then sewn up, and the rows of stitching added by machine, which produce a facsimile of an eiderdown quilt.
The kitchen equipment should include a stove, pots and pans, wash-tub, mangle, irons, and all the usual outfit. Tiny brooms can he made by tying a fow wisps of fibre to a thin skewer or a few little feathers to a matchstick. A set of kitchen towels, dusters, etc., can be made, and, of course, the usual complement of cups, saucers, plates, etc., obtained. Sets made of aluminium are quite inexpensive, and minute cutlery, spoons, forks, etc., are obtainable in tin.

## Furniture Desisned sor the House

Doll's furniture may roughly be divided into two classes. There is the miniature furniture that a child can use with her dolls on the nursery floor-chairs, tables, beds, etc., made on a scale proportionable to the size of an average doll. Then there is the toy furniture used to decorate the doll's house, and it is to this latter type that the accompanying illustrated suggestions chiefly apply. Almost all the designs shown, however, have been so prepared that they can be marle to any size-in miniature form for the doll's house, or to larger scale for floor amusement. At Fig. 1 is a group of toy items for the kitchen. Constructional details are shown at Figs. 2-6

Miniature dining room and bedroom fur niture is shown in Figs. 7-13. Hints for other items may be gathered from our furniture articles on other pages of this work lior the smaller toy furniture odd scraps of iretwood


DOLLY. A dolly is employed for washing clothes in conjunction with a tub. The peg dolly consists of a vertical rod forming the handle; the lower end carries a disk on whicl are mounted a number of wooden pegs. The clothes are washed by using the dolly to propel the clothes, employing an undulating and rotary movement for this purpose.

The chump dolly has the pegs formed by shaping thom from the solid, and are
considcred stronger, as thero are no separate Almost any kind of cake, preferably white, can parts to work loose. Many of the hand and be used for making these sweet cakes See power driven domestic washing machines consist essentially of the washing tub and a dolly that is mechanically actuated, as by turning a handle or pushing a lever. See Laundry.
DOMETT. A cotton imitation flannel, unbleached or white, twill-woven and with a Heecy nap on both face and back, domett corresponds closely to tlannelette (q.v.) and serves the same purposes.

DOMICILE. A man's domicile is the place where he actually lives with the intention of making it his home. It is quite different from his nationality. The intention is very important, because many people live in a country for a very long lime without any intention of making it their home. Thus British nembers of the Indian Civil Service do not luse their English or Scottish or North-Irish domicile by any number of years' residence in India, because it is presumed that on the expiration of their service they intend to come
back to the country they back to the country they always call home.

But mere intention without the fact of
esidence will not do. Thus if 1 , who was born residence will not do. Thus if 1, who was born and have always lived in England, make up $m y$ mind to go and live in Scotland, but do not go-postponing my departure from time to time-my intention does not make me a domiciled Scot.

Until attaining 21, a person's dumicile is that of his father. The domicile of origin is retained until another is ncquined, either by the person when over 21 going to live in another country with the intention of making it his home, or, in the case of a female, by marriage with a man of another domicile.

Domicile regulates a person's matrimonial status and the disposition of his personal property, wherever situate, on his death. Thus, personal property in England of a person domiciled in Scotland must be disposed of by Scots law A will should be made accord. ing to the law of the testator's donicile, and if it be good according to that law it will be recognized by British courts.

Any person seeking divorce must apply to the courts of the country of his domicile, and if he obtains a divorce clsewhere the British courts will not recognize it, and will send him to prison for bigamy if he marries again. In England and Scotland a marriage contracted according to the law of cither country is legal ; but British girls marrying foreigners should be very careful to ascertain that the marriage will be lawful according to the law of the husband's own country. See Naturalization.
DOMINNO. A domino is a kind of loose cloak with wide sleeves and a hood, worn at masquerades by men and women who are not personating a character A small nask, generally covering the upper part of the face only, is worn with a domino. Dominoes are made in a variety of colours and in any suitable material. Taffeta, satin, Italian cloth or sateen are the materials most frequently used. See Fancy Dress.
dOMINO CABESS. Cut some Genoese pastry into small rectangles, split them lengthways, and spread the insicles with raspberry jam. Coat the little sandwiches with royal icing, and when set decorate them to resemble dominoes This may be done with the aid of a forcing fipe and a little chocolate icing.
 Dolly. Loth, peg ; and right, champ Co.. Lia. The block game, which is nore can, usually hy two persons, although wards and then let the players draw for the lead, unless, as is frequently done, the one holding double six or the highest piece in play takes it. This decided, the leader takes the number of dominoes agreed upon, and his opponent follows his example. They look at these dominoes themselves, but must keep from the view of the other player.
The leader then places a domino on the table, and the other player must fit to one of its ends one having the same number of pips as are at that end, e.g. 3 must be fitted to 3 . If the player plays double 3 or any other doublet, which is placed crosswise, he is allowed another turn, while if he cannot fit a domino he loses his turn. Conditions are the same if three or four people play.

A variant of the game is to leave a certain number of dominoes, generally 14, in the pool or centre of the table. These are drawn upon by a player who cannot fit one from his own hand. As he draws when they are face downwards, if he draws one that is unsuitable he increases his holding and thus suffers a disadvantage. The pool is not drawn upon after only two dominoes remain in it. A game is usually for 100 points, these being made by the winner of each round counting the pips that remain in his opponent's hand or hands.

Matador. Another popular domino game is called mataclor. In this, instead of fitting the dominoes with ends like to like, e.g. 4 to 4 , each player in turn must fit one to make up a total of 7. Thus, if the line of dominoes on the table have ' 2 and 4 at the ends, he can play one having 5 or one having 3 , or he can play a matador, as four of the dominoes are called. These are double blank, and threc


Domino Cakes condsting of raspberry gandwich decoratod with rojal icing and chooolate pipa
that total seven, 6.1, 5.2 and 4.3 If he cannot play he must draw from the pool, losing his turn if he cannot find one suitable. If a domino having ono end blank is played, no dominoes can be fitted to it, except one of the four matadors. When no further play is possible the winner, i.e. the player who has the fewest pips on his remaining dominoes, scores the number held by his opponent or opponents.

Other Games. Two other games are known as All Fives and All Threes. In the former two, three or four players can take part. Each takes an equal number of dominoes, provided that at least two remain untaken and that no one has more than seven. They are shuffled and distributed with the faces downwards. The object of the players is to make the two end pieces five or a multiple of five when the pips are added together. All double dominoes must be placed transversely.

All Threes is a variant of All Fives, the essential point being that three and its multiples score instead of five and its multiples. The scoring numbers are therefore three, six, nine, 12, 15, and 18, which score respectively one, two, three, four, five and six. The game is usually played for 61 points.

Another game is known as fortress. Four players take part, each having seven dominoes. The one holding double six leads and the others must play to it, as in the orlinary game, until they can go on no longer. The game owes its name to the fact that the players have the right of placing tho dominoes at right angles to those already down, as well as in line with them, thus forming them into a fortress-like plan.

DONEEY. For people of modest means or for teaching children the rudiments of horsemauship the donkey is very useful. Costing not more than a few pounds to buy, his yearly keep is equally inexpensive, especially if there is a paddock in which he can run. He is hardy, dooile, sure-footed, and seldom is ailing. He measures generally well under 12 hands.


Donkey. Useful anjmal for teaching the olements of
horsemanship to joung ohiddren
If one is bought young, treated in a kindly manner, and given a little corn and hay, he should be able to trot well, and grow up free from the stubbornness so characteristic of the race. Ladies living in the country find an animal of this description must useful for conveying luggage, etc., to and from the station. A light village cart is the most suitable and brown harness looks the best.

In choosing an animal select one of the darkcoloured sort with fine, clean legs. They are said to be preferable to the lighter. If kept out at grass all the year round they cannot be expected to do as much work, or trot as quickly, as if they are fed more like a horse. Children may began to ride a donkey is panniers as soon as they can sit up, later on coming to a saddle. When old enough they should be encouraged to ride bare-backed.

# Doors: Making New \& Improving Old Ones 

## Styles and Methods of Work Explained and Mlustrated

Among the many headings in this work that contain information on doors are Adam Style; Architecture ; Cottage; House. See also Amateur Carpentry; Architrave ; Bolt; Bracing; Burglar Alarm

After the solidly plain doors surmounted by the beautiful arch of Tudor times, Jacobean dnors were elaborately panelled, but towards the end of the 17th century panelling became simpler, doors often showing only two panels each. In the 18th century, however, there were usually six panels or more, but the mouldings retained simplicity. At the end of the century Robert Adam fully appreciated the decorative importance of benutiful doors and designed doors and architraves enriched with fine mouldings and carvings to suit the style of his buildings. Unfortunately a great many ugly doors were constructed during the 19th eentury.

While the doors of the modern house are usually designed by the architect to suit the character of the building. whether modern or influenced by Tudor, Jacobean, Queen Anne or Adam style, much may be done to improve the appearance of existing doors when reconstructing or redecorating the housc. Front doors should never look shabby. This is not likely to happen when the door is of mahogany or matured oak and only needs the ordinary care given to such woodwork and the regular cleaning of the door furniture. It does, how: ever, happen in the case of painted hall doors which have been allowed to remain dusty, dirty, splashed or blistered owing to neglect, wet weather or lack of a sun curtain

Though bright colours for doors in a town street or terrace are attractive, it is well to remember that they will not continue to be so unless paint with a very hard, glossy surface to withstand the weather is uscd. Blaok or dark blue gives a door a dignificd appearance. lut any dark colour is apt to show dust collected in the panels unless carefully kept. Green is an uxcellent front door colnur, the colder greens such as malachite or jade being good with wrought-iron door furniture for a terrace door, while the warm leaf greens form


Door. Iron door with hammered enrichments suitable for the inner hall door of a large house Courtesy of Bayliss, Jones if Bauliss, Lidd.
a pleasant contrast to a red brick house and harmonize with any surrounding trces.
The illustration in the previous column shows a good design for the inner hall door of a large house. It is of hammered iron, panelled with glass.

Improving Ugly Doors. Inside many houses badly made and badly proportioned doors have to be endured or camouflaged. Such a door may be rendered unobtrusive by painting it the same colour as the walls and placing a draught screen so that it is partially hid den, but apart from this expedient there are small improvements which can be made without much expense or trouble. Where panels are shallow, strips of nalrow picture moulding, sold by the foot. can be applied all round inside the panels. The strips are held in place bytiny pins, and may be painted before applying if the door has already been repainted. A good idea is to use a different colour for the moulding, contrasting with the door and match ing the frame, or the mouldings may be painted in gold or silver metallic paint, the pate requires owering while the panols in a pressand the metallic paint used to outline the frame. Such details necessarily depend on the decorative scheme of the particular room

An insignificant door in a room of fair height can be remedied, as shown above on the right, by the use of a plywood pediment and pilasters made of thin boards. This treatment would be particularly suitable for a room with decoration and 'urniture based on an 18th century stylc. Applied mouldings are used to border the pediment and to ornament the pilasters, pioked out with a contrasting colour

Another improvement which can be carried out is also illustrated. The door is cased in plywood and is thus made panelless and Hush. This treatment is suitable when a brilliant enamelled surface is given to the plywood and a rioh colour is used, the architrave of the door being in a paler shade which matches the skirting and cornice of the room. Coloured glass or painted china door furniture to tone make such a cloor highly decorative.

Defects and Remedies. The practical test of a good door is that it opens and shuts easily ; inferior doors tend to drop and drag, being susceptible to damp. Unsatisfactory working of a door is nearly always the result of swelling, warping or other such change in the wood. A common trouble is sticking when shut. Passing a piece of paper all along the crack between the top of the closed door and the lintel, and between the calge of the door and the jamb, working from inside the room, will reveal the region of contact by the fact that the paper cannot be passed along the crack there. The door can be kept open by a wedge inserted under the botton, while the high place is planed down. To plane the bottom the door must be taken down and then rehung.

Sticking can be cured without planing if there is a good wide crack between the door and the jamb on the hinge side when the door is shut. If the sticking region is located between the door and the jamb towards the top, or if it is betwcen the bottom of the door and the floor or carpet, the door should be taken down, the recess in the jainb which receives the top hingo should be cut deoper with a chisel, and the door replaced. If the tight place is over the top of the door, or if it is between the door and the jamb towards the bottom, the same procedure is to be followed, except that in this case it is the bottom hinge, not the top one, that is to be sunk further into the jamb).
A door that will not stay shut or that has to be forced to make it latch or that cannot le locked, can usually be curcd by moving the perforated plate which is provided on the jamb to receive the latch and bolt. If the Intch works correctly when the door is forced home in shutting it. then the plate should he moved a little outwards towards the room. If latch. ing is facilitated by lifting on he door handle, ing down on the handle makes the latch work, then the plate must be raised. In bad cases all three tests will fail, and it is necessary to resort to measurement. The door should be nearly shut so that the height at which the latch meets the plate can be marked Then on opening the door the worker will be able to sce at a glance whether the plate needs raising or lowering.

If the height proves correct, then what is required is to move the plate out towards the room, the exact amount being found by shutting the door and measuring the position of the latch by inserting a knife-hlade in the crack, this measurement being compared with the position of the holes in the plate on opening the door. The plate is moved as required by unscrewing and removing it and then custing an extension of the recess it has occupied in the jamb. The deep holes in the jamb which admit the latch and bolt will probably require extending, an operation which demands care, and the old screw holes must have plugs of wood hammered in and cut off Hush before the new screw holes are made.

The latch trouble inay be due to an entirely different cause from the above, i.e. a broken spring or excessive friction in the lock; the test is to see if the latch springs out frecly when the handle is turned and released with the door open. If this test shows that the mechanical action is at fault, the lock should be taken off the door by removing first the screw securing the handle to its square bar, then the handle, then the bar, then the screws which hold the lock in place in or on the door. and finally the lock itself.

When a door yields at the joints, take it down, drill out any dowels, and take the door to pieces. Then refit all the joints, glue and
 from the illustrations as a guide and varied to suit any particular design, provided that strength and durability are always evident.
Ledged and Braced Door. Fig. 1 is sometimes handy for a cellar door or for temporary use. The battens, of such a width that to. gether they make up the exact size required are 1 in. thick, tongued and grooved together. The tongue of the one outside batten and the groove of the other batten will both be removed.
First cut off all the battens slightly longer than the finished length, select one for the outside and mark the pusition of the ledges, which should be in seotion as in Fig. 2. Nail these on firmly at right angles and place the re. maining boards in position and cramp them together.


Door. Fig. 7. Fine oak door in Jaoobean style. Figs, 8 and 9. Derails of the mouldings, which should be in the solid upright or muntin, the thestyle. panel gruove (Fig. 6).
in and the holes filled in
All the rails are then A rim lock and cross garnet hinges are used, marked out, also the centre and a beaten iron handle is in keeping with
shoulders for which are It is necessary to allow a small clearance all marked from the stiles. round when fitting a door, excopt at the top When cutting the tenons of corner opposite the hinged side. whioh will be the top and bottom rails, found gradually to drop in time. When allow haunches at the out- ordinary butts are used, a fairly big clearance side edges to fit into the is allowed at the bottom for the carpet. If a

Having cut all mortises a plain surround it is customary to use skew and tenons, the panel groove hinges. These take the form of a spiral



properly driven through to moke a secure joint by drawboring ( $\mathrm{q} \nabla$.).

The bottoms of the side posts are mortised into the threshold or tread and two stout galvanized iron dowel pegs driven into them, leaving about 2 in projecting, their purpose is to hold the bottom of the frame socure.
to project on either side of the door post for building int.o brick work, or cut of flush if it has to be set into existing brick. work or conerete which it is not desired to dis. turb. The threshold or step is then prepared and rebated or not as required. The side posts ure mortised and tenoned into the head and sccured head and sccured
by wooden pegs ded in cement mortar and set in holes cut in the brickwork. If the frame has to be set up in new work, it is braced
by dingonal struts of rough wood about 3 in by 1 in., placed as shown in the illustration, to prevent the door frame from racking or getting out of the square.
The iron dowels are fitted to the brickwork and the frame bediled down on cement mortar, set up plumb and square and held in that position with a temporary strut to the ground, guch ts the light scaffold-pole seen in the illustration. The brickwork is thon built up to the framework

Finally, the joint between frame and brickwork is made good on the outside by a cement fillet, and by a wood or plaster lining on the inside. In cases where a new frame has to be fitted to an existing opening. the frame is set up plumb and square and secured by wooden wedges driven in hard, over the top of the door posts and at the ends of the head. The joint is then made good with a cement fillet and an inner lining as before.

It is frequently found in old buildings that the door frame has perished at the bottom, and when the expense of a new frame is not desired an excellent repair is pussible by splicing or scarfing on new feet. Remove the frame and take it to the bench if possible, but whero this is not practicable strut the posts to the ground or the floor while the joints are being cut.

Before fixing a new frame, or refixing an old one, it should be treated with wood preservative if it is to be finished with stain, or with two conts of red lead priming if with paintwork.

## DOORS: THEIR FURNISHINGS AND FITTINGS

## Choosing and Fixing Knockers, Handles, Knobs and Springs

Thls article, together whth the preceding one on Door gives the householder much useful Information oa a subject of interest to every home

Furniture for doors includes knockers, cleaning with metal polish. Such cleaningleaves letter plates, handles, knobs, finger plates marks on the surrounding point and even. and key plates. Front doors usually have tually may rub it off. When in doubt with a knocker, a letter plate and a handle or linob. regard to a handle or set for a painted door The last is generally for ornament rather than it is advisable to choose plain glass, which use on $\pi$ town house door. Sets for interior is always in good taste. Sets in raised Chinese doors are commonly made in three picces, lacquer work or in painted glass are handsome namely, a finger plate, knob and key plate, but in a suitably furnished room.
sometimes there is a second finger plate fixed Door Knockers. The appearance of a front below the key plate. It must always be borne door can be greatly enhanced by the knocker. in mind that the style of the door furniture On massive wooden doors such a design as should accord with that of the door, and choice of metal or of the material and colour used for fancy sets are points of decorative importance.

Fancy sets, suitable for the less formal type of bedroom and sitting room doors, are made in white or coloured glass. There arc also pretty sets obtainable in painted china with wreaths and bunches of old-fashioned flowers. For bedroomdoorscoloured scts in milk coniposition are suitable and aro made in numerous shades. These materials are an improvement on the brass furniture which requires


Door: examples of knockers. Beautiful specimens in bnth wrought firon and brass, from which choice can be made for doors of varying size and period. See text
suitable in wrought iron. Equally striking brass knob, fitted to the spindle by a screw would be the brass knocker in Queen Anne thread and set screw, which sometimes gets style (Fig. 2) on a panelled mahogany door slack and fails to turn the lock
or on one painted in dark colour. Another Tho remedy is to screw up the handle, or to beautiful design is the snake knocker, Fig 3, which is an excellent choice in hand wrought iron for the brightly coloured town house door. The Adam style of Fig. 4 is graceful in brass and suitable for a flat door. The door of a Georgian style house would be perfectly completed by a brass knocker like that shown in Fig. 5, while for the country cottage or bungalow. either Fig. 6 or 7 would strike a pleasing note. Painted metal door knockers are obtainable which are suitable for small front doors. They are made in many designs, from sailing ships to dogs, and Punch and Judy figures. In smaller sizes such knockers are used for bedrooms in some houses. Combination door knocker, handle, and letter plate sets are known as pustal handles. The letter flap of such combination sets is cither horizontal or vertical.

Most knockers are fixed to the door by bolts and nuts, which should be recessed by counterboring the door so that the nuts are below the surface. The holes for tho bolts should be accurately marked out on the door and drilled the suit the size of the bolt ined in conjunction witha latch, or forming an D o o P Norfolk latch (Fig. 5). Among various classes of door handles the first consists of the type in which the


Door. Designs for bandles. Figs. 3-10, showing various types of attractive and decorative patterns, including a door bandle with back plate, lever bandle, Norfolk latoh Gotbic Rate latch, drop cupboard door latch, fush bandle, and handles for cabinets

to which is attached a small lever or furn Latches and locks are dealt with in their respective articles.
The door handle in its simplest form. unconnected with lock or catch, forms a third class. It is used for cabinet work, and on doors fitted on swing hinges and not intended to be latehed Decorative handles are madn in great variety, modelled, for example, on the lines of a lion's head holding a ring in ito mouth. An example of the flush-fitting handle is the drop ring, hinged at the top and ly:ng in a recess formed in the back-plate. When required for use the ring is swung outwardy. Fig. 8 shows one of this kind Of the numerons types of cabinct door bandles the drop bandle is a popular form, and two examples are shomn in ligs. 9 and 10.

Door Knobs. The cheapest types of doar knob screw simply into the door. A hole is hored with a bradawl or gimlet, the knob screwed in as far as possible with the finger 4 and tightened by means of gas pliers, a piece of cloth being wrapped round the handlo to prevent damage by the pliers Frequently this typo of knob is longer in the screw than the thickness of the door. The method of treatment then, shown at Fig. I, consists in reinforcing the door by screwing or nailing hehind it a piece of wood into which the screw can bite.

Wooden handles are sometimes screwed to the door by a wood screw put in from the back, as in Fig. 4. Others aro made with a wooden serew that fits into the handle (Fig. 2), the screw being conted with glue belore insertion.

Metal knobs are often fitted with a screwed shank having a nut and washer with which to bolt them to the door (Fig. 5). A neat "ay to fix such a knob is to counterbore the door and let the nut and washer in Hush, as in Fig. 3.

Door Springs. The term door spring covers all kinds of resilient controls adnpted to the closing of a door. The simplest device comprises a coiled spring having a metal plate at cach end, one attached to the door, the other to the frime (Fig. 1). The spring is set at a slight angle upwards across the door: it is tensioned by turning one end of the spring with a tommy bar, the other end being fast to the plato fixed to the door frame. The number of turns given to the spring deternines the pressure that it can exert, and therefore the speed at which the door will shut without slamming.

The nethod of securing the spring varies, but a common form comprises a steel pin inserted through a hole in the fixed part of the spring plate, and engaging with a groove in the moviable end piece of the spring. Other holes are provided to take the tommy bar, which in emergency may be a stout nail Another type (Fig. 2) comprises a plate with lugs supporting a long arm having a spring in the hub. Une end of the spring is attached to the plate, the other to the long arm. The intter presses on the door. A wheel is fitted at the end of the arm, and runs on a door plate, to prevent damage to the door.

A neat device is a pair of spring hinges (Fig. 3), as there is nothing visible on the exterior of the door, and generally the hinges permit the coor to move in either direction, or are double hung. These springs are wailable

lound in some snug hole waiting for the first signs of mild weather.

Dormice require $n$ roomy cage, and preferably two should be kept together. Their food should be as natural as possible, mainly nuts, acorns and beechmast, with
sulficient water to drink Failing these, they may be given bread and milk.

Doronicum. A hardy plant whioh bears long. stemmed yellow, daisy-like thorns in spring. It is called Ieopard's Bane (q.v.).

DORY. Known also is the .Iohn Dory, this fish resembles the turbot, and is The forcgoing are examples of door springs particularly adapted to domestic requirements. Heavy doors may be fitted with one of the more claborate devices, such as those on a pneumatic system which combine a door spring and check combined. There are several excellent types available, and the requisite directions for fixing and adjustment nre sent out by the makers or factors.


Door Sprlak. Fig. 1. Common spiral spring attached to door and jaub. Fig. 2. Long arm type of door

DORKING FOWL. This fino old Englisin breed is without a rival as a table fowl, having more flesh in proportion to the size of its frame than any other, while in colour, quality and flavour it leaves nothing to be desired. It is a moderate liver, and excels as a sitter and mother. There are five varieties, viz. dark, silver grey, white, cuckon and red, the first two ranking as best. The Dorking is not adapted to confinement, but is an ideal fowl for the farmyard. See Poultry.
Dormer Window. This type is a small attio win. dow built vertically into the sloping roof of a building. See Attio.: Window.

DORMOUSE. This little animal is easily tamed and makes a good pet for children. The time to look for it is in winter, when in a somnolent state; it will generally be


Dorking Fowl. Cock of the old
English breed of table fowl

DOSAGE. The estimate of the amount of a drug or of X-rays, etc., to bo given in particular circumstances is known as dosage. In the British Phirmacopoeia and similar publications an exact amount is not usually advised, but an upper and lower limit are given, e.g. tincture of opium, 5 to 15 minims, the lower amount being what is necessary to produce any useful effcct at all, and the higher the limit of safety. These doses are meant for an arlult, i.e. a person of 21 or over.

People for whom the average dose is far too much are said to show intolerance for the drug, and a person who has discovered intolerance for particular drugs should mention the circumstance to any doctor who mav be called in to treat him.

The dose of a drug injected undor the skin is about half of the doso by tho mouth, but injected into the bowel it has to be twice as much, with one or two exceptions. If it is intended to give a single dose of a drug this will be larger than if the drug is to be given in repeated doses.

Opium is very badly borne by infants and young chiddren, and hercin lies the danger of mothers giving their babies soothing syrups containing opium. On the other hand. chitdren stand largo doses of some drugs very well, like bellailonna and calomel. A rough rule for linding the dose of medicine suitable for it young ohild is to give a fraction of the adult dose calculated by taking the ohild's age as the numera. tor and the age plus 12 as the denominator. Thus the fraction of an adult dose of 20 minims for a ohild of 8 would be $\frac{8}{8+12}$ or $\frac{2}{5}$ of 20 ,

## that is, 8 minims.

## DOUBLE CHEESE.

 This term is used for ohecse made of whole milk, or in the case of soft cheese, viz., cream cheeses, of doublecream, or of a very rich thick cream containing 50 per cent of fat. See Cheese.DOUCHE. As used medicinally a douche is a stream of water or air directed against a particular part of the body, and is used to cleanse or apply tluid medicaments. Astringent douches are employed to allay the discharge resulting from catarrhal inflammation of a mucous surface, and nntiseptic douches are valuable for destroying germs.
The simplest and safest apparatus consists of a tin douche can connected by 6 ft . of rubber tubing, with a hard rubber or glass nozzle, which is easily disinfected by boiling. A warmed solution is poured into the can, which should be held above the head to let the fluid flow out with the requisite force. A useful astringent douche is made up of alum, 40 grains ; eino sulphate, 20 grains, and water, 1 pint. For a mild antiseptic douche. lysol or permanganate of potash solution may be employed.

A douohe may also be used for washing out the nosc in chronic catarrhal conditions, and a convenient form of apparatus is the glass nasal douche. It is filled through a funnel let in at the side, and if the opening of filler is closed by putting the thumb over it, the contents will not cscape at the nozzlo at an untimely moment. When the nozzle is properly applied to the nostril the other end of the douche is raised, and if the pressure of the thumb is somewhat relaxed the fluid runs into the nose. While the fluid is running in at one nostril tho patient bends his head slightly over a basin, opens his mouth widely and breaths deeply in and out The Huid
 masses to the back of the nose and then returns through the other nostril. The following is a useful lotion: borax doz., sod i u m chloride, 1 dram . distilled water 10 oz Add 1 tablospoonful to a pint of warm water and use. Pron. Dush.
DOUGE. By this term is understood a mass of tlour moistened and kneaded, but not brked. Sour dough (leaven) can be, if necessiry, used instead of yeast to raiso llour for bread-making purposes. The dough, or sponge, rises, that is, inereases in bulk and becomes porous, owing to the fermentation set up by the action of yenst, sugar, moisture and warmth, resulting in the formation, entanglement, and subsequent expansion of bubbles of carbon dioxide gas, which, in their efforts to escape, lift up the flour and make the solid mass spongy and light.
Tho quality of bread-dough depends ohiefly on the llour used, that containing the largest percentage of gluten yielding the best bread. and tho management of the yeast. Dough is also leavened or "raised" by two other methods than the use of yeast. One consists of mixing the flour with water which has been saturated under pressuro with carbon dioxide gas, the bread made from this dough being termed merated bread. The second method is by mixing it with various baking powders. See Baling Powder: Bread; Yeast.

DOUGH CAKE. Beforo mixing the fruit and other ingredients for dough oakes grease 2 or 3 cake-tins and line each of them with 2 layers of greased paper, which should reach $\tilde{j}$ or 6 in . above the tops of the tins. Then clean and stalk $\& \mathrm{lb}$. each of ourrants and sultanas. In a large basin rub $\& \mathrm{lb}$. butter into 2 lb . flour, using the tips of the fingers. Afterwards mix in the fruit, 吕 lb . moist sugar and $\ddagger \mathrm{oz}$. of allspice.
Put loz. compressed yeast in a small basin with 1 tenspoonful of eastor sugar, mix them togetiter vigorously with a wooden spoon, and,
when they are creamy, add I pint tepid milk. Pour this liquid into the flour, etc., mix to a light dough, knead it well, and put it into the prepared tins. Put these in a warm place for 1 huur or inore, until the dough has risen to twice its original size : then bake in a hot oven for about 2 hours.

DOUGHNUT. With 1 lb . Hour must be uscd 1 oz yeast, 2 eggs. $\frac{1}{2}$ pint milli and $\frac{1}{2} \mathrm{lb}$. cach of sugar and margarine. Spices, such as cinnamon and grated nutmeg, can be added, and raspberry jam is usually placed in the iniddle of the doughnut.

The yenst should be dissolved in the milk, previously alightly warmed, and the sugar and about $\left.\frac{1}{2} \right\rvert\, b$. Hour stirred in. This mixture is then covered over and put aside in $\Omega$ warm place. When it has well risen and fallen again it is ready for the iddlition of the eggs and the margarine. The eggs should be braten and the margarine melted before they are added, and a pinch of salt sprinkled in.
The dungh having been well mixed, another I lb . flour is stirred in, and the dough is again put aside in a warm place. After about 10 min . it is laid on a Houred board and kneaded into balls, with a small spoonful of jam placed in the centre of each. The balls should he dropped into a deep pan containing boiling lard and cooked for 10 to 15 min . When done they require to be well drained on kitchen paper and rolled while hot in castor sugar.


Dovecot. Fige. 1-7. Small dovecot for attaching to a wall, with diagrams showing method of construction
monly known as the great wood pigeon, is a native of Great Britain; the other two are migrants. The ring dove is a very handsome bird, and its crescent-shaped mark of white, which ncarly encircles the neok, stands out in striking relief against its dark, ashen-grey plumage
Making a Dovecot. In Fig. 1 is shown $\pi$ hanging dove or pigeon cot which providea accommodation for five pairs of birds, three


Doughnut. Four stages th the cooking of dougbnuts. The dougn ready formed on the board, and being dipped in boiling iat ; and the finisbed cakes, draining on paper, and ready for serving Courtesy of Our Homes and Cardens

Doughnuts can also be made successfully on the lower storey and two above. The front with baking-powder instead of with yeast. Beat 4 oz . butter, or butter and lard, to a cream, then add 4 oz . white sugar, a beaten cgg, and a pinch of salt and of allspice. Mix well together, and add 1 lb . self-rasing flour, or household Hour, with which a level teaspoonful of baling.powder has been mixed. If the paste is not damp enough, add milk. Turn it on to a floured board and roll to a thickness of about $\frac{1}{i} \mathrm{in}$. Cut into rounds and push a thumb through the centre of each to make rings. Alternatively in the centre of half the rounds, put a dab of jam, and cover with the plain rounds. These will lose their resemblance to sandwiohes. when cooked as described above.

DOULTON WARE. In its more limited sense, Doulton ware, produced by the Doulton potteries at Lambeth, and elsewhere, conaists of salt-glazed stoneware produced with a single firing, decorated with applied mouldings or scratched patterns, called sgraffito, filled in with neutral colours. A speoial form, called carrara ware, has a crystallinc enamel, sometimes finished with gold and colour.

Various forms of twice-fired carthenware are also produced. Doulton faience has a terra-cotta or biscuit body, decorated with scenic or floral paintings and fired under a dull glaze. One of its forms, called impasto, has thin layers of coloured clays, applied to the smooth surface. See Faience; Pottery.

DOVE. There are three kinds of dove must usually kept as pets, viz. the ring dove, turtle clove, and stock dove The first-named, com-
of the cot is inade to open for cleaning purposes, and when in position it is secured with two turn-buttons.
Almost any wood 1 in. thick may be used. Fig. 4 shows a general view of the construction Required are two sides (A), 1 ft .9 in . long by 1 ft .5 in. wide, strengthened with 2 in . battens fixed as shown at Figs. 2, 3 and 4. The bottom of the lower nests $(\mathrm{B})$ is 3 ft . 1 in . long by 1 ft .5 in . wide, and it rests upon battens fixed to the bottom of the sides, to which it is nailed. The bottom of the upper nesta ( C ) is 3 ft .1 in . long by 11 in . wide, fixed to the upper battens on the inside of the sides.

There are two divisions (D) dividing the lower nests, whioh are 11 in. wide and simply nailed in position. The centre division ( E ) of the upper nests is 11 in . wide by 11 in . high, and fitted above is a ridge piece (F), 1 ft .5 in . long by 2 in deep, nailed to the division. The end divisions (G) are 11 in . wide by 7 h in . high. It will be necessary to bevel the top edges of the sides, divisions and ridge to suit the slope of the roof. The back boards should befitted horizontally, and nailed


Dovetail. Fig. 1. Simple balf-lap dovetail joint. Figs. 2-8. How to mark out and make a common dovetail joint
arider at one end than the other. The case upening, a single duvetail suffices, as shoulders, or sides, of the groove are cut with the saw, and the wood chiselled awny to form the groove. The other part is sawn to the same taper, and half the thickness of the wood sawn away, the joint being finished off by chisel work until a perfect fit is obtained

The conmon dorctail, Fig 2, is much used on drawers and similar cabinet work Suppose the dovetnil is wanted on a drawer side, about 9 in decp, first plane the ends of the wood true and at raight ; then, with the marking gauge, scribe a linc on all faccs of each piece, and at a distance from the edge equal to the thickness of the wood: this is known as the shoulder line. The number and shape of the dovetails have now to be set out on the wood, making use of a scriber and the dividers

First settle the thickness of the pins at their narrowest part, say $\frac{1}{2} \mathrm{in}$., for example. Set off one half this thickness from each end of the shoulder-linc, on the outer face of the wood, as the dovetail has to resist outward


Dovetail. Figs. 10-12. Examples showlag various forms of the joint commonly used in cabinet maklog and joinery
illustrated in Fig. 10. When a dovetail is not to show on the face of the work, as for the front of a drawer, it is known as a lap dovetail. It is set out by seribing a line on the end grain at a diatance from the face of the front piece corresponding to the thickness of wood required for the lap or solid part. The pins arc then set out in the same manner as before and the waste wood removed by saw kerfing, and careful horizontal and vertical paring. The sockets mny be marked out as before and shaped with the saw, and by paring with the chisel

A developinent of the same idea is the secret lap dovetail, in which no dovetail is visible on any face of the work (Fig. 11). This is accomplished by leaving a lap on each part instead of only the face piece: the work of construction is similar to the previous example, but calls for more skill. When the two lapping parts are mitred instead of being lapped, the joint is known as a mitred secret dovetail (Fig 12) The construction of the mitred secret dovetnil is similar to the Inpped sccret dovetsil, except that the mitre is first set out and roughly shaped. the pins and sockets arc formed, and the whole is then very carefully fitted together See Joint

DOWELLING. This is the term given to the method of jointing timber and other materials by wooden or metal jega called dowels.

Iron dowels are used to secure the uprights of door frames to the stone step, and dowels made from iron naila are occasionally used for packing. case making

For cabinet making and similar work straight-grained heech wood dowels may be
pressurc. Then divide the distance between these points into any number of parts, say five, and from these points mark on each side the half thickness of the pin Square off with a try-square, and mark off from these points to the end of the wood. ts shown in Fig. 3.

Set the bevel square to an angle of about $15^{\circ}$, and mark on the end grain the shape of the dovetail (Fig. 4) ; then squarc off from these points with the try-square to the shoulderline on the opposite side of the wood. Set the job upright in the vicc, and cut just inside the lines with a fine-touth tenon saw, then cut away the waste wood between the saw cuts, either with a bow saw (Fig. 5) or by chiselling; in any casc, finish and fit with the chisel.

## How to Mark Out the Sockets

Now mark out the socliets on the other piece. This mny be done in the way described above or with a scriber, marking direct from the pins of the corresponding piece. In the latter method the position and shape of the pins is scribed on the wond (Fig 6), keeping the scriber on the inside, so that the point will not tend to wander from contact with the sides of the pins Squarc off on to the end of the wood (Fig. 7), set it up in the vice and saw to the inside of the lines (Fig. 8) Cut away the waste as before, and all that remains is to fit the parta accurately together, doing this with a chisel, and watching the progress of each set.
When much work of the kind has to be done, it is a convenience to use a metal template shaped to the correct angle for marking out the dovetails (Fig. 9). This tool is obtainable from the shops, or is easily madc from a piece of thin sheet metal.

When two pieces relatively thick have to be dovetailed, as for the framing of a stair-
bought in lengths of about 38 in , and of any desired diameter. Fig 1 shows a dowel with a small groove running along its entirc length. The objeot of this groove is to allow the air and superfluous glue to escape and thus a void splitting the work on hand; the groove also sccretes a certain amount of glue, which increases its loold on the timber

Fig. 2 illustrates the method of marking out and ganging two boards for dowelling. The cdges of the boards are first shot to a truc joint; then the face sides are placed together and the lines for the dowels are marked across


Dowelling. Fir. 1 Grooved dowel. Figs. 2-3. Marking ont and fining dowels to doint two boards.
Fig. Mitre joint. Fir. Fig. 6. Table leg and tramlag
the edges. The boards are then gauged from the face side, thus giving the points indicated in the sketch. A safe rulc for the spacing of dowels when jointing sideboard tops, dressing table and wardrobe ends, etc., is to place the dowels 9 in to 10 in . apart, and place two dowels at cach end, as shown at Figs 2 and 3. The length of the dowels should be about \} in

Fig. 3 shows the two boards prepared ready for glueing. The one on the left is bored to receive thic dowels, and the one on the right shows the dowels glued in position It is customary to warm the cdges of the boards before spreading the gluc. Cramps, to squeeze the joint tight, should be left on the jointed board from one to four hours.

Fig. 4 shows the sketch of a mitred and dowelled frame One corner only is shown The dowels should be at right angles to the line of joint, and consequently the dowel at the outside edge of the frame will have to be shorter than the others. Fig 5 is a leaf for the telescopic screw type of dining table Ciroular dowels are shown at one end, and rectangular wooden pegs at the other: both methods arc good, and, of course, the dowels are only glued into the leaf. The object of these dowels is to guide the shelf into its propes position when the leaf engages with the tahle proper, and tc makc the table and leaf register correctly
Fig. 6 is a dining table leg and portion of the fraining, showing the nethod of dowelling the frame to the leg Cbairs, coucl frames, etc. are made in a similar manner. See Cabinet Making : Joint

DOWER. I: English law this was the life interest which a widow formerly had in one third of her husband's landed property This right has been abolislicd in the case of peraons dying after 1925 In Scotland a widow has a right called 'terce,' equivalent to dower, which entitles her to a life interest in one third of her husband's property in land This right still survives See Marriago.

DOWN. The word down is applied to the soft liair found under the feathers of fowls it also describes kapok, a vegetable donn obtained from such plants as the thistle, etc
For ordinary purposes, a mixture of down and fine feathers gives excellent results, provided that the mattress, cushion or pillow is given frequent and thorough sliakings to prevent lumps from forming. Vegetable down or kapok, which is much cheaper than real down, needs to be separated carefully with the fingers before use to ensure freedom from lumps. The best kind of down is that obtained from the neck of the eider-duck; less expensive varieties include cygnet, duck, and goosedown See Cushion; Fiderdown; Pillow: Quilt; Swansdown.
DRABA. Sometimes called whitlow grass, this is a low growing hardy, evergreen alpine plant whioh must be planted in very gritty soil in a sunny position in the rock garden During winter it is wise to provide protection by placing pieces of glass over them to keep off excessive rain; the glass slould be raised a few inches above the soil by wires Aizoides, yellow., aizoon, yellow; bruniaefolia, yellow; and pyrenaica, lilac-rose, are some of the chief kinds. Propagation is by sceds sown in gritty soil in the rock garden in spring or by division in September.
Drachm. Apothecarics weight equalling 3 scruples or $\mathbf{6 0}$ grains. It is distinct from the avoirdupois dram, which containa 27d grains.
DRAINAGE: Of the Soil. Surface draingge is important to the householder, as waterlogged soil is a menace to health. Systems of land drainage include grading or sloping the surface of the earth, the provision of ditches and trenches, lnying agricultural drain pipes, digging a trench and placing brushwood or


Drainage.
Figs. 1-8. Diagrams illustrating the principles of garden drainare bere described
By special arranocment uith Amalcur Gardening
can be about 3 ft or more acconding to the space a vailable.

The upper surface must have semicircular grooves formed in it, and spaced about 3 in. apart. The underside of the board is strengthened by ledges 3 in wide and 1 in. thick. A hardwood skirting board $\frac{3}{4}$ in. thick and 3 in. wide should be screwed to the board with brass serews to protect the walls from wet. A similar skinting at the front, but only projecting 1 in. above the surface, is a safeguard for crockery
A draining boardshould have a fall towards the sink of about 1 in . in every foot of length; moreover, for sanitary reasons, the board should rubble in the bottom of it, and then closing in the top with soil.

There inust be adequate means for disposal of the surface water at the termination of the pipe lines or trenches These can generally deliver into a brook or pond; failing that, a soak-allay drain must be constructed

This talies the form of a cavity filled with gravel, rough stone, rubble or any porous material, the water collecting in the cavity and ultimately soaking away into the earth The site for a now house or bungalow should drain naturally ; if it does not, a system of surface drainage must be provided. At the same time some pipes must be introduced through the foundations to dispose of any vater that may accumulate beneath the building and cause damp walls or dry rot.

Garden Drainage. Water lying stagnant in a garden instead of passing a way fairly quickly is proof that the natural drainage is insufficient. In draining a garden first ascertain by levelling what fall the land has and in which direction it runs. Then take out a narrow trench a foot or so deep at the top end, letting it slope evenly and gradually till it reaches the lowest print in the garden (Fig. 4). If one main drain is not sufficient, secondary drains, herring-bone fashion, must be added, as in Fig. 7. In this diagrain the main drain is shown running from A towards C, while the sucondary drains are labelled B.

There are three styles of drainage, plain pipe, rubble, and pipe-rubble, illustrated in Figs. 1-3. Secondary drains must bo packed with broken tiles where they join the main drain (Fig. (i)
juints between pipes should be covered with a turf (Fig. 5). The pipes used should have a bore of not less than 2 or 3 in . When rubble is the medinm, layers of 6 in . will be found satisfactory. Generally one drain running obliquely, as shown in Fig 8, will be sufficient in the average small garden, or one main drain and secondary drains:

Where there is not opportunity to take the outfall into a ditch or road drain, let it empty into a tank sunk in the soil. Water will not lre carried off readily if drainage is laid on the level. In clay garden lands drains should not be farther apart than 15 ft . See Drains: Sanitation.
DRAINING BOARD. A draining board is a wooden structure erected at the side of the sink in a kitchen or scullery to facilitate ivashing up, the dishes as they are washed being laid on it to drain The draining board should be made from hardwood such as beech or sycamore at least 1 in . thick; its width slould equal that of the sink, and the length
terminate llush with the walls of tho sink and avoid any crevices where dirt or dust could accumulate. Draining boards can

Essentials in any house dramage systenı include disconnexion of drains from the sewer by means of traps : disconuexion of rain, bath. and other water waste pipes, by discharging thens ints the open air above a trapped gulley: adequate ventilation and self-cleansing apparatus.
The following notes illustrate the general requirements of a small house in the matter of drainage A typical installation comprises the provision of drains for a bath, lavatory basin and sink, a water closet, and means for disposal of rain water. The latter may or may not be a part of the house drainage system, but at least some of the rain water from the roof should be adnitted to the drains


Drains. Fig. 1. Exterior of house showing drainage pipes corresponding to those depicted in Fig. 2
frequently be lixed on deal hearers, secured to adjacent walls, otherwise the best plan is to construct a pair of gallows brackets from sound deal's in wide and 1 in thick. as shown in the illustration. These brackets comprise thrce elements, (a) a vertical strip to attach to


Draining Board supported by a gallows bracket; right. detail of joint between board and edge of sink
the wall, (b) a Lorizontal bearer to support the board, and (c) a diagonal strut or brace. The joints can be screwed together, or preferably mortised and tenoned and securely wedged.
Draining boards are kept clean by scrubbing with white sand or using one of the many brands of cleaning powder which are now on

## Drains: The Domestic System Explained

Points of Importance to both Landlord and Tenant
See further the articles on the various types of house, c.g., Bungalou; Cottage; House; also Cesspool; Disinfectant; Refuse; Sanitation; Septic Tank: Wotet
to ensure periodical cleansing and flushing. In general the whole of the rain water is disposed of by the house drainage systeru. except where a rain-water storage tank is providerl, into which the rain-water pipes would discharge.
The apparatus required is shown in Fig .2. from which it will be seen that the bath and lavatory basin wastes deliver into a separato waste pipe which should be carried up as a ventilating pipe, the open end being above all window openings; usually it is taken just above the caves.
In modern patterns the bath, lavatory basin and sink have special overflows moulded in the stoneware, and these discharge above the seal of the trap underncath the fitting. Where these overflowe are scparato they are treated in the snme way as the Ilushing cistern overflow, that is, the pipe is run through the outer wall for about six inches and cut off in a sloping direction. Should the ball valve of the cistern go wrong, or the taps to any fitting be left running, warning is given by reason of the water pouring out of this pipe.

The waste from the water closet passes down the soil pipe, through the manhole and thence to the disconnecting trap. The bath and lavatory basin dischargo through the waste pipe under the grid of the trapped gulley. The aink waste discharges in a similar way. and both gullies deliver into the manhole and thence to the disconnecting trap.

The bath, sink, and basin are all fitted with a trap or interceptor, which acts as a water seal; the closet pan incorporates a similar device; hence adequate protection is provided against the entry of foul gas.

A pipe is connccted from the manhole to the disconnecting trap, which is situate in a second manhole, marking the termination of the drainage system and the commencement of the sewer. A typical arrangement is shown in Fig. 3, and comprises a disconnccting trap with cleaning eye, a connecting channel, an air inlet or ventilation pipe, and manhole cover. This completes the drainage system.

It is absolutely essential in any system of drainage that sewer gas should be prevented from working back from the sewer (Fig. 3)
into the drains. From this arises the import ance of the disconnecting trap-a bent or U-shaped pipe, so arranged that water lying in the hollow effectually seals or stops up the channel, the water being impervious to sower gas. Every time the drains are flushed this water seal is renewed An inspection or cleaning eye enables the connexion between the trap and sewer to be uscd for drain rods should that portion become blocked; the eye is closed by means of an air and gas proof plug.

The manhole is built in brickwork and well rendered with cement to guard against leakage The cover is generally made of east iron, embedded in cement mortar and sealed with cart grease and sand The air inlet or vent pipe has a flap or non-return valve at the top: this pipe should be some 2 or 3 ft . aliove ground level. The purpose is to admit fresh air to the drains : the air ultimately escapes through the air vent pipe which forms the upper termination of the soil pipe, and thus provides a constant current of air through the whole system. The manhole enables any obstructions to be cleared away in case of a stoppage.

The pipe line between the disconnecting trap and the house manhole must be at raight and continuous, with a regular fall of at least 3 inches in 10 ft ., and nowhere less than 12 in . bclow the surface of solid earth. The house manhole serves a similar pus ose to the disconnector, with the adilitional duty of collect. ing together three separate delivery pipcs.

The pipes from the bath and sink waste are brought to the trapped gully, which terminates at about the level of the surrounding ground, and is hedded in concrete and provided with a brick and cement rendered curb. The waste pipes from bath and sink terminate in shoes which discharge over or under the grid of the trapped gully. This acts in the same way as the disconnector, having a similar water seal. A removable cast iron giating is fitted
The soil pipe is taken by a pipe sloping up. "ards slightly from the manhole to a bend and thence perpendicularly to a junction branch, the arm of which connects to the water closet which incorporates the water seal or trap. The soil pipe continues upward and terminates at least 3 ft . above the roof level, and is provided with a globular wire cap. Fig. 1 shows the usc of a swan neck to avoid

leading the pipe past the bathmom window. The provision of trapsor water seals, Fig 4, at hath and sink outlets in conjunction with those already described entirely closes every possible inlet for poisonous gases.
Sewagedrains must comply with the by-laws and requirements of the sanitary authoritics. No alteration must be made spithout due notice being given, and the work has to be approved by the local authority's inspector

Stoppages. The task of rectifying stoppages is one that brooks of no delay, and the practical man can set about it himself in most cases. If


Drains. Fif. 3. Sectional diagram through disconnecting tran and manhole
$t$ is the sink or lavatory basin that is choked, made on the ground as exhibited by water remaining there instead of running away, the stoppage will probably be found in the waste trap. This should have a screw plug at the bottom, and what is required is to place a bucket or receptacle beneath it, remove the plug with a spanner, and with a flexible cane or soft wire endeavour to remove the obstruction Take care that the receptacle is sufficiently large, as the trap itself holds a fair amount of water, and if much remains in the sink or basin a small bucket might fill to overflowing.
made on the ground liable for repairs if a the landloril is certifies that the house isnnitary inspector for habitation.

If a drain gets out of order by stoppage or foul smell, the tenant should at once inform the landlord, after first endeavouring to remedy the nuisance, e.g. by flushing with hot water and soda, or by using a rod and plunger. If the landlord fails to make the drain right and the householder feels that his family's health is being imperilled, he can call in the local sanitary authority.

Where the drain is condemned as faulty the owner has no alternative but to takeit up and substitute an entirely new one.


Fig.4. Water seal ortra ror bath or sink wastc
A tenant who takes a house for a term of years is hound to keep the drains in proper order. If a drain bccomes faulty through the breaking of a pipe, owing to subsidence of the soil, the liability to repair is the landlord's. If a tenant or his family become ill owing to faulty drains through no fault of the tenant a clain may lie against the owner of the house. Anyone building his own house must have the scwage drain pipes passed by the local authority before filling in.

DRAUGHT : How to Avoid. A draught is frequently due to faulty ventilation, as for example in a small room, when the doors and windows are closed and a fire is burning. Under such circumstances air must be admitted to the room, and unless the doors and windows are absolutely airtight, the heated air will ascend up the chimney and a strong suction be exerted upon any cracks and crevices, with a draught as the result.
The most effective curc for a draught is to give attention to the adequate ventilation of the room, as by opening a window at the top, by the provision of air bricks, or any means that admit sufficient fresh air at a low velocity. When the air is admitted slowly an objectionahle draught is not created. It is the large quantity of air entering at high speed through a small hole that gives the tmuble. Adequate treatment on these lines is more in the nature
of building construction and should have



Draught greluder. esge 1-J. Dovices tor aloging the sap betwean door and Boor. Nig. \&. W astherboard atted to an outade door
through a crevice that would otherwise be draughtproof. Doors and windows are the chief offenders, and the trouble is generally due to defective workmanship and material. The remedy is, however, simple and effeotive. India-rubber draught tube with a canvas flange can be glued or nailed round the window frame so that it seals the joints or covers the cracks. Felt or cloth strips are more durable, as they nevor crack; rubber is prone to dry up and split in hot weather.

Sash windows are effectively protected by cloth-covered sandbags made in the form of long rolls.
Draught Excluder. Fittings of various kinds are obtainable to close the gap between door and flowr. Fig. 1 shows a device consisting of a cloth or plush-covered roller loosely mounted in brass brackets ecrewed to the door. This rolls over the floor when the door is opened or closed, but when at rest the roller lies upon the ground and checks the draught. One type of automatic device is shown in Figa. 2 and 3, and comprises a moulded strip attaohed near the bottom of the door. The end of a sliding member projects and is pushed back by the door frame, thus forcing the movable strip down on to the floor. A tight joint is ensured by means of a tlexible rubber strip at the extremity of the slide. A concealed spring lifts the strip clear of the floor as the door is opened. Owing to the method of outting the diagonal sluts, this type of excluder may be readily reversed to suit the hand of the door.
When considering the application of draughtexcluding devices it is best to inspect the door-frames and to make sure the door shute up tight against the door-stop. If it dnes not, the stopping can be removed and replaced so that it abuts against the door, and this will stop the draught. The door-latch may be slack, allowing the door to rattle. This can be remedied by overhauling the lock or by resetting the socket or staple.

Outside doors are often improved by the addition of a weatherboard (Fig. 4), but this must be throated or grooved as shown, or the
rain-weter will work its way in onder the door. A narrow metal slip projecting slightly above the surface of the threshold will often be a boon in checking a draught.

DRAUGGETS. This game, in America called checkers, is played betwoen two opponents on half of the squares of the chessboard, either on the 32 white squares or on the 32 black squares. For convenience it is here assumed that the white squares are used, in which case the board is set with a black square to the right hand of each player. Each side has 12 pieces, all of the same shape, which are placed at the start in the position shown in Fig. 1. In the notation which enables $g a m e s$ to be recorded the squares are numbered as in Fig. 2.

A draughtaman moves one square forward diagonally. If a man of the opposite colour stands in the way, with a vacant square immediately behind him on the same diagonal, that man can be captured by jumping over him gon to the vacant square, and removing him position black (who invariably has the first move in draughts) plays from 11 to 15 and white replies by moving from 22 to 18, black jumps from 15 to 22 and removes the hostile man from 18. Further, not merely one man can be captured at a time, but a succession of men, all in the same move. Suppose a black man to stand on 1 and three white men on 0 , 15 and 23. Black can jump in succession to 10,19 and 26 , removing the hostile pieces.
The object in draughts is to capture all the opponent's pieces or to reduce them to such a position that they cannot move at all, in either of which cases the game is won. When a capture is possible it must be made. If by error it is not made, there is a penalty called huffing, which consists in removing the piece which could have made the capture off the board, this huffing not counting as a move. It is a player's option either to huff his opponent. to insist upon his making the capture, or simply to let the wrong move stand.
When a man reaches the farther side of the board (the 8th rank away from the player) he becomes a king, with the power of moving and capturing backwards as well as forwards A king is shown by crowning, i.e. putting a spare piece upon him The reaching of the 8th rank completer a move. Suppose a black man to stand on 21 and two white men on 25 and 26. Black can play to 30 , capturing the man on 25 and making his own man a king; but he cannot


Draughts Fig. 1 (left). The plocen att out ready for the game to berin.
Fig. 2. Notation of the board

## Draughtsmanship. See Drawings.

DRAW-BORING. This method is employed for pegging the components of a mortise and tenon joint so that the joint faces are drawn tightly together. The method consists in drilling a hole through and at right angles to the mortise. Next put the tenon into the mortise, and drive it home : then mark on the tenon the position of the hole in the mortise, by scribing a circle on the tenon, using the hole in the mortise as a guide.
Remove the tenon, and, supporting it on a block of waste wood, drill a hole, the same size as that in the mortise, but nearer the shoulder of the tenon, the usual amount being slightly less than the half diameter. Prepare a tapered hardwood pin of a size to suit the hole, put the joint together after removing any ragged edges around the holes, and drive the pin home with a hammer or mallet. The peg then acts as a wedge and draws the shoulders of the tenon very tightly against the mortise, and to a certain extent obviates the need for a cramp. If the joint is to be permanent it can be secured with glue and the peg glued in as well When tho glue is dry the projecting ends are cleaned off smooth and flush. If it is considered desirable to be able at a subsequent time to take the joint apart, the thin end of the peg should be left projecting so that it can be knocked out when desired.


Draw-boring. Varioas stages in this mothod al making tight-Atting mortive jolnts
The peg hole should be nearer the edge of the wood against which the shoulder fits. A common practice is to drill the hole so that its centre is $1 \frac{1}{1}$ times the diameter from the edge of the wood. The various stages in making this joint are illustrated.

DRAWER: How to Make. For drawer construction dovetails are the ideal joints to use, since by their formation they exert resistance in the direction of the chief strain to which a drawer is exposed, i.c. the forward pull. The ordinary hand-cut drawer dovetail does not vary much in form, except, of course, when the particular construction or formation of the job requires different treatment Fig. 1 is typical of the average drawer. When making one of medium size, it is usual to use 1 in . or $\frac{1}{c}$ in. stuff for the front, and $\frac{1}{2}$ in. or $\frac{1}{8}$ in for the sides and baok. At the front the dovetails do not run right through, a small lap being left on the front. This is necessary to
hide the ends of the dovetails, which rould otherwise diafigure the front. To make a drawer such as Fig. 1, all the st uff is first planed up and thicknessed, and marked in the relative positions which they are to ocoupy. The front is then planed to fit exactly between the rails. A good plan when fitting this is to cant the edgee very slightly inwards, so that the front wedges in between the rails. The sides are also planed to fit just hand-tight, and both ends squared off.
The back is now squared up at both ends to coinoide with the job, but it does not occapy the full width of the drawer. At the top it stands down about $t$ in., and stands on the drawor bottom (Fig. 2), so that the position of the bottom must be decided apon; $t \mathrm{in}$. is usually sufficient for this to stand up, so that the distance, added to the thickness of the bottom, will give the bottom position for the back.

When marking out the dovetails, note that the groove for the bottom is contained within the lower front dovetail, as the groove would otherwise-show a gap in the pins. At the back, the square lower edge of the bottom runs right through along the pin, so that when the side is marked out this is cut square (Fig. 2). When all the joints are cut, the front is grooved for the bottom and the top edge of the baok rounded over: the drawer is then glued up

Figs. 3 and 4 show how the bottom is held at the sides, grooved alips being glued to the sides. The objeot of using these instead of grooving the sidos is partly to present a greater width underncath, thus giving greater wear resistance to tho runners, and partly to avoid weakening the sides. The bottom is either nailed or screwed to the back, and is made sufficiently wide to stand out from the baok about $\frac{f}{8}$ in., so that in the event of it shrinking the screws can be taken out and the bottom pushed forward.

## Centre Support for a Lons Drawer

In the event of the drawer exceeding 18 in . or so in length, a centre support for the bottom should be fired. This is about 2 in . wide, and is grooved in the same way as the slipa. A stub tenon is out at the front to fit into the groove in the drawer front, and the support is held at the back with screws, the upper lipping being cut away to bring the groove against the baok. The drawer is then fitted and the top baok corners bevelled off (Fig. 2). The running of the drawer is facilitated if the sides are slightly bevelled off at the baok along the dovetails. Ordinary candle-grease is a good lubrioant to use to ensure smooth running.

In cases where it is required to place the bottom flush underneath, as, for instance, in the trinket drawers of a dressing table, a rebate is run round the front and sides, as in Fig. 8, and the bottom dropped in this. It is also neoessary to arrange the dovetails as illustrated in Fig. 5 to provent any gaps showing at the sides See Birds' Egg Cabinet Bureau; Chest; Chest of Drawers: Desk ; Dressing Table; Wardrobe, etc.


Drawer. Fign, 1-8. Diagrame showing the component pasts and details of constriotion of an ordinery drawer oircles. 32 in . by 23 in ., and it may be of the cheap. clamped variety or, preferably, with battens on the underside. For mechanical drawing it should be truly square on the left-hand side, the left edge being used to guide the stock of the tee square. The ordinary cheap clamped board made of sound, dry pine, will last for many years, and has the advantage that both sides are available. The best quality boards are made with battens on the underside, and are grooved to allow the wood to expand and contract. For the same reason the battens are secured to the board with slotted plates and screws. They usually have an ebony or hardwood slip inserted in the left-hand edge for the tee square to work upon.

Eseential qualities in the toe square are straightness of the ruling edge. This can

## Drawings: Their Preparations and Use

## Some Practical Hints for the Amateur Craftsman

The ficts given in this costribution, together with the Illustrations, are intended to help those who wish to make any of the constructional articles described in this work

The ability to produce an intelligible drawing round one. For fine work a hard pencil, tors. The tools and materials required need not be expensive, but it is well to bay reliable instraments. A mininum outfit comprises a drawing-board tee square, set squares with angles of $45^{\circ}, 60^{\circ}$, and $30^{\circ}$, one or two ruling pens and a 6 in . half set of drawing instru ments (the latter comprising compasses with ink and pencil points, an extension bar, and a pair of dividers) : drawing paper and pencils, some Indian int, a piece of indiarubber and a few drawing pins It will be well to add a pair of mall spring bow compasses with ink and pencil points, as these are handy for drawing small

For all-round use the imperial-size drawing board is the most oonvenient. This measures be tested by ruling a line, turning the square rotating the upside down, and ruling anotherline on top of dividers or the first one; if the edge of the tee square is $c o m p a s s e s$ true the two lines will coincide and appear as while the one. The preferable form of tee square is made in mahogany with ebony edge.

In ohoosing set squares, those made of celluloid or a transparent material are to be preferred, and should have one edge bevelled, as this minimises risk of the ink running under while using the ruling-pen Compasses should have fine sharp points, preferably those with a needle t.eld in a clamp; should have firm joints and exhibit no shake or play on any of the joints. The various types and qualities are disoussed at length under the heading Compasses (q.v.). The same remarks apply to dividers. prises a fixed and a movable steel blade, the ink being inserted between them by means of a small brush or an ordinary pen. It is essential that the exterior of the blades be free from ink, otherwise it will be liable to cause a blot when ruling a line.
The pencils are preferably of the heragonal type, as these do not roll off the board so easily as the
is of great value to all amateur construc- such as an H.H., is to be preferred: but

The ruling pen com where much rubbing out has to be done, a softer pencil. such as an H.B. or B. is more convenient. as it is more readily erased Pencils should be sharpened to a chisel point.
For ordinary working drawings cartridge paper will be found quite suitable, but for more highly finished drawings inink, a smooth surface prper should be used, such as a Whatman H.P., or hot pressed paper. The only inks that are of any practical use for mechanical drawings are those generally known as Indian inks.
In using compasses or dividers, place the metal point exactly on the line or centre from which measurements are to be taken. If equal on both sides of a centre line, mark them by Plan


Drawing. Piga, 1 and 2. EjevaDrawing. pigal and 2. Eimple rooden bor Mig. 8. Bectional
 jection. Fig. 6. Porspective wing of boz needle point
 upon the centre line; as far as possible take all dimensions from a few centre lines When using ruling pens or the pen points in the compasses, charge them with ink from a brush or pen, wipe the points of the blades clean with a piece of rag wrapped round the finger, and before ruling long lines see that the blades have sufficient ink between them, as it is difficult to join up the two parts of a straight line. The pen should travel at an oven speed over the paper, be held nearly upright, and always at the same angle to the paper. Before laying the pens aside, wipe off the ink with a piece of rag or blotting paper. The points of all drawing pens should be kept sharp but perfectly smooth by setting them oocasionally on a piece of fine oil stone. Other instruments used in mechanical drawing comprise proportional compasses, French curres, parallel rulers, scales, and other special appliances

Methods of Projection. There are several ways in which an objeol may be depicted. Simple projection assumes that every part of the object visible in, say, a vertical plane is projected upon an imaginary flat surface, although, in fact, the object may be curved or of any other shape. It is usual in mechanical
 shown in Fig. 7 trangio:red to the wood
drawing to show a plan of the object, that is, the appearance as seen from above, and a front elevation or view of the object as seen from the front and projected upon a plane at right angles to that of the plan ; an end view is also drawn upun a plane at right angles to that of the plan, and alsn at right angles to that of the front elcvation

Where the object is differently shaperl on both sides and both ends, elevations are given of all these four sides. Suppose now the object were hollow and that the cavity could not be scen from the extcrior, this would be depicted by means of a section, this being neither more nor less than projections on a vertical or hori. zontal plane imagined as passing through the object, and it thus shows its shape as if it were parted asunder with a saw.

Isometric projection is a method of showing three surfaces of an object simultaneously, whercas plain projection shows only one face on any one elevation. In drawing an object in isometric projection, all horizontal lines are measurad from ono centre point along lines inclined at $30^{\circ}$ to the horizontal. Vertical dimensions are taken at any necessary place along these inclined base lines.

In Figs. 1 and 2 a simple wooden box with the planes marked on the drawing shows the various elevations. The sections through the box are shown in Figs. 3 and 4. The same box has been drawn to the same scale by isometrio projection in Fig. 5, and in Fig. 6 again in mechanical perspective.

Comparison of the three processes and their relative advantages can thcrefore to made.


Drawing. Fig. 8. Conventional methods of treatin; various materials in mechanical drawing

By the first system the actual shape and good Error may be avoided if the elevation size of the object is depicted either full of the piece of furniture is set out to scale. size or to any convenient scale. The It is equally desirable to know how to set isometric projection gives a better im. out the complete vertical and horizontal scopression of the appearance of the finished object, and dimensions can be scaled off from it. In the thind illustration the appearance of the article is extremely good, but it is not practicable convenicntly to take any dimensions from the drawing. Hence for a working or mechanical drawing, the first system is the best for
amatcur puramatcur pursecond system is very good, as it indicates something of the external appearance of the object and provides the necessary, means of measurement The third system is of value to the architect or constructor who wishes to show the correct appearance of the article when it is finished.
No special instructions are required for the preparation of drawings of objects that are made from flat material with straight or angular surfaces and edges. It is in drawing curved surfaces that greater difficulty is mot with, and as an example Fig. 7 shows one method of drawing part of a chair back, and clearly indicates what has to be done in preparing a drawing for such a piece of furniture. To transfer the ourves to the work it is desirable to draw lines at right angles to one or more of the edges of the piece of wood from which the chair back is to be made; and
 We know exactly then what we are doing, and every dimension-length. width and thickness -may be taken from our set-out. It is not only that the work itself is rendered easier, but again and again we are saved the mortification which results in the discovery that, through some trifling miscalculation, we have cut a costly bit of line wood the wrong size. Careful setting-out, indeed, is the first step towards the attainment of good results in all cabinet work.

In making a full sized dra wing of some detail, e.g. a chair back, squares may be ruled on the small sketch and the drawing transferred square by square to paper similarly ruled on the enlarged scale. By numbering the squarcs vertically and horizontally the chance of error may be eliminated. Where necessary in our constructional articles a squared detail sketch is given, the scale being indicated.

Certain conventional treatments are generally followed in draughtemanahip to indicate sections, different materials, scrow threads, and the internal shape of an obiect, examples of all of which are given in Fig. 9.
The Flaishing Touches. Drawings are usually finished after completion in pencil by going over all essential lines with Indian ink, using the ruling pens, and ink points on the compasses, after which the dimensions are given and the points from which they are taken indicated by dotted lines, the latter conveniently drawn in a different coloured ink. If a drawing is to look well it should be neatly lettered; simple sloping letters are easier to draw than those to set off the distances along these lines and transfer them to similar lines simple letterings and methods of ruling for
drawn upon the wood itself, drawing the them are illustrated in Fig. 10 . drawn upon the wood itself, drawing the them are illustrated in Fig. 10 . curve through the points thus found. The When a drawing has to be copied, it is as method is illustrated in Fig. 8.

Scale Drawings. The amateur cabinet paper or linen. This is pinned over the pencil maker should try his hand at a scale drawing drawings, and wiped over with French chalk of the article he is about to construct, practis. to clean the surface. Subsequent work is pering until he is able to draw mouldings or other formed as if on paper, the pencil lines showing details full size from a scale sketch. There is through the tracing oloth and acting as a guide. nothing really difficult in this; it is a matter When completed, blue prints or black line of knowing how to use the T-square and rule, prints on white paper can be obtained by and rarely involves freehand drawing. The sending the tracings to a firm of photogreat advantage of a scale drawing is that it engravers, or the amateur can make his own shows at once whether the proportions are sun prints in favourable weather.

## Drawing Rooms in Several Styles

## Suggestions for Furnishing and Suitable Colour Schemes

For related information see Chair; Colour; Decoration; Furniture, and for detalls about accessories Curtain; Cushion; Mirror, etc. See also Carpet and the entrles on varlous styles, e.g. Adam; Chippendale; Queen Anne, etc.
There is a certain formality which dis scheme. Small tables instcad of being dotted tinguishes a drawing room from the orlinary about the room aro produced as required living room and from the lounge At the same from a "nest" of four; the larger occasional time, except in a big house where there table is often a useful book table. Comfort are four or five recreation or sitting rooms of is still ensured by the inclusion in the furniture different types, a drawing room should have of a good settee or Chesterfield, and one or a lived-in aspect and express to some extent two lounge chairs, supplemented by several the personality and taste of its owner, so newer types of chairs designed to take up that it does not look mercly a room set apart little space and yet for ease. If a piano, to entertain visitors.

Perhaps one of the best things noticeable in many modern drawing rooms is the tendency to do away with overcrowding, not only of furniture, but also of superfluous ornaments, pictures and cushions. Things have a meaning and a definite place in the music stool, bureau or writing-table and bookcase are added the essential furniture is collected. Niches with shelves for china are always delightful features in a drawing room, while a recess provided with shelves is an excellent place for a gramophone. The records are kept in neat compartments on the
under shelves and the gramophone on the top trave of the door one about thre feet from the floor. It is thus both easily got at and out of the way should the room be required for dancing. A light fitting should be placed conveniently for seeing the records. In small rooms the piano sometimes has to be omitted.

Whatever the furniture already possessed may be, it can usually be improved by good choice of furnishing fabrics. When starting to redecorate, renovate or furnish a drawing room take a view of the whole of its possibili. ties and determine the essential things to be done or bought, and the styles and colours needed to enhance it. This method precludes buying a carpet merely hecanse it is a good hargain, a piece of furniture that is not in accord with others in the room, or picking up cushions at a sale merely because in themselves they are pretty. Such haphazard methods have spoilt many rooms that could have been charming with far less money spent on them than was lavished to produce an unsatisfactory medley.

Country House Drawing Rooms. A drawing room in the country is often simpler in treatment than the onc in a town house. Freshiness and the happy nature of the colour scheme will make up for a mixture of styles in pieces of furniture. Loose covers rightly play ail important part in the scheme of such a room. If they are to be of a patterned cictonne, it is useful to remember that the larger the room the bolder can be the nature of the design on the fabric, but that such a design requires a plain setting. An attractive idea is to have the curtains of the gaily printed material and the covers in plain linen. This looks particularly well in a room where the windows are a feature.

A charming scheme for a sunny drawing room, which hoasted no beautiful architectural features except a well-proportioned group of outward swinging casement windows, was evolied from a colourful cretonne used for the short curtains and box-pleated valance. The ground of the cretonne was dark smoke grey with large bunches of old-fashioned flowers multi-coloured, but with pink and red rose shades and the green of the leaves predominating. A grey wall paper was chosen with a faintly suggested brocade pattern in an oyster shade. The paintwork was carried ont in the latter colour except for the archi.
 Drawing room. Fig. 1. Scheme for the drawing room of a country house, the prevailing tones being beige,
gold and brown. The two long windows and the glass door into the garden let in plenty of light and sun gold and brown. The two long windows and the glass door into the garden let in plenty of light and sun Courlesu of Our llomes \& Gardens


Fig. 2. Corner of a town drawing room. The furnlshing and decoration are
based on a dignifed yet simple Queen Anne style enbanced by flower paintings Courtesy of llampton \& Sons, Lid.

Adam style in designs of doors and chimney pieces, more or less suitably adapted to unpretentious rooms. As a rule this has to lie made the hicst of, as structural alterations are impossible during a threc-year tenancy. A successful method is to paint the walls a suitable pale colour and simulate panels with applied mouldings. Such a scheme forms a good background for most furniture whether of modern, antique, lacquer, painted or reproduction varieties. A ceiling paper of silver is a highly decorative finish if the furnishing of the ronm permits it.

## A Pleasing Colour Scheme

Another scheme which is pleasantly noncommittal is to distemper walls and ceiling a clear pale yellow or in flesh pink, paint the woodwork in a cold sea green picked out with silver, have a settee upholstered in a deeper shade of the same grcen in damask or heavy moite ; repeat this colour also for the curtains, the pelmet for which is trimmed with silver braid and fringe. Loose covers for the chairs would be in a cretonne with a pale green ground patterned in a small conventional design introducing pink and ycllow. A carpet of modern pattern in which the predominating colour is green might be used or one of plaingreen pile. Tiles which are not harmonious in colour can be toncd to suit the woodwork. Waxed walnut furniture with one laoquered or painted piece and a floor standard lamp in the sea green colour would look particularly well in such a room, but the scheme is not one that necessitates any particular style in furniture.
For a town house drawing room the simple Queen Anne style, illustrated in Fig. 2, could he carried out without great expense. The curtain treatment would be beautiful in plumcoloured silk with dull gold trimming. The carpet could be an oriental one introducing plum colour and old rose shades, the upholstery a modern silk tapestry in which the colours of the carpet are blended with a gold thread running through the design, and the walls are painted a soft apple green, while the ceiling is n pale gold colour. The panclled llower painting over the fireplace and the gold net glass curtains brighten the room.

A contrast to this room would be one in which the scheme was hased on a biscuit, fawn and pink wallpaper of classical design. This could be completed by a light brown pile carpet unobtrusively patterned in fawn, taffeta curtains shot with pink, fawn and gold, and loose covers made of a shadow tissue in which these colours blended with a soft blue. Either oak, mahogany or walnut furniture would be at home in such a room.

DRAW KNIFE. This is a tool used by carpenters for roughing out along the grain. It consists of a heavy blade to which two wooden handles are fitted and riveted to prevent them being pulled off in use, the blade being ground to a chisel edge. When using a draw knife the operator stands astride of the woorl to be cut and, holding the knife by the two handles, draws it towards him along the wool, while keeping the blade at an angle to the wood. The result is to draw off inassive shavings slowly and steadily. The action should be one of drawing, not chopping, though chopping has to be resorted to when cutting through knots in the timber.

DRAWN TEREAD WORK. This work is mostly executed on linen of an open weave, which allows the threads to be casily drawn, and is suitable for afternoon teacloths, table centres, and all kinds of house linen. The soft canvases used for duchesse sets and sideboard runners, and also crépe-de-Chine, georgette and satin dress materials can be decorated with drawn thread work.

Modern drawn thread has many additions in the way of fancy lace stitches, from which have crolved the beautiful designs seen on the corners of tablecloths. In its initial stages it began with punto tirato, threads drawn one way of the material, then punto tagliato, threads drawn both ways so that they cross, and these were followed by opum tiratum, the fancy stitches worked on the loose theads.


Draw Knife used in rouglung out timber
needle from right to left under three or four threads, according to thickness, and draw the thread through. Insert the needle in the same place and bring it up again through the hem just above the place where it was brought out before. Insert the needle under the next three threads and repeat, Fig. 1. Fig. 2 shows the hemstitch used as an insertion.

Fig. 3 gives the pattern of a single crossing evolved from Fig. 2 after hemstitching both edges. The clusters of threads are crossed thus. Put the point of the needle from left to right under the second cluster, then let the point travel from right to left under the first cluster, still lieeping the second cluster under the needle, and bring the needle up to the left of the first cluster. Repeat along the line, turning every second cluster over the preceding one, and this will give a running thread through all the clusters. Fig. 3 shows the needle in position for beginning this stitch. Fig. 4 depicts trellis hemstitch. Hem. stitch one elge as at Fig. 1, but when doing the opposite edge tako half the strands from one cluster and half from the next.


Drawn Thread. Figs. 1-5. Simple and more involved forms of hemotitching. Figs. 8-7. Stages in working the drawn thread work corner shown in Fig. 8

The Faggot-Stitcn. Fig. 5 introduces faggotstitch and the punto tirato knot. The latter is used largely in the most beautiful drawnthread designs. Prepare the henstitch insertion as in Fig. 2, then three or four clusters are bound together with the knot, when thev resemble faggots of wood. The thread should be joined at the end of the work, or where there is not a hem it can be tied to the finst three clusters to make the first faggot.
The knot resembles chain-stitch in em. broidery with a slightly different placing of the needle. Take sufficient length of thread to do the whole length of insertion.
Now, working down the line of insertion, turn the cotton towards the left and hold it down with the left thumb; bring the point of the needle over to the left of the cotton held down and insert it down the upper part of the space between the faggot just tied and the next faggot. Pass it behind the three clusters that will form the next faggot and bring the point up over the cotton that is held down by the thuinb. Draw the needle through with sufficient tightness to bind the faggot and let the thread lie in a straight line between the faggots. Fig. 5 shows the accurate position of the needle and thread, which is very important.

Fig. 6 shows how to finish $\pi$ comer so that the threads are not drawn right to the hein Buttonholo the two outside edges of a square along exactly the number of threads that will be drawn on each side, then cut the threarls under the pearl edge of the buttonhole stitches and draw out the threads on both sides, when a square hole will appear, as in Fig. 6. This can be filled with a fancy pattern as in Fig. 7, or with the spider web. Fig. 7 shows a comer where two insertions of faggots cross each other. The working thread crosses the square hole from both sides, then two other threads are laid obliquely across these from corner to corner and secured firinly on the linen. Now join a new working thread in the very centre of the star of threads and work point de reprise under two threads, a comer one and a side one. This stitch is like simple darning-stitch and goes over one thread and under the other until the spokes are nearly covered.

Point de reprise forms the groundwork of the most beautiful drawn-thread designs, wherc a large number of spokes are laid and the stitch darned in and out all the threads aceording to formation of design. A spider's web can be worked on the spokes by weaving round and round the threads, taking care to keep them flat against each other so that thej do not overlap. Fig. 8 shows a completed centro with two rows of faggot insertion and point de reprise fillings at the corners. In this case the threads are drawn right to the hem of the cloth. See Embroidery; Linen; Tablecloth, etc.
DRAW STRING. A draw string of tape or ribbon may be slotted through a casing or hem, and attached in the middle to prevent its being accidentally pulled through the slot too far. A double draw string is often used where fullness is only required for a fow inches, or in drawing up bags, etc. Two lengths of ribbon tape or corl are used, ono being
attached at one end only, the other at the opposite end, and threaded through the slot; the two lonse ends drawing up easily and evenly.
DRESDEN CHINA The best period of Dresden ohina, which is porcelain made at Meissen in Saxony, extended from 1720 to 1775, and the mark is the famous crossed swords in blue under the glaze. To this period belong the breakfast services and other useful wares, with moulded decorations, painted on mauve, yellow, green or marone grounds, with tiny landscapes or flowers the figures and groups, the best are in white, but those with painted decorations arc much favoured. Therc were also clockcases, mirror frames, cabinet-panela, tables, candelabra, and other furniture accessories. word Dresden.
During the 30 years preceding 1814, called has no historic value, such as that which perthe Marcolini period, marked with a star tains to Crown Derby. See China.

## DRESSERS FOR DINING ROOM AND KITCHEN

## The Welsh Dresser and other Kinds Described and Illustrated

Sec further Dining Room; Dining Tahle: Kitchen, and the articles on the woodworking processes involved in making one of thesc articles of furniture, e.g. Amıleur Carpentry

The dresser developed from the buffet, and took its present form soon after 1600 . Oak was used for most of the early ones, but afterwards mahogany became popular and fine specimens were inlaid with box and other woods. The piece of furniture known as the Welsh dresser is made of oak and inahogany combined.

The plain kitchen dresser of deal, with its drawers and cupboards and unbacked superstructure of shelves, is a fixture, whereas the dresser which is sometimes substituted for the sideboard is a movable piece, and the shelves of its upper part are backed with plain wood or panels, and very often enclosed in order to keep the dust off the china that may be stored there Some attractive modern dressers or built-in sideboards are made with glazed doors at the top, arranged either to swing or slide, as well as the cupboneds and drawers in the lower portion. The unenclosed super-structure is inost common: but there is always scope for the architectural treatment of the dresser, and both parts of it may be elaborated up to a certain point without diminishing its usefulness. The chief difference between old and new is in the material. Mahogany is now too expensive a wood for most people. Weathered oak has largely taken its place, and the cheaper woods, stripped and wax polished or atained, often give good results.

Where a dreaser is intended for the display of good china, the shelves should be lightly grooved for the plates and saucers. A few good pieces carefully arranged will show themselves and the dresser to the best advantage.

The real Welsh dresser is easily distinguishable from the many faked ones on the market. The wood is oak, frequently with a simple inlay of inahogany, dark polished, with severe rectangular mouldings, and there should be plain brass droppers for the drawers.

One is constantly aeeing examples, alleged to have heen restored, with dark oak stain on the wood, ourved Queen Anne legs, curved mouldings, or Sheraton shell ornament on the anels, and other contrivances designerl to bring them into line with the popular conception of the period. In a good miany cases the restored Welsh dresser is simply built up on an English foundation, with top back panela supplied from Victorian church pews. A useful test, though not, obviously, an infallible one, of genuineness is the condition of the brass furniture. The brass in a genuine antique will have become browned by the passage of time. Drawer handles looking like new should, therefore, be suspected. Many good furniture makers construct reproductions of period dressers, copying detail with artistic precision, or modern types are designed in limed onk.

Making a Deal Dresser. The particulars of a dresser given here will apply to any length up to 6 ft , and any reasonable height up to 7 ft .6 in ., in which case an extra shelf might be fitted.

For present purposes the dimensions are put at 3 ft .6 in . "ide. Depth back to front can be between 1 ft . 6 in . and 2 ft . Common deal will answer all purposes.

The legs, from 3 in. by 3 in material, are 3 ft . long. The top side rails or ends are double mortised into the legs and are 10 in . wide. finishing flush with the bottom

 in. wide at top and shaped as Fig. I. are cut back $\frac{7}{i n}$. below each shelif to 4 in . wide at bottoin, where they drop into grooves in the top. In marking the heights of the two or thice shelves, first measure the plates and dishes, or any other items that hase to be mounted. Usually the lower shelf is at. least a


Dresser : two antique examples of this piece of qurniture. Left, enclosed dresser of Sussex make, with drawers and cupboards. Right, old Welsh dresser, with panelled back, cuphoards and drawers


Dresser. Fig. 1. 8implo dresser Atted with shelves drawers and cupboards. Figs. 2-3. side elevation and diagrams showing how the pieces are fited
foot above the table top, the others graduated in space as necessary. The stop for plates on edge is formed by lengths of $\frac{1 \mathrm{in} \text {. bead cut to }}{}$ butt between the ends and panel-pinned to the shelves. so that they ensure a safe angle when the plates are tilted. These shelves are fitter into corresponding grooves in the ends, each groove being stopped back $\frac{1}{2} \mathrm{in}$. from the front edge and the shelf corners notched to agree.


A face piece ( J ) is cut into the front edges of ends at top, and upon this the cornice mould will bed as at K, Fig. 3. The mould, a 3 in . by 1 in . section, is mitred to return round ends The face piece can be cut 5.! in. wide, and shaped as Fig. 1 to ease the line. A back of $\frac{3}{3} \mathrm{in}$. matching is best. A length of $\}$ in. mould, cut to butt between the bottom parts of ends, makes a good finish. Brass dresser hooks of suitable size for the safe hanging of jugs are obtninable. A cutting list for the 3 ft .6 in . size is given. Lengths and widths allow for juints and paring, but thicknesses are net.

Dresser for a Recess. Fig. 4 depicts a Iresser fitted to a recess 5 ft . by 18 in . The main face of the lower part, i.e. the legs and drawers, etc., stands forward 1 in ., and is fitted with a set of drawers at the back. Fig. 7 shows the ends made flush with the inside faces of the legs, so that irregularity in the sides of the recess will not makc a difference to the fitment. A batten nailed to the wall (A, Fig. 6) gives ample support. The top rests on the batten and is nailed to it. The legs, cut from 2 in . squares, are mortised for
ion ; it will be necessary to scribe in posiover the skirting. Having fixed the legs to the batten (previously secured), the top is cut out and nailed down. This projects at the front round the walls. The potboarl is best made from matchboarding, and is held at the back by a batten (Fig. 7).

Drawer runners and kickers are fixed as in Fig. 7, and the drawers made. The set of sniall drawers at the back of the top are made separately and screwed
 to the top. The carcass for thesetakes the form of a

DRESSING: What to Wear. The art of good dressing lies in the right selection of material and colour for garments, keeping in touch with fashion, in appearing always to be in the correct clothes for the occasion, and in the careful attention to suitable accessories.
Most people like variety, but this liking, where means are limited, should be curbed before it leads to buying cheap and badly-cut clothes, which will look what they are after a few times of wearing, or of spoiling the appearance of a good dress or suit by shabby footwear and gloves. Clothes which really fit and have been cut to suit the figure, avoiding passing extravagances, look smart for a long time.
Hints for Women. Horizontal lines have a broadening effect. The clever manipulation of st ripes. of trimmings which descend in an unbroken line from shoulder to hem, or of garments in which the waist is only defined at the sides, the elimination of materials with sprawling deaigns or of ton bright a colour, all these are important details and considerations when it is desircd to produce a slimmer effect. Another point is the avoidance of anything strained or tight.
Severe tailor-mades, classical evening gowns of heavy-patterned brocades, floating draperics to wraps and street coats, large hats and collars are not suitable to the small woman however successful for her taller friends On the other hand, she will look well in dresses of light materials ; in soft and Huffy or quaint and picturesque evening frocks, and in leas formal coats and skirts Clothes for the businces woman or girl should be smart but simple, and the style of day or tailor-made drees most becoming to their wearer is the best cloice.

Men's Wear. The hard and fast rulea which govern men's attire make for a standard level in their dressing. With the exception of some of the younger men who take a real intcrest in their clothes, and of a few who actually make suggestions to their tailors, every man's desire is to look


Dremer. Pitg. 4. Usoful dresser made to at into a recesa. Figs. 5 and 6. Front and side elovations. .Fig. 7. Diagrams showing details of drawer ranners and bottom box rebated together, with drawer divisions ability of a restaurant dinner grooved in Thel provided with stops to take the plates, are entertainment. Their clothes are too easily supported by bearers nailed to the wall. recognized and too quickly out of date to be They should be nailed down on to the bearers.
recognized and too quickly out of date to be
the front rails and the ends. These latter are rebated for the back (Fig. 7). The front rails are cut from 1 in. stuff, exwhich is whis is 12 . bated, as in Fig. 7 to take the pot board and bevelled at the front.

Glue the ends up first, then clean the inner surfaces and glue the front, lastly fitting in the back, which is glued and nailed. Now fit

for all ordinary occasions by the posscsaion of adviashle for the woman who hits to study one suit of evening clothes. a couple of white waistconts. and a dinner jacket suit, white bow ties to wear with the first, a black how for the last and, in addition, correct evening shirts.

Colour in Dress. Although to a certain extent influenced by fashion, a woman's choice of suitable colours for dress ahould be guiderl by personal considerations. Clothes should not be merely fashionable but should enhince the personality of the wearer. The fine complexioned girl, with hair varying from light to medium brown. lonks her best in soft or pale clear colours. Violent hues clash with her personality and dull the brightness of her skin She will probably look well in navy blue, grey, or brown, but unrelieved black must he worn with discretion, as it depends for success not on colouring, but on its cut and line and on being able to carry it with an air of diatinction in the way that a French woman will wear it.
A judicions mixture of hlack and white is suitable to nearly every lype; it has the effect of enhancing a brilliant complexion and of putting tone into a nondescript one. This is one reason why evening dress is becoming to most men, and why waitresses or housemaids in regulation uniform look smart and well dressed.
The fair-haired girl with delicate complexion can wear white and many deep shades of blue, brown, red and green, which are rich and not hard. In pale colours she may look insipid. The possessor of brown eyes and fair hair should weir brown or touches of brown as much as possible.
With green or blue eyes, rather palo fair skin and dark hair, bright blues, orchid and fuchsia shades and bright greens are possibilities, hut not reds, browns and orange. The lastnamed colours are for the brunette with rich complexion and brown eyes.
Auburn and red-haired women look well in pale neutral shades, rich copper or chestnut browns, neirly all greens, and the range from straw colour through the yellows up to orange and flame. Brown eyes may belong to this hair, but if they are hlue, most shades of that colour can be worn. The grey-haired slender woman with fresh complexion can wear shades of blue or mauve, also black and white. Black, deep purples, dark blues or mole oolours will apparently reduce the figure, but vivid colours should be avoided by the woman who is not slim.

Sallow-skinned people should avoid purple, which is the complement of yellow, green and unrelieved grey or black.

Testing Colour by the Eyes
Speaking generally, the brunette can wear any vivid and striking colours which are fashinnable. She can wear black, unless her complexion is very sallow, when also she should not chuese arange and amber shades, but rose, brown and beige. The question of whether a particular shacle is suitable can be determined by standing before a mirror and holding a piece of material of the same colour near the eyes. If it makes the eyes appear more colourful than usual it can be worn with becoming effect.
White and grey sliades for gloves or shnes seem to enlarge the hands and fect, while fawns, browns and black make them appear smaller. The wearing of lighter-toned stockings than the shnes diminishes the apparent size of the feet.
The secret of a succesaful schense lies not only in the choice of the principal colour adopted but also in the matching or blending of accesaories. A harmonious effect is often missed hecause the wearer will not keep to one or two colours; while an att ractive appearance results if she chooses her shocs, stockings, gloves, and hat, either to match or to tone with her coat or dress. It is
economy to plan her whole season's wardrohe according to a definite oolour scheme, so that these important accessories can serve to complete more than one of her costumes.
DRESSING: In Surgery. The term dressing is used in surgery for any material applied to a vound to cover and protect it and further its healing. A simple aseptic dressing, that is, one which itself is germ frec, can he prepared by balking ordinary absorthent cotton in an oven until it is slightly scorched.
Whatever the material applied to a wound, a burn or other breach of the surface, it mist be clean and it must aborh diacharges. To provide for absorption of discharges it is usual to cover the wound, etc., with lint or gauze. and over this put a thick layer of absorbent cotton-wool or wood-wool. The dressings are then fixed by a bandage.

In the case of a clean wound it is desirable that the dressing should be dry, hecause moisture filvours the growth of micinhes: but where there is a considerable raw surface and it is desired to keep the dressings moist to prevent them from sticking into the wound, the lint or gauze is wrung out of an antiseptic lotion and covered with oiled silk or gutta. percha tissue, the latter heing cut smaller than the area of lint to be covered.
The smooth side of lint should the applied to the wound, as the Huff of the other side tends to stick in the sore Two useful kinds of lint are ordinary surgeon's lint and boracic lint. Useful gauzes are plain gauze, cyanide gauze, and iodoform gauze.

Among Intions which may be applied for moistening dressings are the following: or chest of drawers used for tailet purpuses. a mirror being placed upon it for assistance while dressing As a distinct picce of furniture. it dates from the end of the 17th century. In the time of William and Mary and of Anne heautiful dressing tables were made in walnut and other fine woods. These were often fitted with drawers. and on them a lonse swing mirror was placed. This stylo has been revived in the 20th century

In the elegant styles for which the 18th century was notahle, dressing tables are remarkable for grace of design and beauty of ornament. On them are found the various decorative features that distinguish 18 th century furniture-the cabriole leg, for instance-while marquetry and inlay are frequently seen. These pieces are of rosewond, satinwood, and other rich woods, and they were designed by Chippendale and other great cabinet makers of the time. who made them alsn in mahogany. In some the mirror, either swing or triple in form, remained separate from the table, but more often it was fitted into the back

Fig. I in the next page shows a finely decorated piece of the late 18th century classical period It is of satinwond, with a how shaped front in which is a drawer. It is supported on slender legs connected by carved rods, at the junction of which is a box. Ahove the table proper are five irawers, and ahove these are two pedestal cuphoards, between which a toilet glass shaped like a shield is swung. The heautiful design is enhanoed by the graceful decoration of medallions painted on the cuphoard doors and garlands of tlowers round the mirror

Fig. 2 shows an older example, being of the time of William and Mary. It stands on twisted legs, strengthened by a stretcher. The mirror and the drawer handles should be


Carholic solution
Lysol
Percel
Boric acid
1 in 20000
1
1 in 3 ()

DRESSING CASE. Dressing cases for men and women are intended to hold the various toilet accessories and requisites arranged compactly so that they can be taken about easily when travelling. The case itself is usually made of leather of various qualitics, and should be cared for as other leather articles. The sizes and contents vary A typical case for a man measures 24 in . by 16 in . by 8 in.; that for a woman is somewhat smaller The fittings are usually of silver but may be of ivory, enamel, tortoiseshell and gold or silver, or even of gold

DRESSING ROOM. In small flats, the bathrooin is sometimes arranged as is hathdressing room. Furniture must be of suitable material to withstand damp and clothes may be kept in the bedronm provided there is sufficient wardrobe acoommodation Failing this roon may possibly be found for a smail wardmbe in the passage Convenient wardrobes are devised containing space for hanging clothes, shelves, and a set of narrow drawers with glass doors, so that a man can see which drawer contains tics. which handkerchiefs, and so on. In the case of the dressing room proper a dressing chest or table must also bo provided. but it is not usually necessary to have a wash-stand. as the modern house gives good accommodation in the bathroom. A small hed or a practioal divan is often also included in dressing room furniture.

## Dressing Tables: Practical and Decorative

## The Choice and Construction of this Bedroom Piece

Other articles upon allied subiects include Bedstead; Chest of Drawers; Wardrobe. See also Bedroom; Bed-Sitting Room; Furniture; Table; and for the accessorics Tailet Mirror: Toilet Set, etc.

In origin the dressing table was a table noticed. Such triple mirrors are largely re
produced to day, both framed and frameless.
In the 18th century Sheraton. Hepplewhitc. and other designers made diessing tables of the type that close up by means of folding doors on the top. The various partitions into which the well under the !id is divided were intended for combs, powders, pstches, and other accessorics demanded by the toilet of fashion. The glass, whach is fitted into the well, rises on hinges in front and is supported by a foot fixed in the back. These articles were made in mahngany, but the cheaper woods also were employed.
In the 19th century the drcssing table became an essential piece of furniture, but many of the tables manufactured in the latter half of the century are of poor design, especially those made to form pieces in hedroom suites of heavy so-called Victorian style.

Modern Dressing Tables. At the beginning of the present century the dressing table was ncarly always bought in a suite of bedroom furniture, and was of the duchesse variety with mirmor attached to supports rising from small drawers on either side. These were manufactured in designs hased on Jacobean, Chippendale. Sheraton and other styles. While there are still many suites made in both modern and antique styles in walnut, mahogany, oak and other woods, and also in painted and lacquered furniture, separate picees are often again preferred, knee-hole and drop-end tables are utilized with separate toilet mirrors, or the dressing table takes form as a corner or wall fixture. Extremes are seen in Figs. 3 and 4 of modern dressing table treatment, showing the severely plain and the daintily trimmed.

The wall fitment of bracket shelves with a drawer on either side of the mirror is both practical and space saving. It would be an excellent arrangement for dreasing table
accommodation in a small dressing room or the article just mentioned (p.230). The Joint Martise cte Fig 9 showa the base in a study bedroom. The other treatment centre mirror is hung with special brass move(Fig 4) is an exampie of a fashion revived from menta made for the purpose, and the side Victorian dave This particular dressing table mirrurs are hinged with ordinary brass butta is of painted wond The curtain is made of let into the inirror framing. art-ailk taffeta to match the bedspread in the roon, and trimmed with silver braid. The top of the table has a scparate cover of the taffeta under plate glass These petticonts for tables can be carried out in a variety of materials suitable for elaborate or simple lurnishing schemes. With transparent fabrics, such as spotted and organdie muslins or voile, a separate lining of sateen is required. In country hedrooma chintz or cretonne dressing table petticoats may matoh the curtains Such waslable materials can be made up as complete covers with topa to fit the corners of the tables and the petticonts gathered on at a depth of about 6 in , or separate tops may he made edged with a 6 in. frill. the petticuat being attached to the table underneath the frill Sumetimes the petticoats have tiers of scallops, or three tiers of contrasting colnurs. as, for instance. three shades of ruse pink voile on a pink sateen fuundation

The most useful dressing table, with ample accommodation for all toilet requisites, is certainly the pedeatal style, as shown in Fig. 6 eapecially when painted to matoh the woodwork of the ronm or carried out in limed oak or pickled walnut, or other wood to suit the rest of the furniture.

Construction of a Dressing Table. Adress. ing table of the more usual type has two or more drawers with mirrors above. The general construction may be gathered from the article on Chest of Drawers ( p .230 ), which also deacribes a man's dressing chest with shaving mirror When making a dressing table with framed three-fold mirror it is important that the stiles or uprights of all three mirrors should be marked out together. to ensure uniformity in size. The method of framing and fixing the glass is indicated in


Dressing Table. Fig. 1. Late $\begin{aligned} & \text { 18th century example of the piece in satinwood. Fig. 2. Reproduction of a William } \\ & \text { and }\end{aligned}$ and Mary dressing table, with triple mirror, in walnut

1. Vietoria \& Albert Museun, S. Kensington; 2, courlesy of Gill \& Reigate
might be made of 1 in whitewood. the boards being glue jointed to the requisite width. The ends are dovetailed to the top and bottom, or in a simpler form of construction these parts might be tongued together. The drawer rail and runners are grooved to take a dustboard, the rail being tenoned to the end, as shown in Fig. 10. The runner is housed to the end, and enters the groove of the rail with a stub tenon. The back of the pedestal (Fig. 8) is of plywood,
The two driwers may bo made up as described in the articles Chest of Drawers and Drawer, the relative depths being adjusted to taste. The handles are shown in Fig. 10. The mirror is 6 ft . by 2 ft . or so, and may be framed up in the manner doscribed in the article on Cheval Glase. The method of securing the glass is shown in Fig. 13. The tubular electric light fitting may be obtained fromi any electrical dealer, a switoh being fitted inconspicnously under one of the bracket shelves. A white or cream coloured switch
would be suitable. Of course, one of the existing lights might be converted, when the switoh in its usual position near the donr of the room would control the mirmr light. The mirror is attached to the wall with plated brackets and screws utilizing rawlplugs

The wondwork of the pedestals, stool. mirror frame and bracket shelves should be cleaned off nicely and prepared for painting One of the cellulose enamels would be eminently suitable for this job, the edges and details being finished in coral pink or delft blue. say, and grev for the ground. One or more coate of cellulnse undercoating should be applied to the wond before the colour coat and on an open grained wood a cellulose paste wood filler night first be employed with advantage.

- A rubher-net brush must be used, as the solvent in the enamel will lonsen the hairs of the ordinary sort of brush. The brush should be used in one direction only in applying the enamel, and on vertical surfaces the strokes should be from top to bottum, ns far as possible

DRESSMAKING. This requires a know. ledge of the correct methods of cutting out and sewing together the various parts that make a garment, though the anme main principles govern the making of all clothes

With regard to cutting out the garment, which is often done with the aid of a paper pattern, it is necessary to know how to set each part of the pattern correctly on the material, so as to got the right hang to the garment.

Fitting and pressing are very important complements to sewing and making. For fitting purposes the garment is roughly put together in the first instance with temporary stitches, known as tacking, and, after the arrangement of other minor details, the garment is tricd on the wearer for the fitting The seams, at this stage, are adjusted to fit the wearer more correctly, and the exact length estimated.

After fitting the seams are fixed permanently. durable stitching replacing the tackings, while the pressing, finishing, and trimming are also done. Presaing in itself is a highly important factor, and can easily make or mar a garment. Various stitches are used in the sewing together of the dress. Simplest of all are the temporary stitches used at the first stage, these not only including tacking as just


Dresgang Table. Fig. 5. Modern design in Ggured oak with a irameless triple mirror Courtes/l of Williamson \& Cole. Lid


Dressing Table. Fir. 6. Two movad e pedestas containing drawers glank a large mirror on which is a tubular shaped light. Small shelves carry toilet requirements. and in front is a dressing stool
described, but also basting. The permanent stitching which replaces the tacking may comprise machine-stitching, running, hemming, gathering, over-sewing, eatch-stitching, herring-boning, etc.

With regard to machine-stitching, it is very mportant that the dressmaker should have a thorough knowledge of the working of a sewing machine, as some models can be adjusted to do all kinds of stitchery, such as hemming, also decorative or trimming stitches: for example, tucking, embroidery, openwork. hemstitching, etc. The sewing machine in fact, is one of the most important tools of the dressmaker. Others include scissors in two or three sizes, sewing needles in mixed sizes, pins, white and coloured tacking cottons, and ordinary sewing and machine cottons and silks, thimbles, buttonhole twist, an inch tape, pieces of tailors' chalk, llat irons, and nn iron-ing-blanket ; also a sleeve-board on which to press sleeves, and a skirt-board for skirts Hooks and eyes, fasteners, etc., can be bought as required. A dress stand should be included.

How to Learn. As a business, dressmaking offers possibilities of a good livelihood, if a thorough knowledge of all its branches is acquired. In order to obtain this, the would-be dressmaker can enter a dressmaking tirm as an apprentice, and afterwards pass through various stages, until she becomes a full hand. capable of working without supervision

Another way of learning dressmaking is in trade schools. There are several of these in large industrial centres, such as the trade schools of the L.C.C. in London, into which a girl may pass directly she leaves achool. In these she is taught every branch of the business, the course, when completed, enabling her to take a place in any house of business. Dressmaking classes are also held at various technical institutes throughout the country for those who cannot afford to give the time for an apprenticeship.

Anyone with an intelligent acquaintance with ordinary needlework will find it possible to make her own clothes at home, with the aid of the various fashion journals now on the market. These journala supply paper patterns of various garments, together with diagrams and instructions showing how to cut out in
material and make up. while the $y$ often include in addition practical articles on various aspects of dressmaking See Cutting-Out.
DRESS STAND. A dress stand is a frume of light wond, or wire, partly covered with canvas or drill made to the measurement of the figure, upon whioh a dressmaker drapes and fits a gown. Dress stands are $h$, le bought in all sizes or made to order: those inade in wire are sometimes partly collapsible and adjustable.

A stand padded to about 9 in below the waistline is the most useful type for fitting on and moulding a bodice or coat
DRESS SUIT. This term 18 given to the suit of clothes worn by men at dances dinner parties, and in the evening Except for thewaistcoat, which may be white, a dress suit is invariably of black cloth See Dressing.
DRIED FRUIT. These Iruits especially currants, sultanas, and raisins constitute important ingredients in many kinds of puddings. cakes and fancy breads Among the varieties dried are apples, apricots, figs, peaches, pears and prunes Before nse, these should be washed thoroughly and soaked for 24 hours in cold water When they are ready to be conked stew them slowly until tender in the water in which they have been soaked. adding sugar to taste.
Fruit drying may be done at home without the aid of any special equipment, but if the result is to be successful the iruit must be perfectly sound. Apples should be peeled, cored and cut into rings. and if thev are not


Dresging Table. Figs. 2-13. Diagrams showins zonstruction of the pedestal dressing table set
to be dried immediately, immersed in 2 quarts cold water to which loz. salt has been added. to prevent discoloration.
Pcars, pceled and cut into hal ves, should be left in the same solution for 15 min ., while, except for stalking, cherries, plums and damsons need no preparation, though the two last-named are better if pricked before heing placed in the oven. The oven itself should be cool, and the drained fruit placed in it on an ordinary wire tray. In order that the fruit may not scorch, the temperature must be kept low and the fire not allowed to burn fiercely. The time of drying will depend upon the kind
of iruit used. apple rings requiring about 5 bours and halved pears a whole day The smaller fruits will not take so long. See Compôte; Currant: Fig: Prune; Raisin.
Dried Fruit Pudding. When fresh Iruit is diffioult to obtain, this pudding is specially welcome Matie it by washing 2 or. each of

Irequently to prevent it from hurning. Leave it to cool slightitly. then pour it over the fruit but do not mix them together. Whisk together to a stilf froth 2 whites of eggs and 1 gill cream. fold into the mixture about 1 teaspoonful castor sugar. and then shake it on top of the emolina etc finally decorating it with strips of angelica If a plainer pudding is required, the cream and white of egg may be omitted
DRIERS. Driers is the namegiven to a group of preparations used to ensure the proper drying of the fatty oils in pnints and varnishes. Litharge (oxide of lead), minium (red lead), and white lead are those usually
drice apple rings, dried pears and dried poaches, and 3 oz of raisins, cutting each of the poaches and pears into 3 or 4 pieces. Put all the fruit into a basin, cover it well with cold water, and leave it to soak for 24 hours Then put it into a saucepan with the water in which it has been soaking. Add 3 oz Demerara sugar, and cook the fruit until it is quite enft. Then put the fruit into a piedish, and continue to boil the syrup for a fer minutes until it thickens. When cold, pour it over the fruit.
Put a quart of milk into a sancepan over the fire, sprinkle in 4 oz semolina, add the grated rind of a small lemon and 2 dessertspoonfuls granulated sugar, and cook nll together until the mixture is soft and creany. stirring it

# Drills and Drilling Methods 

## Boring Tools for Use on Metal

This contribution is one of the group that includes Bent Iron Work: Metal Work. Sec also Bit; Boring: Brace; Chuck: lathe: Rivet

A drill is a small, sharp-pointed instrument with cutting edges, fixed in a stock which is revolved to pierce a hole in metal
Drills are made in two chief grades, carbon steel and high sueed steel, the latter removing metnl faster. For practically all ordinary anateur purposes the carbon is quite satisfactory, and costs considerably less.
For all-round use there is the twist drill, so named from the shape of the double helical Huting, made from to in. to 1 in . or more in diameter. For drilling holes in thin sheet metal and any holes in brass or copper, the straight Huted drill is preferable The flat, arrow head, and diamond point drills are useful, especially in the larger sizes, for drilling holes with n ratchet brace, and are equally effective on iron, stecl, or brass. They are also convenient for use in a lathe, esperially those made from tlat strip metal.
Expansion drils comprise n short twist drill fixed in a ahank, and an adjustable cutter, for drilling large dianneter holes in slieet metal, as when making holes in hot. water tanks, cisterns. and other houschold appliances. Centring drills are used to start the hole when intending to drill one of large diameter, and also to form a properly sloped centro on the end of a bar to be mounted nad turned hetween the centres of a lathe. l'in drills have a central pin or pilot, which guides the drill while it counterboros or enlarges a hole already drilled The general form is shown at Fig 5 .
The limit of size that oan be operated effectively with a hand drill is seldom ovel IG in to $\frac{1}{}$ in. dinmeter. A breast drill will tackle holes up to is in to in in diameter ; a small band-power hench dilling machine will handle diilla up to $t$ in diameter, nnd a powerful hand-power drill of the blacksmith's type will tarkle work up to ${ }^{8}$ in. in diameter. A treadle drill will take up to this size, but for

Inrger sizes a power-driven machine is required Drills are purchasable in millimetre sizes, in letter sizes corresponding to the gauge sizes of wire, and in ordinary fractions of an inch, the latter being the best for general purposes Very small drills are made for watch and clock work and similar delicate apparatus
There are a number of different types of stock, but the amateur may well do with a
hand drill as illustrated at Fig. 3, eflective up tob or ${ }_{i}{ }^{3}$ in diameter holes An example of a powerful wall or bench drilling machine is shown at Fig 4 A reciprocating drill onthe $\wedge$ rehimedean principle (Fig l) drives the drill buth on the upward and downward stroke, by having right and left hand threads formed upon the spindle.

Having selected the right drill for the size hole, place it in the chuck and screw it ip tightly Next inake a centre punch mark exaotly on the centre for the desired hole Then, using a hand drill, hold this so that the drill is perpendicular and in an axial line with the position of the hole, Fig. 3) lintate the drill by turning the crank liandle with the right hand, while keeping the drill and the stock in position with the left hand Exert sufficient pressure with the left hand to make the drill cut properly; this will be evident from the turnings, which should curl up and away fros the drill if working in steel or iron, or in the form of chips or powder from brass or cast iron.

It is necessary to hold the drill stocti steadily, and to rotate the drill at the correct apeed, which varies with the size of drill and the nature of the material Using a $\frac{t}{}$ in diameter drill on steel, the speed would lie about 300 revolutions per min. : on cast imn, ahout 200 revolutions; and on brass, about 650 Smaller sizes of drills should be miated faster, and larger sizes more slowly. If the drill turns off nico clean chips or shavings, all is well ; if not, try a different speed, with greater of less pressure on the drill Drills should be lubricated with light machine oil while working, except on cast iron. which drills dry

The Breast Drill. Breast drille are used in the same way, but pressure is brought to bear by leaning the waight of the body on the pad at the top of the stock, and holding the guide handle with the left hand. The work nust always be held securely, as if the work moves the drill will nlmost certainly be broken. Drills should not lie used to enlarge a hole that is only a little smaller than the drill, as the hole is then apt to jam or tear, or smash the drill A reamar is the proper tool to use for this purpose. If a large hole has to be made, drill a small pilot hole first

The correct shape of the cutting edges can only be maintained by nccurate grinding. Fssentials are that the angles of botli cutting edges are alike, that their length is uniform, and that both faces slope back at the same angle The use of a drilling gauge to teat these
 it drives the drill on both opmard and downward strokes. Fig. 2. Straight shank twist
drill with double helical Guting, the best for all-ronnd use. Fig. 3 Hand drill
in use Fig. 4. Powerful bench two-speed drill in use Fig. 4. Powerful bench two-speed drill
angles is recommended, hs well as an ordinary drill or wire gange plate for testing the size of drills.
laper is drilled with $a$ tubula drill shaped as shown in Fig. 10 A serviceable drill for making holes in bricliwork is made from iron gas harrel, shaped as in Fig. 9 Marble can be drilled with a twist drill.

Glass is drilled in several ways.

chuck on the tail. stock. Flat drills are generally used in a suecial holdeı lield in the slide. rest.

DRILL: In Gardening. The drill is a straight furrow, made in the soil, in which secds are sown It varies in depth from hall an inch to 2 in.. aceording to the wize of the seeds. A wide. llat drill is usually made for large seeds, p.g preas and heans, and a the take a piece of brass double row is sown. the distance betwern tube of the desired diameter and cqual to that the drills depends on the height of the plants of the hole. Revolve the tube slowly, and use carborundum powder moistened with oil, applying the drill tube to the abrasive. Which

DRILL: Linen and Cotton. White linen drill, so much used for men's'suits and ridingbrceches in the tropics, owes its popularity to its coolness in use and a great durability which enables it to withstand frequent washing Ton substantial for dresses, it is excellent for hotwesther inilor-miale costumes, and for boys' sailor suits Blue drill is also ohtuinn ble

Drill is more largely made in cotton tha: linen, and khaki cutlon drill used for the trompy in liclia and extensively for civilian wear in the Colonies. is servicpable also for summer wear in England solid and cempact, didls are woven with twilled or sateen laces, and wear well, because of the strength and number of threads forming the surfacc 'The closeness and solidity of their structure make then some

Drill. Fiz. 9. Diagram of drill made from iron gas barrel, for brickwork. Fig. 10 .
Paper drill in gection. Fig. 11. Method of drilling throurb alass her cotton or line
d-tipued drill
what diflicult to sew. drills make excellent pocketings, and remnants s!ould lie saved to that end. Certain lighter cotton drills, called drillettes, are made tor this purpose.

## Drill : Healthy Exercises for Childden

## How to Secure Balance and a Good Carriage

Other information on the important subject of physical finess will be found under the headings Breathing: Exercise. See also Child; Diet; Food

Suitable exercises keep every muscle in
good condition, strengthening weali anes and making supple those which are tight. Girls especially suffer from weak abdominal muscles, and very often those across the shoulders and the back of the thighs arc too tight. Exercises also help to attain a perfect balance which is the secret of good deportment.

No child should be allowed to overdo these exercises, and they are hest nerformed for five or ten minutes hefore breakfast. Those illustrated have been chosen because they give the maximum result with the minimum amount of expended energy. Hence their advantage over skipping exercises, for exainple, in which an enormous amount of energy is spent in lifting the body off the ground so frequently, much extin work is placed on the Leart, while comparatively little benefit accrues to the muscles.

At school, exercises are usually performed to a rbythmic time, -a piano being used, with the beats well marked But at home, it is
quite enough to clap the hands while the child is getting into the rhythm, and afterwards it can be dispensed with, the youngster doing the counting. Naturally, this rhythmic time is not absolutely essential, but it will he found that it not only prevents the exercises from being rushed through, but gives a certain amount of grace to them as well. Also, a child enjoys doing a thing to rhythmic measure more than without this aid.
Fig. 1 shows an exercise for developing balance. This is most valuable, not only for deportment but for exercising the muscles as well. When the child has become more efficient at balancing, the exercises can be performed with a hook resting on the head. If this stays in position it is a proof that the balance is being strictly kept. Count two for each movement.

First, hands on hips and lift the left leg, pointing the toe; raise the leg and place the hands on the shoulders. Keep the leg raised and stretch the hands sideways. Lastly,
lower the leg and hands, then teet together all in the one count. Repeat with the right leg. When balance has become more assured, while the leg is raised, the hands can be slretched torwards as well as out wards. making it a longer time on the one ley.

The last exercise cill be followed up by the simple une of raising and lowering the heels (Fig. 2). This is esplecially good for the arch of the foot and lor the loot museles, and is also $n$ corrective for Hat fret. Count two for mising the heels and two for lowering. and repeat soveral times. Another exercisc lor the same purpore consists simply of "feet apart and feet together." Count tivo for each movement and repent several times as in the last exercise

Fig 3 illustrates an excreise tor strengthening the back and ablominal muscles Suoh excreiser, us has already been noted, are particularly important for girls. whose abdominal muscles are often weak. The tirst movement is feet apart with a jump. then with a swinging movement raise the two hands and lowet them, taking hold of the ankle with hoth hands, as in the illustration Next body upright with hande oulstretched then repeat the swinging movement, taking hold of the other ankle. Butly upright again with hands outstretched, then hend. taking hold of cach ankle with either haml. lastly, stiaighten up, hands outstretched then down, jumping feet together

The next exercise (Fig. 4) is for the neck muscles and for developing a good carriage for the head. The first movement is done in a sitting position with the legs lucked underneath, as in the photograph. Stretch out the first hand and look towards it, giving the head a smart turn and hold it erect. With the next count of two, place both hands on knees, now repeat the lirst movement with the other hand, taking care of the position of the head. Place hands on knees for the next count of two : now bend the head right down between the knees (as in Fig. 5), counting two: then up again, counting two. Repeat this three times, for this is the most important part of the exercise Now stretch out the legs and stand.

If the child should tire at all during the exercises or after, she should lie flat on the ground with the knees bent and the legs as near to tho body as possible, as in Fig. 6. It is an excellent position of completo resting. and should be used for a tired child even if it is not connected with drill.

The trunk muscles are most important and should he given a chance to be in good condition together with the other muscles. The exercise shown in Fig. 7 is quite simple, but it must be done smartly, with head erect and hack straight. 'Ihis does not mean quickly ; the count of "one." "two." is to be used i" this, as in the others. First, jump the feet apart and place the hands on hips. Now stretch out the hand straight and turn it with the trunk backinards as in Fig. 7 Hands at sides and eyes front. Now repent with the other hands, doing it to time, yet smartly. Hands at sides and jump the feet together. Repeat this three times.

Another exercise for abdominal muscles is the one illustrated in Figs. 8 and 9. This is rather more strenuous and should not be performed more than twice at a time. First lie flat on the back with the legs outstretched and the hands underneath the head, or at the sides, ns shown. Now begin the counting "one," "two," raising the left leg upwards and pointing the toe. Lower leg to the count of two, then hegin with the other leg, pointing toe upwards, then lower. Next raise the two legs together and lower. The last part of the exercise is to draw the legs up, placing hands in front, as in Fig. 9, then on the ground to raise the body. It must be remembered that

yome of these movements, such as the last one, nre to aid the counting or the rhythmic effect. They are not really essential in the sense that they arc conditioning the muscles. Each exercise has its share of both the one helping the other.

With regard to drill costunse, most schools bave their regulation dress, which consista of n y ymnasium tunic and blouse, such as is worn by the child in the illustrations. This can, of course, be varied, the yoke being slightly different, or a blouse with a kilt may be worn. For exercises nt bome any dresy and knickers will do providing they allow free movement.

DRINKING. All the tissuce of the body contain a certain amount of water, and ill addition to this there is a Inrge quantity of free fluid in the form of lymph, cerchro-spinal fluid, and blond. If the body is deprived of water, the tissues become dry and shrunken, the blood is thick, and the circulation sluggish. The body thus refuires to contain a certain amount of water to maintain healtla and life

The natural beverage for mankind is water. and its place can only be taken to a limited extent by other beverages. Milk can replace it largely when the solid diet is restricted, but is usually only drunk in such quantity when it is a matter of duty to one's health, while tea, coffee, and alcobolic drinks in large quantity are injurious. It is is mintter of importance to health that a sufficient supply of water should the taken into the body daily. Water enters into the composition of the tissues and provides for the circulating lluids: it forms more than two-thirds of the body weight. On an avernye nbout $3 \underline{2}$ pints are necessary each dav. and a certain amount of


Drill. Firs. 1-9. Exercises for chlldren des/gned to keep the mascies in good condition and to ensure rood balance and carriage of the body. They are described on the previous page
this is taken in solid food. But the bulk of the day's supply should take the form of beverages.

Tea and coffee arc consumed by most people and are beneficinl, apart from their affording water to the hody, ind harmless if they are tivien properly prepared and in moderate nmount. Cold weak tea is a good thirst quencher, and this or oatmeal water proves very grateful to those who are engaged at hot, Inborinus occupations which cause free perspiration. Milk alone or with sorla water should be taken freely by those whose nutrition is poor.

Alcoholic liquor, if taken as spirits, should be froely diluted, as neat spirit drinking is a fruitful source of gastric catarrh : the same is

ruo of takilly lange umonnts of alcoholic liquots in any form, especially when they are taken apart from food. Beer or light wines are agreeable heverages and tend to increase the appetite and aid digestion, but the heavier brands should he taken sparingly. As summer drinks lime juice or lemon juice in water or sodn water are very wholesome. Cider makes another wholesome drink and appears to bencfit some people who suffer from rheuma tism. The natural table waters may be taken alone or as diluents of other liquids.

Only a moderate amount of liquid should be taken at menls, and then only when there is no food in the mouth. A liberal allownace of fresh, wholesome wnter may be taken with great bencfit in botween meals. It is a mistake to take liquids very hot, as they may easi!y cheok the llow of gastric juice; nn imminderate use of acid liquids, e.g. lime juice, lemonade, etc., in hot weather is a bountiful source of dyspepsia

Drinking Water. Not only must drinking water be free from the gross contamination which sets up diseases like typhoid and alimentary dianoders, but it must not contain too much mineral matter. Gross contamination may gain access to the water not only at its source but also when inside the house.
The source from which the water is drawn should first of all he considered, and the following classification is useful :
Wholesome $\left\{\begin{array}{l}\text { Spring water. } \\ \text { Deep well whter. } \\ \text { Upland sulfere water. }\end{array}\right.$
Suapiclous $\begin{aligned} & \text { Badly stored min water. } \\ & \text { Surface water from cult }\end{aligned}$
bangemus $\left\{\begin{array}{l}\text { Unflitered river water }\end{array}\right.$
In the homo, drinking water should be stored in vessels or cisterns placed in n light and well-ventilated position and kept scrupulously clean. Where there is a main supply, drinking water should never be drawn from the cistern but always from a tap on the riaing main. In districts where rain water, collected from the roof, is used for domestic purposes it should be atored in a covered concrete tank. It should not be allowed to stand in confact with metallic lead, as soft waters are often able to dissolve lead, which may causc poisoning.

Where the source is dangerous or there is suspicion that the water is polluted, ns happens in times of epidemic, it may be purificd at home. This is done most conveniently by bringing the wnter to the boil. Heating it in this way will destroy all germs likely to
produce disease, and has the added advantage of rendering hard water softer than it was before. Some people object to the flat, vapid faste of boiled water, but this may be counteracted by pouring it backwards and forwards several times from one jug to another. This causes the air to circulate once more through the water, lack of oxygen being responsible for its lifeless taste See Alcohol : Beer: Cider : Coffee; Diet: Filter: Milk: Tea; Water: Wine : etc
DRIPPING: How to Prepare.
The dripping from beef is less hard when cold and devoid. of the tallowy and sometimes even rank flavour of that from mutton Spread on bread or toast, beef dripping is a nourishing food often given to children. In cookery, for frying, etc., it is invaluable, and is sometimes used for mixing with the flour for making cakes and pastry.

There are two methods of preparing beef dripping. The first is as follows. After a joint of beef is roasted, pour all the melted fat from the baking-tin into a jar or basin. Pour about a gill of hot water on to it, stir it well, and leave it until it is set and hard Then raise the cake of fat, scrape off any soft or dark part from under it, and usc as required. The water under the fat will often contain a little of the gravy from the meat, and should be saved for stock. If the fat is left on the water for long, it will absorb some of it and go sour. The second method consists of putting all the dripping from the joint in a saucepan with about $\frac{1}{2}$ pint water. Boil it with the lid off the pan, until the bubbling ceases; then take the pan off the fire and cool it a little Pour off the fat, from which." by means of the boiling, and its resultant evaporation, all water has been extracted, into a olean basin and it is then ready for use. Mutton and pork dripping are prepared in the same way. See Clarifying
DRIVING. In driving a single horse the reins should be taken in the left hand, the left or near side rein being held between the forefinger and thumb, and the offside or right hand one bet ween the second and third fingers, the palm of the hand being uppermost. The reins should pass out under the remaining fingers, which should close tightly over them. The arm should be held at almost a right angle across the body with the hand about 6 in. in front of the bottom button of the waistcoat. This will enable the right hand to be used casily when it is neoes sary to enploy both hands, while it can also be used when the whip is required. In driving, the whip should always be used from the wrist, not from the arm

The seat should be above or at least on a level with the horse's head. It should be placed so that the driver can, if necessary, use his lega and feet to nullify the pull of the horse The reins should never be allowed to hang loosely, although it is a mistake to grip them at all tightly. The driver should always feel the horse's mouth. The term hands used in connexion with driving and riding refers to the exact weight and pressure put upon the horse's mouth in guiding him and the give and take of the driver's hands

In driving a pair the reins arc held in the same manner, but as there are two horses to control instead of one, the tank is more difficult, because they may not pull equally.

In Great Britain the rule of the road for driving is to kcep to the left. If another vehicle is overtaken, the one that overtakes
t must leave it on his left, himself taking the right. See Bit ; Horse : Motor Car ; Reins, etc
DROPSY. An accumulation of fluid, derived from the blood vesscls, in the tissues and in the cavities of the body constitutes dropsy. This takes place when the preseure in the veins becomes high, when the vessels' walls are damaged and made more permeable, and when the blood becomes thin. The first condition occurs when the veins are obstructed or when the heart is feeble and oannot drive the blood efficiently through the veins. The second condition exists when the oiroulation is poor or the blood thin and when poisons are present in the blood stream; and the third in anaemio and debilitated states
When it affects the tissues it is called oedems, and if superficial causes visible swelling. If firm pressure is made on the swelling, particularly over bone, a depression is made in the skin by the diaplacement of the fluid, and the skin shows pitting Oedema of the leg may be caused by a garter heing too tight, and it also occurs in varioose veins Oedema may occur in both legs in people who have been on their feet all day, particularly if they are somewhat ansemic. If there is definite anaemia and debility, it may appcar even when the patient is in bed. The same thing applies to the dropsy of heart disease, which, eventually, may appear all over the body. Dropsy also occurs in Bright's disease
Treatment of dropsy depends on the cause. but includes rest, and in some cases messures directed to increasing the discharge of fluid from the body by diuretios (q.v.).

## Dropwort. See Spiraea

DROUGHT. The effcots are more apparent on heavy land than upon that of lighter texture, but the harm to crops during hot, dry weather is in both cases shown in starved and stunterl vegetation During days of drought the value of dcepcultivation becomes apparent, for it is then that the hoe may be put to work to stir the surface carth to some depth. and thus prevent undue evaporation

A thorough and frequent pulverization of the soil a few inches down is one of the best aids possible to counteract in measure the effects of drought, and there is no implement more suitable for the purpose than a three or five-pronged oultivator. A thin covering of some non-absorbent retentive substance is also of assistance, and one of the handieat materials for this purpose is short grass mowings from the lawn.
Watering should be done in the cool periods of evening or early morning. Effectual watering of the soil, overhead sprinkling,
or spraying, to freshen leaves through their pores and wash dust from the foliage, followed by surface stirring and mulching, yield success in droughty seasons. See Soil.

DROWNING: The Treatment. In all cases of death from immersion in a fluid, what oftenest happens is that the fluid is drawn into the air tubes and produces suffocation. It will also be found that there is a large amount of Huid in the stomach. In some cases death is not caused by asphyxia, but by shock, due to cold or fright, or exhaustion from prolonged efforts to keep afloat.
The first thing to do in the treatment of the apparently drowned is to lay the patient on his back, turn his head to the side, examine, and, if necessary, clear the mouth and throat of mucus or anything else found there. Then, without delay whatever. carry out artificial respiration. No matter though the patient
gives no sign of life, and has been immersed in the water for a long time, a persevering effort should be made to resuscitate him

When he commences to breathe of himsell, the rescuer's efforts should be turned to en. couraging the oirculation and bringing back a natural warmth. The patient's wet clothes should be got off, the limbs should be chafed, the direction of the rubbing being towards the heart, and he should be well wrapped in hot blankets, while hot-water bottles, adequately protected against burning, should be placed in the armpits and at the feet. A few teaspnonfuls of hot water may be given, and thereafter a cup of very hot black coffee, or a $\frac{1}{2} \mathrm{oz}$. of whisky or brandy, diluted.
The patient should be kept in bed for at least 24 hours, to allow the heart to recover from the results of the strain thrown upon it. See Artificial Respiration

DRUG. The continuous taking of certain drugs is apt to produce an irresistible craving for them, despite their injurious effect upon both mind and body. The commonest instances are addiction to alcohol, and smoliing. The less frequent drug habits, such as the taking of opium or cocaine, may originate in taking the drug in the first instance under medical orders
To check the serious growth of the drug habit, an Act of Parliament was passed in 1925 which aimed at the suppression of illicit traffic in cocaine and other dangerous drugs. More over, certain drugs can only be obtained by the general public on presentation of a doctor's prescription, which is afterwards retained by the dispensing chemist. The habitual drugtaker can be certified like an habitual drunkard.

When a drug habit has bcen formed, the only satisfactory method of 1 reatment is to get the patient into an institution where it will be impossible to obtain the drug Tonic inedicinal treatment may form part of the cure, but moral treatment is what is really valuable. in the form of helpful advice and encouragement. Little or nothing can be expected from nostrums. See Alcohol: Cocsine; Opium ; Poison ; Tobacco, etc.

DRUGGET. This is a common felt or coarse woollen fabric, frequently printed with a pattern on one surface only, cither used as a protection or substitute for a carpet. A lighter glazed linen drugget is sometimes laid to protect stair carpets and is used for table covering.
DRUNKENNESS. Over indulgence in alcohol causes loss of control over the movements of the body and over the speech, which becomes thick and indistinct. The same loss of control affects the mind, and the mood may become bellicose or maudlin and silly. In some cases a condition resembling somnambulism results. Frequently nausea and sickness ensue. Drowsiness manifests itself sooner or later, and may deepen into coma. This state is very like that of various other oonditions, e.g. apoplexy, uraemic or diabetic coma, poisoning by other narcotic drugs like onium, chloral, etc.
It is often a matter of difficulty even ior doctors to distinguish between these cun ditions and drunkenness, and obviously the greatest care should be exercised in dealing with such persons. It should not be hastily assumed that because a person smells o drink he is simply drunk, for he may be both drunk and ill. It is nccessary to emphasise this point, as serious mistakes have been made and people suffering from apoplexy have bcen left to die because they were sup posed to be simply drunk. A doctor should be summoned at once and in the meantime the person should be kept warm if necessary.
In the treatment of acute drunkenness the patient should be made to vomit and wash out
his stomach with large draughts of tepid water. Strong coffee or sal volatile in teaspoonful doses in water may also be useful. Chronic drunkenness is very difficult to treat and will fail unless the victim can be induced, by beginning his cure in an institution, to give up alcohol altogether. Some of the graver results of chronic drunkenness are sterility, multiple neuritis, a tendency to apoplexy, delirium tremens and insanity, and the likelihood of epilepsy in the drunkard's offspring.

The Legal Aspect. In law drunkenness is a punishable offence in the following circuntstances: being drunk in a highway or public place ; being found drunk on licensed premises: being drunk and disorderly or rintous in a highway or public place; being drunk and in possession of loaded fircarnis ; and being drunk when in charge, on any highway or public place, of a carriage, horse, cattle, or stean-engine. It is also an offence to be in charge of a motor vehicle while under the influence of drink to such an extent as to be incapable of having proper control of the vehicle. A driver may lec convicted of this offence although he is not drunk.

Where husband or wife is an habitual drunkard, the other spouse has the right to apply to a magistrate's court for a separation order. An habitual drunkard is a person who not legally a lunatic is yet, by reason of habitual drinking, at times dangerous to himself, or herself, or to others, or incapable of managing himself or herself. or his or her own affairs. A person who, in intervals of sobriety, is quite harmless and capable of business, may yet be an habitual drunkard. See Alcohol ; Cirrhosis: Deliriuın Treınens: Dipsomania; Separation Order.
DRY CELLL. The term dry cell is applied to the unit of all forms of primary electric battery in which the electrolyte is in a paste or semisolid form, as distinct from the liquids used in wet batteries and accumulators. See Battery.

DRY CLSANING. Soiled garments of a delicate texture which cannot be subjected to the ordinary laundering processes may be sent to a professional cleaner, or the work can be done at hoine, special care being taken when using petrol or other highly inflammable cleaning agents.

Light coloured cloth garments are simply treated by the application of kitchen salt on a pad made from a large piece of white linen or nainsook. Lay the garmient on a table, and zcatter salt over it with a liberal hand, spreading it gently with the finger-tips until a thin powdering of salt is evenly distributed over the entire surface. Next take the pad and rub the salt into the cloth with long downward sweeps, not round and round, since this tends to roughen the surface and destroy the sheen of the matcrial. Finally brush out all the salt, and the cloth will be found quite clean. If there are any badly soiled parts, such as on the hem of a skirt or the cuffe and collar of a coat, repeat the process two or three times.

Silk and satin garments are thoroughly cleaned by the following method, which should on no account be used except in the open air. Spread a clean shect on a table placed out of doors, and have ready two large wash-hana! basins, a tin of petrol, and a soft-bristled nail brush. Half fill one of the basins with petrol, dip the garment into it, giving it a gentle mueezing, then spread it out on the sheet, and brush it all over with long downward sweeps, going the right way of the material, from top to bottom. Rinse and squeeze it in the petrol again, and rub it vigorously with a folded pad made of white cloth. Pour some clean petrol into the second basin, rinse the garment thoroughly in this, squeeze it well, and hang it up to dry in the open air. Pull the garment carefully into shape before hanging it up. When quite dry and free from the smell of petrol, it may be brought indoors and ironed.

Cleaning Furs. Most furs, when really dirty, can be cleaned with hot bran, but this should rarely be necessary if they are wiped with a damp towel immediately after wearing. Children's white furry caps, coats, and capes can be cleaned with cornflour, which is scattered thickly over the fur, rubbed with the tips of the fingers, and then brushed out with a soft, white-bristled brush. This process creates a great deal of white dust, so that it is wise to tic a large handkerchief round the hair and to conduct the operations in the bathroom, where the powder can be easily wiped away with a damp oloth.

It is easier to clean things the first time than the second or third. Surfaces roughen with use, and dust and smoke fasten more quickly. to a rough material than to a smooth one, and are also much more difficult to remove. For this reason the rubbing of the finger-tips on garments during dry cleaning operations should be done as gently as possible, and a hard brush should never be used.
Removing Grease Spots. Alinost all kinds of grease spots will yield to treatment with a hot iron and a sheet of blotting-paper, while fuller's earth, dry pipeclay, magnesia, and French chalk are also effective if spread over tho affected parts, left for a while, and then shaken off. Two applications are usually sufficient.
Another method of removing grease consists of putting a pad of clean cloth under the material, and sponging it on the wrong side with benzol, gasoline or tetrachloride. Use such cleansing agents at an open window and away from any naked light. To prevent the grease spreading as the spirit begins to dissolve it, surround the spot with a ring of French chalk, which acts as an absorbent. French chalk may be used with safety on any light coloured and delicate fabric. The article to be treated is placed on a clean towel, and rubbed all over with the chalk, extra attention being paid to those places where there are definite marks to remove. The garment should then be rolled up in the towel, laid aside for three or four days, and afterwards brushed lightly to remove all traces of chalk. See Clothes.
DRYING: Of Clothes. The ideal method of drying clothes is to hang them in the fresh air on a breezy day. Fresh air, and especially bright sunshine, have a bleaching aotion, and will remove stains and any yellow tinge caused by the soap and soda used in the washing process. More important is the fact that fresh air is a powerful disinfectant, therefore woollen and silk garments which cannot be disinfected by boiling can be rendered free from infection if exposed to fresh air.
In the country the washing may be hung in a meadow or small orchard, which removes from tho house windows a view of the necessary posts and line, somewhat unsightly in small gardens. Strong tall posts, preferably of oak, are required if there are no trees or other supports, such as a brick wall, to which the lincs can be attached.
Galvanized iron wire and hemp rope are the usual kinds of lines used. Rope lines must not be left out of doors longer than neccssary. as rain, with particles of dust and soot, soon causes them to become discoloured and rots the fibres. A soiled line is often responsible for dirty marks on clean linen. After use the line should be coiled up and put away with the clothes pegs, in a linen bag in preference to a basket.

Whoever is hanging clothes out to dry should stand with her back to the wind and peg with the garment facing her, this arrangement allowing the wind to blow well into the garment. Avoid placing the pegs in any very conspicuous part, e.g. peg blouses by the waist and not by the collar. Pillow-cases should be hung with the open end uppermost. Before jregging out, all garinents
should be turned if they are not already on the wrong side, in case the damp clothes inadvertently touch trees or bushes.

The ordinary clothes horse placed around the kitchen stove is a very general way of indoor drying. Woollen garments are the most difficult to dry indoors. Place these on a cciling dryer or on lines hung across the kitchen. Drying in front of the fire often causes woollen and flannel garments to shrink. When indoor drying is a necessity, open the windows and doors to allow a current of fresh air to pass through. This is the best alternative to drying in the open air.

There are fitted cupboards heated by gas, electricity, or oil specially made for drying clothes which are designed so that a current of fresh warn air constantly passes through the cabinct, and arranged that the heavy and moist air is extracted from the bottom. These are specially useful for flats and houses where there is no hot cupboard for airing clothes They answer the doublc purpose of dryer and airer. See Airer: Clothes Horse; Clothes Line: Laundry.

DRY MDEASURE. Dry ineasure is used for potatoes and vegetables generally, also for grain of various kinds. Analogous in some respects to liquid measures, it is as follows:

## ${ }_{2}^{4}$ gills pints $=1$ pint <br> 2 pints $=1$ quart 4 quarts al <br> 

$\$$ yecks $=1$ bushel
36 hushels $=1$ chalifron
A peck or stone of flour weighs 14 lb ; a bushel or 4 pecks of flour 56 lb ., and five bushels or a sack of flour 280 lb . A quartern (or quarter-peck) of flour weighs 3 lb .8 oz . There are a number of local bushels. A bushel of Finglish wheat is 60 lb ., of foreign wheat 62 lb ., of English barley 50 lb ., of oats 39 lb .

DRY MOUNTING. This is a process for mounting photographs and prints of any kind perfeotly flat on any kind of support. Between the print to be mounted and the card or other support a thin sheet of tissue paper impregnated with shellac is placed. This tissue can be obtained from photographic dealcrs. Heat and pressure are applied. under which the shellac melts and firmly cements the print to its mount. No moisture of any kind is required.
The amateur can obtain good results with the ordinary flat iron. A special electric iron is also available. To mount a photographic print by this method, take a sheet of dry inounting tissue of exactly the same size as the print to be mounted and lay it Hat upon the back of the print. Touch the tissue lightly at the two upper corners with the point of a fairly hot iron; this causes the tissue to adhere where it is touched. If the print requires trimming it should be done at this stage so that print and tissues are trimmed together.

Lay print and tissue down on the mounting card in its right position, lift the print and touch the tissue at the bottom corners with the hot iron, so that it adheres to the mounting card. The print is now ironed all over with an iron heated to such a temperature that water applied to it sizzles slightly, i.e. it should be just above the temperature of boiling water. If the tempersture is not right it will be impossible to carry out the mounting process succersfully.
The print should be covered with a sheet of thin tin or a piece of brown paper which has previously been well ironed on both sides, and the heated iron then applied with considerable pressure for about 15 or 20 seo., moving it about so that cach part of the print obtains heat and pressure. If the print is a large one the ironing will have to be done in portions. If the print adheres to the tissuc but the tissue does not adhere to the card, the iron was not hot enough. If the tissue adheres to the card but not to the print, the iron was too hot. See Mounting; Printing.

DRY ROT. The most prolific cause of dry rot is the use of timber in a wet condition, such as might be seen on new buildings when the timber is on the site but lies uncovered perhaps for montha before it is used. If such timber is then placed in position, certian parts heing built in the walls, often covered with mortir, there is no chance of it ever getting dry in a natural way

Combined with the nbove cause the ground on which the building is taking place is often inade up; that is. it has been used as a public tip, whereon any and everything imaginable has been deposited to fill it up to the required level for building

The house is kept down to as low a level as possible to save expense, and perhaps no earth is carted away from under the floors. The consequence is that the wet wood and the foul earth encourage fungus to start.
Preventive Measures. To prevent dry rot the timber should be kept as dry as possible. and if it cannot be kept under cover it should he so piled that the water will run off instead of soaking in. When timber is built into walls, allow it to lie on the bricks: any bricks which are built up to it or which lie on it should have no mortar intervening. Not only does mortar encourage the growth of fungus. but if the bricks come to the wond they will fit sufficiently slack to allow a certain air-space between. The mortar does not do this. Avoid the use of wond bricks. Even if put in dry they are unsatisfactory, but when cut out of the ordds and ends on the joh, usually sonking wet, and bedded in mortar like ordinary bricks. they are a fruitful source of trouble. It is better to plug the walls after: the risk will be practically nil.

Dry rot cannot be cured, but where the fungna has already got a hold it may be destroyed Take out every piece of wood which shows the least sign of being affected. The disense runs further on the inside of the wood than it does on the surface, and unless every trace is cut away it will certainly start again. Next clear out the fungus from the adjoining brickwork, from openings in the
walls, and from the bedding of all bonds, etc. The fungus and the affected wood should all he swept up nnd burnt to prevent the new wood from being attacked.

Before any old wood is replaced with new, the surrounding walls, the old wood left in, and all the new wood should be costed with an intiseptic solution, such as corrosive sublimate mixed fairly strong. This can be obtained from any chemist and nust be used carefully, being a deadly poison. See Wond.

DUBBIN. Dubbin is a greasy preparation for dressing leather and rendering it waterpronf, and is used especially for fishermen's bonts or for boots worn in wet weather. The dressing, which is not glossy, may be made by melting together tallow, 2 oz.: paraffin war, 1 oz. : and heavy mineral oil, 5 oz. and perfuming with a few drops of mirbane oil. Another recipe is to melt together Russian tallow. 8 oz .: paraffin wax, 1 oz ; cod liver oil, 16 oz ., and add aufficient mirbane oil to cover the odour of the fish oil. Dubbin is freely rubbed into the leather after washing off the mul and drying the boots.

DUCHESSE COVER. This type of tnilet cover came into fashion when dressing tables were first made with the looking-glass attached to supports rising from trinket drawers on either side. It is usually a straight strip of white or coloured linen embroidered and hemstitched or inlet with motifs of the lace which forms the border, and is sold in two or three lengths and widths to suit the average size of tables. Duchesse sets may be purchased, with three extra mats to match the cover.

Large squares or oblong motifs in real or imitation filet lace of gond design can be used joined together and bordered with narrow filet insertion. Fine crochet, let into linen or worked to form handsome corner pieces with narrow edging to match, wears better than anything for this purpose. Embroidery or drawn-thread work can be used in combination with crochet or as separate trimming. On coloured linen of rather coarse weave wool embroidery is effective. See Crochet; Drawn Thread Work: Dressing Table.

## Ducks: The Breeds, Their Care \& Cooking

## Methods of Breeding and Feeding with Preparation for the Table

Related information will be found under the headings Apple Sauce; Aspic; Boning; Casscrole Forcemeat: Pastry; Salad. Sce also Chicken; EgR; Incubator

Duck keeping in Great Britain is practised mainly for the purpose of producing ducklings for the table, but there is also a tendency to maintain comparatively large flocks of ducks for egg production Ducks of a good laying breed and strain usually begin to lay when about five months old, and may be kept profitably for egg production at least one season longer than hens.
Types of Duck. The fawn and white Indian runner, the white Indian runner, the khakiCampbell and the buff Orpington hreeda can all be recommended for egg production. Both the Orpington and the khaki-Campbell produce good marketable ducklings of moderate size for the table, although they are not equal in size or quality to Aylesburys.

As a table duck the Aylesbury is unequalled, owing to the superior quality of its flesh, to its size, and to the rapid growth of the young ducklings: but it is not as a rule a goorl layer. Ducklings can be produced weighing from 4 tos 5 lb . apiece at about eight weeks olda reault impossible of achievement with any other duck. Adult drakes occasionally turn the scale at 9 or 10 lb . The plumage is pure white, the bill flesh coloured, and the egga a bright orange. The bodly should be massive with good girth, deep and straight keel, a full breast carried low, the conp almost touching the ground.
The Indian runner is characterized by an almost upright carriage. As a utility breed
it is in the front rank and, although not a large bird, its flesh is of fine quality. As a layer it excels all other varieties, its eggs being large and white-shelled. It is an excellent bird for the smallholder, as it need not necessarily have water for swimming.

The Pekin and Rouen ducks have the merit of size, and the former, besides being rapid in growth, is superior to the Aylesbury as a layer. Taking the average, a dozen Pekin eggs will weigh $2 \frac{1}{2} \mathrm{lh}$., and this is not excelled by any other duck. As a table bird it does not equal the Aylesbury. but its hrenst is wide anil carriea a lot of ileah of a particularly nice flavour and of fine quality.
An adult Pekin drake should weigh 9 lb . to 10 lb ., and a duck 8 lb . to 9 lb . From stock birds of such weight can be bred ducklings which weigh 4 lb . to 5 lb . at 8 weeks, 7 lb . at 10 weeks, and 8 lb . at 12 weeks

Pekins are a canary colour, the bill is bright orange, and alightly convex in shape; the lega and feet are orange, whilst the eye is a dull leaden blue colour.

The Rouen drake has a greenish-yellow bill. dark green head and neck, claret hreast, greenblack back; the thighs are silvery grey, pencilled with a darker shade. A glossy blue hand. bondered by a narrow black outer clear white bar, runs across the wing; the legs and feet are hrick red. The duck is brown, the feathers being laced with bright black lacing;
the wing bar is like the drake's. Stock Rouens in breeding condition weigh-drakes, 10 lb . to 11 lb . ducks! lb . to 10 lb . When fattened they weigh 2 lb . more They are not so white in skin as the Ayleshury and Pekin, and for this reasnn are not quite an popular as table ducks: the flesh, liowever, is extremely rich and luscious. They are a hardy and very profitable breed.

Duck Breeding The breeding of ducks upon a small space is not advisable, and although the smaller laying varieties will hreed without access to water for swimming, better results are secured in the case of the larger table breeds when the birds are able to obtain swimming exercise The cost of feeding an adult duck upon a limited apace exceerls that of a hen, without, as a rule. yielding a proportionate return

Ducks are not sufficiently mature for mating purposes until they are about eight months old, and drakes should preferably be a month or two older. For the best results, young drakes should be mated with ducks from eighteen months to two and a half years old. With the large breeds four or five ducks may he mated with one young drake, while with the smaller breeds one drake may be sufficient for from five to eight ducks. The stock should be kept in active condition by only giving sufficient food to supplement foraging, but when a large number of eggs for consumption is required diet on a more genernus scale may be given.

As regards the duck house, one can either he purchased or a disused shed aclapted to the purpose. It need not be morc than 5 ft . high. hut the more air space the hetter. Ducks and ducklings must have dry bedding.

The use of incubators for the hatching of duck eggs is less commonly practised than in the casc of hen eggs The temperature for incubation should be run at $102^{\circ}$ if a hot-air machine, or $103^{\circ}$ if of the hat-water type. Preference should be given to the use of broody hens. It is seldom worth while permitting a duck to hatch her own egge.

When hatched, the ducklings of the larger table breeds are stronger and more easily reared than chickens, and if mothcred by $a$ hen it is seldom necessary to leave them with her for more than 3 weeks, and from 10 to 14 days or even less will prove sufficient in warm weather. If reared with artificial heat, the temperature of the foster-mother should lie kept lower than for chickens. Plenty of air is required in the heated compartments, and the ducklings should he accustomed to do without heat as quickly as possible. The ducklings of the smaller laying breeds are rather delicate for the first few weeks, and ahould be well protected from rain and damp. No food should be placed before the ducklings until about 36 hours after hatching, and then some damp earth may be supplied in a saucer: in which the birds can find particles of fine sand or grit. For the first feed, bread and milk or fine biscuit meal scn/ded and dried off with middlings or ground oats, or coarse steeped oatmeal with a little naize meal, are among the most suitable.

Feeding Ducklings. This fool, and in fact all the meals, should he given in a moist crumbly condition. At about a week old, hoiled rice can he given for variety, and a little finely chopped cooked ment with this is beneficial. Fresh cooked meat can he given daily in small quantities, or fish meal can be used, or meat meal, provided this he free from hone, fur and hair-frequent causes of impaction of the crop. Both these meals are better if scalded hefore mixing with other meals, and a proportion of five per cent of fish or meat meal in the whole mash is sufficient at first.

From a month old barley meal may be substituted for ground oats. The fish meal can be increased to 15 per cent after the first
month and boiled rice may be included in the morning during hard weather, or if natural diet several times weekly. Fcerling should food cannot be ohtained by foraging. A set take place at 2 to 3 hour intervals cluring the lirst month, and the ducklings will benefit by frequent feeds in small quantity, but this must depend upon the amount of natural fooll which they can obtain for themselves by foraging.
If the ducklings are intended for table, they should not be allowed swimming water, and shonld have their range restricted at the age of five weeks. While fattening they should be given as nuch food as they will consume three times a day. The fattening food should consist largely of barley meal and good quality middlings. A small proportion of maize meal can be added, and ground or crushed oats used as an alternative to barley meal. Boiled rice can lie continued, mixed with middlings, and it is an advantage to boil the rice in water in which nettles have previously heen well hoiled. Fish meal should he omitted when fattening and cooked meat offal supplied in its place. Duckilings for the table should be killed when about 10 weeks old, and in any case beforo they begin to show the adult feathers. Ducklings intended for stock

Treatment of Roup. Ducks and ducklings are subject to fewer diseases than fowls and chickens. Like fowls, they suffer from roup, but of a far less virulent type. There is no dis. charge from the nostrils, but there is from the eyes, which water copiously and damp the feathers all round Foam and dry matter collect, giving the duck a very peculiar appearance. The eyes should be bathed and wiperd, and if the eyelids look sore a little vaseline should be rubbed round. and the birds should also be given roup powder or sumitable pills. When the sun's rays are


powerful. ducklings should never be let out in the middle of the day, or some are sure to lie alfected by sunstroke, as the covering of the skull is very thin. They will be found lying on their backs licking feebly, and seldom if ever recover. Adult ducks are not affected in this way. as their purposes thrive better upon free range and feathers afford protection from the sun's raye. with only sufficient food given to supplement Plucking the Birds. All hirds should be their needs after foraging. Similar food as for tahle hirds may be used, except that fish meal may be continued and barley meal replaced with middlings in larger proportion.

Adult ducks upon frce range only require one feed daily for about eight months of the year. This should be given in the evening. and should be a moist mash consisting of simple ingredients such as middlings, bran and maize or oat meals, with about 10 per cent. fish meal. A moderate feed of steeped
grain or of meals should be given in the
tarved for a full 24 hours before killing, in order that the crop and intestines may be emptied of food. The best method of killing is to dislocate the neck just where it joins the head. This method, when properly performed. results in the breaking of the jugular vein, and the blood drains lions the hody veins into the neck. Some persons like the fowls to be bled by a knife passed through the slot in the roof of the inouth.

Birds should always be plucked while the body is still warm, as the feathers then come
out more easily and there is less danger of tearing the skin. If this is not possible the operation should be post poned until 24 hours after killing. In plucking. fowla should be held by the legs, with the head hanging downwards The feathers should be drawn by a firm yet gentle pull towards the hend The plucking should begin at the tail and be continued in the following orler: back, neck. wings, sides, lags, and breast. The breast bone should not be broken. The wings and half the neck must be left unplucked The legs and feet should be quite clean.
When plucking has been completed. the birds should be singed and packed tightly, breast downwards, in a shaping trough with their heads hanging over the front board They are left in position for the flesh to set and cool. A long, narrow board should then be placed along their backs and the board weighted, a common method being to use a 9 Ib. brick to every two birds. In placing the birds in the trough, the stern is pushed hard up against the back board, thus giving the birds a shortened appearance

How to Cook. Ducks repuire a shorter time for cooking than either fowls or turkeys, since their flesh is much firmer and closer When buying ducks, it is well to remember that they are at their best uncler a year old. Their bills and feet should be yellow and pliable. If they are red and feel hard, it is an indication that the bird is old

When roasting a duck after truasing spread plenty of beef dripping over it. Put the giblets into a pan with a pint of atock and six neppercorns and stew these to make the gravy. Put plenty of dripping into the baking tin tor basting and allow about 1 hour for couking. The oven must he hot when the bird is put into it. After 10 min . lower the heat alightly and continuc cooking in the same temperature until the duck is done. A quarter of an hour to each pound of meat and a quarter of an hour over is a good average time to allow for cooking. Frequent basting with the dripping is necessary, and must be done quickly, as heat is lost in opening the oven door.

When cooked, remove the bird from the oven and untruss it. Place on a hot dish and mix the dripping with a little llour before browning it over the fire. Stir in any brown particles clinging to the sides of the tin. then add a little giblet stock and also $\frac{1}{2}$ pint brown sauce or water and a seasoning of salt and pepper. Buil up and cook for $\overline{5}$ min., then strain the gravy into a liot turecn. Garnish the dish daintily with watercress.

The duck should be served very hot with apple sauce, green peas, roast potatoes. celery or other seasonable vegetables, and a little of the gravy should be poured round the dish.

Braised Duck. Duck is excellent braised in a casserole. Wash 1 lb turnips, 2 carrots and a stick of celery, and peel an onion. cut all into large pieces and then put then into the casserole. On these lay 2 slices of ham, then 1 good-sized duck, trussed for roasting, and lastly another 2 slices of ham. Put in a bunch of parsley and herbs tied together, $\frac{3}{3}$ pint brown stock, a little salt, and a dust of nutineg. Lay a piece of buttered paper over the bird, put the lid on the casserole. and let its contents cook gently for about I hour or until the duck is tender. When the duck is ready, remove the skewers and string, replace in the casserole, and serve.
Savoury Recipes. Salmi of duck is prepared from a roast bird. Put the gililets into a saucepan containing a little stock, 3 fincly shredded shallots, and a little cayenne pepper and salt, and stew them gently for 25 min . Then cut the roasted bird into neat pieces. add it to the gravy, and let it simmer until it is thoroughly heated. When this is done, arrange the pieces of duck on a hot dish. boil up the gravy and add the juice of a bitter
orange. Strain this gravy over the duck and serve the whole very hot accompanied by an orange salad.

A rich dish known as terrine of duckling is prepared by first making a forcement with ducks' livers as the chief ingredient. Season 5 or 6 of these with pepper and salt, and sprinkle over them a little powdered hay leaf and thyme and half $\Omega$ small chopped onion. Have ready heated in a frying pan 3 oz butter and the samequantity of chopped fat bacon, and in these put the livers over a fierce fire to heat, but not to cook thoroughly Leave them to cool. and then put them through a sieve.

Bone and stuff a duckling with the force meat. tie it into a more or less natural shape, and put it into a terrine. Sprinkle over it a wineglassful of brandy and lay on it a alice of fat bacon: then cover the terrine, and place it in a bain-marie in the oven and cook the bird for about $\frac{3}{4}$ hour. Makea savoury jelly with the bones of the bird and some good veal stuck. and use it for covering the duck. Before dishing the bird, make certain that all grease has been removed: coat it with the jelly, and serve it cold in the terrine on an oval dish.
Duck Pie. Duck pie is a baked pie and makes it welcome change from the more usual methods of cooking duck Prepare it hy cutting an average-sized bird ints neat jointe, and frying these in a pan containing 2 or 3 oz dripping. When the pieces are of a delicate brown tint. lift thens out of the pan, drain them thoroughly and mix them with a little sage and onion stuffing. Simmer any trimmings left over in a saucepan containing just enough water to cover them, and add half a chopped onion and a pinch of aalt.

Parhoil a few large potatoes. then cut them into slices and arrange them, with the joints of duck and stufting, in alternate layers in a piedish. Moisten the whole with a little water hefore covering it with puff pastry and bake it in a fairly hot oven for about if it hours. Before serving the pie, pour a little of the stock from the trimmings through the hole in the pastry.

The Eggs. Slightly larger than hens' egge. ducks' eggs are either light green or white in colour and contain a greater proportion of oil. They are, too, more strongly ilavoured, and because of their richness are not suitable for invalids.

The eggs may be boiled, poached, or cooked in any other way as directed for hens' eggs. The time required for cooking them is approx. imately the same as that required for other eggs. In the preparation of puddings, cakes, pastry, etc.. where the use of eggs is recommended, duclis' eggs may be used with excellent results. Employed in this way, they are most economical, one duck's egg being equal to two small hens' eggs.

DUCK: Linen and Cotton. Serving in its heavier form for tent cloth, duck in its lighter makes is used for sailors' white uniforms and for men's suits in the tropics There are both linen and cotton lucks, and the former are the inore expensive and last longer The cloth is not twilled, but plain, and is often made in hopsack pattern for suitings. It is stiff and wears well.

Uppers of gymnastic shoes are of ten marde in white cotton duck. Awnings, sunblinds. stretchers for deck chairs, hammocks, boat sails, motor car covers, kit-bags, are other uses for heavy duck.

DUCK BOARD. The name is npplied to $n$ form of slatted framework used to place on muldy or aoft ground io act as a temporary footpath Such boards can readily he constructed from odd material : convenient sizes are 6 ft long and 18 to 2.4 in wide.

The term is also applied to a board used by plumbers and tilers when building or repairing a roof; it is used to preserve the roofing matcrial from damage by the workers' boots

DUFFEL CLOTH. Taking their name from a Flemish town, dufiel cloths are winter overcoatings Warm without being too heavy, they are a useful alteruative to nap cloths, and have generally a plain surface with a short lluff of fibre. soft and spongy
DUMB BELLS. Dumb bells are grasped one in each hand. and it is claimed that their use brings every muscle in the body into play. Iron ones, weighing from $\ddagger$ to $i \mathrm{lb}$. each. are the most general, but wooden ones are also used The weight depends upon the age and strength of the user. It is a mistalie to use bells that are too heavy, as they cause undue exertion, while those that are too light are almost useless
The best times for using the bells are in the morning, just after a bath, or before retiring to bed. Most persons will find 4 or 5 min . quite sufficient for this exercise. although usually men train. ing will give much morc time to it. There are a number of useful exercises which may be repeated for 20, 30 or 40 times. Onc is to raise the arms horizontally and rigidly till they meet over the head, and then to lower them in the same way. Another is to hold the hells at full length in front of the hody, then raise the arms vertically and lower them in the same way. A more elaborate exercise is to place the bella on the ground, then, hending from the hips with the legs quite stiff, take them in the hands and raise them with rigid arms over the head. This exercise is an excellent means of improving and trengthening the muscles.
The dumb bells illustrated are constructed in the form of the hands, so as to give a hetter grip than is given by the ordinary bella. By turning the ring $A$ in the direction of the ariow the pressure resistance is increased ; by turning it in the opposite direction the resistance is decreased The minter 13 indicates in pounds on the scale the pressure exerted to close the dumb bells. Whilst exercising, the user should keep the two halves firmly closed, and to emable him to do this a bell $C$ will ring when compression is complete. To begin, the spring should be set at a minimum resistance ind gradually increased. See Exercise.
DUMB CRAMBO. This is a variant of charades and may be played under similar conditions. Sides are picked, and one side goes out of the room while the other selects two words which rhyme with each other, e.g. nose and rose. They decide that the other party shall act rose, and accordingly tell them that the worl rhymes with nose. The outside party proceeds to act in dumb show any word which thymes with nose until they guess the right one.
The spelling of the word is unimportant providing that the sound is the same. In the case given they might act the word as if it were spelt mws. The hest results are obtained when the guide word is one which has many rhymes to it, and if the most unusual of these is chosen in order to tax the ingenuity of the acting party. See Charadea; Crambo.

DUMBNESS. The condition of dumbness arises from inability to produce articulate speech and its most. frequent cause is deal. ness (q.v.).
DUMPIE FOWL. This is a Scottish breed characterised by remarkably short legs giving it a curiously squat appearance. It is a verv fine layer, a good table bird, and an excellent sitter and brooder. It is bred in several culours the most popular of them being cucson or tiarre I like the Scotch Grey. See Fowl : Poultry.

DUMPLING. Dumplings are male Irom the same ingredients as a plain suet pudding. and cooked, tied in a lloured choth. in boiling water. J'hey can be served plain, in soups. stews and hashes. or made savoury and served with gravy
To make dumplings, $\frac{1}{2} \mathrm{lb}$. suet should be allowed to 1 lb . flour and I teaspooaful baking powder. These ingredients are atirred together with a pinch of salt and mixed with cold water into a suft paste. This is divided into balls, and these are ticd up in the corners of a floured pudding clotla which has been wrung out in hot water, and are then boiled for about $1 \frac{1}{2}$ hours.

Savoury dumplings are made by adding to the above ingredients 2 tablespoonfuls of chopped parsley and I tablespoonful of mixed herbs. pepper and salt. They should be dropped into the stewpan an hour hefore dishing up the stew. See Apple Dumpling
DUNDEE CAKE. This fruit calic is very simply made. Cream together 5 oz granii lated sugar and 7 oz. margarine, afterwards beating in 3 eggs. one by one. When these are mixed stir in $1 \frac{3}{2} \mathrm{oz}$. ground almonds. \& lb flour. if oz. sultanas. and $\frac{1}{2} \mathrm{lb}$. currants.

Beat all theae ingredients for $n$ few minutes, and put the mixture in a greased cake tin lined with greased piaper reaching 2 inches ahove the top of the tin. Cover the top of the cake with halves of blanched almonds ind bake it in a moderately hot oven for about 2 to $2!$ hours, lessening the heat after the first 20 minutes, and corcring the top with paper when lightly browned


Dundee Cake, a ricn ruit cake the top of which is covered with blanched almonds

DUNGAREE. For making overails dungarce is extensively used. It is a cotton fabric, usually blue or brown, a strong twill. often rough to the touch, not easily torn and made from hard-twisted yarn. See Overall
DUNNING. Although appetising when thus trented, cod loses much of its nutriment in dunning. The tish is opened, well ole:Incal. and the non-edible parts removed, then washed and scaled. It should be rubbed inside and out with common anlt and left to hanns in a cool place for 24 hours. A mixture is made of 1 oz. brown sugar and 1 oz. saltpetice tu $20 \%$ bay salt, and this is rubbed intot the fish. The fish is sprinkled with common salt and allowed to stand for 24 hours mora It is then drained, well dried, and liept in a conl. dry place until needed. See Corl.

DUREAM CUTLET. Prepare these cut lets by putting 1 oz. butter and the same quantity of flour into a saucepan, and mixing them over the fire. Add $\downarrow$ pint stock or water, and let it boil, stirring all the time, then put in a pinch of salt, pepper and cayenne and 1 dessertspoonful of bottle sauce. Then pour the liquid into a bowl add 3 or 4 tablespoonfuls of breadcrumbs, and $\frac{1 \mathrm{lb} \text {. of any minced meat, }}{\text { a }}$ mix them well. and spread the mixture on to a plate.

Lay it aside to get oold and firm, then cut into triangular shapes with a floured knife, starting from the centre. Sprinkle the hands with flour, and shape each piece into a neat cutlet. putting an inch of macaroni into the narrow end of each to represent a bone. Egg and crumb the cutlets, fry them in hot fat. and arrange them in a circle round a hot diah. Mashed potatoes, spinach or green peas might be heaped up in the centre of the dish.

DURHAM PUDDING. Put a table. spoonful of Demerara sugar and gill water into a saucepan and boil them for 5 min . to produce a syrup. Stalk and wash $\frac{1}{\mathrm{lb}}$. red currants, add them to the syrup in the pan, and cook them slowly until they are tender, which should take about 20 min . Dissolve the contents of one packet of red currant jelly in a pint of hot water.

Line a pie-dish with sponge cake, splitting the cakes in halves, and placing the top halves to the bottom and sides of the dish. Mix the stewed fruit with the jelly, and pour the mixture over the sponge cakes until the dish is full. Then place the remaining halves of the sponge cakes on the top of the dish. with the cut side inside. Press these well down so that the fruit and jelly soak into them, and cover the top with a dish, pressing it down with a heavy weight, and leaving the whole until it is cold and set. Turn it out to serve. Any kind of stewed fruit can be used for Durham pudding.

DUST : A Menace to Health. In large towns the air is laden with particles from fires and furnaces, and dwellers in those places show the effects in pigmentation of their lungs. In coal and other mines, and in certain classes of workshop and factory, e.g. potteries, steel grinding shops, eto., unless the ventilation is attended to and spraying adopted, workers who do not wear masks are liable to suffer ill-effeots from the irritation of the lungs by dust. In occupations involving the deposition of dust on the skin, inflammation of the skin or dermatitis is likely to result, unless strict cleanliness is practised. (See Spring Cleaning.)

The air passages have natural protective powers against dust, but when a large quantity is inhaled the defensive meohanism is overpowered, and some of the dust remains and produces discoloration of the lungs. The lungs of an infant are pink, but after years of residence in a town or elsewhere, if there is much dust in the air, they become grey, apparently without any bad effect on the lungs or the general health. But if the accumulation goes beyond a certain point, or if the particles inhaled are irritating, a reaction is produced in the lung tissucs, and catarrh of the bronchial tubes is set up. The general health suffers, the patient is anaemic, and later consumption may occur.

The risk to life involved in the chest diseases due to dust varies even among dusty occupations, but the tin miner certainly stands the poorest chance. The terms grinders' rot and potters' asthma convey the menace to health in other occupations : the list is a long one, including workers in cotton and grit mills, tobacco factories, sawmills, brickworks, etc. Preventive measures are carried out in most factories and mines by improved ventilation, keeping the air damp, etc., with immense
benetit to all concerned Workers in dusty trades should always wear respirators, however truublesume they find these to be in the course of their employment.

DUSTBEIN. The metal sanitary dustbin is secure against insects, and also against pmoling animals, pruvided the lid is always kept on. as it should be The lid also keeps the contents of the bin from getting wet or being blown about when there is a wind.
The dustbin should be kept clean, both inside and out, by means of hot water and aome disinfectant, such as permanganate of potash. It should be placed outside the house on a firm. dry foundation in a spot readily accessible for the dustman. The contents should be emptied at least once a week. Dustbins should be used, as far as possible. for dry refuse: all damp refuse should be burnt See Refuse Sanitation
DUSTER. Bought dusters, unless extremely low priced, are satisfactory, but it is economical to make dusters at home from material which would otherwise be thrown away. Ordinary cotton materials are unsuitable, as they are non-absorbent, but wincey, Hannelette, and old sheets all cut up into serviceable dusters when hemmed. A slightly damp (not wet) duster colleots dust more readily if a room is really dirty. To wash out the grime and grease from soiled dusters, the best medium is a soapy lather to which a little soda has been added
A soft piece of chamois leather soaked in cold water and wrung out tightly makes an excellent duster It can be used on the finest furniture without fear of scratching, and will remove the most obstinate fingermarks. An additional advantage is that chamois leather leaves no threads or Huff behind it. When polishing any kind of furniture. a great saving in labour can be effeoted by using a hot duster. It is a good plan to keep a couple of dusters in a cool oven and use them alternately while they are warm. A high polish will then be easily seoured. Care must be taken to see that the dusters are not soorahed.

DUSTING. A house should be dusted throughout every day. In the living-rooms the fireplaces should be done first and the room swept. and no dusting ought to be attempted until the dust caused by the sweeping has had time to settle.

All dusting should be done from the top to the bottom-that is to say, mantel pieces and the higher pieces of furniture are done before fenders. etc., ss the dust dislodged from them will sink on to the lower places, and be finally removed from them. Every ornament must


Dutch Garden. Pigs. 1-4. Plans of examples of formal gardens, the laying out and planting of which are described in the text
be moved: it is not enough merely to go round them. as that will leave an ugly ridge of dust.

Among things which are frequently neglected, vet which provide harbourage for dust, may be mentioned picture frames bars of chairs, and electric-light shades or gas-lamps. for which a light dusting brush may be used. Last of all, the surround of the floor should be dusted For this purpose a slightly damped duater may be used. or a long-handled mop.
Dust Sheet. Made usually of coarse sheeting, dust sheets can be cut from any spare length of material They are eapecially useful when spring-cleaning, white-washing, or distempering is being done, or when the occupants of a house are leaving for holidays If they are not bought ready-made, the sheets should be hemmed down on all four sides.

The amount of material required depends upon the size of the article to be onvered, but for an armchair about $2 \frac{1}{2}-3$ yards of wide material should be sufficient. See Brush.

DUSTPAN. The tin scoop with a handle into which dust is swept by means of a small brush is chiefly used for colleoting the dust on stairs. The dustpan and brush have been largely replaced by the use of vacuum cleaners and carpet sweepers. See Carpet Sweeper :

## Vacuum Cleaner

DUTCE AUCTION. This method of selling goods is the exact reverse of the one in ordinary use. A high price is first named for the article or property offered. and this is reduced by stages until a bidder is found. See Auction

DUTCE CEBESSE. A true skim-milk cheese, the Dutch product is mild in flavour and has many good points, although it is less nourishing than the whole-milk cheese, and is frequently a little salt. This class of cheese is best for keeping purposes, as it dries and hardens, wheress the rich, fatty varicties of cheese are prone to decomposition. Its shape and colour vary, some being round, othery oval and either coloured a brilliant red or left yellow on the outside. See Cheese.
DUTCE GARDEN. With its trim and formal beds and borders, carefully trained yews and clipped dwarf box edgings, tho Dutch garden has a charm of its own, and though no longer so fashionable as it was in tho 18th century. many fine examples are still to be found in England, the result of gonerations of careful treatment. Directions and plans for laying out a Dutch garden are given in this articlo.

A Dutch garden should be enclosed by a clipped hedge of yew or box, and if possible laid in a position where it can be looked on from above. Planning the forination of beds and borders is a simple matter, with such a diversity of geometrical shapes availablo, among which squares, circles, hexagons, and rectangular forms, such as those shown in the diagram, will be found most suitable. In the centre of the garden may be placed an ornament to which the beds converge, and this may take the form of a trained tree, a stone figure, a weeping or pillar rose, a sunclial, a fountain, or a fine stone vase to be kept filled with seasonable bedding and bulbous plants. Crazy paths of York stone, having wide crevices
between, planted with tufte of lowly plants, are at the top, under the very old-world in appearance. Well-rolled gravel will also serve
In planning the beds all angles and circles should be carefully pegged out with wooden stakes, and, as far as practicable. boards should be nailed against these to outline the shapes desired. Gravel should then be laid for the paths, and after this has been rolled thoroughly hard, the boards may be removed, and the beds filled to a proper level.
Box edging may afterwards be inserted, but it is advisable to use a garden line when planting to ensure regularity of outline. Although construction may be carried out at any time, autumn or spring is the best, as the dwarf box required for edging is then in suitable condition for planting. Clipping or training of the box is best performed during May, and after planting due attention must be given to watering until the roots have taken hold of the soil

The Dutch garden is usually planted with low-growing plants which do not obscure the lay-out. A modern variation, now more popular, is the Formal Garden in which free-growing plants are set in beds and borders of formal design.
Plans for the Gardens. The accompanying plans suggest four arrangements for typical Dutch formal gardens. The first example would result in a charming old-world garden.

Corner heds, A, B, FIG. ${ }^{\text {C }}$ D, cubbage, Provence, anask, and Clina roses
Centre bed, E-A aundial surrounded with clumps of southern-wood, thyme, or marjoran, with viola Maggle Mott planted lietween.
Outer beds.-1F, white Howers; G, red flowers: H, yellow Howers ; J, blue thowers ; K, white llowers L, red Howers; M, yellow howers; N, blue llowers. O. Seats or arbours of elipped yew

Fio. 3
Outer border A.-Mixed smapdragone
B to E.-Beds of mixed perennials and annuals. Inner beds - Roses carpeted with violus
Centre.-Weeping or pillar rose, sundial, or elipped trec.
r. Seat or arbour.

## Vic. 4

A paved or red-tiled garden of anglea
A naved or red-tiled garden of angles
A A.-Mixed border of holly hocks, sunflowers, AA-Mxed border of holy hocks, gunflowers, basonies. ark plants.
BB. -Mixed beds of annuals and perenuials, with a rose. preony, or sla contre of each angle.
C.- Pillar rose with carnations and violas. lagested plan an edglog of Mrs. Sinkins $p$ in
Fig. 2 displays a somewhat elahorate and not uncommon type of bed. The darkest portions show the inner and outer edgings of dwarf box, the tinted parta signifying grave and the white spaces where flowers are to be planted around dwarfed shaped trees. Such beds entail hard work and great attention if they are to be successful ; but the result is well worth the trouble that has been taken See Crazy Paving; Garden; Path; Tile.

DUTCHMAN'S PIPE. Popular name of a very vigorous hardy climbing plant valued chietly for its large leaves, Aristolochia sipho. The curious shape of the small brownish flowers has given rise to the popular name. Some of the hot-house kinds of aristolochia have evil-smelling flowers of extraordinary appearance.
DUTCH METAL. This is a copper zinc alloy with a high proportion of copper; it is so ductile that it can be worked down to a thickness comparable to that of golil leaf This fact, coupled with its yellow colour, leads to its use as a cheap substitute for genuine gold leaf in gilding work ; it is also sometimes used in powder form for so-called gilding.
DUTCH OVEN. Formed like a miniature roasting ecreen, the Dutch oven is made to fasten on to the bars of an open grate or range. It is fitted with two or three meat hooks ood, and contains adripping pan below, which is sup ported on iron rests The oven is designed to enable a smal joint or fowl to be cooked in front of the fire when other means of roasting are not available.
The fire should be clear and the suspended meat must be turned and basted precisely as if cooked on a spit. This method, if properly carried out, gives the joint the same Havour as if roasted in the old-fashioned
way. It is really a form of toasting or grilling. A Dutch oven may also be used for cooking chops, steaks, bacon, or fish, and it is adapted for browning the top of macaroni cheese, scallops or other savouries. For this purpose the dishes should be rested on the dripping pan

For those persons without a kitchen range or gas cooking stove the Dutch oven presents a solution of the difficulty of rossting, but it must be kept scrupulously clean. It should be scoured in the same way as tinware See Roasting

DUVETYN. The cloth known as duvetyn derives its name from the French word for down, duvet, and it emulates the downy softness of peach skin or the slin of young animals. Silk duvetyns are the best known, and their surface approaches that of hatter's plush. Ornamented with stencilling or embroidery this cloth is suitable for such articles as blotters and Hoor cushions.

DWARF BEAN. The French or dwarf bean is one of the best summer vegetables. The pods, which should be gathered while the seeds are immature, are of more delicate flavour than those of the runner bean. Deeply dug and manured soil is necessary to ensure good crops.

Sceds may be sown out of doors at fortnightly intervals from early May until the middle of June to provide a succession of produce in late summer and early butumn. The seeds should be set about 3 inches apart and 1-2 inches leep. The seedlings must be thinned out so that they are 9 inches or so from each other. The rows ought to be 20-24 inches apart. Canadian Wonder is a good variety, though most scedsmen sell their own special sorts.

Farly crops of dwarf beans under glass are obtained by sowing the seeds at intervals in August and September in 8 inch pots filled with lonmy soil, keeping them in a frame until October and then placing them under glass in a temperature of 55 to 60 degrecs.
The climbing French bean, which needs the aame treatment as the dwarf kind, provides pods of excellent Havour throughout many weeks It is less vigorous than the runner bean. Tender and True is one of the hest varieties.

The waxporl or but ter beans are grown for


Dutch Oven Useful roasting contrivance in metal provided with four meat hooks and dripping pan
the sake of their pale yellow pods, which are conked without being sliced ; both dwarf and climbing types are available and they need the same treatment as advised for French beans. Mont d'Or, climbing and Golden Waxpod, dwarf, are favourite varieties.
The ordinary runner bean can be grown without sticks if the ends of the shoots are pinched off frequently: the plants thus remain dwarf and become well branched. They cover a gond deal of ground, and it is necessary to support them with short sticks to keep the pods off the soil. See Bean.

DWARF TREES. The miniature Japanese trees of larch, orange, maple and various evergreen conifers have become popular in Great Britain and are imported in considerable numbers. Some of those exhibited are said to be over 100 years old, yet so restricted are the roots that they remain dwarf and the stunted branches give them a very picturesque appearance.

The trees may be grown in a room window or unheated greenhouse, but they need careful treatinent to preserve them in a healthy condition. Incorrect watering is likely to affect them adversely. The soil should be watered only when it is moderately dry, but sufficient water ought then $t_{1}$ ) be given to moisten the soil thoroughly. If the soil is kept in a sodden state or if it is allowed to dry out, the trees are certain to suffer. They must be placed in a light position though not in strong sunshine. Grs-heated or gas-lit rooms do not suit them. Every year it is advisable to take off some of the surface soil without damaging the ronts and to replace it with fresh compost of loan and a little sand.

During mild weather in spring and summer the trees benefit by being placed out of doors, for they are hardy trees. Branches which tend to spoil the symmetry of the trees should be shortened whenever necessary. If a tree shows signs of ill-health it should be turned out of its pot. the latter being scrubbed clean and provided with adequate drainage. The tree should then be repotted in loamy soil containing sand and a little crushed charcoal.

Miniature trees can be grown at home by setting seeds of various trees in pots, repotting them seldom, and pruning the branches to force the trees to grow in the ahape desired.


Dwary irees: wo specimens. 1. Thuya obtusa, 70 yearg old, 30 Inches in height. 2. Miniature orange, 15 years old, $\theta$ inches high

## Dyeing Fabrics at Home

## Hints on an Economical Form of Domestic Renovation

By following the instructions given in this article clothes and furnishings an the tinted not Byly in one but in two colours. Consult also cnirics on Batik: Colour Schemes, etc.

The many varieties of dyes on the market prove the popularity of home dyeing. Articles. both n! dress and houseliold hangings, may hecome faded and shabby a considerable time before they are worn out. With the expenditure of a little money, time, and tiouble they can be renovated by tinting to match their original colour, or the colour may be entirely changed. One immeraion in a dye bath completely recolours articles of plain material. Patterned fabrics may require two immersions or even three bcfore the pattern is quite hidtlen by the new colour.
The usual forms in which dyes are sold are cakes, Hakes. powders and tubes of paste. Some are soap dyes, the dye being intimately mixed with soap. others are merely colouring matter put up in convenient forms for use

Cold water dyes are chiefly used for giving pale and delicate colours th fabrics of fine textures such as silk, muslin. eto. Some lycs are prepared for woollen and silk fabrics. some for cotton and linen, the reason being that animal fibres take dyes differently to those inale from vegetable fibres. If a cotton and wool mixture fabric is to be dyed, choose a cotton dye because wool. will take a cotton dyc. but cotton will not take a wool dyo. lsuy plenty of dye. It is far better to buy one packet too many than not enough.

Initial Preparation. Before commencing, remove all buttons, buckles, bead or other trimmings, which obviously could not be expected to dye satisfactorily Any stitcheddown parts, such as turned-bick cuits, collars, hems, revers or pleats should be unpicked. This allows frce access of the dye solution to all parts of the garment. Thoroughly wash every article before attempting to dye. This parlicularly applics to new materials: any sfarch remaining in the fabric will prevent the dye taking evenly. Grease and dirt act in the same way Although the directions on a few soap dyes distinctly state that previous washing is unnccessary, gond results must not be expicted if the washing is neglected. It is a well known fact that a really dirty garment is not thoroughly cleaned by simply immersing it in hot soapy water Rubbing or friction of some kind is essential. Further, any dirt coming from a soiled article when mixed with the dee solution will naturally prevent the dye giving such a clear or brilliant colour.

Weigh the articles carefully before making the dyc solution: this avoids waste, and ensures sufficient solution being ready. The


Dyeing. Fig. 1. Straining the dye through fine muslin. Fig. 2. Two wooden spoons are used for stirring the dye bath
directions supplied with some makes do not hut only how much anlution can be miade from the packet. In these circumstances individual judgernent must be used, remernbering that a small thick article, eapecially of wool, will often require much more liquid than a large one of fine texture

Method of Dyeing. For the dye hath ohoose a hasin or washing tuh large enough to take the article to be dyed conveniently. The utensil selected. if required for cotton goods, must be caprble of being heated over the fire. White enamelled iron ware is the most suitable. Ordinary china basins can he used for all dyeing that does not actually require to bo boiled.
Make sufficient dye solution not only to cover the fabric easily, hut to allow room for stirting and moving the article about All dyes, whether soap dyes or not, should he completely dissolved in hoiling water. If the packet is hard it requires to be shrediled or crushed. Should the dyc not dissolve eusily, place it in a small enamelled jug or basin and boil for a few minutes. When quite dissolved strain the concentrated dye through muslin into the dye bath (Fig. 1), and dilute with water. Before adding the material, test for colour by dipping $n$ small piece of the same material into it If this is not possible, take a small piece of fabric resembling the article in colour, and texture. Rinse well and dry; if the result is satisfactory. it is safo to proceed. If a decper or paler tone is required, nore dye or water must he added.

Should the test not give the exact colour, try judicious mixing of one or morc colours until the desired shade is obtained. Most makers prepare dyes for sale in about 20 different shades but by mixing these $\pi$ much greater number of colours can be produced Details about the particular dye are printed on the package and dircctions should be carefully read. When the dye bath is ready, open out the article, which has been previously washed and rinsed, but not dried, and place it in the solution. Use two smooth wooden sticks or spoons (Fig. 2) to inove the fabric ahout. On no account should the dye bath be left, as it needs constant stirring whilst being heated Unevenness of shade may result from carelessness at this stage.

Most makery advocate the use of salt, some also of vinegar. Salt is particularly useful when dyeing cotton goods, as it enhances the depth and brightness of the colour. The average time required to dye is from 10 to 40 min ., according to the tone required, deep shades requiring longer than pale ones. Navy blue, for in stance, would require 40 inin., while a pale blue would be dyed in 10 min .

Thedyeing completed, the colour must be fixed by thorough rinsing in several changes of cold water until no colour comes from the newly dyed article. A certain
amount of unabsorbed colour is always lost in rinsing, and this must be taken into account when preparing the dye bath Wring the article lightly and hang it out to dry. taking eare to put the pegs in some inconspicuous part. When nearly dry take the article fiom the line and roll it up ready for ironing.

Delicate fabrics such as georgette or chiffon do not require to be hung up: any surplus moisture can be removed by rolling the garment in a clean cloth. Such materials and certain crepes are apt to shrink after immersion in hot dye. They should be pulled into, shape during the ironing process while the fabric is still damp. When irnning newly dyed material protect the ironing sheet from stain by placing a piece of muslin or thin cotton between the shcet and article being ironed If much dyeing is being done, it is advisable to wear a rubber apron Ruhber gloves are useful when rinsing after dyeing dark colours, such as black or dark brown, as there is sometimes sufficient dye in the first rinse waters to stain the hands Lemon juice will usually remove such stains, or an application of peroxide of hydrogen

Skilled treatment is required for such articles as suede, kid, or huckskin shoes or gloves, furs, carpets, rugs, waterproofs, overcoats, woollen costumes, or any heavy garments having interlinings and paddings, and the dyeing of these should not be attempted at home.

Knot Dyeing. Certain articles such as straight scarves, unlined curtains and cushion squares, made of thin fabrics, can be decoratively treated in two hiarmonious colours by means of knotting after having first been dyed in the ordinary way. The article should be rinsed and then knotted tightly in the middle with smaller knots at each corner, oras in the case of curtains-at each lower corner. The knotted fahric is then dyed in a second deeper colour in the same manner as before, rinsed and unknotted. The two colours will blence into each other with a pretty shaded effect without hard lines of division between the tints.

Should it be wished merely to give a contrasting horder effect-to a scarf, for instance -the article may be tightly bandaged with cotton raga, after the first dyeing and rinsing have been accomplished, leaving exposed for the second immersion only the ends. The scarf is then simmered as hefore, rinsed, and the bandaging removed before drying and ironing. This method of dyeing gives a charming effect to short curtnins made of natural shantung silk.

DYNAMO: Working Principles. The dynamo is a machine employed for converting mechanical energy into electrical energy. and consists essentially of an armature rotated in a magnetic field.

The general arrangement of a dynamo is shown in the diagram. The magnetic field is produced by a cast iron frame or yole into which are fixed an equal number of iron poles, each pair being diametrically opposite. Upon each pole is mounted a magnetizing coil, the coils heing so connected as to influence each alternate pole as it $N$. pole, and cach intervening pole as a S. pole. The yoke is necessary to provide a path for the magnetic lines of force outside the armature, while the magnetic circuit is completed across the air gaps between pole tips and armature. The armature takes the form of a cylindrical iron structure inounted between bearings. Electrical conductors are carried by this structure, each cutting the magnetic lines of force as the armature rotates, with the result that a relatively small clectric current is set up in each conductor. Upon the number of conductors, the number of magnetic lines of force produced by the field coils. and the speed of rotation depend the value of the electric
current generated by the dynamo. The current is collected by the brushes from the commutator, a motating contact device
Any convenient mechanical power, such as a gas, steam, or oil engine, may be employed to rotate the armature, the imporiant point leeing to have sufficient power at the speed necessary to enable the dynamo to deliver the voltage for which it is wound
Types of Dynamo. Certain tyres of dynamo have been evolved for eprecific duties. Thus. the dynamo on a motor car has a duty different from that of the appar. atus which is used for lighting a private house, while a dynamn for charging accumulators would not he suitable for lighting purposes. charging dynamin delivers a heavy amperage at a low voltage, whereas a house lighting dynam" gires a lower amper. age at a higher voltage

Typical windings are the series, shunt. and compound respective!y. In the serics winding the armature conductors and the ficlal coils form one continuous cirouit, it being characteristic of this winding that the voltage varies as the load tluctuates. For
this reason the series dynamo is not suitable either for charging or lighting. In the shunt winding the armatureconductors and the field coils form two separate circuits, and a handoperated regulating resistance is introduced into the field circuit. The purpose of the latter is to control the voltage genernted in relation to the load fluctuations plus the voltage drop due to the heating of the coils. IIthin well defined limits a shunt wound dynanio can be considered a constant voltage machine The compound method of winding combines both serics and shunt. Its utility lies in the fact that it accommodates itself to load fluctuations by virtue of the series winding, which increases the magnetic field as the load increases. Such a machine is cxcellent where the current demand varies within fairly wide limits. Details of the windings and the spced of the dynamo should be found on the maker's plate fixed to the machine.
A dynamo to give the hest reaults must be properly installed upon a sliding base fixed to a firm foundation. The sliding base enables the machine to be properly lined up with the engine, and allows the driving belt or chain to be adjusted to a nicety. A dynamo bolted direct to an engine shaft through a coupling is said to be direct driven, and when once lined up needs no further adjust ment:
It is important to house a dynamo in a dry place, as damp has a detrimental effect "pon the insulation and may canse " earthing" troubles. Dust also should be kept away from the machine. If fixed on a wooden Hoor, a thick bed of incombustible material, such as asbestos. should be placed heneath the dynamo to insulate it. All wires and connexions must be properly protected, as, for example, by enclosing them in steel tuhes, or in any manner that will ensure them being out of the way of gas-pipes, a hot flue, or heat or acids that might tend to destroy the insulation.
Regular attention has to be paid to replenishing the oil boxes. The used oil should


Dynamo. General view of small dynams snowing commutator, armatuie. brushes, feld magnets, and driving pullep
be drawn off and replaced with a fresh supply No oil must get on any part of the insulation. as oil is a solvent of rubber, and if it be allowed to get on the rubbered wires the rubber will perish, and ultimately cause a failure

Commutator and Brushes. The commutator and brushes give the most trouble and should be regularly inspected When in good order there should be no sparking at the points of contact. The contact face of the brush should be of the same curvature as that of the commutator. and this can he ensured by
placing a piece of glasspaper between the brush and the commutator and then rocking the Iatter so as to rub the paper on the brush and thus shape it to the desired curve. This applies to the usual carbon type of brush. those made of copper gauze are shaped with a very fine file and emery paper In either case see that there are no loose ends to cause sparking.

The pressure of the brush on the commutator should bo adjusted if requisite, by altering the tension of the springs The rocker Hrms should be properly spaced, two being diametrically opposite, and four spaced at $90^{\circ}$ a part. A slight movement of the rockers will often correct sparking and ensure perfect running, but this can only be determined by trial. The commotator should not be lubricated. When all is in good order it should be a dark coppery colour: if blackish it indicates that the brushes are too soft. A bright and scraped appearance indicates either that the brushes are too hard or the pressure is too great.

DYSENTERY. Under this name are included several forms of intestinal inflammation. In hot countries cases are constantly cropping up. In Gieat Britain epidemics are not infrcuuent in asylums and other institutions.

The disease is spread by germs in the excreta of a patient suffering from the discase finding their way either into food or drinking water. This may happen in several ways. Flies may feed on infected excreta and then defilo food, beverages, or food utensils. Infected excreta may be drained into shallow wells or washed into surface water This water may be drunk or used for washing raw food, e g. salad or food utensils. Lan food may be infected by polluted soil, and not washed clean. Persons found to be carriers of the disease frequently havo been amongst those handling food, c.g. cooks, waiters, nurses, etc.

There are two main forms of the disease: bacillary and amoebic. For one or two days an attack may resemble ordinary acute diarrhoea, and then the stools are found to contain
mucus (slimel streaked with blood. Soon the motion may consist of mucus and blood only. There inay be scvere straining and griping pains The patient may die Irom weakness or from perforation of the bowel, or may become the subject of chronic dysentery

The patient should be put to bed at once between hot blankets and hiave a hot-water bottle at his feet. The abdominal pain will he relieved by hot fomentations. He may have whey or albumen water at 4 -hour intervals. Armwroot may be useful. In the bacillary form 1 dram doses of sodium sulphate should be given every hour till the straining is relicved, and then at less frequent intervals The doctor will treat basiliary dysentery by injections of anti-dysenteric serum and amoebic dysentery with emetine.

Preventive Methods. The stools of the patient should he mixed with a disinfectant before being disposed of preferably by burning Efiorts should be inade to diminish the number of flies. No fond or beverage should be left without a cover if llies are about All water for drinking or washing fond or food utensils should be hoiled or otherwise sterilized unless it comes Irom an unimpeachable source The hands should be washed thoroughly before partaking of food Salads should be avoided. and care should be taken to prevent chills and to correct constipation and diarrhoea (q.v.).

DYSMENORRHOEA. Pain occurring ut the menstrual periods in women and girls. and felt in the lower part of the abdomen It is always more or less disabling, and may be very severe. The causes are numerous, but always include some abnormality in the sexual organs

The patient's general health is important. Iron in some form will be necessary in anaemia. Constipation must be corrected If the pain is severo the patient should remain in hed, and the abdomen and fect should be kept warm. Much relief may be obtained from hot mustard hip haths or foot buths. Aspirin, grains 10. or phenacetin, grains 7, with citrate of catfeine, grain I, may be given to a woman, and will frequently lessen the suffering. Alcohol in any form should never be given.

Dyspepsia. See Indigestion

E
AR : Anatomy and Diseases. The human ear is divided into three parts -the external. the middle, and the internal ear The first consists of the auricle or pinna, the ear in the popular sensc, and the external auditory meatus or passage which runs if in. inwards from the earhole and ends at the tympanic or drum meniliane stretched across the passage Sound waves entering the passage strike against the membrane and cause it to vibrate.

The middle ear lics inside the membrane. Its chief contents are the ossicles, three tiny bones which connect the drum with the actual hearing apparatus, or internal ear In the posterior wall of the middle ear there is the opening into a small passage leading to the mastoid antrum, a hollow space in the mass of bone to be felt inmediately behind the ear In suppuration of the middle ear infection may thus pass through and cause mastoid discase. In the anterior wall there is the opening of the Eustachian tube, which leads directly to the back of the throat. The importance of this tube is that through it air can find its way into the iniddle ear, so that the air pressure on the two sides of the drum is always kept the same. The deafness so commonly noted in chronic catarrh of the nose and throat is generally due to the catarrh spreading up the Eustachian tube and closing it

The intarnal ear or labyrinth is divided into three parts: the cochlea, the true organ of hearing, in front; the semicircular oanals,
which control balance, and the vestibule, between thear others.
Sound vibrations can reach the inner ear otherwise than through the air Thus if a tuning-fork is sounded and the end of the handle placed on the bone hehind the ear or elsewhere on the skull. the note will be clearly heard if the internal ear is healthy If it is not heard we imply that the patient suffers from nerve deafness due to discase of the internal aar or the nerve connecting it with the hearing oentra in the brain The tuning-fork will be heard distinctly, however, where the deafness is due to blocking of the external passage as by wax, or to disease in the middle ear causing stiffiness or destruction of the membranes and the conducting bonex

Discharge from the ear is most commonly due to inflammation of the middle ear, with the formation of manter which escapes through a perforation in the drum-membrane. This condition is a frequent complication of the convalescence of measles or scarlet fever in children, or it may result from simple cold in the car. The treatment of discharge coming from the middle ear must be supervised by a doctor

Perforation of
the drum mambrane may be caured by some shar it instrument poked into the ear, or by the impact of water in diving. etc., bul most commonly it is the result of middle. ear inflammation. The ears should be pmoneted in high diving by plugs or otherwise. It is $n$ dangemus practice to box children's cars, as this is a frequent cause of perforation of the drum membrane.
A foreign bolly in the ear may be in living insect or something which has been pushed in. It is safer to have it syringed out by the doctor, and the sooner the better. If it is a pea or a bean, no one should be allowed in the meantime to put water in the ear, as this causes these to awell and renders their removal more difficult.

On no account should alteinpls be made to remove a foreign body with a hairpin or other inslrument.
Mastoid disease is most usually due to infection from the middle ear through the opening above mentioned. The symptoms are sudden fever. pain behind the ear, shooting over the head and down the neck, swelling, redness and tenderness on pressure on the bone behind the ear, and usually a profuse discharge. Suppuration occurs in the spaces within the mastuid process, and as the pus cannot readily escape through the narrow opening into the ear or through the hard bone on the surface of the mastoid, it tends to turn inwards, and may produce meningitis or abscess of the brain. Early surgical treatment is imperative.

Nuises in the car may be the result of $n$ large number of causes, e.g. chronic inHamma. tion of the middle ear causing partinl deafneas, certain drugs, such as quinine, sodium salicylate, etc., catarrh of the nose and throat, etc. Treatment will depend on the cause. Wax in the ears may be remuved by gentle syringing as deacribed under the heading Deafness.

Earache. This pain in the ear may be due to a number of causes. Among these nre neuralgis, a boil in the meatus, impacted wax, the presence of a foreign body, or inflammation of the middle ear. Teething in children is a nother cause.
To relieve the pain, heat should be applied. A hot-water bottle may he covered with
flannel or a shawl and laid againat the ear, or a fiannel bag may be made and filled with common salt which bas been roavted on a shovel. This should be applied as hot ss it can he boine. If. however, the pain is con: tinuous, a doctor should be consulted.

Ear Cap. The purpose of ear caps is to correct prominent ears in children Made of mercerised cotion or of silk, they ans worn round the head at night, being held in position by straps firmly but not too tightly tied They can he obtained in most sizes frimm chemists, surgical instrument makers, and diapers.

EARLY CLOSING.
In Great Britain, since the passing of the Shops Act of $191 \%$, it his been ommpulary for shops to close for one half-day a week, and this is the early closing day. The term is also applied to the movement which resulted in shops closing earlier in the evening, the result of Aots of Parliament paased in 1922 and 1928
The day chosen varies from place to place. being fixed by local authorities alter consulta. tion with the shopkeepers: buta shopper should acquaint herself with it in her own locality so as to avoid disappointment In oentral London the early closing day is Saturday, but in other places it is more usually a day about the middle of the week, Wednesdny and Thursday being the days that are most requently selected.
EARRINGS: Choice and
Care. While never quite out of fashion as ornamente, atyles for earringa change frequently. especially during periods when "omen are wearing much fancy jewelry and new deaigns are evolved in keeping with various dress fushions When long earrings are being worn, good examples may be purchased at shops whioh specialise in antique jewelry. Many such carrings are made in two parts, a top or atud and a long dmp, or an intricately deaigned lower part, which houks on to the upper patt. These ornaments posscss an advantage for those who do not care for elaborate earrings in the mornings as the studs can be used alone, the lower parts being added for formal wear.

The two main types of fastening for earrings are illustrated, the first being suitable for pierced cars and the second for unpierced. The latter type are nttached by menns of screws to the lobes of the ears. They should be light in weight or they are linble to drag the lobes and either to hurt or to be lost.
Fastening Methods. The fastening of valuablecarrings should never be of the type which serews on the lobe of the ear. It causes unbearable discomfort if the fastening device is screwed so tightly to the ear as to prevent the possibility of the ornaments falling off. Those who possess diamond or other valuable earrings ahould have the lobes of their ears pierced. This can always be done by a practical jeweller without any risk and with very little pain.

Before purchasing earrings inquiries should be made as to whether the wires or fastenings
are of silver or gold The less expensive varieties may have metal fittings which might possibly poison the ear, though the extra cost of silver is infinitesimal. For anfety when wearing earrings the style of fitting that is most reliable is what is known as the Brissure fastening. This is an old French atyle, consisting of a wire which. when passed through the ear, is covered by means of a grooved loop of gold or silver affixed to the ornament by means of n spring hinge. Withdrawal of the wire from the lobe of the ear is thus renderel impossible without the hinged loop being first opened ao us to uncover the car wire at the back of the ear.

EARTH : In•Electrical Work. Any part of an electrical circuit which is connccted to the ground or earth is said to be at earth or zero putential

A good earth system is very necessary in wireless reception. The wire from the eartls terminal on the set to earth should be as short as possible. It is immaterial whether this wire is of the bare or covered type, but it should be of a substantial cross section: copper acrial wire, $7 \cdot 22$ gauge, is suitable. A main water pipe makes a satisfactory earth, provided the earth wine can be attached close by the point where the pipe enters the ground] If. for example, the set is to be used in a room at the back of the house, the earth wire can be joined near the tap in the kitchen or scullery. The lead pipe should be acraped clean anil bright for a diatance of about one inch, and an earthing clip attached. The earth wire from the set is then connected to the torminal which is provided on the clip

Gas pipes make unsatisfactory earths owing to the fact that high resistance joints are employed. Moreover, considerations of safety make it undesirable to utilise a gas pipe for this purpose.
If the receiver is not conveniently placed in relation to the main water supply, a buried earth may be employed. The earth wire is soldered at several points to a large sheet of zinc or copper, which is buried cdgewise in damp sail to a depth of about three feet. After cleaning off any excess flux with methylated spirit or petrol, it is advisable to protect the joint with a coating of paint in order to prevent corrosion.

An alternative to the metal earth plate is an earthing tube, which is driven into the ground and has a terminal at the top to which the earth wire is attached Besides this connexion it is as well to lead the bare wire down through the tube, and out through one of the holes near the bottom, where it may be soldered or ot herwise attacherl to the tube Earth tubes arc usually perforated, and should be filled with
water at regular intervals during dry weather to ensure satisfactory electrical connexion with the surrounding soil.

A counterpoise earth is sometimes used for shortwave reception, and may comprise one or more wirea. running beneath the serial and a few feet above the ground The wires have to
Earring with Spring Brissure Pierced Ears
biced Ears
Earring. Types o ng. Types of fastenings for both Screw Fastening for Unpierced nierced ears

be insulated in exactly the same way as the aerial, and may be passed through an ebonite lead-in tube to the earth terminal of the set.
If a decrease in volume or Hatness of tuning is observed, it is as well to inspect the parthing
system, making sure that any terminals or other jointa have not become dirty or otherwise defective. A faulty earth may alan produce high frequency and low frequency instability. See Aerial.
Earth Switch. This is ab device for disconnecting the receiver and joining an outdoor serial direct to earth, so that atinospheric discharges (e.g. lightning) How etraight to earth instead of passing through the aerial circuit of the set A stoutly constructed single pole change-over switch having a forcelain base is suitable, and should preferably be mounted outside the house. near the nerial lead-in insulator. It is advisable to provide a cowl or other covering to prevent laaknge of the aerinl currents to earth over the surface of the switch in wet weather.
The connexions are as follows: The aerial lead-in is joined to the centre terminal or nim of the switch. One side of the switch is then connected via the lead-in insulator to the aerial terminal of the set, and the remnining side is joined to earth. Thus in one position of the switch arm the acrial is connected to the receiver, while in the other position the serial is joined direct to enrth. The serinl should alwilys be earthed when the set is not in use

EARTH CLOSET. In country districts where no public sanitary arrangementa exist, an earth or chensical closet. located in an outbuilding, takes the place of the town water closet. A simple form consista of a movable receptacle or pail beneath the seat. Dry loamy


Earth Closet. Sectional diagram showing method of construction and hopper for earth supply
the seat, feeding through a hopper to a shoot terminating above the pail at the back. A Ilap can be fitted to regulate the flow of dried earth, as shown in the figure aloove.

The outbuilding for an earth closet con advantageously be built of hrickwork and should be frequently lime-washed. A wentherboarded erection is cheaper, but the numerous crevices harhour a great number of insects. The floor should be of concrete raised three inches above the level of the ground, with a fall to the entrance door. The chcapness of the best earth closet system is a great recommendation, and if constructed to embody the foregoing features it will prove entirely satiafactory in country districts for a small-sized housc.

It should be noted that dry loamy parth is the best niaterial, as its deodorant properties are greater than those of ashes, etc. In fact. unless earth be used, the closet may be treated by local by-laws as a privy, with the result that more frequent cleansing is insisted upon. This applies particularly when a fixed receptacle is used See Cesspool: Refuse; Sanitation; Water Closet.

EARTHENWARE. This term is used for household and other articles made of clay and similar substances. Glazed and unglazed earthenware of fireproof quality is largely used


Earth. Aerial-eartb switch, single pole change-over type. Io this switch a simple form of lightningarrester gap is incorporated
as a substitute for imn, tin aluminium cte. in the minufacture of saucepans and other kitchen utensils. It is casily kept clean and does not rust, besides which na in the case of casseroles, the dish itaelf may be brought to the table. Earthenware utensils require no scrubbing or polishing, but should be washed in warm soapy water immediately after use. In case of stains, soak the pans in hot water to which a little soda has boen added, or apply some finc sand: then rinse and dry thoroughly. See Chin』; Crockery ; Delft ; Fireproof.
EARTHWORM. The ordinary earthworm is the friend rather than the enemy of flower gardeners. because of the work that it does in mixing and lightening asoils.
Few people would object to worms in lawns but for the fact that at certain periods of the year there is a heavy crop of casts which entirely spoil the appearance of the grass. The application of worm killer (a preparation sold by seedsmen) which must be thoroughly watered in, will destmy the worms.
EARWIG. This pest damagos the petals of dahlias, chrysanthemums, carnations and other Howers. Most damage is done while the gardener is sleeping. At dawn the earwig oneepa into a place of refuge, such as a dahlia petal, into the openings of $n$ sponge. a wisp of hay in a flowerpot or a hollow stem such as that of a dead sunflower The gardener should, therefore, place one or other of the articles mentioned among his planta to serve as traps. In the case of sponge or hay, he imnierses it in boiling water in order to kill the insects; if they are in hollow stems, he must either shake or blow the pests out into boiling watcr. The traps should be set in the plants in the evening and examined in the morning.

EASTER. This Christian festival falls in March or April. In England it has come to be a general holiday which includes Good Friday and Easter Monday, and often extends from Thursday evening until Tuesday or even Wednesday morning It is celebrated by the giving of Enater eggs. and sometimes by presents of other kinds, but is more popular as the first holiday season of the year.

For some years business men and others have carried on an agitation in make Easter a fixed date. A measure to this effect was passed into law in 1928, but it will not become operative until the Home Secretary
makes an order to that effect. The Act fixes Easter Sunday as the Sunday immediately after the second Saturday in A pril.
The dates on which Easter Sunday falls during the ten years 1931-1940 are as follows :

| 1931 | April ${ }^{\text {a }}$ | 1936 | A n H |
| :---: | :---: | :---: | :---: |
| 1832 | March 27 | 1937 | March 28 |
| 1833 | April 16 | 1938 | Aliril 17 |
| 1936 | April 1 | $193!$ | Anir |
| 1035 | 1 pril 21 | $19+0$ | March 2 |

EASTER EGG. Among the leas costly varieties of Easter egg are the small chocolate ones. either filled with cream and marzipan. to imitate the yolk and white, or hollow. and sometimes containing chocolate drops or other sweets. There are also fancy neats filled with cggs ; the nests are usually made in eardboard or light hasket work, and the egga may be of almost any kind of sweetstuff.
For more costly gifte there are the large egg cases, made of painted cardhoard, silk. satin, or some decorative materiab. Thess can be filled with a piece of jewelry or with chocolates or perfurne.
An Egg Hunt. An Easter egg hunt is an inexpensive way of entertaining children the eggs being hidden in the garden. . Small chocolate eggs aliout the size of a bantam's egg. and done up in silver puper, are most suitable, two or three eggs apiece being allowed The hiding of the eggs in the garden should not be done too carefully, and a note should be kept of each place chosen. in order that any not discovered may he retrieverl at the end and earh child have a fair share Clumps of rock plants or low growing shrubs offer excellent hiding-places. Two or three eggs may sometimes be bidden in the same place to look like a nest. The children should all start seeking at the rame time, and the hunt should not last too long : in most cases half an hour should be suflicient Should the weather be unfavourable the hunt may be equally woll arranged indonrs. where many ingenious hiding places are available.
EASTON'S SYRUP. Syrup of iron phosphite with quinine and strychnia, known as Easton's syrup, is an excellent tonic for conval eacenta in alight anaenia. loss of appetite, general debility. ctc. A dose for an adult is $\frac{1}{2}$ to I fluid dram in a little water. It can be obtained in tablet form in $\frac{1}{2}$ dram and dram strength.

EASY CHAIR: How to Make. For making the framework for an easy char such as Fig. I, either beech or birch is a ruitable wood, and the joints are the inortise and tenon in preference to dowelling. Fig. 2 is a perspective view of the framework, and the dimensions are indicated in the working drawings at Figs 3-6. Sot the job out to full size, as this will then show clearly the various anglea at which the shouldera aro cut. Fig. 6 shows how the back is marked out. The log is tapered away at the bottom on the inner edge to the height of the stuffing rail, $6 \frac{1}{2} \mathrm{in}$, a piece being glued on at the back to ture the shape.
Economy may be exercised in cutting out
the front legs. Two pieces of stuff are glued the front le


Easy Chair. Fig. 1. Padded cholr, which can be easily made by the amateur. Fig. 2. Framework
lugether, and the shipe cut out afterwards The scrolls at the top are obtained in a similar way Having cut out all the stuff. Whe joints are marked out and cut, all the various lengths and sizes being obtained dinectly from the setting out. Glue the front and back up separately, and allow them to sot hefore glucing the side rails. The joints may te further strengthened by pinning then with $\ddagger$ in. dowels. When the whole is glued up, all sharp edges must bo removed with a raap, and the bun feet fitted, with s in. or 1 in . dowels. It is advisable carefully to stain and polish them hofore fixing.

The fitting of the castors is important, as in the event of these becoming louse and sagging, strain is throw on the joints of the framing. Full instructions for the springing and covering of this lype of chair will be found in the article Üpholstery. See Armchair: Chair; Chail Bed.

EATING. The mastication of lood is necessary for its thorough subdivision into small enough portions to make digestion easy. The operation should not he hurried, as it too oflen is, the ill-mnsticated fond being swallowed by the assistance of Iraughts of liquids This can be avoided by refrailling from the use of liquids throughout meals. See Diot; Digestion: Drinking: Fish; liond: Fruit: Indigestion, etc.

EAU-DE-COLOGNE There are excellent English makes on the market, or this perfume can be prepared at home if preferred. refiesling on a railway journey and, in addiCare inust he inken to pmeure the best rectified tion, does much to alleviate a headache. alcohol. The following ingredients are placed in an ordinary glass bottle.

| Ractified a lenhol |  |  |  |  | 12 plats if drams |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Esprnce of | lemon | $\ldots$ |  |  |  |  |
| - | lurganmot | $\cdots$ | + |  | 11 | - |
| . | cedrat. | $\ldots$ | $\cdots$ | . | 12 | " |
| " | lavender | -. | $\ldots$ | . | 1. |  |
| - | mosemary | . |  |  | F |  |
| $\checkmark$ | thyme |  |  |  | I |  |

The mixture must he well shaken until the essences dissolve in the alcohol. The liquid is then strained through a filter paper, which can be oblained from any chemist, and put into hottles with close-fitting stoppers
The toilet uses of eau-de-Cologne are many Rubbed into the palms of the hands after washing and drying them, it keeps them free from perspiration in hot weather. It is a good facial astringent for use nbout once $n$ week. A pad of cotton wool should be squeezed out of cold water and then further moistened


Eaves. Fig. 1. Showing now and where the tascla and sofft boards are fixed. This arrangement is
particularly suitable for cottage property particularly suitable for cottage property afterwards at night Eall-de-Cologne is EAVES; Of a Building. Eaves oon-
stitute the lower portion of a sloping roof which projects beyond the wall of a house. making, with the aid of an eaves chamnel or gutter, an overhanging drip for rain Witer A projection of 18 in ., and in some cases from 2 to 3 ft . will not be too much. The advantage of wide eaves is that hesides protecting the walls and upper windows from the weather, they give good shadows and thus remove the hleak appearance of a too rigid roof line.

In designing the eaves the questions of the indispensable gutters on the fringe and the down pipes must be studied. If the envos arecontinuous along the front or side of a house-not broken, that is, by gables or other interiuptions-the question of down pipes is greatly simplified. As regards gutters, the half-round variety is better than those with mouldings.

A simple form of eaves in course of oonstruction is illustrnted in Fig. 1. which shows very clearly the arrangement of the fascia board, as the vertical board is called, and the position of the soffit hoard. which is fixed in a horizontal manner to the feet of the ruof rafters. This arrangement is very effective on cottage property. A convenient and economical scherne is to use a 4 in . fascia board, I in. thick, and a 6 in . soffit board, $\frac{3}{4} \mathrm{in}$. thiok. These boards are fitted to the feet of the rafters by outting the latter to shape, getting them all in line by stretching a
with eau-de-Cologne. The face should be cord between the end rafters and cutting all hriakly patted with this pard and then sponged the rafter feet accordingly The boards are with cold water. Skin food may be applied then nailed securely to every rafter The gutter, if of the O.G. type and, say. 4 in wide. is then screwed directly to the front of the fascia, thus saving the expense of the usual gutter brackets.

A more elahorate arrangement is that shown in Fig. 2, where an eaves course of brickwork has been introaluced for the purpose of effecting a better appearance. The soffit is enolosed by a buard supporled on brackels. See Architecture; Bungalow: Housc: Roof.

EBONITE. Ebonite is a hard usually black material made by incorporating rubber with other ingredients. It is amenable to a high finish, and has many domestic applications, examples heing gramoplinne records, fountain pens, electrical apparatus. for which last named purpose it pussesser good insulating properties. It is procurable in the form of rods, sheet or tubing from ironmongers and dealers in electrical apparatus.

Ebonite can be cut with a hack saw in the ordinary way. When drilling holes in it, the drill is apt to clog, and should be backed out frequently. soft soap can he used as a luhricint. Filing is hest accomplished with very coarse or rough files.

EBONY: The Wood. There are several kinds of ehony, which is a hard, dense, and heavy wood, often quite black in colour. Generally the heartwond is black, or nearly so, and the sapwood yellowish grey or brown, or nearly white. The wood too is of ten streaked with whades of lighter or darker colour. Ebony is valued ohietly for its colour : it is used for veneer, for inlaying, for amall turned articles. and for small cabinet work; heing a scarce wood, it is often imitated. The artificial sort, sometimes known as German ebony, is mostly stained sycamore, pear, or boxwood, and is used for the backs of certain hrughes of the cheaper aurt.

Ebony furniture which has hecome dull and shabby looking may be restored by the application of olive oil. If it has lost its poliah, it is hest treated with a preparation consisting of vinegar 3 oz, linsced oil 6 oz., methylated spirit 3 oz.. and butter of antimony $\frac{1}{2}$ oz. See Wood.

ECARTE. This is a card game for two persone which is plaved with a piquet pack of cards. The rank of the cards is king (high), queen, jack, ace, ten, nine, eight, seven (low), the ace coming between the jack and the ten.
The cards are cut for deal, highest dealing, and five cards are dealt either three at a timie and then two at a time, or vice versis. The 11th card is turned up as the trump; if it happens to be a king the dealer scores one point. After the trump has been turned up, the two players look at their hands If the dealer's opponent is willing to play his cards as they atand he says, "I play." If, however. he is dissat isfied with them and wishew to strengthen his hand by discarding and drawing, allowing the dealer the same privilege, he says, "I propose." The dealer may refuse, and say, "Play," or may accept, in which case he deals his opponent na many fresh cards as he discards. The dealer hiinself
then may discard and refill his hand, and the players may repeat this procedure until one or the other declares his willingness to play.

Disearded cards are placed face downwards on the table, and are not looked at by the opposite player. If a player docs examine such cards he may be called upon to play with his cards exposed, face upwards on the table If a player, asks for more cards than there are left in the pack he must take back into his hand enough cards from his last discard to fill his hand. Players may discard any number of cards up to five, and have their cards replaced by an equal number. If the dealer's opponent proposes and the dealer accepts them, the dealer's opponent must discard at least one of his cerds.

Before leading a card, the dealer's opponent says, "I play," and thereafter the winner of each trick leads for the next trick. If a player holds a king and wishes to score it, he must announce it before any card is led, but he is not bound to announce or score it if he does not wish. Players must follow suit, and take the trick if possible. If a player cannot follow suit or take the trick with a trump, he discards If he fails to follow suit or win a trick when he could have done, or trump when he could have followed suit, it is a "renounce," and the cards are takien up and the hand played again

Scoring. Should a player thus renouncing take less than five tricks on the replay, he cannot score. If he takes five tricks he scores one point. Tricks are turned down as taken, and must not be examined afterwards during play. If a player throws down his hand as not being worth a point he cannot score, even though he would have won if he had played If he puts down his hand and claims one or two points he may score them if his hand substantiates his clain.
The king of trumps turned up counts one point to dealer: held in the hand one point to holder if declared as already explained. Dealer's opponent who stands or dealer who refuses counts one point for taling three tricks and two points for five tricks, called vole. If a player stands or refuses and fails to talie three or more tricks his opponent scores two points. The first player to make five points wins the game
ECLAIR. The small finger-shaped cakes known as ćclairs are prepared from chous pastry, the mixture used for making cream buns, etc. The top mny be iced cither with chocolate, coffee, or other icing, and the inside filled with confectioner's custard or whipped and swectened cream. See Banana; Chocolate Eclair; Cream Bun: Custard, etc.

ECRU. Silk before it has been boiled and cotton and linen before being bleached are écru, which in French signifies the natural colour. Iace and curtain nets can be bought either in white or écru, implying in this case a alightly brownish shade.
ECREMA: Its Treatment. The commonest of skin diseases, eczema is characterized by reddening of the skin, by little hard pimples called papules, and watery blisters or vesicles containing matter known as pustules. When the skin is raw there is a sticky discharge.
In the causation of eczema two factors that must always be looked for are external irritation and increased susceptibility of the skin. The external irritant may be something employed in one's occupation or hobbies, e.g. augar in haker's eczema It may be eold or heat, friction of clothing, or otherwise. Strong sorp, cosmetics, thoth pastes, may produce eczema about the lips: decomposing sweat is another cause. Irritants may be brought to the skin by the blond.

Every effort should be made, by better personal hygiene in respect of exercise, sleep. fresh air, and diet, to increase bodily and
mental tone Alcohol in all forms must be given up. Sugar must be reduced Tea and coffee should be discontinued in acute eczemar. and may have to le watched subsequently. Salted ineats, pickles, chutney, and highly seasoned dishes must be avoided. It may be found best to restrict the patient to milk diet. Woollen underwear miny have to give place to silk or cotton. Mild or super-fatted soaps should be used, and none at all in acute eczema.
For erythematous eczema or redlening, lotions or powders are applied, such as calamine lotion, or the following dabbed on and allowed to dry.

## Tinc oxide powder Solution of lead subacctate On .. .. $\begin{aligned} & 3 \\ & 1 \text { drams } \\ & 1\end{aligned}$ Alycerin <br> Camphor witer to minke <br> 1

A useful powder is made up as follows. and is dusted on to burning red areas occasionally : Zine oxide powder

2 drams
Talcum bowder
Starch.
4
Papules are usually found on the arms or legs Burning is not so pronounced, but the itching is often intolerable. The lotions given above may be used, or the following ointment applied locally twice a day:

## Carbolle acid <br> Calonel <br> 15 kmins 20 20 <br> Zinc oxide ointment.

 2 ož.When vasicles occur, the skin of the face, particularly in children, is the cominnnest site of this varicty of eczerna. The lotions mentioned above may be used, and when the discharge lessens, Lassar's paste, which is composed of zino oxide powder and powdered tale, 2 drams each; vascline, of oz ; salicylic acid powder, 10 grains. Pieces of lint or old linen are used, the paste being spread evenly all over. The dressing is changed when it becomes moist. For children, equal parts of zinc ointment and lanoline could also be applied in this way.

Making a Starch Poultice. To clean the parts and remove the crusts, gently sop off with a little cotton wool wet with olive oil. If the crusting is lhick a starch poultice or dinchylon ointment mny be used. The poul. tice is inade by making a paste with a heaped teaspoonful of fine starch, and then making up to a pint with boiling water. Allow to cool and apply on six or eight layers of bulter muslin. Anoint with cold crean before applying the poultice.
For reducing the inflammation the parts may be sopped every hour with a saturated solution of boracic reid, and then treated as for the vesicular stage. In the terminal stage, characterised by redness, thickening of the skin and scaling, this ointment may be used: Liquor carbonis letergens, $\frac{1}{2}$ dram; white precipitate ointment, 1 dram; lanaline and vaseline, equal parts, to 1 oz . This will also be found useful in most cases of sub-acute and ohronic eczema.

EDAM CHEESE. Of the two varieties of Dutch checse, Edam is round in shape and Gonda is tlat. The Edain cheese is made of milk deprived largely of its oream, so that although highly nutritious, it cooks badly, the reason being that it is deficient in fat. See Cheesc.

EDELWEISS. This favourite Swiss mountain Hower (Lcontopodium alpinum) can be grown without difficulty in rock gardens in Great Britain. It neerls a sunny place and should he planted in loany soil with which stones have been mixed. The plant grows about six inches high and has grey leaves: the small yellow Howers are surrounded by greyish-white woolly bracts, which are more curious than beautiful. It is propagated by sceds sown in pots of soil in a frame in spring: growth is slow for the first year.

EDGING: In the Garden. There are two kinds of garden edging, known respectively
as " live" nnd " dead" The former consigts of plants. the !atter of various materia!s, e.g. wood tiles, briclis. concrete, or rockery stone A rockery edging is very aitractive : if the spaces between the stones are fillerl with sandy loamy soil many pretty lowgrowing rock plants will thrive there Strips of wood fastened at intervals to short stakes driven into the ground provide $a$ chenp and convenient ellging to Hower beds and borders but tiles or a narrow edging of concrete are more lasting Bicks set in various ways are often used, and if hard hricks are chosen they. last indefinitely Soft bricks are soon dunaged by frost A concrete or cement edging is made by setting up a narrow trough of boards and filling this with home-made concrete or cement. When it has set the hoards are ramoved
Live edging., that is those composed of plants, are more attractive and gencrally to be preferred. There nre auilable kinds among both perennials and annuals: the former ought to be used if a perinanent edging is roquired Edging plants in a border which runs alongside a lawn are apt to spread on the grass and ruin it: this can be prevented by having a narrow paved path alongside the border. Not only does this prevent the grass being drmaged, hut it provides a dry fonting when the lawn is sodiden, and the plants look very charming when trailing over it. The best perennial edging plants are thrift (armeria), mossy saxifrage, pink, London pride (Saxifraga umbrosa); Campanula muralis. stoneca op, Veronica rupest ris, aubrict in. yellow alyssum, arabis and viola. P'ink, aubrictia, alyssum, arabis. mossy saxifrage, Iondon pride and viola should be cut well back ufter llowering to keep them compact

Some of the low-growing annuals make charming edging plants: sceds are sown out of doors in March-April to produce plants that will bloom from June onwards; they perish after the flowers arc over. Some of the best are Virginian stock, dwarf white alyssum (best of all), leptosiphon, limnanthes, candytuft, nemophila and nemesia. The last named is sown under glass early in Dlarch. Golden feather (Pyrethrum aureum) and half hardy plants such as mesembryanthenum, echeveria, and lobelia are often used as edgings to formal summer tlower beds. The edgings can be kept trim by the use of the tool called the edging iron. Sec Border: Flower Garden: Path. etc.

EEL: How to Cook. Fels are at their best. during the autumn and winter months, and are usually stewed.

After being skinned and cleaned, the fish is cut into small pieces, $2-3 \mathrm{in}$. in length These are placed in a jar with a sliced onion, is tablespoonful of chopped parsley, 1 oz. of mar. gerine, pepper, silt, and a squeeze of lemon juice. A clove or a teasponful of anchov: sauce may be added. The jar is then covercd and placed in a saucepan of cold water, being allowed to simmer until the cel is tender. which takes about two hours.

To serve eels fried they should be cut into short pieces, dipped in scasoned flour, and


Edelweiss, a ropular Swiss mountain flower which can be grown in British rock gardens
coated with egg and breadcrumbs or hatter, and fried until criap and brown They should be well drained before the dish is served, and garnished with tried parsley The amaller fish are best cooked in boiling salted water to which a little vinegar lias been added and served with butter and parsley.

Baked eels can be prepared by cutting the akinned and cleaned fish into short lengths, and standing these in an upright position in a shallow baking-tin Pour in a little water, add salt and pepper to taste a little minced parsley. chopped shallots, and some sweet herbs. and balie the whole in the oven. When the fish is ready take it out of the tin, and thicken the gravy with a small lump of butter rolled in tlour. A little white wine may be used for flavouring
Collared eel is prepared by cutting off the head and tail of a fairly large fish and then skinning it and slitting it down the centre. removing the backbone. Lay the eel Hat on a table and spread over it a seasoning made from two finely chopped sigge leaves, 2 cloves and 2 blades of maoe, a small bunch of herbs (chopped). and pinches of allspice, salt and pepper to taste.
Roll up the fish and tie it securely with a piece of tape. Put the head, tail, and backbone into a pan of well-seasoned water. Boil down these trimmings, then add the fish to the stock. and stew it for $35-40 \mathrm{~min}$., or until it is tender.
To pickle eels, skin the fish, slit them down the centre, and. after removing the bones, rub the flesh over with salt. Lay the eels aside for 3 days, turning them daily : then wash and dry them thoroughly Season them with a little nutmeg, cloves, macc, and bayleaf, then roll up and tie them in a cloth. Bnil them until tender in equal quantities of white wine and vinegar, take them out of the pan to cool, and put them, with the liquor, into clean jars.

Eel Broth. A nourishing broth for invalids is made by simmering lb . of small eels in a
pan containing 2 quarts of water: a lew sprigs of parsley, 2 or 3 thin slices of onion. and a few peppiercorns. Continue simmering until the fish is broken. then season the broth sparingly and atrain it off

Eel Pie. To make cel pie the ecls should lie washed. skinned, cut into short pieces. and placed in a pie-dish on a foundation of forcemeat. Lemon juice, chopped parsley. and seasoning should be sprinkled over them. and the pie covered with a crust of short or puff paste. The pie should be baked from $\frac{3}{3}$ to I hour in a moderate oven, and a white sauce can bo served with it

Eel Spitchcock. This dish is prepared by cleaning an eel, rubbing it over with salt, and then slitting it up the middle and removing the bone. After washing and drying it, cut it into pieces 2 or 3 in . long. dredge these with llour to dry them and then shalie it off Make a thick egg batter, to which a little seasoning, minced parsley, sage and shallot have been added. Dip the piecea of fish in this, and then rull them in fine breadcrumbs Repeat the process, and then broil them over a clear fire until they are pale brown in colour. See Batter: Conger Eel. Pastry.

EELWORM. This is a minute garden pest which attacks cucumbers, tomatoes, daffodils and other plants.

The first symptom of attack is a drooping and yellowing of the foliage, followed by the stem becoming limp, ind the collnpse of the entire plant. The finer branches of the root are more or less studded with swollen portions or knots, varying in size up to $\downarrow \mathrm{in}$. acruss ; knoty of larger size are also often present on the thicker branches of the root. To destroy these eelworms the soil must be thoroughly saturated three times. at intervala of a fortnight. with a solution of one part cresylic, or liquid carbolic acid. in 40 parts of water. The plants that are ruined by the eelworms should be hurnt

## EgGs and Egg Dishes

## The Best Ways of Preparing a Staple Article of Food

See also the entries Batter; Curry: Custard; Onieletre: Savoury Souffé, etc. The articles
Diet and Food may be consulted, as may those on Chicken; Duck; Poultry Diet and Food may be consulted, as may those on Clicken; Duck; Poultry

Like milk. an egg is a pertect food, as it together: the mixture is lighter, colouring and contains all the requisites of a diet-proteids, fat, carhohydrate salts, and water. The volk is rich in fat and in lecithin, a substance which is important in the nutrition of the nervous system and in growth A duck's egg contains more fat than that of a hen. The digestibility of an egg is impaired by keeping, hence the value of reah eags. Digestibility is alsu affected by conking. raw, lightly boiled, or poached eggs being much more easily digested than hard-boiled. Hens' eggs arc those most commonly eaten: ducke' egge are larger, and stronger in Havour. Turkeyse eggs are considered to be delicately flavoured, and the small, spotted egg of the plover is regarded as a delicacy.

Beaten Eggs. The binding properties of a heaten egg are utilizal in the mixing of dry ingredients, such as dried fruits, sugar. and llour, for puddings and cakes; minced meats and fish, for the making of rissoles. cutlets. etc. Snvoury mixtures are most successfully fried if dipped in heaten egg, as the egg cooks round the outside and makes a coating that prevents the frying fat from reaching the food Eggs, hoiled or poached, are much used as an nddition to simple dishes; the hoiled whites and yolks, chopped finely, are a favourite garnish for cold service meat dishes. Hardhoiled eggs are a feature of most salads.

Fggs a re beaten into batter to give lightness and substance to the coating mixture. When hoiled or steamed puddings are mixed with them, the ingredients adhere more closely
together: the mixture is lighter, colouring and
flavouring richer, and the whole more nourish ing Eggs hind the ingredients of a cake, and help to inake it lighter, especially when the yolks and whites are beaten separately
The yolks add colour and richness to sa voury dishes, and make woups for invalids more strengthening Pastry is given a deep hrown gloss if it is brushed nver before baking with a little egg Yolks of eggs are the foundation of mayonnaiso sauce, and also of almond paste for cakes.

Whisked white of egg with the broken shell is used for clarifying clear soups. Adrled to jellies when they are alnust set. and whisked into them. it makes the jellies light and foamy. A jelly will turn out whole if the mould has been smeared with white of egg, and circles of kitchen paper brushed over with white of egg make excellent jampot covers.

White of egg is particularly useful in cooking for invalids, as it is rich in albumen, and more easily digested than the yolk. The beaten whites of two eggs added to a tumbler of hoiled water that has been left until tepid, with a pinch of salt added. make a nourishing drink for an invalid who can retain no other food.
Boiling and Poaching Eggs. To boil an egg, it should he lightly placed in a pan and covered with boiling water, then drawn to the side of the fire where it vill simmor, but not boil. In ten minutes the egg will be cooked with a firm white and soft yolk. To boil an egg hard 15 min boiling over the fire or gas ring should be allowed, and if required
for use cold the egg should immerliately be plunged into cold water to prevent the yolk becoming discoloured. and to make the shell leave the white When boiling cracked egge, wrap them lightly in tissue paper
To poach an egg, if a poaching vessel is not available, a shallow pan should he half filled with boiling water, to which a pinch of salt and a teaspoonful of vinegar are added. The egg should be broken into a cup. gently slipped into the pan. and drawn to the side of the fire. As soon as the white has set. the egg is cooked.


ESg. roacoea eges on coasc. au aupelfang
Poached eggs are served on toast, and garnished with parsley, or are served over a dish of mince. To fry an egg. use the frying-pan containing the fat from fried bacon, or heat a small piece of fat Break the egg into a cup and alip into the boiling fat The pan should be placed over gentle heat, and the egg is ready as soon as the white has set. If preferred the egn can be turned with a thin egg slice and fried on the other side before serving.

An egg poacher is an appliance which comprises essentially an outer pan or water vessel with an inner plate whereon are located the egg divisions. These may he any convenient number, but four is a useful size for the average household

Scrambled Eggs. Scrambled eggs served on rounds of toast inake a good brealifast dish Prepare them by breaking 2 eggs into a brsin, whisk them and mix in 2 tablespoonfuls milk, and a little salt and pepper: Melt 2 oz. butter in a saucepan and, when hot, pour in mixture. Stir with a fork over a gentle heat until the mixture sets, and then turn it on to pieces of toast.

What are sometines known as Scotch eggs lire made by shelling 2 hard-hoiled eggs and. rolling thern in a little flour to dry. Skin 2 raw sausages, season the meat and wrap it round the eggs. Coat the latter with beaten egg and then roll them in breadcrumbs Put them into a deep frying-pan containing smoking hot fat and fry them alowly, to make certain that the sausage-meat is thoroughly cooked. When fried. cut each egg in half, place each half on a hot cronton, and garnish it with fried parsley. Tomato sance makes a good accompaniment to this dish.
Egg Dishes. Egg-and-tomato cutlets is a dish that does not take much time to cook. Melt 1 oz . of fat in a small saucepan, and in it fry 2 tomatoes. When cooked remove them and rub them througt: a sieve. Add to the fat 2 hardhoiled eggs, chopped into small pieces. Put the tomato pulp hack into the pan and add 1 teaspoonful of chopped parsley and seasoning, and 1 gill of thick brown sauce. Then heat up the yolk of an egg, pour it into the pan, and stir the whole over a gentle heat until the mixture

binds. Turn it on to a plate to cool, shape the mixture into cutlets, brush them over with the alightly whipped white of an egg, and coat them with breadcrumbs: then fry them in smoking hot fat If the inisture is ton soft to shape into cutlets, add some breadorumbs to it When the cutlets are ready for dishing. drain them and arrange them on a paper doily on a hot dish

Eggs au Gratin. Eggs treated in this way form the basis of a tasty supper dish Put 2 oz of sliced oheese in a casscrole or baking-dish. well greased with butter or dripping Sprinkle with pepper and salt, a little chopped parsley. and a piece of butter or margarine Pour over it $\frac{1}{}$ gill white sauce, and break on the top sufficient eggs to cover, or allow one egg to each person The yolks should not be broken

Sprinkle the eggs with breadcrumbs and grated chcese and place a few pieces of butter on top. Bake in a hot oven for ahout 10 min . The remains of any savoury white sauce can be used to pour over the cherse in place of the milk and Hour A few drops of anchovy essence added to a plain white sauce mixture give a piquant flavour

Egg Jelly. A jelly that is made from eggs is much used in sickroom cooliery To make it, dissolve $\frac{1}{2} \mathrm{oz}$ of gelatine in 1 gill of cold water. Add $\mathbf{4 ~ o z}$ of castor augar and the juice and rinds of an orange and a lemon Stir over gentle heat, on no account allowing the liquid to boil. Remove the lemon and orange rinds and beat separately the white and yolk of one or two eggs

Add to the yolks a wineglassful of sherry or brandy and stir in the gelatine liquild Stir in lightly the stiffly heaten whites of the eggs and pour the jelly into a wetted mould

Egg Mayonnaise. This favourite hotweather dish is one made from 6 handboiled eggs, the same number of tomatoes, 1 pint of thick mayonnaise sauce, and a little pepper and salt Shell the eggs, and cut them into halves lengthways. Then cut the tomatoes into halves, put them on a bakingtin, and bake them in the oven until they are just tender. but not bmken

Let these get cold, and then arrange them in two straight lines down a pretty dish, dusting a little salt and pepper over each Lay the halves of eggs on the top. with the out side downwards. Flavour the maynnnaise nauce with tarragon vinegar, and then pour it gently over the eggs until they are smoothly contor Garnish this dish with pickled chilliea cut into small diamond ahnpes. (See Mayonnaise)

Eggs sur le plat are prepared by melting a small piece of butter in a fireproof dish and then hreaking 2 egga into it Season to taste with salt, pepper, and chopped parsley, and then pour over them 2 tablespoonfula of cream and put one or two little lumps of butter on the top. Bake the eggs in a slow oven until they set, and then serve them in the same dish

Poached eggs served on squares of toast with a little green sauce poured over them make an appetising dish Poach 6 egga as already described, and prepare the sance by washing 2 oz . of leaves of tarragon, chervil, parsley chives, and watercress mixed Pound these together in a mortar. mixing with them n few dmps of anchovy essence. and pass the mixture through a wire sieve. Add to it $\&$ pint of white sauce, and atir the whale in a pan over the fire until all the ingredients are well blenderl.

Poached eggs may also he served on spinach Rub lb. of cooked spinach through a wire sieve, or chop it finely, melt 1 oz . of butter in a saucepan, and put in the spinach with a little seasoning When quite heated through place the spinach on a hot dish, and arrange 2 or 3 poached eggs on top.

A tasty and economical dish is given the name of vegetarian egg. To prepare it boil 4 eggs
hard, put them into cold water, then remove the shells. Buil 4 oz of lentils until tender. Melt in a saucepan 1 oz . of butter or margarine. atir in 1 oz of flour and a tablesporonful of milk of water in which the lentils were boiled, and cook until the mixture leaves the sides of the pan. Add the lentils, a teaspoonful of mixed herbs. and pepper and salt. Mix all together and turn on to a Houred plate. When the mixture has cooled and become stiff, divide it into small pieces and cover the eggs with it Dip them into beaten egg, then mill them in breadorumbs Fry in hot fat, cut each in half, and serve hot, garnished with fried parsley.
Egg Drinks. Egg flip is a drink prepared fmm beaten eggs. sugar. and brandy, though the last-named ingredient is anmetimes replaced by sherry or port.
Egg nog is prepared by beating up an egg, strainıng it into a tumbler, nad adding to it 2 teaspoonfuls of brandy and halt that quantity of castor sugar fill up the glass with $\frac{1}{2}$ pint of scalded milk

Substitutes for Eggs The various substitutes on the market include egg powders, custard powders and dried eggs, but it must be remembered that although these may give to any dish an identical appearance, they cannot supply the food values of the real article

In a simple cake mixture eggs can be omitted and a level teaspoonful of baking powder used to each cupful of flour A dessertspoonful of vinegar in which half a teasponful of bicarbonate of sodla has been dissolved can be used in place of 2 eggs in a cake containing fruit or ginger. The vinegar should be the last ingredient to be added. Milk must be used to bind the dry ingredients When using eggs for cakes or puddings, one egg can serve for two if yolks and whites are beaten up separately Instead of an egg with a milk pudding, a teispoonful of grated suet can be used. In making custard, instead of 2 eggs to a pint of milk, one cgg and a tahlespoonful of corntiour can be substituted. The comiflour should be blended with a little cold milk and added to the milk just before it boils, and brought to the boil in the pan Stir in the egg after the milk has been removed from the stove

Testlng Eggs. There are various ways of testing the freshness of egga. The shell of a fresh egg is dull and frequently has almost $n$ bloom, while that of n stale egg is glassy and smooth. An egg with a stained shell has probably heen preserved in lime, and if a musty smell clings to the shcll it has probably been preserved in bran One of the surest testa for the freshness of cggs is to place them in a bowl of water. A fresh egg will sink to the bottom of the versel and lie in a level position. and a bad egg will tloat on the surface.

Another test is to hold the egg up to the light, in front of artificial light if possible. A fresh egg has an almost transparent alicll: the yolk is discernible and the white unclouded A black speck inside the egg or a thick and clouded appearance is a sign that the egg is not fresh. A stale egg appears to be more transparent nt the end than the middle, whereas a fresh egg gives a reverse effect.

Preserving Eggs. Waterglass is one of the most widely sold preparations for preserving cggs: the process really is preservation in lime. The freshness is su successfully retained that the eggs treated in this fashion can be used for all the purposes of fresh eggs.
To make the lime preservation at home, pour 6 quarts of boiling water on to 3 lb . of lime Add 1 oz of cream of tartar and $\frac{d}{2} \mathrm{lb}$. of salt When the preparation is cold, plunge the egge

They will swim in the liquid, and should be kept in the tub or vessel in a cool room. or on the shelf of the larder, and taken out as required It is important that they should be kept at a low temperature, so that the air and Huids which are in the shell do not decompose.

Clarified butter and gum arabic can be used as outside preservativen The eggs are dipped several times in clarified butter and hung in nets, small end downwards. in a room that is kept at an even temperature of about $33^{\circ} \mathrm{E}$ I gum arabic is used, paint over the agge with a brush dipped in the gum, and afterwards pack them in dry charcoal

New laid eggs may be atored in racks, that is, on wooden shelves containing holes for the insertion of the egge, with the small ends downwards. They can be kept fresh for months provided they are preserved straight from the nest and are perfectly dry and kept at a low temperature in the summer, but secured from freezing in the winter. It is unsafe to keep them in a refrigerator, as a fungus forms inside the egg.
Eggs can be preserved by pickling in the following manner They are first boiled for 10 min ., then placed in cold water The shella are taken off, and when the egge are quite cold they are put in jars and covered with spiced vinegar The jara should then be covered with nirtight covers, and the egge can be kept until they change colour

Cups and Spoons. Eggcups are generally made of china or pottery, but are also to be had in aluminium, nickel, or silver, and in wood China eggcups should match the breakfast service in colour and pattern Some are provided with sancers to match. or four or six eggcups are made to fit into a single stand when they are bmught to the table For the nursery, sets are made with nppropriate designs. Individual eggeups are alao made to order. with cach child's name painted on his own cup

The eggspoon is a variant of the ordinary small spoon, and is used for eating a boiled egg It is somewhat smaller than the typical tea spoon and somewhat shallower in the bowl Four or six of these are often made to go with an eggstand, and sometimes the bowls are lined with gilt. (See Spoon.)

Uses for Eggshells. Eggahells are used both for cooking and cleaning purposes, and conatitute a valuable ingredient in food for poultry For whitening enamel-lined pans, the shells should be finely crushed and, in the case of stains, mixed with ordinary salt. Crushed eggshells are effective for removing discolora tion from glass water bottles and decanters. The shells should he put into the lottle with warm water and a little shredded soap. allowed to stand, and shaken occasionally Eggshells are poundec and mixed with other foods for chickens, or with hard-hoiled eggs in the case of small chicks. In cookery cggshells are sometimes userl in order to clarify clear soups and broths.

EGG - AND - TONGUE ORNAMENT
This is a form of carved ornament used on furniture and for panel mouldings It is also


Egg-and-Tongue Ornament, used in furniture and mural decoration
a favourite style of moulding for picture frames and is frequently found on ohimney pieces in Gcorgian style It is also known as egg-anddart urnament, as the character of the decuration is made by egg-shaped forms alternating with tongues or arrows. It was used by botli Adam and Chippendale.

EGG BOILER. An article that served this purpose existed in the 18 th century. It is usually an ovoid or tlat versel in two parto, with a ring for 3 or more eggs. The body is supported in a frame with legs, and under it is a small spirit lamp An antique egg bniler in silver is illustrated in page 410 . It is made to hold 8 egga, and on the handle is a sand glass. The lid is divided and opens outw ards on
hingea at either side w discluse the egg ring which is attached to the handle and is remeivabic from the vessel

Thn egy warmer wae made to serve a slighily difterent purpose, i.e. to keep the egga warm, not en bril them. It had no lamp. but was provided with a liner or hot water jacket and a light tray by which the pggs could be let. dowil or raised from the bowl.

EGG COSY. Egg cosies are designed to keep boiled eggs hot when they are put in their eggcups. They are unually included in breakfast tray sets, with tray cloth. napkins and tea cosy to niatch Tiny detachable linen or lawn covers are worked in coloured crosestitch to match the china used. The padded cosy is made like a miniature tea cosy. Egg cosies can also be made from white blanket cloth stitch. ed in colour. Two semicircular pieces are nefderl. When "kewn together they should be large enough to cover the egg and ege cup. See Crossestitch: Tea Cory

Egg Plant. This is an alternative name for the aubergine. a plant of the natural order Solanaceas. See Aubergine

EGG SEAMPOO. The beaten yolk of an egg either used alone or mixed with hot water makes a good shampeo for a greasy scalp.

The yolk of an egg is beaten up in a gill of tepid water. This is rubbed thoroughly into the scalp and hair, and then the head is douched repeatedly with warm water till the hair is clean. The shampoo is effective, and cloes not have the hardening effect on the hair of soap, ammonia, or apirit. If liked, a few drops of oil of lavender may be added. See Hair: Shampon.

EGG STAND. Stands made to hoid a number of eggcups for use on the table can be had in a variety of materials and styles. Some are of china and others of earthenware or metal. The eggcups aro placed in holes in an article which is shaped not unlike a basket, from which they can be removed when required. Silver or clectro-plated stands usually have pegs on to which the cups fit, and a device for holding spoons. A handle, often in the shape of a ring, is provided for lifting the stand. The screws or other fastenings of these articles need inspecting occasionally.

Egg frames, as they are called, existed in the 18th century, when they were made in silver and Shefficld plate. They are sometimes found in combination with a toast-rack or salt-cellar. One fine example stands on ball feet and is decorated with shells and the gadroon. It is fitted with cut-glass eggcups.

EGG WHISR. Various kinds of patent egg whisks can be obtained from the ironmongery stores. One of the most satisfactory types is manipulated by means of a small wheel with a handle attached. This wheel, when set in motion, causes the wires to rotate rapidly so that the egg is whisked to the required stiffness in the minimum amount of time.
Eglantine. This is a name sometimes given to the fragrant sweet briar (q.v.).
EGYPTIAN STYLE: In Furnishing. Sometimes if it is wished to give aspecial character to a sitting ronm, or to make an
appropriate setting for ornamental Egyptian porsessions, this style is auggested in the decoration and in the furnishing fabrics The latter may be woven or printed in the conventional stripes or in the figure and animal designs of ancient Egypt, while views of pyramids, the Sphinx. and fallen pillars half buried in desert sand appear on lampahades and are embroidered on cushions, or are painted on screens or wall panels.

Browns, from sand colour to the darkest shade are used with Nile green and scarab blue to show the Egyptian inspiration, which also appears in trimmings and beaded tassela, srabesquedesigns on rugs or carpets and carved wooden screens. Such a furnishing scheme must be kept as simple as possible or the owner of the room will quickly tire of it.

EIDERDOWN. Owing to its extreme lightness and the large quantity of air and downit encloses, an ciderdown gives extra warmth with only a negligible increase in weight, air and down being nonconductors of heat. Ventilation is provided
by small circular holes, which are strongly buttonholed to provent fraying and any eacape of down.

Down quilts, as well as pmoiding extra warmth, are decorative when covered in silks and sateens of beautiful colour and design. The most important matter is to get a perfectly down-proof material that is light in weight and soft to the touch. Down-pronf printed sateen, cotton-back satin, fancy shantung, Jap silk, and artificial silk taffeta are the materials chictly employed. The last two possess the disadvantage of easily slipping off the bed unless sateen is used for the under side. See Down: Quilt.
ELASTIC. The elastic used for garters, suspenders, braces, belts, corsets, surgical stockings and many other purposes owes its stretching quality to rubber. The more strips of rubber there are in a given width the better the elastic.
If overheated the rubber loses its virtue. Moist heat is less detrimental to it than dry, so that an elastic article that may stand wash. ing will suffer from artificial drying: rubber is ruined by hot ironing or by overstraining. Oil is detrimental. After a certain time any rubber perishes and must be renewed.

Elastic Stocking. A stocking made of a woven elastic fabric is used to exercise equable pressure on the leg from the foot upwards, and so assist in the return of the blood from these parts when the veins are dilated and varicose. It should always be properly fitted. A woven elastic bandage has the advantage that it can be freshly applied each morning and the preasure properly adjusted. See Varicose Veins.
ELBOW. The region at the elbow or bend of the arm possesses two joints, the elbow joint and the joint between the upper ends of the radius and ulna, the bunes of the forearm. The elbow joint is of the hinge variety

Dislocation may take place at these joints, a common one being a backward displacement joint and forming a prominence on the back
of the elbow The troatment of dislocations is to support the arm in a sling and apply cold to the joint while awaiting the doctor Fracture of the Inwer end of the humerus near the joint is liable to be followed by stiffness for a long time.

Sprains of the elbow are treated by the application of cold water and suppurting the limb with a greater arm sling. Tennis elbow is a painful affection of the arm. it dues not interfere with the coarse movements of the limb, e.g. lifting weights but it renders very difficult movements calling for a finer adjust ment of the muscles. e.g. handling a tcacup It has been suggested that it is caused by using a racquet with too big a handle for a comfortable grasp. See Bandage. Disloca. tion: First Aid : Fracture.

ELDER. The common elder (Sambucus nigra) is a hardy shrub distinguished by its soft stems, lobed leaves, the odour of its white Howers and its clusters of black fruits. It will Hourish in shady places and is useful as a shelter shrub in seaside and other windy gardens There ars several varictios with coloured leaves, e.g auren-marginata : the variety laciniata has deeply cut ornamental leaves The golden leaved varicty of the redberried elder (Sambucus ravicmisa aurea) is a handsıme shrub of considerable garden value The branches should be hardy jruned each spring, for the leaves are mont highly coloured on the fresh shoots. Propagation is by cuttings sel out of doors in autumn
ELDERBERRY WINE. For elderberry wine, take 5 gallons of water, buil for half an hour. and then stand till just cool to the hand Add this water to a tub in which have been placed 20 lb . of Malaga raisins, choppred with a knife or shredded and the stalks removed. A wooden tub is best for this purpose, but a glazed stoneware vessel will serve.

Stand the tub for 10 days in a moderately warm roon, stirring at least three times a day in order to kerp the raisins submerged At the end of this time press the juice out of 10 lb . of fully ripe elderberries, and to this juice, which should be about 5 pints in amount, add $2 \frac{1}{2} \mathrm{lb}$. of sugar, boil for half an hour, cool, and add to the raisin liquor Stir the mixture thoroughly and strain it off into a $4 \frac{1}{2}$ gallon cask.

Slight fermentation may go on for some days, and the cask should be bunged lightly to let the gas escape; better still, bore a hole in the bung and fill it loosely with ontton wool. Keep the cask full. and do not allow it to get chilled. The wine should be ready to bottle in a couple of months. If the raisin liquor should show no sign of fermentation after 5 or 6 days, 2 or 3 oz . of brewer's yeast may be added; but this should be unnecessary if it has not been allowed to get too cold.
ELDER FLOWER WATER. To make this water, take 8 oz . of elder Hower blossom and 1 pint of raw alcohol. The Hower blossoms are steeped in the alcohol for 10 days, and the liquid is strained through filter or blotting-paper A few drops of simple tincture of benzoin is then added. The mixture is placed in small bottles with airtight stoppers. Elder flower water is soothing and whitening when applied to the skin it can be added to the washing water

EIECAMPANE: In Medicine. The drug is obtained from the ront of Inula helenium, a bug plant, and is used for many medicinal purposes. It is found useful in dropsy ; it acts as a tonic and stimulant. and it may also be used as an expectorant and as an emmenagogue. Externally it has been found helpful in scaly skin diseases. The dose is 20 grains to 1 dram.

ELECTOR. An elector is one, whether man or woman, who is entitled to vote at elections for members of Parliament and for
town councils. countr councils and other Incal authorities. To became an elector onc's name must be placed upon the electoral roll, which is drawn up twice a year The ordinary qualifications are residence or the nccupation of business premises for six monthe, and the attainment of 21 years. Thuse who are in doubt about their position should apply to the town cleck if they live in a borough. or, if not. to the clerk of the urban or rural district council. See Vote.

ELECTRICITY: In Medicine. Treat. ment by electricity may be employed in various kinds of discase The best-known forms used arc those of galvanism and faradians. The former is consiant current electricity : the latter is an induced curient of an alternat. ing nature. A high frequency current is one which reverses the direction of its llow so rapidly that there may be as many as two million alternations per second. Diathermy, which is a heat-producing agent, is carried out by an intense current of this description.
The galvanic current is used in ionisation for treating neurasthenia and other constitutional diseases: to stimulate paralysed muscles: for norve and muscle testing: in electrolysis for the removal of birthmarks and superfluous hairs. The faradio current
is of value in the regencration of wasted muscles. in obesity this form of electricity being used in the liergonié method: and in certain gynaecological conditions

High Ïrequency is especially valuable in conditions of pain and congestion, and in treating skin lesions such as boils and ulcers. Diathermy is used to destmy piles and various kinds of tumours: to increase metabolism to relieve neuritis: in pneumonia. and for other purposes. Diathermy is much superior to poultices and similar hot applications, because the heat is produced in the tissues themselves.

The application of electricity to the diagnosis and treatment of disease can only be carried out properly by a doctor or under his immediate supervision. much of the work is done by specialists.

Indirectly, electricity is used in medicine to operate the electro-magnet, used for removing metallio Ioreign bodies from the eye; burrs, used in operations on bone and on the teeth : and vibratory machines for massage Instruments on the principle of the tclephonc are used as aids to the deaf. Eleotric lamps are used for radiant heat baths, and clectric currents, with suitable apparatus, are necessary for the production of artificial sunlight and of X-rays. See Electrolysis.

## Electricity in the Modern Home

## Devices which Lighten Labour and Increase Comfort

This article describes the wiring and fittings desirable for an up-to-date housc, and explains how to mike the best use of electrical equipment. Sce also Belts ; Cooker ; Fire : Fuse; Kitchen, etc.

In a house that is connected to a public electric supply main the possible applications of electricity for lighting, heating, cooking and the driving of small machines are almost endless. If the wiring of a house is carried out in accordance with the recognized rules (and it is the business of the supply undertaking to see that this has been done before the installation is connected to its system). the chance of any accident is negligible. A wire cannot canse a fire unless its temperature has heen raised to a red heat or more; but while heat is developed in any conductor through which a eurrent of electricity passes. wires such as arc used in the electrical insiallations of houses do not hecome appreciably heated unless the current passed through them is a great deal larger than that which they are intended to carry.
Safeguards Against Fire. The circuits are always provided with fuses, which are in effect weal places that. in the event of the current lecoming excessive through some accident, give way at points so arranged that no harm can be done. These fuses consist of short lengths of metal which melt at comparatively low temperatures, so that if the current in the circuit becomes too great, they are heated and melt before the rest of the eircuit becomes unduly hot. In so doing they break the circuit and cut off the current, which cannot be reatored until a new fuse is put in.

A small supply of projer fuse wire should always he on hand for emergencies. This can be purchased from most electricians, and should be of the same thickness as beforc. For any ondinary house lighting circuit it should not be larger than that known as $5-\mathrm{amp}$. wire. The use of too large fuse wire may be an infringement of the wiring rules approved by the fire insurance company. Full direct:ons for replacing a burnt out fuse are given in the article liuse. If after replacement the new fuse should melt also, then some definite reason should be looked for and the fault removed. This is a job for a practical electrician. It may be that the lights and small appliances on the circuit take a total of more than 5 amperes, when,
in emergency, the fuse might be strengthened to two strands of wire-not morc. The main double pole switch should be open while any such repair is in progress, so that no current can pass.

Mains and Meter. In the case of a public supply, the main wire. or service cable as it is properly called, will be brought into the house, and terminate in the basement or other convenient location on the ground floor. The company will also fix two safety devices known as fusc-hoxes. and, when the installation is complete, will test the whole system. If all is correct, they will fit the fuse wires and close and seal the fuse-boxes. Both the meter and the fuses remain the property of the company and must not be interfered with

From these fuse hoxes the current is taken to a double pole switch, so that the current can be entirely disconnected from the housc at will, and from this point to a meter, to indicate the amount of current consumed. The current is taken to various fittings known as distribution hoards, and thence by thinner cables to the various lamp points and other fittings. This system is known as the wiring system, and it is the part of the work carried out by the electrician or contractor employed by the house owner.

The source of supply settles the nature of the electric current (i.e. direct current or alternating), and the voltage of the system. The voltage for lamps and fittings must correspond with that of the system Thus a


Electricity. The dial of an electricity meter showing nositions of the dial hands. The correct reading should be 9475 tion of the hands.
lamp that is made for a 110 -volt circuit can only be used on that voltage : if the voltage is less, the lamp will only glow dull red, and if a higher voltage is used the filament will be fused and the lamp destroyed The quantity of current depends on the number and type of lamps used in the house, and this determines the size of the wires and the nature of the safcty devices or fuses.

Measurement of Electricity. The pressure of the electricity is called voltage. measured in volts; the quantity is the current. measured in amperes (amps.): and the power is measured in watts, this being ascertained by multiplying the volts and the amps. Thus a pressure of 200 volts and a quantity of 5 amps . is known as 1,000 watts. 1,000 watte equal I kilowatt ( $k w$. ). The hasis of payment is the Board of Trade "unit" or kilowatt hour (kw.h.), which is equal to the power taken in kw. multiplied by the time of use. Thus a l-kw. fire used for one hour or a $2 \cdot \mathrm{kw}$. fire used for half an hour consumes one unit.

In reading the dials of an electricity meter, start with the right-hand side putting down the figures in order of units, tens, hundrads. thousands. The dial hand should always he read as indicating the figure it has last pisssed and not the one to which it may be nearest. Thus, if a dial linnd is very close to a figure, whether it has passed that figure or not must he determined from the preceding or lower dial If the dial hand of the lower dial has just completed a revolution, the dial hand of the higher dial has passed the tigure. but if the dial hand of the lower dial has not completed a revolution the dial hand of the higher dial has not reached the tigure, even though it may appear to have done so. When one dial hand is on 9, especial care must be taken that the dial hand of the next higher dial is not rad too high, as it will appear to have reached the next number, but it will not have really done so until the dial hand at ! has come to 0 . The dial hands on adjacent dials revolve in opposite directions: therefore, a reading should always be checked after being written down, as it is easy to inistake the dircction of rota-

The small size dial, marked l/10 kw.h., and sometimes coloured red, is usually lor convenience in testing the meters, and in reading the meter consumicrs need not regard anything below the dial divided into units or kw.h.

Wiring Speciflcation. The following specification of wiring suitable for medium size rooms is issued by the Electrical Development Association, 15, Savoy St., London, W.C.2.
fuont Entrance.-One lighting point at front entrance ; switch in suitable position in hall.
Hall.-One ceiling liglating point. In large or lo=g halls, additional ceiling or wall points as required. Two two-way swithes ined ith convencht mostions. for fire und vacuum cleaner.

Diving Room.-One ceiling lighting woint over centre of table; one switch in room near entrance. Wall points as required. Additional switclies to le installed to control wal aslits. One small plus percolator etc Onc laruc plug ind switcli at side percolator. etc. Onc large plug and switchat side of treplace.

Drailina room and hoviae. One ceiling lighting point in centre of roonl ; sivitch near entrance Two simall pluxs fixed "ear window or flreplace or in otlicr convenient position. One larac phug and sivitch on skirtlag at side of tireplace or window.
Kitohen and Scullery.One ceiling lightlng point. Additional ceiling or wall loints may be installed in relling or on wall over cooker, or sink. Ono switeli to
control ceiling light. One sinall earthing plug flxed between 3 ft . earthing plug fixed between ${ }^{3} \mathbf{n}$ it. and ${ }^{4}$ it. from lloor in suitansle
nosition for use of iron, etc. two large earthlng plugs and switches for fire, water heater
or wash tio ler. Hpecian wimwith cooker nall kettle coutrol board if not nrovided by suppay suthority.
LarDfr, Backnoor, and OUTHOUSER.-LIghts to he installed as required. One switch to lie llxed In niost connvenient position for encli light.
Garaok.-One ceillag lighting point: one outside light over karaga door if desired. One suvitch Inside donr to enntrol inside light: one waterpironf earthed owitch to control outaide llaht to be fixed outside. One sinall earthing plug for collvenient connexinn of handlamp, enuine heator. etc.

Notr.-In the kitchen, srullery. Inrder, parage afid wherever there is a concrete, stone. tiled or componition floor, iampholders are to lie made of mavilatint matorlal and switclies nre un be enrtlice or mado of insllinting material Landiva.- (Ine ceiling llahting woint to he flyed sn as to Illuminnte landlng and top of atsirs. Two tun-way swifelice to be fixed one nil the landing nind on ground flonr. One amali
on plus for convenlent connexion HeDroovs. Hedroons. -One ceiling lighting point. Wa\| noints for hracket ighta to be installed if iralred.
Two two-way awitclies to control celling light, one fleed at the donr and the other near the bod. An additional switch to be installed to control wall bracket points. One sniall plug to be fixed preferubly 3 ft. from the floor near the und for table lamp. kettie, ctc. One Inrge plug and suitch to be fived on akirting in a convenient poaltion for lire.
Batirnom.-One ceiling lighting point preferably JVer basin uall bracket over shaving mirror. One inade of insulating ninterial. Sivitches to be earthed or made of Inaulating material. All applianers alich an towel rall. water lieater and llre, to bo sermanently flxed and all exposed metal connected with earth. Portatile clectric appllanecs, such as a fire, alinuld not be taken into thir bathronm.
Water Closets, Attics, loft, Cuplioards.Ceillng or wall liahting pulnta as requlred One switeh for ench light. It in recommended that lights should be installed in all places such ns cupbonrds under stalrs, etc., which are not properly fuminated log general lighting.

The above specification is based on the assumption that electricity will be available under a "Two part" or "All same price for lighting as for heating If this tariff is adopted the wiring is much simplified In arranging for an installation it should be apecified that the work and materiala


Eilectridity. Aooge, switull piag below, interlocking switch-controlled connecsing plur


Wall Plugs and Sockets One of the great advantages of electricity in the house is its cleanliness. and another is its Hexibility With r few yards of tlexible wire a portable electric lamp can be placed exaotly where it is most comfortable to read by, and similarly small electric appliances, auch is irons and toasters, can be used in the position that is most convenient The Hex has attached to one end a bayonet catch adapter which can be inserted in the lampholder of any fixed electric lamp The bulb. however, muat previously have heen removed. and thia means that the fixed lamp and the portable lamp or appliance cannot be used simultanecusly This difficulty can be got over by using a special form of adapter, oue end of which is inserted in the fixed lamp holder. while the other has two branches, one to tako is lamp and the other to take the adapter attached to the Hex of the appliance

A hetter plan. however, is to have sockets and plugs placed on the walls of the rooms The adapter at the end of the tlex then takes a somewhat different form, con sisting of a plug with two prongs or pins which go into two holes in the sooket and establish the circuit. Preferably, the wall sookets should each be provided with a switch, so that the current can be switched off when the appliance is finished with and before the plug is withdrawn from the socket A good type of awitch plug incorporates an interlocking device, *) that the plug cannot be withdrawn from the wocket unless the current is tirst switched off
The nuerits of the various types of electric light fittings are discussed in $a$ subsequent irticle, and the larger conking appliances are Jealt with under the heading Cooker. Apart from these and the various henting appliances, deacribed later. there are the many accessories for the home which sild to comfort ar lighten labour

Most electric appliancos, such as a tosster, coffee percolator, table warming plate, or Hat iron can be safely connecterl to the ordinary lighting circuit. This applies also to the vacuum cleaner or the motor for work ing a sewing machine, but not to the larger appliances. The lighting circuit is not usually designed to carry the heavy currents that are required by Inrge appliances, and if it is asked to do so the result will be blowing of the fuses. If electrical heating, or cooking appliances are to be used on any considerable scale, it is easential to have $\Omega$ separnte circuit. This need not involve an extra meter, as most aupply undertakinge have a system by which a fixed atanding charge is made, and all unita consumed are charged for at a Hat rate, whether used for lighting, heating, or for small mechanical


Electric Heating. Fig. 3. Back view of electrle fire of the type illastrated above, showing the beating elements, wire connerions and foot switch Courtesy of Bellino s Co
cases gas-filled lamps arc used and the walls are light in colour and the cciling white.

Electric Heating. By far the majority of electrio heaters used to-day are of the open wire element tupe. Thic element which provides the heat consists of some varicty of porcelain, fireclay, asbestos or mica bar, on which open coils of resistance wire are wound. These coils end in terminals which are wired up to the switches of the heater, and when the current is turned on the coils glow to incan. descence and thus project hoat out into the room.

Fig 1 shows a period stove, lesigned to heat a coom 18 ft . by 16 ft It tibkes 3 , 2 or 1 unit per hour, according to the switching. A smaller size to heat a room about 16 ft by 14 ft . by 9 ft . high, consumes at the maximum 2 units per hour, but can be reduced by the switch to half power, when it will take I unit per hour. It is generally arranged, in fires of this type, to leave one of the elements permanently connected across the main supply Thus the plug must be renoved from the wall socket, or the wall plug switched off. entirely to switch off the lire, preventing any possibility of a live Hexible lead being left lying about the lloor, where it might be a source of danger.

Fig. 2 shows the standard clement or fircbar emplojed in this make of stove. The face of the bar consists of at number of wells of parabolic shape, in which the heat generating wire is scated in correct focus. The heat rays projected on to the bar from the glowing wire at its focus are thrown out in parallel horizontal beams, and thas the maximum amount of


Electric Heating. Yig. 7. Horjzonta air warmer for a small room Courtesy of Belling de Co
radiant hent is projected. Fig. 3 shows a back view of a lire with the cover removed. The switch used on this type is designed to be operated by means of the foot.

With electric fires there is frectlon from draughts. An existing coal grate need not be displaced, as a portable electric fire may be stood on the hearth in fiont of it. Fig. 4 shows

- fireplace


Fir. 8. Electric convection heater resembling a hot water radiator Courtcsy of belling \& Co. specially designed for electrio hentillg. The lire is shown in process of fixing. 'Ihis type may he placed flat against a wall. lig 5 illus. trates another electric fireplace, in this case one of the Ferranti type In the "Tri city" fire, shown at Fig. $\mathrm{B}_{\text {, }}$ there is a series of metal re flectors.
A figure that is given to decide upon the size of electric fire required to

heat a given room is 1,000 watts, or 1 unit per hour per 1,000 cubic it of space to be heated. 'Thus in an ordinary room, say, 10 ft. high by 14 ft . by 14 ft . (i.e. cubic capacity 1,1960 cubic ft.), a 2,(0)0 watt (2 kw.) fire, consuming at maximum 2 units per hour would be a suitable size.

Other methods of warming by electricity in clude various forms of convection heaters (popularly termed "radiators") and ialso systems wherc the heat is mainly dissipated by actual radiation from the surface of the clement, which is non-
fixed. Fig. 5.
place. Ferranti electric fire-


Electric Eeating. Fir. 4. Bell selfcontalned fireplace, showing how fire is
encrsed in a steel tube 2 in in diameter. The tubo is supported on brackets, the number and length of the units being proportioncd to the size of the room to be warmed. There is $\Omega$ rapid rise of temperature when the current is switched on, nend full heat is available in a few minutes. The temperature may be automatioally controlled by a thermostat. This system is illustrated at Fig. 9.

In a system known as Dulrae panel warming selfcontained electric heating elements are disposed in the heater is the air wirmer of the convection ceilings of the room, and the apartment is It is designed to hent rooms 12 ft . by ceiling areas. This system can be readily in. 10 ft . by 9 ft . high, and consumes 1 unit per stalled when a house is in coursc of erection, and hour. The dimensions are 8 in by 18 in. by may also be npplied to existing buildings. An 4 in high Other convection heaters resemble automatic device regulates the hant, and this in appearance the vertical radiators used in may be set to just the temperature needed to hot water warming systems. The heating lieep the room and its contents well aired (e.g. elemonts are contained within the casings (Fig. 8). There are also hot water indintors, in which the water is warmed by an electric immersion heater fitted in the lower part of the oasing. The convection heaters describel are especially useful for warming halls or passages.
A system well worthy of attention is that known as "Unity" tuhular clectric heating. it works by low temperature radiation, the whole surface of the tube being active. The
heating coil is laced on a nica frame and


Fir. 9. "Unity " Tubular System installed in a nursery achool. Heating tubes ara attached by brackets to the skirting boards and the system operates by low temperature rajiation Courlean of Young. Osmond if Youna. Lid.

# Electric Light : Fititings for The Home 

Suggestions to Suit the Several Styles of Room

The reader is referred to the preceding article on Electricity : and also co Candleshade; Lampshade; Standard Lamp. Bedroom; Hall: Staircase may he further consulted

The effective pussibilitios of room lighting known are the 'opal' ard pearl. The bulb have assumed an important place in schemes for interior decoration sinse electricity has been within the reach of so many pcople and is likely to become still more accessible Eren where any public supply of current is unavailable it is not a matter of great expense or difficulty for a house in the remotest country district to have electric lighting by means of its own generating plant, as for this sole purpose a much smaller plant is sufficient than would be required for heating

When planning the lighting for $n$ mom the practical side will, of course, not be uverlooked for the sate of the decorative. The two necessary considerations on the first side are the adequate placing and strength of lights for their requisite purposes in the partioular room and the economy achieved by choice of the correct type of fittings. It is a much better scheme, for instance, to hare wall plugs conveniently placed for extra lamps than to depend on one central fitting for all purposes, which must either be too dnzzlinz for the

eyes or quite ineffectunl for concentrated light on reading or work It is not cconomy to strain the cyesight or to produce irritntion by a glare when it is unnecessary.

Several new forms of gas filled lamps have been intro duced which overeone tho tendency to a glaring light when used with the type o pendant or wall bracket which discloses the bulb. At the same time these do not in any way interfere with lighting effi oiency. The most commonly
known are the opal and pearl. The bulb
of the former has an inner clear glass and an outer one of thin opalcscent glass, while the latter bulb is frusted on the inside

Modern Ideas on Lighting. The modern lighting expert not only brings out the good features of a room, but also creates fresh heruty by his artistic methods and designs. Wall niohes covered with gold or silver leaf or metallic paint and a framing of mirror glass. metal or contrasted moulding. are rendered even more effective by night than by day with a concenled light placed above and below to show off the china or other ornament in the niche Other niches or small wall cuphoards have glass pancs in the doors, which are in themselves fine pieces of decoration, being tinted, engraved, scmi-transparent with sand-blasted designs, or beautiful with metal work in wrought iron or bronze The light, white or coloured, shines through these glazed doors with a glowing effect. Other decorative ideas for corner lighting are glass statuettes and flower bowls placed on stands

which are lit from inside, the light shining through a top of frosted glass which illuminates the glass object on the stand. Moulded glass panels are also set into walls to give diffused lighting when lit from behind

Strip lighting is effeotive for reccsses, or cupboards, but is too expensive to be practical for most people when employed for the concealed lighting of a whole room ruund the cornice. Strip lights set in tubes of frosted glass are, however, a feature of modern lighting and are very practioal either as wall fixtures arranged vertically with metal plates and bands as shown in Fig. 1 , or set in a single tube horizontally for illunimating mirrors. An illustration of a fitting of this kind can be found in the article on dressing table attached above the mirror in the deaign for constructing a pedestal table.

While modern wall and ceiling fixtures tend to severity of style, beautiful effects are obtained by means of good outline and by the faint stripings and diffused lighting whioh glows from the translucent or opaque glass used by the designers. Such fittings as those illustrated in Figs 2, 3, 4 are obviously suited to the modern type of room and would look out of place in a room furnished in a period atyle. Fig. 2 would be a charmingly decorative wall fixture for a drawing room, while Fig. 3 would be equally appropriate for a dining room, hall, staircese, or lounge fitting and would decorate a corner in the practical fashion of to-dny when things bcautiful are also required to be useful. Other charming wall bracketa for aitting rooms have oxidised silver or gilt mountings with either rimpled or tinted glass.

For a sitting room there is still a general liking for a central fitting using two or thrce 60 -watt lamps, especially where a room is of good size. This fitting is usunlly supplemented by tableand floor atandard lamps and by wall fixtures where theac are necessary. Fig. 4 illustrates a plain ceiling fitting of effective and beautiful outline for dining room or living mom with appropriately severe style of furnishing. Pendants are alao made of imitation vellum in squared or oblong tiered designs with coloured tassels of woollen beads and silk on the corners of the lowest tier Thesc pendants have a somewhat Chinese character, which renders them particularly suitable for a room with pieces of lacquer furniture. A modern lantern form of ceiling fitting for a hall is designed for tubular lamps with an outor friumework of oxidised metal alternating with strips lacquered in a brilliant red or green
Colour in Lighting. Colour is of importance in lighting as it is often possible to improve the aspect of a room by this means. Warm tints should be chosen, whether for the colour of lamps behind translucent glass or for shades Blark lighting; white or bluish, for general effects should be avoided, though for local lights or for reading and working lamps, it may be essential. The suitable colours for shades arc pink, and tones from cream to orange, because these are related to the actual colour of the light itself. They are not only hecoming, but also impart a cosy look to the sitting room, an inviting one to the entrance hall, and an appetising one to the food in the dining mom-all important points in the well-run home.
Lighting the Kitchen. Kitchen lighting is of atill greater imporlance from the practical point of vier. A good kitchen central light is a 100 watt lamp enclosed in a bowl of opal glass fixed close to the ceiling. A light should also be placed over the stove, while onc in the larder and in the kitchen cupboard saves much time and trouble.
Bathroom lighting also is satisfactory with a diffusing central opal globe enclosing a 60 -watt lamp. A small fixture is useful over
the bathroom mirror with a 25 -watt lamp. Should the mirmr he used to shave by, the light may be fixed underneath so that it shines upward on the chin.

Period Fittings. While it is obviously absurd to talk of Tudor or Queen Anne olect ric fittings. the lighting fixtures have to he
 brought into decorative harmony with such perjod styles in furnishing, as expensive forms of concealed lighting are i mpracticable formost people. In a bedroom the most imnor.


Electric Light. Fig. B. Wall brackets and central Atting for a loity room
Courtesy of Wiarino \& Glllow
tant lighting fixture, besides that for the dressing table, is a good reading lamp or bed head light. For a country bedroom wooden wall brackets in oak are designed to hold candle lamps which are in keeping with old-world furniture.
The simple central fitting in tinted glass illustrated in Fig. 5 is suitable for a dining ronm or sitting room, and is pleasing whether used with modern or 18th century style of furnishing. In a dining room such a fitting can be hung rather low over the table. The lofty and good sized panelled room of Georgian style is suitably lighted by grace-


Fig. 7. Lantern fitting in wrought iron suitable for a ball or ataircase
fully shaped wall brackets and a ceiling fitting as ahown in Fig. 6 For a lower room the such anterns may be either suspended on central hitting is of ten a lower room the chains or hung from wall brackets made of the wall lighting heing supplemented by standard lamps in equally harmonious designs.

Lantern fittings in wrought iron look particularly well for panelled halls and staircases or for rooms with oak-beamed ceilings. The one illustrated in Fig. 7 is a good example, and

## Electric Motor: Its Care and Use <br> With Instructions on Building a Model Motor

## In the first part of this article we give hints on the care of fractional horsc-power motors. The second describes a model motor which the amateur can build. See Boat

Small motors-fractional horse-power motors, as they aro termed-are used for many domestio appliances, and the handioraftaman can employ a suitable type to run his lathe or other small machinery.
As a rule, the household appliancesvacuum cleaner, washing machine, refrigerator, etc.-are covered by the maker's guarantee, and the motor or machinery should not be interfered with. It may be an advantage, however, for the handy man to know how to deal with minor defects on other small motors.

The electric motor working under industrial conditions is n prime mover giving the greatest service with the minimum of attention. The essentials are to keep the oil reservoirs for the bearings properly cleaned and filled with good oil: to see that tho lubricating ringe are travelling or carrying oil to the sbalt: to keep the brush gear, commutntor and windings free from dust, dirt and oil; to make sure that the commutator is clean, and that the brushes are properly bedded to the curvature of its oircumference.

To clean an oil lubricated bearing, first remove the drain plug, where this is provided, or the overflow pipe when it is not, and draw off the old oil. Replace the plug and fill the rescruoir with paraffin until it reaches the top of the overflow pipe. After a while this can be drained away again. After refitting the plug fill the reservoir with fresh oil, and replace all oil-hole caps.

A motor fitted with ball bearings need not usually be disturbed more often thinn once every twelve months. The wisest plan is to get an electrical engineer to repack the ball race with grease, since the bearings require properly fitting and adjusting.
Oil must be wiped nway from brush gear, commutator and windings, and all dust and dirt either blown out with a bellows or otherwise removed. Oil, unless removed, may penetrate the insulation of clectrical machinery and prepare it to receive the duat and dirt which so often leads to a breakdown.

A careful inspection of the commutator should be made before this part is touched. If it is of a coppery colour ita condition is hoalthy, and no more should he done than just wipe it with a clean rag. Otherwise, the surface can be polished with fine carborundum clnth wrapped round a piece of wood and held against it while the armature is revolved. Care must be exercised with a commutator that is ventilated or has undercut micas, to ensure that copper dust does not fall between the segments and set up short circuita. A commutator of the latter type should have periodical attention by an elcctrical engincer.

To bed carbon brushes properly to the commutator surface a atrip of carborundum cloth should be inserted between the brush and the commutator (with the eutting face towards the brush) and carefully drawn backivards and forwards until the whole of the carhon face has bcen shaped.

Electric Motor for Toys. The amall electric motors and dynamos used on toys are of two kinds, known as alternating and continuous
ourrent. The former has a two-part commutator; the latter has three or more segments on the commutator, and is the more common. Some small motors are constructed with a permanent magnet instead of a field winding, as. for example; the smaller hoat motor shown in page 114.

The construction of a small motor suitable for driving a toy hoat or for any other amall. power purpose is not difficult, as all the parts can be purchased in the rough. Figs 1-6 show a practical type of motor with horizontal ficld magnets : the winding is at the back, and the whole is low and compact, and adapted for almost any kind of mechanical toy. Castings may be obtained from Whitney's, 129. City Road, London, E.C.I.

The field magnet tunnel should he bored in a lathe, but if this cannot be done it must be carefully cleaned up to shape with a halfround file. Then the various holes are drilled and tapped as shown on the drawings, and the field windinga put on. Each layer must have just the same number of turns of No. 22 D.C.C. wire, and is insulated with a thin slip of waxed paper, and the wire coiled even'y. For the motor in question 38 feet of wire will be needer. Before winding, the cone and side cheeks should receive a covering of several thicknesses of waxed paper. The armature casting is drilled and fitted to the shaft, and the armature poles trimmed up if required so that they just clear the poles of the field magnets The casting is secured to the shaft by a grubscrew, a hole being drilled for this through one section.

The armature windings are No. 24 D.C.C. Ench slot holds two layers with sir turns each, and 13 ft . of wire will be needed. The


Electric Motor for Toys. Figs. 1-6. Planand diagrams of a smallelectric motor suitable for driving a model boat
wire should be given a coat of shellac varnish. All turns of the wires are made around the armature cores in the same direction. Each winding starts on one side of the cores and terminates on the other The starting end of the first coil is attached to the commutator segment iwo places away from the pole pieoe. and the linishing end, twisted up with the starting end of the second coil, goes to the next adjacent regment of the commutator, and so on. The finish of the last coil is joined to the same segment as the beginning of the first coil. The slots in the commutator are sct exactly opposite the centre of the pole pieces The latter should be insulater with cutton tape.

The back bearing (Fig. 4) is attached to the main casting underneath by two screws Fix it temporarily and mark the position of the hole for the armature shaft. The hole for the shaft shoukl not go right through. A small oil hole is masle on top and countersunk a little way with a larger drill. Two holes are drilled in the frame and tapped for the screws. The bearing should be positioned so as to bring the armature in line with the field magnet poles, and the armature must of course turn quite easily and just clear the poles.
'The brushes (Fig. 6) are made from narrow strips of copper ganze rolled up to fit inside the brush holders, and are held against the commutator by coil springs made from steel wire. A hole is drilled through the top of the frame and tapped to take a brass screw which retains the brush holder in place and allows it to be adjusterl. A hole for each brush holder is drilled through the face of the frame, large enough to take a fibre insulating bush, through which the holder passes. The brush holders inay be made from brass tube, a nut being soldered on to the outer edge for the terininal.

The front bearing of the armature shaft is a boss on the bridge piece (Fig. 5), the latter being attached by two screws as shown. The boss is drilled through and an oil hole formed on top. Holes are needed also for the two terininals. The latter require each a fibre bush. A hole is drilled through each of the fixing lugs, to fasten the motor to its bed

The Commutator. The commutator hay six segments. It is formed from brass tubing, driven un to a piece of fibre rod. The position of the segnients being marked out, pins are driven into the fibre through holes drilled in each segmont, and the segments are parted by making slots with a hacksaw. Take the slots clean through the brass ferrule and well into the fibre. The pins prevent the segments frum coming away from the fibre. A hole is drilled through the axis of the fibre, and the commutator is driven on to the armature shaft, to which it must fit tightly. The armature will find its own running position in relation to the field, and the shaft is then pusitioned correctly in the bearings by slipping a short piece of brass tube on the shaft between commutator and front bearing. This forms a washer, and its length must be such as to afford sufficient play between front and back bearing. The latter forms a stop for the back end of the shaft.

The wircs from the field coil go one to the lower brush shown in Fig. 2, and the other to the luwer (neareat) terminal. The other brush and terminal are connected together by a short piece of wire. The accumulator positive is joined up to the upper terminal and the accumulator negative to the lower terminal. The appearance of the finished motor may be seen from the illustration in the article on Boat, where also a suitable propetaw, coupling, and shaft are shown. A 4 to 0 -volt accumulator will energise the motor, and if it is desired to use it in a model boat a special lightweight low built type of accumulator can be employed. Should this or any similar motor not work.
the whole of the eannexions should be examined: if they arc in order the windings should be tested for continuity, anll it should be ascertained if there is a loak to the frame of the motor The commutator segments should be examined, as it is possible that a short circuit is occurring bet ween one segment and another If the motor still refuses to work, then the adjustment of the bruahes will have to be tried.

ELECTRIC SHOCK. A severe electric shook causes a person to cry out, and he may fall to the ground and stop breathing If he remains in contact with a live wire the current should be turned off. If this cannot be done at onoc. his connexion with the wire should be broken: but proper precautions must be taken in doing so. The rescucr should stand on a pile of dry cluthing, if a dry rubber mat is not available, and his hands should be covered with rubber gloves, tubacco pouches or dry woollen clothing. A dry stick, if at hand. may be used to push the wire off the body. It will be notod that emphasis is laid on overything used in connexion with the rescue bcing dry, as moisture conducts eleotricity readily

If the patient has stopped breathing, artificial respiration (q.v.) should be carried out. Smelling salts may be held to the nose, or if the patient can swallow he may be given diluted spirits of sal-volatile He should be kept as warin as puasible -.

ELECTRODE. In a primary cell electrodes are the plates or eleinents. The electrode most vigorously attacked by the electrolyte is known as the anode, and the other plate as the cathode. The poles or terminals of an eleotric battery are known as electiodes also Anode: Battery

ELECTROLYSIS. Tho operation of breaking up chemical compounds by passing an oleotric ourront through them is termod electrolysis, and when skilfully performed it is effective in removing supertluous hairs, birthmarks, moles. and for other purposes. Living tissues are killed by electrolysis. the area of

## Flectro-Plating For the Amateur <br> 

deatruction varying with the strength of the current and the length of time for which it is used A caustic effect is produced, but there should be no scar if electrolyais is performed by a skilled operator. As this method for destroying superfluous hair requires so much time and patience it has to sume extent been superseded by diathermy. Electrolysis is applicable to scaftered hairs ; comparatively few can be removed at one sitting, while by diathermy ay many as 200 can be depilated by. a skilled operator When used to destroy naevi (birthmarks) a general anaesthetic is usually necessary. especially in the case of children undergoing the operation. Electrolysis is sometimes effoctive for the cure of aneurism and hydatid cysts See Depilatory : Hair.

ELJCTRO-MAGNET. The combination of a coil of wire and an iron core is known au an electro-magnet, the wire as conductor carry. ing an electric current round the iron bar in the centre. It has a cominon application in the electric bell. See Bell : Relay.
ELECTRO-PLATE. The wisest thing when purchasing eloctro-plated table forks and spoons is to go to one of the leading firms of silversmiths or gencral stores and to pay the price for a quality that can be reoommended by the retail dealer. Even if the best qualities which are marked A.I, E.P.N.S., are not within the reach of the purse of the prospective purchaser, there are other qualities, known in the trade as B and C , which are reliablo. provided they have the recommendation and guarantee of an old-established retailer. The patterns of table forks and sponns that are most popular are those which are simplest in design. such as the old Einglish and fiddle patterns.

It is best to wash plated ware in hot water to which a few drops of ammonia have been added with enough shredded soap or soap powder to make a good lather. The electroware should be thoroughly washed in this water, a soft mop or piece of tlannel being used It should then be rinsed in very hot, clear water, and immediately dried in a dry, soft towel After drying, rub with chamois-leather.

## How to Coat Small Articles with Silver or Nickel

This articie describes the process of electro-deposition and explaina how to make solutiona for copper, nickel and sllver plating. The work also containg eniries on a number of artcles to which the proceas can be applied, e.g. Bowl: Crumb Scoop

The procoss of elcctrically depositing one metal upon anuther is known as electro-plating. The home-worker can do a great deal with an inexpensive outfit, provided only small articles have to be plated. and the first thing is to clean them

The amateur is counselled to treat all articles of brass or copper as follows First clean and pulish with fine emery-paper, or on a buff in the usual way; then attach a fine wire to the object and immerse it in a solution of potash. The solution is composed of 2 oz . of caustic potash to $1 \frac{1}{2}$ pints of water. This must be brought to boiling point, and the articles immersed until perfectly clean Rinse them in clear hot water, and then place them in a potassium cyanide solution, composed of 4 oz potassiuin cyanide to 6 pints water.

The cyanide is an extremely poisonous substance, and the greatest care should be laken in using it. The hands and arms must be leept well away from these solutions, and the fumes must not be inhaled. The articles muat be wired so that they need not be touched with the hands.
The pmeess of electro-deposition is brietly as follows. When an electric current is allowed to How from one immersed terminal to another through a metallic solution (the electrolyte), and the anode, or terminal at which the curnent. , e.g. Bowl: Crumb Scoop
enters the solution, is of the same kind of metal as that in the solution, the metal will be conducted from the anode and deposited on the cathode. This ultimately results in the cathode becurning heavily coated with the metal and the anode being cither reduced in size or entiroly dispersed If netal articles to be plated are arranged aind connected so as to form the cathode, they will therefore become costed with inctal (see illus.).

Batteries and Bath. Assuming that only small articles are to be dealt with, the following outfit may be suggested. The source of electric current can be a 4 -volt accumulator of, say, 40 ampere capacity ; or a Bunsen battery or Daniell cells may be used. The bath can be a glazed earthenware jar, deep glass bowl, or a wood vat. Some stout brass or copper ruds $\frac{1}{8}$ to $\frac{\text { If }}{} \mathrm{in}$. diameler, and long enough to span across the mouth of the jar, aro needed on which to hang the articles to be plated. These rods are most conveniently provided with binding screws or terminal nuts at one ond for easy attachment of the electric conductor or wire. Copper wire of 24 to 16 gauge is needed, the fine wire for wiring amall articles and the stout 16 gauge for the larger ones.

The next requirements are the motals and solutions. Iron and steel articles must be coated with copper, and a solution for plating is composed of 4 oz of copper sulphat?
dissolved in 12 orz of distilled water Add a strong solution of ammonia until no more green crvstals are precipitated add more ammonia solution, until the green orystals are re-disaslved resulting in an intonse bluecoloured solution Then add slowly a stiong solution of potassium cyanide until the solution is clear Add $f$ as much again of the same potassium olution. and vater to make $2 q u a r t s$ The anode may be a perfectly clean piece of copper plate or bar
Silver Plating For silver the solution may be prepired by dissolving $\}$ uz of silver nitrate in oz. of water, and adding slowly a strong solution of potassium cyanide. Pour of the liquid and wash the white precipitate care fully by putting it in a corked bottle, partly filled with water. Shake it well, stand it aside and allow the precipitate to settle. Pour awny the water, refill, ahake up and illow to settle as before This sloould he done until the precipitate is clean

After this washing, add a solution of potassium cyanide until the precipitate is entirely dissolved Then add about 1 as much again of the same potassium cyanide solution, and make up un ! quart with water This lind of plating requires from 2 to 4 volts, and a pure silver anode innat be used. Iron, steel, zinc. lead, and pewter should be copper-plated immediately before the silver plating is effected

A quickening solntion of 1 oz . of potassium-mercury-cyanide, 1 oz of potnssiuin cyanide, and 1 quart of water should be prepared. Articles thit have been copper plated are first cleaned and pickled, immersed directly into the quickening solution, and left there unti the surfice is unifurmly covered with mercury, when it is rinsed in clean water and placed in the silver-plating bath

This gives better results than direct deposition on the copper, as the silver adheres much better. Iron and steel articles should be kept moving while being plated. The silver will he deposited in from 20 to 30 min , and if all is correct. the article will appear dull or lifeless and nearly white, and must be polished with scratch brushes, rouge, and buffis A small polishing head is very handy for this work Gold can be deposited in the same way
Nickel Plating. Nickel plating is similar to copper plating. and a suitable sulution for it is composed of nickel ammonium sulphate, 1t oz.: ammonium sulphate, it oz. : water, 1 quirt Hot water will hasten the dissolution of the crystals An electric current of 2 voltes and density of $5 \frac{1}{2}$ amperes per sq. ft. of area of the article to be plated, is required for this solution. Pure nickel is used for the anode

Electrical connexions are completed directly the objects are placed in the bath of solution the annde is connected to the carbon of a battery, or the + sign of an accumulator, and the cathore is connected to the zinc of the battery, or to the - sign on an accumulator Do not allow any article being plated to touch the anode or the sides of the vat, or a short circuit will result. Place the objects into the vat and see they are all clear of ench other before switching on the current

Plate as many objects as porsible at one time Prepare the objects by cleaning, etc. immediately hefore plating; do not leave them hanging about, or they will get dirty and the result will he failure. See that all connexions are securely made. Judge the correctness of the work by watching results.

ELEPHANT APPLE. The fruit of an Indian evergreen tree, about the size of an apple and with a hard, woody rind, is known as the elephant apple. The pulp has been used in dysentery and diarrhoea. The gum which exudes from incisions made in the bark is a constituent of Indian gum-arabic

ELIMINATOR. This is an apparatus which replaces the high tension battery in a wireless recciver and in some cases also low simple design. Large battery operated receivers may require considerable modification -e.g. ndditional screening of the high fre quency amplifier from the detector section, etc.- to ensure satis actory working with mains valves, parti cularly to avoid back coupling, the picking up of mains hurn, and interference between transformers, coils and unscreened tun ing condensers. In adequate screening in mains-operated sets also accounts for lack of selectivity, with the consequent fatners of tuning often met with. A suitable high tension eliminator can be employed with practically any receiver, provided the lighting mains are nvailable direct current and there are two types,
The D.C. Type. In the case of D.C. eliminators, it is usial to insert $\pi 10,000$ ohm power type variable resistance in series with mains voltage, and a secondary to give the the positive mains terminal for the principal desired output voltage. The output is applied


Eliminator. A typical example of a battery eliminator for use with alternating current
tension and gridbias batteries The use of an "allmains" unit in conjunction with a recciver primarily designed for battery operation frequently leads to instability and it is better to employ an elimina tor to replace the high tension hattery, and to retain the existing low tension and grid bias batteries unless the set is of
voltage regulation. After pussing through a filter (smoothing) circuit composed of two low frequency chokes in series, and two nuain smoothing condensers, the maximum voltage can be tapped off for the anodes of the screen-grid or power stages of the set. Adjustable voltages are obtained froin tapping points on a potential divider connected across the positive and negative points at the output end of the smoothing circuit.

With the D.C. type there areimportant points to note about the arerial and earthof the sct.

Connect the negalive side of the mains by way of a large condenser to a special earth terminal on the eliminator the earth wire should therefore be remoted from the earth !erminal on the set and joined to this terninal on the mains unit. The aerial should be isolated from the sel.
Isolation is effected by the insertion of a fixed condenser between the aerial terminal on the terminal strip and the wire which is joined to it inside the recciver. This should be of the mica type, value 01 mfd . The earth connexion must be properly made to a water pipe, or efficient earth plate

Eliminator for A.C. Mains. Since alternating current is continuously changing in direction, it is necessary to rectify the current so that it flows in one direction only before it can be applied to the anodes of the valves. Hence, an A.C. climinator must be provided


Eliminator. A theoretical diagram of the eliminator shown in the photograph below. Note the number of smoothing condensers and their positions

There are two types, with some form of rectifier, usually of either
to the rectifier and then passed through a filter or smoothing circuit. The method of tapping off the variour high tension voltages is similar to that used in the D.C. eliminator. If A.C valves are employed an ad. ditional 4 volt winding, for the heater circuit, will be required on the transformer. The removal of the earth wire from the earth terminal of the receiver is not necessary in the case of an A.C. mains unit.

A loud speaker output filter (with two isolating condensers) or an output transformer should be employed in the case of sets operated from eliminators.
In choosing an eliminator care should be taken to ensure an adequate current output. If the receiver comprises one or more stages of screen-grid
high frequency amplification, and a power output stage, the total anode current consumption may be in excess of 30 milliamperes. Therefore a small eliminator designed to give a maximum output of 20 milliamperes will not be suitable, and a larger one should be chosen. Overloading a mains unit can produce only unsatisfactory results, e.g distortion, poor sensitivity and loss of volume
Eliminators are liable to introduce back coupling in a receivcr, which usually takes the form known as "motor boating" and is recognizable by a continuous "pop, pop, pop" The trouble can frequently be remedied by the use of a de-coupling unit consisting of a resistance and by-pass condenser. The resistance, which may have a value of 25,000 ohms, is connected in series with the positive high tension lead to the detector valve A 4 mfd condenser is then joined between high tension negative or earth and the end of the de-coupling resistance remote from the eliminator It is advisable also to de-couple the screening electrodes and priming grids of screen grid and pentode valves respeotively See Alternating Current; Direct Current: Filter: Potential ; Rectifier: Resistance: Smoothing. Transformer

ELM : The Tree. This well-known British tree (ulmus campestris) is handsome and imposing at its best, but owing to its habit of casting large branches, and as the roots travel a long way, it should not be planted near a garden Branch-casting is commonest in hot weather Its proper place is the park, where its fine appearance and bright leaf colour in autumn render it desirable. It may attain a height of 100 ft .

ELM : The Wood. The elm is a hardwood with rather limited uses, though excellent for some purposes. The English variety is a dark brown colour with curly and plaited grain, which does not split easily It is tough and flexible and often takes the place of ash, being cheaper It is very durable under water, and is olten employed in the construction of boats and barges. One of its chief uses is for coffins

Elm is not used for building and very little for furniture, not being durable enough for the first, while its appearance is against it for the second : besides which, it is liable to warp. The bodies of barrows are often of elm, and it is largely used for wheelwright and agricultural purposes See Wood.

EMLACLATION. When there is wasting of the body, the stores of fat under the skin and elsewhere disappear, showing up the angularities of the frame, and there is also a loss of bulk in the tissues generally This will occur in disorders of the digestive apparatus if they are at all severe or last for some time. There is also marked wasting when high fever has lasted for some days, as in the specific fevers, or from long continued low fever. In diabetes wasting is rapid, and it also occurs in tuberculosis. The treatment will depend on the cause. See Diabetes; Diarrhoea; Diet; etc.

EMBEZZLEMENT. This is a form of theft by a servant or clerk from his employer. It differs from larceny in this: a servant commits larceny when he takes money or property of his master out of the master's possession with the felonious intent of depriving the master of his property. He commits embezzlement when, having money paid to him for his master, he appropristes it for himself with the intention of not accounting for it as he ought to do.

A simple illuetration is as follows: A shop assistant sells an article for 18 . and puts the 1 s . in his pocket. This is embezzlement. On another occasion he sells an article for 1s. and puts the money in the till, but subsequently takes it out again and appropriates it. This is larceny; because when the shilling went into
the till, it went constructively into the posses sion of the assistant's master
The punishment for embezzlement is imprisonment up to 2 years with or without hard labour, or penal servitude for not less than 3 and not more than 7 years. The court has also power to deal with a tirst offence under the First Uffenders Act Beoides by clerks and servants, embezzlement may be com mitted by partners as against their co-partners. and also by one joint owner against another. and by publio officers who may not be strictly clerks or servants.
EMBOLISM. When some solid budy is carried along by the blood stream until the narruwing walls of a blond vessel prevent it from going farther, the result is embolism or sth,ppage of the blood vessul. If an artery of the heart is blocked death will pnsue, and the result will be senctas if an imprirtant artery of the train is nffected. In the case of less important blood veasels the only result may be atrophy or degeneration of the part from lack of nourishment.

A common cause is when a stationary clot in an artery becomes detached and moves with the blond stream. If the embulism consists of microbes there will be multiple absoesses : if it consists of tumour cells.
growth will take place at the site of the em. bolism, and in this way a cancerous tumour may form in the brain as a result of cancer of the breast, the cells from the latter having got ints the blood stream. Pending the doctor's arrival the patient must be kept at rest.

EMBROCATION or Liniment. The liquid preparation known as an embrocation or liniment usually contains oil or spirit, to be rubbed in or applied outwardly to the skin in sprains. chronic rheumatism. chronic lumbago, eto Examples are camphor and ammonia liniment. soap liniment, belladonna liniment, etc. Liniments act mainly as counterirritants ( $q \vee$ ) A useful liniment for relievires pain is the following

| Chloral hydrate |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Menthol |  |  |  |  | 1 |  |
| Thymol |  | . |  |  | 1 |  |
| Camphor | . |  |  |  | 3 |  |

The following is a stimulating liniment for sprains, chronic stiff joints, eto

| Oll of turpentine | . | .. | .. | .. | . | 12 oz |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Soft soap | .. | . | .. | .. | .. | . | 11 |
| Camphor | .. | . | . | .. | .. | . | 5 |
| Water | .. | . | .. | . | .. | .. | . |
| W |  |  |  |  |  |  |  |

For chest complaints in young children camphorated oil is a favourite liniment, but care should be taken lest undue irritation of the skin is set up by too vigorous rubbing.

## EMBROIDERY FOR HOME AND DRESS

## Decorated Needlework Described in Detail

For related information see Applique; Canvas: Cross Stitch; Darning; Drawn Thread: Lace; Tapestry; Woolwork. See also Cushion; Table Cloth; Tea Cosy, ete.

The subject of embroidery is here divided into six main classes, namely, embroidery on white materials, linen embroidery, embroidery on silk and velvet, gold embroidery, embroidered laces, and appliqué embroidery These are again subdivided into many kinds of work, and many of the stitches are adapted from one class of work to another. Tapestry work includes such a big section of decorative embroidery worked upon counted threads and in which the stitches entirely cover the material that it is dealt with in a separate article.

Embroidery is usually worked on a background of toile circe (waxed cloth), in an oblong frame specially made for large pieces of work, or in a tambour frame, which consists of two rings, the top one having a spring which causes it to expand as it is pressed down over the bottom ring and material. The latter frame keeps the work quite taut and prevents puckering of the material. Some skilful workers never use a frame. but hold the work smoothly over the forefinger of the left hand or the first two fingers, holding the material firmly with the other fingers and the thumb outside the part being worked. Designs can be bought already traced on material. or a transfer
can be bought. The latter is placed on the
material ink side downwards, and the wrong material ink side downwards, and the wrong side firmly pressed with a moderately hotiron, when the whole design should be clearly seen on the material. The iron should not be rubbed up and down. a firm pressure on each part of the design should be quite sufficient if the transfer is any good. Another method is to trace a design from a drawing, when it is given in the required actual size, or to draw an original design.

Place a piece of semi-carbon paper, inked on one side only, on the material in position where the design is wanted. Put the tracing of design right side upwards over this and secure at corners with drawing-pins to prevent slipping, but first put a tiny piece of paper between the material and the carbon where the drawing. pin goes in, to prevent the material from


Embroidery. Pig. 1. Butterfly worked in broderie Anglaice and above, three stages in mating an eyelet
being marked with carbon ink. Now go firmly over the lines of the design with a blunt knitting needle or sharp learl pencil, and when the carbon is removed the design will be seen
clearly on the material. For transferring clearly on the material. For transferring designs on dark material use a white or red carbon, but as this rubs off with much handling carbon, but as this rubs off with much handling design with running stitches, which can be worked over afterwards.

Embroldery on White Materlals. Madeira work is known by its working thread of greenish blue on a white background, and much of the finest Swiss embroidery is worked with a blue-grey thread. This class of work on



Raised Stem-Stitch. Work this stem-stitch as before, but first lay alons the line you cotton as a found ation and take the stem-stitches over It


Buttonhole-Stitch. Working from left to right, the needle is passed downwards over the tiread


Long and Short
Stitch. One long and oneshort stitch taken alternately


French Knot. Twist the thread round the needlc, holding thread with the left thumb while drawing the needle down close to wherc it first came out

Buttonhole Ring. This is worked in the anme wayas ordinary butonrale ating iro one centre

Feather Stitch.
Bring the ncedle up on the centre line from left to right. and then vice versa. Hold the cotton down with the left thumb so that the ncedle passes ove it each time


Ornamental Blanket-Stitch Work like buttonhole-stitch, rom left to right: but pass he needle two or threc time nto the sinme hole at the top thus making little pyramids


Sloping Satin-Stitch. This is worked from the base upwards from the outside to the centre of
the lear


Fishbone-Stitch. This is like sloping ratin-stitch, but the needely from left to right from the centre to tlic outside, cacl stitch being a little stitch being a hittle
nbove the previous one


Snail-Trail A useiul atitch for stems Bring the needle up to the rold the hread bencith the left thumb. About $\frac{1}{2}$ inch from
he beginning put
n the needre of the the left putting the meedic over the thread which is still under the huinb). Bring the needle up again the other ide of the
hread, and draw
the thread through. A straight stitch and knot will have becn formed. Continue in this way

Satin Stitch. Work the stitches across, placing them close together to cover the fabric without raised effect tiny runningstitches can be put in flrst ior padding. This stitch can be worked from right to left or left to right


Lazy Daisy Stitch. Bring the needle up in the centre of the flower, hold the thread under the left thumb, put the needle back in the same hole as Draw the thread through, keeping it under the point of the needle. Put the needle buck about $\mathrm{i}^{\mathrm{t}}$ inch below to fasten the loop down, bringing it up where the next daisy loop begins


Rose-Stitch. Make a French knot and then work a series of atitches round and round it, beginning In the middle and proceeding outwarda

Loop Stitch. This is aimilar to chainstitch, the necdle passing down the eentre over the cotton, but catching it down with a tiny stitch before going 011 to the next loop


Fly-Stitch. Make a long stitch and catch it down with a tiny one at the cent re

Back-Stitch. Take a running stitch, but with the next stitch the needle passes behind the last stitch bring the needle out. leaving a similar space and proceed as before


Crossed Back-Stitch. This is used on transparent materials; it makes a close ine of cross-stitch on the wrong side, and two rows of back-stitch on the right. It is worked on the right side. Put in the needle as if for ordinary back-stitch, pass it under the material sloping it a little down to the wecond line. Draw it out and makc a back-stitch on the recond line. Bring the ncedle up again under the material, leaving enough space to make a backstitch on the top line as before


Chain-Stitch. Bring the needle through the material, hold the thread down under the left thumb. Put the needie down just Where it came through, then take up one-eighth of an inch of material and draw the thread through. kecping the loop under the thuind till you get to the end. Continue in this way

Fancy Chain-Stitch. For this make alternate large and amall loops. The erh can be varicd by working two small lonjs and then onc large one


Embroidery. Fig. 2. Renaissance work, an eflective form of embroidery tor white materials. such as the tablecloth shown here
nerring-borie, French small scissors so that the cutting may be most knots, eyelet work for carefully done. Venetian embroidery has Madeira and broderie buttonholed edges and bars, the inside of the anglaise, straight and design being filled in with fancy stitches and sloping satin stitch for fillings such as those used in needle-made leaves and solid designs. Initials and monograms can be carried out with the above stitches, with many varieties in fillings for the main stems of the letters
Openwork Embroidery. Real Madeira worl consists of eyelets worked in groups to form a design They are all circular and distinguish this work from broderie anglaise, the
the whole is executed with embroidery cotton, some less twisted than others, to cover the surface quickly and give a smooth finish, such as floss embroidory cotton, flax thread for working on linen, and very fine threads for Swiss embroidery and lace stitches. A coarser cotton is used for padding raised work, while Venetian, Richelieu and Renaissance employ several kinds in one picce of work, the buttonholing being executed in a firm twisted thread and the bars, picots and lace stitches in a softer thread. Hedebo or Danish cut work should he done with linen thread for the main outlincs, and ordinary sewing needles and crewel needles are employed in the process.
latter having ovals as well as circles. Broderie anglaise is not limited to eyelet work but often has solid stitches mixed with it to suit the design. Good materials should be used such as linen, crêpe-de-Chine, lawn and heavy Japanese silk. Either white or coloured thread is uscd and though the embroidery is classed as one on white materials, in this as in other work in this class, coloured materinls are often chosen for its modern expression.

The pattern is transferred to the material, the ovala or circular eyelets are outlined as in Fig. I (see first oval), then these running stitches are whipped, passing the needle through under each stitoh but not through


Fig. 3. Cross-stitch In colour on white linen, suitable for the border of a dachesse cover
Some designs have to the outlined before the material (sec second oval). Now with sharp actual fancy stitches begin, and where this is so it is important to be exact in following the design, as the effect of a piece of work can he spoiled by careless or slovenly outlining. The thread should be fastened on the material by means of a few running stitches, never with a knot, and this also applies when doing the actual embroidery. Only in very special instances is a knot allowed.

When finishing off a thread the end should he taken through some of the stitches at the back, or hidden inside a completed part of the design, so that there are not any untidy ends at the hack of the work. When a raised effect is wanted the spaces inside the outline must be filled with solid stitches, and this is known as padding, for which a soft, thick thread is specially sold. The stitches are piled high towards the centre and shaded off at the sides according to the shape of leaf or flower, and to get good round embroidery it is necessary to make the padding quite firm. The stitches most commonly in use in embroidery are illustrated and details given for working them
The chief stitches used in white embroidery are acalloping, made with buttonhole stitch, stem stitch, crewel stitch (the difference between these last two stitches is that for the former the thread is thrown over to the left, while for orewel stitch it is thrown over to the right), back stitch, crossed back stitch or
embroidery scissors a clean cut is made up the centre of theoval (see third oval) and beginning at the bottom left-hand side the whipped stitches are overcast, completely covering the outline of the design and also taking in part of the material which is folded back from the centre of the oval. Renaissance work has the outlines in buttonholing and the pieces are connected with buttonholed hars, under which the material is cut away at the back. The buttonholing is done over a single tracing thread and of the same width throughout.
The flowers and leaves may be ornamented on the outside edger with picota made by putting the needle half its length ints the last buttonhole stitch, twisting the thread 10 to 12 times round it, pushing the needle through the twists, pulling up the thread so that the spiral forms a semioircle, and then continuing the buttonholed edging. The details of flowers and leaves is often worked out in raised satin and stem stitch and knots are used for centres (Fig. 2). In this illustration of a design for a linen table oloth, the outer edge is of plain buttonholed linen instead of picots. Richelieu work is similar, but the connecting bars are ornamented with picots, while in Renaissance the bara are buttonholed without picots.
Having finished the embroidery the matcrial is cut away underneath the worked bars, leaving these intact, and using a sharp pair of laces, instead of the plain linen spaces teing eft as in Richclieu work
Danish hedebo work has openwork designs overcast and the material cut away at the back. Open spaces are crossed with threads; and these in turn are overcast or rolled. It is combined with open lace stitches worked as a background independently of the material background, as this is afterwands cut away, Satin stitch is often applied between the cut work on the solid portions to embellish the design. Piqué embroidery is work done on a firm background, as the main outlines of design are covered with a cord, sewn along the line, or they are overcast closely, while the centres are filled in with fancy stitches to represent figured materials and damasks, or something of that kind.
Linen Embroldery. Linen embroidery has two varieties, all those done on counted threads, and embroidery done over a design which has been transferred to the niaterial rrespective of lines. Old embroideries of this class were worked on very fine linen, but modern work is done on linen specially woven with rounded thrcads, which arc easily counted and drawn.
Cross-stitch (Fig. 3) is the simplest form of this work, besides numerous geometrical designs which can be carried out by counting the threads. Two-sided line stitches are used in which the needle passes alternatively over and under the threads of the material and in returning covers the threads previously left uncovered. Square stitch is formed in this manner, while chain, long and short stitch, stem stitch, and other ordinary embroidery stitches are used for floral designs. In the cross-stitch design shown in Fig. 3 the curls for the peacocks' tails, and for the fowers on the shrubs are worked in darning atitch. In one variety of linen embroidery the background is darned, leaving the design in the plain material. The background having been filled in, the design is back-stitched to outline it and the centres of flowers are filled with clusters of French knots. Khetha work (Fig. 4) is the reverse of this, having a bold floral deaign outlined in stem atitch and filled with rice stitch or darning stitch (q.v.). The stamens are here suggested in satin stitch. Such work is quiokly done and most effective for cushions or house linen.

Hardanger work (Fig. 5) is a form of openwork on linen and is done on loosely woven canvas, on which the threads can easily be counted. Buttonhole and picot bars aro employed where the material is cut away, or the bars are done in darning stitch and loop stitch and the pattern in straight stitch, which is really satin stitch without padding. the


Fig. 4. Khetha work, in which the effect is chiefly prodaced by the darning stitch
stitches covering in this ease the requisite number of threads.

Punch work produces a drawn thread effect 'Fig. 6) by means of a special punch needle, without the trouble of drawing threads. Various outline stitches may be used for the pattern and satin stitch for flower centrea, the punched holes of the hackground being worked uith tiny hem stitches
Hungarian emhroidery is worked on coarse unbleached linen, the rougher the better, in gay colours and hold designs. By these means beautiful effeots are gained

Distinctive names are also given to other kinds of embroidery, some of which are of a national character. In all work classed as linen embroidery clear spaces of the material are left hetween the designs, the whole ground never being covered as in tapestry work.
Silk and Velvet Embroidery. Embroidery on silk and velvet requires special care. The design cannot be satisfactorily marked on the right side of velvet; it must be lightly traced on the back and the outline followed with white tacking thread, so that the tacking stitches are prominent on the right side of the material. If the work is too big to hold over the finger, an oblong frame must be used, as a pile material cannot be pressed into a round rame. A piece of stout calico should be sewn round the edges of the velvet, and by this it should be laced to the frame with long stitches. the top and the bottom edges first, getting them quite taut, and the sides last. Ordinary embroidery stitches are employed, but in the case of chenille, which cannot be drawn through the material, it must he couched


Embroldery. Fig. 5. Hardanger work. Design for a table runner worked on loosely woven linen or canvas
tion of another kind to forma pattern, giving the effect of patchwork, hut carrying out a definite design It comes under embroidery in its mod ern form, as the designs are sometimes attached by means of huttonhole and fancy em. broidery stitches, while the centres are filled with ornamental stitches and lace fillings instead of the old corded edge or plain fell stitch. It standi out in hold relief, and is quick work in enmparison with ordinary needle emhroidery. Hence its popularity for the decoration of cushions, curtains and bedspreads.

The small pieces that form the design should be tackerl down in position before working, putting the tacking threads near the edge of the top piece and working over them when doing the embroidery. They can be drawn out afterwarda from the back of the work. In the case of floral designs the veinings of leaves and the special outlines of Howers can be worked afterwards through the two materials. By this method the motifs are kept in position with embroidery stitches, which is more popular than the old method of pasting the top material to the foundation.

Embroidered laces come under the same heading as canvas embroideries, where the background is of a loose texture, and all kinds of fancy lace stitches and fillings are used, and others producing a drawnthread effect. Colbert embroidery comes in this class, and includes imitations of 1)resden lace stitches and damask stitches and open fillings. Fancy darning on net is included under the title of embrdidery laces, but work done on filct net comes under a title of its own and is a special clans of work.

EMERALD. These beautiful gems are usually set in combination with tinest dismonds. The stoncs that arc deep green and perfectly transparent down as in laid work ( $q . \nabla$. .). Beautiful work is that arc deep green and perfectly transparent
done by copying Japanese and Chinese designs. irc higher in value than almost any other gem Chain stitch is much employed for bouqueta of Howers, while needle painting is done by means of a flat embroidery stitch and colour shading.

Gold Embroidery. This inoludes all embroidery done with gold and silver threads. It is expensive work, so is only employed where very rioh effects are desired, such as ecclesiastical ornaments and vestments. It requires a strong foundation, such as brocade, velvot, or tlick cloth. The padding for bold designs is done with ordinary white padding cotton, only the surface stitches heing worked with gold thread. The working threads should be handled as little as possible, and a fine stiletto is a great help in making small holes for coarse threads to pass through. This work requires much practice, and in some countries many years' apprenticeship is served in it.
Appliqué embroidery consists of the laying of pieces of one kind of material on a founda-
of the same size or weight. Leas valuable
emeralda arc those in a lighter shade of green in which therc ore white or dark quartz-like markings. These stones when closely exumined have the appearance of being cracked, but notwithatanding these natural Hawlike mark. inga, they command very bigh prices.

Emeralds should always be set in gold claws or in gold hand settings, the latter having the upper edges with milled grain tinish which gives the gold hand the appearance of having had a very fine file drawn across it. Though diamond ornamenta may be set in platinum, emeralds used in combination with brilliants should be set in gold.

The under side of the settings of gems in invariably open, to enable light to be reflecterl through the faceta of the stones. Therefore it is easy to keep cmeralds or similar gems free from dust or soap by brushing the backs of


Fig. 6. Puncn work. Enective design lior linen mats edged with lace, suitable for a luncbeon set

C'ourtesil of Hurrod'x. Ltid
the stones with benzine Another method is to brush them with eau-de-Cologne or sume other spirit which will easily evaporate. A soft toothhrush is best suited for the purpose Care should he taken to prevent emeralds from becoming scratched, as they are much softer than other gems

In recent years the emerald has been so clowely imitated that the stones known as synthetic emeralds are almost indistinguishable from the real gems These copies not only reproduce the clear emerald, but also the stones with quarti markings See Jewelry: Ring, eto

EMERY. Emery is a very hand mineral, a variety of corundum. Owing to this quality, it is used for abrasive purposes. Emery cloth and emery sticks are made, like emery paper by coating the particular material with powdered emery mixed with glac or with some other adhesive sabstance.

Emery Paper. This is invaluable for finishing the surface of netal work. It consists of a paper or linen back coated with an adhe sive and evenly covered with powdered emery The material is available in shects. rolls, or narrow btrips, generally known as emery tape or bands. It is made in many grades, from the tinest, viz. FFFF or SF, to a very coarse gratin. CF, equivalent in cutting power to a socond cut file.

A specially tine grade of emery pisper is much used by jewellers and scientific instrament makiers. and sold as blue back. Fmery


Emery. How to use a strip of emery tape for cleaning up work after it has been brazed
tape is irequently used in lengths of 3 ft. or thereaboute, especially for cleaning up covered work. It is held and manipulated by both hands, one pulling on one end of the tape, the other maintaining an even pressure (see illus.).

Emery Powder. This is an abrasive: its most usual domestic application is in the form of knife powder, sprinkled on a leathercovered board. against which the knives are rubbed and polished There are a number of various grades

Buff sticks, polishing bobs, and similar appliances are coated with emery powder, either by moistening the emery with a drain of oil or by coating the surface of the stick with glue and sprinkling the emery upon it while hot.

Emery Wheels. These are manufactured in a wide range of sizes and grades, from a very small size to large ones requiring $n$ powerful engine to drive them For amateur use a 3 in . or 4 in . wheel is quite large enough to drive by foot-power, or by means of a small bench emery grinder driven by hand. The latter are invaluable for keeping tools in good condition. See Grinding; Polishing.

EMETIC. A number of medicaments are used to induce vomiting, and are termed emetics Examples are: mustard and water, a tablespoonful of mustard in half.glass of cold water; a full glass of warm water, in which a tablespoonful of salt has been dissolved; a tablespoonful of ipecacuanhs wine. This last is a favourite emetio for use with children. A dose of a teaspoonf ul may be given a child of 18 months in bronchitis where the patient is unable to congh vigorously.

An emetic should always be the first trealment in poisoning by irritants or narcotics, but must not be given in poisoning by corrosires, such as sulphuric acid, e'c.
If there is any delay in the action of the emetio, vomiting may be hastened by tickling the baok of the throat with a feather or a paper spill. See Poisoning.

EMINENAGOGUE. This is a remedy for increasing the menstrual How when it is diminished in different diseased conditions. One of the simplest and safest means to be employed for this purpose is a very hot hip bath, to which a teaspoonful of mustard has been added for each gallon of water. There are about a dozen official emmenagogues, the most useful being ergot, potassium permanganate and apiol, the essential extract of parsley. Extracts of certain ductless glands have also been of value. Pron. E-men'a-gogue.

EMPHYSEMA. This is a chronic chest complaint in which the air cells of the lungs become over-distended with air, the resulting pressure leading to destruction of the walls of the air-cells. The diminution in the total lung surface thus produced means deficient aeration of the blood. The disease develops very gradually. In advanced cases the chest becomes rounded or barrel shaped, and the patient is round-shouldered. Cough becomes a marked symptom as the disease continues to advance. The patient should live, if possible, in a dry, equable, sunny climate. The bowels should be kept free. Pron. Em-fy-sē'ma.

EMPIRE STYLE. In furniture this name is given to the style which originated in the years after the Revolution in France. An attempt to copy Greek and Roman forms, its characteristics are classical mouldings and pediments, capitals, wreaths of laurel and of palm. Mahogany, satinwood and rosewood were used; a feature of many pieces is the bronze mounts. Tables, chairs and other pieces are also ornamented with mounts in heavy gilded designs. Much of the furniture was silvered or gilded, while the tripod and the X legs for chairs, etc., were often seen. This style succeeded the Directoire in France and
then passed to England, where Sheraton made pieces in Empire and also in Directoire style. See Dining Room; Directoire; Sheraton.
EMPLOYEE. This word refers to any person who is employed by another, who is called the employer. Most of them must be insured under the national health scheme, and employers are responsible for injuries and accidents that may happen to them while at work See Charwoman: Chauffeur: Groom: Insurance: Servant.
EMPLOYERS' LIABILITY. The liability of an employer for injuries to a servant will in most cases be determined under the Workmen's Compensation Act. In some cases, however, the employer will also be liable either at common law or under the Employers' Liability Aot. The sums then recoverable will be greater than the amount of compensation under the Workmen's Compensation Act. By the common law, an employer is only liable to a servant for accidents which happen to the servant through the employer's fault or negli. gence. He is not liable for injuries sustained by the servant by reason of the negligence of a fellow-servant, even though the fellow-servant is in a position of authority over the one injured.

By the Employers' Liability Act, which does nut apply to domestic servants, nor to any employees except those engaged in manual labour, the employer has been made responsible for injuries to a workman resulting from a negligent order given by a person whose order the workman was bound to obey; the defeo. tive condition of the ways, works, machinery, or plant; the negligence of a person having superintendence of the work; obedience to the rules or by-laws of the employer.

If an accident to a servant liappens by reason of the breach by the employer or anyone for whom he is responsible of any rule or regulation laid down by Act of Parliament for the safety of the workpeople, the employer is liable, quite apart from the Employers' Liability Act. Domestic servants have the rights of any other employee under the Workmen's Compensation Act. See Servant : Work. men's Compensation.

EMPLOYNIENT EXCHANGE. Theee
institutions are found in every populous centre in Great Britain. At them the unemployed in the district register their names, and it is
possible for employers to obtain there domestic servants, charwomen, and others. Application should be made, if possible, in person, to the clerk in charge, who will take down the particulars of the vacant situation and send likely persons along to the address given. No fees are charged. They were established in 1909 and until 1910 were known ns Labour Exchanges.

EMPYEMA. Empyema is a collection of pus in a cavity of the body, particularly the pleural cavity between the lung and the chest wall. It may be a sequel to pleurisy with effusion, or it may occur as a complication in infectious diseases like typhoid and scarlet fever, or in consumption and pneumonia

Empyema may begin suddenly with a chill and sharp pain in the side, made worse by coughing. Then the signs of fluid in the chest make their appearanca In other cases, as in scarlet fever, its onset may be very insidious, with no symptoms pointing to the chest, but it is noticed that the patient shows pallor and declining strength. If after the crisis in pneumonia the patient appears to have fever. the possibility of empyema should be suspected. This is very important in the case of young children in whom the disease, though simulating pneumonia, may be empyema from the start. When a young child supposed to have pneumonia is markedly delirious, empyema should again be kept in mind; also in obscure wasting diseases in children or when the wasting is accompanied by symptoms suggesting tuberculosis of the lungs.

In these cases the doctor diagnoses empyema by drawing pus from the chest, and treatment is to drain the cavity. If the compressed lung expands again the patient may be little, if at all, handicapped thereafter.

EMULSION : In Medicine. An emulsion is a watery mixture with a milky appearance due to its containing oil in tine droplets Examples are emulsions of cod liver oil and of castor oil. Many people who have difficulty in taking plain cod liver or castor oil can take the flavoured emulsions with ease, as being more readily digestible.

EMULSION : In Photography. Whether on glass, film, or paper for the production of negatives or positive prints, photographic enulsion consists of a light-sensitive salt, such as silver nitrate, suspended in gelatine or collodion. See Ferrotype: Film; Plate.

## ENAMEL FOR THE DECORATION OF THE HOME

## Advice on the Treatment of Furniture, 苂oodwork, etc.

## Here are described the correct methods of using enamel paints, how to re-enamel a bath and how to apply quick drying cellulose finishes. The decoration of small wooden objects in enamel is also included.

The householder rightly looks upon enamel as a high-grade paint, used chiefly for the preservation and decoration of interior woodwork. Metal is extensively enamelled, but with essential differences in treatment, and the articles are usually stoved for 24 hours or so, to bake the enamel. Enamel as applied to jewelry, pottery and other articles is quite distinct from that used by the house decorator. The process is described in the article Enamelling (q.v.).

In the use of enamel for woodwork, etc., preparation of the work is of the highest importance. For new interior woodwork proceed as follows: First rub down the wood with glass-paper, unless it is already perfectly smooth, then brush over all knots with a preparation sold as knotting; when this is dry apply a coat of priming to the whole of the woodwork. Brush the priming well into the wood, and when it is dry, clean it down with sandpaper, remove all dust, and fill up all cracks with stopping and putty. Screw and nail heads, which should be below the surface, must be covered with stopping or putty well pressed in until it is level with the surface.

To close up the pores of the wood, the whole must be given one coat of a suitable undercoating. This when quite dry and hard should be smoothed with old fine sandpaper and dusted ; it is followed by a second undercoating of a colour similar to that of the enamel. This second coating must be allowed to dry thoroughly and quite hard; it should present a perfectly even colour and a good surface, but will be matt or semi-glossy in appearance. It must not be soiled, or touched with greasy hands. When quite hard give one good flowing coat of the enamel. Interior wall surfaces of plaster or cement must first be primed or filled with a good coat of reliable priming solution; this is needed to stop the suction of the plaster, as otherwise the unequal porosity of the ground work will affect the colouring, the enamel drying with a patchy effect.

New exterior woodwork should be treated in the same way as inside work, except that outside quality material should be used for the undercoats. Exterior white enamel work should be finished with two coats instead of one, the second applied after the first is thoroughly hard and dry. The amateur will
probably more often be called upon to deal with cxisting woodwork that has already heen painted If in good condition, and when the new colour is the same as the old, it will suffice to rub down and wash the paint with sodawater, stop up holes and give one cont of matt enamel or second undercoating, finishing with the glossy enamel. When the old paint is in bad condition it can be well rubbed down, given one coat of stopping, again rubbed down when dry, all cracks filled and then treated as for new work.

Interior wall surfaces, previously painted and in good condition, can be given one coat of undcrcoating and one of glossy enamel. Walls in bad condition are enamelled as for new work. Distempered walls to be converted to the modern flat cnamel finish can be treated as for new work, but finished with underconting and a final coat of flat enamel

## Application of Enamel to Metal

Exterior ironwork should be cleaned of rust, given n coat of anti-rust priming, followed by two coats of glossy enamel, flatting the first coat of enamel by sandpapering and dusting prior to applying the final cont of glossy enamel. Bicycles and similar vehicles made of inetal are preferably baked or stove enamelled. If they have to be done at home without an enamelling oven, treat then as for exterior work, taking care to olean thoroughly every part hefore commencing the work. Special enamels are sold for this work.

The illustrations show the right and wrong ways of manipulating the brush A useful type is a Hat bristle brush ready ground, or worn in by previous use, cleaned and washed. When using proprietary enamels always uso undercoatings made by the same manufacturers. Do not add anything to the enamel ; simply stir it and apply it in broad, generous strokes of the brush. Do not apply too much enamel, or it will run and show ridges, nor must it be brushed out too thin, or hare places will appear, with unequal gloss. The thing to bear in inind is that a gool coat of enamel should be of equal thickness everywhere on the enamelled surface, and just as thick as it can he without sliding downwards. When enainelling a room do the prominent parta, like the donr, cupboards, and windows, first, and finish with the skirting. Begin with the panels of a door: then do the muntins, top, iniddle and bottom rails or crose-pieces, and finally the stiles.

Enamel sets very quickly, and in half an hour from application it cannot be touched up without showing. Endeavour to apply the enamel so that the finished work is always behind the brush. Thus in covering a large area work up and down or across from side to side, sn keeping the edge of the enamel always alive or workable. In dealing with windows, cut in all the sinall rails first, and then finish on the broad areas.

Enamelling a Bath. To clanse the bath scruls it with hot water and suap extract. This will usually remove all the grease and dirt, but should these be obstinate the application of some gritty scouring powder may be nccessary. When the scrubbing has been completed, two or three good scourings with cold water should follow. 'The next step is to wipe the bath dry and to smooth the surface by rubbing with glass paper of nedium texture. Special care should be taken to rub down the parts around the exit pipe and wherever the old paint has been chipped a way from the surface.

The bath must then be allowed to dry thoroughly. From now onwards until the last coat of enamel has dried no water must be permitted to fall into the bath. It is well to tie up the taps so that they cannot he turned on. Also, as taps often drip, it is a
good plan to suspend an old empty paint can under each tap, or to stop the mouths with a cork. Just prior to the application of the first cont, the bath must be wiped iree of dust and grit. If smuts have blown in from an open window, it may be advisable to rub them off with a rag dipped in turpentine.

Many good enamels are specially sold for bath work. The one selected should be purchased in two grades: (a) to dry with a matt or dull surface, and (b) to dry glossy. Twice as much of (a) is needed as of (b).

The lirst and second coats should be made with the dull-drying medium. They should be applied sparingly. Do not try to hide all the marks of discoloration with the lirst coat. The aim should be to obliterate a little of the discoloration as each coat goes on until none is left when the final painting has bcen carricd out. If a non-glossy enamel be used for the two preliminary coats, each will be dry after the lapse of two days, and then the glossy enamel may be applied; this should be left for a week. As paint hardens quicker in dry weather, it is best to do the work in spring or summer If on placing the hand lirmly on the new surface there is the slightest disposition to adhere, it may be considered as atill insufficiently hard.

When, however, the paint is dry, the bath should be lilled with cold water, the plug should then be removed and the hot tap allowed to run In this way, the cold water should gradually give place to warm and then hot water The latter should be allowed to

remain overnight, when the job may be considered at an end. If the plug be made of metal, it will be advisable to replace it with a rubber one, so that it will not chip the new surface.
Cellulose Finishes. Cellulose enamels are on an entirely different basis from oil paints, and thus possess different properties. In the manufacture nitrocellulose is dissolved in specially prepared solvents to which plasticisers, gums and resins are added. Special pigments are incorporated to give the deaired colours and tints. The drving takes place by evaporation of the liquid solvent content, and the action is very rapid.

In their first stages of development cellulose cnamels were only suitable for application by spray, a method used extensively in industrial work. It has been found possible, however, to produce cellulose finishao which do not dry too rapidly in the early stages to make then inpossible to brush These modified finishes arc, in fact, very suitable for application by brush, and the technique differs only slightly from that with oil paints The products are characterised by many desirable properties such as quick-drying, good gloss and great durability. They are generally suitable both for indoor and outdoor work

## Special Methods for Cellulose Enamels

When using a cellulose enamel stir the paint well up from the bottom and apply with a clean rubher-set brush having soft bristles. The lirush should be well charged with the paint and handled so as to diatribute it evenly over the surface. The second charge of the brush should he applicd at some little distance away from the first and the material laid off towards the previously painted area By linishing the stroke with the tip of the brush lightly in a wet portion, brush marks and "drags" will be avoiderl. The material should not be brished out in the manner of an oil paint, but only sutticiently to give complete and even cover. Only a small aren at a time should be covered. At roum temperature, the first cont should be left a minimum of 2 hours before the second is applied. The shades are mixed tugether to obtaill any particular colour

Brushing cellulose enamels can he applied over alinost all types of surfaces, but these should, of course, always be clean and dry. tll traces of polish, wax, grease and cil should first be removed with turpen. tine. Rust on metal should be removed by sandpaper and good quality petiol until no trace of it reınains. On bare wool. plaster or wallboard a speci. ally made undercoat is usually recommended, as this helps in building up to a good tinish.


Enamel Fig. 1. Applying putty to all holes and cracks. Fig. 2. Sandpapering hightly to produce a level suriace. Fir. 3. Applying the undercoating. Fig. 4. Laying of vertically. Fir. 5. Flowing on the enamel : note grip on brush and absence of brush marks. Fig. 6. Cutting-in edge of moulding

Such undercoats are usually on an oil base. The undercsat should generally be given a drying period of cight hours or more before the finishing coat is applied

Before applying cellulose enamels to finished surfaces these should be sandpapered nmooth, and the rame applies to all rough places or parts where the old paint film is broken through, when the edges should be " fcathered " down. All traces of varnish must be romoved Cellulose enamels should not be brushed over a surface that has been recently painted with varnish or enamel, or lifting may occur When applied over surfaces which are already painted, the life of the cellulose finish will only be that of the old paint film beneath

Clear Cellulose Varnishes. These are particularly suitable for use by amatours on stained furniture, such as sidebuards and dining tablew, where french polish would ordinarily be employed It is necessary to remove every trace of grease or was polish from the surface before the clear cellulose is applied. The varnishes are not intended to be employed over a cellulose enamel to increase the gloss, as a better method is to rub the surface with a cloth moistened with a little polish suppliod by the manufacturer of the enamel. An occasional rub over with this polish will ensure that the gloss is retained Clear cellulose varnishes are only suitable for indoor work.

The solvents in cellulose finishes arc inflamnable, and the material should noi be used near a fire or any open flame. It can be used on geysers and fireplaces without fear so long as no flame is present while the material is being applied, or within a few hours after application. When used indoors the noom should be well ventilated.
ENAMEL: Flower Designs on Wood. A modern note for small artioles is struck by staining white woorl brown or grey and using enamely only to paint the decorative pattern than by dolng all the work in the latter material. White wooll door plates, trays, blotters, hoxes and book ends can be quickly tranaformed into charming sets by this means. The contrast of the matt background and shining flowers is attractive
The set of powder jar (or it would do equally well for oigarettes), trinket box and pin tray here illuatrated could be stained grey, using a water stain that is ohtainable in amall bottles.


Enamel: Trinket boz. pin tray and powder jar in stained grey wood with fower design in brightly coloured enamels See key diagram above


The surface of each white wood article is turst rubbed dow $n$ with a piece of glass paper and then, having diluted the staill to about half its strength with water, each piece is painted. When dry the stain is rubbed down with glass paper and polished with a stiff brush in order to give a satisfactory surface on which to enamel the pattern

## ENAMELLING AN <br> Method: vistal

Having told how a pendant ant on to describe the use of non-firiu $u_{\mathrm{b}}$, miplets,
In most cases enumelling is used in conjunction with metalwork. In cloisonné enamols, or instance, it is inseparable, fine wires being tirst soldered to $n$ base. The muffic furnace is of great importance to the cnameller: This can be heated by gas or electricity. For quite small articles the jeweller's enamelling furnace shown in the photograph on page 426 could be employed. It is worked with a draught burner and does not require air blast The following tools are noeded: a sinall hench, a pair of furnace tongs, a porcelain peatle and mortar, a pair o! small shears, an otching point, or scriber, and a set of enameller's


# NRATIVE ART 

 brush, acid bowl, and a sinall vice standard silver wire. saw round the engraved line.on the pin tray the on the pin tray the leaves are done first, then the two half-open Howers are coloured, then the white one and last the blue, allowing each part of the design to dry in turn. The design on the trinket box only is outlined in the diagram above, but this is reproduced in actual size and can be easily adapted to suit the sevenal pieces.

The chosen design is traced on traoing paper and transferred to each article, using red carbon paper, a small piece of which is placed between the design and the wooden surface. Take oare not to lent the wood.

The colours are then filled in according to the chart. using small tins of enamel supplied from an arts and crafts department or studio. Outfits of 10 colours can be obtained for 4 s . 6 d with medium A boxwood stick is used to apply the enamel in a oircular motion, spreading it evenly over the surface ; where one part of the design intersects another, allow the underneath part to dry before colouring the before colouring the
tyeydecigrated by fired enamel, this article goes igns for a trinket hox in imftation cloisonne
an upright-drill atock and ansall drills, a wire

Enamel Pendant. A simple pendant would form an easy joh for the beginner. The design having been ohosen, the following materials will be nceded: A picce of fine silver shcet, gauge 10 , aizo $2 \frac{1}{2} \mathrm{in}$ by $2 \frac{1}{2} \mathrm{in}$. Fine silver, i.e. unalloyed, should always be used for best colour results, as standard silver, i.e. alloyed, blackens when heated and dulls the enamel Besides this there arc required a sheet of silver foil, gold shell, loz. gum tragacanth, a small bnttle of purc sulphuric acid. and a pioce of

Take the piecc of silver and trace upon it the shape of the pendant. Carbon paper will give a good impression on the inetal. Then. with the scriber, or etching point, engrave the traced linc, so that it is plainly seen when the oarbon rubs away The next operation is to

Fix a saw in the suw frame, being careful that the teeth are pointing outwards and downivards towards the handle. Screw up, so that the saw is absolutely taut (Fig. 1). Saw a small hole in the bench peg, the small projecting part of the bench (Fig. 2). Place the silvor on the peg, just above the hole. Hold it firmly with the first and second fingers of the left hand. Placo the saw in the hole against the edge of the silver, moving it up and down in even strokes. It is the down stroke that outs, and must, therefore, have slightly more pressure. Kcep the saw perpendicular. When coming round a curve, move the metal gradually mund, not the suw. See that it is kept flat
all the time (lige 3) It it is allowed to tip up it may break the saiv

Drilling the hole for the insertion of the ring necds n little practice Place the drill in the chuck Keep the drill-stock perpendicular placing two fingers on the cross-bar See that the cord is not caught at the top (Fig 4) Rovolve the spindle until the cord is twisted down it. Very gently press the cross-har down. and it will come up agnin without a second movement (Fig. j). When spinning, no furthes pressure is ncocssary. The metal must now be annealed or suftened. If the bench is not litted with a burner for the hlow pipe the furnace can be used

Having in the tirst instance obtamed a good heat in the muffle, put the silver on the firing plate. With the furnace tong plact it in the mufle for a few scconds until the silves reaches red-heat. Great care inust be taken to withdraw it immedintely, as it will melt if left ionger The silver may be plunged into water to cool. It will now be soft and pliahle, and is ready for doming Holding the silver by the pelges, place it on the stecl stake and tap it with the planishing liammer, inaking even pits in circles until it heconics the required dome (Fig (i). Should the metal become stiff and springy. the annenling process must be. repeated Enamel applied in Hat metal drawa up, eracks and tlakes off Hence the reason or doming

The pendant iy now seady for cleaning The jresence of any grease or disculoration may ruin a colour: therefore too much attention cannot be given to the following: Pickle is tho tochnical name given to the weak solution of acid used for cleaning metals

Particular sare must be laten in the mixing, and these instructions failhfully followed, or a serious accident may resull. The quantilies are one part sulphuric acid (eitriol) to 20 parts water (abone 10 fluid oz of venter to ! oz. of acid). Alyays noser it? reater ints ihe bowl first;
velphuric acid gently, a few drois
civering the entire surface of the te
Even so, the bowl will be found iveir. Wuch Should this process be revers unid poured in quickly or carelessly, the su" mixiug would eneat- tenat enningh is calua an explusion.

After leaving it a few seconds the pickle is ready for use. Place the bowl upon a gas ring with a small fame. Put the silver in, and heat until it is just on the boil Renove the silver from the howl with n mateh end or piece of wood. It is not advisable to put the hands in the pickle more than is necessary. Never use iron tweezers. Iron in pickle leaves a pink deposit on the silver. Next talie the silver to a tap, and with the wire brush, under running water, brush the surface briskly. When back and front are absolutely bright and free from srease it is ready for the enamel.

The grinding must now lie done. Clean the mortar thoroughly. In it place, with a little clean water, a small piecc of enamel of the desired colour. Jxperience only will teach the amount necessary to cover a surface. Take the pestle, which must also be cleaned, and tap it gently with the wooden mallet, reducing the enamel to small Hakes (Fig. 7). Then grind with the pestle until it becomes a fine, even powder (Fig. 8). The water will now be milky This milkiness must be washed away under running water until the water is perfectly clear Care inust be taken not to wash the enamel away. This can he avoided bo giving it time to aink at each rinsing. Put the enamel in one of the saucers with a littic water, and cover it with the lid Repent this operation with each colour that is requirad

Where a thin motal is employed, $\pi$ counterenamel will have to he used. 'This menns that the hack is covered with enamel. It is done to prevent cracking, ao the metal and enamel

contract at different tutes during cooling. the edges gently to disperse it over the surface Take tion Hakes of gum tragacanth and soak Then smooth it over, using a slight preasure in a sancer with water. When the liquid is until the whole surface is evenlyand thoroughly sticky to the touch, cover the back of the pen- covered. Care should be talien that the enamel dant with it, using a clean sable paint brush. is not too thick. The moisture should be The pendant or piece of silver to he denlt with sonked up with clean, white blotting paper or should he held on the tips of the fingers by linen rag. To apply the enamel to the front the the edges. bacle upwards, to avoid marks on pendant must be turned, but atill held in the the nilver he milver.
This having been done, the next step is to shaded as required, but no gum tragacanth is take a small spatula or penknife, and with it necessary on this side of the article The surconvey the enamel to the back (Fig. 9). Tap facc ahould then be sinonthed over with a
palette knife (Fig 10), and the moisture absorbed by the method

## just explained.

The firing plate (Fig. 11) is now required This is made of nickel-sheet, and must be cut in such a way as to clear the sides of the muffie, and short enough to allow the door to close. Turn the end up, so as to give a grip for the tongs. The muffle should now be an even cherry red, with no dull black spots. This is essential for gond results Place the enamel on the firing plate, lifting it carefully with a palette knife. Remove the door from the muffle and rest the plate in front and leave it there (Fig. 12). When all traces of mois ture have evaporated it is ready for fring. At this stage the powdered enamel is dry and easily shaken off, so care must be taken in placing in the muffle (Fig. 13).
The difference in the melting points of various colours make it impossible to say exactly how long an enamel should remain in the muffle The onameller inust watch carefully and see the changing as the enamel melts. door out ant it is not good to have the frames ap. ime, as it chills the muffle. When the enamel is nearing the molten state, hold the tongs over it, and when they are reflected in it, the enamel is fired and must be removed quickly. Overfiring is disastrous, and neglect at this stage may easily spoil the pendant or other object being fired. Do not remove the pendant or other object from the plate, but put it near the muffle to cool gradıally. The enamel has now had ite first firing. It may happen that there aro holes in the surface, or that part of the counter-enamel has dropped off. This must be patched when cold, and refired before proceeding.

Silver and gold foils are used for still brighter effects. In this pendant, silver foil might underlie the small spots of the design to give a jewelled appearance. Take the sheet of silver foil and. holling it between the packing papers, cut smallcirclesto thenumberre. quired. These are applied to the surface of the enamel by means of a spot of gum tragacanth solution. Fire again, but this time it is only nocessary to reach red heat. When cold, cover the foil with spots of enamel. A small sable brush is best for this purpose. Spots of white or other light oolourarealso
done in thisoperation. Again only a slight
firing is given, so that these spots are ulazed but do not sink to the surface level. There remains the heightening of salient features of the design with gold. For this take the gold shell and a fine sable brush. Using a littlc water, paint the design with s strong, clcan line, and fire again.

The pendant is now linished except for the jump-ring for hanging. This may be made from a piece of standard silver wire, cankerl to slip easily thruagh the hole already dirillerl.

Cigarette Box. The panels of the cigarette hox illustrated in Fig. 14 nre simple examples of painted enamel. They are held by means of copper
 In addition to the tools and materials already mentioned, a ground glass slab and glass muller are required, also a small bottle of oil of spike laverder, a bottle of fat oil of turps, and one gramme of iridium black. The plaques are enamelled on copper shcet. gauge 5 or 6 .
Mark off, with the scriber, the five pancls (i.e. four for the sides and one for top), seeing that they are parallel and true. They should measure about $f$ in. each way above the actual size when finished. The doming pulls the edges inwards, and thus the design would le hidden under the frame if it were not slightly smaller than the metal. With the shcars cut on the etched line and round off the corners with a file. Anneal the metal as indicated in the making of the pendlant.

Dome each plaque (Fig. 6) It is important that all the odges and corners lie flat on the bench and do not rock. Next pickle and brusli the plaques, making then very bright.
Coloured ensmels ap plied directly on to copper look dark and heary. therefore the plaques art first covered with a cleas crystal enamel, called cop. per Hlux. To cover the five plaques, about $\frac{1}{\mathrm{l}} \mathrm{lb}$. of copper flux will be required.

Cover the back and front of the panels, not forgetting the gum tragacanth on the back. Remember to press the counter-enamel down well, and smooth the domed
sidc. Enamel will not find its own level when it is molten, so if caro is not taken at this point, a bumpy sarface will result. Dry the plaque in front of the muffle and fire it until the flux is quite clear. While it is cooling. trace the design on tracing paper. Place over the plaque a piece of carbon paper and the tracing above it, fixing it down with four drawing pins.
lun over the tracing with a hard pencil to produce a clear carbon line on the flux. Take the ground glass slab and on it put a small quantity of iridium black, one drop of fat oil of turps, and a few drops of oil of spike lavender. Grind together with the muller. With a fine sable brush paint over the carbon line. It nust be strong and distinct. If too much oil is used it will be blurred, especially after firing. Fvaporate the oil in the front of the muffle, then fire until the line is glazed. The greatest heat is at the back of the muffle, therefore that end of the enamel will be fired first. The enameller must not wait for the other end to fire, but take the plaque out and turn it. so that the other end gets the sanie temperature. This must be olserved in every firing to a void overfiring at one end.
Cut the silver foil into the required shapes between two pieces of paper. Cover the back of the foil with gum tragacanth and place it in position on the plaque, pressing it down firmly. This must also be dried before tiring, as if moisture is left under the foil it will bubble. While it is cooling, grind the colours, wash each carefully, and place them in clean saucers. In applying, with an end of a palette knife or pen-knife, care must be taken not to merge one into the other. To avoil this, clean up any enamel which has gone over the outline with a sable brush. Dry and fire as before.

Finishing Touches with Gold Shell
Possibly the work will look blotchy and uneven in colour. l'articles may have flown off when it approached the heat, leaving here and there patches of the flux exposed. These must be covered with colour and fired again. When the colour is satisfactory it is morked on with gold shell, which is used in line and dots. Where the drawing needs improvement, e.g. on the rigging of the ship, line work is expressivc, and dots are effective on the crest of the waves. After firing the gold, this panel (Fig. 15) is finished. The side and end panels are shown in Figs. 16 and 17. As regards colour and manipulation, they are repetitions of the lid panel just described.
The numbers of the enamels used in the panels may be useful. They are as follows: sky-blue, 167; Ship-ruby, 115 ; Sailsyellow, 105; Sea-blue, 136. For the lish, ruby and yellow ase employed, the sea boing of the same shade (136) as in the top panel.


Enamelling. Fig. 14. Cigarette boz in polished copper, riveted on cedar wood, with enamollod deajgns on inget domed plaques

The live panels having been completed, they arc applied to the box in the following way. Sheet copper, gauge 10. is used: Cut separate pieces to cover the lid, sides, and end of the box. In the centre of each of the picces measure the space to be cut for the panel. making il a quarter of an inch smaller each way,


Enamolling. Fig. 15 (above). Deagn for an onamelled plague in the lid of a cigarette bor. Figa, 16-17 (below). Designs for side and epd panels

shown in outline at Fig. 19, is suitable for \& trinket box. Choose a picce of copper 12 in wide, and measure it on the box. Make a tracing of the design and fit it on the box before tracing it on the metal. Make sure that the design fits the article, and, if necessary, alter it to fit so giving it $\frac{1}{\text { b }}$ in. all round to hold it when To trace on the metal, go over the whole fixed. Drill a small hole to insert the saw, of the deaign with a steel tracer, working and saw along the line, keeping well on the from the under side of the metal, and inside. File up the frame until it is true and fits the enamel. Berel the back to follow the shape of the dome sides.
Dome tho copper frame, so that while the enamel is held in place the outside edges lie flat on the box. Bevel the edges round the enamel. Measure off the holes and drill, gauging the drill by the diameter of the pins. Fix the frame to the box with $\frac{f}{2}$ in. copper pins. If the wood is thin the pins must be cut to the required length before being driven. Cover the sides and the ends in the same way.

In cloisonné enamel, fine wires or cloisonnés are soldered to a metal plate. Finely ground cnamel is filled in between the wires and fired. The surface is then ground evenly to the height of the cloisonnés. Opaque enamels are usually employed in this type of work. The fish design would be quite suitable for an experimental piece.
Non-firing Enamel. There is no comparison between the two kinds of enamel, but for many purposes liquid enamel is more practical, and it is much more quickly applied. The materials required are 8 colours in bottles, 1 bottle medium, No. 0 , or 00 round sable brush, and 1 small stick with pointed end. Enamel of this kind can be used with equal success on wood, leather, glass, and metal, and its application is a simple matter.
One class of enamelling is an excellent reproduction of cloisonné work, and is not difficult, but accuracy is essential. The Lespece of copper, cut the various pieces out. design illustrated in Fig. 18, with lid and side at least $\frac{1}{\mathrm{~A}} \mathrm{in}$. on the end of each side, is in.


Enameling. Fig. 18. A copper covered bor embossed and treated with brilliant coloured enamels. For design 500 Fig. 19
being left all round the top. Fit the two short sides first, turning over the in in., and nail along the bottom of the box. Glue the rest of the metal on to the wood, using metal glue. Fit the back, turning the $\frac{1}{15} \mathrm{in}$. over as before, and nailing down, then glue the rest. The front is treated in the same way. The ends of the front and back must be made neat by hammering over the edges of the side pieces.

Round the lid glue slips of copper which have been punched. The top edge can be hammerod over the top of
the box to about in lix the top panel over this, get it into its right place and nail it down, using $\frac{2}{6}$ copper nails. Prick a hole before inserting the nail, using n metal pricker, then insert the nail and hammer in place, using a nail-driver. This tool is employed so that the marks of the hammerhead do not show on the copper When the whole of the box has been oovered with copper, give it a hard mib with a leather, and it will be ready for enamelling.

Consult the key (Fig. 19) for the colours. Work in the enamels with the small stick sold for the purpose. Work all the colours from the centre to the cdge, which is raised, and beyond which the enamel should not go. Mauve is ohtained by mixing a little lapis blue with red. Mis it in a small oontainer made out of a piece of sorap copper. Do not finger the ennmel, as the marks of the akin show, and cndeavour to work cleanly.

Key to colouring: 1, green ; 2, buff ; 3, mauve: 4, lapis: 5, cerulean bluc: 6, pale mauve; 7, turyuoise.

The enamel spreads, so ieave it well inside the design, ns it does not look well if the colours join up. In all enamel designs there is a division left between the different parts, so following out the idea ol cloisonne, where the outlines are formed by the wire divisions. When the brushes are finished with they can be cleaned with methylated spirit. The bottles should be corked well when they are put away, and the liquid stirred before it. is


Enamelling. Fig. 19. Design for working liquid enamel without firing on copper. saitable for ud and side of boz
used. If the colours become thick, pour a little of the special medium into the bottle and stir it thoroughly.

ENCEPRALITIS. Inflammation of the brain substance, especially of the grey matiter, which is known as encephalitis, may be due to an injury to the skull, to inflammation extending from disease of the skull bones, as in middle-car disewes, when an abscess is likely to result, or may be due to poisoning, as in acute alcoholism. It often accompanies meningitis, and may also occur as a separate disease, which is commonest in young children, although occasionally adults are affected by it. Encephalitis is said to be microbic in origin.

In children it may follow measles, scarlet fever, pneumonia, and other infectious diseases, but more frequently the previous health lias been good. The onset may be marked by druwsiness and irritability, and perhaps vomiting. Then convulsions ensue, the child going from one fit into another The tcmperature rises perhaps to as bigh as $105^{\circ}$. The convulsions cease and are succeeded by deep unconsciousnces or coma. which lasts for a variable time. When the patient begins to wakc up it may be noticed that there is paralysis of one side of the body and face. This, after lasting for somo weeks, may gradually disappear, while in other cases a certain


Endive. 1. Blanching under plate 2. Blanching under box. 3. Plants in frame during winter. 4. Planting on ridges. 5. Batavian endive. 6. Blanching under pots. 7. Soil preparation : a fine soil fubsioh

Hu spectal arrangenient uill Amateur Gartenino
the water should be changed twice so that the natural bitterness of the plant will be reduced, and, when tencler, the leaves should be put into cold water, left for several minutes. and then squec\%ed dry Endive cooked in this way may then be chopped and rewed like spinach. After a preliminary boiling in slightly salted water, endive heads may be stewed in a pan containing a small lump of butter, seasoning to laste, and a little crean See Salad

ENDIVE : Use on Furniture. This decoration found on certain pieces of furniture is modelled on the curled leaves of the endive It is used on Ionis XV rococo
annount may be permanent. Mental entectilement may also result

Enceplatitis lethargica, popularly known as sleepy sickness, is also a disease due to a microbe and is infectious, though apparently not strongly so, It is likely that some people are carriers of the disense It is characterised by persistent drowsiness. the patient always dropping off to sleep, from which however he may be roused to answer questions. Squint is common, and a notable sympton sometimes present is persistent hiccough

If the patient recovers he may do so completely. On the other hand there may be serious sequelic. Frequently this state resembles that of the discase known as Parkinson's, or paralysis agitans. In other cases there is a tendenoy to jerky movements suggestive of St. Vitus's dance. Still other cases exhibit mental and moral defects, such as lying, uncleanliness, etc. The disease which may occurat any age, is notifiable, and in any form requires the prompt attendance of as doctor. Pron. En-sel-a-li'tis.

ENDIVE. This salad plant is of value in late summer, autumin and winter. The chic sowings are made in June, July and August. Seeds sown in June and July will furnish endive in autumn, and an August sowing will provide winter supplies. The rows should be 16 inches apart and the seedlings thinned to 12 inches from each other If the supertluous seedlings are planted on a fresh site they will provide a later supply than those that are left to grow where sown. Seedlings raised in August should be planted in a garden frame in October to ensure winter produce. Endive needs well manured and deeply dug soil, which must be kept moist in hot, dry weather

The blanching process, which is essential to the production of succulent endive, takes about 4 wecks. and should be started when the plants have well developed centres. A simple method is to cover each plant with an inverted flower pot and to obscure all light by covering the hole in the pot. Plates or tiles may be used. Blanching can also be carried out by tying the leaves together to exclude light from the middle of the plants. The round-leaf viricties of the Batavian condive are excellent, and the various forms of the moss or curled endive are also to be recommended

Cooking. Although principally used in salad-making, endive may also be cooked like any other green vegetable. When it is boiled,
decorration, and was utilized by Chippendale in his renderings of French detail.
Endocarditis. See Heart
ENEMA: Its Uses. An enema is an injection of Huid into the rectum or lower howel and is also resorted to in supplying nourishment to the body when this cannot be given in the ordinary way.
An enema for constipation may consist of water alone or with soapsuds, olive oil, castor oil, turpentine, etc. A soapy-water enema is made by pouring a pint of boiling water over l oz of soft soap and stirring well till the soap)

Nost model steam ellgines function on one of two principles, either with the simple oscillating cylinder or with a double-action slide-valve cylinder. In the former case the cylinder itself turns about the pivot pin, and as the end of the oylinder moves from side to side, so it automatically covers and uncovers the steam port.

The stean enters the first port, forces the piston down to the bottom of its stroke, by which time the cylinder has moved over and closed the steam jort, and as the piston ascends the cylinder it uncovers the cxhanst port and allows the steam to escape. A small spring and adjusting nut are fitted to the pivot pin to kecp the cylinder and valve face in contact.

The double-action cylinder is a fixture, and is provided with a slide valve, like a miniature box without a lid; this noves up and down by the action of the cccentric, and alternately covers and uncovers the steam ports, admitting steam first to one end of the cylinder and then to the other. At the same time it connects the steam passage in the cylinder with the exhaust port, which communicates with the exhaust pipe, and allows the used steam to eacape to the open air.

Timing the Valve. For anything more than a toy, this type of cylinder should be adopted In important item is the correct timing of the valve; this is accomplished by first setting the crank at its dead centre, that is, at the end of its stroke, with the piston almost touching the end or cover of the cylinder. The eccentric is set at right angles to the crank; when in this position the valve should
is dissolved It is allowed to cool sufficiently. Two tablespoonfuls of castor oil, 6 oz of olive oil, or a tablespoonful of rectified oil of turpentine may be made up to a pint with warin soupy water; or $\frac{1}{2}$ to 1 oz of Epsom salts may be dissolved in the same quantity ol warin water. Instead of giving a large watery enema glycerin may be used and 2 or 3 teaspoonfuls will proliably suffice. In obstinato cases the injection of $\frac{1}{2}$ to 1 pint of warm olive oil will be helprul
The cnema may be administered by an ordinary douche bag or can, to which is attached a couple of yards of narrow tubing ending in a vulcanite nozzle which should be smeared with vaseline. The patient is placed on the side with the thighs bent up on the abdomen. When the bag and tube have been lilled with the lluid, the nozzle should be gently inserted into the rectum. The bag sliould then be slowly elevated some two lect above the patient, so that the lluid may flow in. An enema may also be given by using a Higginson syringo, a rubber tuhe with a bulh in the middle.

ENGAGEMENT. $\Lambda n$ engagement or hetrotlal is the formal recognition of the lact that a man and woman intend to marry. The perind lasts from then until the wedding day. Almost invariably the man gives to his fiancee, as the lady is called, a ring known as the engagement ring, and sometimes one is given by her in return. Sometimes a public announcement of the engagement is made through the newspapers.

If the parents of the two are unknown to each other, steps are usually taken to bring them together. Sometimes the engagement is celebrated by a dinner jarty or other social function. An engagement is regarded in English law as a contract, and if either party breaks it an action for breach of pronsise of marriage can be begun. See Agreement ; Breach of l'romise: Marriage: Ring; Wedding.

## Engines and Boilers for the Model Maker

## Small Power Plants Constructed with Simple Tools

Useful hints are here given on the care and running of model steam plants. Reference should he made to the associated articles Boat; Electric Motor ; Locomotive; Railway
cover both steam ports. The eccentric is sligstly advanced or rotated until one of the steam ports is just about to be uncovered. Steam is therefore admitted to the back of the piston, and the engine will function correctly. This principle is applied to model locomotives, and many other types of steam engines, but in various sizes and proportions according to the models.

All small steam engines should have regular attention in the way of lubrication and cleaning. The boiler should not bo left standing alter a run, but emptied of water; any surplus spirit should be emptied from the container, the body of the machine wiped dry with a cloth and all working parts lubricated. 'The safety valve requires to be inspected from time to time. All methylated spirit should be kept securely corked up in a can, and away from the engine The container must be wiped dry on every occasion when it is filled.
The water in the boiler should never be allowed to get too low. Its lerel can be seen in the water-gauge glass, but as a rule the spirit lamp will burn out before the boiler water is all boiled away. When the spirit lamp is retilled the boiler should always be replenished at the same time. Should the pressure of steam risc to an alarming extent, turn of steam to the engine and run it at fyll speed; also either remove the spirit lamp or clse blow it out.
Simple Steam Engine. The diagrams given in Fig. 1 show the parts needed for the construction of a small horizontal boiler with oscillating engine, together with a suitable lanip.


Engine. Fig. 1. Diagrams ol parts which are required to construct a simple engine A. Side eleration and sections of complete model. B. Details for the spirit burner. Fig. 2. Parts arranged to drive a aimple toy locomotive

It is suitable for driving a model boat, but by engine may be built quitc arranging the boiler and engine in a different casily by the least experimanner, and making the other parts to suit, enced beginner Cylinder they can be adapted to drive a toy steam and standard are of gun. locomotive of the simple type shown in metal, the crankshaft, disk l'ig. 2. In this model the boiler casing is and crank-pin being in one made from tin, the cylinder is disposed piece of steel. The boiler illustrated, which between the main frames, and drives the wheels has a working pressurc of 20 lb ., is suld com-
through simple spur gears The boiler can be plete with lamp and funnel.

Boilers. A simple horizontal or vertical boiler for a stationary engine is readily unade by utilising scamless copper tube of $2 \frac{1}{2}$ to 3 in. diamcter for the barrel, the ends being closed with gunmetal castings or flanged copper disks which just fit inside the barrel. The ends are silver soldered or brazed to the barrel. A casing and firebox of tinplate or other sheet metal may be made for a horizontal type In the case of a central flue upright boiler the lower part of the barrel may serve as a firebox, suitable air holes being made and an opening for the entrance of the lamp-tube and
Engine. Fig. 8. A usefal engine buitt rom parts supplied by Stuart Turner, Ltd., suitable for working amall models

made from thin brass tubing, closed with brass
ends that must be securely soldered.
The cylinder can be purchased ready for use from most of the dealers in model engine supplies, and a simple form of standard may readily be made from sheet metal. The valve face of the cylinder is soldered to the standard, and holes are made in the latter for pivot pin and main bearing. The crank is bent up to shape from a piece of steel wire. Wheels for the toy locomotive can be bought from the model shops, where also a suitable flywheel can be obtained. The locomotive wheels are simply driven on to their axles, remembering to fix the gear wheel before putting the second wheel on to the axle. By setting the boiler in a vertical position and making a circular spirit lamp, these parts can be converted into a vertical engine.

Fig. 3 shows a robust doublc-acting oscillating engine suitable for a small boat, or for running Meccano models or similar toys It is larger and more powerful than the simple type just described, the borc and stroke being i's in. The set of paits is sold by the makers, Stuart Turner, Ltd., Henley-on-Thames, at a trifling cost, and the
burner. The lower boiler end is fixed inside the barrel at the appropriate height, convex side uppermost, and is bored for the brass tube which serves as the flue. This latter passes up through the top end, and is carefully silver soldered or brazed to both boiler


Engine. Pis. 4. Babcock \& Wilcox type model boiler in part section. Fig. 5. A Stuart mill engine with cylinder in section
ends. A good boiler for larger stationary engines is the Babcock and Wilcox type shown in Fig 4 The boiler is made in two sizes the smaller for engines up to $\frac{1}{2} \mathrm{in}$. bore and $I$ in. stroke, the larger for engines up to in bore and If in stroke. The boiler of the latter is composed of seamless copper tube, $8 \frac{1}{d} \mathrm{in}$. long and 3 in in diameter, the ends closed with gun-metal castings silver soldered to the barrel. 'Through the bottom of the barrel five water tubes, $t$ in in diameter, also of seamless copper, are fitted by silver soldering them to the barrel, one end being lower than the other to ensure rapid circulation. The

stcam is taken from the top of the boiler, through a screw-down needle valve, inside the boiler casing, coiled over the top of the burner to act as a simple type of superheater, and connected to the engines by a union nut.
The casing is made from lour iron castings The castings for the casings, and the gunmetal builer ends, tubing and fittings, are all supplied by Bassett-Lowke, Ltd., Northampton. The boiler is quiet easily assembled by the amateur. All that is necessary is to drill holes

for the fixing screws through each of the end castings, tapping the holes drilled in the side plates, any roughness on the castings being smoothed off with a file. The boiler sits in the circular recess cast in the front plate and rests upon pad pieces on the back plate, castings: it is held by sel screws thruagh the upper purtion of the back plate. The boiler fittings comprise a screw $\cdot$ down steam valve, a safcty valve, pressure gauge and water gauge, all of which can be parchseed with the castings. They are fitted by brazing thc bushes, which are supplied with the fittings, into the boiler


Engine. Fig. 6. Component parts of the Stuart mill engine
main bearings, remem. bering to place the eccentric sheave in place before doing so The Hywheel is fitted to the outer end of the crankshaft, and secured with a sct screw. The crankshaft has a shouldered screw to act as a crank-pin, which has simply to be passed through the big-end bearing of the connecting rod and screwed in place.
The cylinder. piston, and slide valve are barrel, and then screwing the fittings into assembled and screwed in place with threc place, seating them on to a thin lead washer. screws passed through from the underside of The glands for the water-gauge glass are packed with fine cotton soaked in tallow. The holes for the gauge glass must be directly in line to avoid risk of fracture.
Two separate castings are provided in the shape of a lire door; these fit into holes corod in the front of tho boiler casing, and are held in place by a ${ }^{\frac{3}{2}} \mathrm{in}$. diameter steel pin. These are simply pushed into place, and may be removed to inspect the flames from the burner. This boiler can be heated by a gas ring or by a vaporising spirit lamp.
The chimney, $7 \frac{1}{2} \mathrm{in}$. long, is made from stout brass tube $1 \frac{1}{\text { in }}$ in diameter, which presses into a hole cored into the top of the


Engine. Fig. 7. 8ingle fue launcth boiler, with blow lamp. Fig. 8. Another type ol marine boiler, made fig. 7. courlesy ol Bassett-Lowlie of Whitnelys
the back plate casting. The chimney is belled over at the top, and at a distance of $\frac{5}{8}$ in. from the bottom is provided with a brass ferrule $\frac{1}{4}$ in. thick and $1 \frac{1}{2}$ in. in diameter. The tube may be polished and lacquered, or painted in any colour. The best finish for the boiler is Brunswick black, and for the castings a brick red to represent brickwork.

Horizontal Engine. An excellent hurizontal steam engine for amateur construction is illustrated in Fig. 5, and is known as the Stuart mill engine ; the castings and machined parts may be obtained from Stuart Turner, Ltd., Henley-on-Thames, or most model supply shops. It can be purchased in the form of fully machined castings, shown in Fig. 6, thus obviating the necessity for lnthe work and enabling tho engine to be constructed with the aid of simple hand tools. In Fig. 5 the cylinder is shown partly sectioned, to illustrate the construction.
The method of erecting this engine consists in taking the bed-plate casting, cleaning up the surface, and fitting the crankshaft to the the bed-plate casting, care being taken to see that the piston rod is in perfect alinement with the guides These are composed of two rectangular bars of steel bolted in place, with distance pieces between them and the machined surface of the bed-plate casting. The crosshead hns to be tested to soe that it slides
$\qquad$

[^2]
frecly without shake in the guides: any roughness in the casting should be removed with $n$ fine file or by scraping The little end of the connecting rod should turn freely in the jaws of the orosshead, and is secured with a steel pin. The piston rod sorews into the end of the crossliead, and is secured with n lock nut. The piston and glands should be packed with linen thread soaked in tallow to ensure a proper steam-tight sliding fit when the engine is working. Tho eccentric strap is fitted to the shcare, and the eccentric rod placed in position and scoured with a lock nut. The knuckle joint at the end of the valve rod is then serewed in place, and the two connected together by a litle bolt and nut.

The slide valve is timed as described earliet in this article, all bearings carefully lubricated, the remaining loolts and nuts placed in position, and the engino is ready for use. It might be inounted upon a hardwood base and connected to the boiler previously described by fitting the stenm pipe to $\Omega$ union screwed to the valve-cbest cover. the exhaust pipe being taken to the climney or disposed of in any con. venient manner. This little plant would then drive a number of work ing models, or even a omall-sized dynamo.

Marine Eng!nes. Re. quirements for the power plant used in a model liner, destroyer, or speed boat are light-
ness, compactness, economy in steam consuinption, and a low centre of gravity. A good boiler is one of the single-flue type (Fig. 7) with a number of water tubes across the llue. Since the liue is surrounded by water no outer casing is needed, and the boiler fits snugly in the bull. the weight. being disposed low down.

Fig. 8 shows a marine boiler made from sheet copper shaped up and riveted together This has a dome, from which dry steam is taken off for the engine. In the absence of a dome, the steani pipe is usually made to traverse tho flame before going to the engine.

Boilers of the above type are best lired with a parafin or petrol blow lamp. preferably the former. Special lamps are made for the purpose by the leading model engineering firms (see Fig. 7), but it may be practicable to use one of the tubular commercial liumps made to heat a soldering iron.

The engine shown in l'ig. 8 tnas be built up from the machined set of castings and parte supplied, with the requisite bolts, nuts and screws, by Stuart Turner, Lid., already referred to. If the worker anticipates any difficulty in driiling and tapping the holes. this work will also be clone by the manufacturers for an additional charge. The engine is enclosed in an almminium casing has hall bearings, and weighs, with fly-whecl, 21 oz Other particulars are : bore $\frac{3}{} \mathrm{in}$., stroke of in. and height from bottom of crank case, $4 \frac{1}{2}$ in The crankshaft is balanced. A displacement lubricator would be a desirable addition.

Another enyine for which a set of machined parts is sold by the nbove inentiuned firm is that illustrated in Fig. 10. This is an enclosed twin-cylinder engine with $\frac{3}{3} \mathrm{in}$. bore and $\frac{3}{4}$ in. stroke. The heipht is 4 in .; width 3 in . ; and
 and the gear whecls, with other working parts, run in an oil bath. This set is supplied with all holes drilled and tapped. The engine will propel a 4 ft . 6 in. boat.

ENGLISH TERRIER. This lively, in telligent and companionable dog is very similar to the black and tan or Manchester terrier, but his colour is pure white without any markings save his black nose. Any others are blemishes, according to show regulations, though the presence of a spot or two might not be considered as such by the family to which he is attaohed.

An ndmirable ratter, he does not always shine as a house guardian, his sense of hearing not being so acute as in other breeds, and often he is distinctly deaf. He has a long, narmow, llat head with fox-like muzzle; small black cyes and upright ears. The tapering tail is carried fairly level with the back. The coat is close, hard and glossy. and the weight from $12-20 \mathrm{lb}$. The English terrier is rarely seen to-day, having become alinost extinct. See Dog.


Engine. Figs. 9 and 10. Two examples of Stuart marine engines which can be built ap from sets of macnined parts

# ENLARGING METHODS FOR AMATEURS 

## How to Make and Use Photographic Enlargers

The following article covers the whole field in a fascinating department of phorography, being thus one of a group that includes Developing; Exposure; Photography ; Printing

A properly expused and developed vest. pocket negative can well be enlarged iroin $2 \frac{1}{3}$ in by 15 in. to a really large picture 12 in . by 10 in ., or 15 in by 12 in. With the finest anastigmatio lenses enlargements on much greater scale than this are made.
Apart from the obvious use of getting large pictures from small negatives, the amateur will find that he can often greatly improve his photograph in enlarging it by getting rid of unnecessary or disfiguring detail, as seen in the examples in Figs. I and 2. The original snapshot (Fig. !) of a harbour contains much irrelevant detail that destroys the interest of the photograph. By enlarging the centre portion of the photograph (Fig 2), a really interesting and well-balanced picture is obtained.

1'hotographs may be enlarged either by the use of daylight or by artificial light, but more reliable results are obtained with artificial light. The simplest form of daylight enlarger is scen in Fig. 3, which consists of a box, small enough at one end to take the negrative that is being enlarged, and large enough at the other end to take the sheet of bromide paper on which the enlargement is made. Near the negative end a small lens is placed controlled by the shutter; the focus in fixed, and only one size of enlargement can be made with the particu. larenlarger. Exposure is marle by placing the enlarger out of doors, with the negative towards a clear sky, the time necessary being found by test. An cxposure meter will help in judging times.

Artificial light enlargers are of different types. They may be grouped in two olusses : (a) Those that use large and somewhat expensive condensing lenses, and (b) those that use reflected light in some form. A standard form of condensing enlarger is scen in Fig. 4, where A is the lantern house, B metal collars containing the condenser, which open and close to vary the distance between the light in the lantern house and the condensing lens, the latter being fixed to C , the carrier stage, in which D , the slide carrier holding the negative to be enlarged, is placed. Bellows E, permit the focussing of the lens $\mathbf{F}$. The focussing of both lens and condenser is effected by sprockets and chains, worked by milled headed screws, G. It is nccessary to be able to focus the condenser itself, since the inore the enlarging lens F is racked out, the siorter inust be the distance between the light source and the condensing lens
With apparatus of this nature it is easy to make colargements of every size from any negative, the only limitation being the size of condensing lens. The rule is that its diameter must be equal at least to the diagonal of the negative to be enlarged.

In using an enlarging lantern it is essential to see that the light is accurately centred and focussed. This is because the condensing lens only makes use of a point of light from the source of illumination, as will be seen in tip diagram, Fig. 5, which shows the complete
optical syatem used in an enlarging lantern. This also illustrates the necessity for accurate centring, for if the line AB does not pass through the centres of the light-condensing and enlarging lenses, it is impossible to get even illumination.

An enlarging lantern arranged in the vertical position ofiers distinct advantages. Adjustments are made rapidly, and in some types automatically, while no separate casel or table to take the whole apparatus is required, An efficient form, the Kodak, "Autofocus " enlarger, is illustrated in Fig. 6. The lamp-house A contains a reflector with a shcet of opal glass to diffuse the light; be ow are the negative carricr $B$, the bellows $C$ and an anastigmat lens $D$. No condenser is re. quired A gas-lilled lamp of 150 watts is recommenderl. An automatic focussing device, E, gives a sharp image whatever size enlarge. ment is chosen. The apparatus is designed to be clamped to a table. If a V.P.K. negative be used ( $2!$ in. $\times 1 \% \mathrm{in}$.) enlargements up to

$8 \frac{1}{4}$ in $\times 5 \frac{i n}{}$. can we made ; the largest negative which the carrier will take permits an enlargement up to $21 \mathrm{in} \times 14 \mathrm{in}$., other size negatives giving proportionate enlargements.

A slightly more elaborate iwechanism employing a condenser, the Ensign "Magnaprint " is shown in Fig. 7. Its characteristic is tho speed with which enlargements are produced, a $1 / 1$ plate enlargement from a $\ddagger$ plate negative being prepared in 3 seconds. The focussing is semi-automatic, the whole instru ment moving on the pillar and locking into position for the required degree of enlarge ment. The maximum is $20 \mathrm{in} . \times 16 \mathrm{in}$. from a $\ddagger$ plate negative. This enlarger is also avail. able for copying or photographing prints or sinall objects using the lamp-house as a source of light.

Various light sources may be used in enlarging lanterns so long as provision is made, where a condenser is used, for raising and lowering the light and for forward and sidewarl movements The ideal form, from some: points of view, is the electric are, but this is somewhat expensive and extravagant of current. The gas-filled type of electric lamp is quite satisfactory, particularly if a lamp with a projection type filament is obtained. A 60. watt or 100 -watt lamp should be used to get a strong enough light.

Where the ordinary electric supply current is not available, one of the smull (i.volt gas. filled bulbs, which are used in motor headlights, iun off an accumulator can be successfully adopted.

When it is proposed to take a photograph with a view to enlanging a negative afterwards, care should bo taken to soe that the negative is fully exposed and developed for a somewhat shorter time than usual, in order to obtain a thin negative, which gives the best results in an enlarging lantern. A thin negative of this kind should bo one in which, while every detail can be clearly seen, the densest parts will allow type to be scen through them when the negative is placed upon a printed page.

The Making of Enlargements. The process of making actual enlargements from small negatives requires very little practice, though it needs the cultivation of an eye for picture


Enlarging. Figs. 1 and 2. Above, small snapshot same size as orlginal negative. Balow, enlargement of portion of negative showing the greatly improved picture obtained by getting rid of irrolevant detail such as the barrel, roof, and figure cut in half, and useless foreground and ninteresting sky Photo by P. J. Morlimer
making, i.e. the selection of the best portion of the negative to enlarge, the suppression of irrelevant detail

To make an enargement, place the ncgative in the negative holder. with the top end ol the negative nearest the photographer's hand and the film side towards the enlarging easel. It the negative is an oblong one, place it in the holder upside down with the film outwards By noting these points the enlarged picture thrown on to the easel will not only be the right way up. but will also be the right way round

Next, turn on the light and, with the nega tire in the slide holder, focus the front lens sharply on the cnlarging easel according to the size of enlargement required Then take out the negative and inove the light backwaril and forward by racking the lantern housf until the disk of light thrown on the enlarging easel is perfectly even If the centre of the disk is more lirightly illuminated than the rest, the light must be pushed forward: it. on the other hand, the centre is dark the light is too near the condenser and must be racked back a little. Minor incqualities of light on the easel can usually be rectified by placing a sheet of ground glass between the light and the condenser This diffusion of the light will help to render less conspicuous in the enlarge ment scratches and other minor defects in the film ol the negative

Placing the orange cap over the lens, pin or otherwise insten n piece of bromide paper on the easel in position so that the required portion of the picture falls on to it Removing the orange cap, an exposure is made while three parts of the bromide paper are covered with a piece ol card; then expose successively the three remaining parts of the bromide paper, giving each portion an equal exposure. Thus fonr exposures will be made on one piece of paper ranging from one to four times, and it will be easy to decide, after development, which of the four exposures was nost nearly right

No detailed guide lor exposure in enlarging can be given, since the strengths of artificial light vary so greatly and the density of negatives differs so considerably. When the time of exposure for the particular negative has been lound, a careful note of it should be made, either on the envelope containing the negative or in a negative record book. For details of developing and printing the reader should consult these beadings.

One of the best developers for bromide enlargements is amidol With prints that are


Fig. 4. Standard torm of artiffial light enlarging lantern with condensing lenses Courtesy of Ension, Led


Enlarging. Fig. 3. Simplest form of daylight enlarger consisting of a boz and a fired focus lens
correctly and not paintod underneath with dull black in order over exposed de. to reduce light reflecting. velopment with amiaol stops when the image is fully developed

Many difleren types ol bromide papery are avail able for enlarging purposes, varying from the ordinary glossy surface, used in press photo graphy, and matt surfaces of different grades of smoothness, to very rough-surlaced papers, some heing tinted crean to give warmer effects In general smooth matt surface paper is more suitable to enlargements with much tine detail, while broad effects are olstained with the rougher papers $A_{n}$ en arged print which is a little dull in colour. particularly in the shadows, may often be inproved considerably by rubbing te surlace with encaustic paste.


On the baseboard are fitted the tubes and sliding platform for the lamp-house. Dimensions are given in Fig .10 The long tubes are fastened at each end to blucks of wood by straps of tin bent over and screwed to the blocks. The latter are kept in position by nails or brads round them (not through them) knocked into the baseboard. They are thus independent of the baseboard, and the whole of this portion is casily removed. On the long tubes are placed two shorter pieces of slightly larger tubing, which slide frcely and are connected by a stout plate of copper or other metal, soldered at each end. A slot is cut in the centre. Pieces of an old tubular brass camera tripod serve this purposc, ol brass curtain rods of two sizes can be used

On the centre plate the lamp-house propet is lixed; it consists essentially of a cigar box with an adjustable lamp carrier (Fig. 11). It is fastened to the plate by a bolt and nut, which passes through the slot on the plate (Fig. 10), thus permitting a sideways move ment of the lamp house to allow for the adjustment of the light. Backward and forward movement is supplied by the sliding tubes on which the plate is supported; upward and downward movement by the adjustable lamp carrier. In this case an old focussing pro

Maklng an Enlarging Lantern. A home. macie enlarging lantern using a condensing tens, with the amatcur's camera for projection, and having all neccssary adjustments can be made for little more than the cost of the lens.

The body consists of 3 -ply wood taken from n tea chest, the dimensions of which are shown in the sectional diagram (Fig. 9). It is built up on a stout hasehoaird 16 in long $7 \frac{1}{9}$ in wide, and \% m
thickiFig
10). 'Гo this baseboard the two sides of the box which consti. tutes the lantern are screwod They are 2 in shorter than the liase board; a re. movable end piece. A, car ties a black velvetcurtain to cover the end of the box and prevent light leaking
 out The end piece lits loosely to perinit the withirawal of the lamp. house and its fittings. Its dimensions are seen in Fig. 9 : the two sides are screwed at the top to a piece of wood it in. long, $2 . \frac{1}{2}$ in. wide and about $\frac{1}{5}$. thick, and braced at the bottom by a piece $7 \frac{1}{f}$ in. by ${ }_{8}^{3}$ in., by $\{$ in It is shown partly withdrawn in Fig. 8

The box has practically no top. At the lront a cover, B , about $3!\mathrm{in}$. or 4 in . deep, is ! movided (Fig. 9). Along the top of both sides strips of tin, C, $12 \frac{1}{2} \mathrm{in}$. long, $1 \frac{5}{8} \mathrm{in}$. wide. bent along their length at right angles, are nailed and screwed. These angle strips are bent so that one side is at least ! in. wide, the other being ${ }_{8}^{3} \mathrm{in}$. or less, and this wider side is
jection picce trom a disused magic lantern was made use of, the lenses having been removed. Such pieces of scrap optical apparatus can be easily picked up from optical dealers or on second-hand stalls. An alternative arrangement for raising and lowering the light is shown in Fig. 12, where an ordinary electric bell or wireless terminal, A, slides up and down a rod, the tlex of the electric lamp being gripped, not too tightly, between two nuts on the shank of the terminal. Similat forms o. light holders can be improvised.

The lamp-house is completed by tivo pieces of wood (Fig. 13), screwed on to the top of the cigar box with a circular hole cut in the centie to allow the focussing piece used as the lamp carrier to pass through.

The purpose of these pieces is tn provide a covering for the light when in the lantern.


Einlarging. Fig. 6. Showing the very efficient Kodak Auto-focos" enlarger. Fig. 7. A more elaborate mechanism, the Ensign "Magnaprint"enlarger Courleny of Kodali, I.Id., and Easiun. Llil
[he covering moves with the tight, and pre box with pieces of wood out to tit, or it may vents direct rays escaping from the lantern, he properly mounted.
since it moves underneath the overlapping The condenser box is made a light-tight fit strips of blackened tin. If lurther means of light exclusion are required, pieces of 3 -ply wood $7 \frac{1}{2} \mathrm{in}$. by 3 in . or 4 in . can be placed on top of the box at either end, according to the position of the lamp-louse. At the front end of the lantern a slot is cut with a keyhole saw to take a frame bolding a sheet of ground glass for diffusion of light, if necessary. The slot is cut at the height of the condenser, and a strip of wood is fastened inside to provide a ledge for the diffusing glass.

The condenser box is seen in the photograph (Fig. 14) and the diagram (Fig. 15). For a $5 \frac{1}{2}$ in condenser such as is necessary for an-
in the front of the lantern in the manner shown in the photo (Fig. 8) and in the diagram (Fig. 9). A solid piece of wood, D, a bout $\frac{1}{2}$ in. thick and 63 in . wide, supplies a platform for the condenser box. It is screwed on to an
 both sides uprights, $F$, of $\ddagger \mathrm{in}$. 3 -ply wood are screwed, with a cross-piece at the top, of the depth required to make the condenser box a reasonably tight fit. When the condenser box is in position light leakages are stopped by stuffing strips of black cloth all round; these are nailed down with narrow strins of 3-ply wood (see photo Fig. 8).

To avoid moving the lantern backward and lorward in enlarging different sizes the easel is arranged to slide along a plank 1 in . by 7 in . Details of its construction are seen in Fig. 17. The easel consists of an ordinary large-sized drawing board fastened to a sliding saddle. piece by means ol two copper brackets, which are cut out of a piece of 2 in . square metal and folded up as shown in the dotted lines in the sinaller diagrams in Fig. 17. A thumbscrew passes through the saddle, gripping the edge of the plank to keep the easel fixed in the desired position.

Enteric. See Typhoid.
Enteritis. The meaning of enteritis is inflammation of the intestine. See Colitis : )iarrhoca: Intestine.


ENTREE. This name s given to made-up dishes such as chicken cutlets, quenelles, fricassées, ris. soles, ragoats, soufflés, etc., and may be either hot or cold. If more than one entréc is served. the hot should procede the cold. The remains of tish, poul try, gaine, and meat can be used, and kidneys, sweetbreads, and livers are employed. The entrdo course at dinner follows the fish, and precedes the joint.
Entrée Dish. These aro made in silver, Sheffield

larging $\frac{1}{4}$-plate negatives, a bis cuit tin $6 \frac{1}{\frac{1}{2}} \mathrm{in}$. square and about $2 \frac{1}{2} \mathrm{in}$. deep is required, or a larger one can be cut down to fit, the cut ends being turned over and soldered. An aperture is cut in the bottom of the tin $4 \frac{1}{2} \mathrm{in}$. wide and $3 z \mathrm{in}$. deep, i.e. a little larger than a $\frac{1}{2}$-plate. A strip of copper the length of the condenser box and $2 \frac{1}{4} \mathrm{in}$. wide is taken and bent over at right angles, one side of the bend being if in. wide, the other 1 in . A second strip of the same length $2!\mathrm{in}$. wide is bent over at right angles, each bend in this case being $1 \frac{1}{2}$ in. wide. These strips are bolted on to the top and bottom of the con denser.box to allow the negative carrier to be pushed in between the strips and the box, gripping it but permitting free movement. On the copper strip which is bolted on to the top of the condenser box a hooked piece is soldered on to support the camera, as shown at A (Fig. 15) Its dimensions are given in the smaller diagram (Fig. 16). This hook fits into the slot at the back of the camera in which the focussing screen slides. The condenser is wedged into the tin



Enarging. Showing a nome-made endarging lantern with condeaser. Fig. 8. Lantern using electric lignt and amateur's camera. Fig. 9. Sectional diagram of body of lantern made of three-ply wood. Fig. 10. Baseboard and sliding platform for lamp-house. Fig. 11. Lamp-house and adjustable carrier. Fig. 12. An alternative lamp holder for use with electric light. Fig 13. Top cover for lamp-house and base for lamp carrier. Fig. 14. Condenser boz made trom biscuit tin, showing arrangement for holding negative carrier and camera. Fig. 15. Sectional diagram for construction of condenser box. Fig. 13. Metal for strip holding camera soldered on front of condenser box. Fig. 17. Details of easel with method of attachment to sliding saddle
plate and electro-plato, and may be purchased singly or in pairs Such dishes are often found with a detachable handle, which enables the cover to be turned upside down and aach dish made into a pair. Sometimes they have fixed liners with a space between the two parts for hot water. The entrée dish lends itself to rather elaborato ornament, and good 18 th century specimens fetob high prices. See Sheflield Plate; Silver.
ENTREMET. This term is applied to all dishes of dressed vegetables, such as caulillower su gratin, cassolcttes of cuoumber, etc., as well ns to hot and cold sweets and afterdinner savourics.
ENURESIS. In young children enuresis or bed wetting is sometimes a very troublesome complaint It is not wise to malic a fuss about it, and in an ordinary case there should be no threat of punishment. The bedclothes should not be too heavy, and the child should not be allowed to bury himself beneath them, nor to sleep on his back. An old method of preventing this is to tie $n$ cotton-reel on the small of the back.
The diet should be simple, avoiding spiced food and condiments, and the last meal should not be heavy nor too near bedtime. No fluid should be allowed within an hour or two of going to bed. The bladder should be emptied just before getting into bed, and the child should be awakened in an hour or so to empty it again. A mackintosh shcet and draw sheet should be used. If constipation is present it must be corrected, and the motions should be observed for the presence of threadworms. In boys circumcision is sometimes necessary. Adenoids and enlarged tonsils are a common cause. When no obvious cause is present suggestion may be a valuable help.

EPACRIS. This evergreen heathet like shrub is suilable only for cultivation in $a$ hented greenlinuse where the various kinds bloom in autumn, winter and spring. It belongs to the group known as hard wooded plants and is not an casy plant to grow well. In spring when the Howering season is over the plante should be pruned; any repotting that may be necessary is done then A suitable compost consists of peat (or peat twothirds and loam one-third) with sand added frcely. The pots must be well drained. Grent care in watering is necessary to ensure that the soil becomes neither sodden nor dry. Propagation is by cuttings insertod in pots filled with sandy peat and placed in a propagating casc under glass in summer.
EPIDEMIC. The name opidemic is given to a disease when it affects a large number of people at one time. Tho discase is usually one due to a microbe. but other canses may operate and affect large numbers of perple. e.g. a poison contained in some article of food or lead poisoning from pollution of water by lead pipes These epidemics of poisoning and of dericiency diseases, when once their nature and causation are apparent, can be casily brought to an end

Notification and isolation bave helped to limit the spread of most infectious discases. In the case of small-pox, vaccination has been invaluable; and in the case of what are known ns the water-borne discases, c.g. enterig fever and cholera. The same may be said of control and, if necessary, the steriliza. tion of water and milk supplies. Much may be done to limit the extension of diseascs in which insects, such as the mosquito, flea, house-fly, etc., are the agents of infection, by measures of exterminating the insects or for affording protection from their bites or contamination Protective inoculations with serums and vaccines, by increasing the resistance of the body, have proved suocessful.
It is not clenr why some epidemics occur at more or less regular intervals. In the case
ol diseages which may affect the some person is by cuttings in summer in a frame Another repeatedly, there will be a certain period of immunity after the illness and, as in the case of induenza, the epidemic may sweep over the community in a series of waves separated by varying intervals of time Widespread minteorological conditions may be factors. and lowered resistance affecting large comnunities because of food shortage See Inoculation.

## Epidermis. See Skin

EPILEPSY or Falling Sickness (Gir epilēpsis, عeizure). Disease of the uervous system characterised by periods of unconscious ness. Epilepsy most commonly begins in childhond, before the fifth year The fundamental cause is unknown, though fright, injury alcoholism, and an attack of illness appear to be exciting causes. The offspring of those parents who suffer from insanity of ueurasthenia are mire prone to exhibit epilepsy than are other childrens

The incidence of epilepsy would be much diminished if epileplics refrained from marrying and having children, every child of an epileptic need not have the taint, bu in a family some members are almast surt to have it.
Two forms are recognized. In petit mal the attacks of unconsciouisness often last no longer than a few seconds and there are no convulsions. Grand mal is characterised by the occurrence of convulsive fits The subject may have a preliminary sensation or nura, which warns him of what is going to happen Sometimes the beginning of the sit is marked by a loud cry: At first the muscles are rigid. and suspension of respiration catuses blueness of the face After a fow scconds, violent convulsions occur, and the tongue may be severcly bitten. After one or two minutes the patient passes into a state of somnolence which may be succeeded by prolonged sleep.

During an actual fit all that can be done is to prevent the patient from hurting himself. He should be allowed to remain in the recumbent poature, the clothes should be loosened round the nock, and a roll of cloth should be introduced between the teeth to prevent the tongue from being bitten. The most useful drugs are the bromides of sodium and potassium. These should be given for a long period. Careful attention must be given to the general health of the sufferer
Epispastic. See Cantharides: Counter Irritant.
EPSOM SALTS. Sulphate of magnesium in the form of Epsom salts is much used for purgative action, the best time for taking it being immediately on waling in the morning. A moderate dose for a grown person is a tesspoonful in a tumbler of hot wnter For stronger action 2 grains of calomel may be taken at bedtime and Epsom salts first thing in the moming. Some people find it easier to take the effervescing magnesium sulphate, of which of to 1 oz . may bo taken in a glass of water and drunk while effervescing.

In certain cascs of heart disease or Bright's disease, where the tissues are becoming waterlogged through the fluids in the blood escaping through the vessel walls. morning doses of Ejpsom salts sometimes give good results by removing from the system any excess of fluid. In this case the dose is clissolved in the smallest quantity of water which will take it up, in order to encourage a frec escape of Huid from the walls of the bowel. See Aperient: Constipation.
ERCILLA. This is a self-clinging evergreen creeper, with leathery leaves and racenues of purplish flowerd, which spring from the axils of the leaves. It is suitable only for walls, for it is not very hardy Any ordinary anil suits it, but sandy loani is best. Propagation

EREMURUS (Giant Asphodel or King's Spear) These remarkable plants produce a large tuft of long strap-shaped leaves and in early summer send up tall strong epilica, the upper parts of which are covered with closely mas 9 ed llowers. The large floshy roots are of extra ordinary formation they radiate from a central bud like the spokes of : cart theel.
Planting is best done in carly nutumn and $n$ shelter ed place, e.g among shrubs, must be chosen, for the plants start into growth early. There should be $a$ (i-in. onvering of soil nbove the roots. which must be handled carefully because they are brittle. Well. drained lonmy soil suits them best: clayey land must be made suitable by adding old turf, sand and some leaf-mould or decayed inanure. It is advisable to protect the mots in winter by placing ashes or leaves on the soil nbove them. The best method of propagation is by sceds sown in a frame as soon as they are ripe Ereuurus robustus bears pale mosecoloured llowers on a stem up to 10 fect high; himalaious, with white flowers, grows 6 to 8 feet; Warei, reddish bronze, is 0 feet or more high Bungei, 4 to 5 fect, with yellow flowere. is one of the best for small gardens.
ERGOT. The ergot, a fungus which sometimes appcars among grasses and weeds, is very fatal to the plants aftacked. The ergotted seed becomes black and elongated like the spur of a cock, from whence it derives its name. The remedy is to gather and burn all infected plants
Poisoning by Ergot. Ergot is used in inedicine, but should only be taken under the doctor's direction. In acute ergot poisoning following on an overdose of the drug, the chief symptoms are violent sickness and diarrhoca, licadache and dizziness. These symptoms may gradually pass or may increase in severity, the patient falling into rapid convulsions, leading to loss of consciousness and death While ivaiting for the doctor, an emetic, e.g a tablespoonful of mustard in half a tumbler of water, may be given, and when the patient has vomited thornughly, 2 tablespoonfuls of castor oil. Strong hot tea should also be given freely.

Symptorns of poisoning may also appear through eating bread containing rye which has been attacked by the fungus.

ERIGERON. (Summer Starwort.) This is $n$ most valuable plant for the herbaceous border: in summer it bears numerous large daisy-like flowers on stems up to 2 ft . high, in shades of lavender, purple and other colours.

The piant thrives in ordiriary well cultivated dirty yellow or leadish-white soil and enn be increased by division in tho autumn or by sowing seeds in a bos of soil in a frame in spring.

The commonest kind is Erigeron speciosus, 2 ft. high with mauve-purple flowers; opeciosus superbua with more richly coloured


Erigeron. The Summer Starwort, a beantiful hardv border flower
blooms is finer. Quakeress, lavender, is one of the best of all; other finc modern varieties are B. Ladhams, mse-pink; Pink Pearl, blush-pink; Asa Gray, apricot-buff; Amos Perry, lifac; and Fontainebleau, lavender. blue. Alpinus, 9 in., purplish blue, and aurantiacus, 6-8 in., orange yellow shado, are suitable for planting in tho rock garden.
ERINUS. Erinus alpinus is a pretty Little plant of trailing growth suitable for crevices in tho rock garden; it flourishes best in well-dirained gritty soil. It is not as a rule long lived, but can casily be increased by seods sown in spring in the rock garden where the plants are to flower the following year. Erinus alpinus is only 4 or 5 inches high, and bears rose purple flowers in early summer.
ERMINE: For Wear. Ermine, which is the fur of the stoat, is mostly obtained from Canada and Russia, tho coat of the British stoat not clianging colour to pure white in the winter to the same extent as it does in northern regions. The skins are narrow and about 10 in . long, the tail being white with a black tip, and the fur short and close. What is known as summer erinine is the beige colour fur of the stoat's coat in summer.
Ermine loses its whiteness, and becomes yellow with age : it can be cleaned, but once the yellow tinge appears, bleaching will not restore its pristine purity. This yellow colour may be kept from appearing for a considerable time if the fur is stored away in darkness when not in usc.
Ermine is trying to the complexion, and looks best in the evening for coat, collar, or wrap. Being easily soiled, ermine needs to be treated with great care. After use it should be wiped over lightly with a fine white cloth and wrapped between layers of tissue paper. When badly soiled, ermine is best sent to the cleaners; but if it is to be treated at home, cornflour should be rubbed in with the tips of the fingers, and afterwards brushed out with a soft, white-bristled clothes brush See Fur:
ERMINE MOTH. The small ermine moth is found in nearly every orchaid and garden, and the caterpilars are very destructive to trees and shrubs. The moth itself may be identified by its upper pair of wings, usually of a leaden whitencss, with small black spots on the edges of the wings, which also are fringed with livid-coloured hairs. The caterpillar is about $\frac{1}{2}$ in. in length, the body being a
and the head brownish.
The moth often selects apple, pear, plum, or almost any fruit tree on which to deposit eggs in masscs near leaf:bud and blossonl. The caterpillars archatched during autumn, but rest under a protective scalc until trees are coming into leaf, and then spin a thick web of threads round a young slioot, enclosing foliage, within which they live, feeding upon the leaves.

When each caterpillar is full grown it encloses itself in a cocoon of white silk, in which it pupates until the month of July, when it emerges as a moth. Remedies are to kill the moths before they deposit eggs, and burning or crushing of the caterpillars while in their webs.
According to Leallet No. 65, issued by the Ministry of Agriculture, the most antisfactory trentment for affected trees and hedges is to spray them soon after the blossom is over with lead arsenato (l lb. of lead arsenate pacte to 20 gallons of water).
ERYSIMUM (Fairy WallHower). Free Howering annual and perennial plants with small wallflower-like blooms in yellow, orange and other colours. The two most popular annuals are arkansanum, yellow, and peroff. skianum, orange. They do best when sown out of doors in carly autumn to bloom in spring and early summer. Seeds may, how. ever, be sowll in spring to provide plants in bloom from July onwards. They flourish in ordinary soil, preferably that which is not


Erysimum. One of the fairy wallilowers (Erysimum arkansanam), a bardy annual
clayey: Erysimum rupestre is a rock garden plant, 3 or 4 inches high, which bears yellow flowers in summer. It is easily grown in sandy soil.

ERYSIPELAS. Erysipelas, or St. Anthony's fire, is an acute, rapidly spreading inflammation of the skin, and sometimes of the
underlying tissues, accompanied by heat,


Ermine Motk, an orchard pest. 1. Mature nsect. 2. Egg mass. 3. Caterpillar. 4. Cocoons. 5. Apple shoot with web Miniotry of Aurculture and Fisheries and
swelling, rednoss and pain of the affected part, together with high fever and general prostration. The teinperature may run up to $103^{\prime \prime}$ or $104^{\circ} \mathrm{F}$., and the patient will vary likely become delirious.

The skin of the face is the most common site, and large or small blisters may be present. The patch spreads rapidly, the parts first attacked getting paler and perhaps.scaling. If the eyelids or scrotum are involved, there may be much swelling owing to the laxity of the tissues in these situations.
The disease is due to " germ, a streptococcus, like those which cause suppuration, finding its way into the skin. Infection may take place through an open wound of any kind, even a slight scratch. Debilitating diseascs, such as diabetes and Bright's disease, and alcoholism, by weakening the resistrnce of the tissues, predispose to the disease. Erysipelas is a discase notiliable to the authorities, and treatment should be in the hands of the dootor. See Infectious Diseases

ERYTHEMA. This is a blush or reddening of the skin occurring in patches of various sizes which temporarily disappear upon pressure. It is due to many causes, such as emotional disturbances which produce blush. ing; external irritation in the case of chilblains; effects of heal and sunlight; friction of the skin by ill-fitting clothes, etc. ; counterirritants like mustard; nervous influences, e.g. neuralgia; and poisonous substances in the blood, eg. belladonna; poisons derived from the bowel, etc. Whero therc are no symptoms other than redness of the skin, with perhaps slight itching and burning, the application, of a lotion such as the following usually gives immediate relief


Water to
0 minima
4 oz.
The lotion should be mixed with equal parts cold water and sopped on to the skin. In erythema due to chafing, the irritable parts may be dusted several times a day with a powder composed of zinc oxide 1 part, magnesium carbonate I part, starch powder 2 parts. The part should be washed before applying the powder.
Erythemr multiforme is an reute inHamma. tory skin disease characterised by papules. lumps, red patches and sometimes blisters on tho skin. Erythema nodosum is characterised by pinkish-red round or oval swellings chietly over the slin boncs. The treatment should be supervised by the doctor, unless it is slight. If the digestion is poor or the patient is of a constipated habit these matters sbould be put right.

ESCALLONIA.
Thesc aro beautiful summer-Howering shrubs, most of them being evergreen. They are not very hardy, and in all except the mildest districts must be grown on a sunny wall. Escallonia macrantha, with attractive evergreen leaves and rose-coloured Howers, makes an admirable hedge in seaside gardens in mild localities, but clsewherc it needs the shelter of a wall. One of the hardiest is Escallonia langleyensis, a vigorous shrub 6 fect or more high, which may be grown in-the open garden in southern counties and


Escallonia macrantha，a crimson－flowared bedge shrub which thrives in seaside gardens
bears rose－red llowers Exoniensis and philip－ piana，both with white flowers，are two fairly hardy sorts Escallonias thrive in ordinary soil and are propagated by cuttings set in sandy compost in a frame in summer．

Eschscholtzia．This is the botanical name of a showy hardy annual，the Californian poppy（q．v．）

ESKIMO DOG．Most of the Arctio and sub－Arctic dogs share certain features in com－ inon，being of a wolfish appearance．The head of the Eskimo particularly takes after that of the wild animal，but the dog differs in one respect by carrying its tail tightly curled over thic back．The colour may be whito，black， black and white，silver grey，etc．Opinions vary about their disposition．Some say they arc uncertain in temper，others give them excellent characters．See Dog．


Eskimo Dor．Specimen of the breed，which in appearance is closely akin to the woll

ESPAGNOLE SAUCE．From this rich brown foundation sauce many other varieties are preplared．It can be made by melting 2 oz ．of butter in a stewpan，and adding to it 3 oz ．of ham or bacon cut into dice，a bunch of paraley and herbs，tied together，an onion and a carrot（sliced）， 1 tableajoonful of chopped mushrooms， 3 peppercorns，and a clove．Fry all these a light lirown．then add 2 oz ．of Hour．

When this is also brown，pour in 1 pint ol brown stock，add 3 sliced tomatocs，and let the sauce simmer gently for $\frac{1}{2}$ hour，stirring it occasionally and keeping it well skimmed． Add a wineglassful of sherry，with seasoning to taste，and then rub the sauce through a
sieve or tammy cloth，adding a little more stock if it is too thick．The wine and mush－ rooms may be omitted．

ESPALIER：For Fruit Trees．The norizontal eapalier tree is a convenient type for planting alongside the paths in the fruit and bitchen garden，the branches being trained on wires stretched between posts Such trees，if correctly managed，produce exceptionally fine fruits They are suitable also for planting against a wall．Apple，pear and plum are usually grown in this form The trees may have one tier or，as is shown in the illustration，several tiers of branches．A f́resh tier is formed by allowing a shoot at the top of the main stem to grow until it is 12－14 in． high；the top is then cut off，and when side shoots develop one on each side is sclected and trained horizontally at about 12 in．above the tier bencath．Other shoots are rubbed off

At the winter pruning the new branches should be cut back to within 12 in ．of the base of the previous summer＇s growth；thus they will extend every year by about 12 in．The summer pruning consists of shortening all side shoots late in July to within 6 in or so of the base；in winter these arc cut back to within about threc buds of the base． See Apple；Cherry；Fruit：Pear：Plum，etc

ESSENCE．Es－ sences are the essential oils from aromatic plants，obtained by a process of distillation and made into solution with purc alcohol． They are much used in the preparation of sweet and savoury dishes The commonest used are essences ol vanilla，lemon，almond， cloves，leppermint and ginger．These are very strong and one or two drops are sufficient to provide the Havour required

To make essence ol lemon， $1 \frac{1}{2}$ cupfuls dis－ tilled water should be mixed with 1 cupful pure alcohol and $\frac{7}{2} \mathrm{O}$ oil of lemon．Saffron should be used to colour． Orance essence is made from 6 oz．alcohol mixed with $\frac{1}{2}$ oz．sweet oil of orange，and coloured with cochineal．Almond essence is made from $\frac{1}{\mathrm{oz}}$ ．oil of bitter alnionds， 1 table． spoonful distilled water and $1 \frac{1}{2}$ cups alcohol．

Essence of cloves is prepared by infusing 1 oz．cloves in 2 oz．proof spirit for the period of a fortnight，straining it and then bottling the essence for use．

To make ginger essence，$\frac{1}{2}$ oz treshly powdered ginger，$\frac{3}{}$ oz lemon rind，and $\frac{1}{2}$ pint brandy or spirits of wine are needed．Let the rind and ginger soak into the liquid for a fortnight．Shake the whole daily，and then strain and bottle it，when it will be ready for use．See Almond：Lemon：Vanilla．
ESSENTIAL OII．The chief tlavouring part of vegetable substances is known as the essential oil That of lemon，for example， has the complete odour of the lemon，essential oils being diatinguished from lixed oils by this characteristic property．Almond yields both an essential and a fixed oil，but it is only the former that smells of almonds．Essential oils differ from fixed oils in not leaving ar greasy stain on paper．

ESTATE DUTY．This term is used fot the duty payable in the United Kingdom on death from the eatates of persons who lenve property．It was first imposed in 1894 and is graduated according to the value of the estate． The value of all property left，real or personal．
settled or unsettled，is added together and duty charged thercon at the rates noted below
In the case of amall estates，i．e．those under £500，the executors can pay，if they prefer， a sum of 30 s．if the value is not more than $£ 300$ ． and of 50 s ．if it is between $£ 300$ and $£ 500$ ． This frees them from all other charges．
The payment of the duty on estates of high value may be made in the form of real or leaschold property which is part of the deceased＇s estate．Certain classes of war loans are taken in payment at their face value， provided the doceased had held the stock for a certain period

Other provisions of the law about estate duties deal with gifts made during lifc（inter vivos）．If auch were made within three years of death they are regarded as jart of the estate and duty is charged thereon．If the gifts were for charitable or public purposes the period allowed is onc year．Exceptions to this are gifts less than $£ 100$ in valuc，settle－ ments made on marriage and those which were part of the deceased＇s normal expendi－ ture，e．g．an annual allowance to a daughter

Personal estate and real estate are valued separately for death duties．On personal property interest at the rate of 4 per cent is charged from the day of death until the


Espalier．Example of an apple tree，the branctes of whicu bave been
settlement of the account．On real property the duty may be paid by instalments over a period of eight years．In this case interest of 3 per cent．is charged，but only from 12 months after death．See Executor；Legacy Uuty；Probate；Will．

| $\begin{gathered} \text { Excecdlug } \\ \substack{500} \end{gathered}$ | $\begin{array}{r} \text { P'er } \\ \text { cent } \\ 2 \end{array}$ | Exceeding $亡$ |  |  | $\begin{aligned} & \text { Per } \\ & \text { cenit } \end{aligned}$ |
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Estate Duties．Table showing the scale of duties in lorce after the Budget of 1830 ，in which the rates
on fortunes of 8120,000 and over were increased

ESTMMATE．An estimate is a statement giving the probable cost of an undertaking by one who is prepared to do the work．Before building，repairing，or decorating a house， laying out a garden，removing furniture，it is advisable to ask builders and others for is advisable to ask builders and others for
obtained from two or more firms and the it is wiser to err on the side of formality, and prices compared. The lowest estimate, however, is not always the most economical.
The success of any estimate depends to a large extent on the care and accuracy with which the inquiry is expressed; no one can quote a price for a piece of work unless the requirements are set out in sufficient detail. There should be a clear, precise, and definite statement of the work to be done, when and low it is to le done, the materials to be used, terms of payment, and a penalty clause for failure on either side. Often when an inquiry is made the terms are ambiguous or indefinite, with the result that some misunderstanding arises later.
When a house is to be built, it often prys: to engage an architect or quantity surveyor to prepare a bill of quantities. This includes a list of everything to be used in the work, and is the snfest method to adopt, as the surveyor will see that the work has been done and the materials used in the right way and without waste. On the other hand, if a profcssional is called on to advise or quote for a piece of work, it is assumed that ho will perform the task in a "orknan-like manner, and failure to do so is justifiable cause for complaint by the employer.

Estimates for building need to be examined with even greater carc. An estininte becomes a contract when it is accepted, but it may contain a clause providing for an increase in the figure in the event of any change in the, rate of wages or prices of materials, and adjustments of this kind must be nllowed for or the contractor can withdraw. See Architecture; Bungalow; Cottage; House.

ETHER: Use in Medicine. 'I'lie purified iorm of ether is employed for producing anacsthesia. It may be sprayed on the skin to Iree\%e it, and diminish the pain of an incision or puncture, or on tender points in neuralgia. As a general anaesthetic ether is preferable to chloroform in many cascs, because it acts as n heart stimulant. It may also be used as a rapid stimulant in fainting, collapse and cardiac weakness generally, as a carminative in Hatulent dyspepsia, and as an antispasinodic in asthmatic conditions. Ether should not be administered by an unauthorised person. The drug is very intlammable, and should never lee handled near lamps, fires, etc.
ETIQUETTE: Some General Rules The rules of etiquette which obtain in a social, business or professional environment forin a safeguard in dealing with other people correctly. This is particularly the case when the sur roundings are new and formality has to be observed with strangers, without any sliffness.

For instance, in the case of a family settling in a country district after living in a large town, certain differences of etiquette should be studied. Of these the two most important are that the new arrival should not call on anyone first, and should be careful to distinguish between calls and card leaving, hy returning the sane form of civility in each case. 'l'o call on someone of $\Omega$ higher social position who had only left cards would be to appear pushing. and perhaps cause a prejudice against the newly arrived family. On the other hand, to return cards where a friendly call has been made would be frigid, and be talien to mean that the acquaintance was not cared for.

Another instance where a knowledge ol etiquette may be of importance ie in the case of women whose husbands' profession stations them abioad. By observing the strictly correct procedure they avoid getting into a wrong set, because, by being polite but not intimate, they gain time to form a cool judgement without giviny offence. The best plan is to follow the advice of someone who is already well established in the locality. A general rule which may be followed when in doubt is that
that possible when confronted with a is well to observe how other people ancet it.

Appointments should be punctually liept, whether jusiness or private. Letters should be answered as soon as possible. Invitations should be clearly and cordially expressed, and replied to in the same vein. A lettor of introduction should alwilys be given to the person it is intended to benefil open and delivered open. If not used the giver should be notified and the reason explained, with thanks for the kind intention It is not neccsary to introduce people to each other unlesy they are likely to have something in common, but where there are only one or two persons present it is better to introduce them than to allow anyone to fcel awkwarl. Whatever the respective rank. age, or position, the man is always introduced to the woinan, and unmarried women to the married, unless the former is of superior rank. The onus of future recognition rests upon the person to whom the other is introduced.

Mer and Women. The rules of etiquette between men and women have been somewhat modified. In social life a man would rise when his hostesy or other women entered the room or stood: he would open the door for them and follow their lead. In business this would be absurd. Some years ago it would have been hard and fast rule for a man to give up his seat to a woman standing in a train or public conveyance. Now a business girl realizes that an older man may be more tired than herself. but anyone on beng offered a seat should accept it graciously without argument.

When walking with a woman a man should be on the kerb side of the pavenient, and should never greet or leave her out of doors without raising his hat. The rule for a man about paying fares for a woman is one which udmits of variation. Many independent women think it unfair to allow a man to pay. Whatever the reason they should not argue and a woman should always be prepared to pay for herself quickly to save any awkwardness

As far as the ballroom is concerned, it is worth while cultivating certain little courtesies, which go hand in hand with good manners. Always avoid dancing steps which draw attention to yourself, and never show off unless you happen to be an exhibition dancer. Introduction, though n simple matter, is one very fow people take the trouble to perform gracefully. At a dance, or anywhere else, the man should be taken up to the girl, and the person who performs the introduction, with a slight inclination of the head towards her, should say : "Miss _ inay I introduce Mr. " and then, inclining the head towards the man, say : "Mr. -., Niss-_."
Never hurry over an introduotion, and pronounce the names very distinctly.

The etiquette which governs dress is not altogether founded on fashion, and its rules are best interpreted by suitability. The most elaborate clothes inight be worn at a wedding which would look out of place elsewhere in the daytime. A greater laxity obtains now in these matters.

At many informal partics evening clothes are not expected, though when in doubt it is best to be formally correct. When staying in country houses people are expected to have the right clothes for any outhloor sports in which they take part, and to wear the correct evening dress for dinner. See At Home: Call: Cards, etc.

EUCAINE. Substitute for cocaine as $\Omega$ local anaesthetic. Solutions of the drug may be dropped into the eye or injected into the skin for operations on these parts, or injected into the gums for tooth extraction. In an ointment eucaine may prove useful in cases of intolerable itching.

EUCALYPTUS : Medicinal Uses. Euca lyptus oil is obtained by distillation from the fresh leaves of the Australian blue gum-tree 'The dose is one-half $t_{1} 3$ minims, and it may be taken on lump sugar. It has been given in aguc, in septic fevers, and in oonsumption and chronic bronchitis when the sputurn is foul smelling. It is a strong antiseptic and disin. fectant. The following makes a useful inhala tion or spray in diseases of the air passages

## Eucalyptus oil <br> Light carbonate in umsiosiii <br> Water to make

Add one teaspoontul of the above to a pint of hot water and breathe in the resulting vapour.

Encalyptus ointment smeared on boracio lint is a good application for abrasions and burns. Tincture of eucalyptus is efficient in arresting bleeding.

EUCHARIDIUM. This is a pretty, harly annual, belonging to the evening primrose family. It may be sown out of doors in nutumn to provide spring flowers, and in spring to yield summer flowers lt likes well drained soil in a sunny position. The favourite is Eucharidiun Breweri, 6 inches Ligh, with pale rose-columed flowers which are slightly scented.

EUCHRE. This is a chrd game for two, three, or four players. Here the game is described for four players, who play ns partners, two against two. Three varieties of packs aro used. A 32-card prok, the ordinary full pack, from which all cards firm the six to the two inclusive are omitted, a 28 -card pack, in which the sevens are also omitted, or a 24 . card pack, on which all cards from the eight to the two are omitted.

The carils rank according to trumps. In the trump suit the jack, known as the right bower, is the highest card. The second highest card is the jack of the suit the same colour as trumps. This jack is known as the left bower. The order of the cards is then the ace, king, queen, ten, etc., of trumps, followed by ace, king, queen, ten, eto.r of the suit the same colour as trumps. In the tiwo suits of opposite colour to trumps the order is as at whist. If a joker is used it becomes the highest trump.

The deal is by cutting, low dealing, nce being low, and for cutting all other cards counting as at whist. Five cards are dealt to caoh player, in one round of three at a time and one round of two. The next card is turned up for trumps. The game is to take at least three tricks by the player or partners who make the trump. If the players who call trumps fail to make the three tricks they are said to bo euchred.

The eldest hand begins play by ordering up the trumps or passing. If he orders up the trump, then the dealer must take up the exposed trump card and discard one from his hand. But he does not take up the exposed trump until his turn comes to play, though he must discard immediately. If eldest hand passes, then dealer's partner may say, "I assist," thus ordering the dealer to take up the trump, or ho may also pass, and so with the third player. Finally the dealer himself may take up the trump or pass. If he passes he turns the trump card face downwards on the top of the pack. If all have passed, the eldest hand has the right to name a fresh trump, suit or pass, and each player in turn will have the privilege as long as the plaver before has not named the trumps. If all players again pass there is a fresh deal by the next player, eldest hand.

If a new trump) is named of the same colour as the one rejected, it is cailed making it next, but if of the opposite colour it is called crossing the suit. If joker is played it is customary to say before a dea! what suit the joker shall represent if turned up. When the
trump is made, eldest hand leads and cach player in turn follows suit if possible. If not, he may trump or discard. The winner of each trick leads for the next trick. As each trick is made it is tumed face downwards, and is not allowed then to be examined. A player who has named a trump may elect to play alone against his opponent, in which case his partner places his hand face downwards on the table and takes no further part in the play of that hand The ordering up of the trump, the taking up of the trump by the dealer, or the making of a fresh trump, all come under this rule

Rules on Revoking. If a player revokes and it is not discovered till the trick is turned over, the hand is abandoned as soon as the revoke is claimed and proved. Players must allow tricks to be examined at the end of the game when a claim for revoke is made, or they suffer the penalty of a revoke. If the revoke is discovered before the trick is turned the player's adversaries may take back their cards and play fresh ones if they wish, but the player's partner cannot. Exposed or cards dropped face upwards nust be played at the tirst opportunity. A player who holds the incorrect number of cards cannot claim a misdeal after the first trick has been played, nor can lie or his partner score that hand.

The players or partners who macie the trump and win threc tricks score one point. If they win five tricks they score 2 points. Failure to take threc tricks is euchre, and the opponents score 2 points. A lone hand scores 4 points for five tricks; one point lor three or four tricks; and his opponents 2 points if he is euchred. Two points are scored by a player's opponents for a revoke, and 4 points by lone hand if his adversaries revoke. The game is 5,7 or 10 points up as may be agreed upon by the players. In three-handed euchre the maker of the trump plays against the other two players. He scores 3 points for a fivetrick win, and one point for three or four tricks, and loses 2 points to each of his opponents for euchre.

EUGENOL. This is a colourless oily liquid smelling like oil of cloves, of which it is the chief constituent. It is strongly antiseptic and is not poisonous. When applied to mucous membranes it diminishes sensation. Eugenol makes a useful application in neuralgia and toothache, and is much used in dentistry. Eugenol may also be used to relicve itching, 10 grains in 1 oz . of lanoline.

EUONYMUS. This is a group of hardy evergreen and leaf losing shrubs, suitable for various purposes in the garden. Euonymus japonious is a well known hedge shrub, which is particularly useful in seaside gardens, where it is less liable to be attacked by the magpie moth, which often disfigures euonymus hedges in inland gardens. Euonymus radicans and its variegated leaved variety are trailing shrubs which will thrive beneath trees and provide a uscful evergreen ground covering. The common spindle tree (Euonymus europaeus) is very handsome in autumn when its brightly coloured fruits are at their best. Ali chrive in ordinary soil and are increased by cuttings set in a frame in late suminer, or by seeds sown out of doors. Euonymus radicans is increased by division in autumn. From the bark of this shrub a dried extract. known as euonymin, is made, and frequently employed in medicine as a purgative.


Euonymus. The trailing Veronica zaulicans which can be grown suc-
cessfully beneath large trees

EUPHORBIA or Spurge. The genus of plants of this name includes annuals found in gardens and hedgerows, e.g. E. peplus and the common sun spurge, some shrubs, and plants which resemble cactus. When cut they exude a milky juice. The Euphorbia peplus, also known as petty spurge or devil's milk, is useful in asthma. Pilulifera, found in Australia and S. America, also known as Australian snakc weed or cat's hair, is also used for asthma and for hay fever and coryza. Euphorbia obtained from an American species is a remedy for bronchitis.
In poisoning by a species of euphorbia there is vomiting and purging, the face becoming dusky. Give an emetic of mustard and water and a dose of castor oil, or, if the patient is voniting, encourage by draughts of tepid water. Thereaiter give demulcent drinks, thin arrowroot, etc. Keep the patient warni and if breathing cesses resort to artificial respiration. See Poisoning.

EUSOL. The compound solution of hydrochlorous acid known as Eusol is an antiseptic Gluid made by mixing bleaching powder and boracic acid together in water. It loses its strength fairly rapidly, especially in hot weather. It will be found useful in most conditions where an antiseptio lotion is necessary. It is too irritating for the eyes, though it may be sprayed on the thront.
Dakin's solution is a similar preparation and keeps better. It is prepared in two strengths. The stronger will keep for a month and should be diluted with six parts of water before used; the weaker is not suitable for use after a wcek. All these solutions can be obtained freshly made up from a chemist. See Antiseptic.


Eustac̃blan Tube. Diagram showing anatomy of passnges running from anatomy of passages running
ear to
nose and throat

EUSTACHIAN TUBE
tubes are narrow passages about 1 l in. long, leading from the back of the throat near the posterior opening of the nose into the cavity of the middle ear. Each tube is lined with a delicate mucous membrane, and in health is always opened in swallowing, allowing the free passage of air into the middle ear cavity. The importance of this is that it allows the air pressure in the middle ear cavity to keep the same as that outside the car drum, and thus a free movement of the latter is kept.

Sometimes in catarrh of the nose and throat the catarrh spreads along the Eustachian tubes, blocking it up and so preventing the frec entrance of air to the middle ear. Partial deafness and buzzing sounds in the car are frequently due to this cause. See Ear.

EVENING DRESS. Setting aside court dress, which is a matter of uniform or regulation costume, evening dress for men resolves itself into a well-cut dress suit and a dinner jacket suit. The swallowtail coat and white tie arc worn for the formal house or restaurant dinner, theatre or evening party. Either a white or black waistcoat is permissible, though the former gives a smarter, brighter appearance to the wearer. Tlie dinner jacket, always with black bow tie, is worn for informal dress at home or out. It frequently makes its appearance now at smaller dances,
is usual in the country house when a dinner party is not being given, at bridge partics, and for quiet theatre-going occasions.

When dining with formal acquaintances it is best to wear full evening dress if in doubt as to what is expected. Where the invitation is received through the post well in advance of the date of the party it is usually a sign that it will be a formal one, and require the regulation swallow-tails. For outdoor wear in large towns a black overcont, crush hat, and white silk scarf are correct with evening dress.

EVENING PARTY. The formal evening party is often merely a reception, begiming about 9.30 and going on till after midnight. It may follow a dinner party to enable a larger circle of the hostess's acquaintances to meet some distinguished person in whose honour the evening's entertainment is given. In this case, those who are invited arrive at any moment within the time limits and stay as long as they wish, in just the same way as at an afternoon At Home. On the other hand, should there be a special fenture, such as music, bridgc, roulette, cinema sliow or lecture, it is usual to put this on the invitation so that the guests may arrive at the hour stated. Dancing also, if intended to form the staple attraction, would be mentioned. Eyening dress is the rulc.

For a mixed party includ. ing children, which might be given at Christmas or for a birthday, games are often introduced, card and conjuring tricks are popular if well donc, charades are a never-failing attraction when thought out beforehand and dressing facilities are arranged, while suoh games as clumps and musical chairs have a perennial appeal. In the country the parties of such a descrip tion often start early in the evening.

For light refreshments or suppers at all these entertainments selections from the saine kinds of food are served; sandwiches in all their varietics, meat jellies, mayonnaises, eggs or prawns in aspic, every sort of galantine, terrine, pie, cold sweet, savoury and ice. In the winter hot soups, served in cups, and in the summer iced drinks are in special demand. Iced drinks and ices should be available throughout the evening, and where there is no staff to distribute them the guests should be asked to help themselves to refreshments.

Informal Partics. Some hostesses specialise in small Sunday evening parties, only inviting those who are likely to enjoy each other's society, and without any formality. It is usual to serve a sit-down or help-yourself supper about eight o'clock at this type of party, and evening dress would be optional.

Informal after-dinner parties are useful methods of entertainment where accommodation is limited, and give opportunity for introducing people whom one is anxious should meet each other: In such cases the invitation may be by telephone or sont in a friendly note, asking the prospective gucst to come in after dinner on such and such an evening.

Nothing elaborate in the way of refreshments is needed. Usually coffee is hancled round as soon as the company is assembled, and liqueurs may be offered at the same time. Fruit. cakes and cocktails or other drinks may be offered during the course of the ovening.

Entertainment during such an evening can take the form of cards, music, or merely conversation, according to the tastes and talents of the guests. If any of the guests can contribute items, a cabaret performance is devised, the room for dancing can be oleared
except for chairs, small tables set round the walls, and the necessary piano.

For $n$ more important musical evening a concert may be arranged either to introduce talent or for a charity. If for the latter purpose, the preliminary work involved in getting up a concert includes some advertisement of the forthcoming event in the local newspapers, by the distribution of handbills among residents and for exhibition in shopwindows, arranging and numbering the seats, and providing tickets and programmes. See Bridge Party: Cocktail Party; Dinner; Thentricals.

EVENING PRIMROSE. Some of the evening primroses are perennial, but others are biennial. The latter perish after they have flowered, and must be raised from seed every year to ensure an annual display of bloom ; the perennials live on from year to year. The common evening primrose, Oenothera biennis, of which the flowers do not open during the daytime, soon becomes a weed in gardens, for it sows itself freely. It is not noarly so attractive as some of the perennial kinds, although useful for odd comers and in the shrubbery

The best of the peremnials is Oenothera Iruticosa or Fraseri; this is a splendid border plant, 18 inches to 24 inches high, which bears bright yellow flowers that are open during the daytime. Speciosa, 2 feet, has beautiful white flowers, and missouriensis, $\AA$ trailing plant for the rock garden, has large yellow blooms. The new Oenothera trichocalyx, " feet high, with


Evening Primrose, the fowers of which are closed during the day and open in the evening white flowers, blooms in summer from seeds sown in spring under glass.

The even. ing primroses suitable for planting in bord ers
flourish in ordinary soil; missouriensis thrives best in well-drained sandy loam. The perennials can be propagated by division of the clumps in autumn or spring, or by sowing seeds out of doors or in boxes of soil in a frame in April-May.

There are several annual evening primroses, of which the most striking arc taraxacifolia, blush, 6 to 8 inches high; rosea, rose colour, 0 to 8 inches; and bistorta Veitchii, yellow and crimson, 12 inches. The two firat named are hardy anmmals to sow out of doors in April; the last should he sown under glass in March.

EVERGREEN. The term is applied to the innumerable trees, shrubs and flowers which retain their leaves all the year round, instead of shedding them in the autumn, as deciduous or summer leafing shrubs do. With the exception of the holly, box, and some varieties of the oak, there are few evergreen native treos, but notable instances of other popular cvergreens are to be found in the laurel, privet, ivy, and rhododendron See Andromeda; Aspidistra; Bouvardia; Box; Butcher's Broum ; Ceanothus; Ivy, etc.

EVERLASTING FLOWER. The socalled everlasting flowers are uscful in the garden during the suminer months and for room decoration in the autumn and winter. If they are required for use in winter they should be cut during dry weather before the blooms are fully expanded; after having been set out in a cool room to dry they should


Evarlasting Flower. One of the everlasting fowers, Eelichrysum, which flowers in summer and may be dried for winter decoration
be bunched and hung, Howers downwards, indoors until required for vases.
Those chiefly groun are hardy and half hardy annuals-helichrysum, acroclinium and rhodanthe. Helichrysum is a hardy annual, and should be sown out of doors in early April where the plants are to grow; it reaches a height of 2 feet or more and bears large blooms in crimson, orange, yellow and other colours. Rhodanthe and acroclinium, with rose or white flowers, are of slender growth and reach a height of about 12 inches; they mnay be raised from szeds sown out of doors in April-May or under glass in March: they are often grown in pots for the summer decoration of the greenhousc.
EVERLASTING PEA. This is a useful climbing summer-Howering plant for covering a trellis, porch or other support. They are hardy, thrive in ordinary soil and reach a height of 6 to 8 feet. The hest way of raising a stock is to sow seeds in a box of soil in a frame in spring or out of doors in April. The commonest kind, Lathyrus latifolius, bears rose-red flowers; the variety White Pearl is more attractive. Lathyrus grandiflorus has rose crimson flowers.

EWER. This name is given to a wide spouted jug made in earthenware and glass The early ewers were used for holding water to pour over the hands after meals. These werc usually of silver or other metal, and some were made with a basin to match. See Crockery; Cream Jug; Jug.

EXCHANGE: Of Goods. Many persons wish, instead of selling and buying, to exchange one article for which they have no use for one which they want. Furniture dealers, especially those who sell antique and second-hand goods, frequently take one article in payment or part payment for another. I popular way of bringing about an exchange is to advertise in one of the newspapers, say the "Daily Telegraph" The articles to be exchanged should be described as clearly as possible in the limited space available, and it should be stated when they can be seen.
EXECUTOR: His Duties. An executor is a person who is appointed by a will to see that it is carried out; on him devolves the duties of seeing that the testator's debts are paid, and his property disposed of as he has directed. It is well to appoint two executors in a will, for one may die before the testator or immediately after him, and before the duties have been completely carried out. If the estate is a small one, and can be wound up quickly, it is bctter to appoint two in the alternative, thus: "I appoint as executor of this my will John Simith, or if he dies before me or refuses to act then I appoint

William Jones." It is best for a testator to nominate as executors penple who are younger than himself.

An executor's first duty is to prove the will, either at Somerset House or at one of the local Probate Registries. It is wise to employ a solicitor to do this The next duty is to collect the property. All dehts should be got in and all stocks and shares transferred to the executor's name, at any rate so far as may be necessary for him to realize enough to piay the debts and legacies. The first debts to be paid are the funeral and testamentary expenses incurred by the exccutor, and next the debts owing by the accused in his lifetime; and after that, when all debts are discharged, the executor begins to pay legacies, and to distrihute the property.
An executor should be diligent in collecting debts-that is, he should not delay so long that the debt becomea statute barred. Debts should be paid in the folloiving order
(1) Funcral expenses and expenses of proving will and getting in property
(2) Debts preferred by special statutes
(3) Rates and taxes and wages to certain servants ; compensatlon due under Workmen's Compensation Act. contributiony to msurance Acts.
Next. the ordinary debts must be paid, but cerfain debts are deferred until all others have been met, e.g. money lent to wife by husband, or vice on terna that hender should receive a inte of interest on ternis wiat lender showlile receive a rate of
If the deceased left plenty of assets to pay all his debts, it does not matter in what order the executor pays them; but if there is not enough to go round, the executor should adhere strictly to the order given above.

As between the people to whom money or property has been left by the will, the executor often has to make a choice; he has to take some of the property to pay debts, thus leaving not cnough to pay all the legatees. He must apply thic assets towards payment of debts in this order
(1) Pronerty not disposed of by will, sublect o a fund ior pecuniary legacios
(2) Property included in a residuary gift, subject (3) Pronerty specifcally appropriatel for pay. nent of debts.
(4) Property disposed of subject to a charge for payment of debts.
(5) Any fund for necuniary legacies
(6) Property specillcally disposed of in will.
(7) Property uppointed by will under a general nower of appointment.

An exccutor is liable personally to the estate if he wilfully neglects to collect or realize the property. He is personally liable to a creditor if he admits assets by paying a debtor of an inferior class when that creditor is of a superior class. He may be liable if he personally promises a creditor to pay his debt; but the promise cannot be enforced unless it is in writing signed by the executor or his agent.

If the executor gives notice to creditors by means of advertisement in certain newspapers calling for claims, he is not liable for debts notified after that time.

Occasionally a legacy is bequeathed to someone who cannot he found, e.g. a melative who has emigrated, address unknown. In such a case the executor would be well advised to pay the money into the chancery division of the high court, and then await the claim. See Death; Estate Duty ; Legacy ; Will.

EXERCISE. I healthy child rejoices in exercising its muscles, and the more vigorously the better. Children who are cooped up in cramped and badly ventilated rooms are prone to develop rickets. Their bones become soft, bend easily, giving rise to mis-shapen chests, bandy legs and other bony deformities. A large number of girls, mostly amongst the poorer classes, show a faulty development, the reason being that they are very frequently kept indoors for household duties.

Games, therefore, are the natural right of the young, being necessary to their growth.

It a child is indispused for games by lack of bodily vigour, attention should be given to its health, and suitable gentle cxercise should be selected, to lead yradually to something more strenuous In adolescence games provide a safe means whereby a superabundance of energy may be expended. Apart from their uselulnces in developing the body, games should be encouraged as a means of developing character and of enabling the child to come into casy relationship with his fellows

Nor is exercise less necessary for those whose hodily development is complete. The sedentary worker who neglects exercise becomes stale, his vigour is diminished, he suffers from a lack of elasticity, and his digestion is apt to be sluggish. If he also lives well in the way of food and drink, these evils will be intensified and he may become obese or gouty, suffering from arterial disease or a combination of these, and break up comparatively early in life. Exercise improves the tone, the size, and the firmness of the muscles, strengthens the heart and lessens its work, increases the excretion of waste products by the lungs, the skin, the kidneys and the bowels, and so makes possible a free, untrammelled activitv of all the hodv tissues
Nothing call compensate Wholly lor the lack of exercise in the open air, but in the case of town dwellers whose opportunities in this respect are limited, an hour once or twice a week in a well-appointed gymnasium will be of the utmost value, or carefully chosen exercises may be done regularly at home in a well-ventilated bedroom Exercises involving much strain should not be undertaken by those whose hearts are weat, or who are much older than 30

Walking provides good (excrise it one walks sufficiently fast, and more particularly if the wall: is uphill; but as the value of exercise is largely enhanced by the extent to which interest is excited, the superior claims of golf are apparent, apart from the additional exercise to the arms For the same reason any ot her suitable game should be pla yed whenever it is at all possible to do so. See Beauty Culture; Breathing: Diet; Drill: Figure

EXHAUST : From the Engine. This word is used for the waste steam or burn gases ejected from an engine, and also for the exhaust piping. In internal combuation engines the waste gases anc expelled through the exhaust valves and the exhaust port into the exhaust pipe. Most motor cycles are provided with a device known as an exhaust lifter, usually controlled from the left-hand side of the handlebars. This raises the exhaust valve when required, releases the compression of the engine and prevents firing

The fumes from the exhaust of a petrol engine may contain the highly poisonous gas known as carbon monoxide, produced by imperfect combustion of petrol in the cylinders.

If the engine is allowed to run while the ar is standing in the garage, the extaust pipe must be connected to the outer air, and the buikl iny ventilated by opening doors and windows
EXOPHTHALMIC GOITRE. Over action of the thyroid gland, which is situated in the neck just below the Adam's apple, is the cause of a clisease to which the name exophthalnic goitre has been given. It may be contiasted with myxoedema, which is due to under-action of the same gland. Its ohief characteristics are prominence of the eyeballs, enlargement of the thyroid gland, rapid heart action, and a continuous tine tremor. The disease is more common among women, and it is possible that worry or excitement may help to bring it on

The symptoms are very gradual The heart brat is quickened and may range between 100 and 120 instead of the normal 65 to 75. The action is abnormally forcible and the
vessels in the neck, the pulses at the wrists and in front of the ears, eto., become readily visible. As a rule thr patient loses ilesh and becomes anaemic.

Everything should be done to secuie mental as well as physical rest, and in the case of a town-dweller slie should be sent if possible to live in the country for a time, avoiding excitement and getting plenty of fresh air and plain food. Ten hours' sleep is not ton much in suoh cases. The drugs mostly given are iodine, arsenic, digitalis, belladonna, and the bromides. Attacks of diarrhoen and vomiting should at once be brought to the notice of the physician. The application of X-rays has proved a successful cure in many cases of exophthalmic goitre In severe cases an operation is undertaken

EXPECTORANT. A ding used to piremote rasier expulsion of expectoration fion, the air passages in disease by altering the character of the secretion or otherwise is termed an expectorant. Among these are sodium or potassinm bicarbonate, a mmonium chloride, ammonium carbonate, iodide ol potassium, ipecacuanha, squills, volatile oils (e.g. camphor), balsams (c.g. compound tincture of benzoin), and a variety of others Some expectorants are depressant to the heart, e.g. pecacuanha and antimony, and care has to be talien in giving them to the aged and debilitated, for whoni stimulating substances like ammoniun carbonate, ammoniacum, and camphor arc preferable

The following is a typica. expectorant mixture such as might be prescribed in a case of chronic bronclitis. The dose is 2 tablespoonfuls cvery $\&$ loours


EXPECTORATION or Sputum. Material coughed up or got rid of by spitting may come from the mouth, nosc, throat, air passages, or lungs A clear, sticky sputum, like white of eos, occurs in the carly stages of bronchitis, pharyngitis, and of lung conditions such as phthisis and pneumonia. In chronic catarrhal conditions of the nose and throat greenish. grey, sticky material is hawked up in "clearing the throat," frequently stippled with black specis due to inhaled dust. A brownish or yellowish-red sticky aputum constitutes the rusty sputum of developed preumonia
Streaks of blood in the aputum may come from the mouth in sjongy conditions of the gums, etc., the throat from adenoids, etc., or the air passages generally when inllamed When in larger or sinaller quantities of pure or ahmost pure blood, it is termed hamoptysis Thic commonest cause is consumption. Theblood is coughed up, it is bright red and is mixed with air these circumstances dis. tinguishing it from haema. temesis, or blood from the stomach, which is vomited and is usually dark in colon' and intermixed with food.
In disenses in which there is expectoration this should not be received in a hand kerchief, otherwise it dries and is shaken off into the air, carrying with it the disease microbes. In cascs of consumption a pocket spittoon or spitting bottle. is always insisted on for this reason, but there are othere than consumptives whose expectoration is dangerous, and it is their duty also to use a bottle and protect their neighbours IVithilu

doors the sputum may be received in pieces of paper, which are immediately burnt, or if they are received in a receptacle this should contain some antiseptic solution, e.g. of lysol See Bronchitis; Pneumonia, etc.

EXPOSURE : In Photography. Corred exposure is the key to success in all forms of photography and without it цood results cannot possibly be obtained The camera cannot be treated as an instrument in which only a button has to be pressed and the machine does the rest. The simple roll film camera with a lens of an aperture of 18 ol 111 (U.S numbers 4 or 8 or Kodak No. 1 fol V.P.K.) will give satisfactory results for most subjects on sunny days in midsummer without. any special consideration of exposure times, for it is designed to do this, but at other times of the year or on dull days and with certain kinds of subjects a knowledge of the conditions to be observed is absolutely essential.

There are four conditions which govern the exposure: The actinic, or photographic, value of the light; the sensitiveness, or speed, of the plate or film used; the lind of subject being photographed; the aperture, or speed, at which the lens works. Taking the last condition first, it will be assumed in this article that a lens worling at an aperture of 18 (as explained under F Numbers) is used For a lens of $f 11$, such as is found on the ordinary V.I'K and other eheap roll film cameras. all the calculations must be doubled
The actinic value of the light varics very considerably according to weather conditions, time of day and time of year. It does not necessarily follow that because the light. appears to be bright it is good in the photographic sense; for what has to be considered is not the appearance of the light to the eye, but its chenical action on the sensitive film Nome forms of light which are hardly perceptible to the eyc have very definite action on the photograjhic plate. Again, winter sunshine, which may appenr to be atrong. is photographically weak, and even on an August day the light is not quite so stiong in the alternoon as it is in the morning.
Small variations in the chemical strengtl, of the light do not matter, because the latitude allowed by modern filns peimits exposuras which inay be two or three times the thenretically correct figure without impairing the result. In fact, for the amateur working with a roll filn camera it may be broadly atated that the one thing he has to guard against is under-exposure; he is hardly likely in taking snapshots to over expose.

The second consideration, the speed of the plate or tilm used, is one that will give the amateur very little trouble if he will adopt the plan of finding the plate or film that suits his purpose best and sticking to it Deternining the speed of a plate is a very complex matter. Not only do different plates vary in speed or sensitiveness in ways which are not comparative in spite of the so-calledspecd numbers marked on the hoxes, but even different batches of the same plate will vary. Experienced workers in photography. therefore, find that the best results are ohtained if they conline themselves, as far as possible, to one brand of plates or films whose speed they know.

As to the third consider. ation, the kind of subject that is photographed, the novice soon learns that a white object requires n
shorter exposure than a dark ona He does not always reoognize that darkneas of colour is not the same as darkness in lighting, and that a white object poorly lighted may pactually require a longer exposure than a dark objeot well lighted.

Guides to the exposure required for various objects under different conditions may be found in elaborate tables in photographic handbooks calculated according to time of year, olimatio conditions and speed of plates or films.

The most sure and satisfactory method of calculating exposure is probably to use an exposure meter, such as Watkin's Bee Meter. These exposure meters depend upon the time taken for a piece of sensitive paper to become coloured. This is seen in the half-circle A at the bottom of the illustration, alongside of which is a standard tint $B$. The time taken by the sensitive paper to acquire the colour of the standard tint varies with the photographic strength of the light. Instructions for its use are given with the meter.

It provides an accurate method of determining the strength of the light under the conditions actually met with at the time of making the exposure.

A simple form is supplied for purely snap. shot work which shows whether the light is good enough for an ordinary snapshot, i.e. the exposure of about $1 / 25$ th of a second, which the shutters in the cheaper cameras give. If the sensitive paper in the meter docs not darken properly in the minimum time stated it indicates that it is practically useless to attempt to take a snapshot.

Cameras with single speed shutters marked as working at $1 / 25$ th sec. usually give an exposure of about $1 / 1 \mathrm{j}$ th to $1 / 20$ th sec., which is about the longest exposure that can safely be given with the camera held in the hand if mevement is not to show itself in the picture. Cheaper shutters marked as giving an exposure of 100 th of a second generally give about $1 / 50$ th. These variations are all to the good, as they result in longer and better exposures.
Longer exposures can easily be given. Rest the camera on a fence, a gate post or the top of a chair, and by setting the shutter to "bulb" give short-time exposures. Thus, with the shutter set at bulb the release is pressed and let go again instantly. If this is done as quickly as possible without shaking the camera an exposure of about a $t \mathrm{sec}$. will have been given. For 1 sec. do the same with a perceptible pause between pressing the release and letting it go, or by pressing the release while the words "one, two" are said sharply. Doing the same while saying sharply "one, two, three, four" will give a 1 sec. exposure. See Developing; Film: Plate: Snapshot.

EXPRESS DELIVERY. Packages and letters can be sent from most post offices for express delivery by special messenger. The charge is 6 d . for each mile or part of a mile, and a ld. for each package in addition to the first up to a maximum of ten. Packages over 1 lb. in weight pay a further 3d. By this service live animals, liquids, and loose cash can be sent and persons conducted to and from any given place. The messenger can take back an inland telegram without extra charge.

Packages may also be posted and then sent by special messenger at the charges mentioned from the post office to the address thereon, instead of waiting for the ordinary postal delivery. Additional fees are charged if messengers are kept waiting for more than 10 min . These range from 2 d . upwards.

On payment of 3d. to a servant of any of the olief railways, in addition to postage at the ordinary rate, letters not exceeding 2 oz . will be forwarded, and paseed on from one
company to another at a junction, by the next available train or steamship, to be called for at the station to which the letter is addressed, or to be tranaferred to the neareat. letter bux for postal delivery. The letter may be taken to a passenger atation of the railway company, or sent there by express delivery on week days. It may also be forwarded after conveyance by train by express service.

ESTIRACT. Meat extracts are obtained from lean meat by various processes, which include the use of heat. They contain a very small amount of nutritive material, their chief constituents being extractives, substances which result from the breaking down of proteids, and mineral salts. They act as
stimulanta and help to remove fatigue. They also improve the appetite and digestion, so that other food which is taken at the same time proves of more use to the body. Meat extracts are useful flavouring agenta. Extract is sold in bottles of various sizes, and with a little hot water, soup or broth may be quickly prepared.

Malt extracts contain a large percentage of carbohydrates, which are readily dissolved and digested, and one also finds in them active diastase, the ferment which converts starch into sugar. Thus they provide an additional and suitable supply of carbohydrate, and also assist in the digestion of starchy food. See Beef Tea; Food, eta

## The Eyes and Their Care <br> Hints on the Preservation of the Eyesight

The subject of sight is dealt with in this Encyclopedia under a number of headings, e.g. Eyeglass; Sight
Teating ; Spectacles. See also the entries on Astigmatism; Blind; Cataract and other eye afiections
Of all the organs of the human body the is ushered in with intense pain in the eyeeye is the most delicate in structure, the most ball, frequently radiating around the eye, and susceptible of injury by disease, accident or sometimes accompanied by headache and overstrain, and any affliction of this organ calls for expert treatment at the earliest possible moment. In no case is this more essential than in ophthalmia of the newly-born, a disease whioh makes its appearanco within a day or two after birth and is the cause of the great majority of cases of blindness. It is characterised by the discharge of pus from the eyes; any such discharge calls at once for skilled attention if total blindness is to be provented.
Visual Defects in Children. During child. hood various faults of vision, such as shortsight, long-sight, squint and astigmatism, may make their appearance, and parents and guardians should be on the alert to have the cyes of children examined at once if they observe any signs of visual defect. The child suffering from short-sight will hold objects which he wishes to see nearer to his eyes than is normal and cannot identify objects that are at a distance. The child who is long-sighted will complain of pains in the eyes and of headache when read. ing or writing, due to over strain of those muscles by which the eyes are focuseed on near objeota. In all sucl cases glassos are essential.

Squint is most frequently due to over-atrain of the fooussing muscles, and is a sign either of weakness of these muscles or of long. sightedness. Astigmatism is generally caused by irregularity in the curvature of the front of the eyeball, and demands the provision of speoially ground glasses. Its presence may be suspected where the subject complains of eye strain or of headache, especially after a visit to a kinema, theatre, etc.

Eye Changes in the Elderly. After middlo age difficulty niay be experienced in viewing objeots clearly which are near at hand. This is due to hardening of the internal structures of the eyc and weakness of the muscles of focussing, and assistance inust be rendered by glasses, which will require to be strengthened as the disability increases with advancing years. If it is found necessary to obtain stronger glasses more frequently than every five years, and especially if at night-time street lights or candles are seen surrounded by rainbow-coloured rings, it is possible that the subject is suffering from a dangerous disease known as glaucoma, which, even in its chronic form, demands immediate surgical treatment. When acute, glaucoma
 vomiting. Its onset, therefore, is liable to be mistaken for a bilious attack, and valu. able time wasted in securing treatment. In all cases where glasses are required, they should only be obtained on the prescription of a qualified oculist.

In order to a void the occurrence or aggravation of visual defects, it is of importance that all close work should be done in a good light. Excessive light is equally harmful. In reading or writing, a prosition should be adopted in which the source of light is, if possible, behind and from the left. This is particularly inportant at the school age. Undue stooping when writing should be avoided as tending to increase tension within the eyeballs, and therefore to aggravate any existing predisposition towards short sight. For the same reason tight neckwear and excessive physical exercises may be harmful. Reading in bed is injurious, and children should never indulge in it.

Diseases and Injuries. A stye is a small abscess which forms at the root of an eyelash. It should be treated by pulling out the eyelash involved, and by bathing the eye frequently with a hot lotion made by dissolving a teaspoonful of common salt in a pint of water which has been boiled. This lotion is also useful for all simple intlam. matory diseases of the eyelids. Chronic inflamniation, however, demands drastic treatment by an oculist, as the condition may be due to trachoma, a condition which is dangerous alike to the patient, owing to the possibility of blindness supervening, as well as to others who may become infected.

Soiled towels in public lavatories should never be used to dry the eyes, as the infection of trachonue, as well as of many other conlagious diseases. nay readily be conveyed by such means.
To prevent the sealing of the lids which is so frequent in inflamed eyes, and does harm by imprisoning the discharges, the eyes should be well smeared at bedtime with a salve or ointment. Useful ointments are 10 grains of boracic acid powder in 1 oz . of soft paraffin or vaseline, and equal parts of yellow oxide of mercury ointment and vaseline. A little glass rod with a rounded end is a convenient instrument to use for applying. The lower eyelid is drawn down and some ointment, picked up on the end of the rod, is put on its
inner surface. The patient closes his eye, part of the day For such persons eyeglasses and by gently rubbing over the surface of the lids the ointment is spread over the eyeball.
A lotion or collyrium (q.v.) should always be used comfortably warm. It may be applied by soaking a piece of cotton wool in the lotion and squeezing this out into the eye, or by means of an eyebath (see below).

Foreign bodies in the eyes may usually be removed by brushing with a camel-hair pencil, or the moistened corner of a pocket handkerchief. Il simple measures fail, instil a drop of castor oil into the eyc, place a soft pad, as of cotton wool, over the closed eyelids and secure this in position by applying a bandage lightly. A doctor sliould be consulted without delay.

Wounds of the eyeball are extremely dangerous, no matter how trivial they may appear, as they may be productive of blindness. A blow on the eye, as in boxing, may cause serious internal injury even though no external signs aro visible. It is of importance $\hat{\omega}$ remember that failing vision may be the first symptom of grave diseases, such, for example, as Bright's disease or diabetes.

Hygienic Measures. When in perfect health, the whites of the eyes should be of a clear bluish-white. Redness shows that the eye is suffering from a slight cold or a strain. Give the cyes a warm boric lotion bath three or four times a day, using a teaspoonful of boric acid powder to every $\frac{1}{2}$ pint of hot water. To remove a yellowish tint from the whites of the cyes, drink a glass of hot water to which the unsweetened juice of a lemon has been added. In all treatment with bandages and pads, medicated cotton wool and butter muslin are the most hygienic materials to use, since they can be thrown away. Spongen should never be used unless they are certain to be deatruyed immediately afterwards.

Pcople who write or read a great deal often suffer from eye strain This may be relieved by bathing the eyes in a solution of salt and water, a taasponnful of salt and a quart of water. Pure cold water is in itself a good eye wash, or a woak solution of zinc sulphate will be made up by any chemist and is very good for tired eyea After extra fatigue a strip of lint, nuistened with water and laid on each eye and kept in place by a bandage for about ten minutes, is very helpful.

An eyebath is a convenient appliance for washing the eyes. This is a little vessel of glass or some other matcrial, with its edge shaped to tit into the socket of the eyo. It is filled with the lotion and the patient bends forward the head and applies the edge of the bath firmly round the cye. He then throws his head back and opens the eye widely. The lotion is kept in contact with the eye for a minute or two. The cleansing may be facilitated by opening and closing the eye several times while the bath is in position.
EYEBROW. If eyebrows aro too thin a little red vaseline or cocoa-butter can be applied nightly with a small eyebrow brush, which is like a minute toothbrush in form.
In applying any strengthening lotion care must be taken not to encourage the growth of hairs between the eyebrows. Some eyebrows have a tendency to meet over the nose. The use of tweezers keeps the line of the brows in good trim, unless the hairs are abnormally coarse, when electrolysis may be employed by a good operator. Brushing the eycbrows with a clean brush lightly smeared with a little brilliantine each morning tends to darken thom and give them a silky appearance. It is possible to have the cyebrows and lashes tinted in any desired shade of brown or black See Beauty Culture; Face.
EYEGLASS. Eyeglasses are usually worn by persons who do not require glasses constantly, but only for a particular purpose or for
are perhnps more suitable than spectacles.
Excluding the single eyeglass, or monocle. there is not a great dcal of variety in the eyeglasses worn by men and women in ordinary life. There are slight variations in tho nature and strongth of the spring that keeps the glasses in position on the nose and in the shape of the bridge that unites the two glasses: there are glasses with rims and glasses without, and there are glasses that fold up and glasses that do not, but that is practically all. The frames, however, vary in quality and material, ranging from the cheaper ones of nickel or steel to the expensive ones of solid gold. Silver is rarely used for these frames, but rolled gold is frequently seen. Some persons have eyeglasses with horn or tortoiseshell frames. Some wear a cord to attach the eyeglass to some part of the person: others prefer to carry them in a case.

The eyoglass has usually a rim of metal round the glass proper, but many persons wear glasses without rims, and for these certain advantages are claimed. Their weight, it is said, is about one half that of ordinary eyeglasecs: they are, when properly fitted, almost invisible, and they have no rims to interfere with the vision if they get slightly out of place.
The Frames. The frames of eyeglasses are often inade in other inaterial than metal, and those fashioned of tortoiseshell or horn are not easily repaired. When the nature of the damage permits, the fracture can be mended with Canada balsam, using this as a cement. The parts are held together with finc bindling wire, or with a strong paper-clip of the John Bull type, and left for 24 hours to set hard.

A common fault with eyeglasses is for the frames to become distortod and forced out of they will not be admired if blemished by surface defects. Correct diet and exercise are essential factors, but local treatments are also integral to the preservation of a fine skin. It is quite easy to call to mind inany healthy women and girls who do not prossess beautiful complexions for the simple reason that they take no care of them.
On the other hand, the athletio movement of the past twenty years has undoubtedly improved the akin, eyes and hair of the sex in general. The sports girl breat hes more deeply, and so possesses a bigger supply of oxygen in her blood, expressed in greater physical beauty, owing to her better circulation. This combined with saner views on diet and fresh air has also lessened digestive troubles and constipation which have a directly adverse effect on the facial appearance.

A frequent cause of a sallow, wilted look is sinıply the neglect of drinking sufficient water. The normal body requires three or four pints a day, some of which is taken in food. A glassful should be drunk at night and in the morning. A free use of water combined with plenty of fruit, green vegetables, a nourishing diet, fresh air and the regular performance of breathing exercises will remove premature hollows under the eyes and round any unbeconning facial angles.

Facial Contour. Superfluous flesh in a youthful face will often respond quickly to correct diet and massage, when the desire to reduce is strong enough to make certain sacrifices, such as cutting down sweets, pastries,
line. In bending the parts and bringing them into place, keep the fingers of each hand close together with the bent part of the frame between them, thus localizing the strain. If a small pair of pliers is used, remember not to exert ton much pressure and smash the glasses. When viewed in plan the lenses should be in lino. and likewise when viewed from the front. The plaquets, or nose grips, are often faced with cork, and this can be cleaned with petrol, or new pieces cut from a good quality bottle cork and cemented in place. See that the plaquets are in line and at equal angles to a vertical centro line.

Eyeglasses with astigmatic clips, or those in which a spring draws the two parts together, will benefit by cleansing with petrol, and the spring be retensioned by drawing it through the fingers and thus increasing its length. Replacement parts are generally obtainable from manufacturing opticians See Sight; Spectacles

EYELASH. The beauty of the eye depends to a great extent upon the oyelashes. They should be as dark or a sharle or two darker than the hair. They can be printed at night with castor oil applied with a camel's hair brush. If tho eyelashes are inclined to be very straight they should be gently brushed upwarl over an orange stick laid along the erlge of the upper cyelid. The use of a slightly astringent eyc lotion containing witch hazel tightens the eyclids and prevents fall of the lashes.

EYELET. An eyelet is a small round hole in cloth, sailcloth, etc., which is worked like a buttonhole for the passage of a lace, ring or rope. In needlowork it is best known as the open hole which is used in various forms of einbroidery for working berries and similar small round parts of the design. See Embroidery : Stilctto.

## Face: Contour and Skin Treatment

## The Use of Simple Cosmetics and Massage

## For related information see the articles Beauty Culture: Diet; Hair; Neck; Skin. Consult also the entries Powder; Soap, etc.

A good facial contour ranks next to a fine and not giving way to laziness. The muscles complexion in creating a general impression which preserve the contour of the face must of beauty. The skin is of first importance, be kept healthy because on their vitality because no matter how handsome the features mature good looks depend.

The upright carriage of the head has a good iffect on these muscles. Exercises to assist in preserving the contour of the jaw are
given in the entry on Neck. The pursing of the lips as if for whistling, when exhaling during breathing exercises, smoothes out lines from nostrils to the corners of the mouth and helps to correct a sagging tendency towards the points of the jaw. A simple little exercise which wards off a double chin is to protrude the lower lip and blow as if trying to blow away something from the tip of the nose.

The following hints are also useful for the preservation of the contour of the chin, the most important line of the facc. After applying a skin cream, smartly pat along under the chin with the back of the hand (or a rubber patter) for about two minutes to stimulate the muscles. After washing dab an astringent lotion coniposed of one part of toilet vinegar to two of rosewater, under the chin. A daily treatment which is raid to remove a double chin is to use an emollient cream and an astringent on alternate days with a chin strap which is worn for fifteen minutes. Soak a pad of cotton wool in the astringent and after kneading and patting the muscles, place this under the chin and keep it in position with the strap. The next day massage with a skin cream and wear the strap for the rame length of time.
Astringents and Creams. The face shoukd always be thoroughly cleansed before apply. ing an astringent or massage. A good method is to sifuceze a pad of cotton wool out of cold
water. sprinkle it with a lotion composed of 2 oz . extract of witch hazel and 10 oz . rose water, and then spread over it a cleansing cream, and with upward strokes of the pad thoroughly wash the face and neck. A pleasant cream for this purpose is made as follows :
Take $\frac{1}{2}$ oz each of white wax and sperma ceti and 4 oz white vaseline; melt together and pour into a heated bowl. Very gradually add 3 oz orange flower water and 1 oz . witch hazel, stirring all the time, and continue stirring until the emulsion is cold.

This way of cleansing the face is satisfactory during the day, after a journey, or exposura to wind and sun, or when the complexion is intolerant of soap and water. It may be used at night before an astringent or if any makeup has been applied to the skin during the day. The value of an astringent is that it braces the skin by closing relaxed pores, and it is essential that any foreign surface matter should be first removed. Nearly every skin benefits by washing daily with soap and water, massaging the lather over the face with both hands. A good rubbing with a turkish towel across the back of the neck and behind the ears stimulates the circulation after the final cold sponge in the morning.
There are many degrees of astringents, and discretion must be used in choice for the individual skin. (See Complexion.) Sponging in the morning with cold water to which a few drops of simple tincture of benzoin have been added is sufficient for the fresh complexion. The use of a complexion milk, after washing, containing benzoin and cucumber is suitable to most skins. It is not worth the trouble of procuring the many ingredients which go to the making up of these milks, when excellent preparations are on the market at a small cost

## For a Relaxed Skin

If $\frac{1}{2} \mathrm{oz}$. simple tincture benzoin is added to the 2 oz . witch hazel extract and the 10 oz . rosewater this makes an excellent mild astringent for dabbing on the face with cotton wool, and also for tired eyelids if a pad of cotton wool is squeezed out of cold water, soaked in the astringent, and laid on each eyelid for 20 minutes during a short rest. Should the facial condition be really flabby a stronger astringent is composed of 2 oz . toilet vinegar to 4 oz . rosewater. This can be used at night and an emollient applied afterwards to prevent undue dryness of the skin The patting movements with the pad of cotton wool moistened with an astringent stimulate the circulation and help the removal of waste matter before closing the pores. This process'toncs up the skin.
Lanolin is the basis of many so-called "skin foods." An inexpensive but satisfactory crearn is made by melting 2 oz hydrous lanolin with 2 oz . white vaseline and stirring in 1 oz . each of olive and almond oils, and 2 dr each boracic powder and zinc oleate. For anyone afraid that lanolin will encourage superfluous hair (used in such proportion it is quite unlikely to do so) a cream with a casein basis may be used. Casein is prepared from the albuminoid matter of milk, and a simple emollient is composed of 3 oz casein, 6 dr . buracic acid, 3 dr. cocoa butter. Occasional massage with olive oil may also be necessary to counteract dryness. This ail is soothing for treating temporary conditions of dry skin caused by exposure to wind and sun

For a sunburnt skin relief can be obtained by a piece of lint saturated in warm water to which a few drops of cloudy ammonia have been added, care being taken to keep the eyes closed while holding the lint to the scorched skin. To remove tan a mixture made of two parts peroxide of hydrogen, one part lemon juice, and one part rosewater can be applied to the face, after using the cleansing
cream, and allowed to dry on. If this treatmen should be too drastic at first, dilute the mixture with more rosewater. Freckles, which are pigmentary discolorations of the skin, are not unsightly unless they are ton numerous and deep in colour. They may be hidden, and to some extent the rays of the sun may be counteracted by the use of a calamine lotion and face powder.
The formula for calamine lotion is as follows : Prepared calamin, 6 dr . ; powdered oxide of zinc, 2 dr ; glycerin, $1 \frac{1}{2}$ or. ; rectified spirit of wine, $1 \frac{1}{2} \mathrm{oz}$.; elderflower water to make the lotion, up to 8 oz . This lotion deposits a fine powder. To keep it on the face of a child a soft muslin musk is necessary

The following ointment may be rubbed sparingly in at night, but should not he used for children. It produces a peeling of the skin which usually leads to the disappearance of the freckles. Mercury perchloride, 1 gr . powdered starch, 2 dr. ; powdered oxide of zinc, 2 dr . ; soft paraffin, 4 dr

The treatment for blackheads is described under that heading. The application of calamine lotion, after sponging the affected area with hot water, is useful for both this unhealthy state of the pores and for a spotty condition of the face.
Facial Packs. From earliest days of heauty culture, facial masks or packs have been used. These are said to embody cleansing and astringent properties Special mud and clay packs are variously recommended for clearing the skin and eliminating acidity. A simple and efficacious pack is made by placing a tablespoonful of fuller's earth in a cup and mixing with it sufficient rosewater and witch hazel lotion to make a thin paste. Oatmeal may be used as a pack mixed with buttermilk, which possesses whitening properties when it is applied to the skin. A facial mask which bleaches is made with almond meal mixed to a paste with the sunburn lotion containing peroxide, lemon juice and rosewater. Another pack is of half a cupful of cooked oatmeal into which 2 tablespoonfuls of milk and one of glycerin have been thoroughly stirred Yet another is of egg. The beaten white is first applied with a camel-hair brush and allowed to dry on the face. A second painting with the white is followed, when this is thoroughly dry, with the application of the beaten yolk. This egg mask and


Face Plate Contrivance invalumounting work to be turned across the forehead Toothache.
more cream is applied, and the chin and checlis arc lightly pinched with the cushions of the finger-tips. Then, with fingers placed on the cheekbones, the thumbs meeting under the chin should stroke upwards to meet the fingers with a firm pressure, returning lightly under the chin. Repeat this movement for two minutes. Next, stroke the finger tips from the point of the jaw past the corners of the mouth to the nose and very lightly across the closed eyelids to the roots of the hair and

Lines should be followed and not rubberd across. Should there be a vertical furrow between the brows, it may be stroked gently upwards. The cream must be very lightly patted in round the eyes with the third finget, as the slightest rubbing will stretch the sensitive skin there. After this the massage cream may be wiped off. If the massage is performed at night a little emollient may be left on round the eyes and along any deep lines; if during the daytime, the skin may be toned with a mild astringent before powdering.

FACEACHE. Pain occurs in the face in inflammatory and suppurative conditions, e.g. dermatitis, gumboil, mumps, etc., and the cause of the pain is indicated by the redness and swelling which are also present. In the absence of such plain indications, un explana tion for the pain should be sought for in clisease affecting the teeth, eyes, nose and the cavities leading from it, the car, etc., and in the general state of health of the patient, as anaemia, constipation, gout, hysteria, Heumatism, and other disorders frequently underlie the occurrence of pain. See Neuralgia

FACE PLATE. A face plate is a contrivance used on a turning lathe as a means of mounting work to be turned. It comprises a circular disk, generally of cast iron, with a projecting boss at the back. A hole is drilled through the centre and screwed to correspond with the size of the screw thread on the mandrel. The plate is, as a rule, provided with holes or slots through which bolts are passed, which, in conjunction with clamp plates, bolts, and nuts, are used to fasten the work to the face plate. See Chuck: Lathe.

FACING: In Dressmaking. This is the name given to a strip of material laid along the edge of a garment, either on the wrong side, for neatening and strengthening, when it is the other packs described are left on for an sometimes termed a "false hem," or else hour and then washed off with pure soap and on the right side, as an ornamentation, this warm water. Afterwards, a light facial mas- often being of a contrasting material. The sage with an emollient should be given. A name is also applied to the top layer of such thin muslin mask cut to the shape of the face portions of a garment as are made of double with eye-holes and tied on with ribbons is often used to keep these applications on theskin.
Helpful Massage. Some women are afraid of facial massage as they think it stretclics the skin. This is only the case if wrongly or too hurriedly applied. All four movements, atroking, friction, pétrissage and tapotement can be used with advantage. The first starts the treatment with firm upward strokes when using the cleansing cream. Then, having wiped this off with an absorbent tissue, an emollient cream is applied and light friction given with the cushion part of the finger-tips, working the cream with circular spiral movements over the face. Facial massage should have an upward and outward tendency to correct the droop of the muscles. Then with the wrist held loosely the peroussing novement already described is performed with the back of the hand under the chin. Next
material, i.e. the collar and cuffs

As regards the cutting of facings, the rule for the lirst mentioned type is that the strip can be cut on the straight if the edge to which it is to be applicd is straight. A curled or rounded edge, however, is either faced with a strip cut on the cross, which can be pulled to shape, or else with a strip cut to the exact shape of the garment, and of the same way of the grain, these shaped pieces always being used for the facings laid inside the front edges of a coat, and also for the top layers of collars and cuffs, etc. One way of attaching a facing of the strip type is to set it over the garment, with the right side downwards, and to stitch it on just within the top edge; then to turn the strip over to the wrong side, and to hem the unattached edge down.
Another plan employed is to turn in the edges of the garment, set the facing over it,
turn in the lacing edges and hem or slipstitclı down When attaching a coat frons facing, the inner edge is left detached.

FAGGOT: In Cooking. This is the name given to a preparation made from calf's liver, or the inferinr parts of a sheep, such as the liver, lights, pluck, and heart.

To make faggots from the intestines of a sheep, procure the liver, lights, pluck, heart and swectbread and some of the skin. These must be well washed, put in a saucepan with cold water poured over them, brought to the loil and simmered gently for about 15 min Add salt and pepper and pour off the liquid Boil an onion in a little water and chop it Cliop the liver, lights, etc., and pound them well with the onion. Then add a sprinkling of nixed herbs and a pinch of nutmeg, and stir in sufficient breadcrumbs ti) make a firn paste.

Mould the mixture into squares and wrap each square in a piece of skin. Place them in a baking-tin that has been well greased, and lrave it in a moderate oven until they are n pale brown Make a gravy to serve with the laggots from the liquid in which they are boiled. Add pepper and salt, and thichen with a tablespoonful of flour made into a paste with a little of the cold liquid. Bring it to the boil and add a little caramel or gravy colouring if necessary
FAGGOTING: The Trimming. This is wimetimes used for beading to make an open seam for a dress or underwear. A slightly different variety of faggot stitch is used in drawn-thread work. The two edges to be goined should be sewn to stiff paper or toile circe, about $f$ in apart. The tacking threads should he about $\frac{1}{4} \mathrm{in}$. in from the edge of the hems to allow room for working the stitch isnder them.

The following plan will keep the stitches even. Place a ruler along the edge of one hem, and at cuery $\hat{i} \mathrm{in}$. mark put a dot on the material with a lead pencil. Repent this operation on the opposite hem, but let the first dot come half-way between the first and second dot of the opposite edge, then the other dots will follow in order. To work the faggoting, join the thread on the wrong side of the hem at the top left-hand corner, holding the worl so that the seam is in a perpendicular line before you, the stitching proceeding downwards. Bring the needle


Fargoting. An example of this useful trimmlag up from the underside of the hem on the opposite
side, through the first dot.

Now put the needle under the stitch just made. which lies across the opening between the two hems; put the needlc under the opposite hem and bring it through at the dot. It is important that the needle should be put down behind the thread last made so that the stitch comes under it. The illust ration shows this position. Repeat this operation down the whole seam, then cut the tackings and take away the paper. See Drawn Thread Work.

FAHRENHEIT. This is onc of the two chief ways of measuring heat by a thermometer. On a Fahrenheit thermometer the distance from the freezing-point of water to the boiling-point is $180^{\circ}$. The freezing. joint is marked $32^{\circ}$ and the boiling-point $212^{\circ}$. See Centigrade; Thermometer
FAIENCE. This nanc is applied to various kinds of earthenware pottery and tiles having a highly glazed or enamelled surface. The


Falence. Persian bas-relief in polychrome faience brick $\begin{gathered}\text { the period of Darius ( } 500 \text { B.C.) }\end{gathered}$
word comes from the name of the Italian town Facnza, which made a speciality of this pottery from the time of the Renaissance. The alt of the Moorish potters who eatablished themselves in Spain and left, among other examples of their skill, the tiles of the palace at Seville, spread to Sicily, and from there prepared the way for the Italian masters of majolica faience. Luca della Robbia is the best known of these. In the 15 th century he created the most beautiful examples of this tin-glazed ware.
Damascus comamelled earthenware also is believed to have helped to inspire ceramic art in Europe, as it was largely imported during the 15 th century. Holland made the delft ware which was a compromise between majolica and Chinese porcelain, its methods being taken from the former and its designs from the latter. In 1676 a Dutch potter settled at Lambeth and started delft faience ware in England Some varieties of Josiah Wedgwood's ware are styled English faience.
Germany developed faience methods for stove tiles and beer tankards, while in France the best known faience was the blue Roucn ware developed afterwards at Moustiers in a variety of colours. Enamelled brickwork was used in the days of Darius, and was the forerunner of the splendid glazed tile decoration which is extensively enployed in Persian architecture.
Modern fabrics of Doulton, Minton and Ault are among those classed as faience, also some makes of Japanese pottery. The decorative effect may be in form, the beauty of monochrome glaze as seen in certain tiles, or through polychrome designs heightened by applied reliefs. Many modern reproductions of majolica are good, but others tend to be crude in ornament and colour.
For this reason picces which bear the sign manual of creative artists, or, as in the case of Della Robbia reproductions, aim at preserving the best traditions of the past, may be sought for as satisfactory notes of decoration in a sitting room. Sometimes one may rejoice in the possession of pieces that ought to be safeguarded, such as a fine Satsuma vase, a Rhineland tankard, a Leeds bowl, and even a piece of Valencia lustreware or Urbino majolica. See Delft; Lambeth Ware; Majolica; Pottery ; Terra Cotta; Tiles

FAILLE. Heavy taffeta woven with a pronounced rib is sold as faille. It also makes the most serviceable of ribbons, and is more hard-wearing than ordinary taffeta.

FAINTING: How to Treat. The cause of fainting is a deficiency of blood in the brain, which produces a temporary loss of consciousness. The fainting fit lasts usually
lor less than 1 min. but may be prolonged when it follows severe losy of blood or disease of the heart. In people predisposed to fainting any sudden strong emotion may tend to bring on a fit. A blow on the abdomen or on the head, intense internal pain, standing up quickly from a sitting posture, or getting suddenly out of a hot bath may cause fainting, especially if the heart is weak.
When one feels laint one should get into the fresh air or close to an open window and lie down or sit with the had bent forward between the kners A fewsips of cold water or a little spirits or sal volutile in water will assiat recovery. If a person faints, lay him on his back with the head low, loosen the clothing about the neck, chest and waist, and let him lie still until he recovers. He should have as much fresh air as possible, and when necessary may be carried into the open air, the head being kept low.

Recovery can be belped by the following measurcs: Sprintle the bands and face freely with cold water. Gently slap the face and hands with a soft, wet cloth. Put a bottle of smelling-salts or eau-de-Cologne to the nose. After recovery the person should rest lying down for a few minutes. In severe cases the legs should be raised well above the body and massaged in the direction of the heart. If breathing is not resumed, artificial respiration ( $q$ v.) should be carried out. See Dizziness.
FAIRY RING. This popular and superstitious name is given to rings of toadstool-like fungi which establish themselves in grass, and sometimes assume considerable dimensions. The grass in and around the rings is generally of luxuriant growth, because it benetits by the nitrogenous matter in the decaying fungi. A fairy ring can be exterminated by watering it with a solution of sulphate of iron or copper, 1 lb . in 3 gallons of water Afterwards a little fresh soil may be applied and grass seed sown in spring or September to cover the bare spot See Fungicide
FAIRY ROSE. This is a dainty dwart form of the Polyantha type of rose, compact in habit, with elegant leaves, and bearing bunches of pretty blossoms. It is suitable for pot culture, as it does nut grow more than 1 ft . high. Plants raised from seed generally llowev three months after sowing. If grown outdooms they demand well-drained soil in a sunny position See Rose.
FALSE ACACIA. The name of lalse acacia is given to Robinia pseudacacia, a familiar tree with pinnate leaves and drooping clusters of white, pealike tlowers. It does well in town gardens.
FALSE HEM. This is a strip of material sewn at the extreme edge of the part which requires additional length, turncd over to the wrong side and hemmed at the required depth. In cases where there is not enough material to allow for a deep hem to be turned up, a false: hem can be added of sateen or any material the same colour as the garinent itself, taking care that the facing does not show on the right side.

A double hem can be made by folding a piece of the same material over and attaching it to the edge of the garment, covcring the join with a trimming or fancy stitching. In
the case of a thin material the false liem can be joined to the garment by means of faggol stitching. See Faggoting; Hem

FAMILY COACR. Family coach-is an old-fashioned game which is popular among small children. The players sit round the room, and each chooses some part of the coach to represent Thus one will be the box, another the lamps, another the wheels, and so on II there are a great many players, each part may be taken by two or three children.

Somebody tells a story about the journeyings of the coach and its adventures on the road, mentioning the various parts in the course of the narrative. As each part is mentioned, the child who represents it has to get up and turn round, and when the coach itscli is mentioned the whole party has to do the same. Any player failing to respond to his or her name in the story has to pay a forfeit, which is redeemed at the end of this amusing game in the usual manner

FAN : Uses and Ornament. Fans are of two distinct types, the folding and the nonfolding. The non-folding kind, in use with evening dresses, consists of one or more plumes. The stick or handle may be of tortoiseshell or mother-of-pearl, or of compnsition to imitate either of these, of jade, amber or coral.

The folding fan was invented by the Japanese, and is said to have heen suggested by a bat's wing. From Japan it sprend to China and thence to Italy, and was introduced into France by Catherine de Medici in the 16th century. The non-folding fan was inspired by the palm leaf, and dried palm leaves are still used for the cheapest kind of oriental fan. The earliest known fans were of this straight shape, and are recorded in stone on the walls of an Egyptian tomb at Thebes, where a Pharaoh of the 18th dynasty is surrounded by fan bearers.

Spaniah fans have the advantage of expanding from right or left, and are most usual in black lace with black bog oak carved mounta. Beautiful fans, painted, feather, or lace, still come from France. Interesting Chinese and Japanese fans can sometimes be picked up in curio shops. They may be made entirely of carved ivory, tortoiseshell or wood, the blades being strung together with coloured ribbons, or of folded, painted silk
The principle of Japanesc fan painting is worth noting, because it has inspired the most successful designers of all nations. As the fan is invented for cooling purposes, patterns should be light and airy. The Japanesc carry out this ides often by suggesting flowers, rushes, or branches of shrubs waving in the brecze, with birds, butterflies or fish introduced to balance the design. These Japanese designs can be copied successfully by an amateur on a plain silk or gauze fan. Quite a success has been achieved by a strnight Japanese fan, shield-like in shape, gold designed and varnished with red lacquer, hand-

ornamentation is a favourite design in fan painting. they can be placed to suit the arc of the fan, and filled with landscapes, classical figures or heads after the style of cameos.

If the fan is to tir painted, the fabric must he painted before it is made up It must ion cut to the desired size, leaving a good margin for turning in. Stencil colours suitable for painting on silk, georgette or gauze ahould be used If a pale some tassels depending from its stick; this is colourod silk is chosen, the design looks very carried by the wearer of a black cevening dress well in liquid Mandarin inks applied with a A charming idea from an old French fan is fine brush. The design must be carefully a centre medallion of pansies bordered with a drawn on the silk before painting. Further ribbon knotted at the top and festooning to border a smaller medallion on either side containing the monograms of giver and receiver. Unig monograms of giver and receiver. beautiful 18th century fans, to be seen a "Th the centre medallion the words South Kensington Museum Designs painted menoughts of you are painted. The three on these fans were the work of Watteau and medallions connected by some kind of light other genre painters. See Stencilling

## FANCY DRESS FOR JUVENILES AND ADULTS

## Suggestions which Improve Attractive Costumes

## In this Encyclopedia related information will he found under the headings Children's Party <br> Dance; Dancing. Sec also Making-up: Theatricals

A costume which is out of the common, basket of mixed llowers, the straw hat full that does not cost too much, and is comfort- of pink roses, or the ribboned lamb, one of able to dance in is what most people desire in the way of a fnncy dress. English or French costumes of the powder periods are always dignified and becoming, and though they can hardly be said to be uncommon are required for a ' Powder Ball,' and are often favoured by men and older women who do not care for the exnggerated typo of costume seen at any fancy dress dance. Adapted by modern designers, dresses that are suitable for wear with powder and patches may be quitc original.

Whatever the style, if a white wig is to be worn, care should be taken not to hire one with a woolly, wispy appearance. It ought to be well dressed, with that crisp formality in each curl which marks the finest designs, and is better, especially if it is to be worn with a strictly period 'square cut' 18th century costume such as is shown in Fig. 1, when it is not made of pure white hair, but with a slight mixture of grey. Patches placed on the cheek and chin should not be forgotten. These cost 1 s . 3 d . for a box of assorted sizes. Women require $a$ dainty pink and white make-up with accentuated cyebrous and lashes for wear with a powdered or white wig.

Shepherd and shepherdess or other rustic china figures furnish models, copies of which can be carried out by the clever amateur dressmaker. Such picturesque ideas are more charining for children than grownup persons, and can be carried out inex. pensively in printed and plain sateens. Success lies in matching the delicate colouring and approximating the various patterns of the painted materials; also in copying the details of the oblong birdcage with stuffed bird
Fan of cream coloured lace, monnted on an amber frame Courtesy of Selfridge a Co., i.td emerging, the oval which typical objects should be carricd. except when dancing.

Very small girls look attractive as Christmas. tree fairics A pretty design is shown in Fig. 2. Small boys may favour a pierrot or harlequin costume (Fig. 3), unless they set their hearts on a wooden soldicr, pirate or Red Indian design. Patterns for many good fancy dresses are obtainable from the best pattern services.
The topical costume often finds favour with men: a clever idea from a newspaper cartoon or caricature, a popular play or book title travestied. These are necessarily whims of the moment, and their value lies in being apt and well done Other inspirations may come from studying the posters on the hoard ings, either of plays or advertised goonds Characters out of fiction and drama of present and bygone times always make their appearance, more or less effectively, at fancy dress dances, nnd this class opens up a wide ficld. Sometimes a dance is arranged when all the dresses have to be of a period or out of a book -as, for instance, a Victorian, or an Arabian Nights' ball. The Victorian jockey (Fig. 4) is a suggestion for a man's costume for the former

National dresses offer a variety of diatinc tive designs, of which many beautiful examples are illustrated in such n work us "Peoples of All Nations." Such costumes look wel! in pairs, and attract the cye to both partners

Oriental Make-up. Oriental costumes open up a wide ficld of choice and can be dignified. beautiful, piquant, mysterious or comic accord ing to design and suitability. A beautiful Chinese princess dress is shown in Fig. 5 Such costumes need a special make-up for the skin and eycs to render them effectively in keeping with the character represented. This is not a difficult task according to the following directions.

Having cleansed the face thoroughly with cold cream and wiped it with an absorbent tissue or soft towel, apply grease paints Nos. 5 ) 2 and 6 for a dark foundstion, blending the colours evenly over the face: $\Omega$ few strokes
from each stick of paint will suffice, then with a batik dyed design which is outlined working them in with the finger-tips. If the effect is too dark a little No. 2 grease paint well worked in will remedy this. Having They may be in pierrot style for a boy thoroughly smoothed the foundation tint or a white sleeveless blouse and a short apply a grease rouge (or a little grease paint striped skirt may be worn as the foundation


Nu. 9) and smooth carefully. Now soften a piece of white soap and place it over the eyebrows. When this is dry, smooth the grease paint very gently up to it and the hairs will be invisible. Apply an eyebrow pencil, drawing the ends of the eyebrows in all upward slanting curve, slightly or exaggeratedly according to the requirements and character of the costume.
To give the oriental effect to the eyes a line is drawn from the outer corners upwards, about half an inch long, with a black lining pencil, and after powdering the tace with a dark shade of powder, a woman should make up her lashes heavily with black mascara, and a man lightly, just sufficiently in his case to reinove any powder from them. To give a dark-eyed effect the for a girl. upper eyelids should be shaded with a deep The object is blue lining pencil. A brilliant but rather dark red shade of lipstick should add the finishing louch for a woman.
Some Quaint Costumes. Many variations of black and white fancy costumes are seen at a big dance. A chimney sweep design, with a stove-pipe hat made of cardboard and covered with black paper, the bodice of white sateen with bricks marked on it in black stencil paint, trousers of black velveteen fringed in long strips below the knees, black gloves and a sweep's brush in place of a fan, supplies an idea for a quickly made costume. A chessboard design is also striking for either a man or a girl. The long trousers are made in black and white check sateen with braces to match over a white silk shirt. The headdress or cap is ornamented with chessmen in black and white.
Polka dots of black on white sateen make up into an attractive pierrot costuine with ruffles half-black and half-white. A silk wig can be worn with such a costume, which is made of black silk knitting yarn on one side of the parting and of white silk yarn on the other. Another beautiful black and white dress is shown in Fig. 6. The body part of this butterfly and the skull cap can be made of black velveteen, while the wings can be of white silk


Strange wigs may form an important part in quaint designs. They are best and coolest made on a foundation of embroidery canvas shapel to the head. Wigs are effective in wool or linitting silk left in loops or the loops cut and frayed to form a fringe; another way is to make them of tiny blossoms and !eaves. Small roses, jcssamine, violets, and lilies of the valley are suitable with leaves skilfully introduced to soften the face line, and each dress carrying out the colour and petal shapes of the llower chosen. Other wigs are made completely of coloured feathers.

In wool and silk these wigs give a touch of originality to the many variations of the pierrot and pierrette, and all the harlequinade characters. Such costumes and many flower costumes can be effectively made up in crîpe paper for children's fancy dress dances, when the object is to have bright and original designs with a small outlay.

FANLIGHT. Originally this term meant a glazed sash filling the arched head of a door or window opening, and was so called from the fact of its having bars radiating upward like a fan. Nowadays it denotes any sort of small uindow at the top of a door or larger window.

Most fanlights are bottom hung, on stout butt linges, the casement opening inwards from the top. A simple quadrant of iron, with double cords, pulleys and a cleat, is cheap to buy and ersy to install.

FARAD. An electro-magnetio unit of capacity. It is the capacity of an electrical condenser charged to a potential of one volt by one coulomb of electricity. A microfarad $(\mu \mathrm{F})$ is one millionth of a fared.

The application of electricity produced by an induction coil is known as faradism or faradization. It is more stimulating than the constant current, and may be applied to the whole body or to any part. See Capacity; Condenser ; Electricity.

## Farcy. See Glanders.

FARIIACEOUS FOOD. Farinaceous foods consist very largely of staich: bread, 50 per cent. ; oatmeal, 63 per cent. ; maize, 64 per cent. ; macaroni, 77 per cent. ; and rice, 84 per cent.; and in the last-named the amount of proteid is small. Wholemeal and standard bread contain the fat soluble vitamin $\mathbf{A}$, and are richer in organio phosphorus compounds than white bread, and possess obvious advantages for children unless white


Fancy Dress. 1. Powdered wig and period constume. 2. Christmas Tree qairy. 3. Barlequin pierrot. 4. Victorima jockey, for a "character" dance. 5. Chinese princess design saitable for an oriental ball; it is carried oat in Chinese embroidery. 6. Butterfy, a beautiful design for a black and white costame. 7. Feathers, consisting of a softly draped silver gauze bodica with skirt of white feathers and georgette 1. Claude Harris; 2 and 3, Bassano 7. Henri Manuel
bread is sulpplemented by milk, butter or animal or fish fats. Margarine of the vegetable variety does nothing to improve the food value of white bread in respect of vitamin, though it supplies fat. Wholemeal bread is less easily digeated than white bread, however, and may give rise to syinptoms of indigestion. Maize in the form of cakes or porridge is a good food, but the flavour is too coarse to make it a food of choice. Its derivatives, hominy, oswego and cornflour, have not this disadvantagc and are often used in this way.

Farinaceous foods provide the starch which is a necessary constituent of diet, and some provide proteid also. and to a less extent fat ; but, to balance all these constituents to our requirements, their use must be supplemented by other things. See Diet; Flour ; Food: Maize ; Oatmeal ; Rice, etc.

FARTHINGALE CHAIR. Chairs of this kind were made for women in the days when farthingales were worn. The specimens in existence date mainly from the 17th century, and am valued by collectors. They are without arms, and arc much higher in the seat than ordinary chairs. Most are upholstered, and some have a squat, padded back, with a horizontal top rail See Chair.
FASTCOLOUR. Colours should not be called fast if they are liable to change seriously upon ex. posure to sunlight, but clotb so dyed or printed that its colour is substantially unaltered after a fortnight's exposure to sun and air can reasonably be ao described Colours are not fast unless they will bear washing, and a test in this respect is to boil a sample for 10 min . in soap and water, with a handful of conmon weshing soda to the pint.

The crucial test of fastness is the readiness of the seller to give the money back should the colour fade, and certain cloths can be guaranteed in this way lacking definite guarantees, the assumption nust he that fast colour does not mean unalterable fast ness under all con ditions of wear and laundering. The matter is really important, for in sorne circumstances the garment is useless when the colour has gone. Articles made in mixed colours cannot invariably be redyed, and as a general rule redyeing, whether done at home or at the dyers' and cleaners' works, is less fast in colour than a good dye applied while the cloth is being made. See Colour; Dyeing; Laundry.

FASTING. Properly speaking, fasting means complete abstention from nutritious food for a shorter or longer time. It is sometimes a useful remedy when carried out under the supervision of a doctor, but for the great majority of people a prolonged fast is exccedingly risky and nearly always injurious. The temporary deprivation of food will frequently lower the resistance to infection by the germs of disease. After a long fast the digestive organs are in a debilitated state, so food should at first be liquid, and taken in very simall quantities.

In cases of acute gastritis fasting for at least 24 hours is required to give the stomach a rest ; and a short fast will also be useful when, from over-indulgence in rich food, the liver is overloaded and biliousness has been induced. Abstinence from certain kinds of food, or a large reduction in the quantity taken, is beneficial in many conditions. Thus, in diabetes and in obesity, starchy and sugary foorls are much curtailed, and in certain toms
of rheumatism and in other diseases marked benefit may accrue by omitting butcher meat from the diet. See Dict: Obesity, etc.

FAT : Its Food Value. Fat is found in the body in adipose tissue, bone marrow, and clsewhere. Adipose tissue is widely distributed amongst the tissues and, with the exception of a fell situations, e.g. the eyelids, exists as a layer of varying thickness beneath the skin. The stored-up fat forms an important fuel reserve for the use of the body
Fat is made up of carbon, oxygen and hydrogen. No nitrogen leeing present, it cannot take part in the building-up of the muscles or organs, but it supplies heat and energy to the body, an ounce of fat giving more than twice as much as an ounce of starchy food

Fat alone cannot support life, but it is a necessary ingredient of any diet. Fats that are derived from vegetable substances and sold as margarine do not provide a suitable source of fat for growing children, on account of their not containing fat soluble vitamin. This is present in mother's milk and is derived from the cow's milk and animal fat included in the mother's food. Fish oils also contain it. Infants require a larger proportion of fat than adults. When a child is fed on cow's milk, the whole of the natural fat ahould be present. On skimmed condensed milk a child will starve.
The standard proportion of fat in the diet of an adult is as follows

## Protein

Carbohydratc
12
50
While proteins and carbohydrates (sugar and starch) are digested by the juices of the stomach and pancreas and absorbed into the blood emulsified into a soapy tluid vessels, fat is emnlaid in the intestine and is absorbed into the
The following table shows the percentage of
fat in various articles of food


## See Diet

FATHER: His Legal Position. By fathor, in law, is meant the father of a legitimate child, as the father of an illegitimate child has no rights or duties towards it, save is so far as he may be ordered to contrilute by an affiliation order. While father and mother arc living together the father is the sole guardian of the children. If they are separated and any question arises, the court will decide.
A father is responsible for supplying his children with food, clothing, lodging and medical attendance up to the age of 16 . If he is too poor to do this, he must see that they are attended to, e.g. by the poor-law authorities. A father is not responsible for thic consequences of any wrong done by the child, nor is he liable for its debts unless they were incurred with his authority. In certain cases of offences committed by his child, the father may be ordered to pay the fine. A father has the right to choose in what religion his child shall be brought up. See Affiliation; Child: Guardian: Illegitimacy: Mother.

FATIGUE. Alter a hard day's work, mental or physical, the vigour of the whole body is lowered. Waste matters linve accumuInted in the system, and until they are carried off by the circulating blood a greater or less sense of fatigue reminins.
It is a mistake, when in this state, to eat a full meal, even if food has not been taken for some hours. A tiued person should lie down for half an hour, or longer, before taking a meal. Recovery will be all the quicker if one neither talks nor reads. Massage, when obtainable, is the best of all restoratives when one's muscles are tired and clogged with waste matter. Alcoliol only disguises fatigue, in no way removing it. See Brain Fag.
FATSIA. This is an excellent room plant with large, handsome, indented evergreen leaves. In warm showery weather the plant may be placed out of doors
Tall growth may he remedied by the process known as stem-rooting, by which the top of the plant is converted into a dwarf. Repotting, when necessary, is done in March using a compost made of two parts loam, one part leafmould, and one of silves sand. This plant is hardy in the southern and ot her mild counties.

FAUCET. This is a term usually applied to the socket of a cast-iron pipe It is also used to describe a spout with a plug or spigot used for drawing liquor from a cask. The name is also, in some districts, used as a description for any kind of tap from which water can be drawn, for a hot or a cold water syatem See Stop-cock; Tap. Pron. Faw-set

FAVUS. In human beings favus or honeycomh ringworm is a contagious disease which may apicar anywhere on the skin, but oftenest on the scalp. Its chief characteristic is the formation of bright sulphur-yellow, irregular, cup-shaped crusts, pierced on the scalp by the hairs. They are easily broken off, and when renoved a reddish sulface is seen, which leaves a scar on healing The canse of the disease is a vegetable parasite or fungus

In treatment, the hairs piercing the crusta must he pulled out, and the rest of the hair should he cut close. The crusts are softened by applying lint wet with olive oil, and covered with gutta-percha tissue, and removed by washing with soap and water A germicidal application should be applied morning and evening, composed of precipitated sulphur, 4 drams, and purified lard, 2 oz. Treatment must be continued for many months where the scalp is attacked X-ray treatment sometimes gives excellent results See Ringworm

In Poultry. The disease favus or white comb in poultry is due to a parasitic fungus, Iophophyton gallinoe, which is distinct from that causing favus in mammals. This fungus attacks the comb and wattles of birds, and spreads from the naked parts of the head to parts covered by feathers. The breast and more often the rump may be attacked. One side only of the neck may be quite denuded of feathers, whilst the other shows no signs of the disease. As a rule, however, it is the comb that suffers first and most from the attack

The first signs of an attack are small, pale, irregular, cup-like spots on the comb or wattles, generally appearing on the comb first. These spots grow together, and sooner or later form a crust of a dirty yellowish-grey substance, which is often arranged in concentric layers. When the feathered areas become invaded the disease is more persistent and may end fatally. The feathers may become erect, dry, and somewhat brittle, and fall off, the naked skin being covered with crusts. The affected birds exhale a mouldy odour.

The treatment consists in bathing the infected parts with warm water and soft soap, and then applying some ointment to destroy the parasite. An ointment made of sulphui and lard, mixed in equal proportions, is a
simple remedy. Another more eltective but more expensive remedy is nitrate of silver, which, when rubbed into the comb and wattles, has been found of great benefit. An
ointment of 5 p.c. of nitrate of silver in soft paraffin (vaseline) is recommended for the purpose in Leaflet No. 67 issued by the Ministry of Agriculture-from which these particulars of the disease and its treatment are taken. Red oxide of mercury 1 part, to lard 8 parts, is an excellent remedy if persistently used for several days. Before applying the ointment the diseased parts should be carefully fomented, and all the crusts removed as far as possible with a blunt knife.

FEATHER BED. When feather beds are made, care should be taken to see that the feathers are thoroughly stoved and sterilized in the first instance; they may then be enclosed in a case of ticking, the inside of which is rubbed with beeswax to prevent feathers from pushing through.

The dressing may be done at home or by the firm responsible for the manufacture of the bed. The process consists of separating the light feathers from the quills, and returning the cleared or loosened bulk to the case. See Bedding: Bedstead; Mattress.

FEATHER EDGING. In furniture this is a method of using marquetry so as to give a frame of special character round a central panel. It is found especially on walnut pieces of the reign of Queen Anne. It is made by cutting two thick strips of wood so that, when they are placed side by side and glued down, the grain of each piece meets in a feather-like formation. It is also known as herringbone. See Marquetry : Queen Anne Style.
FEATEDRED JOINT. A feathered joint is one in which the joint between two pieces of wood is secured by means of a narrow strip of relatively thin wood known as a feather. To a large extent it is similar to the groove and tongue joint, except that the latter is formed from the solid.

Featheredge boards, such as wrather-boarding, where one edge is thinner than the other, are laid overlapping, and the joint is sometimes known as a feathered joint. See Joint.

FEATRER GRASS. This is the English name of Stipa pennata, an ornamental hardy perennial grass worth growing in a border for the sake of its graceful, nodding plumes. Propagation is by seed, sown in a frame in spring or by division in autumn. Stipa gigantea, the giant feather grass, grows 3 feet high.
FEATRERS: Their Care and Cleansing. The feathers of poultry, when they have been properly cleansed and preserved, provide the household with material for stuffing cushions, beds, bolsters, and pillows. They are also useful to make good deficiencies when remaking such articles.
To achieve the best results, care in plucking the birds is essential. There must be no skin or flesh adhering to the feathers, and in the case of geese the coarse feathers should be removed first, so that the fine inner down may be kept separate. This down forms the most valuable kind of feather. Chickens are sometimes plucked too young for their feathers to be of any value, and only those of mature fowls should be used. The same applies to pigeons. Game feathers, too, are seldom worth preserving, as they are apt to be tainted, and likely to remain so indefinitely.
There are two methods of preserving feathers, viz., wet and dry, the former being adapted to small feathers and quills, and the latter to small feathers only. To prepare by the wet process, place the feathers in water heated to a temperature of $100^{\circ} \mathrm{F}$. into which sufficient white curd soap has been dissolved to form a milk-like emulsion. Then stir and let soak for an hour, after which stir again,
and then collect on a sieve to drain off. After and resume their soft, fluffy appearance if con similar treatment in a second warm bath, stantly shaken during the drying process using Castile soap instead of white curd soap, Swansdown trimming can be washed in the rinse the feathers in two baths of tepid water, same way, and dried before a fire, with con made slightly alkaline with a little ammonia, and finally in a bath of clear cold water. The feathers should then be placed in paper bags and dried in a mildly heated oven.

Preserving by the dry process is effected by sprinkling the feathers slightly with a dilute non-corrosive disinfectant, and packing them loosely in paper bags. The bags should then be placed in an oven sufficiently
 hot to scorch paper in 5 or 6 min ., and left there until the bags begin to brown. In both processes the feathers must be subsequently beaten lightly to get rid of dust, after which ready for use. After five years the feathers usually require re-dressing.


Feather stich. Lett to right: single,
double and treble forms of this docoration stant shaking. When not in actual use, valuable feathers should be wrapped in tissue paper and stored in boxes with either camphor or naph. thaline balls as a protection against moth.

FEATHER STITCE. This is a useful trimming, as it can be executed with coarse cotton, fine silk, or any other medium in order to suit the foundation. There are three forms of feather stitch, single, double, and treble, formed with one, two, and three stitches in succession to the left, and the same order to the right, of a centre line.
The beauty of this work depends on its regularity, and this can be ensured by dots or by running a centre line. For ordinary purposes the stitches should be about $\frac{1}{8}$ in. apart

Ornamental Feathers. Ostrich feathers that are dirty and straight can be washed and recurled. The feathers are dipped in and out of a warm lather of soapy water. They are then well rinsed, shaken out, and dried in front of the fire. They burn very easily, so, although heat is essential, it must not be too great. The feathers should be shaken constantly and when dry recurled by drawing a blunt penknife or ivory paper knife along each strand. Great care must be taken not to cut the feather : the point of the knife can be used if blunt, otherwise it is better to use the back of the blade. This is held obliquely, and drawn across the strand until it curls.

Feathers that may have got damp and straight through exposure to rain can be curled in the same way. In the case of a feather ruching, it is enough to shake the trimming before the fire immediately after exposure to damp. The feathers must not be allowed to dry straight. If they do, the process of recurling becomes much more difficult.

Feathers are bleached by washing them in warm soapy water, and then exposing them to fumes of sulphur. To dye feat hers, first put them into hot water. and allow them to drain. When they are lifted out of the dye, they should be rinsed at least twice in clean, cold water, and then dried before the fire. If red, however, one rinsing will be sufficient.

Marabout trim. mings are washable in warm soapy water,

FEE : Of Professiona! Men. This word is chictly used for payments made for services rendered by professional men. e.g. doctome. solicitors and architects

Fees of Doctors. Doctors usnally charge a certain amount per visit, which sometimes includes medicine, hut sometimes does not. It varies with the size of the house visited and the standing of the patient. An ordinary middle-class family will be charged anything from 5s. to 10 s . fd. per visit. Double feew are charged for night visits, but much less when the patient visits the doctor. The class of patient recustomed to do this is, however, dealt with under the National Health Insurance scheme.

There are various special fees. For instance. in cases of childbirth it is usual to charge an inclusive fee of perhaps $£ 55$-5., which includes attendance at the time of delivery and until the patient is well again, unless unexpected developments occur. The fers of specialists, both for consultation and for operations, depend almost entirely on the standing of the man employed. In the ordinary way a first visit to a London specialist will cost £3 3s., and subsequent visits one or two guineas each. Larger fees are charged if the patient is visited. and still larger if an operation is perforined.

Doctors do not usually give any details of their visits when they render their accounts, usually half yearly, so in most cases the householder can only surmise whether or not the total is approximate, in his opinion, to the services rendered. Nursing and maternity homes charge fees, but these vary yery much indeed.

Solicitors' Charges. The fers charged by solicitors are laid down in a scale whioh was drawn up under an Aot of Parliament. This scale chiefly relates to sales, purchases and mortgages, and is based upon the value of the projerty or the amount of money involved. The fees charged are intencled to cover the services of the solicitor and his clerlis, but not anv outlay for stamps, duties, etc. Very few solioitors charge on the full scale, but on the other hand it is almost impossible for a layman to check his solicitor's bill. He can, however, make a bargain for a fixed sum when he commissions the work, or if dissatisfied be can have the bill of costs taxed. This, however, may involve him in considerable expense.

Fees of Archltects. Architects charge usually on the amount of the contract. A charge of 10 p.c. on the cost of a house of moderate size is generally regarded as rensonable. Fees or commissions are also charged by house agents and auctioneers. For selling furniture by auction a usual charge is 5 p.c. on the amount realized. For selling property a smaller percentage is usually charged, especially if the amount involved is considerable. A oharge of 5 p.c. is also made for letting houses and furnished flats, the amount being paid on the first year's rental. These fees are paid by the seller or owner, the buyer or tenant usually paying nothing. Valuations of furniture, etc., are also charged on a percentage besis, which varies from $2 \frac{1}{2}$ to 5. There is usually a minimum fee of five guineas.

FEEBLE-MINDED : Care of. Children who are mentally weak may be greatly improved as a rule by intelligent careful training and attention to their health. On the other hand, if neglected or otherwise improperly treated, they may remain permanently backward, and find it very hard to earn a living or go through life with ordinary success. There are innumerable grades of inental weakness

From the earliest age the inother must try to arouse the child's interest in his surroundings. Little things that healthy children notice and learn about for themselves the feeble-minded ohild must be taught. is he becomes old enough to understand, habits of cleanliness and self-control must be impressed upon him.

Threats and scolding and punishment are worse than useless. The child must not be ridiculed or cowed. but encouraged. Bad habits must be corrected. In this matter it are objectionable If he stenls, explain that he will not be trusted, and that things will be locked up: if he is untruthful, tell him that no one will believe what he says in future, and that people will dislike him. This is better than punishing or threatening or scolding.

The weak-minded child must be taught regular liabits. He sloould go to hed and get up much about the same time every day, and have meals at fixed hours. He should be tanght to make full use of all his senses-sight, hearing, touch, smell, and taste. Physical exercises, when supervised, and massage, will help ill developing and training in the proper use of the muscles.

In many cases it is hetter not to send the feeble-minded child to school until he is at least six years old. If a special school or institution for children of feeble mind is available, he will be muoh better there than at an ordinary school. Nuch has been done by legislation to asfeguard the interests of the mentally deficient.
FEEDER: For the Baby. This serves the same purpose as a bib, hut is larger. It usually takes the form of a square or oblong piece of material, from one side of which a semicircular picce is cut out for the neck, tapes being secured to the shoulders to fasten it round the back of the neck, while often tapes arc sewn to the base of the sidea, to pass round the waist and tic at back, so that the fecder does not move out of position. Sometimes, however, the back is made exactly like the front, so that the feeder can be reversed as neerled.

Feeders are made of good white washable materials, and the favourite trimming consists of animals, such es bunnies or chicks, done in appliqué work. Feeders are generally made of single material, hemmed at the edges, or buttonholed. Pretty designs can be worked in cross-stitch, the feeder bound with a contrasting colour, which matches the emhroidery.

Making a Pattern. A pattern for a feeder may be drafted thus: Cut a piece of paper to measure 13 in . long and 5 in . wide. Mark one of the shorter calges with the word top. Measure from this top edge down one of the longer edges some 2 in., nad make a mark there; then measure from the first point across the top edge some 2 in ., and make another mark. From the mark in the longer edge now cut through in a nicely curved line to the mark in the tope edge, and so hollow out the neok part. The pattern, when drafted, consista of half the feeder, and the shorter of the two long edges is the centre front. When cutting it in material, this front edge should be put to a fold in a piece of doubled fabric, so that a whole feeder can be cut out. The neck should be faced in with a strip of material. See Eimbroidery.

FEEDING BOTTLE. On account of the difficulty in keeping the narrow glass and rubber tubing clean and free from germs, the old type feeding bottle should never be used. The stale inilk which is certain to accumulate in the tubing-no matter how carefully it is washed-invariably becomes a breeding-place for disense germs, which may set up diarrhoea or even worse ailments.

The best form of feeding bottle is that in which the rubber teat fits directly on to the end of the bottle. The teat should be of good rubber, so that it can be readily turned wrong side out and thoroughly cleaned after each feed. At the other end of the boatshaped type there is a rubber valve to allow the admission of air to take the place of the milk the baby sucks out. The hole in the
nipple ahould be large enough to nllow the infant to draw out the milk without too much difficulty, but it should not be too large, or the milk is holted, with subsequent vomiting or indigestion (See illus. p. 50.)
It is best to have two bottles, one of which can be kept in a cleansing solution while the other is in use. Immediately after each feed the teat and the rubber valve should hoth be renoved, and, together with the hottle itself, be well washed, a clean hrush being used if necessary dipped in scalding water for a few moments. The hottle, teat, and valve should then be soaked until next required in a solution containing half a teaspoonful of sodium bicarbonate to each pint of wnter. On no account should the mother or nurse put the nipple in her oun mouth in order to start the flow, as by this means infection may be conveycd to the baby. See Baby.

## Feet. See Foot.

FELLOE. A felloc, or felly, is the outer rim of a wooden wheel, or the curved pieces of whioh it is composed. A simple example is the wooden wheel of a garden wheelbarrow, which generally has four separate pieces or fellies forming the rim. These pieces are separately an wn from suitable timber, and when made up in this way the grain of the wood is more nearly concentrio with the wheel, which is much stronger than if the rim was saun from a solid piece of board.
Should a small wheel be broken at the felly, the damaged part may be sawn out, the joint faces of the remaining parts cleaned up true, and a new felly cut to shape from timber of a corresponding thickness, the joint faces being carefully fitted to the old work and secured with short dowels rounded at the end. The steel rim will have to be removed and replaced in the usual way.

FELT: Varieties and Uses. There are many uses for the various kinds of felt in house furnishings and in the manufacture of hats. In the latter the two chief kinds of felt are fur and wool, the former being the more expensive. Rabbit hair obtained by paring away the skin from the fur is the chief material used in making fur felts, and hare fur is employed for velours felt. Specially fine surfaces are put upon hat felts by using a little of such fine hair as nutria.

Felts proper have no thread atructure, hut are made by matting together fibres which exhibit peculiar powers of cohesion. Goods, however, arc sold as felts, notably for carpet or mattress underlays, in which there is an upper and a lower surface of hairy felt and an intermediate woven layer. Felts of this type are practically stretchless and retain their original dimensions, where other kinds may tread out larger, or run up in size. Felt is not designed to take much pulling strain. but if necessary to stretch it tight the pull should he in the direction of the length rather than the width. Fine felts closely compacted from soft wool are made into bedroom slippers with a thicker, coarser felt for the soles.

Roofing felt, whioh is the coarsest kind, is composed of hair, wool, jute waste, and other rough fibre. Used under corrugated iron roofing it tends towards coolness in summer and warmth in winter. Nailed upon wood and treated with tar and shingle, it makes an inexpensive non-conducting weatherproof roof. Odd lengths make excellent packing material, and strips serve for draught-excluders. Refrigerators can be improvised with felt as a covering. Felt is useful to protect pipes of a house from frcezing.

Felt Appliqué. This decoration is effective for Hoor cushions, work bags, coverlets, nursery cushions and mats. Bundles containing a number of good-sized pieces of different coloured felt are obtainable at liandicraft shops, or it may be bought by the
yard. As it costs 4/- the yard and $\frac{1}{1}$ will If a thick wool is used it can be conched on cut out quite a number of flowers, animals, etc., it is sometimes better to buy it in this way if several articles are to be made or decorated
Motifs are cut from the picces of coloured felt and applied to hessian, cloth, canvas, crash or to a groundwork of the felt itself. Designs and translers are easily obtainable from a needlework department, or can be originated to form motifs without much difficulty. Wool or matching silk is used to stitch the appliqué. Sometimes flowers are worked in the wools, while leaves and a jar or vase containing the bouquet are cut out in the felt and applied with coarse buttonhole stitch.

If a thick wool is used it can be conched on
the edge of the felt with small stitches in a matching silk (see Laid Work). This method looks particularly well for conventional flower or geometrical designs. Ciroular holes are usually cut in the centres of flowers and filled in by darning across, using a colour contrast for the horizontal and vertical stitches. See Appliqué ; Embroidery ; Woolwork.
FENBERRY. The name is sometimes given to the cranberry, a hardy evergreen trailing plant bearing deep red globular fruit of sour Havour. It requires an open position on marshy peat, and may be propagated by cuttings, layering, or by division of the plants. See Cranberry.

# Fences and Fencing Methods 

## Efficient Varieties and How to Erect Them

## This article, which concludes with a section on the low about fencing, is supplemented by other entries on Gate; Post; Wire Netting, etc.

The object of a fence is to define a boundary and to serve ns a protection against intruders. It should be strong, efficient, and pleasing in appearance, and can be made ornamental in character. Oak is by far the best wood to use for a fence, not only on account of its long life, hut on the score of appearance, and the very small cost of upkeep, an occasional cont of wood preservative heing all that is necessary. The construction should be simple, and preferably the posts should stand abuve the top line of the fence. It is a wise precaution to put such fences together with galvanized iron nails, as an ordinary nail quickly rusts and so will cause unsightly stains.
Oak pales nailed to triangular section cross hars let into strong onk uprights make an effective fencing if the pales are overlapped by a $\frac{1}{2}$ in., 4 pales being usually reckoned to cover 1 ft . of length. Fig. 1 shows an onk pale fence in process of repair, with new gravel boards being fixed.

Chestnut Pale Fence. A cheap and effective type of fence is made of cleft chestnut pales, fastened together by galvanized wire. This fencing, which is supplied in 10 yd . lengths and can he rolled up into a bundle, is excellent for enclosing woodlands and for small gardens. The chestnut fencing is made up in a variety of styles with the pales of uniform height ; or, alightly more ornamental in appearance, with adjacent pales of unequal length. Stock heights vary fmm 2 ft . to G ft., with 2 or 3 row's of wire. This fence can bo rapidly fixed in any position, even over rough and undulating ground. The stinining or end posts should have butt ends and be properly hedded into the ground. Intermediate posts can bave pointed ends, and he driven into the ground by means of a wooden bectle or mallet.


Fence. Tig. 1. Repairing a cleft oak pale fence with new gravel boards

Before fixing the fencing the straining post and gate posts should be securely strutted, to prevent them being pulled over. One end of a length of fencing is then fnatened to the first post, and the whole picce strained tightly with a simple block and tackle, or with thic nid of a 6 ft . pole used as a lever in the manner indicated in Fig. 2. The wires are then secured to the posts with galvanized iron staples, drivon in tight. The assistance of $n$


Fence. Fix. 2. Fence of cleft pales, showing use of lever for straining the wire when securing the leacing to the straining post
ron clip which passes through a hole in the dropper and is closed on to the wire by a special hand tool. This type of fence is especially adapted for undulating ground. Fig. 4 shows a strong fence inade of conencte straining posts and standards. to which are attached six horizontal wires. The posts could be cast in a simple mould, the holes for the wires being made at the same time.
The shape of the posts may vary, but a pattern which tapers on two sides will be found satisfactory, and is more economical in coneretc. Inmedintely before the concrete is placed in the mould the reinforcementa should be fixed in place. For ordinary sized posts, steel rod $\ddagger$ in. in diameter, placed one at each corner of the post, within about 1 in. of the outer surface, is suitable. The ends may be bent over at right angles, and if bound together in the middle with a piece of stout wire, the reinforcing strength will be greatly increased. The mods should first be wined together in the form required, and the concrete then placed around them in the mould.
After the concrete has been properly cured, Which will take n month or so, the fence may be erected in the ordinary way. A post a bout 7 ft . long should be sunk in the ground to a depth of about 2 ft .0 in . to 2 ft .9 in or so, according to the nature of the soil and the strain to which it is likely to be subjected.

The corner posts will be rendered stronger than the ordinary line posts by making them of larger dimensions, and reinforcing them with larger rods, say, of \& or $t \mathrm{in}$. rod, placed on each of the four sides, ns well as in the corners. These corner posts should be securely braced up hy struts, in order to withstand the constant strain to which they will be subjected hy the wire.

Points of Law. Except in certain special circumstances there is no legal obligation on the ouner or occupier of land to erect a fence. At the same time everybody is bound to keep his own animals from sccond person is necesaary for this. To join up treapnssing on his neighbour's premises, and the lengths, wire theun trgether with the ends of the galvanized wire, which are left protruding.

A simple type of fence is made by using prepared timher framed together and completed by nailing slats of wood on to two or morc longitudinal rails (Fig. 3).

Wire Fences. An extremely durable fence is made of galvanized hard steel wire woven together to form n network. The horizontal and vertical wires are secured in the process of manufacture by an immovable knot. It is available in rolls of 55,110 , and 220 yd The horizontal wires are at unequal intervals, varying from 7 to 10 in . at the top to 3 to $6 \frac{1}{2} \mathrm{in}$. at the bottom, according to the type of fence and its purpose. The vertical wires are spaced 11 in . to 22 in . apart. The type with smaller meah makes $n$ strong pig fence. In erecting such a fence it is absolutely necessary that it should be tightly stretched, for which purgose it is desirable to obtain the regulation straining tools supplied hy the manufacturers. The posts may be of iron, wood, or reinforced ooncrete, and all corner. gate, and end posts should be properly strutted.

I similar fence made with horizontal wires only is suitahte for cattle, and can be erected without trouble by straining and fixing it to posts by otaples. Besides the straining posts and intermediates there are iron spacers ("droppers") which do not enter the ground. The wires am secured to these by a form of
trespnssing on his neighbour's premises, nnd
is liable for the consequences if he does not. If n fence is put up, there is not any right in anybody to have it kept up, npart from contract. But a contract of tenancy usually implies a legal obligation on the tenant to mnintain existing fences. Somctimes a duty is cast on the owner of a fence to maintain it ns between hin. eclf and his neighbour.

Where land adjoins a highway, if the owner chooses not to fence it, hecannot complain if damage is done by straying cattle which are being driven adong the highway, but if cattile stray about the highway and damage property the owner can claim


Fig. 3. Simple fence made from prepared timbers


Fence. Fig. 4. Example of a concrete post and wire fence, showing the method of bracing the straining post with a strut
damnges. The owner of land adjoining a high- copicd in modern way must fence off anything dangenousand likely to cause damage to travellers. Thus it is negligent to leare unfenced a hole or pit near a dark country road. A wall or fence adjoining the highway is a nuisance if it is in a dangerous condition, and the owner is liable not only to pay damages to anyone who may be injured in consequence of his neglect, but also to be indicted for a public nuisnnce.

It is dangerous to use barbed wire for external fences. If one erects a barbed wire fence as a boundary between his own field and a neighbour's, and any of his neighbour's cattle are injured by it, he will be liable. So also if he places a barbed wire fence next to a public road, and if such a fence is blown down by a sudden gust of wind, he will be liable to any member of the publio who sustains damage. It haseven been held that the owner of such a fence adjoining a public footpath is liable to pay daninges to a person whose coat is blown by a gust of wind against the fence and torn.

The local authority, if satisfied that $n$ barbed wire fence adjoining a road is a nuisance to the highway, may give notice requiring the wire to be removed; and if it is not removed they may summon the owner before the magistrutes. The latter may make an order for the owner to remove the wire, or, if he does not, the local council may remove it and recover the expenses from him. A barbed wire fence includes a fence on which any barbed wire is placed.

FENDER. This piece of houschold furniture came into use when the open fireplace was abandoned. Fenders are made of brass, steel, or iron, and are cither solid or pierced, often with fire irons to match. Some are freely decorated, the Adam style being used as well as other artistic patterns. Apart from these is the familiar kitchen fender.

Of antique fenders the hest date from the 18th century, some being beautiful examples of crafts. manship. Of the four illustrated, No. 1 is of polished steel, pierced with ovals showing roses and thistles, with a pplied brass ornaments of conventional tulipa It stands on brass ball feet, and dates from the middle of the 18th century. Nos. 2 and 3 are of pierced brass. The former has a middle


## place, etc.

FENNEL. This is a tall, vigorous, hardy and herbaoeous perennial. With finely out ornamental leaves and yellow flowers in summer, it thrives in ordinarg soil and takea up a good deal of room Ferula communis, 5 ft . high, is one of the most decorative: it is increased by seeds or division. Ferula assafoctida and other species supply the assafoctida of commerce. The fennel used for garnishing and other purposes in cookery is foeniculum valgare, a hardy perennial which can be raised from seeds making of liqueurs.
band of fine tracery and upper and lower bands of seroll work: the latter shows plain moulded bands top and bottom, the centre being pierced in rosette patterns with applied circular bosses. Both stand on paw feet, and are middle 18th century work. No. 4, which is later lyth century, is also of pierced brass. It has a serpentine front, the piercing being in two tiers of interlaoed archos with a central cmbossed band of roping

These designs are in keeping with a panelled and are more room than are the various kind of metal, marbled or tiled Hat ourbs. With electric and gas fires the tendency is to do away with the fender as a superfluous piece of furniture. See Chimney Piece; Curb; Firc-
sown out of doors in early summer. The seed are employed for Havouring and also in the

Fennel Sauce. This rauce will give an added flavour to mackenel. Prepare it by picking some fennel leaves from the stalks,
washing them thomughly, and then putting them into a pan of boiling water over the fire. When tender, drain and chop them as finely as possible. Melt 2-3 $0 \%$ of butter in another pan. mix in 19 tablespoonfuls of flour. and blend the two for a minute or so over a gentle heat.

Take the pan from the fire before adding $1 \frac{1}{2}$ pints of milk, then boil up the whole again, stirring all the time. Put in 3 tablespoonfuls of the chopped fennel, together with seasoning to taste, continue boiling for a few minutes. and the sauce is then ready to be served.

FERN: The Varieties. Ferns embrace many species of stove, greenhouse, and hardy kinds, ranging from the wild bracken of woods and common, to the eaquisite varieties grown in stovehouse and greenhouse. They are propagated by division of roots, by young buds on the fronds, and by spores. The fronds are wonderfully varicd in size, texture and colour, and some ides of their wide diversity of shape may be gathered from the diagram, which shows the following ferns

1. Maidenbair
2. Niphobolus nugustatus Splecnwart
Apline hare's foot . Australian spleen wort

Fern. Examples of fern follage showing some of the many varieties of frond. A key to the drawlag will be found in the tert
7. Tunbridge flay fern 8. Bird's foot 9. New Z.enland fern 10. Actinlopteris radlata 12 Hart's tonkue
12. Elk horn © Silvery brake


Hardy ferns are admirable plants for a shady border providing the soil is moist; they do not flourish in dry ground. There arc many crested and tasselled varieties of the male fern, lady fern, hait's tongue and others which are very beautiful in summer and should be planted in preference to the commoner forms. Planting is best done in autumn though it may be carried out in spring. If the soil is clayey, leaf-mould and sand should be dug in freely and an annual top dressing of leaf-mould or decayed manure in March will do good.
Some ferns do well in room windows, for instance the holly fern (cyrtomium falcatum). pteris oretica and its varieties, asplenium bulbiferun and the ladder forn (nephrolepis). Some of the less vigorous hardy fenns also make good window plants. A suitable compost consists of half leaf-mould or peat with sand added.

Therc are many charming ferns suitable for cultivation in a bested greenhouse having is minimum winter temperature of about 55 degrecs. The ferns must be shaded from hot sunshine in-summer and the soil kept moist. The maidenhair ferns (adiantum) are great favourites : some of the most attractive are ouncatum, gracillimum and pacotti. Other suitable ferns are the bird's nest fern (aspleniuin nidus). lace fern (cheilanthes),
squirrel's foot fern (davallia bullata), gold and silver ferns of which the fronds are covered with gold and silver powder, and the ladder fern or nephrolepis. The stag's horn fern (platycerium) is of remarkable appearance, with fronds like the antlers of a atag ; it is grown in peaty soil fastened on a block of wood or boand which is suspended against the greenhouse wall.
The Fernery. An indoor fernery requirew comparatively little labour and skill to provide a source of constant attraction. A position where other plants will fail can be utilised, and there is such great variety that it is not difficult to find a large number of the loveliest ferns which will flourish. Give them plenty of root room and avoid any accumulation of stagnant water.

An outdoor fernery built of rockwork is always attractive. Sandstone is preferable for construction. Use the pieces as sparingly and as naturally as is possible, endeavouring to convey the idea that they are cropping out of the ground. Loam, leaf-mould or peat and sand form a suitable compost.

Fern Case. Filmy ferns, whioh have thin, almost transparent fronds, are very beautiful and can be grown in a closed case in a cool shady greenhouse or in a shady room window. They need very moist conditions, though moisture must not be provided by watering from above. The ferns should be planted in a drained soil compost of sandy peat and loam : it is wise to oover the compost with moss, for this remains moist and thus helps to maintain suitable conditions. The chief filmy ferns are hymenophyllum, trichomanes radicans (Killarney fern) and others. See Aquarium; Asparagus Fern.

FBRN ROOT. The liquid extract of the root of tho male fern is very frequently prescribed for tapeworm, as it destroys the worm and leads to its expulsion from the intestines. The dose of the liquid extract of male fern is 45 to 90 minims : but the drug should only be used under the supervision of a doctor.

Before taking the fern extract the bowels should first be thoroughly emptied by the use of some purgative suoh as one to two tablespoonfuls of castor oil or a dose of Epsom salts taken overnight. The next morning the dose of malc fern is taken on an empty stomach. About four hours later this is followed by a second dose of the purgative, if necessary. The patient shquld make certain that the head of the worm (and not only portions of the body) has come away, and to help in determining this it has been suggested that the receptacle used should be lined with crape. The head is about the size of a pin's head, and is at the end of a tapering neck. The diet should be light for two or three days preceding the treatment, and it may be advisable to keep the patient in bed. See Worms.

Ferric Salts. The name is given to compounds of iron, like perchloride of iron and citrate of iron and ammonium.

FERRIER'S SNUFR. This is an old remedy sometimes used for cold in the head. It consists of subnitrate of bismuth, powdered gum acacia and morphia. A pinch sniffed into the nose allays pain and greatly diminishes the discharge. As this preparation contains morphia, it can only be obtained on a doctor's prescription, and Ferrier's snuff should not be used indiscriminately or too often, or a morphia habit may be developed.

FERRO-CONCRETE. In modern building ferro-concrete consists of a framework or skeleton of steel encased in walls of concrete. The term is applied generally to any structure made of concrete with internal steel strength. ening members. Ferro-concrete is extensively used in all classes of building. See Concreta.

FERROTYPE. Ferrotype is a method of obtaining direct positive photographio images very rapidly on thin iron plates or cards
'Though principally used by itinerant photographers on seapide beaches and elsewhere, it can be employed to provide entertainment in the home.
The thin iron or cardboard plates are coated with collodion emulsion. A special form of camera is used with a magazine holding 50 or 100 plates. It is so arranged that by working a lever the plate is brought into position for exposure. and after exposure carried into a combined developing and fixing bath. At ordinary temperatures the plate is developed and fixed in about 1 min or $1 \frac{1}{\frac{1}{2}} \mathrm{~min}$. It is then rinsed in water and allowed to dry: the result is a positive image (not a negative as in an ordinary camera), with a not unplessing appesrance. With a reasonably good lens the detail is perfectly sharp and the image clear, although, owing to the iron or cardboard baoking, a pure white ground is not possible. Only one copy of each picture is possible, but as it can be produced complete within 2 min . of the moment of making the exposure it is quite feasible to make a series of exposures if a number of oopies of the picture is required.
An improved apparatus of this nature is the Prismotype camera. With tho ordinary ferrotype camera the image is reversed, so that any lettering that may appear is unreadable. This camera overoomes this disadvantage by the provision of a prism over the lens. Combined fixing and developing salts are sold by the makers of the camera, the formula being a proprietary one.

Insufficient exposure of ferrotype plates gives dark pictures, and too long an exposure gives light ones. If white streaks appear on the photograph development is incomplete, and the plate should be returned to the tank. After the plate has been in the developer-fixing solution for 30 or 40 seconds it is comparatively insensitive to light See Developing.

FERTILIZER. This name is commonly employed for artificial or chemical manures, which are largely used in gardening. The main elements of plant food are nitrogen, phosphates, and potash; and these are present in artificial manures suitable for gencral use in the garden.

Fertilizers containing nitrogen are sulphatc of ammonia, guano, and nitrate of soda. Phosphat ic manures are basic slag, bonemeal, and superphosphate. Potash fertilizers include wood-ashes, kainit, nitrate, muriate, and sulphate of potash. Green manures, dead lish, weeds, garden refuse, and animal matter are very rich in plant food essentials, but they need proper proparation by being placed in a heap and turned over occasionally.

Lime and soot are valuable agents; the former is of special value in improving and sweetening soil as well as unlocking inert fertility. Slow-ncting fertilizers, such as bonemeal, basic slag, and kainit, are best applied during autumn; and soluble manures as sulphate of ammonia, nitrate of soda, sulphate of potash, superphosphate, and guano, during the spring.

Never apply these fertilizers to sickly plants, as benefit can only be derived during healthy growth. Moderation should govern the use of any fertilizer, as excess encourages rank growth rather than fine crops, and if a proprietary compound is being used careful regard should be given to the instructions supplied by the maker. See Basic Slag; Lime: Manure ; Potash.

FESCUE. The fescue grasses (Festuca) are often present in the mixtures sold by seedsmen for pastures and sports grounds, and are especially useful for sowing on light land. Festuca glauca, which has blue-grey leares, is a pretty edging plant

FESTOON. As used in architecture and on furniture a festoon is an ornament made to resemble a wreath of flowers. The festoon
was used by the Adam brothers, and a similar decoration is sonietimes found on silver. See Adam Style: Anaglypta. Christmas: Swag.

FEVIR: Its Occurrence. The normal temperature of the human body is $98^{\circ}-09^{\circ} \mathrm{F}$., and anything above that means that fever is present. It is elight. if the temperature does not rise above $101 \cdot 5^{\circ}$; when it rises above $106^{\circ}$ there is a state of hyperpyrexia, which may prove dangerous. In cases of fever the temperaturo usually reaches its highest point in the evening.

Fever nccurs in infectious diseases, and is due to the poisons produced by microbes: in inflammatory disorders, e.g. pleurisy ; in some digestive disorders, in heat stroke, etc. There are certain symptoms which are found in association with a rise of temperature, whatever its cause. The patient feels out of sorts, and there may be a general soreness or aching, headache and backache. Children frequently have convulsions at the beginning. Sleepless ness is common, and delirium may be present. The mouth feels dry, there is thirst and usually constipation. The appetite is impaired, and there may be nausea and sickneas. The pulse rate and the brcathing rate are increased.

Unless the fever is slight the patient should be put to bed in a quiet room. The diet must be liquid only, diluted milk, etc., and water or fresh lemonade may be drunk freely. The following remedy will help to keep a mild attack of fever in check. The dose for a child is 1-2 teaspoonfuls every 3-4 hours, for an adult 2 tablespoonfuls every 3 hours. In the case of children half the mixture only should be given at a time.

Sweet spirits of nitre
Solution of acetate of animonia
Syrup
$\begin{array}{llll}\therefore & \because & 2^{102} \\ \therefore & \because & 11 \\ 0 & \because & 4 & \ddot{1}\end{array}$
When the temperature tends to be high, or the patient is restless or delirious, the body should be sponged with tepid water, a part only being exposed at a time; or a cold pack (q.v.) may be employed. Tho treatment should be superrised by the doctor, and until it is clear that there is no infection the patient should be isolated. See Infectious Disease; Scarlet Fever; Thermometer: Typhoid Fever, etc

FEVERFEW. The popular name of chry. santhemum parthenium (known also as matricaria or pyrethrum). of which the double


Feverfow. Golden feather, or feverlow, popular summer bedding plant with yellow leaves

Howered variety is a useful garden plant, $\boldsymbol{2}$ feet ligh, bearing a profusion of small double white Hlowers. It will thrive in shade and sow itself freely. The name feverfew is also applied to that popular bedding plant, golden feather.

FIBROID. Fibroids of the uterus are tumours composed of murcle and fibrous tissue which may arise in any part of that organ, but are most common in the body of the uterus.

The commonest symptom is excessive loss of blood at the periods, and it is of great
importance that advice should be sought done in summer chiefly, is early. The tumours enlarge just before the menstrual periods, and the occurrence of difficulty in passing water for 2 or 3 days before a period should incite suspicion of their presence.

The period of maximum frequency is be$t$ ween the ages of 35 and 45 . Although the presence of a fibroid or fibroids may not prevent conception, it nearly always renders dangerous, and sometimes inprossible, the birth of the child, or even its development to full time. If the growth becomes infected by germs, general blood poisoning and the death of the patient will ensue. The only treatment of any avail in the great majority of cases is the removal of the uterus.

## Fibroma. See Tumour.

FIBROSITIS. This term is applied in medicine to swelling of fibrous tissue from inflammation and is the condition present in muscular rheumatism, where the fibrous sheaths and intersections of the muscles are affected. Where the swellings occur nerves may be compressed or dragged upon, and this is especially so when movements are made. hence the rcute pain associated with this complaint. The lumps can sometimes be felt.

Fibrositis may follow exposure to cold and clamp, injury or poisoning from sepsis in the mouth, intestine or elsewhere. In some caspa rest in bed is necessary. Aspirin may be useful in relieving the pain, and the bowels should be cleared with a dose of Epsom or Rochelle salts. A course of sulphur may also be beneficial. Heat, either in the form of a hot water bag or of poultices or fomentations will be found comforting. Massage is an all-important part of the treatment, and after the rubbing the patient should make such movements of the part as are possible without pain, and in most cases he rapidly gains freedom in doing this. To prevent recurrences he should keep a clean mouth, pay attention to the regularity of the bowels, and by extra clothing, etc., take precautions against exposure. See Lumbago ; Massage, etc.

## Fibula. See Leg.

FIDDLE PATTERN. Tablespcons and forks are very often made in this pattern, which came in vogue in the l9th century. Its main features are the round end and straight side, the handle having sharp corners where it rounds away into the stem. See Fork; Spoon.

FIDGETS. Elderly peoplo frequently suffer from sleeplessness and troublesome fidgets. This is probably due to a general failing of all the organs, which hinders the purifying processes of the blood. The patient should eat very modcrately and be kept a good deal in the open air, even when unable to take much active exercise. An occasional warm (but not hot) bath before going to bed will soothe the nerves.

A form of fidgets to which other than elderly people are prone is due to muscle fatigue, the limbs feeling nerveless and out of control. The treatment noted above may give relief, but if not. a doctor should be consulted.

FIG : Growing and Cooking. The edible fig is borne upon hardy trees of varying sizes belonging to the genus Ficus, of which the indiarubber plant is a member. Except in mild districts, figs are best grown under glass, or on a sunny wall. They strike readily from cuttings of ripe wood placed in sandy soil, in bottom heat in late autumn. When rooted, the young plants should be given separate pots, and then either repotted as required if they are to be fruited under glass, or planted out against a wall. As the habit of the tree is naturally gross, rich soil must be avoided. If the soil is deficient in lime, mortar rubbish or chalk may be added liberally, and the soil rammed well down. Propagation may also be effected by drawing suckers away from the base of establishing plants. Pruning, which is
done in summer chiefly, is
directed towards prevent. ing overcrowding. Suckers (shoots that grow from the base) should be pulled up. The best variety for general oultivation is Brown Turkey.

How to Cook. The frealt fruit of the fig-tree is useful for dessert. These are always called "green figs," and are sometimes made into jam, or a compôte cooked as follows: To about $\frac{7}{3} \mathrm{pt}$. of water add $\frac{1}{2} \mathrm{lb}$. of sugar, and let them boil together for about 10 min . Add $1 \cdot-1 \frac{1}{2} \mathrm{lb}$. of figs, and simmer them slowly until they are tender. Then take them out, and let the syrup boil briskly until reduced to about $\frac{1}{2} \mathrm{pt}$. Pour it over the figs, and leave them to get cold. Lemon peel added to the water, and a little lemon juice or wine added when the fruit is soft, will improve the Havour.

In stewing, use the small figs, and soak them overnight in cold water. Then put into an enamelled saucepan 4 oz . of sugar, $1 \$$ pint of cold water, and the thinly peeled rind of a lemon. When the sugar is dissolved, add $1 \frac{1}{2} \mathrm{lb}$. of figs, and stew them slowly for about $1 f$ hours. They are usually served with a milk or custard pudding. If liked, the juice of a lemon may be used as flavouring for the figs instead of the peel.
The fruit for eating as dessert should be quite ripe, and must not be kept too long or it loses its delicate flavour and bloom. The finer kinds of dried or Turkey figs serve also as a dessert dish. In appearance they should be slightly moist, and have a whitish tint outside and a rich yellowish brown inside. The smaller figs are drier in appearance, but should be clean and without black patches. They are mostly used for stewing, and are useful for various kinds of puddings. They may take the place of raisins in a cake, and in that case should not be soaked in water.

Fig Cake. A rich cake can be made by sifting $\frac{1}{2} \mathrm{lb}$. of Hour with a pinch of salt, $\frac{1}{}$ teaspoonful of ground ginger, and $\frac{1}{2}$ teaspoonful of baking powder. In a separate basin cream 3 oz . of lard and 2 oz . of butter with 5 oz . of brown sugar, adding the rind of $\frac{1}{2}$ a lemon. When these ingredients have been well worked, add 3 eggs one by one, and beat them well in. Clean and cut up into small dice $\frac{1}{2} \mathrm{lb}$. of tigs, add them to the flour and then mix them with the butter and eggs, taking care to work the dry ingredients in lightly. Lastly, add $\frac{1}{2}$ gill of sour milk, turn the mixture into a lined cake-tin, and bake it for about it hours.

Fig Jam. To make fig jam, weigh some small green tigs, which should not be quite ripe, wipe them, and score them across the top. Lay them in a brine of salt and water for 10 days, then wash them and boil them in fresh boiling water till a skewer will easily pierce them. Put the figs into cold water and leave them for 4 days,


Fig Pudding. Another variety can be made by using equal quantitios of chopped ags and raisins
changing the water each day. For every lb. of figs take l lb. of granulated sugar and make it into a syrup, allowing one gill of water to every lb. of singar. Cool the syrup after straining it, pour it over the figs, and leave them all night. The next day boil the jam till the fruit is quite clear, put it into jars and tie it down securely. (See Jam.)
Fig Pudding. Chop $\frac{1}{2} \mathrm{lb}$. of dried figs very finely, and add to them $\frac{1 \mathrm{lb} \text {. of }}{}$ breadcrumbs, 4 oz . of finely chopped suet or dripping, and 4 oz . of sugar. Beat up 2 eggs, pour them, with a good breakfastcupful of milk, over the dry ingredients, and mix well. A little grated nutmeg or powdered allspice might also be added. Turn the nixture into a well-greased pudding basin, twist some greased paper over the top, and steam it for about 4 hours.
FIG MARIGOLD. Few of the mesembryanthemums or fig marigolds are hardy in Great Britain except in specially favoured places. One of the hardiest is the ice plant, Mesembryanthemum crystallinum, an annual which is raised from seeds under glass in spring; it has succulent stems and leaves and white or red Howers in summer and should be planted in a sumbaked spot. One named Mesembryanthemum cordifolium variegatum, with green and


Fir Marigold, annual suitable tor as sunny garden yellow leaves, is often used in carpct bedding; it is raised from cuttings in a frame in August. In spring and summer the points of the shoots must be pinched off several times to kecp the plants dwarf.

FIGURE : How to Improve. The founda. tions of a good figure are laid in early youth. With ordinary health, if hygienic rules have been observed, a strong, graceful body may be developed which with a little care will retain correct lines.
Diet, fresh air, proper breathing, sufficient relaxation and eaercise all contribute toward moulding a good figure. Outdoor games should be encouraged for normal children to develop healthy growth of bone and muscle. Swimming and classical dancing, particularly in the open air, are especially beneficial, as they exercise every muscle with rhythmic perfection. Skipping improves breathing, balance and carriage. Tennis, when played vigorously, is a good form of exercise.
While perfectly controlled muscles are essential, over-development of these to some extent destroys elasticity and coarsens the limbs. To acquire symmetry and to preserve the good lines of the body a short course of exercises, which flatten and strengthen the back and abdomen, deepen the chest and keep the body supple, should be performed daily. Suppleness and symmetry are the keynotes of beauty. They mean fluent grace of line and movement.

Suitable Exercises. In addition to the exercises given under Beauty Culture and

Breathing, the following three would make up the daily dozen of an excellent course suitable for either sex.
(1) A lunge exercise is good for all the muscles of limbs and trunk. Stand erect with hands on hipe. Take a step forward with the right leg, bending the right knee. At the same time lunge forward and upwards with the right arm to the full extent, following the arm with the eyes. The left arm is simultaneously carried backwards and downwards. Spring back to the original position, then lunge with left arm, bringing the left leg forward. Spring back and repeat the exercise, lunging with right and left -arms alternately.
(2) This exercise should be practised gradually. Lie flat on floor, face downwards. Support the weight of the body on the toes and hands, palms flat on the ground at the side of the body, fingers pointing forwards. Raise the body by atraightening the arms and keeping the trunk rigid without bending at the waist. Slowly lower the body and try to touch the floor with the chin. Raise and lower the body alternately, touching the floor only with the toes, the palms of the hands and the chin. This is a splendid exercise for the arm. thigh and abdominal muscles.
(3) Stand with feet apart, arms extended to the sides at shoulder height, palms downwards. Bend the body forward from the hips until at right angles, keeping the knees stiff. Then bend down and touch the ground between the feet with the right hand, left arm raised to a vertical position above head, keeping the body bent the whole time. Repeat ten successive movements each side. Digestion is stimulated by this exercise, the liver and kidneys toned up by using the back muscles, and, in addition, the abdominal muscles strengthencd.

Do not hold the breath during the exercises, but breathe deeply and evenly throughout. The murements should be repeated until there is a slight feeling of fatigue. It is surprising how speedily strength is improved by persistent practice. See Beauty Culture; Breathing Exercises; Diet; Obesity.

FIGURE OF EIGHT MOTE. Although this moth is exceedingly common and fairly large, it rarely comes under the notice of the gardener; but the caterpillar is often evident to him. The perfect insect is less than $1 \frac{1}{2} \mathrm{in}$. in the spread of its greyish-brown forewings, which bear the distinctive mark from which the moth takes its name. There are two whitish blobs on each wing, and the one nearer to the base of the wing takes the shape of a crudely formed 8 . Flying by night, it is rarely seen, except occasionally by watch. ing the street lamps which attract it. The cggs, laid in September, hatch about April, and the caterpillars which out in the open feed upon hawthorn, blackthorn and crab, in the garden attack apple, plum and other fruit trees. They often appear in great numbers, and may be recognized easily by their characteristic blue backs which have a yellow line down the middle. Each segment of the body of this moth bears four black warts on the back, and the warts bear bristles.

By late June the larvae are full grownabout if in. long; but they are large enouyh to be noticeable early in May. When fullfed they descend the trunk to spin a cocoon near the ground, attached to the bark or sticks or stones. As soon as their presence is detected, a large sheet of somie sort should be spread under the tree where they are thickest, and the branches should bo jarred by rapping them sharply with a stout stick, bringing the caterpillars down in a shower.

FILAMENT: In Wireless Apparatus. In a wireless receiving valve of the battery operated type the filament is a metal wire enclosed by the grid and anode. Upon being heated by the How of current from a low tension accumulator the filament emits electrons from its surface. In this type of valve the filament constitutes the cathode, in contrast to an indirectly heated mains valve, in which the filament (i.e. heater), and cathode are separate.
The filament of a modern battery operated valve is usually connected direct to a low tension accumulator of suitable voltage, the current supply being controlled by an "onoff" switch inserted in either the positive or negative leads. A mains valve derives its heater current from a mains unit, which is controlled by a switch on the mains side of the equipment. A variable resistance is sometimes inserted in series with the filament of a screen.grid battery operated valve as a means of controlling volume. Suitable values are 15 ohms for a 2 volt valve, and 30 or 50 ohms for 4 or 6 volt valves. See Cathode; Valve.

FILBERT, Belonging to the genus Corylus, the tilbert will flourish in ordinary well drained soil. On the chalky soil of Kent the filbert flourishes excellently, and it may be used as a hedge, instead of privet or thorn, or as a scrcen, or in groups. The tree may be raised from nuts planted in the autumn, or from layers or suckers. Popular varieties are whito-skinned, redskinned, Webb's prize, and Cosford. The best crops are obtained from trees that are closely pruned to the shape of a vase. Pruning must not be done until after the catkins have faded: side shoots, other than those bearing the small red-tipped female flowers, are then shortened. They are best freshly gathered, and will then peel easily when removed from the shell. To blanch the nuts for cooking, or any other purpose boil the shelled nuts for a second or two, then tu into a clean rough cloth, and by kerncls remove the brown skins. See Nut.

FILE: Its Uses. A file is provided with a spike called a tang at one end, to which a wooden file handle can easily be fitted. When in use, the file is grasped by the handle in


Fisare of Eight Moth, an orohard peat. 1, male : 2, fomale ; 8, catorpillar the right hand, with the length of the file pointing forward across the top of the work to be tiled; the finger tips of the left hand are laid down on the top of the file close to the point end. Vertical downward pressure is applicd equally with both hands, and at the same time the file is driven forward in the direction of its
length by force exerted principally by the right hand. On therrecovery stroke the downward pressure is entirely relaxed, or the file may be lifted off the work.

Excrt the downward pressure principally with the left hand at the commencement of the stroke, transferring it gradually during the stroke, so that at the finish of the stroke the


File. Correct position in ase: thumb on handle, weight on both arms, file horizontal
principal pressure is exerted by the right hand. This must not be overdone, or rounding instead of flatness will appear; properly done, the gradual transferring of the duty of pressing down from the left to the right hand just keeps the file dead level, and level work is the result.

It is essential for the work to be held in a vice or otherwise rendered absolutely as firm as possible. The above description applies particularly to the use of a flat file on a flat surface (see illustration).

Files are classified according to size, shape, and roughness of surface. The only shapes which are required for daily use are known as hand, half round, square, round, and three square. The grades of roughness are known as rough, middle, bastard, second cut, smooth and dead smooth. The amateur will find the following assortment of files useful: a 10 in . bas. tard, an 8 in. second cut, and a 6 in . smooth hand file, an 8 in . second cut halfround, an 8 in . and a 6 in . second cut square, an 8 in . and a 0 in . second cut round, and a 6 in . second cut threesquare file.
FIIET LACE WORE. This lace derives its name from the French filet or net which forms the background on which the pattern is darned. It is a square mesh varying in size from is to $\ddagger$ in. for the atandard filet nets, although larger meshes have become fashionable for window curtains, table centres, cushions, chairbacks,
Filbert. Leaves and frait of a tree
useful to the gardener for hodges and other articles of the kind.

Real filet lace has a hand-made background made with the ordinary netting stitch used by fishermen, but with a much finer ncedle and mesh, a round ateel knitting needle being used for the latter where a mesh of less than $\frac{1}{8}$ in. is required. Many English filet laces are worked on a machine-made background, the designs being darned on the net by hand.

Fig. 1 shows a square of hand-made net lashed firmly to a square filet frame of thick wire, bound with green silk. With a small piece of work, the ground net should bo sewn to strong calico, and the latter sewn or lashed to an ordinary frame bound with strong calico. A round embroidery frame could be used for small motifs, by sewing the latter to a piece of material each side so that the net in the middle is quite free.

The stitch employed is the ordinary darning stitch, passing the needle under and over the
meshes of the net in an up-and-down direction until the space is filled A specimen of this is shown in the lower part of Fig. 1. The working thread should be of the same thickness as the netted threads, and the number of times the darning must be done in one space depends on the thickness of the thread. Embroidery cotton, flax thread and flourishing thread form suitable mediums for this, as they are only slightly twisted; hard, round threads and tight twists should he avoided. Coloured embroidery silks might be darned on dress net, with a judicious blending of the colours.
The most expensive filct laces nie worked in cloth darning, shown in the top left corner of Fig. 1. To do this, darn up and down as described above, but work only half the number of threads required to fill the space, then darn in the opposite direction, going under and over every thread in turn, including the net background
Making a Lace Border. Fig. 2 shows how a lace border can he made and a corner formed in the same deaign. The darning passea over three threads of the mesh on the leaves, and over two threads for single spaces For the heading of the lace-the straight cdge by which it is sewn to the material to be trimmed -a straight line of three rows of threads is darned right along. To make a firm edge the net should be cut away to its proper depths allowing for a small hem to be turned, and the border darned through the two thicknesses of net, so that there is not a raw cdge. The lower or outside edge of the lace is buttonholed, and this must be worked before the net is cut.

Fig. 2 shows the direction the stitches should take to form pointed scallops, and the buttonholing is worked from left to right. They are worked on two sides of a mesh up to the top or deepest point of a scallop, then on threc sides of the mesh at the dip, and down the side of next point, one mesh at a time. To furm the corner the direction can be followed from the illustration. In the latter the net is cut away on one side, and the portion after the corner is left ready for cutting. Geometrical or conventional flower designs can be copied from cross-stitch hooks and from filet crochet patterns. See Crochet.
FILIGREE. Filigrec ornaments, such as brooclies, pendants, necklets, earrings, etc., are made of very thin flat wire, the upper surface of which has fine mille. griffe markings, like the milled cdges of silver or gold coins, but somewhat deeper. The designs are formed by a series of hand-twisted wire loops or circles frequently ornamented with cabochonshape stones, such as turquoises, sapphires, corals, etc. White or grey oxidized silver or gold wire is used.
The fincst silver filigree is made in Italy, and. in addition to articles of jewelry, there are heautiful specimens to be seen in the form of sweet dishes, jewel cases, etc. See Brooch; Earring.

FILLET: Of Meat and Fish. Strictly speaking this is the fleshy part of the thigh or therl Museum. S Kiensington name undercut of a sirloin of heef, but the Kodat comnany have abandoncd the manuname is usually applied to small boneless por- facture of ginss plates, whether for amateur tions of ment or fish, dressed in various ways and shaped, if meat, like cutlets, or, if fish, in strips or neat pieces. See Beef; Fish; Mutton; Veal, etc.
FILLET: In Furniture. This is a small flat face that separates round or oval members in a moulding. The fillet helow an ogee
moulding is sometimes known as a keel fillet. The one above it, which projects beyond the curved member, is known as the wing fillet. See Moulding.
FILM : In Photography. Celluloid films have many advantages as compared with glass plates. They are lighter, not liable to breakage, and less liable to halation than unbacked glass plates. In the roll form as cartridges for daylight loading they arc extremely convenient for snapshot work. The tendency to curl up when dry has been overcome by coating both sides with gelatine. Roll films suffer from a liability to longitudinal scratches, probably caused by rolling too tightly ; care should be taken when


Filet Lace. Fig. 1. Showing hand-made net attached to wire frame, and method of making darning stitch. Fig. 2. Design adapted to a border and corner, suitable for edging a tray or table clotb
the film is in the camera to sce that both top and bottom spools revolve easily.

Roll films are a little more awkward to handle in developing and fixing than plates (see Developing). They are partly sensitive to colours, being orthochromatic but not panchromatic, or equally sensitive to all colours. They are obtainable in fairly high speeds

Filins are also available in Hat form, six or a dozen exposures being carried in a film pack. Thesc arc exactly similar in characteristics to roll films, hut are designed for use with plate cameras. For more advanced photo. graphers flat films of n stouter kind are made which have all the advantages of plates and none of their disadrantages.

They are to be obtained both orthochromatic and panchromatic, and in the higher speeds. These flat or cut filnis arc carried separ. ately in plate holders or dark slides, and are treated as if they were plates. Films are so convenient that the or professional use.

As films are more liable than plates to surface danage by scratches and finger marks, it is $n$ sound plan to harden them by immersion for $\ddagger$ hour in a solution of one part of formalin in 25 parts of water. After removing the surface water with fluffless blotting paper

the film can the dried before a fire. If dried thus without hardening it would melt.
The Clearing Bath. Stains on a film caused during development, both on the front and sensitive side and on the gelatine back, can usually be removed by a clearing bath. The film should he thoroughly washed to get rid of the slightest trace of hypo, and then immersed in the following solution
Alum
$\underset{\text { Water }}{\text { Citric }}$
Water
If chrome alum is used the quan tity should be 1 oz . instead of 2 oz . This solution can be uscd two or thre times, and it brightens the negative considerably. To remove the film from useless glass or gelatine negatives, soak them for several hours in strong soda water and place them in water which is nearly boiling; they should then come off quite casily.
To strip the film from a cracked or broken negative, place the negative in a bath made of 1 dram of potassium fluoride in 1 pint of water, with 10 or 12 drops of strong hydrochloric or sulphuric acid The film will float off, and after rinsing in cold water can be lloated on to another piece of glass, and when perfectly Hat squeezed on and allowed to dry slowly, surface water being drained off. This process enlarges the film considerably, and the new glass should be at least if
times the size of the original negative. If this enlargement is not required it may be prevented by soaking the film in methylated spirit immediately it is detached by the acid aolution. See Cinematngraphy; Developing : Fixing; Negative.
FILM PACK. This is a means of using flat films in a plate camera with the advantage of daylight loading. Six or 12 films are placed together in a cardboard holder, each film being backed with black paper, the end of which projects at the top of the pack and carrics a number. The whole pack is placed in a film-pack adapter fitted to the particular camera, taking the place of the ordinary dark slide or plate holder. When a film is exposed it is changed by pulling out the numbered tab ateadily and without excessive force; this pulls the exposed filin round a roller nt the hottom of the pack so that it is changed from the front to the back of the pack, and the next film is rearly.

When the last paper tab is pulled out a shield is brought in position in front of the last exposed film, protecting it from light and nllowing the whole pack to be removed from the adapter in daylight. If it is desired to develop single exposures the adapter containing the pack can be taken into the dark room and the iequired filma removed, care being taken to close the pack pioperly before replacing. See Devcloping; Film; Fixing; Photography.

FILTER : For Drinking Water. When drinking water is suspected of being contaminated it should be carefully filtered before use. As an extra precnution, it is well to hoil it firat. Water loses its confained air by boiling and becomes flat, but the process of filtration restores more or less air. The water supplied to city people is thoroughly filtered, but in country districts, where the
supply comes from wells and streams, the process must be carried out in the home Where disease germs are present, however, reliance should not be plaoed on filters; the best safeguard is to boil drinking water.
Several filters suitable for use in the home are on the market. The Pasteur-Chamberland is made in several types, the largest being pressure filters for attaching to the main water supply. A smaller one, of the nonpressure type, made to stand in the house, is of earthenware or enamelled iron. Its size varies, the largest being able to deal with 16 gallons of water a day and the smallest with three. A filter of this kind is illustrated in Fig. 1.
Another useful type is the silicated carbon filter (Fig. 2), made in various sizes and styles. For ordinary domestic use there is a stoneware article, the largest size of which has a capacity of 12 gallons. These need from time to time extra charges of the silicated carbon, which is the purifying agent. Filters on the same


Filter. Fis. 1. Mon-prespure fliter in enamelled iron. A, unfiltered water ahamber: B, iltaring tabes: C. pure tin collector: D, pure tin giphon tabe: E, iltared watar chamber: P. draw-0. cook Pis. \& Carbon flitar in itonoware. Ap space flllod by granuiar carbon: B, aerator oover: C, small abostos rope ring Courtesy of Grilish Pastenp-Chamberland Ful made for table made for table 20 henries. The the

frequency stages
It protects the loud speaker or telephone windings, sinoe the insertion of these delicate windings direotly in the anode circuit of a low impedance valve might result in a breakdown.
The filter is, moreover, an aid to stability in a receiver or amplifier with two low frequency stages. Employed in conjunction with a de-coupling resistance and by-pass condenser conneoted in the anode circuit of the detector valve, an output filter is particularly useful in cases where the high tension supply is derived from a mains eliminator liable to produce " motor-boating" and other troubles. The filter also permits the use of a single long lead from the set to a distant loud speaker, so avoiding induction effects. The socond terminal on the loud speaker is connected to any nearby earth point.

A common value for an output filter choke is but a general one is three of sand to one of lime-putty. It can be allowed to stand, .fter it has been thoroughly mixed, till nearly hard but not dry, and can be made to the required consistency with water or lime water for immediate use. It is less likely to shrink or crack if prepared in this way, and may be mixed with colouring matter to give any required tint. One part of sand may be omitted, and one part of crushed marble, sla baster, or spar substituted in order to give a different type of surface. See Plaster.
Finger. See Hand.
FINGER AND TOE. Finger and toe, anbury, and club root are all names for the
 same troublesome disesso attacking the roots of turnipe and cabbages. See Club Root. FINGER BOWL. Finger bowls may be of plain or cut glass, those of the former type being often coloured.


Fingar Bowl. 1. Barly moulded Irith finger bowlo c. 1780. 2. Bowl of Bristol Blue glase with gilded dige, a 1800. \& Lrish out glas Fork, 0.1800. 4. Finger bowl decorated withinate ontting, c . $1820-80$ Courteay of Cecll Davia
they should harmonise with the dessert service and the table decorations generally.
Finger bowls of old glass can occasionally be purchased, and are usually of greater beauty than modern ones. Some are of the double. lipped type, and are found in a variety of patterns, cut and engraved. More rare are the barrel-shaped ones, the charm of which lies in the beautiful steel-blue quality of the old crystal glass, austerely deoorated with groups of raised lines. See Glass ; Table Laying.
FINGER STALL. A finger stall is used to protect broken nails, cracks at the top of the finger, or any small wound which needs to be covered, but it should never be used on an open wound without some kind of bandage or dressing, as it is not aseptic.

Rubber finger stalls may be bought from any chemist, but ordinary ones can be made from an old pair of gloves. Cut of the glove finger corresponding to the finger for which the dressing is required, leaving a triangular piece of material extending from the base. This is then pierced and a piece of tape inserted. The tape should be long enough to cross over the back of the hand and take a turn round the wrist, being then fastened. See Bandage: Dressing.

FINIAL : In Furniture. This word is used for the top finish of a vertical member of a piece of furniture. Examples are the ting acorn tops found on the supports of Queen Anne looking-glasees, and the terminal ornament at the top of a pole fire-screen.

FINING: In Cookery. Fining is the process by which thick or cloudy liquids are made to appear clear. Home-made wine. jellies, and soups are frequently fined. The wines are treated with isinglass, and jellies and soups with white of egg and eggshells boiled with the liquids and afterwards strained. For clear soups raw beef is minced and substi. tuted for the white of egg.
FINNAN RADDOCK. The name is given to the cured and dried haddock procurable all the year round. The fish is of a creamy yellow colour. See Fish; Haddock.

FIR. This name is commonly used in refer ence to various conifers, e.g. abies, picea, pinus and others
Fir Cone. Fir cones make excellent fuel for an open grate. They should be collected and dried, and then stored in a $\log$ basket. When the fire has bumed up well and is bright and clear, put on the cones. They burn briskly and give out a pleasantly fragrant smoke.
A large fir cone makes a reliable weather glass. It should be hung up in the porch or liall. When wet weather is to be expected the cone will close up tightly, owing to the moisture in the air. When a spell of dry weather is coming the cone will open and spread out. See Deal: Fire; Fuel; Wood.

FIRE: How to Lay. Much depends upon the corrcet laying of a fire, but no difficulty whould be experienced if a sufficient supply of dry wood is kept ready for use.
The kitchen fire is generally the first to be lighted in the morning, by raking out the dead cinclers and ashes from the grate, placing crumpled paper in the bottom, with the finest kindling on top of it. Upon this is placed slightly larger wood, with a fairly large piece, and a few knobs of coal on the top. The top of the range should then be replaced or the kettle placed over the opening, the dampers adjusted correctly for draught, and a match applied to the paper. The paper inay be saturated with paraffin oil before it is placed in the grate ; to tip paraffin over the whole fire is risky.

In the case of an anthracite stove, the same procedure may be followed, except that, instead of the damper, the small door at the bottom of the stove should be opened when the fire bas been lit, in order to provide more draught, and a fairly large quantity of anthracite placed on the wood. For open grates no damper is provided, but the grate is generally larger, and more wood can be laid on it. Open grates are more common in the country, and a wood fire is easily made up before coal is placed upon it. The same procedure may Ise followed in the case of barless stoves and fireplaces, although in the latter case it is generally wood that is burnt.

Where the fire is open, that is, not enclosed, as in a range or slow combustion stove-care should be taken to see that the register is opened before the fire is lit, or the room will be filled with smoke. Essentials are that there shall be room for the flames from the paper and kindling and a sufficiency of air for proper combustion, for which reason there must be a space for the air to get through. It is useless trying to light any fire if the kindling be so tightly packed that the air cannot pass all through it, a good draught being a great help to speedy and effective fire lighting.

Fire Lighter. Special compositions, gener ally of pitch and sawdust, are sold for fire lighting. In some cases the composition is placed on kindling wood all ready for use, and in others it is sold in blocks, divided up into squares, one of which is used at a time They are very useful when the kindling wood is damp, but care should be taken that they are stored in a place that is not greatly exposed to heat, as they are liable to catch alight.

Pine cones are converted into fire lighters by soaking them in a mixture of 8 parts of resin to I part of tallow. This is done while the mix ture is hot ; the cones are improved by sprinkling them with sawdust. As they are very inflammable they should be stored in a safe place, preferably out of doors, but protected from the elements. See Anthracite; Coal; Gas; Grate, etc.

FIRE : Precautionary Measures. One of the first duties of the householder is to ensure that proper precautions are taken against fire, and while much has been done by legis
lation so far as the building of the house is concerned, the interior arrangements must be carried out by the inmates themselves. Various safeguards and emergency measures to be adopted in case of fire are outlined in this article, together with a brief description of some of the fire appliances on the market. Such measures include the provision of extinguishers and ladders, the immedinte closing of doors and windows, and the application of water, sand, or a chemical extinguisher.
Open fireplaces ought to be protected by an efficient fireguard at night, or on occasions when the house is left unattended for any length of time. The storage of inflammable oils should be in an outbuilding, and not in the house itself. Oil used for lamps should be kept in a safe place away from any heat, and the lamps themselves wiped dry at the time of refilling. Candles and nightlights should never be left burning unless properly protected by a holder of adequate size or housed in a candlestick with a glass shade. Never put a lighted lamp in any position where the heat from it may be a source of danger. A lamp is usually alight for a considerable time, and while the heat at the start may not amount to much, the cumulative effect may be enough to scorch, and finally to fire, adjacent woodwork. The airing of clothes at an open fire should only take place under supervision, as a cat or a dog may easily overthrow a clothes-horse and cause a fire. Another wise precaution is the provision of metal ash-trays : many fires have started from a dropped cigarette-end

## Importance of Instant Action

The greatest safeguards against fire are those which can be quickly a pplied. Speed is everything; the biggest fire starts as a tiny one, and therefore if a fire occurs act at once. A tumblerful of water applied at the instant of the outbreak may suffice, or the prompt application of a thick rug or mat
If the hedroom curtains catch fire, seize a pillow and beat out the flames, and if assistance be at hand, let the doors and windows be at once closed, and apply the water from the toilet jugs thrown forcibly into the heart of the fire. An outbreak can sometimes be suppressed by the prompt application of a wet blanket.

When it is necessary to enter a burning building it is better for two persons to go in company, so that if the first is overcome by the smoke the other may be able to effect a rescue. If the snooke is very dense the entrance should be made on the hands and knees. A wet handkerchief, towel, or a damp sponge gripped in the teeth is an aid to breathing, as it acts as a sort of filter for the air

Many excellent fire-fighting appliances are on the market, and their purchase should be looked on as an investment. The chemical extinguishers are probably the most effective for domestic use. They are made in many sizes and types, but those of two or three gallons capacity are as good as any in an ordinary house. They work in various ways. In some there is a handle to be turned; in others the appliance is turned upside down, struck a blow on the floor, and the liquid at once directed into the heart of the fire. Whatever the type adopted, its method of use should be demonstrated in the presence of all those normally resident in the house, so that all may be familiar with it. The appliance should be kept in a well-known and accessible position.
Insurance Against Fire. A policy insuring a house and its furniture against fire should be taken out by every householder. The rates vary, but lis. Gd. for each $£ 100$ insured is a fair average. It is more economical in most cases to take out a policy that covers other risks, e.g. burglary and employers' liability as well.

A fire insurance nolicy is essentially an
agreement in good faith. A failure to disclose any material fact necessary to estimate the risk properly vitiates the policy, and the same is true if anything is done without permission of the insurer whereby the risk of fire is increased after the contract has been made. The risk of fire as a result of invasion, riot, strikes, or civil commotion is not covered by an ordinary fire policy.

Fire insurance policies are issued either subject to average or without average, and those who take one out should make inquiries on this point. In the former case, if the full value is not insured, the insurer must bear a proportion of the loss. For instance, A insures his house for $£ 1,000$, but its total value is $£ 2,000$. A fire damages it to the extent of $£ 800$, but the insurance company will only pay him $£ 400$, or half the amount of his loss, as his house was only insured for half its value. If, however, property is insured without average, the full amount of the damage is payable up to the limit of the amount insured. See Insurance.
Fire Alarm. Fire alarms are of two classes. Thosc installed in the public streets are set going by breaking the glass and pulling a handle or knob; an electric circuit is completed, and a bell rings in the firo station. Those installed in the building to be protected are of two kinds, those which merely indicate that an excessive temperature has been reached in some part of the building, and those which release a jet of water about the place where the fire is.

The first kind generally consist of mercurial thermometers. When the mercury reaches a predetermined limit it will touch a wire fixed in the glass and thus complete an electric circuit which causes a bell to ring or a steam whistle or "syren" to go off. The sccond consists of fusible metal disks which are fixed generally in the ceiling, and melt when a dangerous temperature is reached in their neighbourhood, letting down a spray of water : an audible alarm is usually conbined with the disk apparatus.

FIREBRICK. Firebricks are manufactured from various kinds of earth and treated to render them lire resisting. Moreover, they have the property of radiating heat, and arc an excellent non-conductor of heat. For this reason it is an ideal material for the back of a fireplace, or any other location where great heat has to he resisted.

Firebricks are obtained in a wide range of sizes and shapes. Modern grates which are made on the barless principle often havo a fircbrick back extending the full height of the grate. See Grate.

FIREBUSH. This is the common name of Cratacgus pyracantha, a type of evergreen hawthorn, bearing white tlowers in May, followed by bright scarlet berrios in autumn. Ordinary soil is suitable for the firebush, but a sunny aspect away from the shade of other trees is desirable. There is a superior variety called Lelandi, of more compact growth, and bearing dark-green leaves with clusters of white Howers, followed by bright orangescarlet berries.

FIRECLAY. A variety of clay that will withstand extreme heat is used in making firebricks, for setting parts of a grate or stove, and for other purposes where resistance to great heat is essential. The best qualities come from the neighbourhood of Stourbridge. It is obtained in powder form, has to be moistened with water, and applied in a plastio state with the aid of a trowel, or pressed into place with the fingers, according o circumstances.
Many excellent compositions are on the market that have fireclay as a base. They are sold under different trade names, and have much to rccommend them for amateur


Fire Guard in wire, essential in the nursery Courlesy of Selfridges
use as, being purchasable in small tins, they are economical in use and of a proper consistency for such work as the repair of a damaged fireplace. Fireclay is very useful for luting the joints around a stove-pipe, for making good any defective places in an anthracite stove, or in fact any place which is subjected to the heat of a fire. See Firebrick; Grate.

FIRE GUARD. An essential picce of hearth furniture where there are children, a fire guarel is also useful as a protection against flying sparks which might cause damage during absence from a room after a fire has been lighted. A useful form which will save many anxious moments in the nursery is of wire netting and shaped so that it eompletely masks the grate opening. By the Childron Act, 1908, any person over the age of 16 years who has the custody, charge or care of any child
under the age of 7 years is liable to a fine of $£ 10$ if he allows that child to be in any room containing an open fire grate that is not suffi-
 Fire Irons. Set of modarn hearth furnishings in
wrought lron. Above, fre irons in Adam style in wrought lron. Above, Gre irons in Adam style in polished steel, 18th century
Courtesy of C. prate \& Sons
against the risk of being burnt or scaldedthat is, if the child actually suffers serious injury or is killed. It is a defence that the adult person in charge took reasonable precautions against the risk; as, for example, by having sonseone else in the room to look after the child. It may even amourt to manslaughter to lcave a child in a roons with an open firc grate left unguarded.
FIRE IRONS. These articles, used for tending a fire, consist of poker, tongs and shovel. They are usually sold in sets to match the fender or other fittings, and sone sets include a hearth brush. They are made of brass, iron and steel; also of copper and oxidized silver. The older types of fire irons rest on two fire dogs, a development of the old andirons or dogs, but a modern faslion is to bang them from a stand made to match. Newer than a stand with the imple.
ments clustered round it is the wrought iron frame, with tongs, pokicr, hearth brush and bellous all to match the log irons, as shown in the illustration.
These oldest existing examples, known as log irons, were implements used for inoving logs from the fire. consisting of a fork and a roller. Smaller oncs of sinilar type came later into use. Afterwards fire irons were designed in the Adam style, and a beautiful set is shown here. These are of polished steel with engraved urns on the top of the handles. The panel of the shovel with its honeysuckle decoration is in keeping with the remarkable grace of this set.

The methods of cleaning and caring for fire ironsvary to some extent with the metal. Polishing is necessary from time to time, and those in unoccupied roomsshould be guarded from damp. See Andirons; Coal Box; Poker; Tongs, etc.

## Fireplaces, Homely and Beautiful

## Principles of Design and the Best Styles Described

For related information see Anthracite Stove; Chimney Piece; Grate; Range. See also Cottage : House; and the entries on Coal; Coal Box ; Curb; Fender; Fucl

Fireplaces are so linked up with traditions of British home comfort that, whatever the methods of heating used to supplement them, there is little likelihood of their going out of fashion in living-rooms. This is particularly the case with forms of fireplaces which are atructurally good and designed in fabrics eminently suitable for their purpose.

Brick fireplaces endure for several reasons. They are right in many stylcs of moms and different periods of architectural decoration ; they suggeat complete comfort and plense the eye. The warm tones and harmonious colours of good bricks, combined with their delightful texture, render them a particularly suitable material when built up in simple but effective designs. British brickwork has had a gool revival in this century, and for fireplaces mixtures of old English 2 in. handmade l,ricks are often chosen, which are well burned to a pleasing variety of tints. In many of the newer houses the bricklayer has put his craft to $n$ specially artistic use in carrying out excellently designed fireplaces.

Where coal lires are not desirable, gas stoves of architectural character to resemhle a coal fire, or one marle of imitation loge, and burning in $n$ dog grate can be reasonably associated with a brick fireplace of the less heary type. An anthracite stove may also the auitably framed by the simplo treatment for a hall fireplace shown in p. 240, though such a design would he equally pleasing for a small sitting room or country bedroom, with either a gas or coal fire.

Attractive Examples. Many larger modern livingroom fireplaces are baserl on designs taken from genuinely old examples such as that scen in Fig. 1. This beautiful fireplace with its massive oak shelf, heam, square tiled hearth and stone curb is many centuries old. Interesting detaila are the fireback, dog grate and fire dogs or andirons which support the antique fire irons. Firebacks look their hest in such a setting. Modern adaptations of these are copied in cast iron or can be made from sheet metal with applied ornament. The deaign call be carved in wood

or modelled in plaster on a ennvas backing, and the finished casting obtained from an iron founder. Various sizes of cast iron firebacks were commonly in use in the fireplaces of the 17th, 18th and 19th centurics, and were made in Sussex during the 15th century. The earliest designs were very simple, but those of the 17th century reproduced to day are decorated with flowers, fruit, figures and rarious heraldic emblems.

Brick and tilework fireplaces in bold simple designs are an excellent choice for oak panelled or half panelled rooms, and are quitc suitable in the country type of drawing room, where the keynote is comfort and the furnish. ing of a somewhat solid character. Brick lonks particularly well with carpets and rugs in mellow oriental colourings and with curtains and covers of linen printed in a Jacobean design or in conjunction with chintz hangings. Such a fireplace may provide cosy nooks on either side for winter evenings, and immediately produces a feeling of velconic and homeliness with $n$ wide hearth and curb in one with the chimney piece and with brass accessories to enhance the glowing warinth.
In modern adaptations of Tudor style the stone arch, open hearth with its herring bone
brickwork and simple treatment of the the chimney breast and setting the gas fire mantelpiece are seen Nothing is more easy direct against the wall. Electric fires, which to keep clean than the hearth of this period, need no flue, can be placed anywhere in the either during the day when the fire is burn- room, hut as a rule they are decoratively best ing, or when relaying. The fircbrick interior in a modern fireplace setting, though when of with canted forward back is very cfficient: the kind which simulates an ordinary fire, they burning little coal and throwing out a good are seen in various period settings. heat, but by its size admitting of a big fire on a cold day, while rough logs can he burnt instcad of the specially cut ones necessary for sone types of grates. The beauty of copper or brass wall and hearth fitments add to the attraction of such a fireplace. Fig. 3 shows an adaptation of Tudor style in Bath stone and old English bricks l'liles surround the sent out into the room. The brick fircplace outer part of the hearth finished by a solid seen in Fig 5 possesses a barless slow combus. tion grate Various othe, forms of fire or fireplace interior will be described in the article on Grate.

Structural Details. In designing a house, it is im. portant to locate the fireplaces as far as possible on the internal walls. Every fireplace in an outside wall involves a separate chimney and stack to itself, and the multiplication of stacks is an cxtravagance.

Fireplacce are formed by building projections, generally of brick, either into the room or outward into an external chimney stack. Theso projections are known as jambs. The usual size of a fireplace opening is about 3 ft . so . when intended to be fitted with the usual registerstove or grate. A charming oak curb. Even in these days of electric fires alfect can be obtained by removing the montel most people really prefer a genuine coal fire, register-stove and builifing a fireplace with especially the down firc in the modern render- bricks. These can be sct in front of the walls ing of a Tudor room either wood panelled or of the jambs, and the work can be carried out oak-heamed.
While a Tudor stone or a brick fireplaco seems ideal for the dining room or lounge hall the being some bullnose bricks with which to form Georgion the dining room or lounge hall, the the face of the jambs, and some nicely coloured he of shown in Fig. 4 is perfect for stock or facing bricks. These must be set in with painted panelled walls. The curved steel femler, steel hasket grate and fire irons, pale green tiles, white marble surround and ornamented shelf are beautiful features of the whole.
Modern fireplaces of small type abandon such architectural treatments and adopt rectangular designs and receding planes usually without ornamental moulding. Such a design is shown in Fig. 2, with a dovegrey marble surround and black marble curb. This fireplace is particularly suitable for a small llat. The coalbox is in the lower part of a built-in bookcase, the companion cupboard containing wood. In this example the mantelshelf is very narrow ; often in such a fireplace it is absent.

In many modern fireplaces slow combustion grates are found, or they are merely settings for gas and electric fires. A gas tire neerls a flue only a quarter of the area necessary to that for a coal fire, and it is possible to use llue blocks built into the partition wall. Space can thus be saved by doing away with



Fireplace. Fig 3 (left). Adaptation of Todor style in Bath stone and old English bricks. Fig. 4. Drawing room fireplace in Georgian atyle in panelled setting
Left, E. F. Collins; rioht, courlesy of Country Life, Lid

The tireplace opening should be small in relation to the size of the room, as a small opening and a large room accord well, while a large opening in a small room is never a success. The width of a fireplace depends so much on


Fireplace. Fig. 6. Diagram sbowlag section throagb a \& imple brick-built Areplace
the room that any definite rules are impossible, but 12 in . will suit most rooms up to 12 ft . sq. The opening is governed, of course, by the size of the stove. A 16 in . or 18 in . stove will be suitable for a room about 16 ft . long by 12 ft . wide, but muoh will depend on the geographi. cal position, number and size of windows, and number of outside walls.

FIREPROOFING. There are various methods of treating an artiole or piece of material so as to render it partially or wholly non-inflammable. In the case of fabrics the treatment consists in immersing the articles in a liquid, or of spraying them, and is obviously limited to those inaterials which are not liable to damage by being so treated.

For example, fancy dreases made from muslin and other common materials may well be fireproofed, but a rich evening frock would sustain damage if immersed in chemicala Various formulne have heen published from time to time for the fireproofing of fabrics, and these vary very much as regards their efficnoy. The follnwing are applicable to materiala of the olasses mentioned:
a. A strong solutinn of tungstato of soda.
b. Ammonium borate, 1 nart.

Potassium carbinato, 3 marts.
Water, 33 parts.
Wood is rendered fire-resistant by the use of any of the recognized fireproof paints, these being applied in much the same way as ordi nary paint. Fireproofing compositions may also be brushed into the wood, or the articles may be entirely immersed, cither plan being adopted according to the nature of the work. In addition to the use of fireproof paint, whitewash is a good protective for woodwork. It is made by dissolving lime in water with the addition of a little whiting, and is simply brushed over the work. Two or three conts will act as an efficient fire-retarding medium The following are effective fireproofing compositions for wood :
a. A strong solution of tungstate of soda.
. Anmonium borate, 2 parts.
Potassium carbonate, 6 parts.
Water, 80 parts.
FIREPROOF WARE. Cooking utensils made of fireproof china, earthenware and glass have now largely replaced metal pans and pots, especially for braising, stewing and soup making. Casseroles can bo bought in all sizes, from the large type capable of holding a family stew, to the smaller ones used in the preparation of ragoûts, salmis and hot pots. Ramequin cases in brown or green fireproof china are also
sold for making small soufflés, creams, etc. also white china shells for holding scallope of meat, fish, game or vegetables

Au gratin and other baking dishes are obtanable in the same wares, and are invaluable in houses where menls have to be kept waiting, for they can be left in a hot oven without fear of breakage. Groen china entrée dishes, also fireproof, are equally useful, while even more attractive are the ones in glass Brown earthenware casserules and square baking dishes look well on an oak table. All fireproof ware can be kept clean by washing it in warm, soapy water, and burn marks may be removed with fine sand. Stains caused by fruit or vegetables are best trented with soap and water. The dish should be soaked in this solution and then washed in the usual way. See Casserole
FIRE SCREEN. Of the two types of small screens known as fire screens one only, the shield on a stand, which can be fixed into position to protect the face from the fire, is true to its name. The other is rcally an empty grate screen with a purely decorative value.
The first is rarely seen except in the genuine or reproduced styles of the eighteenth and tho finst half of the ninetcenth century. The second type should be carefully chosen. A well-blacked grate is preferable to the chenper and less artistic forms of bought screens.
The mahogany Chippendale style fire screen, with glazed brocade, or needlework panels, is always correct with furniture of the same character, and so is the Louis XV type of ornate gilt panels, and the Empire model with ormolu decoration Screens in decorative leather work are suitable for a living-room, while furnishing jaspé and linen are quickly and effectively embroidered in coloured wools to make panels for wooden frames. A piece of Chinese embroidery, glazed and framed in narrow black, looks well if nicely fitted to the grate opening of a small fireplace.

A pretty screen for a sitting room grate is made by ferns or flowering plants arranged in a simple two-tier flower box to suit the size of the fireplace, but it is often impossible to exclude the down draught from the ohimney without $\Omega$ slieet of glass fitted to the opening


Fire Screen. Left, early 18th century screen in coloas print on silk with a carved and gill limewood frame and stand : late 18 th century
Left. by surteay of Waring at allow. Litd. riolht. Gy,
Dernilssion of the Director, Victoria and Albert il useum. dermission of the Director, Vetoria and Albert if useum.
behind the flowers. Another idea of the same type is an arrangement of cut flowering shrubs or foliage in a pottery vase Metal screens, chromium plated or in rustless steel or oxidized silver or copper, have the merit of not tarnishing. These usually match the ourb or fender and fire irons, and are sold in a suite or separately. See Flowers; Lenther Work.

FIREWOOD. Firewood can be bought ready for use in bundles, but is cheaper when bought as rough wood from a grocer and chopped up as required. In country districts local supplies can be obtained. If the wood is cut when green it will hare to be dried and stored for some months.
If the oven has been used during the day. wood may be left in it all night, and will thus dry quickly and thoroughly. Logs of wood are useful to supplement coal and to burn with slack. Sometimes opportunities occur of buying discarded blocks of wood paving. These are an excellent form of fuel for the house on account of the tar with which they are soaked. See Coal: Fuel, etc.
FIRMER. A firmer chisel is an ordinary carpenter's chisel, having a blade of normal proportions, neither thin, as in paring chisels, nor of exaggerated thickness, as in mortiso chisels : the blade has $\Omega$ tang and shoulder to take a wooden handle.
The firmer gouge is the ordinary form of gouge as used by carpenters and joiners; the blade is more or less curved, and may vary from practically flat to a semicircle in cross section. It is sharpened on the back by grinding on a grindstone, and whetting on an oil stone, in the usual way. Firmer gouges are employed for all olasses of curved work and, in addition, for some forms of carving, such as hollowing and shaping a model boat hull. See Chisel; Gouge.
FIRST AID : How to Render. Everyone should know how to give some aid in cases of accident and sudden illness. A few simple mensures promptly carried out will often prevent serious developments, and may save life-
It is a common incident to see would-be helpers lifting a fainting person into a sitting posture. The fainting is due to insuffioiency of blood in the brain, and this manoeuvre still further reduces the supply, thus prolonging the fainting fit. Indeed, when the heart is very weak or the patient has lost a great deal of blood death may be caused by lifting him.

In cases of unconsciousness the first essential is to loosen all the patient's tight clothing and provide for a frce current of air. To assist this other people should not be allowed to crowd around him. When the face is pale, the patient should be laid flat on the ground and the legs slightly raised: when flushed, the head should be raised. In both cases the head should be turned to one side. Nothing of any description should be given by the mouth until consciousness is restored.

On no account should those rendering first aid make any attempt to force brandy or other slimulant down the throat of an unconscious person, as this may result in choking him.
It should be the rule not to move a person who has been hurt or becomes suddenly ill, except so muoh as is necessary to permit of his breathing easily, until some opinion has been formed as to what is the matter with him. Urgent conditions like bleeding and shock should be attended to first, the former by taking the necessary steps to arrest haemorrhage, and the latter by applying warmth. In cases of severe burns, especially in children, a shock-like condition may be present. By putting a child in a warn bath not only is the shock treated, but the removal of clothing is made easier.

Before beginning artificial respiration, in all cases where it is necessary, the mouth and the back of the throat should be examined to
make sure that they are clear. Clothing should not be removed unnecessarily in the case of accidents out of doors. In the case of hleeding, the wound may be exposed by slitting a seam with a knife, but while this is being done pressure should be put on the main artery. If a person's clothes are on fire, some heavy fabric, a rug, a blanket, or cont, should be thrown round, and he should be rolled on the floor in this.

In sending for the doctor, it may save valuable time if he is told, preferably in writing, the general nature of the emergency, e.g. bleeding, broken bone, poisoning, etc., and details, as to the part injured, the poison suspected, and so on
First Aid Cabinets. First-aid cabinets for servicc in the home in plain deal, fumed oak, and white enamel are sold in various sizes. They contain all the dressings and bandages necessary in case of accident, while some of them, finished with nickel-plated fittings and plate-

## Fish : Choice, Cooking, Food Value, Etc.

## Some Facts of Daily Interest to Every Housewife

## This article describes the several ways of cooking fish, gives information ahout various fish dishes and contains other facts of value in the home. See the entries on fish ordinarily eaten, c.g. Cod; Haddock: Halibut; Salmon ; also Diet ; Food

Next to meat we must rank fish ns one o the most valuable sources of the proteid, or body-building material, and fat. This food may be used, with benefit to health, by persons who do not require a full meat diet for the repair of bodily waste. Even those workers whose occupation requires a liberal diet can thrive upon a little meat and a moderate allowance of fish. For townspeople of sedentary employment or for those engaged in light manual work, fish constitutes one of the best proteid foods.

Cod, haddock, smelts, and flounders are among the lean fish, and very little fat can be derived from them. But cod has a high percentage of proteid, and is therefore nutritive.

For energy, as well as the restoration of tisasue, we need a varied fish dietary, and fat fish should be chosen by persons whose labour demands muscular exertion. One of the virtues of a fish diet is its full absorption in the body. Only about five per cent of the solid matter of fish is lost in digestion. All the lean fish are readily digested, and are therefore recommended to invalids ; and any fairly normal digestive system can absorb salmon or the more oily kinds.

Cost and Food Value. It must not be sup posed that the cost of some kinds of fish has any relation to their nutritive value. A dozen oysters yield only a small amount of fat, and about as much nourishment as a single herring. A sole may please the palate more than a plaice, but it contains considerably less fat; halibut is almost as nourishing as turbot. Mackerel have much less fat than eels, but more proteid. Tunny, sold in tins, has over 30 per cent. of fat.

One great advantage in a fish diet is its digestibility as compared with meat. Cod is perhaps the least digestible fish and mackerel the most digestible. Lean fish, such as whiting, can be digested readily by many invalids When a food is cheap it is often refused on the
ground that cheapncss and a lack of nourishment go together. This is not the case with any of the fat fish-herrings, blonters, sardines. sprats, and eels.

Some kinds of fresh fish may contain as much as 70 per cent. of winter. Oysters have over 77 per cent. of water and about 22 of nutriment. In a salt herring there is 53 per cent. of nutrients. The difference between the amount of fat in fish is shown by comparing a hake with a mackerel. In the former the fat is only about 5 per cent. and in the latter 25 per cent. But the lean fish are by no means devoid of nourishing matter. Cod contgins 91 per cent. of body-building material but very little fat. Turbot yields rather over 84 per cent. of proteid, and halibut contains 79 per cent.

Varieties of Fish. There are unreasonable prejudices against eating several kinds of valuable fish. One of the blennics, known as the cat-fish or wolf-fish, is often despised as a table fish, but it is very good eating. Some of the British sharks and dogfish are quite edible. They are rejected because of their unattractive appenrance. One of the tastiest fishes that swim is the gurnet or gurnard.
The handsome lythe or pollack is not a good fish for kecping. and must be eaten soon after it is caught. The edible quality of this fish is not sufficiently known, and the same may be said for the coal-fish or saithe and sea bream.

The choice of fish may be largely determined by its appearance. Fresh fish is stiff, plump and firm, has bright, firmly attached scales. clear eyes, and red-coloured gills. When the freshness wears off the fish becomes flabby, the Hesh is easily indented with the finger, the eycs are dull and glazed, while the scales fall off ensily. Growths about the head or fins, unsightly blotches and scaleless pintches re well-known signs of disease
In stale fish the gills change to a dark red or a whitish colour ; but this test is not
infullible, for trawl-caught fish are suffocated often in the process of hauling in the nets, and the gills become congested and dull-looking. Oysters should be firmly closed, but if slightly open, the shells should meet instantly and tightly on the blade of a knife heing inserted between them. If the shells gape, the fish are unwholesome.

Tinned Fish. Tinned fish should be turned out of the tin as soon as the latter is opened, and consumed as quickly as possible. Lobster, in particular, keeps hadly. Tins which show signs of rust, of being soldered in many places, or which give a hollow drum-like sound when tapped or shaken, should be rejected. Sardincs, smnll herrings and tunny which are preserved in oil should he taken out of their tins and kept in a covered china or glass dish. When air reaches the open tin. chemical action is sct up, and the oil becomes impregnated with the metal. A wholesome smell characterizes cured fish which is in good condition. In case of doubt, make a small incision with a knife near the backbone and test the odour

Fish should be kept in a cool, dark place, and whenever possible in prepared paper bags placed in ice. If the bags are fastened down the fish should keep fresh.

Cooking Directions. Fish are usually fried or boiled, hut there are other methods, such as steaming and grilling and baking. Boiled fish lose some of their nutritive value in water. but steamed fish retain the nutrients, and are more agreeable to the palate. Most fish that can he boiled can be steamed

The general rule in boiling all kinds of tish is the avoidance of haste. The water should be heated until it is near the hoiling point, and the fish, wrapped in muslin, placed in it and boiled quickly for 2 or 3 min . only. The heat must then be reduced, and the fish allowed to simmer; 3 lh . of fish will require 20 min . for boiling, and 35 for steaming: 1 lb . of tish will require about 12 min . boiling. Casserole cooking is a good method with large fish. which should be placed in the casserole in fillets with a little butter. An onion, pepper. and any kind of spice that is approved, such as cloves, should be added. After stewing for 5 min , a glass of white wine will give an additional flavour, or a teaspoonful of Worcester snuce, and some slices of lemon. Take the fish up on to a hot dish and allow it to drain well still wrapped in muslin. Remove muslin and pour away the liquid that has collected before serving.

Two or thrce of the coarse freshwater fish are scarcely worth cooking. Barbel is an exnmple, though in Spain this fish is conked with onions and spices, and eaten by the peasantry. Chub arc insipid and very bony. liream from fresh water are edible, but cannot be considered luxuries, and the same may be said for roach. Carp and tench have slightly more flavour, and may be stewed or fried in olive oil, butter, or beef dripping. Pike may he cut into collops and fried, or stuffed and baked. Perch should be skinned to remove the rough scales. Gudgeon are rather morc Ilavoured than many river fish, and may be fried like perch. Trout of over 1 lb . should be filleted and fried or grilled. Large lake trout and sea trout are best boiled. Kedgerecs, curries, and rissoles can be minde with almost any kind of fish as the main ingredient.

The flat fish-skate, soles, plaice, and dabs -are best cooked by frying, either whole or in fillets. Cod, large haddock, and pollack should be cut into steaks before frying. Fish are often stuffed with forcemeat and baked.

In the preparation of fish it is essential that each cloth or cookery utensil should be thoroughly cleansed after use, or the next article of food which comes in contact with it will contract a fishy flavour. A saucepan or kettle in which fish has been boiled, or
one used in making fish soup inust be washed separately from other pans. After touching fish it is sufficient to wash the hands in the ordinary way to remove all odour
Curing Fish. Fish cured in the following way will keep for a long time. Clean and carefully wash and scale the fish, and, if large split it down the back. Rub it thoroughly inside and out with finely powdered common salt, and bang it in a cool, draughty place for 24 hours. Next rub into it a mixture of 1 oz of bay-salt and $\frac{1}{2}$ oz each of coarse brown sugar and saltpetre.
Lay the fish on a dish, cover it with more salt and leave it for at least 48 hours. Then turn it, cover it again with fresh salt, and leavo it for a further period of 24 hours. Drain off the brinc after this time, dry the fish, fix it on thin sticks, and hang it in a cool. dry, airy place. If kept for long soak the fish in cold water for 24 hours before cooking it.
Filleting Fish. Large fishare seldom filleted unless a portion is purchased that can with advantage be boned and cut into strips or pieces Flat fish, such as soles and plaice, niake the best fillets, although haddock and whiting are frequently used for this purpose. To fillet flat fish, lay it down upon a board and with a sharp-pointed cook's knife cut off the head and fins: also cut the tail across. Score a line down the spine and, pressing the knife against the bones and taking long, even cuts, take off one side of the tish. Then turn it round and remove the other side. Turn it over, and repeat the process.
Hadduck and whiting are treated in the same manner, but in these cases there are only two fillets, instead of four, to be removed. It is economical to fillet fish, for the bones can be used to make fish stuck for the sauce.

Frying Fish. Frying is the quickest way of cooking most fish. Small lish are usually fried in the frying basket, and fillets and steaks of fish are fried either in deep fat or in just sufficient fat to cover. In all cases the fat must be very hot when the fish is inmersed ; su hot that it has ceased to bubble and a blue smoke is rising from the pan. All fish before lieing fried must be well dried, and this is best accomplished by rolling it in flour seasoned with salt and pepper

Fillets and steaks of fish are usually dipped into beaten egg and conted with breadcrumibs hefore being fried, or dipped into batter. When the outside is of a pale brown colour the fish is cooked The fish is lifted out of the pan with a fish slice to prevent the flesh from breaking. Fried fish must he well drained before being served. This is cone by p!acing it on a sheet of kitchen paper or on a cluth It is served up on a dish paper, and the usual garnish for fried fish consists of pieces of cut lemon and sprigs of fried parsley.
The fat most commonly used in Great Britain fur frying fish is land or dripping, Hlthough some prefer the continental custom of frying in olive oil. Frying oi! can be bought at provision shops, and is not so expensive as pure olive oil but equally efficacious.
Fish Stock. This atuck forms a good basis for fish soups or sances. Make it by putting 1 lb . of bones, heads, and trimmings of any fresh fish into a saucepan containing 1 quart of cold water a blade of mace, a small peeled onion, 4 cloves, 6 peppercorns, and a pinch of salt. Bring it to the boil, let it simmer for 10 min ., then strain it. If the stock is allowed to boil too long it will become bitter. Fish stock must not be kept from day to day as it soon turns sour.

Using Cold Fish. There are many ways in which the remains of cold cooked fish can be made into appetising breakfast, luncheon, and supper dishes. Any cold, left-over sauce should be used for mixing these dishes, and they should always be well seasoned. The following five recipes will be found useful.

Fish Cake. Any cooked white fish and some cold cooked potatoes, in the proportion of 1 lh . of fish to $\frac{1}{2} \mathrm{lb}$. of potatoes, are needed to make these cakes. Skin, bone and flake the fish, rub the potatoes through a sieve, and in the ineantime melt 1 oz . of butter in a pan over the fire and add to it a tablespoonful of milk. When these are hot, put in the lish and potato, the beaten yolk of an egg and seasoning to tastc, and stir the whole over a low heat for a few minutes. Spread the mix ture evenly on a plate, mark it with a linife into a dozen even-sized divisions, and form each into a neat, round cake about ${ }^{\prime}$ in. thick Brush these over with beaten egg, coat then with breadcrumbs, and fry till brown in a pan of amoking hot fat. The mixture may also be formed into balls and fried

Fish Galantine. Take the skin and hone from 1 lb . of any cooked white fish, break it into flakes, and mix them with two teaspoonfuls of chopped parsley, the beaten yolk of an egg, seasoning to taste, and enough egg. anchovy, or shrimp sauce to bind the whole. Make the inixture into a ro!!, place this on a greased baking sheet, brush it over with the white of egg, then sprinkle it with breadcruinbs or maize meal, and bake it in a fairly hut oven till brown. This galantine can be served hot with the same kind of sauce as is userl for mixing, or cold with salad
Fish Moley. Chutney and grated coconut should be served with this Indian dish. To prepare it, cover $\ddagger \mathrm{lb}$. of desiccated coconut with boiling water, and leave it to soak. In the meantime, fry 2 oz of sliced onion in the same quantity of dripping. Add $\frac{1}{3}$ teaspoonful of powdered tumeric or saffron, the strained coconut water, a sma!! piece of green ginger, 1 teaspoonful of sliced chillies, 1 lb . of cooked fish, cut up into small pieces, a tablespoonful of vinegar, and a little salt. Simmer the whole till it thickens, and then heap it on to the centre of a dish, arranging round it a border of boiled rice.
Fish Mould. These moulds can be made from the remains of any cold tish. Remove all skin and hone from about 3 heaped table. spoonfuls of fish, put the flesh in a mortar, add 1 tablespoonful of fresh crumbs, 1 teaspoonful of chopped parsley, 1 oz . of warmed butter, a beaten egg, 4 tablespoonfuls of milk, and seasoning, and pound all well
Well butter some sniall dariole monlds, fill them with the inixture, cover them with pieces of greased paper, and steam them gently for $\frac{1}{2}$ hour in a pan containing enough boiling water to reach half- way up the moulds. Turn the moulds on to a hot dish, pouring round them $\ddagger$ pint of parsley sauce.

Fish Pie. Any kind of cooked tish can be used for making this pie. Prepare it by rubbing 2 heaped breakfastcupfuls of masherl potatoes through a sieve. and adding to them 1 or. of melted butter, a tablespoonfu! of nilk, and salt and pepper to taste. Then mix all well together. Renove the skin and bone from one heajed breakfastcupful of cooked fish, chop it up coarsely, and place it in a pie dish.

Melt loz. of butter in a saucepan, stir in the same quantity of flour, and then add 1 pint of tish stock. Stir this sauce over the fire until it boils and thickens, add 1 hard-boiled egg


Fish Kettle of blue enamel fitted with wire strainer.
Courtesy of Staines Kitchen Eluipnient Co.
chopped in large picces and reasoning to taste Add sufficient of this sauce to the fish to moisten it well, and cover the dish with the potato mixture, amoothing it evenly over the top, and marking it with a fork Scatter small lumps of butter over the whole, and bake the pie in a moderately hot oven until it is biown. Salt cod may be used after soaking and preparing.
Uses of Fish Bones. Fish boncs provide valuable manure for the garden if placed in the ground immediately before or at thic time of seed sowing. They are usually mixed with 0 other manure before use, and succeed best in dry soil. Bones left over from meals may be used in this way, but uncoolied bones are better.

Bones in the Throat. In most cascs where a fish-hone is caught in the gullet, it is rither spat out or swallowed later on with a holus of food. A scratch inay then remain and gire the mistalien idea that the bone is still there. When the hone effects a lodginent it is a good plan to swallow large monthfuls of bread not much masticated. Small bones may sometimes be gradually dissolied by taking occasional sips of lemon juice or lemon juice and water. If the bone is not removed by these mensures $n$ doctor should be consulted, or the results may be serious.

Poisoning by Fish. Several varicties of fish are poisonous by reason of substances that are manufactured by certain of their glands, e.g. liver, ovary, etc. Some are always poisonous, some at certain periods, and some only to persons who are peculiarly susceptible.

In Great Britain mussels, mackerel, and sometimes oysters, as well as tinned salmon, crab, lobster, eels, elc., occasionally produce severe svmptoms of poisoning. This is usually due to their having heen invaded by microbes, e.g. that of botulism. Oysters have been responsible for carrying enteric fever and allied disorders Mussels, especially those taken from docks, harbours, and the mouths of rivers, where the water is contaminated with sewage, are frequently poisonous.

FISHER FUR. Inng-haired and dark brown in colour, fisher fur, or fisher marten. as it is also called, is obtained from the largest of the marten tribe, an animal ineasuring 2 to 3 ft . in length. Fisher fur, like all other darkcoloured pelts, may be cleaned with silver sand. Put the sand into a dish in the oven, and when it is thoroughly warmed rub it into the fur. It may then be shalien or, if neccssary, brushed out. See Fur

FISH KETTLE. This is a utensil for cooking fish. It is generally oval and fitted with a strainer or drainer, and is made of block tin or aluminium, while some of the better kind are lined with copper. The drainer is essential for several reasons. It enablea the fish to he lowered gently into the kettle, and to be taken out again without breaking, and may also be used to keep fish warm when it is not to be served immediately. The Urainer is placed across the kettle and the fish, which should be covered with a clean cloth, is put upon it and is thus kept warm by the steam. Fish kettles may be cleaned in the same way as other aluminium or tin pans. See Aluminium: Tin.

FISH KNIFE. The blades of these knives are of silver or electro-plate, not of stcel, and are therefore blunter than the ordinary table knives Fish knives and forks are made either in two pieces, the hinndles being of ivory, mother of pearl, or silver, or they are made in one piece entirely of metal
Plated fish knives and forks or fish servers should be washed immediately after use, with hot soap suds, to which a small lump of whitening should be added. If there has heen any delay, after washing, rub the surface of the knives and forks lightly and quickly with cut !emon, then rinse in the suds again and wipe the articles dry.
FISH SLICE or Server. This article of table use, now represented by fish carvers, was introduced into Fngland in the 18th century and is valued by collectors It has t.wo inain shapes, one in the form of a trowe!, i. - having a triangular blade, and the other with $n$ curved edge on the working side. They were madc in ailver and Sheffield plate

A somewhat similar slice, suited to kitchen use, is made of tinplate or sheet aluminium, and the handle formed in one with the blade. This is used for lifting and turning fish when frying it. It has holes for draining the fat.
FISH STRAINER. This is a perforated metal plate with handles, upon which fish is placed when it is boiled in a fish kettle. The handles are perpendicular to the plate and reach to the top oi the pan, so that the fish can be lifted out of the water and drained without fear of its breaking. See Fish Ketele.
Fit. See Apoplexy; Convulsions; Epilepsy : Fainting: Hysteria.
FITCH. Fitch fur, obtained from a small animal of the marten species known hoth as fitch and pole-cat, has long black top hair and yellow underwool. It is used as n trimining and is of ten dyed satisfactorily to imitnte sable.
The word fitch is somewhat loosely used in connexion with artists' brushes made of ox hair and used for painting in oils.

FIXATIVE. Any materinl used to make anmething permanent or fixed is a fixative, as, for exnmple, that used in the form of a spray in fix the crayon or pencil lines on a drawing. This is perhaps the most usual npplication in a domestic sense, and such a fixative may be composed of dry white shellac dissolved in purc alcohol, sufficient of the shellac heing used lo form a thin film when it is sprayed on to the paper that is used for the drawing.

The fixative can be obtained at any artists colour shop and is put up in a convenient forin in a small hottle. The sprayer is an L-shaperl tubular device sometimes known is an atomizer. One end is inserted into the hottle of fixative and the other end used as a mouthpiece, and as the wind is hlown into it. the fixative is drawn out and deposited on the paper in the form of $a$ fine spray.

FIXING: Photographic. The photographic negative or print is fixed when those portions of the sensitive chenicals in the film which have not heen acted upon by light and the developer are dissolved out. This is usually effected by a solution of hyposulphite, or thiosulphate, of sodium, commonly called hypo. in water

For fixing negatives and films a solution should he made of 4 oz . or 6 oz . of hypo in 1 pint or 20 o7. of water. It should not he weaker than 4 oz . to the pint for negntives, hut may be stronger. In making up the solution warm or hot water should he used; hypo in dissolving reduces the temperature of the water considerably, and if cold water is used it will take an inconveniently long time to dissolve. The solution should he cold before it is used.

It is not possible to sny at what precise point
certain that the process is not complete when the creamy emulsion has been dissolved away;
negatives must bc left in the fixing solution for double the time that it takes to remove this creamy appearance from the back of the negative Stains, dark patches and other markings which cannot he removed from negatives are the result of incomplete fixing.

When the fixing aolution has been used two or three times it is likely to become discoloured and stain negatives. It is therefore desirable to use only fairly fresh solutions. A pint of the solution given above will fix efficiently about a dozen 4 plate negatives An acid fixing so!ution is particularly desirable for bromide prints. It is made up in the following proportions :


The potassium salt should not be added to the hypo solution while it is hot, or sulphurous acid may be given off and the solution thereby weakened This bath gives clear and brilliant negatives ; it can he used for all fixing purposes, except for P.O.P or daylight printing papers.

It is essential after fixing negatives and prints to remove every trace of the hypo, or the print will gradually fade. Washing mny he done in running water or by frequent changes of water. More than 90 per cent. of hypo is washed away in the first 10 min ., but considerably longer is required to remove the remainder, and for this purpose it is essential that the negative or print should be in perfectly fresh water. It is uscless to expect to wash a negative effectively by placing it at the hottom of a basin under the tap with water overflowing at the top; what happens is that while the larger portion of the hypo is dissolved and washed away, the negative lies in a weak solution at the hottom of the bisin.
Various forms of washing apparatus for both negatives and printa can be ohtained. In freely-running water negatives and hromide prints should he washed for at least 30 min . ; prints on thick paper or card and P.O.P prints should be washed for an hour. See Bromide Paper: Developing: Gaslight Paper.
FIXTURES: The Law About. Legally fixtures and fittings are those articles affixed or joined to property in such a manner that while so nttached they become part of it, e.g. gas or electric: light fittings, tapestry on the walls, etc They may belong either to the Iandlord or the tenant. In the ordinary case a tenant is not allowed to remove fixtures even though he has himself put them up. Where, however, they are fixed for ornament, or for the convonience or pleasure of the tenant, or for the purposes of his trade or business he may remove them so long ns he does not injure the landlord's property in doing so.
After a tenant is in occupation he may put up over a doorway a wood or plaster ornament, panel, or frieze. These may he removed by the tenant if by so doing it will not damage the landlord's property. Otherwise they remain in the house and hecome the landlord's, although the tenant paid for their erection. Blind rollers, towel rails, fireplace accessories which were in a house when the tenint entered into possession remain the landlord's property. Blind rollers are often removed by an outgoing tenant under the mistaken idea they are his perquisites. To take nway fixtures unlawfully is larceny at law. Trees, shrubs, etc., which were in the garden when the tenant entered into possession remain the landlord's fixtures.

In another sense a tenant can remove certain Gxtures from their places, but must not take them from the house when giving up possession. Hangings, blinds, grates, stoves, may be taken down or removed to make room for similar
articles of the tenant's own, hut here again no damage must be caused to the landlord's property, and on leaving, all such fittings must be replaced, or the substituted ones left.

It should be particularly noted that a cupboard built into a house is the landlord's fixture, as distinct from a movable one provided by the tenant.

A tenant should remove any fixtures he is entitled to take at the time of quitting the premises, as he cannot re-enter the house for the purpose of removing them.

Trade fixtures are removable by the tenant, unless there is any stipulation to the contrary in the lease or agreement. In agricultural tenancies, such as farms, small holdings, allotments, the tenant is entitled to compensation for any improvements. For example, if he walls off part of his garden and plants fruittrecs, so that in the course of a few years there is a valuable orchard, he will demand and receive compenantion, as he cannot take the orchard with him on removing. On the other hand a town tenant must lenve all fruit trees in his garden as fixtures of the landloril.

Much trouble is anved if the tenant aske for and receives from the landlord a complete list of fixtures, as it often happens that these get Inst or destroyed, and the landlord demands payment or damages in respcct of thein For exainple, he finds a kitchen raker is missing, and accuses the tenant of removing it. Probably it was missing when the latter entered upon the tenancy, having heen taken by a previous tenant. A list in duplicate agreed upon by landlord and tenant at the commencement of a tenancy would avoid much misunderstanding. See Blinds; Bracket: Cuphoard Curtains.

FLAG. This is the popular name given to some varietics of the family of iris. It is also known as the poor man's orchid. The word flag is generally intended to refer to the wild yellow iris, or to the purple iris, which blooms in such a prolific fashion in June in suburban gardens. It is not, strictly speaking, a hulhous plant, hut has rhizomous mots, which may be separated in the autumn if increase of stock is desirable. Its botonical name is Iris germanicus. See Iris.
flageolet : In Cookery. The sinal green beans of French or kidney heans, known as llageolets, are cooked in several ways. In Great Britain they are gencrally sold in a dried state, though they are also excellent when fresh and cooked in the same manner ns green pens. Dried Ilageolets need to be washed and soakicd overnight before heing put into a saucepan containing just enough cold water to cover them A small quantity of mixed herbs and an onion should be added to give flavouring, and the whole hrought to the boil.

The heans require about 2 hours' cooking before they are tender, when they should be drained and tossed over the fire in a pan containing a littlc butter. They arc then ready to be sensoned and served. Fingeolets may also he served in egg, or paraley. or any ot lier suitable sauce, in which case they should be cooked until tender according to the directions already given, drained. and then rehcated in the sance.

FLAGON. This word is employed for a versel used for holding liquid, one somewhat taller than the tankard and fitted with a lid. In England flagons are found in the 16 th century or earlier. The lid was hinged at a point well back on the handle, and was provided with $\Omega$ thumb-piece, so that when drinking, the drinker could keep the lid quite clear of his mouth.

Flagons were minde of silver, as well as of pewter and cheaper metals. One example, illustrated in the next page, dating from 1663, is of silver gilt. It is cylindrical in shape. with a


Flagon. Left, flagon of serpentine marble mounted in silver-gilt ; about 1830. Right, flagon ol silver-gilt, repoussé with tulip flowers, leaves and animals; 1003 Courtesy of the Director, Victoria \& Albert Museum, S Eensington
fat cover and a scroll handle. The thumb piece represents a pierced heart, and is beautifully chased and embossed It stands $15 \frac{1}{2}$ in. high. To-day the word is used for the glass bottle in which certain kinds of wine are sold See Silver: Tankard.

FLAGS: The Game. Also known as French and English, this is an excellent game for large parties of ohildren, such as picnics, school treats. and the like. It is played out of doors or in a large schoolroom, as a good deal of space is required The players are divided into two sides, which are chosen in the ordinary way.

A line is marked across the middle of the ground: one side occupics onc half of the ground and the other side the other half. At each end of the ground are laid handker-chiefs-stones, caps, or any other portable objects do equally well-which represent the flags of the side, and are to be defended agninst the enemy. The sides then take up their position in their own camp, and the game hegins
It is the object of each side to capture the Hags of the other, but the moment a player uteps across the dividing line he can be caught by any member of the opposing side. If caught he is a prisoner, and must stand hehind the Hags with outstretched hand awaiting rescue If he succeeds in reaching a flag without being caught, he can carry it hack in safety. No Hag may be taken while there are prisoners to be rescued. The game continues until one side has captured all the flags of the opposing side.

FLAME FLOWER. This is the popular name of Tropaeolum speciosum, one of the most beautiful of hardy climbing planta It has pretty light green leaves and in late summer hears a profusion of scarlet flowers. It flourishics hest in the cool, moist, northern counties and is often difficult to establish in nouthern districts. The roots should he planted in March or April in well dug soil to which leaf-mould has been added freely, and the position must he a shady one. It is often planted on the north side of an evergrcen tree or hedge.

FLAN. This is a fruit pie or tart made by lining a flan ring or mould with Han pastry, and filling this, after baking, with tinned or stewed fruit and covering the fruit with a thickened syrup. Flans are usually eaten cold.

Flan Pastry. To make this, take 6 oz . flour, 3 oz . butter, $\frac{1}{2}$ oz. castor sugar, $\frac{1}{2}$ teaspoonful baking powder, 1 yolk of egg, and a little cold water. Sieve the flour, add baking powder, sugar and a good pinch of salt, rub in the butter, add the yolk of egg and a little water to
air to escape Cover thic bottoin of the patry with crusts of bread so that it will keep straight while baking. Bake in a fairly hot oven 30 to 45 minutes or until a nice golden brown. Remove the crusts when donc, and fill the flan case as required.

Almost any kind of tinned, bottled or stewed fruit can be used for flans. Apples should not be allowed to stew to a mash. but are better cut in very thin slices and arranged in the tlan case in circles, the slices overlapping each other slightly. Other large fruits, such as peaches, pears and plums, may be cut in slices, but they are often used whole. Tinned pineapple slices give a prettier effect than the chunks, and cherries or other small fruits of a contrasting colour can be arranged in the holes in the centres of the slices. Slices of orange, cut crosswise through the sections, with the pith and pips removed, make a delicious flan. In this case use the juice from other tinned or stewed fruit to mako the syrup. Small fruits, such as cherries, strawberrics, raspberries, gooseberrics, red or black currants, aro always used whole.
To fill the flan case, drain the juice from the tinned or stewed fruit, and arrange the fruit in the flan case. Put the juice in a saucepan and bring to the boil. For each gill of the juice allow a teaspoonful of corntlour, blend this with a little water and add to the juice when boiling. Stir until boiling again and simmer for about eight minutes or until it thickens a little. Then add a teaspoonful of castor sugar to the gill, boil up again and let it simmer until thickened and reduced a little. Allow this syrup to cool, then pour it over the fruit in the flan case to just cover it, and leave it to get cold and set before serving. The top can be decorated just before sending to the table with little mounds of whipped cream.

FLANK : Of Bacon and Beef. The side of an animal from the ribs to the thigh is termed the flank. It is used mainly in connexion with beef or bacon. Thick flank of beef, though coarser in fibre than some other parts of the animal, is well flavoured and generally tender. It has no bone and little fat, is reasonable in price, and is therefore one of the most cconomica! parts to buy for puddings, pies. etc. Thin flank is rather fat, but is low'priced and suitable for stews. It is excellent pickled and eaten cold. See Bacon ; Becf.

FLANNEL : Its Treatment. Fabric, not made from all wool cannot legally be sold as flannel unless qualified by some other word. Ceylon flannel, for example, is an accepted name for a wool and cotton mixture, and Canton Hannel for an all-cotton cloth. Various district flannels have a celebrity of their own.
bind stiffly. Roll out Welsh Hannel, apparently the original one, is the pastry about of a slightly different character from York$t$ inch thick. Well shire, Lancashire, and Irish Hannel.

The difference lies largely in the sort of raw wool used in the several localities, as some are softer than others, and hence warmer nnd more soothing when worn next the skin. White flannels which are used for underwear arc sulphur-bleached tike blankets. Natural llannels are of a greyish or brownish mirture colouring, and this sliade originated by the intermixture of wool from brown and black sheep with white fleeces. A similar colouring is now often the outcome of mixing wool dyed for the purpose. Grey flannels arc made in several shades by blending white, blue, and black wool.

Flannels are also woven with stripes and checks in light and dark colours for men's shirts, but not all wool shirtings are strictly entitled to the name flannel.

White tlannels are made for cricket and tennis trousers in a heavier material than for shirts and underwear, and West of England flannels arc espeoially to be recommended.

The fancy flannels sold by tailors for summer suits in striped and other patterns with threads in several colours are of no constant character, although generally light, soft, and warm. They vary considerably in their capaoity to keep their shape when made into garments. Good tailors allow carefully for the shrinking propensities of the flannels they sell.
More or less all tlannels shrink upon washing, and the disposition to shrink is greatest in those made of the softest and finest wool. In dealing with baby flannels it is well to dry them by hand before the fire, counteracting the shrinkage by gently pulling out the fabric in each direction as drying proceeds. Harsh flannels shrink less because of the nature of the wool from which they are made. There are chemical processes, requiring very careful control, by which woollens can be rendeted unslirinkable, but these are not invariably efficacious or beneficial to the finished effect.
The heavy West of England flannels mode for trouserings, and for blue blazer conts, are treated slowly and laboriously in course of making, and this, while addine appreciably to the cost, adds also to the satisfaction in wear. Cheap flannels can be quickly produced which are exceedingly difficult to distinguish at first sight from the superior qualities, and dissatisfaction with them accounts in part for the superseding of tlannel by other fabrics.
The easiest method of making a llannel seam is to join the two edges of dannel with a running stitch a little more than in. from the top of the material. The right sides of the two pieces must face inwards. Ncaten the edges with sharp seissors, open and press the seam flat and turn down the edges of the Hannel on to thôir own pieces of material. Then commence from the left side, and catch the extreme edges down to tho materials by a herring-bone stitch. Flannel seanssused in the making of babies clothes, flanncl blazers, etc., are finisned with a binding of narrow silk ribbon pressed to give a nent, Hat appearance. See Blanket; Bleaching; Laundry.

FLANNELETTE. An all - cotton cheap imitation of flannel, flannelette is made in a variety of qualities, and can be had white, dyed in plain colours, and with either woven or printed designs. Some лre twilled, others plain. Countless burning accidents have occurred from leaving flannelette-clad children near an open tire, and the inflammability of the material is its greatest drawback. Almost any fabric will burn if kept in sustained contact with flame, and the objection to cheap flannelette is not that it can be burnt, but that flame leaps along its hairy surface, quickly enveloping the wearer. To guard against this risk, the first essential is a tire-
guard, and care in keeping matches out of burnt in an open tray of some kird. The which can be made at home The framework the way of young pople. The second is to simplest form is a flat lid a biscuit tin is wire or bamboo covered with trate buy a good quality of flannelette with not too much fluff on the surface.

FLASHING : Brick and Stone. This a nail, as shown in Fig. 2. This gives a噱 slope to the rpparatus, so that the is turned up into the joints of brickwork, or light of the flash is thrown well to the front into a groove or raglet, about 1 in . deep, cut in stonework. It is intended to prevent injury to the brickwork by rain splash. ing from the roof, and in addlition to form a watertight connexion between the tiling or roof covering and the adjacent brickwork. The best material for this work is sheet lead of a thickness known as 5 lb .

The flashings shown in Fig. 1 are fitted by cutting a strip of ihe lead to a suitable length, with one side cut into a series of steps equal in depth to the distance between the brick courscs. The upper edges are then bent over and ingerted into the joints between the brickwork, for which purpose the mortar has to be raked out, the metal secured with wedges, and the joint pointed in cement. The other part of the flashing is turned under the tiles or roofing material, and in good work is wurked over a board with a V-shaped fillet or tilt, upon whioh
 of the operator. A strip of touch-paper with the flash powder heaped on it provides ignition.
Two satisfactory forms of flashlight lamp are shown in Figs. 3 and 4 In the first the powder is on a tray, elevated on a cane or long stick; it is the tiles are eet. There is
 Simble cover tuashing. Fig. 3. Examples of horizontal cover fashings whioh assists in resisting thus oxtra covering fired by bringing a lighted taper into contact The stepped side known as a cover flashing is employed in a similar manner, but rests upon the top of the tiles (Fig. 2). Various arrangements of horizontal cover flashings are given in Fig. 3. The householder will do well to see that flashings against exposed brickwork are in sound oondition. See Gutter ; Rool.
FLASHLIGHT : In Photography. For photography at night, both incloors and outdoors, flashlight in the form of magnesium powder, or the mixture sold as flashlight powder, offers great possibilities. Magnesium ribbon burns too slowly; the casiest and safest form is magnesium powder, burnt by being threwn through a flame.
The apparatus consists of a narrow cup in which methylated spirit is burnt, and an inner cup in which the magnesium powder is placed. The spirit is lighted, and when the photograph is to be taken the rubber bulb is pressed firmly, blowing the powder through the Hame and giving a brilliant flash An easily contrived nome-made alternative is shown in Fig. 1, consisting of a long-stemmed clay pine, round the bowl of which is fastened a piece of wick or cotton wool with wire. This is soaked with methylated spirit. The bowl is filled with magnesium powder, the cotton wool lighted, and air blown sharply through the mouthpiece, by means of a piece of rubber tu'bing with a bulb.

Be sure that only nagnesium powder is used; if any of the flashlight mix. tures are put into this type of lamp a dangerous explosion is likely to follow.
Flashlight mixtures are perfectly safe when used correctly, but the amateur should not make them himself. Flashlight powdurs give a much more powerful light than magnesium powder. They should be

For ordinary purposes in a room with light. coloured walls to reflect the light, a heaped teaspoonful of flashlight powder will give good results with a subject not more than 10 ft . from the camera, and $a$ lens of not less than $f 8$ aperture and a fast plate. For larger rooms with lenses of fll apcrture or !ess, and ordinary films, a heaped tablespoonful should be used.

In all flashlight work indoors the utmost care must be taken to see that the flame does not come anywhere near curlains or other inflamnable material.
One great disadvantage is the smoke. The only way of getting rill of the trouble is to use an apparatus in which the smokcis traplued. Fig. 5 shows a form

Fiq. 1
 wool soaked in methylated spirit round bowl. Fig. 2. Home made tray for powders. Fig. 3. "Easilight" for flash powders. Fig. 4. Johnson's flash-lasnp. Fig. 5. Smoke-trapping apparatus for flashlight

Fig. 3. courlesy of Ensign, Led.; Fig. 4, courtesy of Jonothan Fallowfid

## Flats: Some Hints on Furnishing

Making an Attractive Home for the Town Dweller
See the entries Bachelor Flat: Basement; also those on the various rooms, e.p. Bathroom; Bedroom; Dining Room; Kitchen. Consult too Carpet: Colour; Cooker; Cuphoard; Necoration; Electricity; Fireplace, etc.

In the future anyone who has to live can grow flowers and, plants, and, if space in the central districts of a big city seems permits, fruit trees and vegetaljes. The destined to dwell in n flat, as this type of residence appears to be on the rapid increase owing to the high cost of land and the consequent necessity for more people to live under the same roof. Specinl furniture, heating and cookery equipments are being designed for flats, with a view to increasing comfort and convenience and at the same time taking into consideration the necessity of space saving.
Advantages and Disadvantages. From the family point of view flats have certain advantages and disadvantages. The rent of a flat usually includes rates and taxes, and sometimes lighting, an arrangement which simplifies the estimating of expenditure. The initial outlay of starting housekeeping in a flat is considerably lower, as less furniture is required. The fact that all the rooms are on one floor minimises the labour of housework, compared with houses with one or more floors

Where the family are out a great deal and no regular maid is kept, the porter can rcceive parcels and take charge of the flat, thus giving a greater sense of security. Flats are particularly convenient for those who have a house or cottage in the country where they spend week-ends or holidays. A flat has a!so a distinct advantage over a house in that the latter cannot be left for long periods without getting damp, while the former, having occupied rooms either above or below, or both, remains comparatively dry

The disadvantages of flats render them less suitable residences for families where there are young children The entire lack of garden with its playing space within sight and call is a serious drawback. Nany men also dislike this absence of a garden, and the cooper-up feeling of a small flat is ol,jectionable to them. They like their oun front door and their own back garden where they


Flat. Fir. 1. Sitting room in a small flat, where comfort is allied with an effect of spaciousness llumplires \& Vera Joel
it is to keep it spotlessly clean, free of any thing likely to collect dust, and to have a place for everything, rather after the manner of a well-designed caravan. Ideas for such arrangement and equipnent will be found in the article on Kitchen.

The decoration and furnishing of larger Hats presents no particular problen It is in the case of small rooms where every inch of space has to be utilised without being overcrowded that ingenuity and good selection are required. When buying furniture it should be chosen for its practical value as well as for its decorative appearance. If it takes up too much space it will not look decorative.

A writing.desk is best selected that can give the maximum amount of drawer accomnodation, and therefore the merely beautiful writing table with cabriole legs but little storage capacity for papers will be eschewed in favour of a practical burcau or desk. The book table, the divan, the wardrobe compactuin, the sectional bookcnse, the fitted corner cupboard and dresser and the drop-end table arc all suitable pieces for flats. In very small dining rooms and dining recesses metal furniture looks well because it is suitable. A step-shaped wall bookcase, the top of one "step" at a convenient level for a reading. lamp, and that of the lowest for an occasional table, is another useful piece of furniture Rounded corners, sunken handles and flush edges are all excellent points in space-saving pieces.

The Illustrations Described. Fig. 1 shows an interesting example of a sitting room in a small flat. Comfort is ensured by the big easy chairs, with their pleasing upholstery, while the plainer surfaces of floor and painted walls give an effect of space increased by the facts that there is neither fricze nor cornice and that the ceiling is in one colour with the walls. The window and fireplace treatments are particularly good. The architrave designed for the former successfully obviates a curtain fabric pelmet, while the fireplace treatment has effectively disguised the usual ugly small mantelpiecc found in many flats of this size. Just indicated on the left of the photograph is a convenient recess fitted with shelves for books and glass.
The other illustrations are of an ordinary London flat which has been treated in a style specially designed to do all ny with superfluity and yet achieve decorative value by means of goud line and colour. The dining room end of the living-room is furnished with chairs having frames of metal tubing, red canvas being used for the backs and sents. The table and small sideboard are topped with heavy opaque glass and framed in metal. The window treatment at the other end of the room is particularly attractive, aluminium strips being substituted for pelmets, while the outer curtains are brown and the glass curtains of pale yellow voile. The walls, distempered in light buff, are left bare of pictures. The writing table is a beautifully designed but simple piece of furniture in natural oak.

Cupboards play an important part in flat comfort, and many practical suggestions will be found in the article on them (p. 324). Wherever there is avaitable space in hall, passage or bathroom it should be utilised for a cupboard in which to store linen, plate, glass and china. If the hall and passage are dark and narrow, light-coloured walls are essential to create an illusion of space; if there is an angle turn in the passage a lighting fitting placed there will illuminc both hall and passage.

Legal Points. The law governing flate is, in the main, similar to that for ordinary dwelling houses, as for legal purposes a flat is a separate house. Dealing firat with unfurnished flats, the tenant who is about to
take a flat must de. termine what his tenancy will beyearly, quarterly, or monthly. He can take a lease of a flat for a number of years or for a shorter period.

The chief thing is to have a proper agreement in which nre set forth the term of tenancy, rent, stipulations as to repairs, etc. Careful study of the agrecment before signing will prevent trouble later. Particularly should the tenant note his position in regard to repairs, the amount of rent, and period of notice required to terminate the tenancy on either side. A schedule of fix.


Flat. Fig. 3. The window treatment in the living-room of a London flat, the dining recess being shown in the illustration below ture should te provided by the landlord. Occupiers of flats e.g. bicycles, prams. All these matters are usually pay an inclusive rent, the landlorl usually dealt with in the tenancy agreement. paying all rates and taxes. Gas and electric light are usually not included in rent.
In the case of flate where a number of tenants use a common stair and eutrance, the precisc obligation of each tenant in the matter of cleaning and lighting should be clearly defined. Where there are only two or three flats in a building the tenants usually come to an arrangement as to their respective share in cleaning and lighting.
l'articular attention must he paid by tenants of Hats in the matter of nuisances. Mats should not be shaken from a window so as to canse annoyance to the tenant in the flat below. Any noise, also, that disturbs the rest of the tenants, above or below, beyond what is reasonable, constitutes a muisance, as also are late singing or playing on a musical instrument. If carried to excess and con tinued to a late hour a tenant or tenants can get a court injunction to have it stopped. A professional singer would he entitled to practise in a flat, but not at a late hour. The occupier of a flat must not leave objects on a landing so as to annoy the other tenants,


Flat. Fig. 2. Dining recess in the living-room of a
London flat. The frames of chairs and table are of chromium-plated metal tubing

In the matter of sub-letting care shou!d be taken to see whether the agrecment requires that the consent of the landlord should first be obtained. A tenant within the lient Acts who sub-lets all the premises coses the benefit of the Act, i.e. he can be turned out.

Furnished flats are preferred by many persons, and these are governed by much the same conditions as regards tenancy as unfurnished. The rent is higher, and they do not come under the Rent Act. The chief precaution here is to see that the owner or superior tenant furnishes a complete inventory of all furniture and fixtures. Household and table linen are not as a rule included thercin.
In a case where a tenant having a lease of a Hat sub-lets it to another party he is still himself liahle to the landlord for the proper upkeep and conduct of the premises. If the sub-tenant proves undesirahle he must he given notice to quit, and, failing that, a court summons must be taken out. Nost landlords will stipulate for no sulb-letting, or they will want to he satisfied as to the desirability of the sub)-tenant.

A house may not be structurally converted into flats without the permission of the local authority, though a man can let his house to two or three tenants if he wishes, provided no change is made in the structure, and call these sets of rooms flats. For rating purposes he must acquaint his local collector of his action. This conversion into flats is highly technical, and legal advice should be obtained.

FLAT FOOT: Its Treatment. This is a deformity in which the normal arch of the foot sinks and the sole tends to turn outwards, so that the person walks more on the inner border of the foot. Most frequently it is due to a gradual weakening and strctching of the ligaments and muscles which maintain the arch, from much standing. \cute cases are treated by putting the foot into plaster of Paris, thus ensuring rest for the overstretched structures.

From the outset in ordinary cases, the patient must be supplied with proper boots. These should be roony enough, and the inner side of the boot should be raised $\frac{1}{3}$ in. This is done by putting a leather wedge on the heel, the base of the wedge being on the inner side. The heel is also prolonged forwards on the inner side for 3 in. A similar wedge is put on the sole of the boot. The result is that the patient walks more on the outer side of the
foot and the ligaments-are saved from stretching. Even when his boots are off, the patient should be scrupulously careful that his weight is taken mainly on the outer side of the sole. The leg muscles should also be strengthened by tiptoe exercises, massage and electricity. A cold foot-bath at bedtime, followed by dipping the feet alternately in basins of hot and cold water, are helpful. See Foot.

FLAT IRON. In the ordinary household a flat iron is the most usual implement for ironing linen, etc., though in towns it has been largely replaced by the electric iron. Flat irons are sold by weight, and 4 lb . is a good nedium size, though the professional laundress uses hoth heavier and lighter ones. See Ironing; Laundry

FLATTING. In painting, a flat or lustreless surface is produced by the use of flatting paints. These are so prepared that they dry up with a dead surface like distemper, but with the lasting qualities of good oil paint, and when thoroughly dry and hard can be washed with soap and water. Such surfaces lend themselves to stencilled designs and similar ornamentation. Flat colours are obtainalile from any oil and colour shop. See Paint.

FLATULENCE: Its Relief. The accumu lation of gas in the stomach or intestines is a very common and troublesome affection. In the stomach it may be duc to dilation of that organ, the narrowing of the opening through which the digested food passes into the intestine, or to any other cause which allows fermentation to occur. People who cat in a hurry or do not chew their food properly, and those who allow bad teeth to remain unattended to, are frequent sufferers, and the affection is common in hysteria. Flatulence in the intestine is mostly due to fermenta. tion of food caused by bacteria in cascs of constipation.

For temporary relief any one of the following carminatives may be taken: $\frac{1}{2}$ teaspoonful of tincture of ginger in a wineglassful of warm water; 2 or 3 drops of oil of cajuput on a piecc of sugar ; $\frac{1}{2}$ to 1 teaspoonful of compound tincture of cardamoms in water; 10 to 20 grains of compound cinnamon powder.

For intestinal flatulence measures must be taken to prevent constipation (q.v.). In this form, which usually becomes troublesome tivo or three hours after a meal, intestinal antiseptics should be used. Useful drugs here are salol in five-grain cachets twice daily between meals. A pill which gives good results is made up thus, one being taken when the Hatulence is troublesome and the dose being repeated next day if necessary :

## Menthol <br> Powdered ginge <br> Glucose to make <br> . .2 grains $.26 \ddot{1}$ .8 pilis

## See Diet; Indigestion.

FLAVOURING: In Cookery. One of the most important processes in preparing a successful dish is the Havouring, which is generally added last. No hard-and-fast rule can be laid down as to quantities: the safest way is to use all flavourings sparingly, and for the cook to taste as she adds.

Where sweet dishes are concerned, the most common flavourings are vanilla, almond, and lemon. Vanilla can be procured either as an essence, of which one or two drops only are required, or in the form of a pod. The latter is boiled with the milk or other substance, and removed when the preparation is cooked. Almond easence is used in the same way as vanilla. These essences are added as the preparation is removed from the stove.
Almond flavouring is given to a custard or similar mixture by dropping a laurel leaf into the milk and bringing it to the boil. The leaf should then be taken out. Lemon rind, boiled up in the milk to be used for a custard or milk
pudding, etc., will give a delicate lemon flavouring; but care nust be taken to pare the lemon 'rind very thinly, so that none of the white pith adheres, or a bitter flavour will result. A bay leaf gives a much-liked flavour to savoury dishes, minced meat, etc., and is also used for pickled herrings.

For soups and other savoury dishes a favourite Havouring is a bouquet gami. This consists of sprigs of parsley, mint, thyme, blade of mace and a bay leaf, which are tied in muslin and put into the dish, being taken out before the dish is served. Other flavourings that are much used are nutmeg, ginger, cinnamon, allspice, mixed spice, and cloves. Celery seeds, parsley, chervil, and taragon are used as flavourings for soups and sauces, and a few drops of essence of anchovies, tomato ketchup, and mushroom ketchup are also much favoured in savoury dishes. To give a delicate onion Havour to a salad, ruo the inside of the bowl with piece of onion or garlic. See Almond; Clove: Essence; Onion: Spice, etc.
FLAX. There are some lovely garden flowers among the flaxes, suitable for the Hower garden and rockery. They tlourish


Flax. The yellow fax (Linnm favum), a charming ock garcen fower
best in well drained or rather light soil. The best two for the average garden are Linum perenne and Linum narbonense, which grow about 18 in . high and vear blue flowers in summer. Linum flavum and Linum arboreum, 10 to 12 in , high, with ycllow flowers in summer, thrive best in the rock garden. Linum grandifforum rubrum is a hardy annual with bright red flowers; from seeds sown out of doors in March-April, it blooms in July. The perennial kinds are easily propagated from seeds sown out of doors in April.
FLEA. The flea is a carrier of plague from rats to human beings. To get rid of fleas, dust the sheets with insect powder or sprinkle them with essence of peppermint. The underclothing should also be sprinkled with peppermint essence or a few drops of chloroform here and there. Dogs and cats should be washed every week or two and dusted with an insect powder. For the irritation of a flea-bite apply a dilute solution of carbolic acid or of ammonia. See Insecticide.

## Fleabane. See Erigeron.

FLEA BEETLE, This insect, also known as the turnip flea, is a minute beetle, of which there are many allied specimens. They vary in length from \& to $\frac{1}{12} \mathrm{in}$. ; the thigh joints of the hindermost legs are strongly developed, which gives them power of leaping like fleas. The most familiar and most destructive of these has a longitudinal stripe of yellow on each wing-case. The mature beetles pass the winter in hiding under any rubbish left on the


Flon Beetle. Left, matury spocimen of the curnip pest. Right, larval form also deposit white eggs in batches on the lower surface of the leaves, which hatch about ten days later. The young grubs of the flea bectle bury themselves in the tissues of the leaves upon which they feed.

The pest should be dealt with first by clearing the seed ground of all débris which will shelter the beetles in winter. If, however, the seedlings are already attacked, they should be sprayed with a solution of soft-soap, quassia, and paraffin in water. To give the seedlings a chance of surviving the attack, the sceds should have been sown thinly, a course producing more sturdy plants. A scattering of nitrate of soda, 1 oz . per yard run of row, is helpful because it encourages the seedlings to grow quickly. Many of the beetles may be captured and destroved by sweeping the seedlings with a buttertly net. Applications of lime and of soot arc beneficial. See Insecticide
FLEECE. Fleece is the coat of wool shorn from a sheep, but the word is also used to describe any soft, woolly material of a fleecy nature. The kind generally employed in dressmaking consists of a thin, machine-knitted woollen web, made specially with a view to being wire-brushed and having a fuzz of fibre teased to the surface. It is used for lining gloves, house slippers, and children's winter coats. The lining should fit the article exactly, and should be put in while the garinent is in the making, not after it is finished. See Wool.

## FIEX: In

 Electric Fittings. This word is an abbreviation for a flexible insulated wire, generally used to connect movable olectric fittings to convonio each separately insulated from the other; they are usually braided on the outside and then twisted together. Bell flex should not on any account be used for eletric lighting appliances.

Flex. Construction of flexible wire cads : above, for push-in terminals; below, for terminal auts
ground, and in spring when the seedlings of turnips appear they swarm on the young leaves, nibbling small holes in them until they become useless whicl weate or dies. The female beetles

Lighting Hex is similar, but comprises more fine strands, each of them larger in diameter than those in the bell flex, and the insulation is more robust. The heaviest form of flex wire is that known as workshop flex, and is again more substantial than ordinary lighting flex. It is usually braided on the outside over both of the wires, or may have an outer covering of a rubber compound. Such flex should be used for electric lieaters, small motors, the vacuunl cleaner, etc.

Flex should never be used if it is in a damaged condition, since, if the insulation is worn or cut, there is great likelihood of its breaking down and causing a short circuit. If the covering of the wire shows signs of wear or damage (e.g. where it enters a plug or lainp), new connexions should be made, the wire being cut back till a sound portion is reached. If the rubber insulation has perished a new length of flex should be substituted. The connexion of flex wires to electric light fittings should be done with great care. The insulating material must be removed to leave exposed the two separate bundles of stranded wires. These should be wiped with a piece of emery paper, and each bundle twisted together. The ends aro turned over at right angles and doubled back upon themselves. The wires can then be inscrted in their place in the fittings, and secured with a set screw in the usual way.

Where the flex is to be attached to a binding screw or terminal contact post, and secured by means of a nut, the wires are twisted round into the form of an eye. In either case it is essential to prevent any single strand of wire becoming separated from the rest, as this might cause a short circuit.

FLOAT: In Plastering. This tool is used by plasterers to lay on plastet and to bring it to a smooth or fine surface. It can be made from ordinary deal or other wood, but must

The ordinary fars of supply of current. drawbacks are its liability to attacks of moth is ardinary flex, as found in domestio use, and its tendency to harden into lumps. s of three types. The common bell flex Cotton flock, although neither so light nor consists of two separate stranded wires, each springy as wool flock, is said to be free from composed of a number of very fine wires, and the danger of moth, and is extensively used for be perfectly smooth in the face and very slightly rounded on the edges. The back should have a con veniently shaped handle set length ways, as Figs. 1 and 2. See Plastering.

FLOCK. The material known as flock is manufac tured from the refuse of wool or cotton, or from old cloth or rags that have been broken up by a machine called the devil Wool llock is unsed for cheaper uphol stery and mattress tery but its
 upholstery in spite of its tendency to become popular flock is that made from rags, but its employment need not now be feared, since under the Rag Flock Act (1911), the sale or manufacture of unclean flock is prohibited and rag-flock must be sterilised and purified to a standard of cleanliness laid down by the various local authorities. See Bedding; Mattress; Upholstery.

FLOCK PAPER. This name is given to a variety of wallpaper covered with Hock, or fine powder obtained from cloth and similar material. The use of flock paper for special decorative panels or miniature carpets in a doll's nouse, or to represent a lawn or grass on a model of a house, is effective. See Wallpaper.

## Floors and Floor Coverings

## Methods of Construction and Repair

Garious constructional and other articles in this work deal with the subicct of hoors and mooring, c.g. Archliecture; Board; Bungalow; Cottage: House; Joint; Wood. Sce also Amateur Carpentry; Carpet: Damp Course; Linoleum; Rubber, etc.

The importance ol a good sound Hoor to any dwelling cannot be over estimated. Health and comfort alike demand a floor that is even and level, free from draughts and immune from damp

The simplest floor is laid directly upon the earth, and many old country cottages atill have lloors of rammed earth, generally covered with bricks, stone slabs, or flooring tiles. Picturesque as they may be, such Honrs are always cold, prone to dampness, and generally very uneven. The best treatment is to remove the old tiles or bricks, excavate the earth for a depth of about 6 in., lay a good sound hed of concrete lloated off level, and re-Iny the bricks upon this foundation, after having treated the surface to a generous application of hot tar or asphalt. The bricks or tiles will be set in mortar and well grouted. Those badly worm can be laid upaide down if the under side is in gond condition. This saves buying new bricks.

Most dwelling-houses are flonred with timher, consisting of Hooring hoards averaging 1 in . in thicliness and 5 to 6 in . in width. These may have plain edges or be tongued and grooved, the latter being more rigid and draught-proof. Any wooden floor laid near the ground must be well insulated from dampness and thoroughly well ventilated. This is accomplished by first covering the whole site with a bed of concrete at least 4 in ., and preferably 6 in., thick. The appearance of such a bed ready prepared is illustrated in Fig. 1.

Two courses nre now open; one is to insulate dampness by treating the surface of the concrete with a thick coating of tar or mastic, and to lay the flooring direct upon it, having previously conted the under side of the floorboards witli some wood preservative. This method has disadvantages, including the absence of ventilation, and it resulta in a hard and unyielding surface. If the site is sloping, much making up is necessary. A damp course is needed, and adds to the expense.

Wood Floors. Taking everything into consideration, a wood lloor is best if laid on joists in the usual way. Particular attention is directed to the following points: the sleeper walls which support the plates upon which the floor-joists themselves are supported, the presence of air-bricks heneath the floorboards, and the double course of damp-course slates Figs 2, 3, and 7 show the relative arrangement of the parta

In such constructions, when the joists span the opening hetween the sleeper walls, they are known as bridging joists and the floor as a single lloor ; it is the simplest and the strongest construction. The joists are usually spaced from 12 to 15 in . apart, their size depending upon the length to be spanned without support. Sizes of timber usually adopted are 4 in . by 2 in . for the ground-floor joists of small houses with rooms a bout 12 ft . wide, provided they are supported at intervals of 4 ft . or so by a sleeper plate and a honcycomb wall or supporting piers of brickwork, topped with damp-course slates, somewhat as in Fig. 3.

The upper floors are constructed in a simila manner A wall plate of timber is set into the brickwork, and upon this are set the flooring joists, which have to be of such st rength that they can safely carry the load. Usual dimensions are 4 in. deep by 2 in thick for an opening 5 ft . wide, but when the opening or span is, say, 10 ft . wide the joists should be 6 in deep by $2 \frac{1}{2} \mathrm{in}$. wide. A 12 ft . opening requires a joist 7 in by 3 in or 9 in . by 2 in . In the latter case light diagonal struts are used in order to prevent the joists twisting sidewaye.

First-Hoor joists should be spaced 14 in apart, centre to centre, and when the joists are more than 8 ft. long they should be stiffened by herringbone strutting, made from $1 \frac{f}{2}$ in. square deal nailed hetween the inner faces of the joists. The under sides of the lloor joists are lathed and plastered or covered with heaver or other building board
The upper surface of the joists is lloored by laying the first plank against the wall and nailing it to the joista a second plank is then fitted up to the lirat and securely cramperl with flooring cramps (see Dog). and nailed to the joists, continuing until the loor is covered.
If the nails are driven through the llooring into the joists, use the regular flooring brads, 2 in. or $2 \ell$ in. long, and punch each one well down below the surface. This must be done when T. and G. (tongued and grooved) floorhoards are used, but plain edge (P.E) boards, especially when narrow, should be nailed through the edge, driving a nail at an angle of about $45^{\circ}$, as indicated in Fig. 9. This results in a snooth floor without any visible nail heads. The floor is finished by means of a plane
Trimmer Joists. When the lloor is not solid, but has an opening for a staircase, or has to be built around a fireplace or hearth, a some-

what different treatment of the joista becomen neccssary As the model by-laws prohibit the fixing of any woodwork nearer than 9 in. to any Hue, it is necessary to provide a trimmer. or brislging piece, into which the ends of the joists are fitted and secured by a joint known as a tusk-tenon Such trimmers are set securely upon wall plates, or firmly built into the brickwork, and should be at least $\frac{1}{2}$ in thicker, and of equal or greater depth. than the joists they support. Fig. 5 shows a trimming joist with trimmers tusk-tenoned.

The lloorhoards should not be terininated directly agninat a hearth or staircase opening. but should rest against n narrower board neatly mitred at the corners, and fitting around the opening. In some cases a trimmer is itself tusk-tenoned between two joists. which should be thicker than normal to carry the extra load inmposed by the trimmer. A diagonal fireplace set in the corner of a room may have a trimnier tenoned into one joist and aupported at the other end on the brick. work. Fig. 8 shows various customary arrangements of trimmers and joists and the names given.

Floorbuards should be laid in long lengths, spanning the full width of the roon, but whenever a joint lias to be made it should invariably come over a joist. ns shown in Fig. 9. The woods chietly used for house floors are onk, teak, pitch pine and deal. It is usuai to lay the boards in narrow widths, say, 4 in . to 5 in ., instend of the 6,7 , or 8 in boards of carlier days, and the finish is generally good enough to permit of polishing
Wood block floors are employed in lecterclass houses, particularly for passages, etc


Floor. Fig. 1. Concrete foor-covering befors laying joists and foorboards. Fig 2, Sleener walls, showing damp course slates, upon which foor plate and joists are laid. Fig. 3. Floor joists and sleeper walls for a ground floor. Fig. 4. Joists built into brickwork. Fig. 5. Trimmers and trimming jolst, showing tusk-tenon joint. Fig. 6. Flooring and joist around a staircase well or odening

They aresome times used in kitchons. They need a concrete foundation, and there must be some kind of bituminous shecting interposed between foundation and hlocks. Usually the under sides of the blocks are dipped in a bituminous mixture before being placed on the concrote. The wood blocks can be had in from $1 \frac{1}{2}$ to $2 \frac{1}{2}$ in. thickness. Parquet floors ( $\mathrm{Y} \cdot \mathrm{\nabla}$. ) are laid with wooden blocks, usually $t$ in. thick, some 9 in. long and 3 in . wide

Composition Flooring. For kitchen, scullery. bathroom and other rooms of these kinds, it is possible to employ a jointless composition flooring by using a plastic material which sets in 24 to 48 hours. Various colours are available, and simple designs can be worked into the material. Stone and concrete floors are used in kitchens, larders. yards, and verandas. For ordinary paving purposes natural York stone is one of the best. There are also various artificial stones made with granite chippings and Portland cement, or clinker and cement. Outhouses and sculleries are generally laid with concrete or cement.
Floor Repairs. The repair of existing floors is a frequent problem. Cement floors do not present much difficulty. The bad places should be further broken away. and deepened. all dast and dirt washed away, and the doficieney made good with strong coment mortar. If the whole surface has worn badly it will be better to hack it all over with a chisel and hammer. Then bruah the surface clean, wet it thoroughly and recoat to a thickness of at leat $\frac{1}{1}$ in. with strong coment mortar (ganged cement 1, and sharp sand 2). A hard burface, fres from dust, is obtained by using cement and fine washed granite chips, adding some reliable waterproofing composition.
To repair wood flooring cut out the bad boards and replace by now, making all joints in the length of the timber over a joist or other firm support. To cut out a tongued and grooved board without damage to the remaining boards, saw through the tongues, using a keyhole or pad saw with as fine a blade as possible. The board can be sawn across by prizing it up at one end, slipping a piece of batten underneath, and outting across the board with a tenon saw.

Decorative Floorings. The simplest mothod of deooration for a wood floor is by staining it. This may be done with one of the branded floor stains or an excellent stain can be homemade with vandyle crystals, which can be purchased cheaply from a chemist. These are melted in hot water: the amount of dilution depends on the colour required for the floor. Having thoroughly cleansed this with a strong soda washing and allowed it to dry, the stain is painted on with a good brush. The polish is not obtained until the floor has had several subscquent rubbings with a wax polish.

Bright colourings of considerable durability are obtained by the use of the floor paints sold for this purpose by most oil and colour merchants. Such paints are chiefly suitable for bedrooms. Tiles are a decorative flooring for certain types of halls, for bathrooms, kitchens and sculleries, but as they are expensive, substitutes are used, one of the most successful being tile designs in rubber fooring. Such floorings are durable, easily laid. comparatively low priced and hygionic.


Floor. Fig. 7. Diagram of prinoipa parts of a ground looz

They also lessen noise, which is a boon in many homes. Obtain. able in different qualities, these floorings are also designed in marbled and plain effects.

Besides parquet floorings, dealt with under that head ing, linoleum in its varions qualities, makes and designs provides useful floor cuvering and surrounds for carpets.
Cleaning Floors. A painted, waxed, or varnished floor should be wiped free of dust and dirt with a soft rag, and then treated to an application of crude oil and benzine. one part of oil being used to three parts of benzine. This is a good cleaning mixture which obviates the use of water, but only a small quantity should be used at a time. It should not be allowed to remain on long and should be wiped off with a woollon rag If the floor has a waxed surface, any good wax pasto can be applied, and the polishing done with a rag, brush, or polishing mop.

Grease spilt on unfinished wood such as a kitchen or pantry floor is best treated with cold water. The latter should be poured on at once. so as to harden the grease and


Fig. 8. Diagram of first floor, giving the names of the timber parts Hoor as dry as possible. See Mayonnaise. preferred. See Embroidery : Silk. fried parsley.
wet patch vigorously, working the brush the same way as the grain of the wood Then wring the cloth out of the water and wipe the

Floor Polish. Beeswax (q.v.) asually forms the main ingredient of floor polishes, but a cheap and effective substitute is to be found in tallow candle ends. To make a polish of these, melt down $\frac{1}{\frac{1}{2}}$ domen or more ends, according to size, and mix the tallow with $\frac{1}{2}$ pint each of paraffin oil and turpentine.
Horence Cream. This is a name given to a salad dressing of the mayonnaise type.

FLOSS SIIRE. Used in needlework, floss silk consists of silk fibres so lightly twisted together that the thread spreads out and gives a glossy appearance. The stitches must be short, for the silk frays easily. A 2-ply or 3-ply floss is the beat, and embroidery floss should be asked for by name, as there are many varieties of twist. Boiling colours are to be

FLOUNDER. One of the commonest of the flat fish found in English waters is the flounder. Its flesh is nutritious, and is easily digested. It should be well washed and rubbed over with salt an hour before it is to be cooked. Dry the fish well and dip it into beaten egg and then into breadcrumbe before frying it in hot fat. Serve it garaished with some

To boil a flounder put it in a fish-kettle with just sufficient water to cover. Add salt and a little vinegar to taste, then bring it to the boil and simmer gently for about ten minutes. It should be served with anchovy or parsley sauce. Flounders can also be grilled. See Grilling.

FLOUR. Fine soft powder prepared from grain, e.g. cornflour rice flour, maizo flour, wheat flour, etc. If Hour is montioned without any indication as to source, wheat Hour is implied.

Flour is described as soft or hard. Soft flour is made from wheat that has a low percentage of gluten, and that of an inelastio kind. A hard or strong prevent it from spreading. The grease may flour has a high proportion of gluten, and that then be scraped off with a knife, and the of a tough kind, which becomes elastic under affected part scrubbed with warm water and certain influences when made into dough.
washing soda. If the spot appears dark after this treatment, spread over it a pasto made from fuller's earth and water, leaving it overnight.

All floors should be well swept in the morning, and if of the polished type, rubbed with a sort duster or mop. For scrubbing purposes, a bucket of hot water, a floor-cloth, a scrubbing-brush, a mat for kneeling, and some good household or soft soap are essential. Commence is that portion of the room farthest away from the door, and with the cloth wet the arrounding boarda. Dip the scrubbingbrush into the water, rub some soep on the brietles, and scrub the


Iis. 9. Diagram illastratiog the rarious methods of fointing onds of foor boards, and of aaling them to the jolite
property of softening gluten and making it elastic. If hard flour is used it should be sifted first. If bread, or something fermented by yeast, is to be made, then only hard or strong lour may be used. The yeast possesses the property of making tough gluten very elastic, and as the yeast produces gas from the sugar of the flour, so the elastic gluten retains it, and bread of large volume is thus made possible.
The colour of tlour is in some respects dependent on the wheat used, on the method of milling, or on the grade. White wheats make white flour, and red wheats produce a yellowish tinge. If the flour has been made in a stone-grinding mill-a method very nearly extinct now-it will be darker than if made in a roller mill and, as a rule, will not keep so long sound.

For some years there has been a growing practice of bleaching flour, generally with nitrous oxide gases, but also with chlorine. This takes away the yellowish colour, but the quantity used is so minute, and there is so little left in the flour, that no deleterious effects can be discovered in the baked articles. Certain other substances, called persalts, are also used to effect a slight bleaching action, while calcium and other phosphates are sometimes added to make soft flour somewhat stronger.
Flour Hutch. Regarded now as an antique piece of furniture, this was originally used to bold flour end bread. The hutch is a form of cupboard standing on four legs and strengthaned by stretchers. The lid is on the top, and inside are usually two divisions, one for bread and the other for Hour. Most of the existing pieces are of oak. With a little ingenuity a hutch can be converted into a modern piece of furniture; for instance, a dresser. In this case a back is necessary, the hutch itself serving for the cupboard.

Flour Sifter. This term usually implies either a flour dredger, used for small quantities, or a wire sieve for langer amounts. The object is to aerate and thus lighten the flour, and to remove lumps or any foreign matter. An ordinary sifter requires shaking before the flour will pass through, but mechanical oncs are obtainable inside which, by turning a handle, wire rings are made to revolve, thus forcing out the flour. See Baking; Bread.

FLOWER BASKET. Hanging flower baskets as shown in Fig. 1 are intended to hold a potted plant, and are very useful in the garden, conservatory, or hall. They are easy to make, and provide a means of putting any waste strips of wood to a useful purpose. If deal is used, it would be best to finish with paint, leaf green being suitable. Any hardwoods could be left plain, or stained and polished with linseed oil.

Fig. 2 shows an elevation, and Fig. 3 a plan of a basket of useful size, in the making of which 20 strips similar to Fig. 4 and four strips similar to Fig. 5 will be required. The strips are intended to be $\frac{3}{} \mathrm{in}$. square, but sizes may be altered as required. The baskets are wired together, holes being bored through the long strips for the purpose. Two wires are used, one at each side, and each runs through the bottom strip and up through the corners, as shown by the dotted lines in Fig. 2. Galvanized or copper wire is most suitable, each piece being some 6 ft . long. In building up, thread the wire through two strips, and

across these thread two other strips, as shown in Fig. 6. The bottom is formed by nailing the short strips over the bottom strips, and the basket is completed by threading the remaining strips over the wires. Care must be taken to have the ends of the wire which project above of equal length; they are twisted over a stout ring, which is used for hanging (Fig. 1). See Basket Plants.

FLOWER BED. Flower beds, preferably of simple design, are made on the lawn and in other parts of the garden and filled with massed flowering plants for the purpose of ensuring a brilliant show of spring and summer bloom. They are planted in October with bulbs and spring flowering plants and late in May or early in June with others which will bloom throughout summer and autumn. See Bedding Out.

FLOWER GARDEN. The chief features of a modern flower garden are the herbaceous border, formal flower beds, rock garden, shrubbery planted chiefly with flowering shrubs, lawn, and water lily pool, with perhaps an adjacent bog garden. The little formal garden, its beds and borders intersected by paved paths, is fashionable and is generally represented even in plots of restricted size.

The principal needs of most hardy flowering plants are a sunny position and deeply dug and manured soil, and if those are provided there is every likelihood of a successful issue. The herbaceous border of hardy perennial plants is perhaps the most important feature of all, for, if planted with a representative selection, it will remain gay throughout the summer and autumn months.

Any kind of land can be made suitable for a flower garden by correct cultivation. Olayey ground is improved by autumn and winter digging and by adding such materials as lime, finely sifted coal ashes, old potting soil, sand, grit from garden paths, leaf-mould, decayed garden rubbish and wood ashes from the bonfire. Light land is improved by digging in leaf-mould, decayed garden rubbish, pieces of turf, hop manure, and stable or farmyard manure. It is better to apply the manure in spring and to fork it in lightly than to dig it in during the autumn or winter.

Planting may be done in autumn or spring or in mild weather in winter. Some of the chief hardy herbaceous perennials are lupin, delphinium, phlox, Michaelmas daisy, erigeron or summer starwort, geum, peony, pyrethrum, bellflower, columbine, sea holly or' eryngium, globe thistle or echinops, evening primrose, purple sage, mauve catmint, sliasta daisy, coneflower or rudbeckia, and perennial sunflower. The spaces between the perennial or permanent plants are fillod with gladiolus. lily, montbretia, and dahlia, and with hardy annuals, of which seeds are sown in spring. Swcet william and Canterbury bell may also be planted in autumn to bloom the following summer.
Formal flower beds on the lawn or elsewhere should be of simple design ; those of elaboratc shape cause a good deal of labour and they are not so pleasing as circular, rectangular or oval beds. It is usual to fill them with spring bulbs, wallfowers, polyanthus, forget-me-not and other early flowers by planting in October. In late May or early June these are taken up and are replaced by summer flowering plants, e.g. zonal geranium, marguerite, lobelia, tuberous begonia, snapdragon, dahlia, etc.
The rock garden must be in a sunny place, and the site must be well drained; if theso conditions are provided, and if leaf-mould, sand, grit and stone chips are added freely to the mound of soil, most of the rock garden plants will flourish.
There are so many beautiful flowering shrubs which are hardy in Great Britain that there is no longer any excuse for a shrubbery planted with uninteresting evergreens. By making a suitable selection one or another of them will be in bloom throughout the spring and summer months. Some of the chief kinds are early spring heath (Erica carnea), Forsythia spectabilis or golden bell, broom, Pyrus floribunda (flowering crab), Japanese cherries, rhododendron, azalea, laburnum, mock orange, lilac, guelder rose, bush honeysuckle or weigela, hydrangea, ceanothus and witch hazel or hamamelis.

## How to Make a Lily Pool

A water lily pool can be made a delightful featurc even of a small garden. It must be in a sunny place, for water lilies will not bloom well in the shade. Some of the small water lilies will flourish in water 18 inches or so deep, so an elaborate excavation is not necessary. By lining the sides and bottom with stones and covering thesc with oement, it is not difficult to make a watertight pool The water-lily plants should be put in mounds of soil at the bottom of the pool in early May ; the use of a few large stones will keep the plants at the bottom of the water. The moist soil at the margin. of the pool provides an ideal home for bog plants such as monkey musk, Iris siberica, Japanese primrose, and many more.

A delightful formal garden can be made by filling the beds with some of the old-fashioned flowers such as columbine, poppies, peony, mauve catmint, lavender, rosemary, pansies, snapdragons, and so on, and paving the paths with stone or brick. A sundial or bird bath might well mark the centre of the garden. If flower beds are made on the lawn they should be few in number and near the edge.

Arches covered with climbing and rambling roses and clematis add to the beauty of the Hower garden, and a trellis so placed as to provide a background to a garden seat or ornament could be covered with climbing plants. Sce Arch; Border; Carnation; Cleınatis; Climb. ing Plants; Daffodil; Dahlia; Digging; Garden ; Herbaceous Border ; Hydrangea: Lily : Pansy ; Rose, ctc.

FLOWERING CURRANT. This is the popular name of ribes, a genus which includes the gooseberry and red, white, and black currants and some useful hardy flowering shrubs. Ribes sanguineum, the common Howering currant, will thrive in shady places; it bears reddish flowers in spring. See Ribes.

FLOWERING RUSE. The common name of Butomus umbellatus, a British wild plant suitable for planting by the waterside in gardens. It grows 2 to 3 feet high, with rose-coloured flowers in summer. See Rush.

FLOWERING TREES. These are well suited to planting in small gardens, and might be used with advantage to screell unsightly surroundings. They provide shelter without casting too much shade. Autumn is the best time to plant, though the trees may be put in the ground in spring and in mild weather in winter. Some of the most orna mental are the flowering crabs (Pyrus spectabilis, Horibunda, Eleyi, and others), thorn, laburnum, Magnolin conspicua, the purple. leaved plum (Prunus pisserdi), Japanese cherries, and lilac

## Flowers and Their Arrangement

## How to Make the Most of Floral Decoration

The reader is referred to the entries on the various howers mentioned in the article, e.g. Carnation; Rose: Tulip; as well as to Bouquet; Bulb: Colour; Table; Vase, etc.

Uniess a pantry and sink are avnilable when arranging flowers, it is best to place a tray with vases and bowls on a table, the bunches of Howers on a newspaper, with another one spread at hand for rubbish : a big jug of water, scissors and a knife complete the preparations. To obviate the use of newspapers and afford complete protection to a sitting-room table, the American cloth tidy illustrated is a useful accessory to flower arrangement, and one which is quickly made. It requires a yard of brightly coloured American cloth, a cotton galon to tone, a pair of scissors attached to thic latter, and a motif of Horal cretonne applied to a corncr of the tidy by means of buttonhole stitch. (See Appliqué.)
If not arranging the flowers in a flat bowl the lower leaves should be removed, as they choke up a vase. All woody stemmed Howers, such as lilac, roses, chrysanthemums, will last better if the stalks are peeled at the ends so that they are free to absorb water.
Should flowers not seem very fresh they may be revived by being placed in quite warm water. The water should be changed at least every second day, and when flowers suddenly become limp the stalks should be cut again. If cut Howers have to be bought, it is worth remembering that they last much longer when they are just coming into their natural growing season than when they are forced or when the species are practically over for the year. Flowers also last longer in well aired rooms than in stuffy ones
Japanese Ideas. Japancse intluenoe has affected the arrangement of flowers. It is nn longer thought sufficient just to stick a bunch into a vase, but rather to make each arrangement a piece of decoration, taking into consideration the relative characters of the Howers, their supports and containers, the colour of the walls, etc., and the shape required to make a pleasing effect. Thus an arrangement


Flower Tidy made from a gard of brightly coloured American oloth, a motif \& floral cretonne being applied to a corner, as shown above on the right. The soimers are attached to the cotton galon edging

FLOWER POT. Flower pots of burnt clay are too familiar to nced description, but as nurserymen usually refer to them by name or number. tlieir sizes in inches, taken from the diameter at the top of pots, are given to prevent confusion. Thimbles, 2 in.: thumbs, $2 \downarrow$ in. : small sixties, 3 in . : large sixties $3 \frac{1}{2} \mathrm{in}$. fifty-fours, 4 in . ; forty-eights, 5 in . : forties, sometimes called small thirty-twos, $5 \frac{1}{2}$ in.: large thirty-twos, 6 in . ; twenty-fours. 8 in . sixteens, 9 in ; twelves, 10 in . The sizes may possibly vary slightly according to different. makea See Potting
off. Sweet williams also require to be massed in a wide vase or bowl, and certain other Howers, such as primroses, wallflowers, and pinks, whose great charm is in scent and colour rather than in form. Tulips are an example of Howers which require a background of wall to look their best. owing to their beauty of line.

Carnations are essentially Howers which look best with a detached treatment of bloom. In a cut-glass vase, as seen in Fig 4, they are perfectly suited. The asparagus fern softens the slightly hard effect of the stalks supported by a wire holder. Geraniums require a formal treatment and look well in a square glass with maidenhair fern. Violets also are a joy in a low crystal vase.
The decorative note is stressed in Fig. 5, an arrangement of Fire King snapdragons in a pale green jug, set on an oak window-sill and harmonising with the printed linen of the curtains. Such long-stalked summer flowers require depth of water and aro better placed in a tall jug or vase. Stocks are beautiful in a pewter tankard, as seen in Fig. 6, the pink, inauve and plum-coloured tones of the flowers and their delicate greenery contrasting exquisitely with the grey metal.

For Heavier Flowers. Where it is desired to get a beautiful effect with heary flowers or sprays of flowering shrubs, an easy method of support is the following: Choose a big, wide vase of some metal or strong pottery. Measure the top opening across and cut two strips of thin wood to fit. Lay these about $\frac{1}{\frac{1}{2}} \mathrm{in}$. apart and nail some crossway pieces about 1 in . from the end; this forms a slot. After soaking in water to make the wood swell a little, place this rough framework about 1 in . from the top of the vase, wedging it in. Because of the wedging, this method is not suitable for glass or china vases. The flowers will rest in the slot, apparently growing from the centre of the vase. Such a support could be used to assist an arrangement of mock orange blossom by the possessor of a Somerset cider jug or other large suitable receptacle, such as a big copper vase, to form the delightful empty grate screen shown in Fig. 8. Through the summer bold arrangements of foliage and tall flowers such as foxgloves, gladioli, dahlias, and Michaelmas daisies can be used in this nay to decorate a country sitting.room.

High graceful flower arrangements form entirely satisfactory corner furnishings, and particularly decorative in a dark corner are tall white flowers in \& white vase. White lilac. chrysanthemums and madonna or Harrisii lilies are all suitable for this purpose. The last named are shown in Fig. 9, brightening a dull hall. Another charming scheme for a hall window-sill is seen in Fig. 3. Here oriental poppies make a brilliant show of colour in a hammered brass vase. Nothing could give a more inviting welcome to an oak furnished interior unless it was a square tall vase of amber glass containing bronze chrysanthemums. It is a point worth noting that these flowers must be placed in deep water as, unlike certain others, do not last well in bowls.
Mixed flowers can be used to create beautiful effects for the table or to be set against a wall. Colour and shape must be well considered. Such mixtures as pink tulips, mauve irises and various kinds of the narcissus family can be well arranged together. Short stalked cottage garden flowers are delightful mixed with apparent carelessness in a green pottery bowl. Another scheme for the country room would be marigolds, cornflowers, big white daisies and field grasses in a pewter jug. Mauve lilac and pink peonies will make a handsome corner decoration. Later in the year dahlias in a pinky mauve shade will look beautiful with mauve scabious, and if arranged
a black Wedgwood bow, Fig. 2, has been achieved with the aid of such a block. and so has that of thesweet peas in Fig- 7. Again, both these flower arrangements are for a position at a table level, and the pottery bowls are well chosen to set them

flowers in the home : SUGgestions for the arrangement of many beautiful varieties. See text
in a big jar spikes of pink gladiolus may be added with excellent effect.

Winter Decoration In the winter months tall spreading arrangements of foliage and berries, such as spindle, the various barberries. cotoneasters and rowans will brighten rooms when flowers are scarce. Another floral decoration which pleases the thrifty housewife is achieved with honesty. Beautiful effects can be obtained by using the flat silvery seed pods of this old-fashioned plant in their natural state combincd with those dyed in shades of pink and mauve against a background of dark evergreens. Baskets of dried everlasting flowers are liked by some people and can be made attractive combined with statice in mauve and yellow and the introduction of sprays of conifer foliage.
The seed heads of candytuft also remain fresh for a long time in water and look charming in a silver or pewter mug against a dark background. Physalis, with its orange scarlet Japanese lanterns. will look beautiful with pine foliage and branches of larch, the stems and cones of the latter dusted with silver frost powder after the fashion of Swiss Christmas bouquets.

Packing. When it is desired to forward Howers by post it is best to cut them in theocol of the day and put in water some time before packing in a cardboard box. Layers of thin wadding between each layer of flowers help to keep then fresh, and it is a mistake not to pack as closely as possible without crushing the blooms.

Flowers for funerals should be sent to the house early on the day fixed. The old custom of using only white flowers has been modified and there is nothing to forbid the use of coloured oncs for this purpose. Roses, carnations, tulips, in fact flowers of all colours, made up into wreaths, crosses, etc., may be sent. If in the announcement of the denth it is also mentioned that no flowers are desired, such wishes naturally will be respecterd.

Pressing. Some people like to press botani. cal specimens while they are away on a holiday or at. other times, while children sometimes do this as a bobby. Such specimens are best carried in a metal case when they are picked and should be pressed shortly afterwards in a botanical press. Sheets of white blotting paper, cotton wool, photographic paste and a small paint brush are needed. For mounting the dried flowers either an album is required or the specimens may be mounted on loose sheets of thick drawing paper and stored in a cabinet obtained quite cheaply for this purpose.

FLOWER SHOW. In Great Britain July and August are the chief months for flower shows. The following suggestions are offered to those gardeners who may desire to enter the lists at the local horticultural society's show, but who do not know the way in which exhibits may be prepared and staged to the best advantage. Those interested should secure the society's schedule as soon as issued, study its various classes, and select those in which it is desired to compete. They should study the rules and send the entry form carefully filled in to the secretary well in advance of the advertised date for closing.

The next matter of importance is consentration upon the cultivation and management of those plants from which exhibits will be drawn. If cut bloom is the object in view, thesc generally will be taken from the hardy plant border. Plants selected should have lairly frequent doses of weak liquid manure, alternately with watering. Cut out all weakly flower spikes and use them for indoor decora. tion, and stimulate strong growths in order to reach perfection.

Flowers for a show are best gathered during very carly inorning. and after they have been
placed in clean, soft water should be sheltered in a cool, dark space until ready for packing. If the show is n long distance awray they should be sent in an exhibitor's hox, which will allow them to travel in good order. If the show is near at hand simply place damp moss round the stems and pack them in boxes lined with clean tissue paper.
Roses and Sweet Peas. Roses that are grown for exhibition purposes require attention not only for stimu. lating cultivation, but also for intelligent disbudding. The best blooms will need shading from bright sunshine when they are opening, bearing in mind that on the morning of the show it will be the opening bud that will be the right one to cut, as its expansion will have developed just about the time when judging is taking place. Tie a band of soft wool round the bud before cutting and do not remove it until the bloomsare staged. Always cut with long stems, and see that flowers are sprayed with clean water from a very fine sprayer.

When arranging sweet peas see that the spikes are so placed that each is clearly visible, and be careful to put only the exact number in each vase, as called for in

FLUE : In Chimney and Range. Flues are internal passage ways or channels to discharge the sinoke and fumes from a fire, foul or hot air from a room, or to supply fresh air. In a cooking range the flues are the internal channels by which the hot gases are conducted past the oven or boiler, as desired.

A brickwork construction with one or more vertical Hues is generally known as a chimney stack. A typical stack is shown in the accompanying diagram. In domestic architecture a flue is usually carried out in brickwork, and is part of the fabric of the building. Flues for gas fires may be formed in the wall itself.

In a dwelling-house a Hue deals with the smoke, conducts the heated and foul air from the room, and acts as a ventilator. Consequently it should never be closed up, unless other means of ventila. tion are provided. Most Hues have been designed for open fireplaces, intended for the use of ordinary coal, and in these cases the grate should be deeply recessed. The back should slope towards the front, so that the smoke has to curl over before ascending the fluc proper. The cross sectiona: area of the flue should be as small the show schedule. Each variety must be as possible and the sides as smooth as praccolour colour, perfect freshness is absolutely essential.
Pot specimens of such plants as fuchsias, zonal pelargoniums, tuberous begonias, etc., will require stopping or disbudding well before the show, and a safe rule is to remove all Hower stems appearing above the leaves at least a month in advance.

Most exhibitions have classes for table decoration. Points towards success are light. ness and grace combined with simplicity of colour and daintiness. Overcrowding is a fat al mistake, and it is too often forgotten that ample space should be left for diners.

Make sure that exhibita are strictly according to schedule, otherwise disqualification may follow. If a class calls for six blooms do not include seven. Cut all blooms before the sun gets on them, and they will retain their fresh. ness until the crucial moment of judging.

Do not st retch time too fine on the morning of the show, and remember that whether your exhibit is finished or not nobody will be allowed in the tent while the judging takes place. Clear up all rubbish from the neigh. bourhood of your stand, and, after putting everything in proper order, leave the tent and await results. If in doubt or difficulty go to the secretary, but do not worry this busy official unnecessarily. See Carnation; Chrys. anthemum : Rose, etc.

FLOWERS OF SULPHUR. This is another name for sublimed sulphur, which occurs as a gritty yellow powder. It is used internally as a laxative, and is especially useful in chronic constipation, piles, and chronic rheumatism. The dose is 20 to $\mathbf{6 0}$ grains, and it inay be taken with marmalade or in milk or treacle. Externally, in an ointment, it is used in scabies or itch, and in other skin complaints. In chronic rheumatism benefit may be derived from sprinkling the affected part with flowers of sulphur in fine powder and wrapping flannel bandages round. See Laxative: Sulphur
ticable, in order to present the minimum of resistance to the ascending air.
To retard down draughts and to stop the passage of rain in wet weather, all Hucs should have at least one bend with an easy slope. The height of the flue opening above the roof should be at least 3 ft . above the ridge or adjacent roofs, and in restricted areas the height can with advantage be much greater.

Ventilating flues are constructed in brickwork in much the same way as a smoke flue, but the opening is often long and narrow, as such an arrangement can be built into the cavity between two walls. Such flues terminate on the exterior in a special elbow or bent box having an opening and flap valve. Indoors the flue openings may terminate in the form of a cast-iron grating with a movable cover, permitting the flue to be opened or closed at will.
Portable coppers, central heating boilers, and fittings of a like character are usually provided with a flue pipe made of cast iron. All such flues must be kept well away from any woodwork, and, where they pass through a wall, should have a proper cast-iron wallbox or plate built in. This type of flue can economically be combined with a simple brick chimney stack, several of the iron flue pipes being conducted into the brick stack.
The Kitchen Range. A regular kitchen range, when built into brickwork, has a rather elaborate arrangement of flues. The provision of two or more flues is for the purpose of changing the direction of flow of the flames and hot air, dampers or controlling valves being provided to check or stop the passage of air through one flue, and to vary the crosssectional area of a flue. Constricting the area of the flue will, up to a certain point, increase the speed at which the hot air ascends ; hence the faster the heated air ascends the more fierce will be the fire, as more air is consumed. Further closing of the damper so far restricts
the: Hue opening that it can no longer pass sufficient air, and the fire is damped down or checked and burns more slowly. By these controlling devices the lieat from the fire can be concentrated on the oven when the oven Hue is open and the other closed, or concentrated on the hot-water hoiler, etc.

The thues need to be cleaned weekly. 'To do this, open the damper and top flues, insert the flue bruslr in each, in turn, and $t$ wist it well in every direction. Next open the rounds on the top of the hot-plate and, with the scraper and brush, gather the soot and scrape it into the dustpan. Tlie lower flues should be cleaned in the same way See Anthracite Stove; Bricklaving: Chimney: Grate Range; Stove Ventilation, ctc.

Flue Brush. A brush with a long, annealed wire handle is best for cleaning a tlue. Four strands of atout wire are tightly tivisted to grip small knots of the inaterial which makes the brush, the remaining length of twisted wire forming the handle. For everyday use a brush is made of black China bristle, and the stiffer the quality the better. A wire brush used occasionally will remove hard carbon or soot deposits and slight corrosions. Long chimney flues can bo swept out with a circular brush screwed to the top of a rod of hickory or other suitable wood; joints are made by screwed sockets, and any number of extra rods can be attached as the brush is forced up the chimney See Brush.

FLUFF. The short fibre which shakes out of beddings and is swept out of carpets is collected with the dust, and is best burnt, unless, of use for the garden. It has a value as manure and may be mixed with garden soil. The fibre assists a light soil to hold moisture and contains plant food. Woollen fluff is bought by hop farmers, being specially useful in growing hops.

Fluff from the woollen cloth mills and shoddy factories is used for stuffing cheap mattresses and furniture. A kind which makes the best stufting for pin-cushions is blanket cardings.
FLUMMERY. This makes a delicious and wholesome cold sweet. Wipe 3 lemons, chip off their rinds very thinly and lay them in a basin with $\frac{1}{2}$ pint of boiling water and $\frac{1}{2} \mathrm{lb}$. of white sugar for $\frac{1}{2}$ an hour. Then dissolve $\frac{1}{2} \mathrm{oz}$. good weight of gelatine in 2 or 3 tablespoons of hot water. Strain this to the water, and add the juice of the lemons and the yolks of 4 egis. Put this mixture into a jug, which stand in a pan of boiling water. Stir gently over the fire till the mixture thickens likic a custard. On no account overheat it. Strain it, and when cool add a glass of sherry. Serve in custard glasses

FLUSH BOX. This is a metal or wooden box or cistern used to supply a sudden rush of water to a closet. A common form comprises a galvanized iron cistern with a siphon arrangement : as the water rises in the tank the nir is expelled from the siphon box, and the contents of the tank are discharged with considerable flushing force.

The device may be used in connexion with a rain-water tank; it will then collect the rain-water as it trickles from the rain-water pipe, and store it until a sufficient quantity has been accumulated to dispel the air from the siphon box, when the contents are forcibly discharged, thus cleansing the drains. In fixing such tlush tanks there must be frce ventilation to the siphon outlet, and the pipe line must be free from a trap; if such a fitting exists it must be removed, or be provided with i ventilating pipe. See Sanitation: Water Closet.

FLUSHING. This affection is apt to be troublesome to many women at the change of life. It may be produced at other times by indigestion, eating hastily, drinking alcohol, tight lacing, and the use of tight neckwear The remedy is to avoid the nccasion of the trouble. Bromides and ichthyol are useful.

FLUSE PANELLING. In furniture this is a method of joining up stilcs, panels, eto., of wooden doors so that all are on the same plane, no part projecting in front of any other. The tops of tall pieces of furniture are often treated in this way to prevent the formation of a hollow well that tends to harbour dust behind the cornice See Door: Panelling

FLUTE : How to Play. The transverse. concert, or, ns it was formerly called, the German, flute is an instrument made cither of ebonite, cocus, or inetal. Of these matcrials,
chluride, otherwise known ns killed spirits, when it has been prepared for use by dissolv: ing in hydrochloric acid as much rinc in the form of odd little picces or cuttings as the acid can attack. Rosin and sal-ammoniac are other useful fluxes

Fluxes for brass and copper include aminonium chloride, rosin, zinc chloride Tallow or mosin are good tlu xes for lead. Zinc is soldered with hydrochloric acid as the flux, and the same acid may be used as a flux on galvanized steel. Chloride of ammonin is a good flux for soldering steel and rrought iron. The soldering of aluminium presents some litt!e difficulty, as the lluxes mentioned are ineffective. Various

Flute. Boobm concert flute, cylindrical, 28 in. Ty cocus the deleterious effects of the moist breath. The silver flute requires a less strong embouchure than the others, which recom mends it to amateurs, but on the other band its tone is not so good.
The instrument has a chromatic compass of about threc octaves divisible into three registers:
The quality of the lowest register is rather recdy The middle register, produced by increasing the air pressure, is fuller and more mellow, while the highest. produced by stil greater nir pressure, and by cross fingering, is pure and brilliant, exccpt in the extreme notes. On the whole, however, the scale is fairly even

After using, the instrument must be thoroughly wiped inside and out, especially near the joints where mointure is apt to collect. and, if not removed, to cause inevitable mischief. An oily rag passed through it now and again will help to keep it in good order, especially in hot weather, and all aprings and moving parts should be periodically cleaned and made to work freely, oiling if necessary, but with a very sparing hand. Should the holes becomo dirty, cleanse them with a soft rag or brush, but never usc anything which may in time enlarge the holes, or faulty intonation will be the result. The flute in its casc should be kept in a dry but not too warm a place.
FLUTLNG. As applied to work done on wood, stone and on silver and similar nietala Huting is the regular semicylindrical ornament with which many pieces ale decorated. Examples are often found on the pillars of candle-sticks and tho hases of teapots, and in stone, plaster or wooden pilasters and pillars. In small ivoodwork, fluting can be obtained by the use of a reeding plane, or hand beader, an inplement in the form of a spokeshave; when applied to plaster work or cement construc. tion it may be either moulded or run in with a templet or horse.

FLUX: In Metal Work. Fluxes are used in uniting metala during welding, brazing, and soldering, to prevent oxidation, to clcan the surfaces, and ensure a sound joint. A flux in common use is zinc


Fly. Above, adult house fly. Below
proprietary solders are sold for the purpose. In addition to the fluxes enumerated there are several preparations on the market. including one, in the form of a paste, that combines the properties of a flux and a solder.
The flux commonly used for silver soldering s borax, prepared by rubbing a lump on a clenn piece of slate, slightly moistened with water ; the creamy paste so produced is then applied to the parts to he jointed, and is an efficient Hux for small work. Borax may be applied in powder form. and in some cases mixed with small pieces of solder. The same flux is in extensive use for all classes of hrase brazing where spelter, or brazing wire, is employed See l3razing. Soldering: Welding.
FLY: The House Pest. The fact that, Hics arc active agents in spreading infectious diseascs is now generally recognized. In a count made of the microbes on the bodies and legs of a number of house-flies the avarage wrs found to be over a million. The diseases of which Hies are the most active carriers include typhoid fever, dysentery. tuberculosis, cholcra, and the epirlcınic diarrhoen from which lange numbers of children die in summer and early autumn.

Flies lay enormous num. bers of egge, and in hot


Foot of house-fly weather female tlies developed from the eggs may themselves be laying eggs within so short a period as threc wecks. The eggs are laid in manure. human excreta, garbage: etc.

War on the house-fly should be carried out relentlcssly by every prudent householder.

The most necessary mensures are to remove manure and garbage heaps to a distance from the house, to keep dust-bins constantly covered and to burn all vegetable and other foad waste. The dust-bin should be thoroughly washed from time to time, and then dried before using it again. In hot weather it should be disinfected once n week with some dry disinfectant. Manure or garbage herps should he sprinkled with chloride of lime.

In the larder all food must be kept in a ventiInted safe or covered with ganze. lood which must be exposed on the table or elsewhere should be protected by wire or muslin covers. Care nust he taken to keep the baby's milk frec from contamination.


Fly. Effective screen made from fine wire mesh fitted Into a frame and inserted beiow the raised sash of a window

It a dead Hy is found in the milk, the milk should not he given to the baby. Fly-papers should be placed about the larder, kitchen, and dining room, nnd other parts of the house if necessary. One device for keeping flies away is a tly screen of the type illustrated This is an adjustable screen of fine wire mesh fixed on a wooden frame, and its purpose is to prevent flies from entering
smearing the inside al a plate, a saucer, or a small ornament with a mixture containing pepper, and in verting it over two sticks or pieces of wood, leaving just room enough for the Hies to cravpl in undernenth An effective mixture for this purpose is composed of $\frac{1}{2}$ teaspoonful of ground hlack pepper with a little brown sugar and either cream or margarine, a little water being used to dissolve the sugar and make a paste Quassia chips are also em ployed, and a recipe for them is to hoil $\ddagger$ oz. of quassia chips for 10 min . in ahout a pint of water and add 4 oz of treacle or syrup. The trap should be cleaned and reset every moming. the result fully justifying the trouble taken.


Beer is frequently used in fly-traps. A recije of this kind contains a tablespoonful of beer, 2 drams of forinaldehyde, and a table. spoonful of sugar, the mixture being put into saucers with some small pieces of bread dipped in for the lies to settle on. Formalin is generally effective for the same purpose, a teaspoonful being added to a little milk in a saucer.
A useful instrument for killing flies comprises a straight handle, on which is fitted a flap made either of wire or leather. It is used by striking at the insects with the flap, which is more or less hinged. Several types are shown through an open window. In this way a free in the illustrations. The construction can current of nir can enter the room, but Hies be carried out in wire or wood. A short cannot get through the wire

Fly Papers and Repellents. A fly paper can mixture of powdered resin of paper with 』 proportion of three perts of the rain, in the of colza. It will suffice if the resin is melted over a slow fire, and the colza stirred into it to form a sticky substance, which is then applied while hot to the paper.

A somewhat different system is to repel the flies by the use of blotting paper soaked in equal quantities of oil of pennyroyal and eucalyptus oil, the pieces heing placed on the window sill or any place where the flies are likelv to enter. Another method is to sonk a sponge or some. crumpled hotting paper in hot water, and pour a little_oil of Lavender upon it.

An effective method of catching flies is to cover the top of a jam jar with a twisted piece of paper in the form of a cone, with the smaller end downwards. The flies will easily find their way in, but cannot escape, as they seem unable to get through the small end of the cone from the inside of the jar.
Another simple form of fly trap can be made by


Fly. Attracted by bait, flies enter the inner cone of the trap from beneath the overhanging metal band at base alterwards emarging through a hole the the fine wire mesh globe
Courtesy of A. W Gamave, Lid


F/Number. Lens front of a band mera with usual series of /numbers marked at bottom
size of the aperture of the lens, the lowest figure being the full aperture when the diaphragm is fully open They govern the speed at which the lens works, and consequently the length of the exposure. A fast and expensive lens will work at $\mathrm{f} / 45, \mathrm{f} / 3, \mathrm{f} / 2$, or even lower, while the lenses on the cheaper snapshot roll film cameras generally work at $\mathrm{f} / 8$ or $\mathrm{f} / 11$. The $\mathrm{f} /$ number of a lens represents the number of times that its diameter is contained in its focal length; thus, if the focal length of a lens is 6 in . and its diameter is 3 in., the latter divided into the former gives 8, which is the $1 /$ number The more the diaphragm or stop of a lens is closed and therefore the higher the $f /$ number, the greater the sharpness of cletail in the picture, both in foreground and distance This is called increasing the depth of focus, as explaincd under the heading Focus. The speed of the lens is directly indicated by its f/number at full aperture, one working at 1/4.5 requiring only a fraction more than a quarter of the length of exposure required by a lens working at $f / 8$; that is, the second lens, which is one often found on tilin cameras, requires an exposure 4 times longer than the first lens to give a good negative.

The usual series of $f / n u m b e r s$ or stops is in the sequence $5.6,8,11.3,16,22.6,32$, each of which requires an exposure twice that of the stop immediately preceding it. For instance, if the exposure time for $f / 8$ is known and it is necessary to stop down to $\mathrm{f} / 11$, the time of exposure is doubled: if $1 / 16$ is used it is multiplied 4 times. These are the numbers usually marked on lenses, but there is also another system, called the Uniform System, or U.S. stops. Some foreign-made lenses have numbers marked on them which are not the ordinary series, such as 6.3, 9, 12.6.
In general, the rule for the calculation of exposure for any unusual $f /$ numbers is that the time of exposure for the lowest number having been found, exposures for the other numbers in a particular serics are proportional to their squares. To do this, take the square of each ot the numbers on the lens mount, and then, taking the lowest as the unit, make a table showing the proportions of each of the other squared numbers to it. See Focus; Iens; Stop.

FOAM FLOWER. The botanical name of this hardy plant is Tiarella cordifolis. It is hardy, 10 to 12 inches high, and bears white flowers in April. It is easily grown in soil with which sand and leaf-mould have been mixed and is suitable for the rock garden or shady border. It is propagated by seeds sown in a frame in spring.

FOCAL PLANE SHUTTER. A form of shutter used in cameras, particularly reflex and press cameras, for objects moving at high speed. It consists essentially of a hlind wound on spring rollers and having transverse slits of different widths. It passes up and down immediately in front of the plate, i.e. it is at the point or plane at which the lens throws an image sharply in focus, hence the name.

The blind is arranged to work at various speeds by increasing or decreasing the tension on the spring in the roller. By varying the tension and the width of the slit used, a great variety of times of exposure may be obtained, exposures as short as $1 / 1000$ th of a second being possible.

A certain amount of practice is required for the successful use of a camera with a focal plane shutter, when snapahotting fast-moving
ohjccts, as, for instance, a cricket ball leaving a bowler's hand, or a football entering the goal. When looking at the screen of a reflex camora the tendency is always to make the exposure a fraction of a second too late, inasmuch as there is an appreciable time lietween the release of the mirror and the actual exposure. It is therefore necessary to anticipate very slightly the action to be snapped, and if the camera is properly focussed beforehand, it is best to watch the subject directly. A quick eye and a sure hand are essential; fnst plates are best See Cainera
FOCUS : In the Camera. Points to be considered with a camera lens are its focus, or focal length, and its depth of focus. The focus of a lens is that point at which, when the camera front is racked out, a clear image, sharp in detail, of the object being photographed
pin-point sharpness. Such a lens is said to have maximum depth of focus.

This is by no means an advantage, as in landscape photographs it destroys all sense of distance, and in portraits gives unpleasing resulta, making the background, for instance, as prominent as the sittor. With a long focus wide aperturc lens, working at about $1 / 4 \cdot 5$, the sharpness of focus quickly falls off, and more distant detail is greatly softened. When the maximum depth of focus is required with such a wide aperture lens, it is obtained by the simple process of stopping it down to f/ll or more.

In cheaper cameras lenses are sometimes described as being of fixed focus. This simply means that the distance between the lens and tho film cannut be varied, and when the camera is opened it will be always in focus.

is thrown on to the ground glass focussing screen or the plate. In the case of a simple lens, or a simple double lens (notananastiginat), this point is roughly Fig. 4 following way. The Foldink Table. Fir. 1. Table standing rigid : lens is racked out central not in use the top is remaed. uns is racked out wark folded upon itself. Figs. 2-4. Details until clouds, orsome far-distant object, are scen sharply on the focussing screen. The distance then found between the ground glass screen and the front surface of the lens, in the case of a single lens, and midway between the two lenses in the casc of a doublet, gives roughly the focus, or focal length of the lens.
For various purposes very difierent focal lengths are required. In the cheap folding camera a very short focus lens is generally used, which has a wide angle, and covers a large field of view, giving a picture with relatively small detail. The other extreme is scen in the telephoto lens, which has a very long focus with a particularly narrow angle. It covers a small field of view, but gives objects on the plate in relatively large scale. For ordinary purposes the amateur is best served by a medium long focus lens. Photographs taken with a long focus lens have a more natural appearance than those taken with a short one. For a camera of $\frac{1}{4}$ plate size a lens of about 0 to $\overline{7} \mathrm{in}$. focus will give satisfactory results; a 5 in . or shorter lens will give the widle angle effect referred to.
The length of focus of an anastigmatic lens cannot be measured in the fashion described above for simple lenses, because difficult optical questions arise
The depth of focus varies with the class of work which tho lens is designed to carry out, and according to its aperture as indicated by its $\mathrm{f} / \mathrm{number}$. By depth of focus is meant the distance at which all objects in the field of view are seen sharply in focus on a ground glass screen. Thus with a short focus, small aperture lens working at $f / 11$, practically everything from a point about 4 ft . away from the camera to infinity, or the farthest distance, will be rendered on the film with

Errors in Focussing. Many photorraples an spoilt by being out of focus through inaccurate judging of distance, particularly in the case of more or less hasty snapshots. The only remedy is practice. This is easily obtained if a camera with a focussing screen can be acquired, or a temporary screen of ground glass fitted to the back of a film camera in place of the film holder, care being taken to see that the ground glass is at the same distance from the lens as the surface of the film. It is necessary to see not only that the principal object is in sharp focus, but that the range of sharpness is properly distributed. A photograph will be quite spoilt if, while the principal object is sharply in focus, the foreground is fuzzy.

If it is found that photographs are obtained which are out of focus in spite of careful estimation, it is well to look to the focussing scale as a possible source of the failure. Photograph an object at an accurately measured distance with two or threc others at shoit distances in front and behind it ; a print will show the amount of error in the scale, this process being repeated for one or two other distances, and the scale corrected as necessary. Etrors in focussing are
often due to careless adjustment of the moving pointer; the pointer should be as close to the scale as possible withont rubbing, and should be viewed from immediately above and not looked at from the sidc.
The Focussing Screen. A focussing screen of a camera should be of ground glass with a very fine grain, and not tho ordinary ground glass obtained from the glazier, which is too coarse for accurate focussing. For a tem porary substitute if the ground-glass screen be brolien. use a piece of plain glass daubed with putty or conted with a thin paste of flour and water ; a fine cambric handlierchief or a sheet of tissue paper stretched tlat may be used in emergency. Sec Camera Enlarging; F/Number; Lens; Photography.

FOIE GRAS. This is the French term for the fat liver of the goose. Madc up into pâté de foic gras, it is regarded as a great delicacy. See Pâté de Foie Gras.

FOIL: In Architecture. This term is used in ornamental tracery to denote one of several almost circular lobes tangent to the inner side of an arc, and mecting each other at points called cusps. Sce Trefoil.

## Folding Chair. See Deck Clıair

FOLDING TABLE. The structural necessities of a folding table are that it shall be perfectly rigid when open, and fold away into the smallest possible conipass when not required for use ; if possible it should also have no loose parts to get lost, but this is not always practical. In Fig. I, the only loose part is the centre bar running through and between the diagonal rails To put the table away, the top is taken off and the loose bar withidrawn; this leaves the framework free to fold up, the top folding either inward or outward, and the lower part autornatically folding in tho opposite direction, forming a quite flat arrangement. The two ends are made first. These consist each of two $1 \frac{1}{2}$ in. legs with 1 in . cross rails screwed to them, as in Fig. 3; at the top is screwed another rail, which equals in width the thickness of the leg and the cross rail together. Tho diagonal rails arc rounded at the ends so as to clear the side rails when leing folded. They arc secured to the legs by nuts and bolts. with a washer


Folding Table. Fig. 5. Circular gate-ler table. Fir. 6. Top hinged over and lers foldink across each other. Fik. 7. Side view, showing by dotted lines in centre leg the position of rails of movable rate. Fin. 8. Table top, showing two stops to limit extent to which table opens
between. It will be noticed that the rails are fixed to the inside of the logs except at one of the corners, in this case at the bottom right corner (Fig. 2) : this is necessary to allow them to clear themselves.

When the whole frame has been assembled. the hole for the centre bar is bored; this may be a narrow brass rod with a knob sorewed on at each end. The top is of 1 in . stuff glued up to width cnd strengthened with battens slotscrewed to the under side; three will be sufficient for a 4 ft .6 in . table. To keep it rigid and in position four small buttons are screwed to the cross battens, as in Fig. 4, these being simply turned to release the top. Allow the top to project to the extent shown.

Folding Occaslonal Table. A small table very useful for occasional use and folding into a still smaller space is depicted in Fig. 5. The top hinges over, the legs folding across each other from the centre (Fig. 6). The legs are cut off 2 ft .4 in ., 1 in . being allowed for the top, turned according to the pattern, and then mortised to take the rails. It should be noticed that the gates fit one inside the other, so that the rails of the one will be closer together to the cxtent of tho width of the two rails. Fig. 7 shows the table open, and the position of the rails of the movable gate are shown in section in the centre leg. Having glued them together, the gates may be fixed at the centres with dowels.

A 1 in. top piece is now screwed to the one gate, as in Fig. 8, being slightly wider than the two gates when folded. and occupying in length just the space between the projection of the legs at the top To this piece the main top is hinged with three hinges. The whole job should now be opened till the gates are at a right angle and two stops fixed to the top as in Fig. 8, this being the extent to which the table should open. The contours of the turnings are most suitable for oak, but apart from this the table can be made in any wood. See Gate-leg Table ; Table.

FOMENTATION: How to Apply. A fomentation consists of a piece of Hannel or other absorbent material wrung out of boiling water. It is a very oonvenient method of applying moist heat, produces the same effects as a hot poultice, and is more easy to renew as it becomes cool. Fomentations relieve tension, pain, and spasm. They form valuable measures in intestinal colic and the intense pain attending the passage of a stone from the kidney to the bladder, or of a gall-stonc. A hot fomentation may give much relief from the pain due to a sprain. Applied to a bruise, it not only gives relief, but diminishes the subsequent discoloration.

Place a thick roller towel over a deep basin and pass a stick through each end. In the centre of the towel lay a piece of coarse flannel or a piece of blanket, folded into two or more thicknesses. Your the boiling water over the Hannel, and let it soak for a few seconds. Then twist the sticks in opposite directions, so as to wring all the water out of the flannel. The fomentation must be wrung as dry as possible and shaken out lightly. Apply it quickly to the painful part and cover it with a piece of jaconet or thin mackintosh. This should overlap the flannel by 1 in . or more all round, otherwise the fomentation will cool too quickly. Over all place a sheet of thick cotton wool. Bandage to prevent displacement. When the ohject is the relief of pain it should be changed every 20 min . The skin should be dried before applying the fresh fomentation.

A turpentine fomentation used to produce counter-irritation, as in lumbago, is made by adding 1 or 2 teaspoonfuls of oil of turpentine to a pint of boiling water, and applying as before; or the turpentine may be sprinkled on the fomentation just before it is applied. In cellulitis, whitlow, or any other aoute
suppurative condition, a fomentation prepared by adding one teasponful of glycerin of boracic acid to a pint of boiling water often gives great relief. See Bandage ; Poultice.
FONDANT, Largely used in the making of confectionery, the fondant forms the basis of many different kinds of sweets. To make it, melt 4 lb . of granulated or loaf sugar in about 4 pint of cold water placed in a saucepan over a low fire. Stir the syrup gently until the sugar is completely dissolved; then pour in 2 tablespoonfuls of liquid glucose. Cover the pan, and boil its contents rapidly for a few minutes, removing any scum. Let the syrup boil to $240^{\circ} \mathrm{F}$., continue skimming without stirring, and brush the sides of the pan occasionally with cold water. This will prevent the fondant from beooming granulated.
When $240^{\circ}$ has been reached, pour the whole on to a marble slab, which has been rinsed with cold water, sprinkle a little water on top of the fondant, and allow the latter to cool slightly before working it with a wooden spoon. When it has cooled sufficiently, it may be kneaded with the hands until it is white and smooth, and then flavoured and coloured to taste. Store it in an airtight box.
Fondant required for coating purposes should be boiled to a temperature $\bar{j}^{-}$higher.

It should be kneaded and stored in the same way, and when required for use placed in a saucepan, together with a little sugar syrup, colouring and Havouring, and melted over a low fire The fondant should be beaten all the time with a woorlen spoon, and must not be overheated. Occasionally it should be removed from the fire and beaten vigorously. Enough sugar syrup is added to make the fondant of a thick, cream-like consistency. When lukewarm, the centres for swects or small cakes which are to be coated are dipped into it and left to dry.
The sugar syrup is prepared by dissolving $1 \frac{\mathrm{lb}}{} \mathrm{l}$ of granulated sugar in 1 pint of water, then bringing it to the boil and boiling it for 5 min . in a covered pan. The lid is removed and boiling continued for 25 min . This syrup may be bottled when not required for immediate use. Fondants may be crystallized by leaving them to stand in cold crystallizing syrup for about 9 hours, and then drying them upon trays.
Fondant Icing. A quick fondant icing can be made by mixing in a pan $\frac{1}{2}$ a gill of cold water, the juice of $\frac{1}{8}$ a lemon and 1 lb . of icing sugar. Warm until a creamy liquid is formed and pour over the cake as required. See Cake; Chocolate ; Sweets.

## Food: Its Value and Preservation

## A General Survey of this Vital Domestic Subject

This article may well serve as an introduction to those on the various items of food and drink that
are found in thls work, e.g. Bacon: Beef: Bread ; Butter; Cake: Cheese; Flah; Fruit; Jam ; are found in thls work, e.g. Bacon; Beef; Bread ; Butter; Cake: Chease; Fish; Fruit: Jam ; Mutton' Pork, etc. See also Break'ast ; Diet; Digeation; Dinner

The principles regulating the proper ration. Diet. The claims of the palate must give way to soundness in dieting, and difficulty, on the score of expense, in providing a proper diet can be overcome quite well by a judicious choice of food-stuffs, as many of the cheap foods are intrinsically as valuable as the more expensive. Skilful cookery can do much to give attractiveness to food-stuffs which are not in themselves very inviting, and this is perhaps the most important factor in solving the dietetic problems of households with very limited resources.

Meat may be (1) home-fed and killed ; (2) fed abroad but killed at home ; (3) refrig. erated, or chilled ; or (4) frozen ; the last is generally mutton. The second class is that of prime animals but has probably lost fat during the voyage. The third class can be recognized by its pink fat and by the outside of the meat lacking the lustre of fresh meat. The fourth class, if unthawed, will be stiff, and, if thawed, the outside will have a faded or perhaps even a parboiled appearance, while fluid will drip or ooze from the meat, which has not the nottled appearance of fresh meat; the fat has a dull, white colour.

It should be understood, however, that chilled and frozen meat are quite as nutritious as fresh meat, and that the inferior cuts of any meat are from this point of view quite as good as the better. As regards digestibility, mutton is more digestible than beef, and beef than veal. Pork, because of its large content of fat, is difficult to digest. Tripe and sweet. breads are easily digested.
Rabbits are in season from September to February; a young animal is distinguished by its smooth, sharp claws and soft ears. The meat is easily digested. Game derives its Havour by being hung for from five to ten days, until, in fact, decomposition has begun ; this, however, has no ill consequences because the meat is dry.
In choosing a fowl an old one will be recog. nized by its stiff, horny feet, long spurs and dark-coloured thighs. The skin of a fowl should not be discoloured and the flesh should be firm. The meat of duck or grouse contains a
considerable amount of fat and is correspondingly harder to digest. The breast of a chicken is the most easily digested kind of meat. Only fresh fish should be accepted. A fresh fish is stiff, the eyes are prominent and bright and the gills are bright red. Salmon and eel contain a considerable proportion of fat, and so require good digestive powers. Owing to their cheapness, herring are one of the most valuable foods. Oysters, if raw, are vcry easily digested. Crab and lobster are difficult to digest.
The qualitics of bread are discuseed under its own heading. Macaroni and vermicelli are preparations of wheat flour and are rich in gluten. Barley has a composition like that of wheat, but it docs not form gluten. It is a good food, though barley cakes are less palatable than, and not as easily digested as, bread. To make pearl barley, the grains are deprived of the husk, rounded and polished. Barley meal consists of the whole grain ground; in Scotch, mulled or pot barley, the grains are husked and roughly ground; patent barley is merely flour formed from pearl barley. Rye makes a dark, somewhat heavy and acid loaf, not so easily digested as wheat bread.

Oatmeal contains relativcly large amounts of protein and fat and, apart from greater difficulty of digestion, is a better food than white bread. It might with advantage form a part of every dietary. Maize resembles oats in composition but is rather harsh in Havour. From it cornflour and hominy are prepared. Rice is deficient in protein, fat and salts, and therefore is mainly a starchy food. Polish. ing the rice deprives it of vitamin.

Arrowroot, tapioca and sago consist of starch simply. There are various kinds of arrowroot on the market, Bermiudan arrowroot being the best. Tapioca is got from casuava root, sago from the sago palm. When these are used as milk puddings, protein and fat are supplied by the milk. The pulses, namely peas, beans and lentils, are rich in protein, but peas and beans are rather difficult of digestion and much of the protein is not assimilated.

Potatoes contain a large proportion of starch with a little protein. Experimentally, vigorous health has been maintained on a diet
of potatoes and vegetable margarine with a flavouring of onion. But the water in which the potatoes were boiled was also taken, the potatoes being very thinly peeled before cooking. The water contains valuable salts and vitarnins taken out of the potatoes. The loss of these salts can be prevented, or lessencd. by boiling potatoes in their skins.
For convenience vegetables and fruits arc grouped in five classes according to their content of carbohydrate, which is their principal constituent as regards caloric value. Their vitamins, salts and acids are of great importance, in many cases of most importance. The carbohydrate content of each group is shown in the table of foods given below. The vege table and fruit yroups are as follows: A Cabbage, lettuce, caulitiower, sprouts, spinach, tomatoes, watercress and radishes. B French beans, onions, carrots, turnips and beets C. Strawberyies, gooseberries, oranges, peaches, pineapples and melons. D. Pears, apples, currants, raspberries, cherries, apricots, peas, parsnips and artichokes. E. Bananas, plums, prunes and potatoes.


## Constituents of some common articlea of food

By reference to this table and to the particulars given under the heading Diet as to the relatíve proportions of proteins, carbohydrates and fats in a diet, and the number of calories needed by various people, it should be possible to construct correct dietaries. These can be varied very largely to suit the family purse.
Storage and Preservation. In the storage of food cleanliness and coolness are essential. On no account should milk, fish, meat or similar fond-stuffs be kept on the floor of the larder, and they should always be covered or screened to protect them from dust and from the visits of Hies. A gauze screen is not sufficient protection against the blue-bottle, as the female deposits her eggs on the gauze and they drop down on to the meat; a piece of muslin should be placed over the meat or on the top of the gauze cover. Weighted gauze covers should be put over jugs or other receptacles containing milk, jam, etc. It is advisable that root and green vegetables should be stored separately.

Coolness may be secured by free ventilation of the larder through n gauze-screened window; by having a moistened canvas cover over a food container; by placing ice on fish, meat etc, or by placing food in an ice-chest.
Much of the food used nowadays is canned or bottled, and a considerable nmount of bottling is done in the homic. To make such food keep it is subjected to heat in the tin, in the lid of which an opening is left to nllow the escape of vapour. This opening is then soldered up, and the contraction which occurs when the tin and its contents cool usually causes the ends of the tin to bulge inwards

If the end of a lin bulges outwards it should be rejected, as the bulging is due to gasess formed by putrefaction. Such a tin is said to be blown.
Unscrupulous traders may perforate the tin, allowing the escape of the gases, then reheat and reseal. The presence of two soldered openings should therefore be viewed with suspicion. Bottled fruit and vegetables are treated similarly. Jam is usually covered after it is cold, and the surface may be sprinkled with some chemical preservative; indeed, something of this kind may be found in any kind of preserved food.

When a tin has been opened the food should be used at once; it is dangerous to allow it to stand in the tin or even, having once healed the food emplied from the lin, 10 allow it to sland.
The use of chemical preservatives for food can hardly be dispensed with, as so much food is imported, and both this and home-produced food require to be stored, sometimes for considerable periods. Some chemicals used for preserving are harmful if taken in the amounta which might well be ingested in the course of ordinary diets containing a fair proportion of preserved food. Boracic acid is an example.
The Public Health (Prescrvatives, etc., in Food) Regulations, 1925, prescribe the articles which may contain chemical preservatives and the appropriate preservative and amount of it for each. The only preservatives allowed are sulphurous acid and benzoic acid

Poisoning by Food. Food poisoning may be due to metallic poisons, copper, tin, or lead, from containers or cooking utensils, but is relatively infrequent. Strict care, however, is necessary to keep such utensils clean and not to allow foods containing acids, fatty or otherwise, to remain long in a copper utensil. Defects in the lining of a tin may cause chemical contamination of food.

Most cases of food poisoning are due to the activitics of what are called the salmonella group of bacilli, for example, bacillus aertrycke and bacillus enteritidis. The symptoms may be caused by the poisons produced by the bacilli, poisons which remain active even if the food is raised a bove the boiling point of water ; or by the living bacilli themselves.
There is vomiting, diarrboea, abdominal pain, cramps in the limbs and some fever. Vomiting and diarrhoca are usually sufficiently severe to clear the bowel, but it will be useful to aid cleansing of the stomach by giving large draughts of tepid water and, if the bowels are not acting freely, a dose of salts or of castor oil. The patient must be kept lying down and be kept warn; stimulants also may be needed. Pain and cramps should be treated by hot applications.

Another lind of bacterial food poisoning is known as botulism (q.v.).

Formerly much importance was attributed to ptomaines, alknloidal products of putrefactive organisms, but it is now clear that such poisons are destroyed in the stomach and are extremely unlikely to give rise to symptoms.

It must be borne in mind that food capable of causing poisoning is rarely offensive or in fact noticeably altered in any way.

FOOL. This is a popular variety of English sweet. The name is taken from the French word fouler, meaning to crush or bruise, and is given to stewed or crushed fruit mixed with cream or custard, and sugar. See Gooseberry; Rhubarb; Strawberry

FOOLSCAP. This word is used lot paper of a size frequently used for writing, though too large for correspondence, and for drawing. A sheet of it measures 17 in . by $13 \frac{2}{2} \mathrm{in}$. A sheet of double foolscap measures 27 in by 17 in See Drawing.

FOOL'S PARSLEY. Also known as the iesser hemlock, the botanical name of this plant is Acthusa cynapium. The leaver have beon eaten in mistake for parsley, though, as they give off a nauseous odour when rubbed together, such a mistake should not occur it is said that the roots have been eaten in mistake for young turnips. The drug bas narcotic properties, and possibly poisoning may occur from eating it. The treatment is to einpty the stomach by an emetic such as a tablespoonful of mustard in half a glass of water: Give a dose of castor oil, and then draughts of strong. hot tea, and kerp the patient warm See Poisoning.

FOOT. The bones of the foot compose threc groups: the tarsus, comprising seven bones, which form the lieel and instep; the metatarsal bones, five in number, on the fore part of the foot; and the pbalanges, of which there are two in the great toe and three in each of the others. The inner border of the great toe is in line with the inner border of the heel, and the axis of the foot is a line from the centre of the heel through the mid point of the end of the great toe

A number of deformities of the foot are caused by wearing badly-shaped boots, the usual fault being too pointed toes; but sometimes, and perbaps in addition to the first, the boots are too short. The toes tend to be crowded together, the great toe being displaced outwards (hallux valgus), and perhaps one or more of the other toes actually overriding the others Hallux valgus is likely to be accompanied by a bunion on the inner side of the joint connecting the great toc with the foot, and this joint may be inflamed and enlarged.

A short boot or one with a too high beel may give rise to hammer tocs, a condition in which the toe is bent upward at its junction with the font and bent sharply towards the sole at the joint in front of this. One or all of the smaller toes may be affected Corns form readily on these toes, and form on the toes apart from deformities when the boots are too tight. Soft corns between the toes are due to the latter being crowded together and to the spaces between not being kept clean and dry. It is obvious that the first thing in the treatment of all these conditions is to have properly fitted boots.

There are two arches in the fout, one from before backward and the other from side to side. The maintenance of the former is largely due to the long plantar ligament, the action of which resembles that of a bow-string. When the arch sinks down in flat foot (q.v.), this ligament and other structures which assist its action are stretched.

The foot is liable to several varieties of deformity besides llat foot, for example, claw foot and club foot and drop foot. Trench foot is a condition resembling frostbite, occurring in those who bave to remain for long periods with wet and cold feet, without the opportunity to remove their bonts frequently.

Ingrowing Toe Nails. The toe nails need a good deal of attention in order to keep them in good condition. Both in the case of children and of adults they should be cut regularly.
Some persons suffer from an ingrowing toe nail, a very painful condition. It is often causid
by a badly fitting boot or one with a very narrow toc The best preventive is to wear square cut boots, raised or blocked at the toes. Cut the nails straight across, never cutting the outer edges, as this only encourages the sides to grow deeper into the skin

To cure an ingrowing toe nail, insert a small pledget of cotton wool sprinkled with boracic acid under the ingrowing part. The pledget should be renewed every morning and the toc anointed with boric ointinent every night.

Care of the Feet. If the feet get very quickly tircd, and the ankles are weak, one of the best remerlies is to bathe the feet night and morning in warm water to which has been added a tablespoonful of brown vinegar or a handful of Tidman's sea salt. The feet must then be dried and well rutbed with methylated spirit or toilet vinegar.

In cases of excessive perspiration the feet should be bathed three times a day at least. and directly after exercise, in warm water to which a little disinfectant lotion has been added. After drying, a change of stockings must be made, and fine woollen stockings should the worn. It is advisable to put on clean stock ings every day until the trouble disappears. A little boric powder may be dusted into the feet of the stoci:ings before putting them on.

To prevent blisters the feet should be bathed in warm water to which either a little powdered alum, permanganate of potash or toilet vinegar has been added. In excellent powder for the purpose is made by mixing together 1 oz each of alum, rock salt and borax. A tablespoonful of this mirture can be added to the bathing water. The feet should be thoroughly dried and rubbed with methy lated spirit or toilet vinegar, particular at tention being given to the heels and the sides of the foot. A little fuller's earth dusted into the inside of the foot of the stocking is useful. If, in spite of all precautions, a blister makes its appearance, it must be carefully dressed to prevent it from sticking to the stocking or being irritated by further friction. A useful preventive is to rub the feet over with witch hazel, and dust them with talcum powder

For rhcumatic and gouty feet relief may often be obtained by means of a footbath of water as hot as can be borne, with a table spoonful or more of bicarbonate of soda added T'he feet should be soaked in it for a period varying from $\frac{1}{4}$ to $\frac{1}{2}$ hour, hot water being added to maintain or increase the heat.

Treatment of Cold Feet. Amongst infants and children indigestion and colic may result from cold feet, while in the case of adults sleeplessness is very often brought about in the same way. The underlying cause, which should be treated, may be anaemia, chronic digestive trouble, neurasthenia, etc. As a palliative thicl: woollen atockings and roomy boots (not low shoes) should be worn in winter A pair of fibre or loofah soles in the boots is an excellent preventive of cold feet. No one should go to bed with cold feet. Warming them at the fire is not free from the risk of aggravating the condition. Exercise is a better method, and has more lasting effects. Another plan is to dip the fect for one or two seconds in cold water and then rub them briskly with a warm towe
FOOT. This measure of length, one of the commonest in use, consists of 12 inches. Three feet make a yard, and there are 5,280 feet in a mile. A square foot consists of 144 square inches, and 9 square feet make a square yard A cubic foot consists of 1,728 square inches, and 27 cubic feet make one cubic yard. The usual abbreviation for both singular and plural is ft., which is used throughout this work. See Long Measure; Square Measure.
FOOT AND MOUTH DISEASE. This is the nopular name for Aphthous fever of animals. It occurs in epidemics which may be widespread. Large and small blisters appear
on the lining of the nouth and on the feet. Cattle, sheep and pigs are chiefly affected, but it may extend to other domestic animals From thein it may be conveyed to huinan beings by milk, hutter, cheese, through wounds, and by other means. It is generally a mild disease in huinan beings, usually lasting 6 or 7 days, but fatal cases do occur. Milk should be boiled when the malady prevails.

FOOTBALL. There are two kinds of foot ball, a round one used in the Assuciation game and an oval one used in the Rugby game. In both the inflated inner ball is protected by a leather covering. When the outer covering gets torn or worn through in a particular spot it can be easily repaired by sewing on a freah piece of leather. Damage to the blailder involves a little more trouble. A usual method of re pairing a puncture is to cut out a circular piece of shect rubber large enough to cover the damaged part completely and leave a nargin over. This piece is applied to the bladder with a solution of india-rubber and napbtha.
A tire repair outfit generally includes patches and solution which are suitable for repairing a football, but the solution may be purchased separately and old pieces of bicycle tire can be used to cover up the puncture. For an effective repair it is essential that pressure should be maintained until the solution has dried thoroughly, and the football should not be used for at least a day afterwards.

A practical method is to lay the bladder on a hard, Hat surface, press the patch in its place, then put a book or other flat object over the pratch, and cover the whole with an iron weight from a kitchen weighing machine, or any other available weight

Football Boots. Since the first essential of the football boot is strength, care should he taken when purchasing to examine the atitching and to sec whether there are any Haws. The best boots have several rows of stitching at each seam, and those showing any signs of broken threads, or stitches so near the edge of the leather that they fail to catch it up, should always be rejected.

Next to strength it is most important that the boots should be waterproof. To ensure this the soles of the best boots are made of first quality chome-tanned leather. There are many qualities, and it should be remem bered that the mere fact of tanning with chrome salts will not turn a poor quality hide into first-class chrome leather.

There are good makes of chrome that are not stamped, and the grain should be exam. ined for imperfections. In good leather this will be firm and even over the whole surface, and should feel firm and hard to the touch. The grain side should be entirely free from surface cracks however minute, as these indicate that the leather has probably bcen tanned from what are termed drysalted hides. A boot made from leather of this sort will quickly become cracked and perished. Chrome-tanned leather is considered to be absolutely waterproof, and is recognizable in general by its clark green oolour. football boot made of sound vegetable-tanned leather will be found almost equally serviceable, provided it is kept well greased to render it waterproof.

A good pair of boots should last several seasons, provided that they receivc proper treatinent. The leather studs on the sole should be renewed as soon as they show signs of wear, and the services of the shoe repairer
ot harness maker immediately requisitioned to make good any burst stitches After play the boots should be thoroughly dried away from the fire, all mud removed, and codd or other fish oil well worked into the leather Failing fish oil, Russian tallow or mutton fat may be used with good effect. This will keep the boots supple and waterproof, and prolong their life much beyond the average. They should be well cleansed and greased hefore: they are laid aside between seasons.
FOOT BATH. When a foot bath is talien to check a cold, or for any reason to draw blood from other parts, it should be as hot as can be borne. An ounce of mustard or a cupful of salt added to the hot water increases the heneficial effects. The legs should be covered with a blanket during the process, the fect sloould be quickly dried with a warm towel, and then coveral with a piece of warmed llannel or a pair of thicli woollen shockings.

A warm foot bath promotes sleep) and removes the feeling of tiredncss after a day's "alking. When a full bath is not talien every clay, a cold foot bath in the morning is very refreshing and keeps the feet warm in winter. Alom, or enough permanganate of potash just to tinge the water, will help to diminish the tendency to sore fect when inuch walking has to be undertaken See Bath.
FOOTMAN: The Manservant. The ndoor duties of a footinan are in some respects those of a parlourmaid, and include laying and waiting at table, answering bells, looking after the fires and lighting, cleaning the silver, and opening the door to visitors. During the earlier part of the day he will be expected to clean windows and knives, fill coal-scuttles, and clean boots. He will also be expected to valet when required and to carry micssages or letters. In large establishments several footmen divide these dutics and are under the butler.

A footman wears a livery provided by the employer. As a male servant, a footman in Great Britain requires a licence, costing 15 s . a year, and must be insured under the National Health Insurance scheme His employer is also liable for him under the Employers' Liability Acts. See Insurance; Servant.

FOOTMAN: The Piece of Furniture. The name of footman is given to an antique metal stand used for keeping plates and dishes hot in front of the firc in the dining room, and usually made of polished brass or steel. They are still used as a decorative and practical accessory on the oldfashioned hearth.

FOOT RULE. Foot rules are made of boxwood, with folding joints, or of steel, either in a single piece or jointed. They inay be from 1 to 3 ft . in length; the average is 1 ft . sub. divided into fractions of an inch, $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$, or even as small as $\frac{1}{64}$. More accurate measurements should be taken with sucto instruments of precision as a caliper gauge or a micrometer. Boxvood rules should be kept in a dry place, and the metal joints occasionally oiled to Steel ines require oiling from time to time to prevent rusting, or they
can be nickel-plated. A folding rule with a Gimm joint can be used as a hevel square in cases of emergency.

FOOTSTOOL. This stool is made in many shapes and sizes. It may be low and circular, octagonal or square, and covered in
bead work or needlework, or in such materials as tapestry, leather, imitation leather, velvet, and carpet. It may be an oblong stool with fect and a wooden frame upon which cane or rushwork is stretched. It may extend the width of the hearth and be known as a fender stool. The modern footstool may also be amplified into a high stool to serve the double purpose of a support for the feet or a low seat. See Pouffe; Tapestry.

FORBDDDEN FRUIT. This is the popular name given to Citrus decumara. It is a good greenhouse pot-plant for decorative pur poses, flourishing in a mixture of loam and silver sand. If given an annual dressing of animal manure it does not need repotting for years. The plants may be stood out of doors during the summer months
FORCEMEAT. Forcencat is a savoury mixture, the foundation of which is breadcrumbs mixed with eggs and scasoning. It is used to stuff boned joints, veal, fowls and other birds, hares, freah haddocks. and other baked fish. Forcemeat balls are sometimes used in addition as a garnish
The following is a simple recipe for a force meat that can be used with veal. Add 4 oz of very finely-chopped suet to $\mathbf{G} \mathbf{~ o z}$. of bread. crumbs, and the grated rind and juice of hal a lemon. Season it with salt and pepper, and add a dessertspoonful of mixed herbs. Bind the forcemeat with a braten egg, and, if more moisture is necessary, add a little milk
Forcemeat Balls. To make forcemeat balla form the mixture into balls, using a little Hour if too moist, dip in beaten egg and fry golden brown. Or they can be baked in the dish with the meat with which they will be served.
Brain cakes or balls are made from calves' or sheep's brains, and are used for garnishing a calf's or sheep's head. See Brains; Breast Chestnut; Hare; Liver; Oyster; Pigeon Sausage; Veal
FORCING: In Cookery. liorcing is the process by which ornamentation of sweet or savoury dishes by cream, butter, or sugar mixtures is carried 0 ut Forcing pipes are of many varieties, and they determine the pat tern or design of the decora tion. A syringe or bag to which funnels of different shapes are attached is used. Forcing sets can be bought for a few shillings and, although the process is not easy to a novice, prac ticesoon brings mas. tery of the forcing syringe. The icing, which should be of a firm, creamy consistency, should be placed inside the syringe, about half flling it. The handle, with the pump pulled out as far as possible, is screwed on and then gently pressed downward, the icing being forced out through the funnel. See Decoration: Icing
FORCING : In Gardening. The art of bringing crops to maturity in advance of their natural season by means of artificial beat is known as forcing. In large gardens the process is usually carried out in forcing houses, scientifically heated; but it is quitc
practicable under less elaborate conditions, and out - of - scason crops niay be obtained by means of a small, warm grecnhouse, a hotbed in the open, oreven in the cellat of a dwelling-house.
Fig. 1 shows how mushrooms can be forced beneath green. house staging in soil liept in position by boards, and sceluded from light by sacks or draping tacked to the edge of the stag. ing. Seakalc, thuharb, chicory, etc. nay be foreed in this manner Other methods are shown in Figs. 2 and 6 , the former being merely a llower-pot inverted


Forcing. Examples of methoda of forcing in gardening. Explanatory details ar erot cor cork plugging the top drainage hole (a), the latter displays a box holding roots, with another turned upside down and placed on top. These three incthods arc equally useful in the greenhouse, or sheltered in a cool, dry cellar or shed.

Methods of forcing in the open air are shown in Figs 3 and 5, the former being a sectional drawing of a good type of forcing. pit, by means of which many crops may be raised with success It consists of a hotbed sunk 2 ft . deep, resting on a layer of brickbats, and boarded round the sides. A frame, some 9 in . narrower than the pit, is placed on top, with about 9 in . of soil inside. Such a pit must always be situated in well-drained land, where the manure will not get water-logged during wet periods, and during frost it should be banked round with leaves or litter, as at a.

Fig. 5 shows how rhubarb, sealiale, etc., may be forced by means of a box placed over the plant, this in turn being covered with leaves or stable litter. A hole is cut in the hottom of the box, so that growth progress may be observed at times, the hole being covered with a removable slab, as shown. Old baths, llower-pots, and other cast-off receptacles, may be used.
Fig. 4 shows how early potatocs may be secured in pots ploced in a light, warm greenhouse. A tuber is planted with a single sprout in a pot, with about the quantity of soil slown in the sketch, the pot being filled up with rich soil as sonn as the plant has grown to a height of about 6 in. See Asparagus: Frame ; Frost; Greenhouse ; Hot bed; Manure


Forcing. Figs. 1-3. Method al folding a square of greasedroof paper to forin an eflective bar fo making cream decorations. Below, bow to cu the tip of the bag, $A$, for plain piping, $B$ for leave. and C , for making stars

FORFEITS. In many children's games failure to accomplish a task set, such as guessing something, or breaking a rule, c.g. answer ing out of turn, or failing to escape from a pursuer, is punished by the offender forfeiting something, e.g. a trinket or handkerchief. At the end of the games these forfeits are called and redeemed, and the process often affords considerable amusement

One player is chosen to act as judge He may kneel or sit, but it is essential that he does not see the forfeits. These are held, one by one, over his head, and a jargon which talies vatious forms is gone through. The judge may be asked: "What is this 1 hold over your head?" or words to that effect. He in return asks whether its owner is a lady or a gentleman He is told and is then asked what the lady or gentleman who owns the forfeit must do to redeen it. Ignorant of the identity of his victim, he then pronounces sentence, and the victim must endea vour to do what he or she is ordered.

The humour of the game lics in these sentences, for they consist of silly and apparently impossible tasks, or actions likely to make the performer look foolish. Such are. bite 2 in . off the end of the poker, which is done by biting with the poker 2 in away; leave the roon with two legs and return with six, which is done by returning carrying a chair; pile two or three chairs upon each other, take off your shoes and jump over them, them referring to the shoes. The player may he told to pay a complinent to every verson in the room; to crawl under the table and hark like a dog; to answer "No" to questions put to him by each member of thecompany in turn ; to rejest a verse, stating the number of the word after saying each one; or to hold one foot in his hand and hop round the rooin.

A popular forfeit is for a person to be asked to spell the word Constantinople a syllable at a time. As soon as he gets to the letter i, all the other players shout "No," which is the following syllable. The speller, however, nalurally thinks that he has made a mistake, and begins again, only to meet with the same disconcerting shout when he reaches it the second time. Another forfeit invariably affording amusement is to require the person to langh in one corner of the room, to sing in another, to cry in another, and to whistle in the fourth. See Children's Party.

A knowiedge of elementary smith's work is of value to the amateur worker. Much can be done with a few simple tools and a homemade forge. The materials mostly used are wrought iron and mild steel. The latter may have a blue-coloured surface, when it is known as Bessemer. A cold-drawn mild steel is preferable for many purposes, as it has a clean bright surface and is better for cold working, since it avoids the necessity for much cleaning and filing.
Practically speaking, the methods here described for the hot working of the metal can be applied to cold bending, except that the metal cannot be bent to such a sharp angle when cold without risk of cracking at the bend. Wrought iron should seldom be bent cold, except when the bends are in the nature of a long ourve, and free from any suggestion of a right-angle bend. The essentials are a forge, an anvil, some hammers, and a few simple forge tools, such as tongs, which the amateur can make, one or two chisels for cutting metal, and some sets and swages, as well as a strong leg vice.
Making a Forge. The simple forge shown in Fig. 3 can be made as follows, and deals with metal up to 1 in . or so thick. The pan (Fig. 1) is made of a piece of stout sheet iron about No. 18 gauge and cut to the shape shown (Fig. 2) with a cold chisel, the sides bent up at right angles and the corners riveted together. The stand is made from four pieces of angle iron about $1 \frac{1}{2} \mathrm{in}$. by ${ }^{2} \mathrm{in}$. thick, riveted to the comers of the pan at the top, and braced together at the back and two sides with diagonal struts of flat iron strip about 1 in . wide and $t$ in. thick, riveted at the top and bottom to the angle pieces.
The bellows should be of the double action type. The outlet pipe is connected by an iron pipe to the back part of the pan, using standard iron gas fittings for this purpose, and taking care to make an airtight connexion by the use of red lead paint smeared on all joints before screwing them together. The tuyere can be purchased if desired, but an efficient substitute can be made from a short length of iron pipe screwed to the air pipe in the manner shown in the diagram (Fig. 4), and fitted with a reducing bush at the outlet end, or nozzle. The nozzleshould beabout 6 to 8 in . from the back of the pan, and nearly at the bottom.

The fire can be lighted with paper and pieces of wood in the usual way. and the bellows worked gently to draw up the fire as soon as it has taken hold. The fuel should be coke or fine slack coal, the former for preference, as there is less smoke. It must fill the pan and be heaped up in the form of a mound, and as the bellows are worked the air will escape through the fire and form a crater of intense heat. It is then known as a clear fire. and is in the required condition for working.
The iron is placed inside and covered with more fuel to exclude the cold

## Forges and Forging Processes

## Equipment and Instructions for the Amateur Metal Worker

This contribution may be usefully supplemented by reference to such entries as Bent Iron Work; Brazing; Soldering; Welding: Wrought Iron Work. See further the articles on Boring; Hardening ; Metal Work, etc.


Forge. Figg. 1 and \& Pan for a homo-made forge. Fig. 3. Pan and framowork complete. Fig. 4. 8eotion of tajdre and pipe connexions. Fig. 8. Parts
should be rounded off slightly so as not to mark the hot metal, and to assist in preventing the face of the hammer breaking away at the corners. The front edge of the face is known as the toe of the hammer, and the back or face nearest to the worker as the heel. A 3 lb cross peine hammer, or a hand sledge of about the same weight, will answer practically all requirements. A sledge hammer is only needed when a helper or striker is available, and one who is capable of handling the tool in the proper manner, otherwise the amateur had better be con. tent with the hand hammer.
A pair of flat-jawed or open-mouthed tongs, and a pair of hollow-jawed tonge can be made or purchased. Their form is shown in Fig. 7. To hold the work properly the tongs should be fitted to the thickness of the job by heating the jaws to a red heat and hammering them together while a piece of the metal to be held is gripped between the jaws, as in Fig. 6. The tongs should not be left in the fire.
Other tools that may be purchased as occasion demands are a flatter, one or two fullers, and one or two rounding tools or swages. The appearance of these can be judged from the illustrations (Fig. 8). The flatter (not shown) re-

Forge. Fig. 7. Above, round or hollow-jawed tonga below open-month tong. Fis. 8. Above, top and bottom fullers ; bolow, top and botiom, rounding tools passage of stock metal while making bolt heads sembles the top fuller, but has a large square
 The hardie hole is used to hold the shanks of the tools, and the pritchel hole to permit the and the like. The two side cdges of the face head. Flatters, fullers and swages require an are often rounded off for a short distance assistant to hold the tools. The shank of the from the horn in order to facilitate the bottom tool rests in the hardie hole of the anvil, bending of rod metal.

The best hammer for all round use is a ball peine one weighing $1 \frac{1}{2} \mathrm{lb}$. to $2 \underset{2}{\mathrm{lb}}$. The face
as shown in Fig. 11 on the next page. The vice must be a good strong one of the regular blacksmith's or leg type, as shown in Fig. 9, and in addition it must be firmly fixed to a strong bench.
Simple Manipulation. As a first attempt an angle bracket can be made, measuring 6 in . long, 4 in . wide, and from stock 1 in. wide and $t$ in. thick. Take a piece of metal of this size and at a distance of 4 in . from the end make two heavy centre punch marks, one at each side of the bar. Place the metal into the fire with these marks in the centre of the fire, and blow it to a cherry-red heat. Do not use more air than is needed to get a hot fire, as an excess of air causes scale or hard deposit on the surface of the metal. When the metal is red-hot remove it from the fire and place it on the anvil with the centre punch marks on the edge of the face, the bulk of the bar resting on the face of the anvil and the 4 in. part projecting. Hammer it over by hitting the extreme end until the metal is nearly close up to the body of the anvil, then hammer the corner to make it square and true.
It will probably be found that the bar has been knocked over so that the two legs of the angle are not in line, and this has to be corrected by placing the metal on the face of the anvil and beating it flat. Do not work on the metal after it has cooled to a black heat; it must be reheated and the work may then proceed. To flatten the angle faces, they are laid flat on the face of the anvil, and the flatter held by an assistant, while the worker
strikes the top of the Hatter with the heavy hand hammer.

The same result is obtained by careful use of the hand hammer. The metal can then be cut off to length, either with a chisel and hammer or by the use of the backsaw. While the work is being heated the greatest care must be taken not to burn the metal, this being apparent by the appearance of bright star-like sparks, or it will be useless.

All man. ner of flat bends are made in the same way. As an example of curved work, assume that it is deaired to make an S hook from meta」 about $\frac{3}{8}$ in. diameter. The first step is to cut the bar to length
 nd true up the ends by means of a file. Heat about half of the metal and, holding it in a pair of tongs, lay it on the horn of the anvil and hammer on the far side of tho horn in such a way as to bend the bar downward. Draw the bar back and forward and continue the hammering until the bar is bent nearly into a circle. Heat the other end and hammer it over as before, using the end of the horn as guide to the shaping. Then lay the hook on the face of the anvil and flatten it with a blow here and there as requisite to cause it to lie flat. If necessary, reheat the metal and lay it flat on the face, and with a few well. directed taps complete the shaping.

Both the foregoing are examples of simple bending which could be accomplished cold. The use of a forge is more apparent when the sectional area or shape of the bar is to be altered, as, for instance, when converting a round to a square. An example of this is found in a simple bolt which can be made by taking a piece of square stuff equal to the size of the head, and drawing down the bar to a round shape, This is done by hammering it over the base of the horn with the hand hammer, as shown in Fig. 10, thus increasing its length without widening it very much The bar is drawn out square, hammered on the sides and made octagonal, then rounded and finally finished with the rounding tools or swages in the manner shown in Fig. 11

Increasing the Diameter of a Bar
The process of increasing the diameter of a bar is known as upsetting, and is accomplished by holding the heated bar upright on the anvil and striking it on the end, thus reducing its length. If the heat is located at the end of the bar, and that end dropped vertically on the anvil, and then struck a blow, it will bulge out at the bottom. By localizing the heat, that is, by heating as nearly as possible at the desired spot, and cooling the adjacent parts with water, the bar will bulge at the hot part and nowhere else when it is struck on the end as shown in Fig. 12. Local swellings, as for example the eye around a bolt hole, are formed by driving a punch through the hot metal and then inserting a mandrel, or tapered piece of steel, and hammering the edges of the metal while the bar is in the hole, at the same time keeping the bar driven up into the hole (Fig. 13).
Some very effective work is accomplished by twisting a bar of hot metal. This is done by gripping the bar in the vice and twisting the other end with a strong spanner or with two pairs of strong tongs, as in Fig. 14, of a size to suit the bar being twisted. Instead of doing all the bending on the anvil, the
amateur will find that good results are given by grasping the work in the vice and then knocking over the part to be bent; but this must be done quickly (Fig. 15)

FORGET-ME-NOT. The popular name of myosotis, of which several kinds are grown in gardens. Some of them are suitable for the rockery, while others are used for tilling spring flower beds in association with bulbs The common early spring forget-me-not is Myosotis dissitiflora; it is a mistake to grow the ordinary kind, for there are modern varieties with rich blue flowers which provide a finer display. Royal Blue is one of the best.
Seeds are sown out of doors on a prepared seed bed in May, and the seedlings, once transplanted, are finally planted in autumn where they are to bloom in spring. The easiest way to raise a fresh stock of forget-menots is to lift a few old plants when the blooms have faded and replant them on a reserve border where the seeds will fall and produce numerous self-sown seedlings. Myosotis palustris, the water forget-me-not, is a beautiful Howering plant very cffective for the bog garden and water side.

One of the best rock garden forget-me-nots is alpestris; it fourishes in well-drained gritty soil and is raised from seeds sown in. a pot of light sandy soil placed in a frame in spring. The so-called New Zealand forget-me-not is Myositidium nobile, a vigorous plant 15 in . or more high, with large evergreen leaves and blue forget-me-not like flowers in summer. It is a difficult plant in many gardens and is usually happy only in the mild western maritime counties.

FORK : For the Table. Some forks are entirely made of silver or plated metal, but fruit and fish forks may have handles of ivory, mother of pearl, bone, or their substitutes. Silver forks will last a very long


Forge. Fig. 10. Drawing down a piece of metal. Fig. 11. Using the swife tools. Fig. 12. Increasing the diameter ol a Dar. Fig. 13. Forming the eye around a bolt hole. Fig. 14. Twisting a hot bar with tongs. Fig. 15. Making an angle bend in the vice
time, but electro-plated ones tend to become tarnished as time goes on.

Pickle forks are obtainable with telescopic handles, which enable them to be extended to reach to the bottom of a tall jar and obviate soiling the fingers. In choosing carving forks attention should be paid to the safety claw. In the best makes of stainless steel, the claw ensures perfect control over the joint or poultry which is being carved.

An implement exists for cleaning betwcen the prongs of a fork. It consists of a number of snall spiral brushes mounted in a wooden surface, the brushes being so placed that they just fit in between the prongs.

The table fork seldom cells for more in the way of repair than a re-shaping of bent prongs, which are easilystraightened out with a small hammer and a hardwood block. At the same time, the points may be re-sharpened, or re-shaped, with the aid of a small file. In both operations care should be exercised to avoid damage to the plate, should the fork be electro-plated, by hammering cautiously and lightly, and by only using the file in order to take off any roughness on the prong.
Carving forks, and others, such as those used for table condiments, are often made with ivory, horn, or bone handles, and these become loose and require refixing. Many of the modern forks are made with a serrated tang which is claimed to be immovable, whereas the earlier forks were nearly al ways secured by rivets passed through the handle and the tang of the fork. If the tang has been riveted and the rivet be broken, it merely requires a new rivet, and to load the hole in the handle with liquid cement-immediately prior to inserting the tang in its place. If the tang is broken off at the rivet hole, as is often the case, the amuteur will do well simply to refix the fork on to the handle by filling the hole in the handle, then pushing the fork into place, allowing it to set hard, and then drilling a small hole through the handle and the tang and securing it with a rivet.

The cement used may be composed of resin and white sand, or 6 parts of resin, $1 \frac{1}{2}$ parts of beeswax, and ith parts of plaster of Paris, dissolving this by first heating the beeswax
and resin, and then stirring in the plaster until a thin, soft paste is formed. The tang should be warmed prior to inserting it into the cement-filled hole in the handle.

Broken Guards. Carving forks frequently suffer from a broken guard. Their repair depends upon the design. Generally a flat spring sunk into a recess formed in the fork keeps the guard in place. Should this break, punch out the old pin, while holding the fork over a suitable hole in an anvil or on a block of wood or lead. Then clean out the slot and remove the old piece of spring ; obtain a new one to pattern, insert it, replace the guard, and grasp it in a vice or strong pair of pliers, using a picce of leather to prevent the fork from being scratched.

Then with the assistance of a piece of steel wire of appropriate thickness, previously prepared and pointed at one end, feel for the holes, drive the pin through, test the guard to see that it works properly, finally cut the wire off close to the fork at each side and slightly rivet up. Take care not to rivet the guard too tightly, or it will be prevented from working. See Carvers; Cutlery; Knife ; Pickle Fork; Silver; Toasting Fork

FORK : For the Garden. A garden fork is usuaily a three-pronged implement, the fork part being of iron and the shaft or handle of wood. It is used for turning up the soil, digging up potatoes, and for other work where it is more suitable than the spade. A good fork should have the handle well fastened to the prongs. It should not be left exposed to damp, as the wood may rot. See Digging; Spade.
FORM. This simple design of seat has its domestic uses Fig. 1 represents a type suitable to be made in deal. The necessary dimensions are indicated in Figs. 2 and 3. The end uprights are cut from $1 \ddagger$ in. stuff to the size given, allowing $1 \frac{1}{4} \mathrm{in}$. for the thickness of the top. At the top edges, corner notches are cut away to take the side rails (Fig. 2), which are screwed in, and a mortise cut lower down in the centre for the lower rail.
A small shoulder is cut on both edges of this rail, so that allowance must be made for this in the mortise; aiso for the wedges (Fig. 4). Having made the joints, the shapings may be cut on the ends and the three rails prepared. It will be noticed that the top rails project beyond the ends, this giving greater strength to the screws, which would otherwise be apt to break away at the ends.

When putting the job together glue the lower rail in first and wedge it, and screw the other rails on afterwards. The top may be secured by screwing from underneath, or may be nailed on if desired, in which case the nails should be punched in. For a hall the form might be stained


FORMALIN. A watery solution of formaidehyde, formalin is a powerful antiseptic. It is much used as a disinfectant, as it has the advantage of not alfecting coloured materials. Sec Disinfectant; Fumigation.

FORSYTHIA (Golden bell shrub). This is one of the finest of all early flowering hardy shrubs. In March and April the leatless branches become wreathed in yellow bell-shaped blooms. The best for the average garden is Forsythia spectabilis $6-8$ ft. high. Forsythia suspensa, which is of slender, rather drooping growth, may be planted in the open but it is better on wall ; it thrives fairly well on a shady wall but better on a sunny one. The pruning of forsythia is carried out as soon as the flowers arc over; old branches may then be cut out and others shortened. The object is to force the shrub to make fresh shoots which will bloom well the following spring. Forsythia flourishes in ordinary soil and is easily propagated by bending down the tips of branches and pegging them in the soil When firmly rooted the ends of the branches should be transplanted.


Forsythia. Spray of the brilliantly coloured flowering shrub known as the goldon bell tree

FOWL: Choosing and Trussing. In selecting a fow for roasting, ohoose one that is young and plump. Male birds are superior to hen birds for roasting; they should have big feet and knee-joints, and the claws and beak should be easily broken, while the hreastbone should be supple. If the neck and feet are very thin and a purple tinge is visible through the skin of the thigh, the bird is old. Old birds may be used for boiling or in the preparation of many made dishes, and the carcasses are excellent for improving the strength and Havour of stock for gravies and soups. An old fowl which would be tough if roasted in the ordinary way can be rendered eatahle if boiled gently for an hour and then roasted for half an hour in a moderate oven
When the hird is prepared at home, commence plucking from under the wings, then gradually work all the feathers off the bird, clearing the breast first. Care must he taken not to break the skin by dragging off the feathers roughly. Pick out the stumps remaining in the wings and legs, and singe off the hairs with a lighted piece of white paper. Lay
FOULARD. Foulards are often, but not invariably, woven with a fine twill, and are firm without being stiff or heavy. The name is given rather to the design than to the fabric itself, which may be woven of silk or mercerized cotton.
The commonest type is blue with a white bird's-eye spot. llack and brown are other favourite colourings with a white spot, which is obtained by discharging the colour, so showing the white of the original silk bencath. Oriental and conventional floral designs are also frequently used.
Cotton foulards have not the good appearance of silk, soil more quickly, and when creased do not lose their folds readily. See Silk

Foundations. See Brick; Conorete.
FOUR-STROKE or Otto Cycle. This is the term given for the cycle of operations in the most common type of internal combustion engine. The full oycle occupies two revolutions of the engine crankshaft; a cornplete operation is performed by a half-revolution of the crank, it being understood that a halfrevolution completes the full distance travelled by the piston. The sequence of the oycle is
(1) induction : the gases are drawn in by the descending piston ; (2) comnression : the gases are compressed by the rising piston; (3) explosion: the gases are fired, and force the piston down (power stroke); (4) exhaust: burnt gases are expelled by the rising piston. See Internal Combustion Engine; Motor Car; Two-Stroke.

being decorated with suitable stencils.
m. Fig. 1. Simple design for a deal form. Fig. 2. End upright, showing notches for side rails. Fig. 3. Part of side elevation. Fig. 4. Lower rail, showing wedges
the fowl on its back on a table and sever the nock where it joins the body. Remove it with the head. but leave suflicient skin in front to turn neatly underneath and cover the opening. Draw out the crop and loosen the entrails, cut across the vent and insert the fingers in the bird to find the gizzard. Pull this out, together with the remainder of the inside, and wash the neck, lieart, liver. and gizzard, cutting open the last-named and removing the bag of stones inside it. It is important that the gall-bag should be taken away unbroken, otherwise anything it touches will be bitter.
How to Truss. Before trussing the fowl, scald and scrape the fect and scaly part of the legs. Cut off the feet and throw them into the stookpot, then wipe the bird inside and out with a cloth dipped in hot water. The bird may now be stuffed at both ends with veal forcemeat, if desired. To truss the bird for roasting, twist back the wings so that they form triangles at the back; then thread a trussing needle with string and make a knot at the end. Pierce the nearest pinion, taking the needle out at the back and catching in the skin of the neck, which should be folded neatly over. Draw the needle through the pinion on the other side, then return, piercing the wing lower down and catching in the top of the thigh on each side. The needle should come out through the lower portion of the pinion. Unthread the needle, tie the two ends of the string securely, and the wings should be in slape.

To truss the logs, pass a threaded needle through the end of the thigh-bone at the back and arrange the legs nently, folding the skin of the lower portion of the bieast under them. Draw the needle back, catching in the legs, passing through the flesh and come out through the wings; then tie the string securely. If fowls are trissed without skewers they are more easily dished up, and all that is necessary to untruss them is to cut the string and pull the knotted end. To truss for boiling, loosen the skin of the legs by working it free with the fingers. Cut the bones of the feet right up to the flesh, and push the legs up into the body until they have disappeared under the thigh. The trussing
may now be completed as for roast fowl except that the stumps of the legs nust be so arranged as to be invisible. All the methods of cooking chickens can be applied to fowls. See Boning; Carving; Casserole: Chicken; Curry; Duck; Egg; Forcemeat : Giblet; Goose; Poultry; Stuffing; Turkey.

Fowl Manure. This is of great value in the garden, but it is potent and must be used with care. The best plan is to keep it under cover and to mix it with twice its bulk of soil before use. The mixture may be applied to fruit bushes, vegctables and flowering plants in spring at the rate of 3 oz . per square yard or yard run of row.

FOX: The Fur. This fur ranges in value from that of the Japanese, Kitt, Turkish, and Patagonian foxes to the more expensive white, blue, and silver. The chenper kinds are almost invariably dyed, and may be obtained in a variety of colours. The fur sold as black fox is almost always a red or white skin dyed, as the genuine black fox is rare and extremely expensive. Silver fox is also rare, and for firmness and softness it has no equal. Blue fox fur is brownish grey in colour, or, in the best specimens, a deep slate.

Arctic or white fox is considered the hest kind for dyeing purposes, as its skin is less likely than others to change colour after the process. As a white fur, however, it necds frequent cleaning, and should not be worn in a smoky atmosphere. Hot bran, rubhed into the fur and hrushed or beaten out again, is the best cleaning anedium.

Cross fox is of the same species as red fox, but its coat is marked with yellow streaks and a dark line runs down the centre of the back. Grey fox is used largely for making rugs and foothags. Fox furs generally, hecause of their softness and tendency to mat, are not recom. mended for durahility. See Fur.

FOX AND GEESE. This is an excellent game for a children's party, either indoors or out. One person, usually an adult or one of the older children, is the mother goose, while a second is the fox. The remainder form a long chain behind thie mother, with arms round each other's waists. It is then the business of the fox to catch the geese.

The mother attempts to stop him doing so by holding out her arms as widely as possible and turning him back whenever he tries to get past her. As he may only take the last member of the chain, and may not force his way past the mother, it requires considerahle agility for him to circumvent her. As the chain grows shorter the difficulty increases. The game continues until all the geese have been captured by the fox.

FOXGLOVE. The common foxglove is Digitalis purpurea, a well known plant suitable for the shady horder, and for open spaces in the woodland garden. It sows itself freely and there is usually no difficulty in maintaining a supply. Often the seedlings are so numerous as to be a nuisance. The old reddish-purple varieties are far inferior to the modern ones, and these ought to be grown. The Shirley strain of foxglove provides tall plants with fine flowers in many showy colours. The yellow foxglove also is beautiful. See Dig talis.

FOX TERRIER. This dog has quick intelligence and most of the virtues that recommend a dog for companionship in the home or on a ramble. It is true, he is properly a sporting dog, bred definitely with the object of entering a fox's earth and driving out the recluse for whom both hounds and hunters are waiting; but he adapts hinself quite easily to a domestic rôle, contenting hinself with an occasional rat-hunt or the discomfiture of tramps.

For his legitimate business he should be rather small, though the show standard
 the legs straight, the fect round and compact, the hind legs strong and muscular, with lone and powertul White should he the predominating thighs and the inarkings should be in either brindle, red, or liver colour.
There are two breeds of fox terrier: the smooth and the wire-haired. The former has a short, smooth and dense coat, of which the individual hairs are scarcely apparent. The wire-haired terrier has a similar coat, but it is overlaid by longer and harder hairs which break up the smoothness of the surface and give an entirely different appearance and feeling. See Dog.

FOX TROT. The slow fox trot, most difficult of modern dances, is of great assistance in acquiring good style and balance. Long gliding steps are employed, some taking two beats, counted "Slow" (S.), others one beat, counted "Quick" (Q.), and these, together with the correct use of contrary body movement (C.B.M.) make this dance one of graceful curves, not mercly a scries of straight steps.

The fundamental steps aro the walk and the three-step. For the walk forward, take a ong gliding step (S.) st raight from the hips, beats of music, counted Q Q.S. When moving forward, go on to heel first, rising on to ball of foot. Take second step on ball of foot, and lower as the third step forward is taken on to heel first. When moving backward, take first step on ball of foot, rising up as the second step is taken on to ball of foot and lowering the heel of this foot as the third step is taken back on to hall
Standardized figures are the feather step, natural turn (Figs 1 and 2) and reverse turn (Figs. 3 and 4)
The gentleman's feather step (S.Q.Q.S.) consists of a long step forward with right foot (R.F.), and a three-step taken as follows. Forward with left foot (L.F.), preparing to pass outside partner, forward R.F., outside partner, forward I.F., in front of partner. C.B.M. is used on the first and fourth steps. A rise is taken at the end of the first step. retained for the second and third, and dropped as the fourth step is taken. The lady's feather step commences with a long step hack with L.F. followed by a three-step, hack with R.F.,


Fox Trot. Figs. 1 and 2. Steps of the natural turn for both partners. Figs. 3 and 4. Those of the reverse turn
back with R.F. C.B.M. and rise and drop are the same as for gentleman.

The gentleman's step in the natural turn (Fig. 1) counted S.Q.Q.S.S.S., is as follows: Forward with R.F., turning on it to R to side with L.F. (commencement of three-step), still turning, back with R.F., back with L.F., turning on it to R. ; pull R.F. back to L.F., turning from $L$. heel on to $R$. heel, forward with L.F. The lady (see Fig. 2) steps back with L.F., turning on it to R., closes R.F. back to L.F., turning from $L$. heel on to $R$. heel, steps forward with L.F., forward with R.F., turning on it to R., to side with L.F., and brushes R.F. through (close to L.F.) and steps back with it. Both dancers use C.B.M. on first, fourth and sixth steps. The figure makes just over three-quarters of a turn.

The reverse turn (Figs. 3 and 4) is counted S., Q.Q.S., Q.Q.S. The genticman steps forward with L.F., turning on it to L., then takes two threesteps, the first consisting of a step to side with R.F., still turning L, back with L.F., back with R.F., turning on it to L The second three-step is taken to side with L.F., forward with R.F. outside partner, forward L.F. in front of partner. The lady steps back with R.F., turning on it to L., closes L.F. back to R.F., tuming from R. heel on to L. heel, steps forward with R.F., and again forward with L.F., turning on it to L. ; steps to side with R.F., back with L.F., and back with R.F. Both dancers rise and drop as in the ordinary three-step on the second, third and fourth steps, rise again at end of fourth and remain up for the fifth and sixth, dropping as the seventh step is taken. C.B.M. is employed on the first, fourth and seventh steps. The complete step makes just over three-quarters of a turn.

The diagrams show R.F. shaded; L.F. in outline; position of foot after turning on it, in dotted outline. To follow them faco direction of toes, turning diagrams at same time. See Dancing ; Quick Step; Waltz.

FRACTURE. The usual cause of fracture is external violence. It may bc direct. as when a cartwheel runs over a limb, or indirect, as where the jolt caused by a fall on the shoulder or elbow breaks the collar bone.

There will be sweiling over a fracture, and a shortening may occur. In the course of a few days the broken ends are connected and surrounded by a mass of soft tissue known as callus, which is later converted into bone. Strong bony union usually takes place, but, instead of bone, gristle or cartilage or simply fibrous tissue may be forined, allowing of more or less bending of the bone, and in this way constituting an un-united fracture.

First aid consists in checking dangerous bleeding by pressure on the main artery, and in the application of an antiseptic or clean dressing to the wound in the case of a compound fracture. In all fractures the ends of the broken bone must be kept at rest to prevent further damage, and if the doctor can be on the spot early, or the accident occurs indoors, this may be accomplished by


Frames for the Garden. Fig. 1. Brick frame: $a$, cement foundations b, toplight ; c compost ; d, botbed. Fig. 2. Same extended for outside heat $a$, outside walls ; $b$, hotbeds ; $c$, compost. Fig. 3. Movable wooden frame : $a_{8}$ hotbed ; $b$, compost ; $c_{0}$ toplight. Fig. 4. Tarf-walled frame: $a_{0}$ turves $b_{\text {, soil }}$ level. $c_{\text {, support for toplight: } d \text {, toplight. Fig. 5. Another turt }}$ stractare with wooden rests for toplights. Fig. B. Section of sunk frame for bardening-off seedilings : $a$, fine ashes : $b$, cinders; $c$, bricks to support toplight ${ }^{2} d_{0}$. toplight ; $c$, ground level. Figs 7 and 8 . 'Vontilating wedges
using piliows, cushions, bricks, etc., to support and restrain the limbs. If the patient requires to be moved at once, splints should be applied, und any material may be used for the purpose if it is sufficiently rigid, e.g. sticks, umbrellas, folded newspapers, etc. When there is difficuite in obtaining splints, an upper limb may be fixed against
some sort are applied to keep the bones in their correct position. After a few days the limb is massaged each day, and the doctor makes passive movements at the joints to prevent stifiness. After some weeks the patient will make movements for himself. liefore putting the full weight of the body on a broken lower limb he should use for sone time a crutch, and later a stout stick.
The term extension for fractures means the mechanical stretching of a limb or part of a limb, and is required most often in fractures Fir. 11


Frame. Fig. 9. Poriabin garden grame with sliding lights. Figs. 10 and 11. Details ol gaides elevation. Fig. 13. Front elevation
the trunk, or the lower limbs can be tied of the shafts of the bones. One way of doing together until splints are available. The this is to fix long strips of adhesive plaster to splints should be padded with clothing or the sides of a limb, say, the leg. The ends of other soft material and should be applied the strips are attached to a horizontal piece of on the inner and outer sides of the limb.

In removing persons suffering from fractures of the thigh or leg the stretcher should be a rigid one. A door taken off its hinges would be very suitable if a stretcher has to be improvised. If a person suffering from broken thigh has to be carried uphill he should be carried feet first, and the reversc on going downhill, so that the weight of the trunk may not press down on the injured limb.

The first thing done in the treatment of a fracture by a doctor is to set or reduce it, that is, to bring the broken ends as nearly opposite to each other as is possible. Then splinis of

wood, or stirrup, a few inches below the sole of the foot. A stout cord is attached to the centre of the stirrup by drilling a hole through the latter, and is then led over a pulley and made taut by having a weight attached to its lower end. See Anklc ; Arm ; Bandage ; Colles' Frecturc; Dislocation: First Aid; Shoulder: Splint.
FRAME : For the Garden. Every gatdener realizes that a frame removes many of the restrictions which hamper his operations all the year round. It is indispensable for the raising and growing of flowers and vegetables in spring and summer, whilst during autumn and winter it is a means of rearing and preserving plints that would otherwise succumb to the first hard frost. Various types of frames are here illustrated.

It is an advantage to set the framo on a hotbed of manure or of manure and leaves; the hotbed, which can be made up in March, should project 12 inches beyond the frame.

A suitable compost, which should be 1 ft . deep in most cases, is composed of three paris loam and one part leaf-soil. Protection is necessary during sovere weather, and this may consist of sacking, mats, bracken fern, etc.

Ventilation lights should always be raised on the opposite side from which the wind blows, using wedged or stepped blocks for the purpose, similar to those shown. Watering should be done early in the day, so that foliage may be dry before night. Plants are more easily cut down by frost while their leaves ne damp). Amongst plants and seedlings for raising, growing, forcing, or bringing-on, in frames possessing a mild hotbed, are the following:
Prussels spronts, cauliflowers, celery, lettuce, mushrooms, parsley, strawberries, rhubarb, onions, tomatoes, cucumbers, early notatoes, leeks, melons, marrows, begonins, violets, pansies, hali-hurdy annuals, etc.
A handy type of emiergency frame is shown in Fig. 4. This will be found useful, as a
protection for hardening-off tender scedlings, for the growing of early salad vegetables, and for sheltering plants that will not withstand the rigour of winter.
In gardens of ample accommodation a plain brick example may be devised according to Fig 1, and if necessary by extension as in Fig. 2, in order to obtain incressed licat from hotbeds placed outside. Such a frame should be erected in a position with a south aspect. A good average size is 6 ft . wide, $2 \frac{1}{2} \mathrm{ft}$. deep at the back. and 18 in . high at the front. If a wooden frame is preferred, the dimensions may be the same.

Where the garden is small a movable frame, similar to that shown in liig. 3, is recommended. A structure of this kind, during early spring, autumn, or winter, may easily be removed to a position facing south. In summer it can be situnted in a spot screened from hot sunshine. The fourth type figured is one built of turves, with a glazed wooden top-light. Another style of turf frame is displayed in Fig. 5, a type often used for the growing of early potatoes.
A Portable Frame. Fig $\boldsymbol{y}$ shows a useful frame of convenient size which the amateur can easily construct for himself. The glazed tops are made to slide. Suggested dimensions are indicated in Figs 12 and 13 . The lower portion can be made in 1 in . matchboarding. nailed together, and with corner blocks screwed inside. At each end, and projecting just the thickness of the top, ie. 2 in., a guide is screwed from the inside, as in Figs 11 and 13. A centre slide and guide is made as in Fig. 10, and fixed to the back and front, the slide being cut into these to bring them to the same level. The water grooves formed in the slides should be carcfully noted.
The front rail of the top glazing frame is thinner than the other rails, and the glass runs right over it ; this is necessary in order to allow the water automatically to run off at the front. The frame is rebated on the inner edge and mortised together, the joints being dowelled to fix them : they should be put together with white lead paint, as glue is unsuitable. The cross-bars may be cut in the solid and rebated, or they can instead be of two pieces screwed together; in either case they are mortised into the main frame. A water gronve is cut at the under sido about $\frac{1}{2}$ in from the front to prevent the water from creeping back into the frame. If several small panes of glass be used, the upper square should overlap the lower one a hout $\frac{3}{3} \mathrm{in}$, and a tack be put at the bottom of each glass to prevent it from slipping; putty is used to secure it in the rebate. All the woodwork should receive at least two coats of paint See Forcing; Garden; Hotbed; Kitchen Garden.

FRAME AERIAL. This is a portable form of wireless receiving aerial comprising one or more turns of wire wound upon a framework which acts as a support. The received signals are strongest when the frame is rotated so that its plane lies in the direction of the transmitting station, this property being utilized commercially for direction finding. In the case of a broadcast receiver, however, the presence of metal objects, neighbouring aerials, eto., may produce large errors in the directional properties of a frame aerial.

Frame aerials are essential for portable or self-contained receivers, and they are valuable generally on account of their sharp tuning and high selectivity. The chief disadvantage of this kind of serial is its poor sensitivity, and for this reason the receiver utilizing a frame aerial should possess at least one stage of screen-grid high frequency amplifioation, and one or more stages of low frequency magnification.

Making an Aerial. A simple acrial suitable for wave lengths from about 200-550 metres, in conjunction with a 0005 condenser, can be wound upon a wooden framework having two
cross supports each 2 ft . long (see diagram) The turns are wound in saw-cuts made in ebnonite strips placed one at each extremity of the framework and secured by wood screws. The winding may consist of 14 turns of No. 22 D.S.C. copper wire (aeven turns each side and one turn per slot), all turns being continuous and in the same direction. The two ends of the winding are taken to the terminals on the vertical support. For the long waves (1,0002,000 metres) 50 turns are required. four turns being wound in each slot.

To connect the frame to an existing receiver, remove the acrial coil (also the sccondary coil if used) and the aerial and earth leads. Con-

nect the frame terminals to the grid and filament of the first valve, so that the winding is then tuned by the aerial tuning condenser See Aerial.

FRAME SAWT. A frame saw is a large flexible saw blade carried in a wooden frame which has a certain amount of "give," so that the saw blade can be tightened by turning a bottle screw. The teeth of a frame saw are coarse, as the tool is intenued for rough work, such as firewood. See Bow Saw; Saw.

FRANC:OA. These graceful plants, popularly known as bridal wreath, are not quite hardy, and are generally grown in pots for greenhouse, conservatory, and window decoration, or they are planted out in conservatories. In mild districts they may be grown out of doors all the year round; in other places they should be kept in a frame during winter. They are propagated by seeds sown under glass in spring or by cuttings. Francoa ramosa, with white flowers, is the favourite kind ; it is a perennial, 2-2! feet high.

FRANGIPANE. This perfume was intended to combine all the chief odours; it has the reputation of being the most lasting perfume made. The recipe is as follows, the ingredients being mixed and allowed to stand for a month, then filtered through absorbent paper :


FRANGIPANE CREAM FILLING. Thi is the recognized term for a filling for pastries, tarta, etc., although often other flavourings, such as vanilla, almond, and so forth, are substituted. It is made in the following way :

Melt 3 oz . of butter in a stervpan, add I pint of milk, and when nearly at boiling-point beat in $\frac{1}{2} \mathrm{lb}$. of dry sieved flour. Beat this well together until smooth. Stir and cook it over a gent le heat for a few ininutes, or until it leaves the sides of the pan without sticking. Cool it for a few minutes, then beat in scparately 2 whole eggs and 2 extra yolks. When well blended add 4 oz of castor sugar, and some flavouring essence. When cold it may be used as desired for filling tartlets, cakes, eto.

FRAUD. Fraud is sometimes a criminal offence. For instance, obtaining goods or money by fraud is a crime. It is also a civil wrong, giving rise to an action for damages.

Fraud consists in making a statement of fact knowing it to be untrue, or with wilful or reckless disregard as to whether it is true or not. If such a statement is made with intent that it shall be acted upon, and the person acting upon it suffers loss, it is an actionable fraud. If the person making a false statement honestly believes it true, he is not guilty of fraud.

There is ono excoption, namely, a falsc statement made in a company prospectus. In such a case, when the state ment is proved to be false, every director, promoter, or other person responsible for the prospectus is liable in damages unless he proves that he had an honest-and reasonable belief in the truth of the statement.

Any contract in duced by fraud may be avoided by the innocent party. He
Frame Aerial. Left, simple aerial which can be made by the wireless enthusiast. The dimensions of the framework are shown in the diagram above can resist any claim made against him on the contract or can have the transaction set aside, and claim the return of anything paid or transferred under it. But he must be careful to take steps to set it aside as soon as he knows of the fraud. If he does not, or if it is im possible to put the parties back into the original position, the transaction will not be set aside, but the innocent party will be left to his remedy in damages

FRECKLES: Their Treatment. For freckles the following remedy is for outward application only, to be applicd at night.
 Glycerin
Sort parallu
A lotion which is intended to be applied to the exposed parts of the face, neck, hands, and arms before going out into the strong sun light, and which speedily dries, leaving little trace of grease, is made up as follows :
Zinc oxide
dra!n!
Pow dered calamine
Olive oil
Solution
Solition of ammonla


The following bleaching lotion applied daily with a camel-hair hrush has the effect of lightening the colour of the freckles. It should be kept tightly corked

Fresh peroxide of hydrogen ( 10 vols.) ..
Ean-de-Cologne
rosewater
See Beanty Culture; Face; Skin.

FREEHOLD. In old English law this is the latter being a combinaone of the ways in which land is held, others tion of free whoel and back being copyhold and leasehold. Frcehold land is the nearest approach to absolute ownership that is recognized by the law. Such land cannot be held by a definite term of years as leasehold can, but must be for an indefinite term or in perpetuity. The owner of it is sub. ject, therefore, to no dues except the ordinary rates and taxes. If he huilds a house upon it he is the absolute owner of house and land.

In 1925 an Act was passed which provided for the abolition of copyhold and other antique tenures in England at the end of three years, and therefore for the establishment only of frechold and leaschold land-holding. See Houre; Land; Leasehold.

FREESIA. These greenhouse winter and spring-flowering bulbs are much admired for their delicate flowers and sweet scent. As they may be grown in small pots, they are suitable for small greenhouses and also for windows. Many people purchase fresh bulbs every year, but this is unneccssary if ripening and drying the bulbe is properly carried out. The bulb should be potted in July or early August, putting about six in a 5 in pot. One pot of freesias is enough for a room. The best soil is a compost of 3 loam and of each of sand and well-decayed cow manure. Cover the bulbs with $\frac{1}{2} \mathrm{in}$. of this mixture. Place them in a cold frame and growth will he evident in a few wecks. Keep the plants close to the light and water very lightly, increasing the quantity as growth develops Hard forcing is not desirable. After Howering, water frcely until the leaves turn yellow, decreasing the


Fresis. Flowers and leaves of one of the new coloured varieties supply as the leaves die down. They are easily increased by off. sets in August.

In recent years many charming new varieties in a wide range of colour have been raised. There are now mauve, heliotrope, crim. son, rose and orange colour. ed freesias. Most of these later varieties are less fragrant than the old white and yellow ones.
FREESTONE : For Building. Any building stone that can be dressed easily or freely is called frecstone; it is generally taken to be the most easily worked stone in a given district. The surface finish can be varied according to the tools employed, and the beds or joints are left rough to prevent slipping, and to provide gtip for the mortar.
The principal varietics of freestonc in common use are termed the quarry-faced, which is the natural face of the stone as it comes from the quarry; hammer-faced, with the lumps knocked off with a hammer; and chiselled, wherc the surface is rough and the marks of the tool irregular. When the surface is smoothed and finished it is known as toolcd. Rusticated freestone is worked over with chisels in imitation of old and decayed stone, and is capable of producing a very pleasing surface if treated on broad lines and on large areas. See Stone.

FREE WHEEL. This is a device on a cycle by which a rider is enabled to keep the pedals stationary, thus allowing the machine to coast while at the same time a restful position is maintained on the saddle. Differing types are the ratchet, the roller, and the coaster hub perdalling brake.

In the first mentioned type of free wheel; ratchet teeth are cut on the inner circumference of the chain ring, and a number of pawls are mounted flush on the outer circumference of the inner member, which latter is serewed on to the hub of the wheel. These pawla engage the faces of the ratchet teeth, thereby transmitting the drive from the chain ring of the wheel.

In the roller or wedge type of free wheel, the inner circumference of the chaill ring is ground quite smooth. The rollera, usually five, are
on the onter circumference of the inner mem thereby driving the wheel. faces. As a general rule the chain ring runs on a double ring of balls, the races for which arc formed on the inner faces of the cover plates and the faces of the chain ring.

The chief essential with all types is to cnsure freedoin of movement of the paits, and to this end the free wheel should be lubricated at in. tervals, say every 250 miles or so. It is advisable to wah out the free wheel oceasionally with paraffin. To do this properly, lay the machine on its side and apply the paraftin while at the same time rotating the whecl, and keeping

the pedals sitationary. Leave the machine to drain, then oil the free wheel. See Bicycle; Coaster Hub.

FREEZER: For Ice Cream. There are many good makes of freezers. A "Half Minute" freczer requiring 5 lb . of ice to freezc a gallon of ice cream is reputed to be the quickest. By its usc ice cream can be preplared in the home, garden, or at a picnic at the last moment.

Vacuum freezers are also obtainable in which ice cream is made by two operations. The ice and freczing salt. in the proportion of thirec cups of crushed ice to onc of salt, лге inserted in the outer container after the freezer


Freezer. The Gardner Hall-Minute freezer, bandy For use at a picnic. Abova, rikht. Rapid vacuum treezer. The ice cream compartment opens from the top and the salt and ice container from the bottom her in recesses cut with an inclined facc When frce wheeling the firiction between the inner face of the chain ring and the rollers tends to push the latter towards the hottom of the inclined recesses, but when pedalling it tends to push the rollers up, and thus wedges the chain ring and the inner member as solid,

This result is attained because the distance between the inclined face and the inner face of the chain ring at its narrowest part is alightly lcas than the diameter of the rollers. It is usual to lit light springs hehind the rollers to keep them in contact with both


French Bulldog. Champion of a favourite breed of house dog
lias been invertel When this container is half full, pack the ice and salt well down, finish filling and then pour in a cup of cold water, clamp down the lid and reverse the container.
Ice cream is prepared according to instructions given with the freezer and poured into the smaller inner container and covered with a lid. The freezer is again inverted so that the ice and salt compartinent is uppermost. Such vacuum freezers arc ohtainable in various sizes. See Ices.
FRENCH BEAN : How to Cook. French beans should be used when very young, for they become tough and stringy when old. Wash the beans and top and tail them, then cut them lengthwise into thin stripy resembling grass blades. Small ones need not be cut. Leave them in cold salted water till ready to conk. Put the heans in a saucepan of boiling salted water and boil very quickly with the lid off for at least 20 min . Drain, and ahake them over the lire to dry them, add a small lump of butter and a little pepper and salt, and serve them very hot.

French beans can also he stewed. Put $1 \frac{1}{3}$ 102 lb . into a greased casserole, leaving them whole if they are sufficiently tender, or slicing and stringing them if there are any signs of toughness. Cover them with 1 pint of white sessoned stock, then put the lid on the casserole and cook until tender. Drain the henns, taking them and the stock out of the casserole. In the cosserole melt a lump of butter about the size of a hen's egh, afterwards mixing in a tablespoonful of flour. Then pour on tho stock, stir the whole until it boils, and put in the heans. Heat thoroughly and serve in casserole. The cultivation of the beans is described in the article Bean (q.v.). See Bran

FRENCH BULLDOG. A French bulldog difiers so much from the British that one is unable to see the relationship between the two. The bat or upright eary, for instance, are the antithesis of those that are seen on the British national dog; the under-jaw does not project in the saine manner, therc is less wrinkle about the head, and in addition the chest is not so wide.

Whatever may have been the case originally, the French breed is now distinct in build and temperament. He is quick and active, instcad of being slow and lethargic, and he makes an
excellent house pet, his average weight being from 20 lb to 24 lb , though some are a trifle heavier. The favourite colour is brindle The coat is short and smooth, the tail short and carried downward in bulldog fashion See Bulldog; Dog.

FRENCE CEALK. This powder has a smooth soapy feel, and is used for sprinkling inside boots or gloves to muke them slip on frecly. In Hat cake form it is used by tailors and dressmakers for making marks on dark cloth or other fabric.
The powder is also emploved for absorbing grease from silk or other material, for which purpose it is sprinkled upon the grease apot and then ironed with a warm llat iron. It is used as an ingredient in dusting powders and for clearing turbid liquids. For the lastnamed purpose powdered French chalk is shaken up with the liquid, and the powder, in settling down, lenves it bright and clear. French chalk, alone or mixed with paraffin wax, is sprinkled over a floor to make it smooth for dancing.

FRENCH COOKERY. Genuine French cookery does not consist entirely of highly sauced and decorated dishes. It cmbraces the knowledge of combining finvours so that one does not unduly predominate. Garlic, for instance, should merely accentuate other flavours, and its actual presence should not be detected.

No waste is permitted and no portion from the boiling or stewing of the ment is thrown away. The liquor portion appears as a good brown soup, well Havoured with vegetable and thickened with sago, macaroni or some other similar substance, while the meat is thoroughly impregnated with the taste of vegetable, a little bacon, and a suspicion of spice and red pepper.

In French cookery the sauce always reccives due consideration, containing in the stock from which it is made the essence of meat or fish whioh it is intended to accompany, and flavoured with herbs such as tarragon and chervil.

Dressed vegetables are a distinct fenture of French cookery, and make a course by themselves. Cold vegetables are formed into salads, and with a mayonnaise sauce or salad dressing make relishes for cold meat. Salads of all kinds are popular with the French, but great stress is laid on the dressing. Almost any kind of salad berb is used in anlads, with portions of meat or fish chopped up, and covered with mayonnaise sauce. See Casserole; Silad; Sauce.

FRENCH CRICKET. This is a game well adapted to small gardens. It is played by any number, without sides, and there is no scoring. Fach batsman plays until he is out, and is then succeeded by the next.

The wicket is represented by the lontsman's feet and lega uj, to the knee. He stands with his feet together, the hat held vertically in front of him, and the first ball is bowled from a spot some fell paces olf. The batsman must not allow the ball to hit his feet, neither must he move them, or he is out. Any memher of the field who stops the ball then bowls it from the apot at which he stopped it, but the batsman must not alter his josition except in so much as he can without moving his fect. If the ball is caught by any player he is out.

FRENCR CURVE. The French curve is used in drawing and design work, and consists of a thin piece of pear wood, celluloid, vulcanite, or similar matetial, cut to a series of scientifically designed curved forms. Its use is of the utmost assistance to those who are unable to depend upon a free-hand drawing. The method of use, illustrated above, consists of laying the curve flat on the paper and marking around the cdge with a peneil. French curves are sold separately or can be obtained


French Curve. Device used by the draughtsman
to enable him to dispense with free-hand drawing
in scts, and are made in a wide range of shapes. Almost any curve can be drawn by combining the various elements from different-shaped curves, but when doing this it is necessary to note if one curve flows freely into the other As a guide, it is preferable to draw around a greater distance than that actually required for the operation, and then by trying the other curves it is possible to judge whioh of them is most suitable. The juncture of two curves should be indicated with a pencil-mark, so that when inking in the drawing the distance which should be drawn by the use of one curve wilt be apparent and the commencement of the other will be clearly defined. By these means the component curves may be prevented from having any suggeation of a sudden change of form or an ungraceful bulge. See 1)rawing.
FRENCH FOLD. Raw edges may be finished by what is known as a French fold. This is a wide fold or bind enclosing the elge, turned over to the wrong side and slipstitched down. The strip for the fold may either he cut on the cross or on the straight, according to the shape of the edge to be bound A French fold may be used to renovate worn or fraved hems, cuffs, ctc., or to finish the sleeves ind hem of a child's frock.

A French fold may he 3 or 4 in . wide or a very narrow fold may be used, but if a marmow one is required a smiall rolled fold of material called a roulean may be made. A strip whould be cut on the omss about I in. wide and placed on the outer side of the material, edge to edge. 13 un a thread $t$ in. from the edges. turn over to the wrong side, leaving $f \mathrm{in}$. on the right sidc. Fold the remaining $\frac{1}{} \mathrm{in}$., 1 urning it inside, and hem it nently down. The four thicknesses of fold placed tound the edge in this manner produce a good round edge, which is most useful in tinishing off the edges

of brocade, yatin, crêpede-Chine, and other similar materials, when it is inpossible to use an ordinary bem.

Another type of French fold which is useful for the same purpose, and is employed to finish the cdges of tunies, frills, eto., is called a French hem, and is made as follows: Run a small tuck on the wrong side of the material as far within the edge ay is desired, then roll the tuok downward, turn the raw edge of the tunic up to meet it, and hem or slipstitch down to this

FRENCH HONEYSUCKLE. This is a family of hardy perennial herhaceous plants bnown botaniaally as Hedysarum The only species much grown is coronarium. or French honeysuckle. It has divided leavos with oval leaflets, downy leneath, and spikes of crimson pea-like flowers in sumnier ; height 3 to 4 ft.
The seed may be sown outside in April or May, and the plants put out in autum where they are to hloom. They will thrive in almost any soil, but require a sunny position Another specics much used is unultijugum, a shrub or sub-8hrub growing 3 to 4 ft high It flowers in July, bearing tlowers purplish red in colour.

FRENCH MARIGOLD. A showy half hardy annual (Tagetes patula) which is raised from seeds sown under glass in slight warnith in February and March: the secdlings are planted out of doors in May. The dwarf varieties, 9 in., ure popular edging plants. There are double and single Fronch marigolda with yellow, orange, and reddish flowers. Legion of Honour, yellow and brown, is one of the ohief favourites for edging. The tall varietice reach a height of 2 ft .

FRENCH NAIL. This type of wire nail is in general use for rough work. It is circular in section, with a fint head, and is procurable in a wide range of lengths and in many different thicknesses. Sizes in common use range from ? in. to G in. long. The 1 in size is particularly handy for fixing beaver and other building boards to the studding. The 3 in . size has many uses in the garden, such as nailing up fencing, while the larger sizes are of valuc in building construction. See Nail.

FRENCH POLISHING. This is a process by which a polish is produced on wood. The polish is a solution of gum resins or gums, and its composition varics. Shellac is always the main ingredient and alcohol the solvent. The simplest form of french polish consists of a solution of $\mathbf{6} \mathrm{oz}$. of shellac in a pint of spirit.

The surface to be treated must first be well coated with polish, and time must be allowed between the rubbings for the polish to settle and dry. At first the main object is to put $n$ shell or covering of polish over the surface, whilst later n glaze is put on the surface thus obtained. It is useless to try and obtain a good polish on a surface insufticiently covered.

Make a polisher's jad by taking a piecc of cotton wool and folding it into a firm pad the shape of an egg, with a point at one end Cover this with a piece of old linen, not too fine, folding over the pad and gathering the ends up into the palm of the hand. Pull the point well out. Open the pad and pour in the jolish from the back; it should never be used on the front. Press lightly on $n$ board or palm
of the hand in order to bring the polish through to the front of the pad.

On New Work. If the wood is rather porous, give it a coat of wood-filler before polishing. See that the surface to be polished is entirely free from dust. Cover the surface with polish by rubbing gently with the pad, using a circular motion. When the surface is covered, leave a little while to harden.

Should the surface be at all rough, it can bc rubbed down with fine powdered pumice used on a rag, but no powder must be left on the surface when polishing is resumed. The pad is replenished with polish from time to time, always putting it in from the back. Continue working in a circular motion until the surface is well covered. If possible, leave it to harden for a short time after each rubuing

It is usually necessary to budy-in, as this process is called, three or four times, leaving a day between each coat. As soon as the work is lacky, leave it until dry: otherwise the shell may be pulled off. Never stop in the middle of the work, as that may result in pulling up the polish. Rub down with pumice between ench coat.

In finishing off, rub carefully with fine pumice and a drop of oil, working with grain of wond. Give a final coat of polish, using rather a dry prd, and leave to harden for several hours. Talie a new piece of cotton wool, and on this puur a very littlee crystal glaze. Rub all over the object, using a circular motion, and when the pad is almost dry, rub hard until a very bright surface is obtained.

Repolishing Old Wurk. The instructions given above apply to the production of polish on new articles. An old piece of furniture such as the top of a dining.room table is repolished on somewhat similar lines. First mix a cupful of vinegar in a quart of boiling water. Dip a piece of flannel into this and quickly wash over the whole surface of the table to remove any grease Rub dry and polish it well, using a soft cloth; then rub it down with a piece of sandpaper No. 0 or a rag dipped in pumice powder. If there arc any holes or deep marks, fill them with stopping and leave it to dry. Rub down to make it even with the rest of the work, and colour with stain to match the wood.

Brown polish known as button polish is the best to use, as it works well and dries quickly and hard. It can be bought at any oil-shop. Make a pad as explained above, and fill it with the polish. Press on the palm of the hand and work in large circles until the whole surface is covered with figure 8 marks. Keep on going over and over the surface.
Should it feel tacky or inolined to pull up the polish, stop at once and put the job on one side. From time to time continue to body-in until there is a thick coat of polish all over the surface. For table-tops a thin cont is useless, as it will orack at once. Rub the surface over with pumice, but do not scratch it. If it requires more polish, go on bodying-in. Take care to remove all dust or grit.
Spiriting On. This is one of the most difficult jobs for an amateur. It must be done gradually. In working in the polish sometimes a little oil is useful, but a void using too muoh, as it sinears, and is difficult to get rid of. As the pad needs replenishing, use methylated spirit instead of polish, alwnys putting it in from the back, and employing 1 or 2 drops at a time. Rub a little harder than before, but always in circles or figure 8 . When only spirit remains in the pad, if the surface is not sticky. lake a clean pad, put a drop of methylated spirit or crystal glaze into it, and rub hard up and down until all smears disappear and the result is a brilliant polish.

Work should be done as far as possible in a narm room. Leave it for 24 hours, and if it Las pone dull rub it well again. See Furniture; Sideboard: Table, etc.

FRENCH SEAM. As it ensurcs absolute neatness on both the outer and inner sides of a garment, a Frenoin seam is widely used, generally on lighter weight materials, in making lingerie, ohildren's frocks, blouses, etc. It may vary from \& to $\ddagger \mathrm{in}$. in width, according to the material.

A French seam is made by taking the two edges of material to be joined and running a thread on the right side as near the edges as possible, avoiding any chance of fraying. Nenten the edges with a sharp pair of scissurs, and turn over to the wrong side. Take the join firmaly between the thumb and first finger of both hands and press it uuwn. Kuna tacking thread through the pieces of material, far enough from the join to enclose the edges left on the right side, before finally finishing the seam by a machine stitch or running thread.
FRENCH WINDOW For a drawing room, or any other room looking on to a garden or a conservatory, French casement windows extending to the floor level are sometimes preferred. It is essential that they should be exceptionally well-fitting, ot herwise the room will be draughty and cold, and they should never be fitted to rooms with a north or north-east aspect. None but thoroughly seasoned wood should be used for the frames of a French window.
It is advisable to make the two casements to open outward. They should be hinged to solid frames, and fitted with rebates in the
frames, at the top and bottom as well as the sides, so that they can close tight against each other and against the surrounding framework. To prevent rain or wind from entering it may be necessary to run a strip of rubber down the centre where the casements meet, on the inside. The problem of ventilation can be solved when the room is fairly lofty by an upper casement hinged horizontally to the top of the main framework and working independently of the vertical casements enclosed by their own frame. Thero should be bolts at the top and bottom of one cascment and a solid sashfastening on the other in order to secure it thoroughly. See Bolt; Casement; Curtains; Window.

FRET, This name is given to any geometrical ornament cut or painted on a flat surface in or on a building. Its most familiar form is the key pattern, derived fron the Greeks, which consists of a series of narrow bands set at right angles to one another, so as to form a consecutire geometrical design. There are several variations of this pattern, such as the diamond fret, in which the lines are set diagonally to the top and bottom boundary lines of the decorated space. Fretwork is frequently employed on the outer stonework of buildings where it is desired to relieve the harshness of $n$ bare flat surface. The name fret is also used for the metal plate which closes the opening below a grate. It is often pierced.

## FRETWORK: A Decorative Handicrafit <br> Practical Advice on Tools, Materials and Designs

The reader may further be referred to the entrics Antofret; Cabinet Making; Chippendale, etc.; also to those on the various woods used, e.g. Oak; Sycamore; 'Walnut
The term fretwork now has a meaning rather used for coarser work, where speed in cutting different from that current a few years ago. is desired rather than a fine finish. Smaller In place of the elaborate models that were saws come in for very thin wood, but are not then popular, we have a simpler atyle in which recommended for ordinary use as they are utility has first consideration. In addition, rather more difficult to control. fretwork has a wider and more important application, owing to the growing popularity of the fret in furniture, and the development of wireless receivers and gramophones, both of which use a fret. Thus the fret has become a decorative motif rather than an end in itself.
The Tools Required. The most important tool is the fretsaw frame (Fig. 1). The 16-in. size is recommended, as it is sufficiently large to saw wide pieces of wood without being too heavy. Some form of tension device is an advantage, such as that shown. In regard to the saw blade itself, the No. 2 is suitable for general purposes. Thicker saws than this are


Fretwork. Fig. 1. How the tretsaw should be held. Right, tension device tor tighteniag the blade
has a flat face covered with a piece of flexible material, to enable it to give to any small inequality in the surface. A set of files is needed to enable the work to be trued up after cutting These tools are the essential ones. There are others, such as the rule, light hammer, plane, and so forth, which can be obtained as the necessity for them arises.

Materials. The wood used in fretwork should be obtained ready planed and glass papered. Such wood has already been brought to even thickners, an important point, because it is essential that joints should fit accurately. Designs are prepared specially to suit standard thicknesses of wood, so that only standard material should be purchased, for preference. Satin walnut is largely used, since it is comparatively cheap, is obtainable in wide widths, and is close in the grain. Oak and mahogany are also employed for better-class designs.

A material which has come to the front in recent years is plywood. This is made up of three or more layers, the centre one running at right angles with those at each side. Owing to this feature plywood is practically as atrong in its width as it is in its length, a particular advantage in certain frets because of the rigidity it gives. One drawback is that plywood shows the layers at the edge, but for certain types of work this does not matter. Wireless and gramophone frets should as a rule be cut in plywood; a thickness of $\frac{3}{16} \mathrm{in}$. is usually convenient. Decorative frets as applied to furniture can be cut in $x_{12}^{x}$ in. or 18 in. plywood. As these are stained and polished the layers at the edge do not show.
Designs. For ordinary fretwork models finished designs are obtainable from various supplicrs. These are printed full size and require simply to be stuck down on to the wood and the outline cut. In some cases, the home worker may like to prepare his own designs, particularly for frets to be applied to furniture, etc. A convenient method is to use squared paper. A portion of the design (perhapa a quarter, or, in some cases, one-half), can be drawn full size, and the position of the other parts mapped with the nssistance of the squares. Tracing paper may be used for copying designs or motifs.
Pasting Down. The design, however ob tained, has to be applied to the wood to enable the cutting to be done. For this purpose paste should be used in preference to glue, since the latter grips the paper too strongly, making it difficult afterwards to peel off the design. The wood should be pasted rather than the design, because in the latter case the moisture is apt to stretch the paper and so distort the design. A clean cloth rubber should be used to make the design lie flat, working it from centre outwards so that any air buhbles are pushed towards the edges. Fig. 2 shows the process.
Large designs are sometimes a little difficult to handle. In this case the method shown in Fig. 3 can be adopted. Here the design is rolled mound a piece of dowel, and the fretwood pasted. By placing the dowel at the top it can be rolled forward and the design unrolled. The latter will then lie flat on the wood. This method prevents distortion Allow the paper to dry thoroungly before beginning the cutting.
Drilling. This operation is closely connected with the actual cutting, for the latter depends in a great measure on where the holes are drilled. As a general rule it can be taken that holes should be made near to some projecting piece of ornament, as the saw is usually started at such places. It is not advisable to start the saw at the mid.point of a curve, as when later on the join is made a disconnected appearance usually results. In some cases such a start is unavoidable, for instance, in a circle; the hole in this case is


Fretwork. Fig. 2 Use of rubter In laying a design. Fig. 3. Laying a large desugn with the netp of a
dowel rod. held when cleaning up the filshed work
made near the line and the saw carefully taken into the circle in a continuous sweep Small imperfections of outline can be corrected with the file.

Fig. 4 shows the Archimedean drill in use. Note that the wood lies on a flat hoard; when so supported the drill is not liable to split out the grain when it emerges at the underside. If laid on a table with a rough and uneven top, a small depression in the latter might cause the grain to break away as the drill comes through.
The drill shown has flyweights, which keep the tool rotating whilst the upward stroke with the bobbin is made.

Using the Fretsaw. It is most important to hold the raw upright, a facility which comes only with practice. The work should be examined after it has been cut and any inaccuracies carefully noted. Never attempt to force the saw into the wood; it only reaults in a broken hlade. Keep it working steadily up and down hy its own weight. It will then cut quite quickly enough and truly.
When a corner has to be turned the saw should be moved up and down without the alightest forward movement, and should be turned gradually whilst in this position. It will be found that the blade will gradually


Fretwork. Fir. B. A. result of turning saw at corvers. B, better method, corners being left sharpand clean
turn in the required direction. It is better however, to avoid turning in the corner, because it is liable to rob the design of its sharpness (see Fig. 6, A). The illustration shows the unsightly gap at the corner made by the turn. A similar thing has occurred at the point of the leaf, where the outline has become dull and rounded. A better method is shown at Fig. 8, B, where the saw is taken into the corner first along one side and then along the other. In this method the two cuts meet and leave a perfectly sharp corner. At the external corner the saw is taken along one side past the corner. It then describes a little loop and comes back along the other side.

A point to bear in mind in all designs is the continuity of line. Where two members of a pattern cross onc another, they should appear actually to do so. The eye automatically puts in the joining lines between them. In the same way where one member branches out from another in a continuous curve, the line should be sweeping and continuous. This should be noter especially by fretworkers who prepare their own designs.

Finishing Off. If the paste has heen used sparingly, it is usually a simple matter to peel off the design. If it shows some resistance, however, it can be damperl slightly, using the water sparingly. On no account allow the edges of the work to become wet, as this is liable to raise the grain, which is difficult to smooth afterwards. After the paper has been pecled off as cleanly as possible the whole surface should he cleaned up with glasspaper, using the glasspaper block (Fig. 5). The work should bo held down on a flat board during the process. If laid on the bench, any incquality in the surface of the latter might cause part of the design to stand up, and so catch the block, resulting possibly in a breakage. Quite small pieces of design can be treated in a different manner. The glasspaper itself can be laid on a flat board and the design rubbed upon it.

No finish such as polish or paint should be applied to ordinary fretwork models. It only chokes up the edges. Certain designs
are somewhat different because they have no elabor. ate internal fret. They are comparativoly plain, and are intended to be lacquered or painted. Frets to be applied to furniture are also in a different category. These are polished with the rest of the job after they have been applied.

Sometimes a file has to be used for fretwork. Filing, however, should be regarded as a last resource, and on no account should the fretting be done carelessly, with the idea of cleaning it up afterwards with the file. This is simply a circle, square, and so on. The eyo readily waste of time. A legitimate use of the tile detects any defects in regular shapes, and the is in fitting joints. It happens frequently s that the design stretches slightly when boing laid, with the result that the joints do not fit properly. A few rubs of the file noticad The soon put this right.

Assembling Fretwork. In a largo number of cases glue is used, the most convenient form bcing the liquid kind in tubes. The nozzle is applied to the join and a little glue squeezed out. When the fret is to bo applied to furniture care must be taken not to allow the gluc to exude at the edges, hecause it is difficult to remove cleanly and looks unsightly. A good method is to squeeze out the glue on to a flat board, rubbing it with the fingers to spread it evenly. The fret is placed on this and rubbed up and down so that the back is covered with glue. It can then bc placed in position and held down by a llat. weighted board. When necessary to use nails in fretwork it is advisable to drill holes first, unless the nails are very small.

Types of Designs. It does not follow that because a design is elaborate it is therefore difficult to cut. In fact, the reverse is often the case, the very intricacy of the pattern hiding any small inaccuracies. The most difficult type of design is that which is built up on a geometrical formation, such as the


Fretwork. Flg. 7. Designs for irets particularly suitable lor loudspeakers or gramophone cabinets
lacing straps certain of the members can be made to appear as if they wore bencath others, by just sinking such parts where others cross. The grain of the applied fret must run in the zane direction as that of the groundwork.

Erinoid and Xylonite. These substances are somowhat tougher than wood, and a special metal-cutting saw should be used for them. One great advantage of using this type of material is that the surface can be modelled to a certain extent nifer the cutting has been completed. The job is finished off with glasspaper and a file, and the surface polished with fine pumice powder. Such things as paper knives and small frames can be made from erinoid or ebonite.
FRIAR'S BALSAM. This is another name for the compound tincture of benzoin. The dose is $\Omega \frac{1}{d}$ to 1 Huid dram. Friar's balsam is much used in lung discnses, especially consmallest inaccuracy is at once apparent in a much used in lung discnscs, especially con-
circle, for example, whereas in intricate floral sumption and chronic bronchitis, for its dis-
or leaf work small errors would pass un- infecting action. It has a stimulating effect smallest inaccuracy is at once apparent in a much used in lung discnscs, especially con-
circle, for example, whereas in intricate floral sumption and chronic bronchitis, for its dis-
or leaf work small errors would pass un- infecting action. It has a stimulating effect



Fig. 9. Designs showing how
comparatively simple designs which are not geometrical in form, and which have no very thin members. Some suggestions for loud. speaker or gramophone frets are given in Fig. 7. As a rule the simpler these are the better. There should be plenty of openings to allow the sound to emergc. Such frets should be cut in ${ }^{5}$. in . plywood.

An imitation of carved work can be olbtained by the use of fret work (Fig. 9). Suitable patterns are those often seen on Jacobean furniture, consisting inostly of interlacing strapivork designs. The design is drawn out in the usual way on paper, and pasted on the wood. The thickness of the wood used depends upon the relief required for the imitaticn carving. Usually $\frac{1}{8}$ in. or ${ }_{16} \mathrm{in}$. is about right. The outline being cut. the whole is glued down to the background of the work: To make the effect still more renlistic the background in the internal spaces of the frets is given $n$ roughened finish by means of a punch. This does away to a great extent with the appearance of an overlay, and miakes the work simulate renl carving. The applied fret itself can be carved here and there. For instance, in dealing with inter
ion, a teaspoonful of the balsam is added to a pint of very hot, but not boiling, water, and the resulting vapour is inhalcd. It is a useful dressing for wounds, as it is an officient antiseptic and also tends to check bleeding. Used in the proportion of one part of balsam to ten parts of water, it also forms a soothing application for cracked lips and rough skin.

Fricandeau. A popular dish made from fillet of veal is known by this mme. See Veal.

FRICASSEE. This is a type of stew, generally white, consisting of meat, game or fish cut into piccos and cooked in sauce.

Chicken Fricassée. A fricassce can be made with half a cold boiled chicken. Take the meat from the boncs, and put the latter, together with a small onion, into a pan with the liquor in which the ohicken was cooked. Cook them woll for an hour or more, then strain off the stock. Melt 1 oz . butter in a pan and stir in 1 oz. flour. Add enough stock to make a thick sauce, put in the pioces of chicken and simmer them gently for 30 min . Mix the yolk of an egg with $n$ gill of milk or 3 tablespoonfuls of cream, and add this gradually to the contents of the saucepan. Stir in a teaspoonful of chopped parsloy, n little lemon juice, and seasoning to taste. Serve on a hot dish garnished with sprigs of parsley and slices of lemon.

Fish Fricassee. Any white fish, cooked or uncooked, may be employed in making a fricassée. To do this, break lb . fish into Hakes and prepare a sauce with $1 \frac{1}{\underline{t}}$ gills milk, a lump of butter slightly larger than a hen's egg, $1 \frac{1}{2}$ oz. flour, nend 4 pint fish stock. Senson this to taste, then add the fish and heat the wholo thoroughly, allowing it to cook for a few minutes if the fish is raw. A squecze of lomon juice may be added just before serving, and a bordor of potato, together with a little chopped parsley, used as a garnish. Sec illus. p. 493.

Rabbit Fricassée. A brown fricassée of rabbit can be made thus: Take out the inside, cut off the head, and remove the eyes. Wash
the head, liver, and heart in cold water, soak them in cold salted water for 15 $\min$, and then put them into a saucepan with a pecled onion and a quart or more of water or stock. Bring them to the hoil, remove the scum, add seasoning to taste, and then simmer for 2-3 hours.

Cut the rabbit into joints, wash and dry Fricassée. Brealdast dish made from any white fish an meantime put six rashers of out a policy from a friendly society should careatrealiy bacon into a saucepan and fry them fully examine the conditions and not sign until gently until the fat looks transparent. Then they are satisfied. If they are unable, for any put them on a plate, and to the pan in which reason. to maintain their paymente, they are they were cooked add $\& \mathrm{lb}$ dripping. When this is smoking hot, cont the joints of rabbit with Hour, and put them in two or three at a time, frying them until golden brown Then take them out and keep then hot with the bacon, fry a sliced onion in the fat, atir in one or two dessertsponnfuls of flour, and let it brown. Skim and strain off about $1 \frac{1}{2}$ pints of the stock, add this to the flour, and bring the whole to the boil, keeping it well stirred.

Add a few drops of browning and mure scasoning if necessary, put back the rabbit, together with the head, liver, and heart, and cook all gently for $1 \frac{1}{2}$ to 2 hours Add the hacon about 15 min . before serving The rabbit should be piled in the centre of a hot dish, with the bacon on top and the gravy poured round Dice of cooked carrots may be used as a garnish. See Oyster; Sweethread.

FRIENDLY SOCIETY. These societies exist for the purpose of enabling persons to insure their lives, to provide funeral expenses or endowments, and to make provision for sickness, unemployment, old age, and various other contingencies
Two Types of Society. Their original con stitution and scope have been greatly altered by law and claanging industrial conditions, and they now may be classified into two groups, the fraternal orders, such as the Manchester Unity of Oddfellows, and the collecting societies, such as the Liverpool Victoria. The organization of the fraternal orders is to a large extent dependent upon voluntary labour. On the other hand, collecting societies employ paid collectors, who usually call every weck upon members for their contributions.
The conditions of membership vary according to the rules of the particular society. Members can insure death hencfits for any sum not exceeding $£ 300$, but the sum assured in respect of children is limited by statute to $£ 6 \mathrm{in}$ case of children under 3 years of age, to $£ 10$ for children under 6 yenrs of age, and to $£ 15$ for children up to 10 .

One advantage of memberahip is the ability to dispose of any sum payable at death, not exceeding $£ 100$, by means of a written nomination, which must he registered at the head office of the society. Other benefits obtainable from friendly societies include relief or maintenance during widowhood or distressed circumstances; when travelling in search of employment; or in such circumstances as shipwreck or damage to boats or fishing nets.

Members can also provide, again by weekly payments, for the old age, i.e. any age after 50 , and for the sickness, widowhood, orphanage, and old age of their dependentr. Other forms of insurance secure the member against loss by fire up to the value of $£ 15$, or of the tools used by him at his work

A momber, in addition to his own life assurance, may insure funeral expenses for hushand, wife, or child, and in respect of a parent, grandparent, grandchild, brother or
sister Endowments the room, such as the fireplace tiles or the and endownent ground of the carpet.

Before distempering the frieze care should be taken to see that the underlying plaster surface is good; any holes should be stopped with plaster of Paris, finished off with a trowel, and, if necessary, with pumice stone On a really smooth surface one coat of the distemper will suffice for a plain frieze in any colour that may he desired. Such colour usually matches the ceiling. In certain cottage rooms nothing looks better than a simple frieze washed with deep cream colour. If the plaster work is roughed up before being coloured the frieze is more effective for an oak beamed roon.

Stencilled Friezes. These are often seen in nursery decoration With this type of frieze,


Frieze. Fig. 1. Frieze for hall or dining room. It is in relief plaster work, distempered pale buff, and surmounts oak panelling
having chosen the design of nursery rhyme, fairy tale characters or attractive animals, the amateur decorator proceeds to trace it with a blue or red pencil on a sheet of stiff oil paper. This is then affixed to a smooth board and the traced pattern cut out with a sharp modelled by an artist or from his drawing, a mould is taken, and the result is reproduced as often as may be desired. The slabs or lengths of frieze are transferred from the place of manufacture to the room, and lixed in prosition on the wall by the same method as ceiling sections.
Imitation plaster friezes in fairly high relief, made of woodpulp, papier mâchć, or asbestos, are also made in sections or panels, and can be ohtained from paper manufacturera. They are applied like wallpapers. Relief motifs are obtainable separately, which can be placed on a plain surface as desired. (See Hall.) In heraldic designs these are particularly suitable for oak panelled rooms. It is necessary to bear in mind that small roons will not stand too higha relief.

An effective frieze for an ordinary room can be made with any good washable distemper. A frieze banding may be used to separate this plain frieze from the wallpaper. Bandings should repeat a defi. nite colour note in


Frieze. Fig. 2. Frieze of colour prints for a nursery. It is very deep so that the detail is easily seen by children, and surmounts a blackboard dado
penkinife. If the pattern is so intricate that first introduced into England in the roign of the sheet after this operation will not hold together, parts of it can be left uncut, these being subsequently filled in with a brush on the wall surface. The oil paper pattern is fastened in position on the wall with drawing pins and the colour, either distemper or oil, brushed over it. The pattern is moved on to the next space to be decorated, and the process repeated until the entire frieze is finished. Unless this is only partially to be decorated at detinitely appointed places, the design selected should be one that fits the spaces to be covered on each wall, and careful preliminary measurements should be made.
 The design itself should be easily contained in the centre of the oil paper, so that its repetition will be practically mechanical, without the necessity of any further measuring. Stencil designs can be obtained which can be traced and adjusted on to the oil paper. Charming nursery friezes are also designed by good wallpaper firms. The frieze illustrated in Fig. 2 is made very deep so that its details are easily scen by small children. Surmounting a dado of "black board" it has an added charm for the day nursery. In the modern room decoration is often cut out and applied on a frieze where interest is required and not necessarily all round the room. For instance, a group of tigures or a flight of birds will be placed over the fireplace, and perhaps at two comers of the room only. The designs of these groups vary according to the decorative shape required by the space. See Anaglypta; Colour; Cornice: Stencilling; Wallpaper.

FRIEZE: The Material. As originally made centuries ago friezes were coarse woollen oloths rendered blanket-like by roughening the surface with wire brushes. A rough face is still a feature of most friczes, which are cloths too heavy for suits, but oxcellent for overcoats for motoring.
Irish friezes are appreciated for their thickness. The cloth is heavily fulled after being woven, and it becomes so dense that wind dues not blow through.
FRILL. This is made of a strip of material out any width, single or double, the upper odge gathered or pleated on to a garment or band, and the lower ellge finished in some way and left to hang loosc. Frills in heavier inaterials ars usually cut on the cross and finislied with a picot cdge or with a bind.
Lace, net, georgette, ninon or any silk or light cotton material may be used for friliing. The lower edge of the frill may be trimmed in many different ways; a hemstitehed border is sometines used, or a tiny rolled hem or scalloped bind may neaten the edge. Frilling -both plain and pleated-in various colours and materials can be purchased by the yard. The pleated kind is the least practical because the plenta lose their shape when washed.
FRINGE : Uses in Furnishing. While fringes for dress are a matter of scasonal fashion, these trimmings have a definite place in decorative furnishing As period trimmings they belong to the 16 th and 17 th centuries and the first decade of the 18th century and were greatly used until the reign of Queen Anne for enriching cushions, hangings and upholstery. During the Georgian periods they were not much employed, but appeared aysin in Victorian times, and are extensively used to-day both as correct period and as modern trimmings for cushions, ourtains and pelmets, bedspreads, stools, pouffes and lampshades.

Fringes look particularly well with Jacobean style chairs, upholstered in greer, brown or marvon velvet and further embellished with heavy cords and tassels. Metal fringes were
and turned legs, but seldom for the later 18th century pieces with cabriole legs, when fringe would have detracted from the embroidered seats then in vogue. Tufted fringe was used on William and Mary chairs. It was secured
Charles II, but straight silk fringes were much employed in the Tudor period and raricgated fringes were seen in early Stuart days. Such trimmings are thorefore correct for the settee and chair with twisted oak frame, or for stools and chairs with $X$ legs reproduced from the Tudor stvle, for William and Mary stools and armchairs with stretchers by small buttons edged with


Fringe. Delow, fringe made by fraying exds of ribbon, linen, etc. Above, left, beaded fringe
silver wire and trimmed velvet upholstery. As trimmings for candle-shades for use with electric light sconoes silk fringes are often employed, and lampshades may be compoaed of silk fringe shading from pale yellow to orange or from flesh pink to deep rose, sewn in wavy lines on a silk foundation.

Fringes can be bought by the yard in various colours and widths from all drapery stores, and are applied by means of a band which confines the top ends of the fringe. Fringing may also be made on the material itself. When this is done the depth of the fringe must first be decided, and a line of machinestitching run at that distance from the edge. All the threads parallel with this line must then be pulled out with a needle or pin until the actual stitching is reached. The machinestitching is not essential, but it helps to prevent the material from fraying. A beaded fringe can be made by cutting a number of threads of even length and threading each of them with the same number of bcads. Fasten off the bottom end securely, knotting it so that the beads cannot fall off. The lengths should then be applied at regular intervals to the edge of a lampshade, or other article to be so adorned, or may be sewn to a narrow braid first and then applied. See Bead; Curtain:

## Lampshade.

FRITILLARY. The most striking of these is Fritillaria imperialis, the crown imperial, which in spring bears drooping yellow or reddish Howers on stout stems 2 feet or so high. The bulbs should be planted 6 inches deep in autumn and left undisturbed for years. The snake's head fritillary (meleagris) 8-12 inches, has beautifully chequered blooms in purple, white and other shades of colour in spring: it flourishes in grass or in the rock garden. Aurea and citrina, with yellow llowers, are two pretty fritillaries for sandy loamy soil in the rock garden. Propagation is by seeds sown as soon as they are ripe or by offsets. See illus. p. 159.
FRITTER. Fruit, meat, fish, cheese, eggs, or bread can all be employed to make fritters. Fresh fruit can be userl, but meat or fish should be already cooked. Remains of cold meat or fish can be successfully reheated in this wray. Hard-boiled eggs should
be sliced rather thickly. A good frying batter should be made, and slices of the fruit, meat, eggs, etc., dipped into it, then dropped into a pan of very hot, deep fat and fried a golden brown. See Apple Fritters; Batter; Bread Fritters; Cheese Fritter; Cold Meat : Frying; Orange Fritter.

FROG: Its Garden Utility The frog should always be welcomed in the garden, and introduced there if he does not come of his own accord. He never touches leaf or flower in the way of food: but in addition to a prodigious consumption of insects of all kinds, he also destroys slugs and earthworms. His soft skin of yellow and brown must be kept moist, and to keep him in a healthy condition and active it is worth while providing for his comfort by having a patch of long grass in a shady corner of the garden, with a sunk pan of water near by, in which he can soak at intervals.
The frog and the toad are quite easily distinguished. In addition to its brighter and varied colour, the frog is more angular, has longer legs, and the moist skin is perfectly smooth. The toad has a rounded outline, is more portly, and the dry, warty skin is of one dark tint, without spots or bands.

FROGROPPER. Under this popular name are included a number of insects allied to the plant-bugs and aphis, and, like them, subsisting by suoking the juices of plants. The familiar and conspicuous cuckoo spit is formed of surplus fluid, exuded by the immature froghopper and whipped into a froth to protect its tender body. If the froth is blown aside the yellow insect will be seen. In the mature stage it uses its hinder pair of legs for making prodigious leaps, and as a rule escapes capture.
In the earlier stages the insect inflicts great damage on many plants, partioularly noticeable on carnations and pinks. Washing with insecticides, such as a solution of nicotine and soft soap in water, is recommended; but the most certain method is to look for the cuckoospit and then destroy the insect by pressure of finger and thumb. See Insecticide.
FRONT AXLE : Of a Motor Car. The front wheels of a car rotate on stub axles which are connected by more or less vertical pivots to the ends of a fixed or dead-i.e. non-rotating-axle secured to the springs. The axle, in addition to transmitting the weight of the vehicle from the springs to the wheiels, has to resist the torque or turning


Front Azle of a Motor Car. Diagram showing a front axle of the dropped type
effort imparted to it when the brakes are applied. This torque tends to twist the end parts of the axle, and the circular section now generally adopted for the ends between the spring pad and the stub axle is best adapted to resist such forces. The diagram shows a front axle of the dropped type.

FROST. During the winter months the householder has to guard against the action of frost. Should no precaution be taken water is liable to freeze in the pipes, especially during the night, the water supply may be cut off, and burst pipes will add to the inconvenience. Except when the frost is unusually severe these troubles can generally be prevented by wrapping straw, felt, sacking, or some other
material round the pipes, and kecping an oilstove or other heating apparatus in any room where pipes are exposed to the cold.

Protecting a Pipe. External water pipes should be protected with a generous wrapping of straw or felt An effective method is to hox them in with a wooden ensing and pack it with straw or hay An important part to watch is the overflow pipe, which protrudes a few inches from the wall and is very often forgotten. Should it freeze, surplus water cannot get awny and flooding may result.

In frosty weather it is as well to shut off the main water supply each evening and to drain the system. The drinking water should come off the rising main, and the supply for the bath, w.o.'s and hot water apparatus is from a storage tank in the roof, fed by the rising main. Usually in addition to the pipe from tank to hath, lavatory basin, etc., there is a scparate pipe running to the hot water tank, each having a stop-cock near the cold tank. It may be well temporarily to shut off the bath and w.c. supply when a had frost is expected, draining the pipes by opening a tap at bath or lavatory basin. The w.e. should he flushed last thing at night, when the Hushing cistern will remain empty till the stop-cock at the storage tank is opened again the following morning If the w.c. water comes from the rising main the supply will have been cut off when the main stop-cuck was turned off.

## The Hot Water System

The lire in the kitchener or independent hot water boiler should be banked up at night. Since the cold supply to hot water system has not been shut off, the circulation in the latter will not be interfered with unless the cold water tank frcezes The rising main having been shut off, the cold tank cannot refill, of course, so little or no water should be drawn from the hot supply taps in the circumstances

If the pipes of the hot water aystem freeze, as evidenced by the water ceasing to flow from the hot taps, the fire in range or boiler must on no account be lighted until the thaw comes. The water must run quite freely and continuously before it is safe to use the boiler.

The householder should make himself familiar in advance with the run of the pipes and the position of the stop-cooks, so that in emergency he can shut off the main supply at the hydrant box usually situated in the forecourt, or at the additional stop-cock which should be provided inside the house. The latter is a great convenience when fitting a new washer to a leaky tap, eto. A long-handled key will be needed for the outside stop-cock, which is on the pipe usually some two or three feet underground. This should be obtained and placed in a readily accessible position. When shutting of the main supply in frosty weather it is preferable to use the outside stop-cock, as then the whole of the service pipe can be emptied, and there is no water left in the pipe to fireeze. Reference should be made to the diagram given in the article Water Supply.

Should it be impracticable to shut of the main supply to a storage tank or flushing cistern it is desired to empty, the ball-cock may be tied up with string, the latter being faytened to a rafter or to a stick laid across the open top of the tank or cistern. Should there be no stopcock on the distributing pipe from a tank, it may be possible to plug the outlet with a piece of broomstick having a tapered end.
Dealing with a Burst Pipe. When pipes freeze there is always a likelihood of a burst somewhere in the system, and this may not show itself until the thaw. If the hurst pipe forms part of the distributing system from the storage tank the appropriate stop-cock near the tank must he turned of. Failing this the taps on the system should be opened to empty the tank as quickly ay possible, and the stopcock on the rising main must be turned off, of
course In emergency the prpe at the burst (on the supply side) may be hammered llat. but this makes subsequent repair more difficult and expensive, as a section of the pipe will have to be cut out and replaced However, to prevent a flood this measure may be justified. When the pipe has been Hattened it should he cut through and the end bent over and hammered tight at the end.

During a spell of severe frosty weather, if the hedrooms of the house are culd or the habit is to sleep with the windows open, a goorl plan is to remove the water from the hasins, jugs or water bottles for the nigbt, as if these freeze they are liable to crack

Frost in the Garden. One of the greatest benefits of frost from the gardener's point of view is the purification and pulverisation of land which follows the freezing of the soil where nutumn digging has not been shirked. Frost penetrates and disintegrates the close particles of heavy olods, reducing them to that friable condition so much desired when sowing and planting time comes round, and destroying the pupae of pests which lurk beneath the surface. To ensure the quicker germination of the seeds of alpine plants it is usual to expose the pots of soil in which they are sown to frost and snow by placing them out of doors. During sevcre frosty weather plants in cold frames should be well protected hy niats. See Apricot;

## Frame; Fruit.

FROST BITE. This most commonly affeots the fingers, the toes, the ears, and the tip of the nose. Children, old people, and alcohol drinkers arc the most likely viotims.
In the mildest form the skin turns to n dusky red, a soft swelling occurs, and pain may be acute. This is the common chilblain In a further stage the chilblain hecomes a blister, which may break and leave a small ulcer. In still severer degrees gangrene results.
When any part is actually frozen, the circuIation must be restored very slowly. The patient must on no account be taken near a fire nor even into a warm room. Put him in a cool room, and gently rub the frozen part with snow, or with a piece of flannel wet with cold water. As the blood beging to circulate, tingling and pain may be felt. Wheir this occurs the rubhing may be carried out more briskly, the hands of the nurse may be applied to restorc warmth, and the patient may be taken into a warmer room.
The sufferer may now be given a small
quantity of warm liquid, such as hot milk or tea If the fingers or the tocs become much congested, raise the limb. As soon as the circulation is fairly restored, wrap the part in cotton wool or Hanncl See Chilblain

FROSTED GLASS. Frosted or ground glass is produced by tivo cssentially different methods. By the first an acid is used to etch away the surface of the glass, and thus render it partially or wholly obscure. The second process consists of grinding the surface with emery and water. thus producing the familiar appearance of frosted or ground glass. A similar result is also ohtained by sand-blasting See Glass

FROZEN FOOD. Many kinds of lood are frozen for purposes of keeping. If frozen meat is properly cooked and of good quality, it almost equals the home killed variety.

Meat should never be cooked while the frost remains in it ; it must he melted out in cold water before the meat is exposed to the firc Frozen meat requires longer and slower cooking than home-killed meat.

Freczing has a more deteriorating effect un beef than on mutton and lamb, C'anterbury lamb in particular suffering little by the pro cess. All frozen meat shrinks while cooking. and allowance for this should be made when it is bought.
All kinds of game arc now preserved by chilling and freczing, which enables this favourite food to be served at table long after the gamc season is over. Rabbits which have been frozen should be converted into entrées or stews. They should be cooked longer than fresh rabbits, and be made savoury with plenty of vegetables. It is not advisable to roast frozen rabbits Most poultry makes an excellent food when frozen. The birds, if of really first rate quality when preserved, may be cooked by almost any method employed for fresh poultry.

Fish which is frozen can be kept for weeks and will be quite fit for table, but it should be soaked for some hours in cold water before being cooked.

Milk is sometimes frozen in blocks, especially if intended for use during a long voyage. When thawed it more closely resembles fresh milk, and is invaluable where invalids or young children are concerned. Fruit also can be kept for a considerable time in cold storage. See Beef; Ice; Mutton; Refrigerator, etc.

## Fruit: Its Food Value and Its Culture

## With Details about the Planting of an Orchard

Further information will be found under the headings Apple; Pear; Plum; Strawberry, etc. See further Grafting; Pruning; also Diet; Food; Jam
When obtainable in good condition, fruit and raisins, contain about three-fourths of should be eaten as regularly as any other their weight of sugar, and also from 2 to 4 per article of food. The great niajority of fruits contain scarcely any tissue-building or energyproducing substances, but they are rich in salts and vegetable acids. The latter undergo changes in the course of digestion and appear ultimately as alkaline carbonates.

Fruit as Food. While not contributing material for growth and repair, some fruits are rich, however, in the vitamin which is necessary to a healthy development and existence, and the absence of which from the diet leads to the occurrence of scurvy. Lemons, oranges, and grapes are fruits that may be mentioned in this connexion.

With some exceptions fruits contain from 80 to 90 per cent of water. Fruits containing over 80 per cent of water are practically useless from the nutritive standpoint alone, but they are nevertheless invaluable for the salts that they contain. Their solid contents consist of sugar, salts, chiefly of potash, and cellulose. The nutritive qualities of a fruit depend chiefly on its content of sugar. Dates and figs, prunes
cent of protein. Bananas contain more than 20 per cent of sugar, grapes and plums about 15 , apples and apricots a bout $10-12$ per cent. The slight percentage of fond material in fresh fruit is reduced by cooking.

For children fruit is particularly wholesome, and, as is shown by their craving, it is a really necessary article of diet. The best varietics for children are apples, oranges, grapes, and bananas. Fruit alone cannot nourish a child, but fresh fruit should be a part of a mixed dietary of milk, cereals, eggs, and meat suit. able for young children.

Ripe fruits act as a regulator of the system, and provide some of the extra Huid required in hot weather. Livery people may eat stewed fruit with advantage. Grapes are valuable in cases of ailments arising from a too generous diet, and the juice is a wholesome laxative. All íruit is more or less laxative, and good for constipated people, when eaten fasting.

Oranges have been recommended in certain cases to persons of a diabetic tendency; but

|  | Water per cent | Carbo. hydrate (gugar) per cent | Proteln per cent | Acids per cent |
| :---: | :---: | :---: | :---: | :---: |
| Apples.. | 83 | 19 | 1 | 1 |
| Apricots | 85 | 10! | 1 | 1 |
| Bananas | 74 | $\because 3$ | $1 \frac{1}{2}$ | - |
| Blackherrice | $8!$ | -12 | 1 | - |
| Cherries | 84 | 10 | 1 | 1 |
| Currauta | 85 | 8 | 1 | $1 \frac{1}{2}$ |
| Dates | 1is | 75 | 2 | - |
| Figs . . | 18 | (i8 | 11 | - |
| Gooseberrica | 40 | $\bigcirc$ | $\frac{1}{2}$ | 21 |
| Grapes | 78 | 111 | 1 | 1 |
| Oranges | 87 | 81 | 1 | 1 |
| Peaches | 89 | 11 | $t$ | 1 |
| Peara . | 88 | 11 | d | 1 |
| Plums | 78 | 15 | 1 | 1 |
| Prulies | $\underline{9}$ | 71 | 2 | 23 |
| Ralsing | 15 | 74 | 21 | 2 |
| linspberrles | 84 | ¢ | 1 | $1 \frac{1}{2}$ |
| Rhubarb .. | 94 | 21 | $\frac{1}{1}$ | 1 |
| Strawberrics | 89 | 6 | 1 | 1 |

Fruit. Table showing the average food content of ihe principal varieties of fruit
patients should consult an expert physician before experimenting with swect fruits.
Watery fruits, such as melons, limes, oranges, and apples, are wholesome thirst quenchers, partly through the water they contain and partly by stimulating the flow of saliva.

Fruit should be eaten only when fully ripe, but not when beginning to decompose. In cities fruit is frequently sold in a very underripe condition. It is then indigestible, and lacks the sugar which forms its chief nutritive matter. In strawberrics is found the same acid that is contained in apples. Lemons and oranges contain citric acid. These acids undergo a change in the bodily chemistry, and do not increase the acidity of the blood
The best time to eat fruit is about two or three hours after a meal. Immediately after food it very often interferes with digest ion.

A person suffering from gastritis or diarrhoca would aggravate his malady by eating fruit. In some people, too, many fruits produce Hatulence. Fruit containing many seeds, including strawberries, raspberries, black: berries, figa, and currants, often cause great irritation of the inteatine in children and elderly people.
Plums, peaches, and apricots are rather tough, and unsuitable for people of weak digestion. The most digestible linds are oranges, grapes, grape-fruit, raspherries, and fully ripe apples and pears.
The Growing of Fruit. The growing of fruit is a matter of considerable interest, and there are many who wish to have, not merely a few apple, plum, pear, or cherry trees, but a garden or orchard in which a variety of fruit can be grown on scientific and economical lines. Such a garden should include what are known as top trees, i.e. apples, cherries, plums, etc., be tween which trecs bearing soft fruit, as it is called, i.e. currants, gooseberries, raspberries, as well as straw. berries, should be planted.
The varieties chosen must be suited for the particular soil; the manner in which the trees are to be trained must be settled beforehand and the plantation must be arranged so
 planted in the corners of each square, with
lillers and soft fruits in het ween.

In plantations of this kind thinning is effected in the following manner: The small fruita are grubbed as soon as the permanent tices or fillers require more space, and later on $\times$ the alternate fillers themselves are reinoved, thus leaving a tree in the centre of each square formed by the jermanent trees Finally, when the permanent trees are nearly full grown, the remaining fillers nust also be grubbed.

The quincunx method of planting is very like the square system. The plantation is arranged in a similar series of squares and the perinanent trees are

Fruit plantation with two varieties of apple -Lane's Prince Albert and James Grieva ( 1 a planted alternately at distances or 14 square leet. Between them, soft frwits $X$ such as raspherries and strawbarries should be olantel
way, except that a tree is planted in the centre of each square As a rule. the trees planted in the centre of the aquare are fillers, but if they are to be retained permanently, an upright variety must be sclected so that all chance of overcrowding is avoided Interplanting with fillers and soft fruit can be carricd out quite as easily as with the square

In the case of triangular or hexagonal plantations the trees are planted at the comers of a serics of equilateral triangles, and are, therefore, equidistant. Such plantations cannot be thinned satisfactorily, and the system is only suitable for plantations consisting entirely of permanent trees. In the cordon system the trees are planted in rows 6 ft . нpart and 2 ft .6 in . apart in the rows. The direction of the rows should be north and south, and the trees trained at an angle of 45 degrees to the ground inciining to
the south
The following are suggestions for plantations of fruit : Bush apples, for example Lane's Prince Alhert and Jaines Grieve, may be planted on the square system, lif ft apart. They should be inter. planted with red or black currants or gooseberries at 7 ft . Alternatively Newton Wonder and Lord Derby can be planted at 20 ft. syuare apart, also on the square, and bet ween them soft fruits at 5 ft . square. A third scheme for bush apples is Worcester l'earmain and Allington Pippin at 18 ft., interplanted with soft fruits at Gft. If half-standard trees are preferred Newton Wonder and Four Systems of Planting. There are in all Allington Pippin should be planted on a 24 ft . four systems of planting top fruit trees: square system. In this case bushapples, pears, square, quincunx, triangular, and cordon. For plunis, or cob nuts can be planted in the the square system the land is marked out in a centre of each square, and the intermediate land can then he interplanted with soft fruits at 6 ft . square.
Turning to plums and pears bush plums of the Victoria and Czar variety planted at 14 ft . square make a good plantation. Soft fruits can be planted between them at 7 ft . square. Bush pears of the Conference and Durondenu variety can be planted at 12 ft . square with soft fruit at 6 ft . between them. A more claborate scheme is for a mixed plantation of standard trees. Apples of the Bramley Seedling and Lord Derby variety should be planted at 40 ft . on the quincunx plan. Between them bush Czar plums should be interplanted at 20 ft . The intermediate land can be planted with Stirling Castle or Lane's Prince Albert apples as fillers at 10 ft . square or witli soft fruits at 5 ft .

Fruit trees may ho planted at any time during their dormant period. provided the land is in a dry, friable condition so that the soil can be worked well in amongst the roots and the land can be firmly trodden without puddling it. The best time to plant is in November
system
that the trecs have suflicient space to grow without overcrowding. Top trees take about 30 years to reach their prime : soft fruit trees take a much shorter time.
The land selected for a fruit plantation, if at all exposed to high winds, must he protected by a windbreak. Iombardy poplars are generally used for this purpose Cuttings a bout 1 ft or 1 ft .6 im . long and 3 ft apart should be planted along the boundarics of the plantation the saine year as the top fruit is planted, and hey will have grown into a high hedge by the time the fruit trees begin to bear. If a shelter or hedge of poplar is not considered sufficient, the lirst row of fruit trees should consist of damsons or plums of the Monarch or Kentish bush variety, which will serve as a rcond shelter.
Fruit plantations nust be properly fenced to prevent damage from hares and rabbits when the trees are young, and pilfering whel yegin to bear. varieties is always difficult. Success is fairly certain if only standard varictics are planted, but it is desirable to makic careful inquirics as to which are the most successful in neighbouring plan tations, so that the selection can be based upon local knowledge of the soi and its capacities.

Caremust he aken that each tre s allowed suflicient space for growth It is a great mistake to plant trees so closely that when half-grownthey have to be pruned very severely, as this leads to a great decrease in the ecreare in the
 Newton Wonder 11 and Allington Pippin (©) varieties are planted at distances of 24 square leet. In the centre of each square is a nut or bush plum a and between the apples, at a distance of 6 square feet. is soft fruit $\mathbf{x}$
Bu rermiasion of II.M. Stationery $\begin{gathered}\text { office a the Ministry } \\ \text { oriculture }\end{gathered}$


Fruit: Planting a tree. 1. Wrong and (2) right methods of planting and manuring. 3. Hole prepared. 4. Right depth for planting i the arrow
shows where the old soil ends. 5. Right method of tying a stake alter shows where the old soll ends. 5. Right method of tying a stake alter
planting. 6. Tying at a later stage. 7. Good example of planting and


Put them into a preserving pan, allowing a quart of water to every pound of fruit. Heat it up, then strain it carefully through a jelly bag and add the juice of 1 lemon and \} lb. of sugar to every quart of syrup. Stir the whole until the sugar has dissolved nnd, when cold, add is little ice and serve.
Various kinds of sytups uscful for flavouring purposes are made in much the same way, except that less water is used The juice of the fruit is either squeezed out, ns in the case of orangea, and then boiled with a little sugar, or extracted by stewing with sugar and a little water, and then position of each tree should be clearly marked hoiled up with more sugar. See Loganberry with a packing stick, stake, or white.

Bush Fruit Trees. Fruit trees may also he grown in pots, and although such cultivation is thoroughly practicable, it is not a profitable proposition without glass. Good specimens should be obtained during the autumn from a nurseryman specialising in cstablished pottrees. Repotting is a most important factor, heing necessary every few years to keep the trees healthy and fruitful. Roots should always be freed of old exhansted soil previous to potting, and clean pots with ample drainage jrepared to receive the plants. A layer of broken turf is then placed on top of the crocks and the roots placed in position. Soil must he well distributed, and made very firm with a potting stick. Pots of about twelve inches in diameter are a suitable size. Leave an inch or so between soil and pot-rim for watering Alter potting give a thorough soaking.

Early in the year the trees are placed under glass; a temperature of 40 to 45 degrees is high enough for the first few weeks; this mas be increased to 50 to 55 degrees later on. When the trees are in blossom the greenhouse must he ventilated freely

Pot fruit trees are placed out of doors when the crops have heen gathered: they must be in a sunny position, the pots plunged to the rims in ashes. Careful watering is necessary to ensure that the soil does not become dry. Pruning is done chielly by dishudding to pre vent the growth of superlluous shoots. Apples, plums, cherries, and figs are suitable for this form of culture.

Removing Fruit Stains. Bcfore it has time to dry the alfected part sliould be covered with salt and then washed without soap, the nikali in the latter tending to fix a stain rather than to remove it If the stain is dry, the material should be stretched over a basin and water which is almost boiling poured over the mark. Very delicate fabrics may he treated by spreading them over a piece of blotting. paper and then sponging on the wrong side with hot water. If the mark still remains, moisten it with a little lemon juice and then rinse it with hot water

Fruit stains on the hands can be removed with olive oil and castor sugar. Mix a little of the sugar and oil to a paste, and then rub this well into the skin. Let it remain for a few minutes before washing the hands in warm soapy water. Obstinate stains may need two or three applications. See Stain.

FRUITADE. Black or red currants, whortleherries, and raspberries are probably the most suitable fruits for making this drink.

Mulberry ; Orange; etc

FRUIT SALAD. This attractive dish is a favourite swect for parties and also for the dinner table in summer Fruit salad is made from uncooked fruits, either fresh, canned, or hottled. The more varieties of fruit contained in the salad the better it is. Pineapple chunks form a good foundation. The salad can be served plain or with cream, ice cream, or custard, with chopped nuts or desiccated coconut as a garnish. Tinned fruit salad can be obtained ready mixed for use
To make the salad of oranges, bananas, and apples, or other comparatively dry fruits, a syrup must be made from sugar and wnter boiled together and coloured pink with cochineal. The fruit should he sliced, sprinkled with castor sugar, covered over. and put aside for an hour or so, and the syrup poured over when cold. A wineglassful of sherry added to the syrup is an improvement. liruit salad can be scrved in separate small glasses or in a bowl.

FRUIT SAUCE. This snuce can be made from either fresh or bottled fruits. To prepare it, boil tngether 2 gills of water, 2 breakfastcupfuls of red or black cuirants, raspberries, or any similar fruit, and sugar to taste. Skim the sauce frequently, and when it thickens strain and serve it with any swect pudding.

FRUIT SLICE. This labour saving device consists of a special knife which preels and also slices fruit quickly and neatly. Such a knife


Fruit. Below, seedling Japanese qulnce and, above, single-stemmed red currant tree, grown in pots
mny also be used for peeling and slicing ur chopping vegetahles.

FRUIT TART. Various kinds of fresh or hottled fruit, used either separately or in conjunction with others, are employed in the making of fruit tarts. Blackherries and apples, raspherries and red currants, and apples and rhubarb are suitable combinations, though any one may be used alone. See Pastry.

FRUIT TRAY: How to Make. A useful article, frequently in demand, is a fruit storage tray. Convenient sizes are 24 in . by 16 in ., 27 in . by 18 in ., and for a fairly large size 30 in . by 20 in Imerican
whitewood is very suitable for making one, but birch, beech, white pine, ash, satin walnut, and common deal can be pressed into service, allowing a shade extra for thickness for the ast-named kind of sood.
Fig. 1 shows a useful type of tray. The sides can be 4 in wide, and are cut to shape to allow a frec flow of air to the fruit, at the same time giving hand clearance. Kidncy-shaped hand holes are also indicated in the ends. The sides can be nailed together, and are stiffened in the angles by blocks. These can finish $1 \frac{1}{4}$ in. by $1 \frac{1}{4}$ in. by if in. long, and when in position will recess $\frac{3}{3}$ in. below the top edge of the frame and project $1 \frac{1}{2} \mathrm{in}$. below it to form toes. The recessing of the blocks will permit of similar trays standing firmly above one another when being stacked.
Close up to the blocks, and in the centre, three cross rails, about $1 \frac{7}{7} \mathrm{in}$. by $\ddagger$ in., and with the upper edges rounded away, are let in llush with the hottom edge of the frame and screwed. The lath bottom of $1 / \mathrm{in}$. by $\frac{1}{8} \mathrm{in}$. lengths is screwed or nailed to these and to the framing (Fig. 2). The stretcher can be cut in right through, as at $A$, but is hest masked by setting the ends $\& \mathrm{in}$. in front face of the framing

Racks for Trays. In stacking, the difh. culty is always that to get at the lower trays, all the upper ones have to be lifted off. Some form of rack, therefore, has its uses, and that sketched at Fig. 3 is easily put together. Four 5 ft . lengths of 2 in . by 2 in . mnterial will serve for the uprights, with the rails top and bottom of the same material cut to the necessary widths and depths. These are mortised and tenoned together, and an additional rail, 3 in. by 1 in., dovetailed in or screwed at bnok, can be added for fixing to
the wall. The main feature of this design Wash and dry it well, removing any unis that each tray will draw out, bearing being eatable parts. Lay it in a saucepan with cold obtained by glueing and screwing a $1 \ddagger$ in. by water to cover it, and a little salt, and dry $\frac{1}{2}$ in fillet to the sides of the dravers, so that it and cut it into thin slices, dipping each these can travel on similar fillets of the same piece into flour seasoned with salt and pepper. width and thickness, screwed horizontally, and Heat about 2 oz of good dripping in a frying at equal heights to the inside of the front and back uprights to serve as slides. The corner blooks of trays must not in this case project below the bottom If properly spaced a


Fig. 3

Fruit Tray. Fig. 1. Tray with recessed blocks, allowing similar trays to be stacked above. Fig. 2. Parts of the iruit tray: A. side cut away for stretcher. Fig. 3. Rack lor bolding trays, which can be drawn out separately
tray ean be insorted between cach pair of pan, lay in the fry and cook it a rich brown. sliding trays, so that it travels on the edges Take out the pieces and keep them hot of the tray immediately below it Fig. 3 should malie these points clear.

FRUIT TRIFLE. This makes an excellent party sweet. Prepare it by splitting a sponge ring into halves, spreading it with apricot jam, and placing the bottom half in a dish. Drain the syrup from a small tin of fruit ralad, heat it, and then pour some of it over


Fruit Trifle. Popular dish for a children's party
the aponge in the dish. Put on the top half of the cake, soak it with the remainder of the syrup, and, if liked, also pour over it $\frac{1}{2}$ gill of sherry. Beat together one whole egg and the yolks of two others, and add to them 1 pint of milk and 1 dessertspoonful of sugar. Pour the custard into a jug, and stand the latter in a saucepan of water over the fire, stirring its contents until they thicken

Add a little vanilla Havouring, and when the custard hegins to thicken take it out and leave it to cool. Then pour it round the outside of the sponge ring until it is not quite level with the top of the cake, and leave it to get cold. Heap the fruit salad in the centre of the ring: add a pinch of salt to the whites of the two eggs, and whisk them to a stiff froth Fold into them a dessertspoonful of eastor sugar and shake them all round the top of the sponge cake, leaving some of the fruit in the centre uncovered If sufficient, shake the remainder over the custard and sprinkle the whole with chopped pistachio nuts

FRY. Such parts of lamb and pork as the liver, heart, etc, are known as fry, and, in the case of pork, also as haslet or liarslet. The sweetbread is also included, and in lamb this is considered a great delicacy. The most usual way of preparing such a fry is as follows:
while the gravy is made. Into the fat in the jan sprinkle a level tablespoonful of flour, fry this a nut-brown colour, taking care that it does not burn. Pour in $1 \frac{1}{2}$ gills of stocli and stir the whole over the fire until it boils Season carefully, arrange the fry in a hot dish, and strain round the gravy. If liked, a small chopped onion can be fried with the meat. If liver alone is served, garnish with bacon. See Bacon; Liver; Sweetbrcad

FRYING. Frying consists of cooking food in smoking hot fat or oil As it is the quickest method of cooking, it is especially useful in an emergency when dishes have to be prepared at a few minutes' notice. Cheap pieces of meat with tough fibres should never be fried, the rapid cooking only serving to make them more tough, hard and indigestible. Fat must reach a far higher degree of heat than does boiling water before food can he successfully fried in it, and should give off a faint blue smoke before the actual frying commences.
There are two methods of frying, the shallow or English method, and the deep or French method. In shallow frying only a small quantity of fat is used, and when one side of the food is cooked it is turned over so that the other side will cook. Deep or French frying requires a deep pan containing enough fat to cover well the food to be fried. French frying is used for rissoles, filleted fish, fish-cakes, etc., and the artiole to be so cooked is coated with batter, egg, and breadcrumbs or pastry. With both methods the fat must be beated until a blue smoke arises before the fond is put in.
Of the two methods, deep frying is the more economical, for though it requires a large amount of fat,


Fuchsia. Method of propagation. 1. Unsaitable cutting. 2. Sturdy shoot with heel (a). 3. Potted shoot with sand round heel. 4. Several cuttings in single dot ; A, sand. 5. Cuttunga in glass-covered boy. 6. Old plant praned
to lurnish side shoots

them on until they are big enough to occupy a good-sized tub.
Ordinary loamy soil, with a little leaf-mould, decayed manure, and some sand will suit the plants. During the flowering season they should be well watered In the winter they should be dried off. Cool-house treatment will suit them all through. Before they start into growth in the spring they should be repotted and cut back.

Propagation is simply effected by putting young shonts in sandy soil under glass in August. These cuttings root very freely, especially in a propagator.

In spring the shape of the plant must be decided on. If a standard fuchsia is wanted the plant is allowed to reach the desired height of stem before it is stopped. If a pyramid is wanted the top of the plant should be cut off to ensure the development of side shoots. Magnificent, tall, pyramid-shaped fuchsias can be obtained by carefully stopping and training and by repotting as becomes necessary

Hedges and large bushes of hardy fuchsias are familiar to all visitors to the south-west and other mild districts of the British Isles. These shrubs will also Hourish in colder districts, though there they are often cut to the ground by frost in winter. If a covering of old ashes is placed over the roots in autumn the shrubs will usually start into fresh growth in spring. The best of the hardy fuchsias are macrostemma, Riccartoni, and gracilis. See Bedding; Greenhouse. Pron. Fow-shah.

FUDGE. A sweetmeat that hails from America, fudge is made from white or brown sugnr, milk, cream or condensed inilk, butter, and Havoured with chocolnte, coffee, and vanilla cessence.
The ingredients required for chocolate fudge are $\frac{1}{2} \mathrm{lb}$. brown sugar, 2 tablesponnfuls of butter, 4 tablespoonfula of chocolate powder, a small tin of unswectened evaporated milk or a teacupful of milk, or $\frac{1}{2}$ teacupful each of cream and water, and a little vanilla easence, Mix the chocolate powder with the milk, cream, or evaporated milk to a smooth paste. Melt the butter in an enamel or aluminium sancepan. Add the sugar and chocolate by degrces and boil up gently until a little of the mixture dropped into a cup of cold water hardens when rubbed between the fingers. Remove from the stove and add the vanilla fla vouring. Pour the mixture on to a shallow buttered tin and mark it out into squares with a knife before it sets.
Another and cheaper way of inaking chocolate fudge is by using 4 tablespoonfuls of cocoa powder instead of chocolate.

Coffee Fudge. To make this use a teacupful of golden syrup, a breakfastcupful of brown sugar, a small tin of unsweetened, condensed milk, a tablespoonful of butter, and 2 table
ordinary or bituminous kind Other fuels are anthracite and coke, used for special slow combustion stoves and for boilers. In country districts a good deal of wood is used, while in some parts of the country peat is burned. Oil. too, is employed as fuel, while electricity and cosl-gns, though not strictly fuels, can be used for warming rooms, heating water, melting metal, and similar purposes. Peat is only found in certain parts of Grest Britain, Cleshire. for instance, and owing to its smouldering propensities is only suitable for fires that are not intended to brighten as well ns warm n room. There are also pntent fuels on the market, but the valucof these varies

Gas fires and cookers and electric henters and conkers arc installed in many homes. In others a system of central heating is arranged, but in all these a certain place is usually left for coal fires, which. although somewhnt waste ful, have attractions for so many persons

Special coke grates are procurable which coin bine the cheerful glow of the open firo with some of the advantages of the gas firc. The coke is ignited by gas jets at the hottom of the grate, which are turned out after about 20 min. the coke then being well alight. In an ordinary grate, with: coal as the main fucl, logs of wood can be burned, and if oak or any other good hardwood is bought it is not unduly expensive. See Anthracite; Coal : Coke; Electricity ; Gas; Oil ; Peat; Wood.

FULHAM WARE. The stoneware produced by John Dwight at Fulham in the last quarter of the 17 th century is highly prized because it marks the beginning of great art in English pottery. Examples of the fine statuettes which he moulded are not often net with.

There was a Iarge output of Fulham ware of morc useful types, readily distinguished from the Cologne ware on which it was founded, and this may be collected to advantage. Besides greybeards it includes brown mugs and


Fudge. American sweetmeat resembling soft toffee, made in various flavourings
lankards, sometince with hunting scenes and Hogarth designs in applied reliefs. There are also Hasks and jugs with horizontal ribbing round the neck, simple noggins with little or no decoration, and the like

This domestic pottery successfully displaced the Flemish Grès ware of the time, and was the forerunner of Staffordshire salt-glaze. Modern Fulham ware is represented by normal types of brown stoneware and other domestic designs See Pottery

FULLER'S EARTH. This mineral is used as a dusting and cleansing powder, both for clothing and for the skin. In the former case it is efficacious in removing greaso from woollen and other fabrics, and enters into the composition of some makes of cloth ball.

Fuller's earth is used on the skin, especially when a bland, inert covering is required for an irritated or chafed surface, and is therefore an ingredient in certain soaps and face creams It is sometimes used for powlering the skins of babies, but when applied as a dressing for the navel or inflamed buttocks of infants it appears to have been followed by tetanus or lockjaw. A powder containing boracic acid is always thercfore to be preferred for this purpose. Fuller's earth can also be employed for clenning lloors and other wooden surfaces. See Boracic Acid: Cloth Ball: Clothes Face ; Stain, etc.
FUMED OAK. Oak can be darkened by subjecting it to the fumes of ammonia. This gives an appearance of age and enriches the


British afuseun
24 hours in a case, cupboard, or small room, with one or more open saucers of liquid a mmonia. A packing-case should have strips of paper pasted over joints that are at all open If one or more panes of glass can be fitted as windows the work can be cxamined without opening the case and letting fresh air in. A quick test of the effect ammonia will have on the wood can be made by placing a piece on the open mouth of the aminonia bottle. A trial for a few minutes will show whether the wood can be fumed or not.

Fuming is usually done after the construction of the article is finisher.. but before the application of varnish or polish.

FUMIGATION. The idea that houses require fumigation after illness from some infectious disease is being rapidly dispelled. It is now generally recognized that in the majority of cases infection is spread by contact with a patient suffering with, or recovering from, the infectious disease. Fumigation of rooms after
such cases has heen discontinucd in many large towns and boroughs without any increase of infectious cases, though spraying with disinfectant is carried out instead
Fumigation of rooms for the purpose of getting rid of houschold pests is still common, but here again the advent of the modern form of penetrating spray, together with the discovery of suitable insecticides, has largely superseded the use of a gascous disinfectant as a means of exterminating insects. The flumigation of tooks, gloves, hoots, fancy leather work and dresses and all fabrics which are likely to be ruined by steam disinfection is still carricd on Ronms or othor spaces to be fumigated must first be sealed hermetically, and can then be treated aclequately by funigation if desired

Sulphur or formalin are most often used. Sulphur may te used in the form of crushed rolled sulphur or as sulphur candles. These arc ohtainable in varying sizes from chemists, and are provided with instructions as to the number required ior a given space. Liquid sulphur eas in cylinders may also be used. The room should be liopt, sealed for at least 24 hours.

Formalin is usually employed in a special apparatus which heats the liquid, causing the gas contained in it to be given off. From 10 to 15 oz . of formalin are required for every 1,000 cubic ft of space. Another method is to pour $10-15 \mathrm{oz}$. of formalin on to $\overline{\mathrm{oz}}$. ol potassium jermanganate crystals contained in r deep dish. Enough gas is produced to treat 1,000 cubic ft . of space. Formalin may alsin be used in the solid form of paraform tahlets. These heated in a special lamp give off formalin gas, 30 tablets heing used for 1,000 cubic ft . of space.
In all methods of formalin funigation the room should he kept warm and moist, and remain sealed for at least six hours. After fumigation the room slould be well aired and thoroughly cleaned.
Other Uses of Fumigation. Fumigation is also practised for protecting plants, frinit trces, and the like from the ravages of garden pests. Imong those used in this connexion are carbon bisulphide, formalin, and hydrocyanic acid gas. Carbon bisulphide is recommended for use against the apple sawtly, as injections of it will destroy the pupae of the sawfly in the soil. As it is poisonous care should be taken not to inhale it freely.

Fumigation may be used also to destroy rats, but this is inadvisable where they are in dwelling-houses, and it must be employed with great care wherever food is stored. For burrows in the open earbon hisulphide may be used. A large wad of cotton wool, rags, or similar material should he soaked with the liquid; this should be at once inserted in one of the main burrows, and its outlets and inlets closed up. The liquid evaporates, permeates through the burrows, and asphyxiates the rats. This fumigant is not only poisonous but inHammable. No light, therefore, should be brought near it. Fumigation is also one of the mathods employed for destroying "asps, and in a different way for protecting furniture. See Disinfection; Furniture; Rat; Spray; Wasp.

## Fumitory. See Corydalis

FUNERAL: The Arrangements. When n death takes place, the nearest relative, or someone acting for him or her, must make arrangements for the funeral, which should take place not later than the fourth day from the death of the person.

The first duty is to sec that the body is properly laid out, this task being usually performed by a woman. If $n u$ one is known, an undertaker will supply one.

The next urgent matters are to notify the death to the registrar, to choose the grave,
and to fix a time for the funeral. If a doctor has been in attendance he will give a cortificate of death, which should be taken to the registrar for the district, at whose offices the necessary particulars about the deceased, age, etc, are entered If no doctor has been in attendance, the coroner must he told, and he will arrange for an inquest, if necossary.

In undertaker should he sent for, or visited, and terms arranged with him. Usually, on knowing how many persons be must convey, the place of the burial, and other such matters, he will fix an inclusive fee for carrying out the funeral, including not only the hire of cars and hearers and the purchase of the coffin, but the payments at the cemetery and the fees to the clergyman or minister and others He must he given the death certificate which has been supplied by the registrar, and which he must show to the officiating clergyman.
The grave should then be chosen by visiting the cemetery or churchvard where the deceased is to be buried. The undertaker will also make this arrangement if requested. In some cases the ground for the grave must be bought outright; in others only an interment fee is charged. Where there is a family vault, notice must be given that it is to be opened. In parish churchyards there is usually some difference made as to fee between parishioners and non-parishioners. The time for the funeral must be fixed, in conjunotion with the undertaker, and the invitations sent out

The service will be conducted by the clergyman or minister attached to the graveyard unless the mourners wish for their oun clergyman, in which case they should acquaint the one in charge with their wishes. It is usual also to put a notice of the death in The Times, The Daily Telegraph or the local paper. This may give the time and place of the funeral, and if no llowers are required it should state that fact. Relatives only may bo invited, but in other cases invitations are extended to friends. In the case of persons having a large circle of friends it is not uncommon to hold a service, to which all friends arc invited, quite apart from the funeral ceremony proper
The Funeral Ceremony. On the day of the funeral the guests arrive at the house just hefore the time appointed for the procession to leave it. After the coffin has been carried out they will be escorted to the cars, the nearest relatives taking precedence over the morc distant ones and over friends. In nost cases friends go to the church, but only near rela. tives to the house.

On reaching the cemetery a service will be held in the church or ohapel, and then the mourners will follow the hody to the grave, where the burial sentences are recited. The guests may return to the house, where perhaps light refreshments are served. On returning to the house the blinds which were drawn down during the ceremony should be pulled up.

For hodies that are cremated a somewhat different procedure is followed. An undertaker is secured and he will make many of the arrangements, hut two doctors must view the body and give their certilicates heforc the ceremony can be carried out. See Cremation; Death; Flowers; Mourning; Vreath.

FUNGICIDE. A fungicide is a preparation for billing fungus on trees and plants. Two that are recommended for fungus on fruit trees by the Ministry of . Igriculture are Bordeaux mixture and lime sulphur at summer strength. Fungicides should always be ap. plied as preventives rather than as remedies, as attacks by fungi develop very rapidly. The best way of preventing an attack is to cover the vulnerable parts of the tree, i.e. leaves, fruit, and young wood, with a fungicide, applied as a very fine spray.

Fruit trees should be sprayed with lime sulphur in February-March before the huds
arc advanced in growth. Amateurs arc advised to purchase lime-sulphur concentrate from horticultural dealers rather than to attempt to make the mixturc themselves, and to dilute it according to the directions. Bordeaux mixture is used just before the blossoms open and again as soon as they have fallen. If lime sulphur is used when the trees are in leaf a weaker solution is required or the leaves will be damaged. Spraying black currant bushes with lime sulphur from midMarch to mid-May at fortnightly intervals is the best way to get rid of hig bud or black currant mite. Bordeaux mixture can be obtained in concentrated form, and then needs merely to be mixed with water

Black spot and mildew on rose trees can be controlled by spraying the trees in mid-winter with sulphate of copper, one ounce in threc gallons of water, by using Bordeaux mixture in March, and liver of sulphur, one ounce in threc gallons of water, occasionally in summer. See Bordeaux Mixture ; Fruit; Lime Sulphur; Spraying.

FUNGUS. This name is applied indiscriminately to parasitic plant diseases that are caused by spores. Fungous diseases such as apple canker, finger and toc disease, are dealt with under their respective headings.

Sometimes poisonous fungi are mistaken for edible mushrooms, with serious consequences. Some varieties are poisonous to all who eat them ; others may be harmless to the majority of people and poisonons to a few, owing to some idiosyncrasy. Even edible mushrooms are indigestible, and may cause diarrhoea in delicate persons and children. They decompose rapidly and should always be eaten fresh. When mushrooms are cooked, set aside, and then warmed up again, they may be harmful owing to the development of poison.

It is not easy to distinguish the harmful from the harmless kinds. A Ministry of Igriculture pamphlet points out that certain tests are quite fallacious. For instance, it is widely believed that the contact of poisonous fungi tarnishes a silver spuon, that all fungi which grow on wood are dangerous, and that an edible mushroom may he known by the fact that the skin is easily peeled off. These heliefs are not to be relied upon.

Poisoning by Fungus. The symptoms of fungus poisoning may not come on for 10 or 12 hours, or even later; then there may be severe pain in the abdomen, followed by vomiting and diarrhoea. The muscles twitch, the skin becomes cold and clammy, the breathing rapid, the pupils of the eyes dilated and the face pale. In some cases nervous symptoms, headache, giddiness, etc., precede or take the place of those indicating irritation of the stomach and howels. The heart gradually fails and the patient collapses. The case inay run on to coma and end in death.

The doctor must be sent for al once, and meantime give an emelic. Use whalever is at hand, rather than have any delay.
A tahlespoonful of inustard or two of salt in a large tumbler of tepid water answers admirably. If these arc not available, give large clraughts of lukcwarm water, and tickle the hack of the throat with a feather. Follow the emetic with a good dose of castor oil ( 1 oz . for an adult).

Kecp the patient lying down in a warm room, and well covered with hlankets. Apply cloths wrung out of hot water, or hot poultices, to the abdomen. Rub the arms and legs vigorously to promote warmth and prevent cramp. Give suitable stimulants, such as hot coffee, hot milk, hot brandy or whisky and water, or a teaspoonful of sal volatile. See Ipple Canker; Brown Rot; Canker; Emetic; Mildew; Mushroom; Poisoning ; Toadstool.

## Furs: Their Varieties and Uses

## The Choice and Care of these Valuable Garments

In this work our readers will find entries on all the popular furs, e.g. Chinchilla: Ermine Musquash, etc. The articie on Rabbit is also of interest. See further Clothes Moth; Rug, etc.

The term furs includes tur coats of various kinds, neckilets, animal ties, wraps, cloaks, capes and muffs Fur is also used for making collars and cuffs and for lining coats, gloves, and motoring rugs : another use is for trimmings and edgings, while felt hats are also made of it. Fur rugs, made chiefly from racoon, goatskin, sheepskin and white bear are used on Hoors and as hearthrugs More costly furs may be used for travelling rugs, and leopard, gazclle and wild cat skins are sometimes employed for upholstery
While the retail price of furs varies somewhat according to fashion, and bargains can be acquired at special and summer sales, certain skins are always highly priced. The value of a fur skin depends upon the colour, texture and durability of the fibres of the underfur, and also upon the pelt. The coats of fur-bearing animals are at their hest towards the end of the winter. The sea otter is ranked as a standard for the seven most precious furs taking the wearing quality of this fur as 100 the other furs compare as follows : Seal, 75 ; sable, 60 ; silver or black fox, 40 ; ermine, 25 white fox, 20 ; chinchilla, 15 .

If the best value is to be obtained, furs should be purchased from a reliable furrier. Imitation skins, so treated as to render them almost indistinguishable from the genuine article, are sold under a variety of names Some of these skins are hard-wearing and, therefore, economical to huy, but others are apt to develop a worn and shahby appearance with undue rapidity.
Rabbit is used extensively as a substitute for seal, erinine, dyed musquash, sable, beaver, chinchilla, and nutria; goat is frequently made to represent monkey and hear; and marmot to represent sable and inink. Hare replaces sable and various kinds of fox; lamb is treated to look like nutria; nutria is used instead of beaver; while dyed musquash often imitates seal and opossum skunk. Sometimes, too, furs are skilfully topped as a means of disguising their real origin, or to enhance their appearance, as, for instance, when light sable is topped to give it the Russian sable colour. This process consists of brushing the top bair with a colour which imparts richness to the fur, while another device is to insert white hairs in the skin of a cheap fox to give it the appearance of silver fox. Badger hairs are used for " pointing" purposes

## Wide Choice of Furs

Furs of the hard-wearing order include astraklian, badger, beaver, mink, goat, bear. seal, musquash, and skunk, but if grace is desired, then mole, sable, chinchilla, marten, fisher, broadtail, fox, and ermine may bc selected. Where cheapness is the main consideration, rabbit, racoon, opossum, fitch, hamster, hare, marmot, Thibet, wallaby, and the smaller wolves are to be recommended.

For women of limited means fur coats are not a wise investment. In mink or other expensive furs they are outsice the usual range of price, and even in cheap furs such garinents are not relatively low priced There are still the considerations of the work of the sorter who matches the skins and of the skilled cutter. At a good furrier's both sorter and cutter command high salaries and have acquired their art through long years of training and experience. A satisfactory fur coat cannot be cheaply priced if it is to preserve a good shape and appearance Poorly sorted skins and badly cut garments of this type look ostentatious and clumsy

The ideal lur coat is warm without being unduly heavy. Hudson seal, which is merely musquash deprived of the top hair, is a skin which makes up into comparatively light coats. It tends to split, however, and is therefore not so bard-wearing as might be desired When a split occurs, the two edges of the eather should be brought together and oversewn at the back, while if the leather itself has perished a new piece of fur will be required. To carry out these renovations it will be necessary first of all to remove the lining. Where a cheaper coat is required, dyed coney or sheared lamb is chosen. Moleskin coats, while not suited to rough wear, are liked by some wonien on account of the colour and their supple quality when well made

Fur buttons to match a fur coat can be made from odd pieces of the pelt scwn over ordinary large huttons and, if necessary, padded with cotton wool. The buttons should be attached to fur coats in this way Sew a piece of black tape, just wide enough to pass through the shank of the button, along the leather for about 2 in . ahove where the first hutton is to he placed A hole should be pierced for each hutton, and the shanks slipped through. Then push the tape through each shank and sew it firmly along between each button, finally stitching it for about 2 in ns at the commencement.

In the choice of furs the discerning woman will realize that fur should he chosen to suit her complexion and hair. A costly chinchilla or ermine scarf may not hecome her nearly so well as a marten tie Fox, too, is particularly becoming, but it is not durable.

Besides being made up into separate furs and into garments, fur is also used for trimming purposes. On winter coats or wraps of velour cloth and sitnilar materials long-haired furs such as lynx or wolf may be used. Lighter


Fur. Moth-proot wardrobe for storing furs, adapted from a cedarwood cigar cabinet
lurs, such as the various dyed conies, sheared lamb, foxaline and also sable, ermine and white or grey dyed fox are used to trim summer coats and evening wraps. Fur sets of collar and cuffs can be purchased unlined, and also trimming in various widths by the yard It is in such sets and trimmings that the retail prices of furs vary nost, according to the current fashion, as often thesc furs are of the cheaper kinds, dyed or shaped to suit the requirements of a particular season and of no lasting value.

While valuable furs which have become old-fashioned in shape are best re-modelled by a furrier, cheaper furs or odd pieces, if care is talien, may be cut at home. If a furrier's knife is not ohtainahle, a strong, sharp penknife should be used. The fur must be laid on a board with the skin uppermost, and the place where the incision is to he made marked with chalk. While the cutting is being done, the fur should he held down firmly at each side. To join two pieces, place them together with the fur inside and oversew the edges. Do not draw the stitches too tightly or the fur will pucker.

Care and Storage. The care of furs is important, for proper treatment adds considerably to the length of time during which they will remain wearable. Natural furs wear best, because dye has a deleterious effect on the pelt or leather, though in some cases it is so slight as to he almost negligible. On the other hand, dyed furs are practically immune from the ravages of moth Furs should be kept in the dark and hung up whenever possible. The fur should fall in the natural way, skins such as fox being hung from the head Before putting on furs shake them vigorously, excepti in the case of such delicate skins as chinchilla After wear, repent the shaking process and go through the fur gently with a metal comb Fiur coats which have been rubhed on the under-slecves or collars should also he combed after use

Wet furs should never be dried betore a fire. Hang them up, preferably in a draught, and when the moisture has evaporated shake and comb them with care. In addition to occasional shakings, the furs should also lee beaten with a light cane and suhsequently combed in order to keep them free from inoth. The presence of the latter can be detected by patches of loose hair. Should these appear the furs are best sent to a furrier, for, though moth is not difficult to keep at bay when proper precautions are taken, it is not casily eradicated once it has actually started its destructive work.
The cleaning of furs may be done either by a professional cleaner or at home, though the former method is to he recommended in the case of valuable skins. Both hran and silver sand, when heated in a dish in the oven, make a good cleaning agent for almost any kind of fur, though sand should not he used on white peltry. Either of these should he rubbed into the fur with the fingers, and afterwards brushed or heaten out. White and other light-coloured furs may be treated in the same way with warm powdered magnesia. Frequent cleaning can be avoided by wiping the furs with a damp towel after wear

Fur hearthrugs require equally careful treatment, for they are quickly attacked by moth. In the summer they tend to make a room look too hot, and should therefore be removed in favour of cooler floor-coverings.

Cold storage facilitates the care of expensive furs during the summer months, and ensures immunity from moth. Furs bought at that time of year from a good furrier are usually stored free of charge till they are required. Special moth-proof bags are sold in which skins may be hung up while not in use, and are particularly useful in this connexion when
the owner is travelling or away from home for a long period.

For home storage of furs a useful moth. pronf wardrobe can be ohtained. The illustration shows a cedarwond cabinet adapted for this purpose, but which was originally made for packing cigar-boxes when exported to this country. Such cabinets are sold by a cigar merchant at prices varying from $\mathfrak{f} 2$ as to $£ 55 \mathrm{~s}$. Cedarwond, especially when perineated with the smell of the cigars, possesses moth-preventing properties and is of decorative valuc, for a piece of furniture of this kind either stained to darken it or preferably, if in accord with the room, in its natural state. When required for storage of smaller furs, the shelves which originally furnish such cahinets can be retained. If these have been removed, as in the one illustrated, a wardrohe rail can be ensily fixed or hooks for fur articles placed in hags to keep them free from dust.
Furlong. This measure of length contains 220 yards and is the eighth part of a mile
FURMENTY. This is prepared by boiling I quart of milk in a large sauccpan over the tire, and putting 2 oz. of stoned raisins and the arame quantity of cleaned currants in another pan containing just enough boiling water to cover them Boil them for 5 min . until they feel solt and are well swollen, then drain off the water and add the fruit to the boiling milk.
Add 1 teacupful of prepared wheat grains, 2 oz. of loaf sugar, and a little nutmeg, and boil all these ingredients for about 20 min . Then take the pan from the fire and let the mixture cool slightly, afterwards straining in 2 well-beaten eggs. Stir the whole againover the fire until it thickens, but do not let it rehoil. add a little hrandy or home-made wine, and pour the whole into a deep bowl, serving it cold
In some districts prepared wheat can be bought by the pint at any confectioner's, hut when it is not pussible to purchase it in this way it can he made at home. Do this by soaking a pint of husked whent in cold water for 24 hours, then put it, with a pint of clean cold water, in a covered jar in the oven Bake it slowly till the grains are quite soft, and it is then ready for use.

FURNACE : How to Construct. A furnace is used to melt metal for casting, and in the article Casting are given diagrams and instructions for building $\boldsymbol{n}$ useful brick furnace suitable for cast irnn or brass. The same article describes a furnace made up from standard fireclay bricks and heated by a gas blow plpe A gas-fired crucible furnace, working on the injector principle, is shown at lig. 1 on this page. In conjunction with the furnace a font blower of the type shown in Fig. 2 is employed to furniah the necessary air pressure


Furnace. Fig. 1. Gas-fired crucible furnace working on the Injector principle. Fig. 2. Foot blower used in conjunction with the furnace to give the necessary gir pressure

Mufle Furnace. A muffle furnace for the enameller is readily made from fireclay bricks, built up as shown in Fig. 3 The furnace body is strengthened with iron bands, and a loug chimney is provided to dispose of the fumes, and to create sufficient draught to cause the fire to burn well and fiercely. All oints must he luted with fireclay. and the whole well baked with the gas burner
In this style of furnace the door is usually at the end and the flue pipe at the top. The burner is locnted beneath the furnace, the latter standing on short legs resting on a substantial base of some fireprool material, such as a fire hrick or a sheet of ashestos on an iron plate A hole is cut in the botton of the furnace to admit the llames of the burner, and a simple damper regulates the amount of air admitted

Fireclay bricks can be obtained flom the ironmonger, who will also the able to procure the clay muffle to go inside furnace, the appropriate type of gas hurner (Fletcher Russell \& Co.'s) with gas and air regu!ators. and if desired a chimney with cast iron foot. The gas sup. ply tap and pipe must be large enough to allow full pressure at the noz. zle. and for the size indicated a half. inch supply is re. quired It is advisable to procure the clay muffle first and to make the furnace to suit it. Dimensions inside inufflefor the furnace in question might be 4 in. long by 2 in. high by 2 in . wide.
For a larger size a ${ }^{6}$ in. supply pipe would be needed, when mufle might be, say, 9 in . by $4 \frac{1}{2}$ in. by $5 \frac{3}{8}$ in. See Boiler; Casting; Enamclling: Fireclay, etc

FURNISHED HOUSE. In London the hest letting seasons are in the winter and during the late spring; at holiday resorts, unless also winter resorts, during the summer months. The houscs are let furnished from month to month. or for three months or ceen

longer, as the case may be. In July and August, when most people take their holidays, the highest prices are ohtained at holiday resorts, but June and September are busy months, while early lets are arranged for May ; in some sheltered spots the season lasts into Octuber.
There are two ways of letting a house. The tenant may carry out the business himself either by advertising or by private

Heaty. thus saving an sgent's commission and other incidental expenses. In most cases. how ever, it is usual to entrust it to an established firm of house agents The agents charge a small commission on the whole tranyaction that is to say, on the tutal a mount eventually realized by the let. They undertake no responsibility for default on the part of the visitor, but any risk is minimized by the stipulation for payment of half the various instalments of rent, in advance.

Thic first step is to enter in the ugent's register of houses to let, the rent required, and particulars of the accommodation available. This is intended for the information of visitors on the look-out for houses, who call on the agents and are invited to see if there is anything in the register that will suit their requirements In this manner the tenant gets in touch with prospective clients, and after that it reats inainly with the principals to come to terms when the premise have been inspected The final step is the signing of an agreoment drawn up by the agents, the cost of which is shared by the partics Under this agrecment the visitor binds himself to take the house for the term and at the rent agreed upon. the tenant paying all rates aud taxes,
If any rooms are unfurnished or partly furnished, which are occupied or used as store rooms, care must be taken to see that they are not included in the number of hedrooms and sitting rooms entered in the agent's book. This is important because if any mistake is made in this respect the tenant may be called upon to furnish the room or make $\Omega$ ieduction in the rent.

Preparing the House. One of the lirst considerations in getting a house at a seaside resort ready for a fainily with children is to arrange it so that it can be easily kept clean From this point of view linoleum is to lie preferred to carpets and rush mats to carpet mats. In case of accident it is always advisable to put away the things that are most valued amongst the household roods, especinlly silver, china and other valuable ornaments. Unless by apecial arrangement plate and linen are never included, and they should be carefully put away. Glass, china and blankets are counted ns necessaries, and reasonable supplies of these should be provided, together with all that is necessary in tlo way of kitchen utensils. Gas or electric fittings must be in good working order. and the same remark applies to blinds, curtains and door locks and any labour*rving devices.
Where the meter is not on the slot system, the gas company ought to be notified of the change, so that the incter can be read, and the tenant pays for the gas he has consumed up to the date of his departure

If the garden is any size, and has been well cultivated, the tenant may undertake to see that it is kept in onder, and make a charge for his trouble, unless the upkeep of the garclen has been included in the rent. It is more usual for the visitor to make his own terms with the gardener, but he is not under any obligation to $10 \cdot s 0$, and the tenant should bo careful to stipulate for the upkeep of his garden upon making the agreement. The latter document should also contain a clause forbidding the newcomer to take in lodgers or to sublet the house or any portion of it Sec Agreement: Cottage; Holidays.

## FURNITURE AND FURNISHING

## Good Taste and Economy in the Equipment of the Home

Other peneral information on this subject will be found under the headings Colour: Decoration. Sce also Antique Furniture and articles on the various styles, e.R. Chippendale; Tudor; and those on the rooms and pieces of the home, e.g. Burcau; Chair; Kitchen; Nursery
While modern furniture is undoubtedly have a late 17 th century dreaser as a sidea good choice for amall rooms in the average hoard, and the dining table, for the sake of flat that is to be newly equipped throughout, there is still a strong feeling for antique styles in furnishing perind houses. The great thing is to choose auch styles with a nicc apprecia. lion of their suitability to their surroundings. In old days no one worricd about period As new pieces of furniture to meet the ourrent modern nced were designed, so they were gratefully acquired by the rich and comfortably settled in the same room with the pieces of former years

Each acquisition was an event as important as the entire redecoration and refurnishing of a house to day. It is still really far more importont to acquire pieces to suit individual needs and to blend colours, shapes, woods and metals harmoniously. than to try to live in the unoomfortable replica of a room only anited to the life of many generations ago On the other hand there are reasons for selecting certain periods to inspire furnishing schemes, the chief of which is the type of the house. One may possess antique pieces and good reproductions, but while there are so many modern decorative schemes in which such picces can be pleasantly set. it is far more difficult to reconcile furniture having metal tubing frames and table surfaces of glossy enamel or glass to a Tudor setting, than to utilize successfully a refectory tahle and oak stools in a morlern dining room with painted walls and a rubber tiled foor.

The Oak Period. As many small houses of to-day are based on the 16 th and 17th century cottage and farmhouse type, it is useful to rememiner that the oak period in antique furniture coincides roughly with the Tudor and Jacobean periods in architecture, and therefore oak is in harmony with lowpitched ceilings and visible heams, brick fireplaces and casement windows. Those who wish to furnish after the style of the 17th century have to day two special conditions with which to contend. They cannot own much gennine old furniture of the period, and are likely to feel tied when trying to equip the whole house to correspond, as they cannot he limited to furniture which was aufficient for a household of 300 years ago. They have to remember that in early Jacoliean timea there was no electricity available, no gas, no sanitary arrangements, and very few carpets.
Some people solve the problem rather wisely by confining one period, such as the Jacobean, to one or two rooms of the house. For instance, a Jacobean hall and even a dining room, in spite of the limited space of to-day, are pursible to furnish with some degree of success. A carved oak cheat is perfectly at home, and forms a very useful receptacle for rugs and other articles. The Jacobean chair, with its hard wooden seat, almost upright back, and straight legs, is right in the hall, and, when cushioned, quite suitable at the table, but scarcely in a living-room where comfort and ease are demanded. The court cupboard or buffet-both terms are correct-makes a picturesque feature

The small gate leg table is more appropriate in the hall than in the dining room, because of its limited top accommodation and inconvenient underframe, which renders it awkward for the legs and feet of diners. An excellent cascment window trentment for either Tudor or Stuart period style hall is given in the article on Curtains.
If the dining room is to be furnished in this style, some liberties must be taken. It may
hoard, and the dining table, for the sake o one with centre rail henenth, but built on the lines of the old draw-table. This table, of which there are many made to day, is quite in keeping with the Jacohean tradition, while being more comfortable and convenient for a small room It was common in the 16th and early part of the 17 th century for diners to sit upon stools placed down the sides of the table. This fashion appears to day in small dining rooms (q.v.). In larger momis tall cane backed chairs namally ansociated with the period of the Restoration are often seen, up holstered in velvet or tapestry and often with fringe to trim the chair aeats The dining roon (and hall) may have a atone flagged floor to all appearances In reality it will be made of composition which is quiet to the tread and warm to the feet. Rugs of old Persian designs may enrich this flooring. Parquet is mure ordinary with a carpet of Oriental type. In this room no mahogany should be used, for it was not employed in the 17th century.

There is something to he said for the use in auch a dining room of definitely modern armchairs and settee upholstered in brown velvet and leather, as they do not clash with any. thing. Leather was a common material for the finishing of chairs in the 17 th century. A piece of furniture that well may be included in an oak room is the burean; though still existent, specimens are very rare of earlier date than the end of the Stuart period, but the bureaus was made of oak in Cromwellian times, and good reproductions are easily obtainable.

The Walnut Period. A drawing room furnished in the Jacobean style is not correct, as such a room was unknown at this period With the arrival of William III and Dutch domestic ideas after the changes of 1688, furniture undoubtedly took upon itself a more comfortable and pleasing aspect Tall sash windows were used more generally, houses became formal in plan and elevation, rooms squarer, and chairs and tables were made frequently of walnut, and showing graceful curves in their structure The William and Mary period saw the arrival of the parlour, and the alteration in social habits, particularly the introduction of tea as a popular beverage, influenced furnishing in the direction of leisured grace and comfort. Upholstered chairs, showing very little wood, began to appear, and the grand. father chair and clock are typical of the time. The picture of a room in the William and Mary or Queen Anne period is one of quiet restfulness and homely charm. The walls had broad panela, often of walnutwith gilt
enrichments, conferring greater dignity than was usually seen with the smaller panels found in Jacobean and Tudor interiors.
Inasmuch as the old parlonr suggests genetal social functions, and not specific use like the dining room. it is the model for the furnishing of the diawing room, or the more gracious type of living-room of today. The Queen Anue parlour was eminently service. able, comfortable, and homely, yet it hall a sense of style, and syinmetry, which appesls to-day as much as it did then.

The articles suitable for rooms furnished in accordance with the walnut period include a mund tea-table, chairs with and without arms, having seats covered in needlework or brucade and concave splat backs, a china cabinet, or a niche with fitterl shelves each side of the fireplace, a bureau, one or two tabourets or footstools, a chest of drawers, a dresser which is without cupboris, a folding card-table, and a sinall settee which was practically a double chair, with two splats divided by a smaller one. outwardly flaring arms and six cabriole legs. known as a courting-seat. The whole of this furniture may he in walnut, and a suitable colour for the hanginge of a room in which it is placed rould be green, though maruon. blue or yellow were often used
The beds of this perionl had very tall posts, and they were fitted with voluminous curtains, with shaped lambrequins (festooned drapery) above the bed itself was low, within a fuot or eighteen inches of the ground, and the posts were not highly decorated. Furniture made in cheaper woods was often painted and lacyuered. Gilding and inlay were also used. Lacquered leather screens, with six folding panels, were a decorative feature

Modern versions of such pieces and accessories are often seen to day. Fig. 1 shows a group of charming painted furniture. The Ledside table and chest of drawers show the earlier influence of Queen Inne designs, while the chair, though reminiscent of the ater and inore classical Adam period, blends happily The walnut period extended in the main fiom ahout 1685 to 1713.

The Mahogany Period. Through the discovery of the value of mahogany for furniture making, the 18th century may be said to be dominated by mahogany as far as furniture is


Furniture. Fig. 1. Group of modern painted furniture showing inspiration from both Queen Anne and Georgian styles, but blended by colour for use in the same room


Furniture. Fig 2. Space-saping bureau wall tirture. The flap folds up and the thickness of the piece is then 31 in. The flap below conceals space for magazines Courtesy of Rowley Galler,
concerned. With the commencement of the age of Chippendale, which can fairly be placed between the end of the first quarter of the 18th century and the commencement of the wars with France (1793), furniture followed in the main the French tradition, becoming lighter and more elaborate in ornamentation.
To possess a home which shows almost throughout inspiration from the mid-Georgian period is simple, for furnishing houses liave reproduced Chippendale, Hepplewhite, and Sheraton furniture in vast quantities. On the whole, these reproductions are good in design, and constructed on simple lines, a voiding overelaboration of carving, and usually selecting the plainer examples as models Bedrooms, hased on those of the late 18th century, often show inspiration from the work of Hepplewhite, and the four-post bed itself, with its lluted columns, is copied. Sanitation, indeed, had not yet arrived at a constant supply of hot and cold water, and the bathroom had yet to make its nppearance. But there were small washstands and dressing tables which combined picturesqueness with that utility and convenience of which to-day we avail ourselves. This bedroom furniture gradually became the Victorian suite, made up of a wardrobe, dressing chest or dressing-table, with or without a washstand, and one or more single chairs.

A bedroom equipped with furniture of the Hepplewhite or Sheraton period, roughly the last quarter of the 18 th century, should avoid the suite, and may pmperly include, beside the bed itself, a tall-loy, or double chest of drawers, a man's wardrobe, hasin stand, fold-ing-topped dressing-table, separate mirror, wing easy chairs, and oddments such as screens and hanging shelves. Until the 19th century it was the custom not to hang dresses, but to lay them flat in drawers. Hence the tall-boy, which gave extensive drawer accommodation, and the wardrobe fitted with trays.
It has taken more than a century to bring the sideboard, in structural essentials, back to

What it was originally
In early Georgian days a side-table, it became a complete sideboard with Hanking cupboards and centre drawers during the last quarter of the 18th century, and gradually developed in size and impertance until in the Victorian age it was almost a domestic altar, and occupied much room. The high back was practically unknown before the reign of William IV, but all through the 19 th century it was part of the conventional sideboard

Today, in conformity with English period furnishing and also with the best motlern ideas, it has shrunk to relatively sensible proportions for the size of rooms.

The Modern Period. A great advance has been made in the structure of upholstered chairs and settees, which are more comfortable now than ever helore The principal reason for this is the development of the use of wire springs and mesh and the consequent increase of durability and resilience. These circumstances have also affected the production of the modern mattress, which has made the bed of today much more comfortable than before.

Divan beds are lavoured because they look decorative in the daytime if attractively covered and cushioned Heads are constructed with fittings which serve as bedside tables and bookshelves in accordance with practical ideas of dual purpose furniture for smaller moms. For furnishing the modern small house various pieces of "double duty" furniture can be obitained, such as a compact sideboard with a writing slab which can be pulled out and is stowed away when not in use, in place of the usual drawers a bove the cupboards; there is also a dining table with a sliding top beneath which is accommorlation for cutlery in baize-lined partitions. The illustration of ${ }^{n}$ amall burenu wall lix. ture (Fig. 2) depicts a particularly useful and space-saving idea The chair and mirroralsu shown are examples of good taste in modern furnishing for small rooms

Very practical built-in furniture is a great feature of modern furnishing Fig. 3 shows a dining room with a built-in sideboard and a glass cupboard. The table in this illustration cannot be appreciated without the colouring. The glass top could be carried out in various beautiful shades-a seagreen, for instance, with table glass in amethyst and the beautifully de signed candlesticks in crystal with a purple line and mauve or silvered candles. The corners of the table are chromium plated, this finish is repeated in the handles of the fixtures and doors. The chairs unexpectedly hark hack to a Regency style, but seem quite at home in company with the lace trimmed mats, the china, cutlery and lustre central lighting fixture.
Modern style is essential in the kitchen. In many of the newest abodes it is small, yet replete with


Furniture. Fig. 3. Modern dining room furniture designed for a small flat. The austerity of the fxtures and glass-topped table is softened by beauty of colour and accessories
seen when not in use, the children's big toys are placed, instead of being cupboard-bound in an untidy mass. Wardrobes are provided with hooks low enough for the small child to reach, so that the virtue of putting thinge a way directly after use can be inculcated early in life. Little low chairs and tables are addec, and that invaluable item the play pen.
Another particularly well plenished apart ment is the modern bathroom, with real or closely initated washable tiled walls, tables with glass tops, and a floor of rubber tiling or cork parquet.

The Care oi Furniture. The beautiful ap. pearance which distinguishes really well-kept old furniture is due, in the main, to two circunistances. It has been shielded from rough usage, and it has been regularly cleaned with the familiar preparation called elbow-grease.

The kind of polish used for any wooden furniture is of comparatively small importance, for none of them is effectual without regular use and vigorous application. None of them will achieve its purpose by a liberal allowance and little rubbing. Beeswax and turpentine is a mixture which, though very old-fashioned, is perfectly safe to use on any wood, and in this connexion it should be remembered that it was the only proparation used by scores of housemaids who, through years of labour, produced that delightful patina we admire so much to-day on old furniture. On the other hand, preparations under various names are reliable, provided they are not taken as substilutes for regular rubbing with a linen cloth.

One of the worst marks and most difficult to remove is the circular stain left by carelessly used glasses in which hot liquid has been served, and it is worth remembering that the more brilliant the polish of the table top the more permanent appears to be the mark. The reason for this is that a fine polish is really a very attenuated film or gloss over the surface of the wood. This film is only obtained after an immense a mount of labour. Alcohol or hot liquid will destroy it, and in the case of french polish only one method will put the matter right. This is to have the whole of that portion of the table-top glass-papered down and to repolish it afresh. The colour niay be restored to varnished or wax-polished surfaces by treating them with linseed oil (q.v.). Ash and deal topped tables, such as those used in kitchens, can always be well scrubbed with soap, sand, and hot water, and the harder they are rubbed the better.

Blistering of Furniture. Occasionally inlaid furniture will cockle. That is to say, the thin veneer will come up here and there in a blister, and it cannot be remedied except by a cabinet maker, who may remove the veneer and re-glue it under pressure. This blistering is caused often by furniture standing too near a radiator, or sometimes damp will swell the wood and cause the trouble. It is curiously true that houses heated by radiators are more likely to damage furniture than those heated by the open fire, notwithstanding the variability in temperature arising from the older system. The explanation appears to be that heat from radiators draws the moisture from the wood, causing it to warp and split. Furniture reyuires fresh air in England, for the wood is not dried to stand great heat as is the case in hot countries.
A weak solution of oxalic acid will clean leather coverings, but all preparations should be very sparingly used, and leather should not often have anything applied to it, or it is liable to become sticky. Horsehair seats should never be re-covered over the old cover, which should be removed and the stuffing taken out and cleaned before stretching a new covering over.

FURNITURE BEETLE. Several species of bectle that in a state of nature reduce to powder the dead, dry branches of trees have taken to the destruction of woodwork in the house -rafters, floorboards, and furniture. They are all very small, longer than broad; their


Furniture Bectle indicated by a fin
wder eseaping from the holes in the wood.
Remedies are very difficult in application Dry heat of about $130^{\circ} \mathrm{F}$. is perhaps the most certain way to destroy the grubs, and if the article affected is sufficiently small the ordinary gas-cooking oven will serve for the purpose. In the case of fixed woodwork and large furniture the apartment must be made absolutely airtight, when it may he lilled
with the va. pour of car. bon disul. phideol hydrocyanic
acid. The. atter is a deadly poi. son and the former, though less dangerous a poison, will contact with a light. Naph.


Worm-holes in cieal flooring (natural size) made by the furniture beetlo
British Museum of Nalural Historu
thaline in liquid form may be injected into the holes, but it is a tedious operation if there are many of them; or corrosive sublinate dissolved in methylated spirits may be substituted where the odour of naphthaline is an objection. See Antique; Sideboard: Wood Worm.
FURNITURE CREAM AND POLISH.
Beeswax and turpentine together form an excellent polish for furniture. Shred the beeswax and add as nuch turpentine as will dissolve the wax to a moderately thick solution, or, as an alternative, add $\frac{1}{2} \mathrm{oz}$. camphor to a bottle containing a pint of turpentine. Let the latter mixture stand for 24 hours before adding 2 oz. finely shredded bceswax. When this is dissolved the polish is ready for use. Neither of these polishes should be made on a stove or close to a fire. Paraffin and turpentine or linseed oil, turpentine and methylated spirit mixed in equal quantities, provide other satisfactory polishes.

A good reviver for furniture which has been some. what neglected is made from $\frac{1}{2}$ pint each turpentine and linseed oil, and $\ddagger$ pint each brown vinegar and methy. lated spirit. Put these ingredients into a bottle, shake them well, and let them form an emulsion before using See Antique Furniture Spring Cleaning.

FURRING: In Building, Furring is the process of nailing small strips of wood to joists, rafters, wall surfaces, or any other part of a building, to form a level surface whereon to fix laths or building boards. The same expression is applied t" packing pieces of timber which are employed to bring uneven pieces of carpentry work to a regular surface, as, for exaniple, the packings under joists, to bring the top surfaces level. Short pieces of timber attached to the ends of the rafters of a roof for carrying the eaves beyond the surface of the wall are also known as furrings. Usually
 fuse bolders
urrings are of quite small section, often about 2 in . wide and $\frac{3}{8}$ in. thick, and in the case of preparing a wall surface for covering with building board it may be necessary to pack out the furring strips so that their faces should be level.

FUSE : How to Replace. An electric fuse is a short length of thin wire of an easily fusible metal which is inserted in the electric circuit as a protection against fire. The current causes heating of the lamps or apparatus and also of the wires and cables, but there is no danger under normal circumstances. If, however, an excessive amount of current llows the heating may approach the limit, when danger from fire will result. Being of an easily fusible metal, the fuse reaches melting point earlier than the other parts of the circuit, and thus breaks the circuit, so that no current can How.

Where the cables enter a housc two scaled luse boxes with glass fronts, one for each cable, will be found situated or: the company's side of the meter. These fuses are not to be touched by the consumer If they happen to fail, he should ring up the company to send and replace thent Next to the meter on the consumer's side comes the main doublepole awitch, consisting of two large tumbler switches connected by a wooden bar so that both work together After the switch comes a pair of consumer's main fuses, through which the whole house supply passes; next comes a batch of threc or niore pairs of fuses, each pair carrying the current for a section of the house; and finally there may be a number of amaller fuscs, which are often away from the other fuse-gear, and control single rooms.

In the event of the sudden extinction of a group of lights, the first thing to be done is to find and examine the fuse which has gone. If the fuse shows signs of heating and appears simply to have melted, one may suspect the cause to le gradual deterioration of the wire through long use, and a new piece of fuse may he substituted Should the wire have disappeared, except for some blobs of melted metal, a delinite fault on the affected circuit must be looked for before attempting to insert a new fuse. The cause may be a short circuit due to a mistake made in wiring some fitting which has been receiving attention, or perhaps the insulation on a hanging flexible has become frayed, thus allowing the bare wires of the two leads to touch and form a short circuit. After the cause of the trouble has been removed, the house inust be entirely isolated by opening the main double-pole switch, when the melted fuse can be replaced by a new one. The ends of the burnt fuse will afford a guide to the proper size
It is important to use the same size fuse-wire as beforo when replacing a fuse, as a larger size may be an infringement of the wiring rules approved by the fire insurance company, and thus may even invalidate the fire policy. The operation consists in cutting off a suitable length of fuse-wire and laying it in place with the ends wrapped round the terminal screws, finally securing the ends by screwing down the terminals, but not hard enough to cut the soft fuse-wirc. See Electricity.
FUSTIAN. Although the name is applied to the whole class of heavy corduroys and molcskins, fustian means nore specifically the dense, heavy cotton cloth with a smooth, leathery face that is much employed for making labourers' trousers. Drabs and browns are the colours most commonly in use, although others can be obtained. Fustian also makes an excellent material for covering chairs and stools.

ABARDINE. Raincoat cloths of various kinds are known as gabardines. Chiefly twill-woven, some of them ar plain-weave, and are of cotton, a mixture of wool and cotton or all-wool. Those which are close-textured are best. Fawns, drabs, greys, slate, smoke, and similar self and mix ture shades are the predominant colours.
Certain wool cloths of a twill or whipcord character and designed initially for raincoats are employed for dresses and tailor-made costumes.
Gabardine is made chiefly in 54 in . width. White or cream gabardine in heavy weight, either in all wool or with a cotton weft, makes an alternative to flannel for cricket and tennis trousers, and is less liable to shrink.
Before being made into raincoats gabardine is submitted to a process which causes rain to run off the surface without wetting the cloth. Rainproof gabardine, unlike mackintosh, is not spoiled, but actually improved, by being dried in moderate heat before a fire. Grease and soap are very destructive of this rainproof property. Cotton rainproof gabardine in the best quality, and made from supercombed Sea Island cotton, wears well, but soon becomes dirty in towns.
GABLE. Properly speaking, the gable is that part of the outside wall, having a triangular form, which risesabove the level of the roof line. The gabled roof istheonly alternative in an ordinary house to the hipped roof, thelatter meaninga roof that is returned round the end of a building. Sce Bargeboard; Bungalow; House ; Roof. GADROON : For Ornament. This is a fluted ornament. It consists of a flowing reeded form, short for its width and rather oval or egg-shaped. It is often seen on the cdges of tables, and is frequent on picces made by Chippendale. It is also found on articles of silver and Sheffield plate.
GAILLARDIA. These are very showy annual and perennial plants with large double or single blooms, ohiefly in shades of yellow and crimson. The perennial varieties are liable to perish in winter on heavy, clayey land, and it is usual to treat them as biennials by sowing sceds every year in June, either out of doors or in boxes of soil in a frame. Cuttings may also be insert ed in a frame in August. Excepton light or well drained soil it is rise to winter butb seedlings and outtings under glass and to

plant thein out in May. Somc of the finest up-to-date varieties are Mrs. Bateman Brown, Tangerine and Mrs. McKellar. The Howers are long-stemmed and useful for cutting. The annual gaillardias are raised from seeds sown under glass in March, the seedlings being planted out of doors in May. These plants are useless after heving Howered. Pron. Gä̀-lar-di-a.

GAITERS : How to Knit. Gaiters can be had in various materials, as, for example, in cather, black oilskin, and waterproof cloth, but they may also be knitted in wool. Leather gaiters may be cleaned with boot polish, and those of oilskin washed with a cloth dipped in warm sonpy water.

A knitted pair, designed for a child of 2-4 years, can be made according to the following directions. Width is given by means of the expansive rib in which they are worked, and extra length can be added to make them suitable for an older child of 4 to 6 years. The materials required are 3 oz . of 4 -ply Beehive Scotch fingering wool, and two No. 10 bone knitting ncedles. Half a yard of elastic about $\frac{1}{2} \mathrm{in}$. wide will be required for the straps which go under the instep to keep the gaiters in position. Fora larger size use 5-ply fingering and No. 8 bone needles, and knitextra length before shaping for the ankle.
Beginning at the top of the gaiter, cast on 48 stitches 1st row : Knit 4, "purl 2, knit 2 ; repeat from * to the end of the row. Repeat this row for $1 \frac{1}{2}$ in. for the welt which comes above the knee. Now begin the knee shaping. Knit plain up to the last 12 stitches, then turn and knit back 24 stitches ; turn again and knit 23 stitches; turn and knit 22 ; turn and knit 21. Continue in this way, knitting one stitch less each time until only 12 stitches remain on the last short row. Now turn and knit all the stitches on the ncedle; turn again and knit first 2 stitches, then purl to within the last 2 stitches, which knit. This completes the knee gusset.

The pattern for the leg begins as follows. lst row: Knit plain. 2nd row: *Knit 2, purl 2 ; repeat from * to the end of the row. Repeat the last two rows until this fancy rib pattern measures 4 in. long. Here extra length can be knitted for a taller child before shaping the ankle
Shapo the leg by decreasing one stitch at each end of every second row until there are only 40 stitches left. To decrease at the beginning of the row, slip the second stitch, knit the third, then pass the slipped stitch over the third stitch. At the end of the needle knit until within three stitches of the end, then knit two stitches together, knit the last stitch. Continue without any further shaping until the gaiter is long enough to reach the ankle (in the gaiter illustrated 43 in.), then work the instep. Knit 12 stitches in the rib pattern, then on the next 16 stitches only, knit for lit in. ; this makes the instep tab. Fasten off the wool very securely but still keeping the stitches on the needle.

Now go back to the point where the last 12 stitches were knitted before the instep tal was begun, and after the 12 stitohes piok up and knit 9 stitches along the side of the instep tab, knit across the 16 instep stitches, pick up 9 stitchies on the opposite side of the tab, and knit the remaining 12 ankle stitches. Work six rows on all these stitches in plain knitting, and cast off rather loosely. Press the gaiters
on the wrong side, putting a thin clamp cloth over the knitting, then sew up the back seam and sew elastic at each side in position so that it will just fit under the instep of the shoe. See Knitting; Sock; Stocking.

GALANTINE. This cold, glazed dish is prepared from boned meat, poultry, or gainc.
A good breakfast galantine can ve made by removing the skin and gristle from 1 lb . of raw topside of beef and the rind from 6 oz . of raw. streaky bacon. Chop both finely or put thein through a mincing machine; then place them in a basin with 6 oz. fresh white breadcrumbs, 2 beaten eggs, and 1 gill of good stock. Season, then pound the mixture gently, either in a mortar or with the end of a rolling. pin. Turn the whole on to a pastry-board, shape it into a roll, tie it up in a floured cloth, and boil it gently for two hours in stock or water flavoured with onions, turnips, carrots, or other root vegetables.

When cooked, lift, and after removing the cloth reroll it and press it between tins until it is cold. Brush over the top and sides with 2 coatings of glaze, letting the first dry before applying the second. Trim the ends, lay the galantine on a dish, and garnish it with aspic jelly. See illustration below.
Chicken Galantine. To prepare this, bone one large chicken (see Boning) and remove the skins from 6 pork sausages, seasoning the latter with salt, pepper, and grated nutmeg. Cut $\frac{1}{2} \mathrm{lb}$. ham and 2 hard-boiled eggs into strips, place the boned fowl on a table, and spread a layer of sausage meat all over the Hesh. On this lay alternate strips of ham and egg. Cover the whole with more sausage-meat, then roll up the bird from side to side like a roly-poly pudding. Tic it up in a clean pudding cloth, and then put it, together with the bones, in a stockpot half-filled with water. Let tho whole simmer for about $1 \frac{1}{2}$ hours, and when it is cooked, re-roll it tightly in the cloth, placing it between two tins or dishes. A good plan is to put heavy weights on the upper one in order to press the meat
Leave the bird to get cold, and in the meantime prepare a sauce by melting 1 oz . butter, stirring into it 1 oz . flour, and cooking the two over a gentle heat for 5 min . Add $\frac{1}{2}$ gill milk and $\frac{1}{2}$ pint of the chicken stock, stir the whole until it boils, and then let it simmer gently for 5 min . Season the sauce carefully with salt and pepper, strain into it 2 teaspoonfuls lemon-juice, and let it cool slightly beforc adding 4 sheets of gelatine previously dissolved in 1 gill of hot water. Reheat the sauce carofully, put it through a hair sicve, and when it has cooled stir in l gill of cream. Then pour it evenly all over the chicken, and leave the whole to set, afterwards placing it on a dish with a borler of chopped aspic arranged round the


Galantinc of boned meat, an appetising breakfast dis
edges. If a cheaper dish is preferred, all milk may be used in place of the cream
Veal galantine is made in the same way, using the same stuffing, but it is glazed in the same manner as the heef galantinc after pressing.
Nut Galantine. A vegetarian breakfast dish is made by shelling and blanching 3 oz . of nuts, skinning them and putting them through the mincing machine. Add $\frac{1}{2} \mathrm{lb}$. breadorumbs, or potatoes, a finely minced onion, and a teaspoonful each of chopped parsley and mixed herbs Season well and bind with white or tomato sauce, and the beaten yolks of tiwn eggs. Make into sausage shape, put into a scalded Houred cloth and tie securely, before placing it in boiling water and letting it simmer for ithours. When done, press and glaze as for beef galantine.
GALATEA. Made for nurses' uniforms and house dresses, galateas are strong twill cottons generally striped in blue and white and sometimes in red and white. Hardtwisted yarn and fast colours are omployed in the manufacture, and they mny be recomniended for very hard weir. Pron Gal-la-tee-a.

GALBANUM. This is a gum resin. grecnish yellow in colour and with a disagreeable odour. It niay be used as an expectorant. in doses of 5 to 15 gr . The compound galbanum pill, also known as the compound pill of assafoetida, as it contains botb drugs, is used in hysteria.
GALEGA (Gont's Ruc). This is $n$ vigorous, hardy, herbaccous perennial which
 bears bunches of pea-shaped flowers in summer It Hourishes in ordinary soil and is inoreased by division or by sceds in spring. Officinalis and Hartlandii, pale lilac and officinalis alba, white, are the chief sorts; they reach a hcight of about 3 ft These plants take up a lot of room and thercfore are Galega or Goat's Rue, which bears scarcely suit-
lilac-coloured, pea-shaped flowers lilac-coloured, pea-shaped flowers in sammer able for small gardens.
GALL. This is another name for the bile, the excretion of the liver (q.v.). The name is also used for the excrescences on the oak, Quercus infectoria, which is produced by the eggs of an insect.

Gall Ointment. This is an astringent ointinent made by rubbing up powdered galls with benzoated lard, and is chiefly used for haemorrhoids or piles. When there is pain in this disorder the gall and opium ointment is better. See Piles: Tannic Acid.

GALLIC ACID. This substance is found in tea and other vegetable products. It is an astringent and acts like tannic acid. from which it niay be obtained by boiling the latter with dilute acids, eg. sulphuric acid. The dose is $5-15 \mathrm{gr}$. It has been used for arresting internal bleeding. and is uscful for the night. sweats of phthisis, and in chronic diarrhoea, etc. See Tannio Acid.

GALLON. This measure of weight is used for beer, milh and other liquids, and for corn. It contains four quarta, and the
standard imperial gallon contains 277274 cubic in Its weight equals 10 lb of distilled wator.

Stock Sizes of Cisterns. The usual stock sizes of galvanized iron cisterns. roctangular in form and open at the top, intended na receptacles for water are as follows

| Gs). | Length | Width | Depth | Gal. | Lengtli | W\|chth | Depth |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ft. in. | it. in. | ft. in. |  | ft. in. | ft. In. | ft. in. |
| 20 | 110 |  |  | 175 |  | 2 | 210 |
| 25 | 20 | 4 | 10 | S00 | 4 | 2 | 3 |
| 30 | 20 | 0 | 18 | 250 | 50 | 20 | 30 |
| 10 | 27 | 10 | 18 | 300 | 5 | 30 | 30 |
| 50 | 97 | 17 | 211 | 400 | 00 | 36 | 32 |
| 60 | 98 | 18 | 22 | 500 | 30 | 8 | 3 B |
| 70 | 210 | 110 | 22 | 6001 | 70 | 0 | 3 亿 |
| 80 | 30 | 90 |  | 700 | 710 | , |  |
| 100 | 30 | 22 | 20 | 800 | 710 | 48 | \% 7 |
| 125 | 3 | 2 | 29 | 900 | 710 | 52 | 3 |
| 150 | 3 |  | 210 | 1000 | 710 | [10 | 37 |

GALL STONE. The hard, stony mass to which the name of gall stone is given consists of bile pigment, lime salts and cholesterin. It may be the size of an egg or no larger than sand, and the numbers vary from one or two large oncs to hundreds of smaller ones. Gall stones, which may occur in the gall bladder or in the bile ducts, are much more common in women than in men. and are rare before middle age Over-cating, lack of exercise, and abusc of alcohol are common predisposing canscs. The active cause is germ infection from the intestine or by way of the blood which sets up chronic catarrh in the gall bladder.

Gall stone colic, or biliary colic, is the intense spasmodic pain occurring when a stone, leaving the gall bladder, passes along the bile prassages on its way towards the intestine.
Preventive treatment consists ill restricting the diet, insisting on sufficient exercisc and keeping the bowcls regular with salines, such as Epsom or Glauber's salte, etc. Alkaline mineral water or plain water should be drunk frecly. Tight clothing should not be worn.

When an attack of gall stone colic occurs the doctor should be urgently summoned Hot fomentations over the whole liver region sometimes relieve the pain. and should be tried until the doctor arrives. See Jaundice.

GALL WEEVIL. Attacks of the little gall weevil are very common to turnips Damage is in the form of small whitish swellings, from the size of peas to that of marbles. The eggs of the weevil hatch into small, grey, wrinkled mag gots, which feed on thic tissues, making a hollow cavity in whioh theylie.

Thopest is worst on light soil and may become serious on any land ir


Gall Weevil. Young turnipg galled by the peat. Top right, the weevil, much enlarged


Galtonia candicans. the bardy Cape Byacinth, which bears white bell-shaped flowers in August article below
proper motations are not adopted. Change of site may not nvert it entirely, but will liecp) it within bounds Should it threaten to become a chronic nuisance, evcry old stem of green and every old unused part of the turnip crop should be charred over the garden fire before being dug intos the soil

The piece of ground for next year's crop should be dressed with fresh lime at the rate of two stones per square rod, the substance being left on the surface for a few weeks and then turned into the top spit. As a further precaution, all transplanted greens should bc well puddled with wet clay and soes the following year before planting See Cabbage ; Club Ront; Turnip

GALOP. This dance consists of gliding steps executed with much rapidity. Slide the left foot into the second position and chassé to the left, making a half turn on tho ball of the left foot and drawing the right foot up behind. The movement is then repeated with the right foot The girl's steps arc the same, but she begins with the opposite foot to the man's This is usually taught with 8 chassé, 4 and 2 danced smoothly
GALTONIA. This is a handsone hardy bulb plant which forms a tuft of large leaves and in August bears drooping bell-shaped white flowers on a stem about 3 fect high. It is known also as the cape hyacinth and as Hyacinthus candicans. The bulbs are hardy, thrive in ordinary well tilled and manurer soil, and are planted in March, 4 inches deep and 12 inches apart. Sand should he scattered round about the bulbs when planting on heavy land. In cold districts ashes should be placed on the soil above the bulbs in winter. See illus above.
GALVANIZED IRON. Shcets of ordinary iron are treated by galvanizing to resist. corrosion, common forms including the corrugated shects used for covering roofs. Flat or Italian roof shecta are made of galvanized imn with one of the sides 4urned up to form a weather-tight joint.

Galvanized iron is handled in a similar way to ordinary black iron, except that for soft soldering the flux should be hydrochloric acid. The soldering iron should not be worked too hot, and the surface of the metal must be thoroughly clezned with a file or scraper
hefore attempting to solder. It may be welded with the oxy-acetylene blow pipe if the film of zinc on the surface is removed by filing

Galvanized Wire. As a rule, galvanized wire consists of soft iron wire coated with a protective film of zinc, applied by one of the recognized galvanizing processes. Being soft and pliable it can be used for binding metal parts to woodwork. It is made in many sizes, from fine to a rod of substantial thickness
liencing wire is generally made of galvanized iron, and No 8 is the usual size for a singleztrand wire. Stranded galvanized wire is used for clothes-lines and fencing, the common size having seven strands and ranging from Nos. 3 to 6 wire gauge. A cwt. of No. 6 contains about 450 yd., a cwt. of No. 3 about 260 yd ., and other sizes in proportion. Gal. vanized barbed wire is generally made of steel, and sold in reels of $\frac{1}{2}$ cwt. or more. Galvanized wire netting in various gauges and meshes is sold in rolls of 50 yd ., from 12 in . to 72 in wide, and from $\frac{1}{2}$ in. to 4 in. mesh the inesh being the size of the spaces between the wires See Fence: Gauge; Wire: Wire Netting.

GALVANIZING. The object of galvanzing is to preserve from corrosion articles made of iron and steel. It consists in applying a protective coating of zinc to the surface of the metal, and requires the use of special machinery. For hot galvanizing, the article to be treated is immersed in a bath of molten netal at a temperature of about $1000^{\circ} \mathrm{F}$.

Electro-galvanizing is carried on in much the same way as the electro-deposition of copper and other metals. Another method is the dry process, sometimes known as sheradizing. The articles have to be properly cleaned, and are then placed in a frame or barrel and heated to about $600^{\circ} \mathrm{F}$. The barrel contains a quantity of zinc dust, and as the articles move about in it the dust is deposited upon them and forms a protective conting. The sheradized surface is rather brighter and more silvery than that produced by the ordinary hot galvanizing. Should the amateur worker desire to have his products galvanized, this can be done by sending them to a galvanizing firm through the local builders or ironmongers.

GAMBLING: In Law. Contracts by way of gaming or wagering are not enforceable at law. Cheques and other securities given for gaming debta may be stopped or recovered from the person to whom they are given. But if a cheque has been paid the money cannot be recovered : and if a cheque or security comes into the hands of an innocent party the latter can recover on it. If an agent is employed to make bets and he pays any bets lost for his principal, the latter is not liable to repay him, even though he expressly requested him to pay the winner.

Money lent to pay a betting or gaming debt is not recoverable at law. If A owes B a gaming debt. and $\mathbf{B}$ threatens to do something which will bring $A$ into disgrace unless he pays, and A promises that if $\mathbf{B}$ will hold his hand for. say, a month he will then pay him, and 13 agrees to do this, then A must pay at the end of the month. This is bccause the law regards the forbearance as a fresh consideration. If a betting agent wins for his principal and receives the money from the loser, he is bound to pay the money over to that principal

It is a criminal offence to send a betting circular to a person under 21. It is also a criminal offence to keep a house or place for the purpose of betting with persons resorting thereto. A house kept as a gambling house is a disorderly house, and both the kceper and the frequenters are liable to penalties. If both parties to a bet deposit the money with a stakeholder, the loser may demand his money back before the stakeholder has actually paid it to the winner.

GAMBOGE. This is a reddish-yellow gum resin that acts as a powerful cathartic, producing copious watery motions. It is therefore useful for ridding the body of fluid in dropsy, and may also relieve chronic constipation. It is generally used combined with other drugs in the compound pill of gamboge, but it should not be used except on medical advice.

## GAME : Choice and Cooking

 choosing game, select birds with firm, thick breasts, smooth legs, short spurs and quill feathers, and feet that are supple and easily broken. The time required for hanging depends upon the weather, the individual tastes of the person for whom the game is being prepared, and also upon the particular type of game concerned. Waterfowl, snipe, and woodcock, for instance, should be cooked while fresh, but most other kinds of game may be hung from between 5 and 10 days, and in some cases for a full fortnight. In damp weather 5 days will probably be found suflicient unless the birds arc liked high, while game that is bruised or damaged in any way shou!d be cooked as early as possible.Hang the birds, unplucked and undrawn and with a piece of string tied tightly round the neck, in a place where there is a constant curient of fresh air, and examine them carefully each day. If there arc any signs of taint, wash the bird in a strong solution of salt and water to which a little vinegar has been added, and then rinse it in clean, fresh water. When plucking game be careful not to break the skin, and before cooking wipe it inside and out with a cloth wrung out with hot water. Snipe, woodcock, and plover, however, should never be drawn.

Roasting is the most satisfactory way of cooking most young game. To roast, pluck, clean, and truss the birds, tying a slice of fat bacon over the breast of each. Cook them before a clear fire or in a hot oven, the time depending on the kind of bird, keeping them well basted with butter or good dripping. If the bird has been hanging for a long time, it will require to be cooked thoroughly. Ten minutes before the game is cooked remove the slices of bacon, dredge with flour, baste thoroughly and return to the fire or oven to brown well. Ilace two or three slices of buttered toast under the birds so that any gravy which drips from them may be absorbed. Then lay the slices of toast on a hot dish, place the birds on them, and garnish the dish with sprigs of watercress. Hot gravy, bread sauce, and fried potatoes and breadcrumbs should be served as an accompaniment.

Game Cutlet. Prepare by melting 1 oz . of butter in a pan over the fire, adding to it $\frac{1}{2}$ oz Hour and $\frac{1}{2}$ teaspoonful chopped shallot, and frying these a light brown. Then pour in 1 gill stock, and stir the sauce until it boils. Add $\frac{1}{2} \mathrm{lb}$. chopped game. free from bone, 2 oz . chopped ham, 1 teaspoonfu! red-currant jelly, $\frac{1}{2}$ teaspoonful lemon juice, and the beaten yolk of an egg. Stir the mixture, but do not let it boil or the egg will curdle. Season it carefully and turn it on to a plate to cool.

Next shape it into neat cutlets, roll these in breadcrumbs, then brush them over with beaten egg and again cuat them with crumbs. Have ready a pan of hot fat, put in the cutlets, one or two at a time, and fry a golden brown.

Game Kromeskie. Mince finely $\frac{1}{2} \mathrm{lb}$ game, 2 oz . ham, and 8 mushrooms. Melt 1 oz . butter in a small pan, and in it fry 2 small chopped onions, browning them as little as possible. Add these to the ganne, etc., mix all well together, and season to taste, using enough brown sauce to bind it well. Turn the mixture on to a plate to cool, and then cut some fat bacon into thin slices about 3 in. square.

Put some of the cold game mixture on each slice, roll these into cork shapes, and fasten the
ends with match-sticks or small skewers. Dip the kromeskies into frying batter, drop them into boiling fat, and fry them a golden brown, finally draining them on soft paper and garnishing them with fried parsley.

Game Pie. A raised game pie is best eaten cold. Instructions for making the psustry are given under the heading Pastry. Chop up fincly 1 lb . each of veal and pork, and season them well with salt and pepper and grated nutmeg. Put a layer of this meat all round inside the pastry, and fill in the centre with strips of raw game of any kind. A mixture of different kinds such as grousc, partridge, hare. and pheasant may be used if liked.
The bones should first of all be removed, put into a pan containing cold salted water and a small onion, and left to simmar for about 1 hour. This will provide the stock. In layers with the game put 2 tablespoonfuls of chopped truffles, the same quantity of chopped mushrooms, and 2 teaspoonfuls of chopped parsley. Cover these layers with some more of the veal and pork mixture, brush the edges of the pastry with a little cold water, and roll out the remainder of the pastry to form a lid. Make a hole in the centre.

Brush this lid over with a little beaten egg, and tie a greased band of paper round the mould to reach 3 or 4 in . above the top. Bake the pie in a moderate oven for $3 \frac{1}{2}-1$ hours, then take it out of the mould, and leave it to get nearly cold. Melt a little aspic jelly, add it to $\frac{3}{3}$ pint of the stock, and strain these into the pie and leave it to grow cold.

Game Pudding. Cooked in the following way, old game can be made quite tender: Cut a brace of birds into small joints, and chop up the hearts and livers. Skin 1 lb . of sausages, roll the meat into balls, cach about the size of a large inarble, and stalk and peel $\frac{1}{2} \mathrm{lb}$. of mushrooms. Make some suet pastry, using $\$ \mathrm{lb}$. of tlour, 6 oz . of chopped suet, a teaspoonful of baking.jowder, a small teaspoonful of salt, and water to mix. Cut off a third of the pastry for the lid, roll out the remainder, and with it line a well-greased pudding-basin. Fill this with pieces of bird, sausage balls, and mushrooms, then pour in enough scasoned stock to reach three-quarters of the way up the basin. Wet the edges of the pastry, cover the pudding with the remaining piece rolled out to fit the top, and then press the edges together. Tie a clean pudding-cloth over the top, put the basin into a saucepan of boiling water, and boil its contents for at least 2 h hours.

Game Saimi. For a game salmi, first of all roast the birds, and then cut them into joints about the size of the wing of a partridge. Lay the joints on one side while the sance is being prepared. The drumsticks should be cut off quite close to the flesh of the log, and put with the trimmings, broken small, into a stewpan, with a slice of fat bacon, an onion, or 3 shallots, prepared and chopped fine, 1 oz of butter, and a bay leaf tied up with a sprig of parsley.

Fry this briskly for 5 min ., then pour over it 1 pint of good Havoured brown stock and a gless of sherry ; 3 or 4 mushrooms, prepared and cut fine, are an improvement. Season and boil the stock until the liquor is reduced by one-half, then stir in $\frac{1}{2}$ pint of brown sauce. Let it simmer for $\frac{1}{2}$ hour, skimming off the fat as it rises, then strain it and add a piece of butter the size of a large nut, and a teaspoonful of lemon juice.

Heat the game thoroughly in the sauce without allowing it to boil. Arrange the pieces on a dish in the form of a pyramid, and pour the salmi sauce over and round it. Garnish with crouttons of fried bread and button mushrooms cooked in butter. See Bread Sauce; Grouse: Gun; Hare; Paitridge; Pheasant, Wild Duck; Woodcock, etc.

GAME FOWL. Originally renowned for its fighting prowess and now for its unique tablequalities, this is one of the most popular of our domestic fowls. It lays a fair-sized


Game Fown. Cockered of one of the most po,ular domestic breeds

Courtesy of The Poullry World

Sometimes it grows no larger and causes no inconvenience. Generally, however, it gradually enlarges and may cause weakness of the wrist. Usually the only satisfactory treatment is by operation.

A more serious condition, compound palmar ganglion, results from tuberculous infection of tendon sheaths. Pron Gang-gle-on

GANGRENE. This means the death of a portion of the body tiesues of some considerable sizc. There are two main varieties: dry gangrene, in which there is little fluid in the tissucs and the part becomes dry, hard, shrunken and black; and moist gangrene, in which the affected part is swollen with lluid and is putrescent

GAPES. A diseare peculiar to young chicliens, gapes arises from the presence of a gape worms in the windpipe. These cause
the chickens to open their months as if gaping, and if not removed in time will result in death by suffocation. The worms can generally be disindged by dinping a long, soft feather in turpentine, gently inserting it into the windpipe, and twisting it round, and then withdrawing it, when the worms will be coughed up by the chicken

Thorough disinfection of soil, conps, and runs must be resorted to whenever an outbreak of gapes occurs. The plan usually adopted for cleaning the land is to lime it thornughly and let it lie fallow for two years at least See Chicken : Poultry.
GAPING. Due to a lack of oxygen in the blood, gaping may result from fatigue or from sitting in a stuffy roum. Gaping is common symptom in persons who suffer from chronic lung trouble.

## Garages and Their Construction

## Housing Large Cars, Small Cars and Motor Cycles

By following the instructlons givent.e!ow the motorist who is handy with a carpenter's toals can easily erect a garage to suit his requirement; Consult the articles Amateur Carpentry: Asbestos: Cement; Door; Wea herboard, ctc. Sec also Bicvele Shed

A garage is a necessity to very many householders, for the requirements of mudern life demand the use of a motor vehicle, and even if this be nothing more than a motor-cycle or a side-car combination, it is desirable to house it in a sound. dry building.

Suitable materials of construction are numemus. In brick districts the use of the chenpest grade of brick might prove most economical: where gravel abounds, the walls could be put up in concrete at small cost. There is a wide choice of timber structures, and suitable asbestos and other building boards.

The motor-cycle and side-car garage shown in Fig. 1 is made on $n$ timber framework covered with asbestos sheeta nad roofed with galvanized iron. It is highly desirable to fix the dimensions of the building so that the sheets can be used in their stock sizes. Cutting them is $n$ tedions business, and there is the risk of breaking the sheets; the sizes available can bo ascertained from the makers or from the builder's merchants

The first thing to do is to prepare a plan of the site and of the building, and to mark the leading dimensions, sumething in the manner of Figs I to 7. The side (Fig. 2) and end frames (Figs 3 and 4) are then made up from 2 in. square deal, halved at the corners, and well nailed together at these and all joints. Cross braces are cssential to provide the requisite stiffiness, as the asbestos sheets look to the frame for their support, and do not support the frame to nny great extent, as is the case when timber is used.

The floor (Fig. 6j) is prepared by nailing 1 in . tongued and grooved boards 10 3 in. by 2 im . joists, the underside being treated with creossote or some other prescrvative The site is cleared of top soil, and nine little piers of brick or stone placed as shown in Fig. 6 so that they will support the sleeper plates, which are of 4 in by 2 in . deal. The sleeper plates should be creosoted, and held in place by pegs driven into the ground to keep them from shifting while


Garage. Fig. 1. Garage for motor cycle and side-car. Constructional drawings are given in the next pare
the floor is placed in position upon them. The Hoor could be laid in cement concrete but in this case the expense is considerably greater

Having placed the floor in position, the walls are erccted by setting up one side frame, and supporting it temporarily with a cross batten. The end frame is ret up and the corners bolted together The walls must be plumbed up true with a plumb bob, and the angle set square, testing this with a large straight edge and a large set square or by the 3.4.5. angle system This is done by measuring a distance of 3 fl along the end wall from the corner, and measuring along the side wall a distance of 4 ft . Mark thesa placea by driving nails into the frames at the exact spots, and when the distance acruss the angle between them is 5 ft , the corner of the building is square. Adjust the wall frames until the corner is squarc and then fix them to the Hoor with two bolts in each section putting them through the joists. The other side and end frames are then erected, and all corners bolted up tightly

The ridge board is fixed in position, and the walls covered by nailing the ashestos sheets to the framing. the uprights for the latter having been spaced so that the jointe between the shects come on one of the frames. The hottom of the shcets should come just below the bottons of the floor to prutect it from the weather and to allow the water that runs down the walls to drip away and not accumulate under the building. This is one of the reasons for the sleeper plates, as they raisc the lloor above ground level. The top surfaces of the slceper plates are improved by nailing a strip of stout roofing felt, or preferably $n$ bituminous damp course, to prevent the damp rising from the ground. Free circulation of air under the floor is ossential.

The roof is $n$ simple inatter when corrugnted iron is used, as the sheets have only to be nailed to the ridge and to the plates or to the top of the wall frames If preferred, it can le made with
hoards and covered with a good quality roof. ing felt or imitation roofing tiles. The interior is all the hetter for a lining of thin matchboard or $3 \cdot \mathrm{ply}$ wood. hut this is not ahsolutely essential. The gable ends are covered with weatherboard, as this is easier to fit than cutting the asbestos sheets. All cornery and the joints between the sheets are covered with vertical strips of wond nbout 4 in . wide and $\frac{1}{2}$ in thick as shown in Fig 7. The doors (Fig ${ }^{2}$ ) are made of matchboard, ledged with 4 by 1 in. deal, and hraced with the same material, provided with a bolt and a stout padlock and hasp.

The whole of the exterior woodwork is creosoted, and the ronf coloured with a dark red paint ; this had better be done after the building has been erceted, as the sheets will have mellowed and will take the paint hetter. The interior can be lined with matchboard or 3 -ply wood ; but if this is not done, a skirting hoard and a striking board should be nailed to the walls to take the thrust of the wheels when the machine is pushed in. An exterior ramp or sloping approach must be made and fixed in place to enable the machine to be pushed in without trouble; these boards should have an casy slope, and he supported on wedge-shaped blocks.

Weatherboarded Garage. For housing the average car a garage of the size given in Figs. 8 to 12 is ample. It mensures about 14 ft .6 in long by about 7 ft .6 in . inside.
nid has a head elcarance of 6 ft. 4 in. Belore starting to build, however. it is a wise precaution not only to measure up the car, but to consider whether a larger car is likely to be purchased

The building consists virtually of four frameworlis forming the walls and a roofing. The frames are made up from 3 in . by 2 in stuff and are covered with weatherboard Each side is made up as a complete unit in itself. and all four are fixed logether with bolts afterwards. This makes the whole collapaible, a great convenience if it is desired to move at any time, and simplifies the crection

Figs. 9, 10 and 11 . give the sides, back and door ends respectively Cut off the various parts to length, taking care to make each set of parts the same length. A simple form of joint to use is the halved joint: all parta can then be cut off to the overall size and the joint marked out with a gauge. When nailing the frames together test carefully for squareness A good micthod of doing this is to pince a lath of wood diagonally across the whole and mark the length. When put into the opposite corners it should show the same length. The diagonal struts shown in Fig ? are added afterwards

The two ends are made in the same way cxcept that the sloping top part is added after the main square part has been put together. Here again the joints are halved, except at the ends of the top sloping members,


Garage : How to construc! the garage for a motor cycle and side-car shown in the previous page,
Fig. 2. Side frame. Fig. 3. Rear end frame. Fig. 4. Front end frame. Fig. 5. Doors, shown Fig. 2. Side frame. Fig. 3. Rear end frame. Fig. 4. Front end frame. Fig. 5. Doors, shown
irom both outside and inside. Fig. 6. Plan of foor. Fig. 7. Details of corner, showing coverbosrds
which are simply bevelled at the underside and nailed down.

Erecting the Garage. The type of flooring the garage is to have must first be determined Concrete is much used nowadays, and has the adzantage of forming a founda. tion for the whole. If this is used channels must he formed in it th allow the hottom members of the walls to sink in so that there is no projection beneath the door A ranip can be formed outside as shown in Fig. 8.

Assistance is necessary when fixing the walls together. They are hell by handscrews. and bolt holes are bured through the joining uprights. Pass the bolts in from the outside. and put washers heneath the nuts. It will be noticed from Fig. 9 that an extra sloping roof piece is fixed at the centro. When this has been added a series of long pieces known as purlins are nailed down on to the sloping pieces, as shown in Fig. 12. These are to take the roof boarda. The last named should preferably be tongued and grooved. Note that the top ends must be cut off at an angle so that there is a good ridge joint. It is a good plan to cut off one hoard to length, and then cutall the others to it.

The roofing felt is laid on in long strips running from side to side without a join at the top. At the joints an overlap of about 2 in . should he allowed. To make these waterproof use the special cement supplied by the makers. Clout nails are used to fix the felt, and hattens of 2 in . by $\frac{1}{2}$ in stuff are nailed down over the joints. When cutting the felt to length an extra allowance of about 2 in . should be minde so that it can he turned up undeineath at the edges.

Fig. 13 shows how the weatherboarding should be fixed. It is added from the hotton upwards, and the nails are driven thmugh the overlap, as shown. Note that the boarding at the sides reaches only to the ends of the side frames. A batten fixod to the edges of the front and back frames has the effect of hiding the ends of the boarding. The decorative battens above the doors are nailed direct over the boarding.

An ordinary casement window framing is made for one side. The framing is serewed or nailed to the sides, and the casements hinged to them. For the doors use tongued and grooved hoards secured by a series of cross picese. Diagonal hraces should be added to prevent the whole from sagging. All timber should be croosoted to make it durable. For a good job rebated or matched weatherloard could be used, which would present a flush inside surface.

Garage in Asbestos Board. A soniewhat lighter garage suitable for the " baby" type of ear is given in Fig. 14. The main frame. work is similar to that in Fig. 8, but the walls are covered with ashestos hoard instead of weatherboarding. Apart from the size of the car it is to shelter, and the space a vailable for it, one should consider the sizes of asbestos board available before starting on the framework. Otherwise, there may be a good deal of unnecessary waste and lahour. The boards are in long panels fixed upright, and the framework has to he so made that the framework uprights coincide with the vertical joints in the boards.
A side framework is given in Fig. 15 This allows for panels 2 ft . wide. If the long sides are made to suit the ashestos boards, the two ends (Figs. 16 and 17) can be made any convenient size, for in-any casc there is a fair amount of trimming to be done here. A fixed uindow is provided nt the back. The frame. work for this is made up complete in itself and is lixed in the space for it after the whole job has heen erected.

Having completed the four frames for the sides and ends (the joints are halved as before),

is connected by telephone with the onner's house, the delay in summoning the car will the slight.

Safety Precautions. The re gulations known as "Statutory Rules and Orders, I929," relating to the storage and usn of petrolcum spiril affect the garage owner. Every private garage or other building in which petrol is stored, whether it is contained in the usual two-gallon cans or in the lank of the car or mntor cycle, must mect with certain requirements.
It must he effectively ventilated: it must have an entrance direct from the open air: it must he separated from adjacent buildings or from other rooms in the same building by fireproof floors or partitions: and suitable fire extinguishing a pparatus must be kept in tho storage place or as near to it as is reasonably practicable. Tho extinguisher carried on the car complies with this last requrement. As an alternative to a fire extinguisher. a supply of sand or other offective means such as loose fine cartli-may be kept in a pail ready for use, but annd and carth are much less effective than a chemical fire extinguisher. Water should not he used on any account. sinec both oil and petrol float on top of the water, which will therefore merely assist in spreading the flames.

If any petroleum spirit is kept in the garage. other than that in the tank of the ear, it should always be contained in the proper screw. stoppered cans and must not be left in on
they are crected in position and holted together. 10s. n week They are often built in Either a concrete foundation can he madc, connexion with a puhlic garago, or or stout wooden slecpers can be laid down petrol filling station

Alternatively. bricks can be sct out and the garage mounted upon these. If concrete is not used for the flooring. a framework with boards laid across it must be made up. In size this should just lit inside the walls, and is lain in position hefore the walls are erocted.
large clout naila are used to fix the asbestos board. Fix the whole in position, trimming them where necessary with an old handsaw. A series of battens of 2 in . by $\frac{1}{2} \mathrm{in}$. stuff can be fixed over all the joints (Fig. 18). These give a decorative touch. It is advisable to stain them liefore fixing. The roof can be made similarly to that in Fig. 8

Ledged and braced doors mado up with tongued and grooved boards are hinged with strap hinges at the open end. A covering strip is nailed down over the right hand door. The ramp can be a series of stout boards nailed down on to three tapering cross pieces.

Numerous by lawe of local authorities contmol the buidding of garagea, and in particular the materials of which they may be constructed and their distance from the public strect or other build ing. Building a garage usually increnses the rate. able value of the premises.

Hiring a Garage. Some motor car owners, such ns those who live in flats, possess neither a garage nor the ground on which to erect one. To these owncrs two courses are open. They can either hire a garage or can keep the car at a public one.

In large citien many lockup garages have been erected, with rents usually in the neighbourhood of


In public garages the charge is so much per week or per month. but this method will be found more cxpensive than building or hiring a lockup one. It has, however, some advan tages, one being that the requirements for repairs of all kinds are on the spot Moreorcr, since it



open vessel. The greatest care must always be taken to avoid any fire or naked light hicing so near any vessel in which the petrol is kept as to he dangerous. It should be remembered that cven a particle of red ash dropped from a cigarette inay cause a fire when filling the car tank.

The fumes from the cxhaust of a motor vehicle may contain the highly poisonous gas known Rs carbon monoxide, produced by imperfect combustion of petrol in the engines.

If the engine is allowed to run while the car is standing in the garage, the exhnust should be ionnected to the outer air so that the dangerous fumes do not escupe into the building. $A$ surther precaution is to open doors or windows in order to ventitate the gurage thoroughly.

## Gardens and How They Are Planned

## How to Lay Out a Town or Suburban Plot

Here are given threc ways of arranging a small garden, together with a plan for a large one Further information appears under the headings Dutch Garden: Flower Garden and Kitchen Garden. Consult also the succeeding artleles Gardener: Garden Furniture; and Gardening; those on Crazy Paving; Dirging: Fence, Fixtures; Greenhouse; cle., and, in addition, entries under the names of individual Howers and vegetables

Planning is garden must be done with $36 \times 5$ ft, $31 \times 4 f$. and $18 \times 2$ ft., after method, otherwise mistakes will happen which wards pegging out the narrow edging for may entail much labour To lay down ferns and iris against the house. Next hard and last rules is not practicable, rince mark out a rectangle for lawn and rose one garden may differ entirely from another beds measuring $32 \times 18 \mathrm{ft}$., which will leave

This article does not cater for those who are three fontpaths well defined as shown in the fortunate enough to posscss a large position plan. The rose-beds $A$ and $B$ mensure $u m i d i d e a l$ surroundings, but for those whose $21 \times 4 \mathrm{ft}$. and $15 \times 4 \mathrm{ft}$. The skeleton of the p!casance is limited to the rectangular plot in town and suburb. The maker of auch a garden is usually confronted with a rectangle of ground encosed by bare wooden fences With a sheet of paper acctionally rulerl, some wourlen pegs and string, and ordinary intelligence, the novice may achieve success with his garden.

For the purposes of illustration a plot of old meadow land is assumed to be the site avail. able, and its measurements are $68 \times 30 \mathrm{ft}$., a good average size. The requirements are space for flowers, roses, vegetables, a lawn. and, if possible, a little fruit, grown within the limitations defined. With this purpose in view three plots are dealt with, each precisely the same size, but differing in aspect. the respective plots facing approximintely north, south, and east.

Fig I deals with a plot of the measurements mentioned : it bas a northerly aspect when faced from the back of the house, shown by the darkly shaded portion at the bottom of the plan. The first operation may be to locate and erect the trellis about 41 ft . from the house, dividing the llower garden apace from that to be devoted to vegetables and fruit: this is shown by the irregular sharled line running between the arch ( $B$ ) and the small summer-house (C).

It is then advisable to take atring and pegs and mark out the borders $A, B$, and $C$, their respective length and width being


Garden. Sanken rarden, with grass and crazy paring, that centres round a llttle lily pond Above, walled formal garden, with paved paths and square beds filied with tall tulips, a different colonr in each bed
mny proceed by following the advice on digging, path making, and lawns, given under their respective headings
The space fot vegetables is necessarily small, hut most amateur pardeners like to raise a fow fresh vegetables for the bousehold in addition to cultivating flowers, and therefore it will give adder interest, as well as some profit. to the general scheme The diagram is almost self-explanatory, the fences being fronted with a bed of rhuharb, a $12 \times 6 \mathrm{ft}$ cool greenhouse $A$, the space allowed being devoted to a storing shed if preferred, a frame $6 \times 4 \mathrm{ft}$, a row of sweet picas $18 \times 4 \mathrm{ft}$, ample room for loganberries, and a bush apple $B$ A path 3 ft . wide divides these from the centre p!ot. and leads directly from

the main path of the flower garden to the greenhouse.

It is suggested that cordon fruit trecs C , nid a second bush npple $D$, be planted as shown in the sketch, leaving the remainder of the space for vegetables Quite a useful crop of such vegetables as carrots, turnips, salads, etc., can be grown here, but, if preferred, raspberries, currants, and gooseberries may be planted instead. Potatoes would be prolitable during the first scason, as these break up new ground admirably Whatever is chosen should be planted or sown diagonally.

In Fig. 2 the plot is identical in size with that in Jig. 1, but the house faces due south instead of north. This difference in aspect naturally requires a different layout. and the suggested remodelling is shown in the diagram
'I'he main border $A$ is now placed on the eastern side, not the side with the eastern aspect, which is a very different thing, continuing squarely to the arch $B$, which leads to the vegetable garden. The path also is transferred to the same side of the plot, the house end enclosing a bed about $10 \times 6 \mathrm{ft}$., which may well be devoted to dwarf ruses, with perhaps a wceping standard in the position shown. Standard roses on the lawn to run parallel with the path would he $n$ pleasing arrangeinent. The dimensions of the laivn are $26 \times 18 \mathrm{ft}$., and flowering trees or shrubs may be planted with excellent effect at C C.
The greenhouse proposed in Fig. 1 is trans. posed against the dwelling house, and it is suggested that instead a conservatory would be an agreeable adjunct to the drawing room.

In the portion reserved for vegctables and small fruits, dimensions $27 \times 17 \mathrm{ft}$., a shed is conveniently placed at $D$, while the frame is placed in a more suitable position at E . The trellis screen is now 43 ft from the bouse, whilst the sizes of the various heds and borders are: A, $38 \times 5 \mathrm{ft}$. F, $38 \times 4 \mathrm{ft}$. : G, $14 \times 3 \mathrm{ft}$. and H , $16 \times 3 \mathrm{ft}$. Bush fruits of various kinds may be planted at J J .
In Fig. 3 an aspect facing due east adds to planning difficulties by reason of the southern side of the garden facing direct north. The diagram, however, makes suggestions which may overcome the drawbacks of nspect Naturally heds should be confined to the north side, suitable climbers heing planted to cover the southern fence as delined in the sketch. The trellis screen and arches A A A are 40 ft . from the house, the length of the main border $\mathbf{B}$ being 36 ft .

The bed $C$ is 43 ft . from point to point, and is about double width at the house end. Bed V may be $14 \times 3 \mathrm{ft}$., and border E $19 \times 3 \mathrm{ft}$. Shrubs may be planted at $F \mathbf{F}$. and standard roses at G G G. The vegetable plot is $30 \times 24 \mathrm{ft}$., and positions are given to a greenhouse or shed at H , and frame J . There is also room for a Howering tree, a loganberry against the bottom fence, and a morello cherry against the fence facing due north. Burders which have a north aspect are often a suurce of trouble and disappointment in small gardens, but the natural shortcomings of such a position may in great part be overcome by judicious attention to suitable plants. Ruses recommended are Dundee rambler, Bennett's seedling. Gloire de beink due to difference in aspect. In Fig. 1 the aspect is north, while in Fig. 2 it is south

A number of hardy plants that will grow successfully in such a pusition include columbincs, various campaunlas, lily of the va!!cy, day lilics, irises, Michaelmas daisics, herbaceous phlox, montbretias, golden rod, spiraeas, Solomon's scal and meadow rue, with ed ging plants of polyanthus, London pride and mossy saxifrages. The soil in a nurth border should always be well dug, and tendency to sourness dissipated by the free use of lime. Amongst shrubs the flowering currant and laurustinus will be found useful.
In Fig. 4 the lay-out of a more extensive plot is dealt with, its measurements being about 154 ft . by 119 ft . This design gives the foundation of a charming garden, whioh is adaptable to any aspect, and sufficiently elastio to allow for alteration according to individual fancy.
Garden Law. Every man is under an obliga. tion to use his property so as not to injure that of his neighbour, and this legal maxim applies as much to the garden ns to the house Most people who have a garden devote more or less attention to its cultivation, although they are not actually bound to do so unless there is a olause to that elfect in their agree. ment in the casc of tenants. But they render themselves lisble to be sued for damages if negligence on their part results in injury to adjoining property. Thus if a drain is not kept in proper repair, and it overflows and works havoc in a well-cultivated garden adjoining, the neighbour will be entitled to compensation.

On the other hand, if the owner of the drain can prove that the flooding was caused by a violent downpour of rain and not through any negligence on his purt. then he can escape



Fig. 3. Another method of laying out the same plot. In this case the garden looks east
liability. The same principle holds good where a tree is blown down by a storm and damages the flower-beds or the greenhouse in the next garden. But if the tree was old and in an insecure condition, so that it was likely to le blown down, and no attempt had heen made to support it. the owner of the green-' house has a good cause of action.

A tenant is usually responsible for the upkeep of the fence in his garden. Where it ahuts on a public road or footpath, he should he specially careful to see that it is kept in repair. If any person blunders into his garden in the dark and sustains injury through atumbling over a spade or a frame, or perhaps has his eyesight injured by contact with pea-sticks, the tenant will be liable if he has failed to keep the fence in proper repair, unless he can prove that the injured peraon was a trespasser. Holes or broken parts in a fence should be made good to prevent dogs or cats straying through from one garden to another and damaging flower beds. This is specially necessary where poison bas been laid down for rats.

Innumerable legal decisions have been given on the subject of fixtures, and some of these apply to the garden. The old rule is, in effect, that what is once affixed to the soil must not be removed. For example, a tenant who has improved the appearance of his garden by planting an ornamental border of box is not allowed to remove it unless by special agreement with the landlord, and the same rule hollds good in regard to trees that have taken root and become established.

But there are exceptions to the old rule of law. Thus, where the tenant is a gardener by
occupation, he may take away any trees and shrubs which he planted for business purposes, and even greenhouses or other structures As a rule, much depends on the terms of the acreement made with the landlord, and it is always advisable at the outsct not to forget the garden when settling what fixtures may be removed at the expiration of the tenancy

A good example of a popular error occurs in regard to fruit trees, for it is often presumed that a tenant is entitled to any fruit which falls into his garden from his neighbour's trees. This, however, is not the law on the subject. In such a case the fruit still belongs to thic owner of the trees, who may exercise his right of recaption by recovering it from the adjoining garden if he chooses. The same rule applics to branches lopped from trees which fall into a neighbour's garden. Where branches overhang the next garden, the tenant of the latter is entitled to romove them if he has cause to believe that they interfere in any way with the growth of his plants, but the branches which he has cut off belong to his neighbour, and he must not destroy them without his permission.

Cutting hedges requires to be done with rensonable care, hecausc where a party hedge is badly injured or dies through carcless cutting the responsible person may be called upon to make good its value to the owner Digging which affects the foundations of a party wall involves similar liability. (See Hedge.)

GARDENER. A gardener is $a$ manscrvant whose duties are to look after the garden, greenhouse, etc. He should, therefore, possess a good practical knowledge of plants, whether for the fower garden or the kitchen garden. He must know when each should be planted, dug up, or transplanted, and his judgement in these and other matters will be frequently tested. His duties include the care of the lawn, while a knowledge of the greenhousc and greenhouse plants is necessary for most gardeners.

Some appreciation of colour is also desirable, as he shonld be able to lay out flower beds. The number of gardencrs kept depends upon the size of the garden. In large oncs there will be a head gardener and onc or more under. gardeners. The best training for a gardenev is to scrve in a junior position in a large garden.

Is he is a malc servant, his employer must pay 15a. a year for a licence for a gardener, whon nust also be insured under the National Health Insurance schemc, but not against unemployment.

Many persons with small gardens require a garilencr for only one or two days a week Such can be hired at a fixed charge per day or per hour, cither from nursery gardeners or privately. No licence is necessary, but in the case of a gardener hired privately one of the employers is responsible for the weekly insurance contributions. For some phases of garden work women gardeners are eminently suited, but obviously are less so than men for the henvier duties. There are in England several institutions where training can to olitained. They, too, must be insured, but no

## Garden Furniture and Ornaments

## Practical and Decorative Open-Air Furnishing

For other information of interest in this connexion see the articles on Bird Bath; Cane ; Cushion ; Hammock: Osier; Summer House; Sundial; Trellis; also Brick; Crazy Paving; etc.
Special furniture and accessories make the garden more enjoyab!e and henlthful during the summer months : well chosen and placed ornaments give it decorative value even when flowers are scarce. The type of furnishing required for the particular garden needs almost as careful choosing as that for the interior of the house. Classical styles in seats and ornaments look well in the formal garden ; rustic furniture, and the decorative touch of anold stone trough, or sundial, in the cottage garden; while in the seaside bungalow garden some kind of shelter is usually desirable ns a protection against the wind. Here too the most modern type of furniture adds a gay note which suits the otherwise somewhat bare look of a new lay out. A useful and attractive little osier shelter is shown in Fig. 1. Its roof is weatherpmofed on the inside, and two windows admit plenty of light when closed against wind or rain. levolving floors en. nbling shelters to face in any desired direction can be supplied.
Many houses, both old and new. have a practical cxtension into the garden either by means of $n$ ver. anda, with or without windows which slide back on warm days, or by the simpler means of a bricked or flagged loggia outside the dining room windows, rden Fig. 4. Plan of an extensive plot which can he transformed into
charming garden, with tennis court, crazy paths, pergolas and borders

Poisonous trees or shrubs growing in a carden have led to legal proccedings when the leaves are eaten with fatal results by n neighhour's dog, a prize rabbit, goat, or ot her pet. Here the deciding factor is whether the leaves projected into the other man's garden, as in that case responsibility attaches to the owner of the trec or shrub, but not otherwise under ordinary circumstances
Garden Chair. See Garden Furniture
which can be delightfully furnished as shown in Fig. 2. Meals can be taken under shelter here, and yet in the open air. Plenty of folding or cane chairs, cushions. a table large enough for meals, and a hammock couch, comfortably furnish such a corner. The important points about garden furniture are that it should be light to carry, should stow away into small space when not required, and that any falsric used for it should be durable, damp resistant
and bright in colour. Nothing is more de pressing out of doors than shably, dingy chairs and cushions Striped canvas in brilliant colours nearly alwaps looks right, and for paintal furniture blues, clear yellows, warm grey and ivory are the best shades from which to choose. In very hot weather for perfect shelter on the lawn from the sun a huge umbrella can ke obtained fitled into a table, which when no longer required can he folded and stowed a way.
Garden furniture will make $n$ delightful change from the more formal interior of a town sitting room if a halcony or flat roof space can lie utilized to provide accommodation for it, and sufficient greenery and flowers in boxes and tubs introduced in order to create the outdoor feeling.

Strong teak wood is made up into good garden suites, and in it settees, armchairs, chairs and tables are obtainable. A square teak wood tahle is designed with slotted top so that rain water drains off quickly. Chairs are made in this wool with fonthoards to keep the occupants' fect dry. Metal furniture has lor a much longer neriod been recognized as serviccable for outdoor than for indoor use. Folding chairs and tables of this type are made with rounded and shaped leg supports which do not make holcs on a lawn. Padded ground cushions with back rests which can be raised when required, and book rests for use with them, are lixurious for lazing or reading Oilcloth may be employed for the underside of ground cushions; raffia cloth is a good material for garden upholstery. Crctonne.


Garden Forniture. Fig. 1. Small but very useful and attractive osier shelter
Town and Country Associated Industries, LId
covered mattresses with waterproofed lining and bolster cushionstomatch provide open-air sleep. ing accommodation A tivo-tiered wagon which can be wheeled out into the garden with all equipment for luncheon or tea and converted into a table by touching a linob is a great convenience. Square stonls made the same height as armehairs, and loose-cushioned and painterl to match, can be used with


Garden Furniture. Fig. 2. An attractively furnished loggia. Fig. 3. Folding table and stools laid for a picnic lunch
slats in each wing can Le 2 in $\times \frac{1}{2}$ in., and the bottom rail of the wing, entered about 8 in above ground, can be $1\}$ in. $\times\}_{8} \mathrm{in}$, mortised and tenoned to uprights.
The uprights of back can he about 1 ft .9 in . long, litted with staples to drop into position in cyes on the back uprights of wing returns, a length of canvas being provided for the hack after the back uprights have been connected by $13 \mathrm{in} . \times \frac{5}{6} \mathrm{in}$. rails. On removing the back, the wing retums will fold up with the stool hetween, clips being fitted so that all will pack llat together with the back

Another type of chair, as shown in Fig. 5, can be made from a barre! An oak bariel is the beat, as this wood when wax polished or oiled luoks and lasts well. Such barrels can be purchased inexpensively. The illustration shows how the chair is made ; inch timber is used for the neat, and the hoops are cither stained a darker shade of brown in the case of an oals barrel, or if the chair is to be painted in a bright colour the hoops look well in black Fig. 5 also shows all attractive table which is casily con-
structed from a barrel. Threc lhesc to form day beds, or without the extra ply wood can be used for the middle shelf. cushions as convenient low tables. A group of a simple folding table and stools arranged as shown in Fig. 3 makes a pleasant tea or lunchion corner. The constructional details for a suitable folding table are given in p. 477.

Garden Chairs. Folding chairs for the garden are simple to construct when made of wood and striped canvas

Fig. 4 shows a light garden armehair. The scat portion is made separatcly, like an ordinary camp stool, the crossing legs being of wood $1.3 \mathrm{in} . \times \frac{8}{4} \mathrm{in}$ and about 2 ft 2 in . long, pivoted on pins burred over on washers. These legs are finished with a stout dowel at top to enter tho seat rails, which are lit in diameter. The canvas is turned in 1 in. at edges and brought over tant to be nailed to the underside of those rails. Height of seat when open can be 1 ft .4 in . to 1 ft .6 in

The armchair effect is obtained by separate wing returns, the uprights of which are $1 \frac{3}{} \mathrm{in} . \times 1 \mathrm{in} . \times 2 \mathrm{ft} .4 \mathrm{in}$ long, and connected at ground by pivots to the cross legs of the stool. The arm rests are 2 in . wide by 1 ft .3 in . long, cr may. be increased to 1 ft . 6 in . The threc

Garden Seats. A wooden seat is a practical
family piece of garden furniture. It can, if well made and brightly painted and cushioned, be also quite attractive
Such seats are usually constructed to accommodate three or four persons. For the former a length of 4 ft . $\boldsymbol{j}$ in is necessary between the ends. and for the latter an overall length of $\mathbf{6} \mathbf{f t} \mathbf{6}$ in. The seat shown in the slictch, Fig. 9, is intended for four persons, and could be mode in painted deal or varnished oak, or, if preferred. teak

In making the scat, start upon the ends. preparing the front and back legs, and fram ing in the rails and elhows The top ends of the fron legs should be turned to the pattern shown at Fig. 15, and the back legs laper above


Garden Furniture. Fig. 5. Dseful garden seat and table made from two oak barrels. wax polished or oiled

monotony, and 's in keeping with either brickwork or crazy paving, and also with stone rases containing decorative evergreens and the bird bath or sun-dial of classical type. Fig. 7 shows a rustic stone seat suitable for the less formal garden.
Stonework gives n dignified air to any laynut, however simplc. Quite delightiul ornanients are made from old stone troughs and sinks placed on two piles of bricks or on
 stone pillars to bring them table-high. Drainage holes having beon pro. vided, and a Iayer of rubble before filling in the soil, rock plants, ferns and mosses $m \cap y \quad b e$ planted in these sinks with one or two pieces of rock placed to give the outcrop cffect.

Lead vases and ornaments give beautiful accents of colour among greenery. Wroughtiron is effective in the old-world garden of sophisticated charm. Wrought-iron wall

Garden Furniture. Fig. 8. Comfortable seat in oak or teak to seat four. Fig. 10. Elevation, showing decoration of battens. Fig. 11. Seat rails. Fig. 12. Side elevation. Fig. 13. Side showing tenon joints. Fig. 14. Joints ol seat rails and legs. Fig. 15. Front leg. Forkey to lettering, see cutting list B"l arrangement with Evany Bros. Lld. Lonlon of garden furniture.



Liarden Eurniture. Eig. o. Giarden seat in Portiand stone, with moulded ornamental ends. Fig. 7. Simple garden seat made from three pieces of rongh stone 6 courgesy of John PiWhite d Sons, Lid.: 7. courlest
anterns, gates, nntiquc well heads and tri angular rose pillars nre all decorative pieces

Statuary requires particularly careful choosing and setting. Ormaments of this kind can be easily overdone and give a restless, crowded effect. The line of low brick wall, topped by Yoik stone, may be broken by one or two figure or animal pieces of good design. Stone dragons or owla treated in a formally decorative style look effective flanking shallow steps, or guarding a stone seat. Realiatic animals and birds do not seem so appropriate for garden ornaments, though obtainable in a variety of deaigns. Pieces of old stone carvings introduccd as reliofs on

brick walls have a benutiful effect. Particularly effective far Horal decoration on terrace walls are simple vases of stone such as the one shown in Fig. 8.
ligeon cotcs and bird shelters are always interesting. Little thatched bird-tables can be bought ready for placing on poles, and alford endless at. traction and opportunity for nature study.

GARDENIA. This is a beautifui evergreen Howering shrub for use in the heated greenhouse, bearing rosetteshapod, strongly scented Howers with thick, waxy, whitepetals. It was popularised as a buttonhole Hower by King Edward VII, but as the habit of wearing buttonholes hos to some extent declined, there is little demand for gardenias now, except for the purposes of funeral wreaths Many people dialike the somewhat overpowering perfume emitted by this Hower. The plant requires a
hasid atmosphere, and a temperature ot about $70^{\circ}$ F Equal parts of well-drained loam and peat, with a quarter of decayed manure and a liberal arlmixture of sand, suit it. It is propagated by inserting the tips of young shoots in sandy soil in a propagator in spring. If the gardenia is grown in the horder of a stove-house, very little difliculty will be experienced so long as the atmosphere is kept moist and the foliage is periodically syringed. If mealy-bug and scale put it an appearance, the lcaves must be sponged with insecticide.
If no border is available, it is quite a simple matter to grow gardenias in pots Very little pruning is reyuired Plants in borders require to be cut back occasionally to keep them within bounds and to preserve their shape. It is well, too, to tie down the lower branches, in order to prevent them from smothering the more prolific wood, which is usually sit unted in the middle of the bush Gardenia floridn is the kind commonly grown See Flowers.

GARDENING: Some Eints. The gardener's first necessity is tools, and thesc should include a good steel spade, a stout fourpronged fork, a clean-tuothed rake, a Dutch hoe. a five-claved cultivator, large and small trowels, $n$ pair of shears, a grass-mower, a birchbroom, pruning shears and knife. an insecticide syringe or sprayer, wheelbarrow, gloves and strong apron, and n garden line A storing shed should be available wherein all equipment may be kept clean and tidy.
Site and drainage will be the beginning of all work. Digging and trenching must be studicd, for earth preparation is the key to success in gardening Soil composition and the application of suitable manures are other matters for study

Practical guidance as to the preparation of seed beds. depth of sowing, together with the thinning and planting out of seedlings, may casily be obtained.

Flowers for cultivation minke fascinating study for the gardener. The formation of a lawn is not a matter for haphazard undertaking. A well-kept and truly-laid sward, even though it be only a few yards square must be made on definite principles. The planting of n fruit garden should be undertaken with suitable varicties of apples, plums, pears, etc. Pruning of branches and roots, perhaps grafting for the purpose of propagation also, will call for attention. In due course a greenhouse may be installed and equipped, giving culditional interest Frames and hotbeds also may find place, becoming a centre for early crops and for rearing tiny acedlings. Propagation by seeds and cuttings in greater variety becomics possible where such appliances arc available, while the cultivation of choice but tender plants for indoor decoration adds pleasing occupation for gloomy days.

The beginner should early learn to distinguish between insect friends and focs, to become familiar with the best insecticides for the crarlication of those that nre harmful, to understand the value of spraying trees in season, and to apply suitable renicdies for the curc or prevention of fungoid discase. See Digging: Fungicide; Spraying.


Gardenia. Bloom of the white gardenia, a fragrant bot-house flower

GARDEN PARTY. In Great Britain this lont, and to prevent decay it is advis form of summer entertainment is very popular. When it is provided by owners of large houses. penple who may be invited only to this one function in the year are glad of an opportunity to see the gardens anc alan the reception-rooms, which are generally thrown open for the necession. A tennis or croquet tournament. archery, or a cricliet match may form the special attraction. and sometimes a compang of pastoral players is engaged Provision may be made for wet weather in the form of a large tent or marquee with an improvised stage.

In tow us a garden party is often an At Home. Wherever tho party is given there is music, either a band or a large or small orchestra, and such games as clocli golf, croquet. etc. are provided for players. with chairs and sents grouped about. Tea may be served in the house or in a marquee.
A good plan is to have a separate marquen for drinks, ices, fruit, and cream, as people who are taking part in strenuous gainos appreciate these refreshments at more or lcss frequent intervals throughout the afternoon Sometimes all arrangements for refreshments, tents, etc.. aro put into the hands of a firm of caterers. In the casc of a large party this saves a strain on the household staft

Receptions, concerts, plays by limelight and informal dances are sometimes given at evening garden parties Semi-evening dress is usual for the women, evening dress for the men. Illuminations for the gardens are generally carried out by a firm of entertainment caterers; brilliant coloured paper Ianterns, patterned with boldly stencilled designs, hanging from the trees, are an effective decoration. Sce At Home: Ices; Marquee, etc.

GARDEN ROLLER. A roller suitable for a small suburban garden should weigh about 2 cwt. ; for Iarge lawns or tennis courts the roller can be 5 or 6 cort., or even more
'The usual types are madc of cast iron, the smaller sizes with solid rollers; the larger have two rollers. and are generally made hollow and are then filled with water or sand to provide the requisite weight.

A good roller should have its elges rounded to avoid cutting lines on the


Garden Roller made from an oil-drum flled with concrete turf. The
handle should be balanced and remain upright when the roller is standing, and be available on either side of the roller, as this saves frequent turning. The bearings should be substantial and easily accessible for lubrication, a matter that should not he overlooked, for if the spindle and bearings are kept well oiled, not only will the machine be easier to push, but its life will be doubled. Rollers madc of concrete are durable, serviceable, and less expensive.
GARDEN SHED. The shed illustrated is marlo in sections, so as to be movable, and consists of two side frames, two end frames, and two frames which, when joined together, will make the top. Suitable sizes are sug. gested on the diagrams, but these may, of course, be modified for special purposes. The upright rails go into the earth at least $n$
lont, and to prevent decay it is advis
able to ohar the portion that is buried. This is better thin dipping the endsin tar

Any rough straight-grained timber can be used for the framework, and when the parts are assembled, $\underset{z}{ }$ in tongued and grooved flooring boards should bc nailed round to complete the work The top should then be covered with a good roofing felt, and a coat of lar will make a reliable and waterproof roof The donr is not illustrated in detail, conaisting only of 3 in boards, nailed to threo cross-pieces and hinged to the upright by $T$ hinges. It may be bracod as shown in the article Door.
The two side frames are mortised and tenoned together where the rerose inils:

meet the uprights, as at the enlarged sketch F , and the centre upright is halved to the ornss rails as at E. A simple and quick way of mortising and tenoning rough framing such as this is to take a $\delta \mathrm{in}$. twist bit and bore out the mortises, leaving the top and bottom of the mortise half-round, as shown at alicteh J ; the tenoned portion is cut with a tenon saw, and a rasp is used to work away the corners, as shown. When putting the tenons into the mortises they should be smeared with thick paint. and secured by a couple of nails driven in from the face
The end frame which will contain the donr is also illustrated. The ends are nailed together, the long centre rail being tenoned into the top at $A$ and halved at $E$, the cross rail $B$, is tenoned at each end. At $G$ a window may bo put in, if desired. The opposite end frame does not require a door, and in this case the rail, $B$. runs right aoross the frame. to be mortised and tenoned into the outside rails; while the centre joint, C , is halved together. The side frames are screwed on to the end frames so as to facilitate removal when necessary. The top consists of two frames nailed together, all the joints being halrod together, as shown at D The triangular end pieces are made previous to making the two top frames. 'The bottom of the shed should be made of old bricks or pieces of stone flag.

GARGLE : For Sore Throat. Gargles are not as much used in medicine now as formerly. Their place has largely been taken by sprays, which reach the back of the throat much more effectively. Gargles, however, are sometimes useful for npplying drugs to the tonsils, soft palate, and for washing out the mouth. A mouthful of the gargle is taken, and the head is thrown back so that the Huid is held at the back of the throat. Then, with. out swallowing, the patient gently breathes out from the lungs, the air bubbling through the Huid. Gargles must never be swallowed.
 a teaspoonful of common salt in a glass of water. This can be used every morning. An astringent gargle for a slightly inflamed or relaxed throat is made as follows

> Spirits of wine
> Glycerin of tannic acid ...... 11 Immas
> Wnter to make.
> 4 drams

A soothing gargle compounded from the following prescription is used for irritable sore throat due to dust, heat, etc


Water to make
dram
An antiseptic gargle is often useful in cascs of sore throat, especially where the breath is of sore throat, especially where the
foul. The following niay be tried :

Solution of notrasium)
permangninte B.P.J
Water to mukic.
20 minims
GARLIC. A bulb belonging to the oninn family, garlic is noted for its pungency both of odour and taste. It is used far more gencrally upon the Continent than in Great Britain.

For ordinary purposes the bulbs are planted whole, 2 in . deep and 8 in . apart, in rows 9 in . from each other, in February. To obtain exhibition produce the cloves or bulblets must be pulled apart and planted separately. In late summer bulbs should be stored indoors.

Garnish. See Decoration in Cookery
Garret. See Attic
GARRYA. This is an evergreen shrub, 8 to 10 ft . high, of which male and female Howers are bornc on separate plants. It is the nale or catkin bearing form that is valued chietly; the long, yellowish-green cathins which appear in early spring are very decorative. This shrub is not very hardy and, except in mild districts, ought to be planted in well drained loamy soil against a sunny wall. Little pruning is needed except tn keep the plant shapely; this should be lone after the fowers arc over. Propagntion is by layering in summer or by sowing seeds in H frame in spring. Pron. Gar-re-a.


Garrya. Cackius of the evergraen shrub

# Gas: For Heating and Lighting 

## How to Utilise Modern Appliances to the Best Advantage


#### Abstract

This article corresponds to the one on Electricity in the Modern Home, and trats the subject in a gencral but comprehensive way. Gas Cookers ure dealt with in the article Cooker, and reference should be made also to the one on Hot Water Supply. Sec further such arric!es as Brazing:


The choice bet ween gas or electricity for the cessential scrvices of lighting, heating. cookking and hot water supply is usually dictated by the presence or availa bility without much expense of one or other of the respective supply mains. When both clectricity and gais are laid on, tho houscholder is in the favourable position of being free to employ either or both ns he wishes, limiting each to the use for which it is best adapted. For it may not be altogether wise to aim at an "all gas" or "all electric" house, as the case may be; the better way generally is to utilise hoth services, in conjunction perhnps with solid fucls, the latter being employed for some portion of the heating arrangements. The choice will be governed, too by the kind of atoves and fuel employed for cooking, and the preliminary remarks in the article Cooker may well be studied in this connexion.
How Gas is Sold. For many years after it was first supplied to the publio coal gas was used mainly for lighting purposes, and even since the introduction of the electric light, the incandescent mantle, an immenso improve ment on the old Hat-Hame burner, has enabled it to hold its own ay an illuminant with remarkable sucocss.
So long as gas was used chielly for lighting with flat-Hame burners it was esential that
on Hictop which has no bearing on the reading, but is used by the gas undertaking for testing purposes (see Fig. I).
Pay no attention to the top dial. Taking the lower dials in their order from left to right. write down the figures shown by the hands. If the hand is between two figures, always write down the lower; if the hand is between 9 and 0 always write down 9 . Then add 00 at the end. The index shown in the diagram reads 751,900 cubio ft. If the reading of a month before had been 740,600 the month's gas consumpition would have been 11,300 (the difference between these two totals) cubic ft.
To convert the ges consumption into Therms multiply by the "declared calorific value of the gas " (gencrally a figure hetween 400 and 500 British Thermal Units per cubic ft. : the gas oflice will tell you exactly what it is for your district) and divide by 100,000 thus :
$11,300 \mathrm{cu}$ bio $\mathrm{ft} .=\frac{11,300 \times 450}{100,000}=50.85$ Therms
Generally, in gas appliances, a Bunsen flamo is employed, and the gas, before it reaches the burner, is mixed with the volume of air neces sary to its combustion. Modern gas appliances are provided with menns for making this adjustment, and if the consumer cannot mako it for himself he should get his gas supply undertaking to do it for him. No one slould continue to use a gas rppliance which is not functioning properly an a defect due to faulty adjust ment is speedily remedicd by a competent person

Much gas is wasted bylcaving burners alight when they are not wanted. Another source of wasto is putting a small kettle or saucepan over a laige boiling ring, or turning on the burner too high; a lame that spreads out from under the vessel and up the sides is mercly wasting heat All vessels should burn with a self-luminous fame With the incre:ssing use of gas for heating pur poses, and the general adoption of the incandescent mantle, which emits light because it is heated to a high temperature, the tendency became to take heating power or calorific valuo as the criterion
This tendency culminated in the Gas Regulation Act of 1920, which introduced a new unit and a new method of charging the consumer. The Act provided that he should pay for the amount of heat represented by the gas he received, so much per therm of 100,000 British Thermal Units, one B.Th.U. being the quantity of heat required to raise the tempera ture of 1 lb . of water by $1^{\circ} \mathrm{F}$. The gas under. takings have to declare the henting value of the gas they supply (so many B.Th.U. per cubio ft .) and to keep to it within close limits.

The Meter. The quantity of gas consumed is registered on the meter by several dials, the coursc taken by the hands being indicated by the numerals. One dial indicates hundreds of cubic ft . of gas up to 1,000 ; the next dial indicates from 1,000 to 10,000 gradunted in thousands; and the third indicates up to $160,0(N)$ cubic ft ., and is graduated in ten thousunds. In larger metors a fourth dial is fitted which records hundred thousands of cubic feet. There is in addition a small dial
used on gas burners should the
教 kept clean and should not be used on coal fires Conl gas is perfectly safe so long as it is conlined to its supply pipes and is not allowed to escape into the roonis unburnt, but if this condition is not observed it becomes danger ous in two ways. In the first place, when mived with from 8 to 15 times its volume of air it will explode violently if a light is brought in contact with it. This is the reason why it is unsafe, when a smell of gas is noticed, to search for the leak with a lighted mntch or candle. In the second place, gas will not support respiration ; in other words, a person immersed in it will be suffocated because there is no oxygen in it for him o breathe. In ad.
 Qas. Fig. 3. Built-in mantel and Ras nre, sultauld $\quad$ or a sanall ourvoun $\quad$ no
chimney breast is needed. Fig. 4. Insert gas fre to replace a coal grate. The Iront bars of the latter are removed and the insert fits into tae opening
of air to the room, with consequent inadequate ventilation. Modern gas fires are provided with what is termed an in-jector-ventilator (sec lig. 2). Of the two openings under the gas grate canopy, leading to the flue, the lower or injector opening carries away the products of combustion, and the upper or ventilator opening takes off a large volume of air drawn from the room. The ascent of the current from the lower outlet causes, by injector action, the outlet above to function as a ventilator. The result is that, while radiant heat is distributed throughout the room, the air is changed often enough to ventilate the apart ment in a proper measure. An interesting development in design is a radiant clement which gives out a larger proportion of its energy in the form of infra-red rays, so that the heat cmitted bears a closer resemblance to that derived from sun rays. and designed to stand indepandently, but the
Gas fires, or gas grates, as they are some- third or insert type is only an auxiliary to an times called, always requirc a flue. Gas fires ordinary fireplace, and is used generally for may be roughly classified into threc main adapting an existgroups, known respectively to the manufacturers as: (a) self-contained: (b) interior, or built-in ; and (c) inset
The self-contained type can be bought in any style or period. So long as an adequate gas supply and flue are available, it can be connected up without further adjunct. It is provided wit.J a canopy to collect the products of combustion and ventilate the room, and the body projects out into the apartment, the back being almost flat. A pedestal boiling burner is often fitted.
The interior or built-in type is one in which the body of the stove is let into the chimney breast, or inantel, and the front is filted more or less flush with the surround. If this type is chosen the coal grate must be removed to make roon for it, and a special surround, of tiling or other material, provided to fit it, as the body of the gas stove projects out behind the surround and takes up $n$ considerable space inside the fireplace. lig. 3 showe a fire of this type used with a special "built-in" mantel. The latter is of cast iron, and is complete with hearth. It does not need a chimney breast, the fluc being formed in the wall by the use of gas. Hue blocks. A substantial cconomy in building costs is possible if such methodis are employed.

Both the self-contained and the interior types of gas firc are in themselves ornamental

| Lengt! of room in fect | Width of room in feet. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 8 |  | 10 | 11 | 12 | 13 | 14 |  |  |  |  |  |  |  |
| 7 |  | 8 |  | 6 | 6 | 6 | ${ }^{8}$ | ${ }^{1}$ | ${ }^{1}$ | ${ }^{1}$ | 7 |  | 7 |  |  |
|  |  |  |  |  |  |  |  |  |  | 7 | 7 |  |  |  |  |
| 8 |  |  |  | B | 6 | 8 | 7 |  | 7 | 7 | 7 | 9 | 8 | 8 |  |
| 10 |  | 0 |  | 0 | B |  |  |  |  |  |  |  |  |  |  |
| 11 |  | 0 |  |  | 7 | 7 | 7 |  | 9 | 9 | 9 | 9 | 9 | 8 |  |
| 12 |  | 0 |  | 7 | 7 | 7 |  |  | 9 | 9 | 9 | 910 | 010 |  |  |
| 13 |  | 0 |  | 7 | 7 | 9 | 9 | 8 | 9 | ${ }^{9}$ | 10 | 010 | 012 | 2 |  |
| 14 |  | $\pi$ |  |  | 9 | 9 |  |  | 9 | 10 | 010 | 12 | 212 |  |  |
| 15 |  | 7 |  | 9 | 9 | 9 | 9 | 8 | 10 | 10 | 12 | 12 | 212 |  |  |
| 18 |  | 7 |  |  |  |  |  |  |  |  | 212 |  |  |  |  |
| 17 |  | 7 | 0 | 0 | 9 | 1 | 10 | 10 | 12 | 12 | 12 | 215 | 515 |  |  |
| 18 |  |  |  | ${ }^{3}$ |  | 10 | 10 | 12 | 12 | 12 | 12 | 215 | 515 | 5 |  |
| 18 |  | 9 | - | 9 | 9 | 10 | 10 | 12 | 12 | 12 | 15 | 515 | 515 |  |  |
| 20 |  | 9 |  | 9 | 10 | 10 | 12 | 12 | 12 | 15 | 515 | 515 | 515 |  |  |



Gas. Fig. 5. Stainless steel built-In fire. Two oxidized conper wall lights are seen above, with glass shades of orange verging to yellow Courtesy of British Commercial Gas Association
applied wall fittinys agree well with modern furnishing Fig 6 shows a pleasing example of a fan-shaped wall fitting with plates of shaded orange glass and mountings of oxidized metal suitable for a sitting room. Fig. 7 is a simpler wall fitting for a batliroom or extra light in a kitchen, pasange or scullery. The central sitting room fitting in frosted glass shown in Fig. 8 is of excellently balanced design, while Fig. 9 illustrates the favourite howl type of ceiling fitting particularly suitable to a dining room.

For kitchen and hathroom use silica shades are recommended, as they diffuse the light, last well and are not affected by heat. In a large living-room the central fitting can be provided with two or three mantels to afford extra light, and in addition wall fittings are an inprovement, as shown in Fig. b. When a local light only E:7 Mren is required such fittings
can be uned without the central light.
For a halla lantern lamp as illustrated in Fig 10 is a good choice, with sides of tinted and frosted glass and bottom of clear ribbed glass. The finish of the lantern may be in bruss, copper, or egg shell black. Ges standard lamps call be placed where required and attached by a flexible tubc with rigid screw to a convenient gas point. They can be obtained either for floor or table purposes and in a variety of designs and finishes.

Useful Gas Appliances. Gas cookers are described in the article Cooker. Other inportant uses for gas are to operate a refrigerator, and to heat the water for domestic purposes. These are dealt with under Refrigerator and Hot Water Supply reepectively A gas tired boiler is a convenient method of lienting a conser. vatory or small greenhouse. The boiler is placed outside the building in a protecting hutch, so that the products of combus. tion are excluded. Such a henting instal lation may be controlled by a thermostat, whioh automatically regulates the temperature.
The introduction of the gas plug point with bayonet fitting (Fig. 1I), has made it possible casily to connect up such an appliance as a gas iron or gas poker (Fig. 12) The latter is used to ignite the coal or coke in a solidfuel grate, and for this purpose is plugged into a special gus point. The poker is pushed into the grate and the gas lighted; neither wood nor paper is needed. The act of plugging in the flexible attachment automatically turns on the gas, while the operation is reversed when the connexion is removed from the plug point, the gas supply being automatically turned off. One gas poker may be used in turn to light several fires in different


Fig. 11. Gas plug polnt with bayonet ftting. Fig. 12. Gas poker used to iknite coal or coke
in a solid fuel grate. Fig. 13. Gas burner for beating curling tongs or a flat iron
rooms, if, of course, plug points are in existence. There are two main types of gas heated Hat iron: in one the appliance is internally heated by a gas hurner, and the iron is, of course, connected to the gas supply pipe by a flexible tuhe. The other type is heated by placing it over a lighted burner on a atand. The latter is placed on the ironing table and is connected when in use to a plug point. Fig 13 shows a useful fitting for bedroom or dressing room, comprising a burner which may be used for heating either curling irons or a sinall flat iron, as desired.

In the summer the disposal of kitchen refuse is sometimes a problem, especially where no cole or coal fired grate or hoiler is used. This difficulty may be overcurne by installing a gas heated incinerator, the cost for gas being negligible.

Gas Mantle. This term is used to describe a manufactured article used in conjunction with a Bunsen burner for producing an intense light. There are two principal varieties, the upright mantle, used in a vertical position over the gas flame, and the inverted mantle, suspended beneath it.

The mantle should be carefully removed from the cardboard box in which it is packed, placed in position, and ignited by the flame of a match. This burns away the coating, and as soon as the flame has died down the gas may be turned on, and the mantle should give a brilliant light. To ensure this, it is necessary that the mantle should be exactly upright. The air and gas regulators on the burner should be adjusted until the best result is obtained. In the case of the inverted mantle a similar procedure is adopted, but here the mantle is fixed on a framework of stentite or similar fieproof material, and comprises a ring with three projecting lugs, which are slipped through slots in the bottom of the burner and rest upon little supports made for the purpose. F'or a small


Fig. 14. Gas rlak with an enamelled base plate. Fig. 15. Drip proof boilink burner, with flat disk at top above central coamber in which gas and air are mixed before issuing through jets

charge inany supply companies undertake the maintenance of light fittings, cleaning them periodically and replacing hroken mantles, etc.

Gas Ring or Boiling Burner. In its older form the gas ring consists of a hollow iron casting. This is in the shape of a pipe leading into a hollow ring, through the top surface of which a series of holes is drilled. The gas, which enters at the end of the pipe farthest from the ring and mixes with air at the inlet, issues through these holes and burns with a bluc llame. The gas ring stands on cast-iron feet, and has vertical webs projecting up from the ring, in order to support a vessel.

Fig. 14 shows a good form of this type of burner, provided with an enamelled base plate. Boiling burners can he obtainedin any size : from 4 in. to 10 in . in diameter, with anything from one to four concen. tric rows of jets. Those containing four rows may, if desired, be fitted with a duplex burner with two taps, so that the ring could the used with eitlier the two inner rows or the two outer rows of jets burning sepsrately, or all four together. The hurner over a sink. It has a storage capacity of 11 gallons should be provided with an air regulator in order to vary the amount of the air supply.

Another form of gas ring (Fig. 15), has a flat disk over a central circular chamber having a series of rectangular holes around its upper end. Gas and air become thoroughly mixed in this chamber, and spread out in a series of horizontal fan-shaped jets. The gas jet openings cannot become clogged nor the Hame extinguished by liquids which hoil over.
The only adjustments required as a rule with any gas ring are those of the gas pressure and the air. The flame of the jets should be adjusted by the gas pressure regulator so that they are just long enough to play over the full holtom surface of the vessel being heated, and they should never be allowed to
lick round its sides. The air should he adjusted so that the cone in the centre of the flame is of a greenish colour, the rest practically colourless, and on no nccounl uminous, otherwise gas will be wasted, the heating power will be too low, and the surface of the heating vessels will become sooty

The central cone should be short, sharp, and steady, and the flame should hiss a little. while having at the same time no tendency to back fire when the flame is turned down low Otherwise the burner is getting too much air. The positions of both the gas pressure regulator and the air regulator should be capable of being fixed by means of a set screw when the final adjustments have been made, so that they do not get out of position when the ring is heing used.
GAS: Poisoning By. Many deaths arc reported every year from suffocation by the breath. ing in of ordinary illuminnting gas. Besides these acute oases, fatal or otherwise, vague illnesses, slight headaches, mental depression, and anaemia often result where a person for hours and days brcathes in even tiny quantities of coal gas

Prominent symptoms in acute poisoning are drowsiness, varying from a slight degree up to the deepest unconscious. ness, with a bluish purpling of the complexion, hard or chalky pictures if printed on the stcrtorous breathing with puffing out of the vigorous paper lips at each expiration, and perhaps frothing about the mouth

Remove the patient from the polluted atmosphere, see that the mouth and throat are clear, loosen tight clothing, and, if hreathing has stopped or is shallow, carry out artificial respiration. The doctor is to be summoned at once. Even after apparent complete recovery, the patient should remain lying down in bed for at least 48 hours See Artificial Respiration

GAS ENGINE. This is a form of internal combustion engine which uses gas as the fuel. In its commonest form the engine is designed to work on coal gas. but types adapted to other forms of gaseous fuel (e.g. producer gas) are similar in general characteristics, differing only in details of design. Most small gas engines operate on the Otto or four-cycle principle. See Internal Combustion Enginc.

GASKET. This is a thin packing piecc of metnl, asbestos, rubher, paper, etc., used to make n gas or watertight joint between metal surfaces. The gasket used for the cylinder head of a motor car engine is often formed of a sheet of nsbestos letween two layers of thin copper. Esch side is given a thin coating of gold size. For joints not subject to heat a gasket of thick brown paper coated with grease nay be used. See Motor Car.

## GASLIGHT PAPER.

Gnslight differs from bromide paper (q.v.) in being very much slower, but a gaslight print has much more snap or brilliance than one on hromide paper. The most brilliant prints are given by the so-called vigorous or contrasting grades. There are other grades, usually called normal or portrait, which give softer prints These are the best to use for negatives which have plenty of contrast and would yield too


Gas. Fig. 17. Old-taghioned kitchen rangereplaced by agas fre with circulator above, and a gas cooker. A conveniently fred gas bracket directs light unon the cultoary processes


Gate. Fig. 1. Diarram howing construction
of simple entrance gate. Right, section of simple entrance gate. Right, section
through gato 02 line $A-B$
gastric juice, but when its vitality in impnired part of the lining is digested off, leaving an acute ulcer The devitalisation of the lining is almost always due to bacterial poisoning, and this may have a definite origin, such as septic tecth, a diseased nppendix or gall bladder, or chronic stagnation of the contents of the large bowel.

Acute ulcers are usually multiple and may ocour on any part of the stomach lining. It may chance that an acute ulecr does not heal, hocoming chronic and possibly persisting for months or years This may somelimes be due to coarse, irritating food, but it appears to be definitely associated as a rule with delays in the cmptying of the stomach due to spasm of the pylorus. There may he varinus causes for this, but it is generally helieved that excessive sinoking inay be one of them

Acute gastric ulcers may be present without causing symptoms There may, however, be dyspepsia and vomiting of blood. A chronic ulcer causes pain which comes on from a few minutes to one or two hours nfter eating and is generally relieved by vomiting. There is always blond in the stools.

The treatment of an acute ulcer consists of rest in bed, a bland diet and a free administra. tion of bismuth and alkalies. Chronic ulcers are treated in the same way, but in certain circumstances an operation hecomes necessary See Indigestion : Stomach.

GASTRITIS. Inflammation of the lining of the stomach, otherwise gastritis or gastric catarrh, may occur as an acute disorder or may he chronic. Acute gastritis may be caused by overloading the stomach with food; by taking decomposing food, an accident more likely to occur in hot weather ; by an alcoholic bout ; or by taking some other poison capable of causing irritation.

At the beginning the patient fecls dull and depressed and usually suffers from headache. There is fullness in the pit of the stomach, a sense of weight and perhaps pain. Nausea is felt sooner or later and culninates in vomiting. At first the vomited matter consists of undigested food, hut Inter there is much mucus and bile. In children there is diarrhoea, with colicky pains, as a rule.

In the treatment of acute gastritis it is obviously desirable to clear irritating contenta out of the stomach, and this may be done in a natural way by the onset of vomiting, which should be encouraged rather than otherwise. By drinking large draughts of tepid water the patient will make the process of vomiting easier and will help to cleanse the stomach. To clear offending substances from the bowel 2 or 3 grains of calomel may be given, to he followed by a dose of salts in the morning.

No food should be given if the vomiting tends to recur, hut as much plain water or soda water as is desired. As the symptoms abate, milk in some form should be given.

Thercafter arrowroot or other milk foods are diagonal member and mortise it into the added, and then sweet breads or steamed white fish Ordinary food is not resumed for two or three days.

Amongst drigs most used for calming the irritation of the stomach preparations of bismuth talie the chief place

If acuto gastritis is at all scvere. or even when it is mild if the cause is obscure. treatment should be superintended by a doctor
Chmonic gastritis may follow an attack of the acute disorder, hut more frequently hegins insidiously. It inny be caused by habitual over-indulgence in food or alcohol, in tobacco and, in some parts of the world, in iced drinks. Habitual failure to chew food properly is annther cause Many suffer from the disease from swallowing septic discharges from the tecth, tonsils and adenoids.

The treatment of chronic gastritis cannot be asfely prescribed until a careful investigation of the habits and functional condition of other argans besides the stomach permits
and if tobacco is used at all it should be very moderately. See Indigcstion; Stomach.

GATE. In its domestic sense a gate refers to the outer entrance to a house, or to the movable part of a fence or wall. Gates leading to suburban houses are frequently made of cast iron in a stuck pat. tern, but the practice in more modern work is to employ oak or other wood. A design for an entrance gate is illustrated in Fig. 1, the making of which is more or less similar to that for a field gate. The joints are mostly the mor. tise and tenon, secured by a wooden peg. Staves or pales are nailed on with galvanized iron or copper nails. The field gate illustrated in Fig. 2 is a typical example. Commence by making the stile or upright to which the hinges are fixed: mortise the top bar and then the other bars into it. Prepare the other stile in the samc way. Thetop bar is tapered on the underside as shown, and mortised to take the three upright picces, noting that two of them come hehind the centre line and one in front of it. Next prepare the

 gate. may be driven in with a hammer; they should he so positioned that the gate has a tendency to swing shut of its own accord The shutting post is fixed in a similar manner, and carries the catch of the latch.

Ornamental gate posta can be made of brickwork or concrete, some very decorative
to shape at the top and left in the natural
form of a irce stump Fix the stile top bar, and dingonal first, then fit the outer stilc and horizontal bars, driving then together with a mallet to make sure they are properly home Sccure all thcac joints with wood pegs properly draw-borcd ( $q$. v.). Then fix the uprights, peg them to the top bar, and nail them to the others. The metal work can be purchased ready for use, and only requires bolting in place with coach holts and nuta.

The hanging of a gate calls for some care if it is not to drop before it has been long in use. The chicf requirement is a very secure hanging post For a carriage gate, if an oak post is used, it should he at lenst 6 in. square, and 2 ft . in the ground, or more if the soil is light. An oak gate post should be sawn to shape at the top and left in the natural
to shape at the top and left in the natural top har and into the stilc. When fitting the diagonal, arrange for it to carry some of the weight by giving the top bar an initial upward inclination
ward inclination


Gate. Fig. 2. Details of a common typa of feld gate
of a fair estimate of the underlying cause or causes. Sound dietetic habits must be insisted on; alcohol should be discontinued, hooks, or the pegs on which the hinges turn.
These pegs arc holted in place or, for a light part being known as the butt. To set up the post dig a hole on the side where the gate will he hung Try the post in place and, when it is all correct, strut it up with temporary battens and pour in sufficient strong concrete to fill the hole; rain it well, and leave it for a day or two to set hard; then drill the holes for the gate
ooks, or the pegs on which the hinges turn.

effects being possible with these materials Those made of brick must have proper concrete foundations: those made of concrote require similar founclations, but may be reinforced with a central bar of imon about $\frac{?}{?}$ in diameter. Thoy are usually cast in a wooden mould and can he erected as described for a wooden post.

Many devices have been adopted to hold a gate shut, some of whioh are illustrated in Fig. 3. They are mostly of imn, wrought or malleable. Means to close a gate nutomatically include tho spring, a weight suspended by a cord running over a pulley on the gate post and attached to the gate. A simple dovice to accomplish the same result is to adjust the

# Gate-Leg Tables 

With a Useful Model for the Amateur Carpenter
Other articles in this work on various kinds of tables include Afternoon Tea Table; Dining Table: Folding Table, and Kitchen Table. Consult also the entries on Amateur Carpentry; Cabinet Making; Dovetail Joint; Drawer; etc.

The gatc-leg table was introduced into England in the 17th century. It developed from the type of table on which the flaps when in use were supported by movable hinges of wood. Instead of these two additionai legs were provided which were hinged and could be moved back when the flaps wero let down : from their shape they were and are still known as gates

The majority of these tables were of oak and circular or oval in shapo with four legs, but others were square or oblong in shape and wero fitted with one, two, or four gates. Some tables have drawers at the ends, while others have the turning known as barley sugar on the legs. Such variations arc not likely to date earlier than the latter half of the 17 th century.

The gate-leg table, especially the round or oval varicty, has been much reproduced by modern makers, as it agrees well with onk dining-room and hall furniture and also suits the sinall rooms of the cottage house.

One authority thus spenks about the age of these pieces: "Their age may be roughly arrived at by a careful examination of the turned members of the legs and, where they occur, of the rails and stretchers. Enrly ones are coarser in design than the later ones. The turning may be a perfectly simple series of balls one above the other, or a pillar with rudimentary cap and base, and the stretchers heavy and near the ground. These tables were nearly always made of oak, and some of the early ones have carved tops. An early date may be assigned to those examples which show an arcaded pattern at the ends carved between the upper part of the legs."

The type provides a good size of top so that the table can be used for dining purposes, though it is really more convenient as an occasional table in the living-room, as it can bo closed down to occupy a small space. Another advantage is that a lrawer may be fitted without interfering with the movable parts of the piece.

Making a Table. Fig. 1 is a table of useful size, measuring $\overline{5} \mathrm{ft}$. by 4 ft . when open, and shutting down to a width of 1 ft .4 in . It is advisable as a preliminary to set the job out so as to get the right shape for the oval top and the correct arrangement for the turnings. A full-size drawing of the legs must be prepared to take to the turner. Prohably a suitable set of legs and swingers, ready turned, could be purchinsed from a local timber merchant, if the turning presented any difficulty. Notice that the legs are all the same shape except the inner legs of the gates, the ends of which have two fin. dowels turned, upon which the gatos swing (Fig. 2).

Start by getting out the material for the legs from 2 in. oak; square them up and mark out the mortises for the rails At the drawer end two rails are put at the top, the upper une
rides so that the upper is nearer the gate post than the lower ride. Thus the gate will always swing shut Practica! ly the same effect can be more generally obtained by inclining the top of the gate inwards.

Attention to a gate inoludos periodical oiling of the hinges and the repainting of all woodwork at least every three years, unless the gate has bcen treated with wood preservative, when similar material must be used instead of paint. Oak gates that havc not been painted can be kept in excellent condition by brushing them with boiled linseed oil. When a gate has worn and aaga it can often be oorrected by removing the rides and resetting them.
being dovetailed (Figs. 3 nnd 4). A drawer may be put at the other end as well if desired, or altogether omitted, in which case a plain rail similar to those at the siden must bo used When marking out the mortises be careful to sce that the inner edges of the top and bottom rails come exactly the same distance apart as the length of the inner gate leg, measuring between the shoulders (Fig. 2). All the rails are then prepared and the tenons cut: the top rails are out of 1 in . stuff and the lower ones of 2 in . squarcs. A moulding is worked along the top of the lower rails to lighten the appearance, but this may be dispensed with by simply rounding tho edges over.
All the joints having been cut and the turnings finished, the two ends and the gates may be glued up and allowed to set. The holes to take the clowels of the gates are bored and the outer legs of the gates cut away as in Fig. 1, so that they close in flat with the side of the table. The side rails may be glued up, fitting in the gates and testing the joh for squareness. It will be neccssary to join the flaps up in pieces to get the width, and a great deal of waste is obviated by joining them up in accordance with the full-size drawing, so that shorter pieces are used for the outer edge.

In better olnas work, instead of a square edge being left at the hinging sides (Fig. 7), n rule joint is used, shown in detail in Fig. 5. Fig. 6 is useful in n long table, as it ensurcs the main top and tho Hap being always |c叉el by reason of the berd


Fig. 8
fitting into the corresponding cavity. The rulc joint, however, is the best. and presents no great difficulty if the essential principle upon which it works is clearly understood
The ourve for the two parts must be struck from exactly the point occupied by the centre of tho hinge. and the squares above the hinge and on the flap must run diametrically to the circle thus struck, as shown by the dotted lines in Fig. 5. Plano the wood up true and thickness it and square the edges to form a close joint. Now set a gauge to half of the diameter of the circle and gauge both sides of the top and the underside of the flap. Tho depth of the square also must be marked. The surplus wood is then cut away and the parts tested together.

Back-llap hinges are used, the knuckles being sunk into the wond to get the required centre No greasc nor any lubricant must be employed until after the job is polished, as grease prevents the stain from taking properly. Before fixing the top, runners and kickers are attached, as shown in Figs 4 and 8 The drawer is either dovetailed or rebated together. The top is fixed down with screws from the underside, putting them through the rails skow-uiso. The table is opened. the top) levelled off, and cleaned up: two stops are secured to the underside of the flaps to prevent the gates from opening ton far.

GATHERING: Of Material. Large or small puckers in cloth that are made by running a thiread through any fullness of material to be reduced, and drawing it in to the required size, are known as gathering. Difierent weights and kinds of material require different treatment in gathering up the


Gate-lez Table. Fig. 1. Oyal-tonped oak table. Fir. 2. Lers, showing turned dowel of inner gate-lep. Fig. 3. Drawer end. Fig. 4. Details of framework beneath table top. Firs. 5, $\boldsymbol{\theta}$ and 7. Three methods of loining the hinging faps. Fir. 8 . Detail of Fig. 3, showing drawer runners and kickers
fullness Thick velours and serges do not gather well. and any surplus fullness should be taken away or pleated. in avoid un neccssary bulk, very little material being left to gather or ense into the band or tighter edge of the mnterial. Most silks gather easily if a thread is run evenly through the fullness $\{$ in from the edge. The smaller the stitch the liner the folds will be when drawn up.

All finc gathering in cotton and linen materials, especially in making babies' and chil. dren's clothes, should be stroked before they are placed into a band or yolie. It is wise to use a double thread for any gathering which is to be stmked, and draw it up tightly, securing it at one end by twisting it round a pin. Take a needle without a very fine point. and, placing it between each tiny fold, draw it awiftly down, making a finc strake with the point. and drawing the gather under the left thumb If this is carefully done, each fold will be of uniform size In hemming down the inner side of the band or yoke on to gathering which has been stmked one stitch should catch each fold

Rows of gathering 1 in or less apart are sometimes used as a trimming. It is often effective if used on light material for summer frocks or children's clothes, and forms the preliminary work in smocking (q.v.) ; a atrong or double thread should be used for this purpose.

GAUGE. A gauge is an instrument used to compare an object with another of known and accepted size or form; and generally called the standard In a wider sense a gauge is a standard of comparison: consequently the word refers both to a gauging instrument, and to the accepted dimensions adopted as a standard
As an example, take the Birmingham standard wire gauge, generally abbreviated to B.W.G This is simply a recognized nad accepted set of figures defining the diameter of wires, and is also used to define the thickness of some sheet metals On the other hand, the Birmingham wire gauge is a measuring instrument in the form of a metal plate with holes drilled in it, corresponding in diameter to the standard dimensions of the B.W.G

The steanigange and water gange on $\Omega$ steam boiler indicate in different manners the pressure of steam and the level of water icspectively. A rain gauge measures tho rainfall in inches of depth, the smount collected in the gauge in a given period being measured by pouring into a graduated glass.
The marking gauge used by carpenters for scribing lines upon a piece of work comprises a wooden bar and n stock made to slide upon the bar, and provided with a thumb acrew or n wedge for fixing it Near to one end the inarl.ing pin or scriber is fixed into the bar, and this is used for producing the marks on the work. In use the sliding part is fixed to the bar so
that the distance from the face to the scribing pin is exactly the desired distance for the required marks from the working fnce o!
the wood This trol is shown in Fig 1. A mortise gauge has two independ. ent adjustable scribers. and a cutling gauge has a movable chiscl-like blade instead of a scriber
A wire gauge (Fig 2) is a round or oblong piate of metal, preferably nicliel plated to protect it from rusting. The cdge is pierced with a number of slots whioh terminate in holes somewhat larger in diameter than the width of the slot. The gauging part is the space betwcen the jaws, or the breadth of the slat. In gauging cither a piece of sheet metal or a wire, the correct gange size of the metal may be taken to be that corresponding with the number atamped against the slot into which the material just fits If in doubt as to the proper size. it is as well to compare by testing with the gauge sizes next larger and smaller. Similar gaugos, known as wire or plate gauges, are used for distinguishing metal up to about $t$ in in thickness or diameter

When using an instrument of this type it is important to ascertain the particular kind of gauge being employed, i.e. whether the Inıperial standard wire gange is being used, the Birming. hain. or the Stubbs gauge The Imperial gauge was legally eatablished in 1884 The Birmingham and Stubbs gauges are both in extensive use, the Birminghnm being employed chiefly for measuring iron shects
 The absolute dimensions sizes commonly used are shown in decimals the propurtions should not be less than one to of an inch in the following lable, arranged three. See Coarsc Stuff; Fine Stuff ; Plastering. under the heading lismingham, Imperial standard, and American wirc gauges :


The full details can be obtained from any asandard text book. As a rough and ready method it may be taken that No. 3 is equivalent to $\frac{1}{d}$ in. No. $7, \frac{3}{1}$ in. ; No. 11, $\frac{1}{\frac{1}{8}}$ in. ; No. 16, $\frac{1}{16}$ in , and No 22, $\frac{1}{2}$ in.
A standard twist drill and steel wire gauge is most useful, cither in the plain type or giving the imperial standard wire gauge sizes. A combination gange, showing the standard size of drills, the corresponding tapping size, and also the full thread or clearing size, is also used.
The screw thread or screw pitch gauge (Fig 3) consists of a number of separate plates secured in a handle, somewhat like a pocket. knife. cach sejuirate jaw being fashioned to
gauges. The gauge to set, and also the strength. For heavy cornices
the correct shape and pitch of the screw thread corresponding with the number and size. stamped upon it.
The fecler gauge is used to feel the distance het ween two objects relatively clnse together. such as the width of a slot. It has separate blades of hard steel of different thickness, marked with numbers, these being the number of 1 ()00ths of an inch of thickness. Such gauges are used by inserting a blade or blades into the slot to be measured.
By means of the depth gauge the depth ol a hole can be readily ascertained. It has a central measuring rod supported by the stock. To use it, the rod is pushed to the bottom of the hole, and the end of the stock placed upon the outer surface or upon the place from which the depth is to be measured Some forms have a micrometric adjustment.

Another uscful gange for the amateur mechanic is a sliding caliper This is made of steel. 6 in to 10 in . long, the stuck being graduited usually in both English and metric measures. Onc jaw is part of the stock : the other slides along the stock and is fixed by a set screw. A vernier incorporated in the alide enables rea.lings to be taken down to Tha in. and ${ }^{3} \sigma$ min. respectively. The jaws are adapted both for inside and outside measure. menta See Cutting Gauge ; Calipers: Wire.
GAUGED STUFF. This term is used in plastering work for coarse or fine stuff which has had plaster of Paris mixed with it, thus shortening the period requited for setting. One part of plaster of Paris to four parts of coarse or fine stuff may be used, up to equal proportions a ccording to the rapidity with which the material is required Gaultheria. See Winter Green.
GAUZE: The Fabric. Although the term is applied loosely to light silks and cottons of open texture, gauze has a special meaning founded upon the method by which the fabric is woven In true gauze the threads are locked in position by being brought round one another. This principle is employed in goods not sold under the name of gauze, e.g in many Madras curtains, in cellular cloth for underwear, and, partially, in leno fabrics.
In fancy dress, gauze is frequently used to form wings for fairy costumes. Wire gauze, aq used for ment-safes and for window shields, is wire woven upon a lonn.

Use in Surgery. Gauze is extensively employed as a surgical dressing to absorb discharges, or narrow atrips may be introduced into a wound to act as a drain, or wounds or cavities may be plugged with it for the arrest of haemorrhage. Gauzes impregnated with some chemical antiseptic have distinctive colours. Thus boracic gauze is pink; cyanide of potassium, mave, etc. See Dressing.

GAZANIA. This flowering plant, whioh is unfortunately not hardy in most gardens, makes a gorgeous show in summer in welldrained soil in a sunny position. Gazania splendens is the favourite kind; its orangecoloured Howers with dark central ring are 2 to 3 inches ueross. Propagation is by cuttings inserted in sandy soil in a frame in August ; it is unwise to plant the moted cuttings out of doors until May. Pron. Ga-zā-ni-a.

GEAR : Spur and Bevel. Gearing as a means of transmitting power from its source to a given point is carried out in its commonest form by the spur tooth wheel, of which there are two forms, the involute and the stub. The former is used alnost exclusively in Great


Gauge. Fig. 1. Marming gauge used by carpenters for scribing lines upon wood. Fig. 2. Standard wire gauge shown measuring the thickness of a brass bar. Fig. 3. Screw thread gauge


Gear. Various types of spur and bevel gear in common we. Fig. 1. Large driving wheel, amall driven wheel. Fig. 2. Small driving wheel, large driven wheel. Fig. 3. Gears of a mangle. Fig. 4. Lawn mower gear. Fig. 5. Single helical gear. Fig. 6. Double helical gear

Britain, while the latter is most favoured by the A merican engineer. Both types have their technical advantages.
With any form of tooth gearing the drive is positive ; therefore, if a wheel of, say, 48 teeth is in mesh with one of 12 teeth, their differenco in speed will always be 4 to 1 . This means an increase or decrease of the power transmitted according to which wheel is acting as the driver. Should the large wheel be the driver, then the small wheel would only transmit onc-quarter of the power expended to drive it. Conversely, if the small wheel is the driver, then the large wheel will transmit four times the power expended to drive it.

By a suitable combination of gears enormous power can be obtained at the sacrifice of speed of the driven end of the train of gears, or a very high speed can be obtained at the driven end at a sacrifice of the power expended. This will he better understood by a reference to Figs. 1 and 2. Two examples in everydiay use are the mangle and lawn mower, shown at Figs. 3 and 4.
On referring to Fig. 3, it will be secn that a train of six gears is employed by which to obtain the necessary power called for at the rollers, and operates as follows: The drive commences via the fly wheel through $a$ to $l$, thence through $c$ to $d$, and then through $e$ to $g$. The $\operatorname{cog}$ wheel $a$, that is a part of the fly wheel, rotates independently on the extension of the shaft of the bottom roller, shown dotted. The cog wheels $c$ and $b$ are in one piece, and rotate on the pin $h$. The cog wheels $d$ and $e$ arc also in one piece, and rotate solid with the bottons roller.
A combination on a similar principle is employed for the screw-cutting train of gears on a lathe. The driver is always mounted on the end of the mandrel, and the last gear wheel in the train is mounted on the end of the lead screw. By varying the combination any desired screw pitch may be cut. Fig. 4 shows the method by which the side wheel type of lawn-mower cutters are driven.
A few of the commonest uses of the spur gear may bo mentioned. The change wheels of a screw-cutting lathe; all types of printing machinery and factory machinery; the timing-gear of the internal combustion engine; gear boxes; clocks and watches. In all cases where power is to be transmitted in the same plane the spur gear can be employed.
Two other forms of square-faced gear are the skew or helical gear and the double helical. With the former the angle of the teeth is in one direction only, and, through the
medium of the sliding engagement, greater silence in operation is attained, but owing to the side thrust that is created by the tooth angle, an additional thrust bearing must be provided for each wheed employed. Fig. 5 illustrates the skew or helical gear. The double helical type of gear (Fig. 6) is, next to worm gearing, probably the most silent gear there is, and with this type, owing to the $V$-formstion of the teeth no side thrust takes place

Where a drive has to turn a corner a beve or worm gear is employed, and with it the angle of the turn need not be a right angle. The bevel gear is used extensively for machinery and bench drills; one notable application of it is the mechanic's breast drill. As with the spur gear, the bevel gear is also constructed with the tecth set at an angle from the centre of the wheel and known as the helical or skew gear, and double helical gear Both typea are used as the drive for the live axle of a motor car.

The worm gear is invariably employed tor a true right-angle drive The percentage of efficiency is not as high as that of the spur and bevel gears, owing to the large area of sliding contact between the faces of the worm and teeth, but worm gear has the merit of extreme silence in operation. Other forms of gear drive are chain drive, the round, the $V$ and flat section forms of belt transmission, and electric and fluid types.
Of chain gearing probably that of the ordin. ary pedal bicycle is the most common type in use. It nay be noted that with this form the gear ratio is not worked out on quite the same principle as with the other forms of gear, the formula being as follows: Number of teeth on chain wheel multiplied by the diameter in inches of the back wheel, and divided by the number of teeth in the hub chain ring.
The proper functioning of all forms of gearing will depend in a large measure upon the correct meshing of the teeth. One of the worst evila to be avoided is bottoming of the teeth, i.e. the tops of the teeth must not come in contact with the base of the engaging teeth. See Bevel Gear; Bicycle; Chain; Clock; Coaster Hub, Differential Gear, Drill; ThrceSpeed Gear.

## Gears for Motor Vehicles

## Types of Chango Speed Gear in Common Use To-day

For further information on this important piece of mechanism consult the articles Bicycle; Differential Gear: Three-Speed Gcar. Sec also Live Axle; Motor Car; Motor Cycle

As understond for motor cars, gear provides gear wheel $c$ and give the direct drive or fourth up to four forward speeds and one reverse speed. When the sleeve is moved to the right, speed. A common type of three-speed gear is shown in Fig. 1. The four smaller diagrams show the positions of the gear teeth for each speed. The gear shafts are arranged to run in the same plane as the engine, and connected to the clutch and the cardan shaft by means of universal joints. With this arrangement the torque, or drive from the engine, is direct through the gear shaft to the gear wheel.

An example of a four-speed gear box is shown in Fig. 2. The first and second speeds are obtained by a pair of sliding, straight-toothed gear wheels; while, for the third and fourth speeds, dog clutches are used to bring into operation permanently meshed gears of helical tooth formation. The helical gear wheels $a$ and $b$ on the ends of the countershaft are in permanent mesh respectively with the wheels $c$ and $d$, the former being driven from the engine and the latter running freely on the driven shaft $e$. The sleeve $f$ is splined to the driven shaft $e$ and, when it is moved to the left, teeth $g$ at one end engage corresponding clutch teeth on the side of the


Gear. Fig. 1. Three-speed car type gear bor, showing engagement of teeth on the three forward gears and reverse
teeth $h$ at the other end engage corresponding internal clutch teeth on the gear wheel $d$, giving the third indirect speed through the permanently meshed helical wheels $c, a$, and $b, d$.
The first and second speeds are obtained by sliding the pair of gear wheels $j, k$ into mesh with the gear wheels $l, m$ on the countershaft in the usual way The gear wheels $j, k$ are splined on the outside of the sleeve $f$. The pair of gear wheels $j, k$ and the sleeve $f$ thus alwnys rotate with the driven shaft $e$, but it should be noted that either of these members may be adjusted independently of the other. Epicyclic Gears. This type of gear is less commonly employed for motor car work, its chief use lying with the motor cycle and the pedal bicycle.

In the epicyclic gear all the pinions are in constant en. gagement. The mode of operation may be easily understood with the aid of Fig. 3; $a$ is a metal ring which carries internal teeth around its periphery; $b$ is an ordinary spurtoothed cogwheel keyed to the engine shaft, whilst $c$ is a cogwheel, the diameter of which is
such as to allow of its engagement with dogs formed integral with the gear wheel $c$, the interna! teeth on the ring $a$ as well as its whioh is capable of longitudinal movement: engagement with the pinion $l$. The arm, $d, c$ is therefore always rotating with the shaft, acts as the bearing for $c$, and is capab.e of $a$, the whole being driven by the engine. rotating independently of the crankshaft $f$, The gear wheel $b$, which rotates freely on the from which it takes its support. To obtain the shaft, $a$, also earries the pulley that conveys high gear, $a, c$ and $b$ are locked solid by a suit- the drive via the belt to the back wheel The ablo means, which causes the whole mass of wheels to rotate as solid with the crankshaft, the arm $d$ being the driv. ing medium to the transmission.
The second speed is obtained by locking $a$, by means of the band, $e$, and allowing pinion, $c$, with the arm, $d$, free movement : by so doing pinion, $c$ which is being rotated in the opposite direction to the crankshaft pinion, $b$, is through the medium of the stationary ring, $a$, being forced to move slowly with the arm, $d$, in the same direction as the crankshaft pinion, $l$, the arm, $d$, being suitably connected to the trans mission, thereby giving the low gear, (A Fig 3). To obtnin the reverse the arm, $d$, is secured stationary ie. temporarily disconnected from the transmission, and the ring, $a$, allowed free movement. By so doing the crankshaft pinion, $b$, which operates the pinion, $c$ in a reverse direction, obviously causes the pinion, $c$, to rosate the ring, $a$, on the inner side of which it engages, in the same direction as itself, the ring, $a$, in this case being the driving inedium to the transmission. The the gear wheel, $g$, allows it to run independently position of the gears is shown at B (Fig. 3). or the lay slaft, $j$, when top gear is in engage-


Gear. Fig. 3. Diagrams illustrating the principle on which the epicyclio gear is worked
A neutral position is obtained by allowing ment; also when first speed is engaged. The the gear to run free, i.e. the outer ring, $a$. is position of the gears for the three speeds prorunning free and being driven by the pinion, $c$, vided is shown at $A, B$ and $C$. It will be noted which in turn is driven by the cranishaft that all gear wheels are constantly in engagepinion, $b$, so it follows that unless the outer ment, the dogs providing thic driving medium. ring, $a$, is locked by means of the band, $e$, the driving arm, $d$, will remain at rest.
A somewhat different design of epioyclic gear is used in conjunction with the pre- boxes, like live axle casings, are provided with select or or self-changing principle of operation. The actual changes of gear are effected by the depression of a clutch pedal, but, prior to the operation of the pedal, a small hand lever mounted on the steering column below the hand wheel is moved to select the appropriate gear. In a typical system there are four epicyclic trains of gear, giving four forward speeds and one reverse. By adjusting the hand lever any gear may be preselected, to be engaged when desired by first depressing and then releasing the clutch pedal.
Fig. 4 shows a type of change speed gear used on motor cycles. It operates as follows: The clutch complete with the chain wheel that is driven by the engine is mounted on the tapered end of gear shaft, $a$, on the central position of which is formed the keyways that drive the

special filler openings, which are so arranged that the gear box is easily filled to the proper level but cannot be over-filled, since any surplus would overflow from the opening. The filler opening is so placed that the oil is approximately level with the axis of the countershaft In cold weather, when the oil is thick, the motorist may prefer to fill the gear box from the top, but the plug of the filler opening must then be removed to ensure that the gear box is not over-filled.

An excess of oil may in some cases be a source of much trouble, since it may leak on the one hand into the clutch casing, or may overflow into the torque tube and raise the level in the axle casing to such an extent that oil may leak on to the brake drums When supplying oil through the ordinary filler opening, the passage into the gear box must be clear, so that the oil does not merely fill up the opening.

Most makers advise that the gear box on a new car should be emptied after the first 500 miles, preferably when the car comes in from a run and the oil is therefore warm and liquid. A plug is always provided at the lowest point of the box for this purpose. After the oil has drained out the plug should be re-inserted and the gear box flushed thoroughly with paraffin, or better still with a special thin flushing oil The gear box should again be drained completely, and then refilled to the proper level with fresh oil. Thereafter the gear box should be emptied, flushed, and refilled at less frequent intervals

GELATINE: The Substance. When bones, ligamonts, and other connective tissucs of animal bodies are boiled in water, a colourless and odourless solution is obtained, and if this is evaporated to dryness, gelatine remains in translucent shreds, of a pale yellow colour. When dissolved in warm water and ailowed to cool, the liquid is converted into a jelly.

In surgery gelatine may be used to check bleeding. As a food, gelatine has a certain value in that it can partly replace the proteins, lean meat, egg white, gluten, etc., which are required to replace what is lost in the wear and tear of the body. Gelatine is much used by manufacturing chemists for making capsules, pastilles, and other articles. See Demulcent.

GELATINE : Use in Cookery. Of the various kinds, sheet or leaf gelatine is the best. It is made in thin, transparent sheets, and will dissolve quickly in water, -1 oz . being noeded for every pint of liquid. Packet gelatine is opaque and yellowish. Of this 1 oz. will stiffen $1 \frac{1}{2} 2$ pints of water, but it may need soaking for 6 hours.

A third kind, opaque gelatine, is chiefly used for strengthening stocks and soups. used for strongthoning stocks and soups.

Gear. Fig. 4. Diagram of a common type of change speed gear, largely employed in motor cycles

Of this $\frac{1}{2}$ oz. dissolved in $\frac{1}{2}$ pint of water, with a teaspoonful of meat extract added, makes a good glaze for a tongue, etc. Powdered gelatine is also greatly used, and is very successful. Sec Glaze: Jelly.
GENERAL POST. The name of this game has become proverbial for a complete cliange round of persons or things The game can be played by any number of people.

Each player chooses the name of a town, which should be written down by the person who acts as postmaster. One is then blindfolded and stands in the middle, while the others sit down in n circle. The postmaster reads out the names of two of the towns, as, for example: "The post is going from London to Exeter": or from Liscrpool to Edinburgh, etc., and the persons representing those towns have to exchange places, while the blindfolded man tries to catch one.
The blind man continues in the middle until he has caught somebody, though the post may pass successfully inany times before he does so- The postmaster should vary the changes as much as porssible, sometimes choosing two people at opposite sides of the room, sometimes two who are next to each other. At the words general post all the players have to change their places. A variant of the game is for a player, not blindfolded, to try to gain the place of one of the two persons exchanging scats.
GENERATOR. The object of the various kinds of generators is to convert one form of energy into another. As an example, the acetylene generator comprises $n$ vessel containing calcium carbide, another to hold water, and a third to receive the gas, which is generated by the drip of the water on the carbide.
An electrical generator is an apparatus for converting mechanical into clectrical energy. The name is generally used in electrical work for a part icular type of machinc, the alternating current generator; but from the domestic point of view it may be applied also to dynamos generating a continuous current Occasionally thic term generator is applied to a boiler which generates steam, particularly the type known as the flash boiler See Acctylene : Dynamo.
GENOA CAKE. To make this cake, wash $\ddagger \mathrm{lb}$. sultanas and 2 oz currants, drain them thoroughly and leave them to dry. Beat $\frac{1}{2} 1 \mathrm{l}$.


Genoa Cake, decorated with almonds, and wrapped in greased paper as removed from baking tin
butter or margarine to a cream with 6 oz . granulated sugar, then add 3 eggs, one by one, beating each in well before adding the next. Stir the mixture for 5 min .
Mix together the currants, sultanas, 2 oz glacé cherries, the same quantity of mixed peel, and $\frac{1}{2}$ oz. blanched and chopped almonds; then sieve $₹ \mathrm{lb}$. flour, measure out I tablespoonful, and mix this quantity with $1 \frac{1}{2}$ teaspoonfuls baking powder. The remainder of the flour, mixed with the grated rind of a lemon, must be folded alternately with the fruit into the butter, etc.
Stir all together lightly, add a little milk, if necessary, and then stir in the baking powder. Put the whole into a greased cakc-tin lined with greased paper and bake it in a moderately hot oven for about if hours. lessening tho heat
after the first 20 min . The top of the cake may be decorated with a few blanched and chopped almonds at the same time as the heat is reduced.

GENOESE PASTRY. Made either white or coloured, this pastry forms the foundation of many small fancy cakes. To make it, whisk 3 egga and 4 oz . castor sugar in a hasin placed over a pan of hot water unti! the mixture becomes thick and free from strcaks. This should take about 10 min .

Put the basin on the table, continue whisk. ing for $n$ few minutes, and then stir in by degrees 3 oz Vienna flour and the same quantity of butter Add the flavouring, then turn the mixture into a shallow baking-tin lined with greased paper, and bake it in a hot oven until it is tirns and lightly browned.
Genoese Biscuits. To make these, cut some Genoese pastry into crescents and other small fancy shapes, coat them with royal icing, and

then leave them in a cool oven until the icing becomes of a palc biscuit tint. When cold the biscuits should be decorated with a few pieces of glacé cherries or angelica, and, if liked, a little more icing. See Biscuit; Icing.

GENTIAN. Most of these dwarf Alpine plants are suitable for the rock garden, and some of them thrive in the mixed border. The drug gentian is obtained from the root of G. Iutea, with yellow, spotted flowers in July ; height up to 4 ft . The interior of the root, like the Hower, is yellow.
Gentiana acaulis is a most beautiful but capricious plant, which frequently will not thrive under conditions which might be expected to favour it It likes well-drained stony loam, a sunny place, and must be watered frecly in early summer. The blue tlowers are largo and tubular, and are borne on very short stems
Gentiana verna is a lovely miniature kind for the rock garden; it is most likely to flourish in gritty loamy soil in a sunny place, and needs an abundance of water in early summer. Decumbens and septemfida are two other beautiful gentians which thrive in deepsandy loamy soil if kept moist in spring and early summer. Farreri is one of the best of the newer kinds.

Andrewsii, 18 in. high, and asclepiaden, 2 ft . ligh, aro more vigorous plants suitable for well-drained loamy soii in partiai shade. Lutea is a distinctive plant with large leaves and stems 2 to 3 ft . high, bearing whorls of yellow flowers in summer ; this thrives in ordinary loamy soil.
Many gentians are unreliable and short lived under cultiva.


Gentian. The beautiful blue trumpet-shaped flowers of Gentiana acaulis, a favourite plant for the rock garden


Georgian Style. Exterior of an 18fh century red brick house by Sir Robert Lorimer. This style is distinguished for its simplicity, dignity and repose Courlesy of Country Llle
one of the most attractive features of these old houses.

The roofs are invariably hipped, i.e. they slope upward and backward from the walls on all four sides. They were not brought down to form overhanging eaves, but were stopped behind the walls, and there was often a low brick parapet or a pediment on the front of the house. At the beginning of the $18 t h$ century the division between roof and walls was generally a heavy wooden cornice. This disa ppears in the Georgian house, a red brick moulded cornice being substituted a little below the parapet. The roof was often pierced with dormer windows, as shown in the first illustration. At first the roofing material was red tiles, but these afterwards gave .way to slates. especially on town or city houses.

Our fine example shows that the central fcature of the façade was the doorway. This was generally of wood in the earlier examples, stone being employed later, and was often covered as seen here by a fine hood and supported on either side by classical columns or pilasters with their correct entablature. Porches were rarely used.

In these houses a great deal of inventive talent was lavished on the hood and the doorway generally, the intention being to contrast this feature so rich in detail with the sedateness of the rest of the front. A fairly sub stantial string course marked the storeys of the house and separated the rows of windows from each other.

The windows were always of the sash variety, tall and narrow, with wide frames Hush with the brickwork, the sashes themselves being divided by glazing bars into scveral rectangular frames. The frames were painted white It was usual particularly in twin or terrace houses to build a basement storey, the entrance floor being raised a little above the ground level. Hence there was the opportunity of a flight of stone steps up to the front door, and these steps were often, in the more preten tious mansions, extended in a sweeping curve on either side as they a pproached the pavement.

Interior Decoration. Throughout this cen tury the tendency was towards lighter construction, inside and outside. Just as the glazing bars of the tall window became less solid, so the constructive decoration of the interior grew less massive.

The Georgian staircase, for instance, is easily distinguishable from its predeccssor The string or support of the stairway was stepped so as to show the end of each stair, instead of being, as formerly, a long, solid entablature. This expressed the main idea of the Georgian staircase makers, that the stairway was a continuous series of steps from floor to floor. Pedestals at the foot of the stairway, which in Jacobean architecture were heavily carved, became little more important than the balusters. The handrail was thinner.
Chimney-pieccs grew altoget her !ightcr in construction, until they culminated in the daintiness of the Adam period Panelled walls continued as the basis of the decoration, but


Georgian Style. Mid-Georgian drawing room with characteristic panelled walls, richly ornamented ceiling and pediments over the door and chimney-piece. The furniture is of the Chippendale period Courtesu of Countr" Life
the panels were simpler and shallower, and ware often in carved pine or were painted in white or cream. It is noteworthy that the same panelling was used throughout the house. The only assertive decorations were the ceiling cornices and the superstructures to overmantels, doors and windows. Wrought-iron work was very largely used, and this minis tered to the craving for light construction Necessarily there are to be found in some purely Georgian houses Queen Anne and even Jacobean features. but overlapping is inevitable in


Geranium graudiflorum, a hardy plant with vioietblue flowers in summer. See below
any architectural period, and the Georgian atmosphere is less mistakable than most.
Our second illustration shows a midGeorgian drawing room with richly ornamented ceiling and broken pediments crouning the larger door and the chimney-piece. The panels are simple in well designed contrast to the cornice decorated with dentils and classical motives. The furniture is of the Chippondale period with side tables enriched with fretted ornament and chairs with pierced splats of carved ribbon patterns. The writing table is an example of the French taste then in vogue with its delicate ormolu decoration. 'The Georgian dog grate, serpentine fender and Oriental hearthrug are furnishing points of interest.
An important development in connexion with Georgian interior decoration was the use of wallpapers. Several factories in London after the first half of the 18th century produced printed and coloured papers in Chinese designs, and as the classical styles became the vogue with the work of the Adam brothers and continued till the end of the Georgian period, designs introducing classical landscapes with temples and statues were popular.

Modern adapters of the style somctimes dispense with some of its most beautiful details. One does not often see a neo-Georgian house with a parapet or a pediment. There is a preference for over-hanging eaves, and only a fow modern houses can carry the ta! windows of the old-time terrace house. A profusion of artistic wrought-iron work is financially impossible in most cases. But the vitality of the style is proved by deviations that may be inade in details without the sacrifice of its general content. See Adam Style ; Bedroom; Chippendale Style; Fireplace; Furniture; Glass; Hepplewhite Style; Regency Style; Sheraton Style ; Silver.

GERANIUM. The true geraniums are hardy perennials suitable for the flower border and the rock garden. The zonal pelargonium, a popular flower for summer bedding, and commonly though erroneously called geranium,

Is a tender South American plant which doe is described under pelargonium ( $q$ v.).

The bardy geraniums suitable for the Hower border Hourish in ordinary soil and are in. creased by division in autumn or spring and by seeds sown in boxes of soil in a frame in April. All are summer-flowering The best of the vigorous border kinds are armenum, $2 \frac{1}{2} \mathrm{ft}$, crimson purple; Endressi, 15 in , rose pink; grandiflorum, 12-15 in., violet-blue: and ibericum, 18-24 in., violet-blue

Geranium argenteum, 4 in , grey leaves and rose-coloured Howers; cinereum 4 in., grey leaves and pink flowers; and lancastriense, 3 in ., rose colour, are suitable for the rock garden where they thrive in sunny places and well drained sandy soil Geranium pratense is the common orowfoot which grows wild in Britain. See illus. pages 334, 528.
GERBERA. This beautiful summerHowering perennial from South Africa, commonly known as the Transvaal daisy or gerbera, rarely succeeds out of doors in Britain. unless grown in a well drained sandy soil in a "arm sheltered position. It belongs to the daisy order and bears very showy flowers, carricd singly on stout stems a bout 1 ft. long; in the newest varieties the flowers are of various shades of red, orange red, salmon, and rose. The typical kind is Gerbera Jamesonii, with bright red or scarict llowers
The beat way to grow the Transvaal daisy is to plant in a sunny border at the foot of a heated greenliouse or in a bed of soil in a sunny frame: it may also be grown in pots under glass. A compost of loam, leaf-mould and sand is suitable. Propagation is by division of the plants in spring or by seeds sown under glass in March.

GERMAN MEASLES. The symptoms of German measles, also known as rubella, resembles those of measles but the discase is much less contagious. The microbe has not been discovered The incubation period is about 14 days. The infection probably spreads from jerson to person on the breath, skin scalcs, and clothing.

An attack may be ushered in by feeling of chilliness, running of the nose, sore throat, headache, pains in the hack and legs, and some feverishness. The glands of the neck generally awell a little, and a red eruption may be seen in the throat. On the first or second day a pinkish-red rash appears on the face and neck, and then spreads down over the body. It lasts from three to five days as a rule. The neck glands remain enlarged, and occasionally those of the armpits and groin become a little swollen.
It is best to put the patient to bed and keep him there until the rash fades. Give him light, digestible food, and if there is any constipation give a mild aperient such as hali teaspronful of confection of senna.

Keep the patient from mixing with other children for 8 or 10 days after the appearance of the rash, and until all catarrhal synnitoms in the nose and throat have disappeared Children who have been exposed to infection should be in quarantine for 20 days. See Infectious Diseasca; Notification; Measlcs.
GERMAN SILVER. German silver is known under several different names, among which are nickel silver, Nevada silver, electrum, and others. It is an alloy of copper, nickel, and zinc, the composition varying. The best quality is composed of two parts of copper, one of nickel, and one of zinc. This grade is more difficult to work but possesses a fine polishing surface, and is used to imitate real silver.
The metal can be easily worked, rolled, hammered or drawn; ease of working depends upon the proportions of the alloy, a higher porcentage of copper generally making it softer. While fairly hard, tough, and not
easily corroded, it becomes slightly tarnished and play is as at whist. Players must follow if long exposed to the air It can easily be soldered Sep Metal Work; Soldering

GERMAN WHIST. This variety of ordin. ary whist is played by two persons. The players cut for deal, the lower cut being the winner. Here the ace counta as the lowest card The winner of the cut then denls out alternately 13 cards to himsclf aild 13 to his opponent. He turns up the next card to show what are trumps and leaves the reat of the pack on the table.

The player who has not dealt then leads.

## Gesso Work in Various Forms

## Modern Uses for this Decorative Handicraft

For related information consult the articles on Italian Renaissance Work; Lacquer Work: Leather
Work and Stencilling. Sec also other ornamental crafts, including Batik; Lampshades: Pattern Printing Work and Stencilling. Sec also other ornamental crafts, including Batik; Lampshades: Pattern Printing

Gesso is a furm of applied decoration The material that is employed consists of a pasty substance compounded chiefly of plaster of Paris and glue. It was used for ornament in relief, and is found Irequently on the fiames of Queen Anne mirrors, on chairs, and other furniture of that period The woodwork was overlaid with gesso in a decorative design and then gilded, which produced the ornate character of the gilt furniture of the late 17th and early 18th centurics.

When used for high reliol gesso powder is unsatisfactory in wear, and for such work barbola paste has taken its place, as it can be easily modelled owing to its plastic nature. and when dry it is quite hard. The box illustrated in Fig. 4 is an example of modern gesso work in low relief; the mirror frame and bowl. Figs. 6 and 7, are ornamented in barbola work The latter is particularly effective when used for decorating painted and gilded cane furniture The former is the loundation paste for alightly raised lacquer work designs.

The wooden box for handierchiefs (Fig. 4)

pencil It is better to make the design on tracing paper, as if much is rubbed out on the box it becomes greasy and the colours work hadly The horder of a conventional floral embroidery design can be well adapted from a transfer on to tracing papei
Mix some gessu powder into a creamy paste with water Apply this to the design with a brush and avoid going over the edge Cam is necessary, as the gesso paste should be modelled a little and applied in the direction it is to lie. Each leaf should be modellecl separately and the roses worked in a circulitr dircction. Several conts of gesso may tee used, but not very thickly as it louks rough when dry. Any unevenness can he rubhed down gently with sandpaper

When the gesso is quite hard it can be coloured with barbola colours Allow these to dry and then varnish with Barbula varnish. Articles can be obtained with the raised work on them and are then ensily finished in colours. The real fascination of the work, however, lies in the nodelling.

Barbola Decoration. Experimental outfits for barbola work can be obtained for 3s. fid Varnish, paste, gesso powiler, tubes of colours. bronve powders, brushes and tools can all be obtained as required in a good ast department.

Barbola can be applied in many ways, one of the most effective being for mirrors Pro. cure a wonden inirrorframe, sandpaper it. then coat it over with quick drying lacquer or ptain. Select a suitable design to trace or copy is first rubbed down with sandpaper and then painted white before being coloured the desired shade with transparent Iacquer. When this is quite dry make a tracing of the size of the top of the box, and design something suitable. Conventional work of the type shown is the most effective. Trace this on to the box by turning the pencil side on to the wood and going over the back with a fairly hard pencil: but should the design be incorrect when reversed, go over the back of the design with an H.B. pencil, lay this side next the wood, and trace off with a harder
 - 4 ?


Gegso Work. Processes employed by the decorator. 1. Rolling paste in
the bands to form a ball. 2. Shaping the leaves or petala. 3. Using the the bands to form a ball. 2. Shaping the leaves of petala. 3. Osing the modeller to make veins in leaves or for other delicate work suit if they can; if not, they can play a trump card, which is superior to those in all other suits The winner of the lirst trick takes the exposed card into his hand and the loser takes the next from the pack They repeat this after every trick and so bave always 13 cards in hand until the pack is exhausted When the thirteenth trick has been made the winner leads one of the cards in bis hand and play continueq until all have been played out trumps being as before. The tricks won by each player are then counted
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Gesso. Fig. 4. Eandkerchlel box, with border of leaves and flowars

Model groups of fruit or flowers, using barbola paste, and stick them to the wood. using a paste made from the barbola to which water and a little powdered glue have been added. It is important to allow the modelled work to become absolutely dry and liard before attempting to paint it.
In modelling use a little gesso powder on the hands, as the paste will work more easily and will not show the marks of the skin. Avoid labouring the work. Takc out the amount of paste required and roll it in the hands, Fig. 1. Should it be desired to form an apple or similar fruit, roll it into a ball, and when the correct shape has been obtained put it on a picce of glase or board, and finish off with a barbola
effective. Try rather large fruit and llowers first, as they are easier and do not tend to overcrowd the work

As the work dries, touch it up where necessary. When all the colours are diy and there is no riak that the paste will shrink, varnish all over with clear varnish. The wreath, shown in Fig. 6, is an equally suitable design for a mirror frame or, in a amall size, for an applied decoration to ornament a waste. paper basket or linen basket in cane. A charming effect is gained by leaving sonie of the Howers silver or gold

To denorate the bowl shown in Fig 7, it must first of all be coloured, using for this purpose either quickly-drying lacquer or barbula colour, which is varnished when dry. While the bowl is drying, model the fruit and lowers which are required for decoration. To make the bowl waterproof it is a good plan to coat the inside with, gold size, using $n$ farge, soft brusli.
Having modelled the apple, leave it on a sniall board to harden, and then model the leaves.


Fir. 5. Toots used for delicate modelling in Gesso work
many opportunitics for the skilful modeller. A liquid medium is sold for use with bronze colours, which are obtainable in glass tubes

Examples of this kind of work are illus. trated in lig. 8. On the left is a powder bowl of papier maché, on which is molelled the heal and bust of a dancer. The bowl itself is lacquered a shade of petunia red, and petals of the pasta are arranged round the dancer's waist and at the edges of the bowl to represent a billowy skirt. The figure should be done in the ordinary manner with barbola paste, and must be affixed to the howl before it is dry, as the bodv must be shaped to the lid of the bowl. 'Then the long petals forming the rest of the decoration should be modelled and placed in position. In this work the modelling tools should be used as muich as possible to nvoid into $\Omega$ ball, then press it fat and form the shape of a leaf. The sides of the leaf should be held in the two hands and pulled gently towards the worker. This appliea to rose petals, as shown in Fig. 2. The modelling tool is then used to finish off delicate hollows, veins of leaves and curled edges (Fig. 3).

Coloured Bronze Powders. Another modern form of gesso work is executed chiefly in gold and silver and applied on a lacquered bacligmund. Ita particular charm lies in its lustrous effecte produced by using colnured bronze powders. It is used for ornamenting many kinds of hnusehold articles, among them candlesticks, mir. rors and powder boxes, and is a form of work that affords use gold and silver bmon put on these coluurs powder, and a grood washable medium, which should be applied with n soft brush.

For the smaller covered bowl, decorated with a rose, the petals must first be modelled and pinced in position, using the modelling timls as much as possible. (See Fign 2, 3.) A few of the petals should be made rather thin to form a centre. Round this centre fix the rest of the petals, pulling them into position, and turning over the edges of some of them. When the rose is linished, put it on a small board, and thuch it up with the modeller. It is aulvisable to finish this before the paste gets hard

The bowl itaelf must then be lacquered deep blue. When it is dry scrape the top and place the rose in ita position. Then make a few leaves and arrange them round the rose. Next gild the rose, and colnur the leaves green, using bright green bronze powder. As suon as this is dry, trans. parent Incquer can be used, a little scarlet for the centro of the lose, then orange, with yellow for the outer petals. Finally the leaves should be coloured with green lacquer.

GEUM (Avens). These are splendid hardy border plants, some of which will bloom throughout the summer months if the faded Howers and the old atems are cut off. The two best are Lady Stratheden, yellow, and Mrs. Bradshan, scarlet; both bloom from May to September. Other ahowy varieties with a shorter flowering season are Orangeman, orangecolour, and Fire Opal, orangered. All these are about 2 ft . high when in bloom Borisii, 1 ft., has orangescarlet flowers. Geum montanum. 6 in., and rep. tans, 8 to 10 in., have yellow Howers in abundance in spring, and are auit. able for the rock garden

Geyser: For Instantaneous Water Heating

## Types for Local or Multi-point Service

## Related articles include those on Rath; Cistern; Gas; Hot Water; W'ater Supply

Strictly speaking, the geyscr is an apparatus must be turned on very slightly, so as to which takes in cold water at one end and discharges it almost instantanenusly at the other, heated to any desired temperature Geysers are made to burn any fuel, but the chief sorts used are coal gas, paraftin, coal, coke, wood and alcohol. Only those burning coal gas are dealt with here, since the principles on which they all work are the same.

The working is as follows: Cold water enters at the inlet pipe and flows around a jacket in the lower part of the geyser until it becomes hested, when it rises automatically into a series of cylindrical chambers, and in passing through these it receives more and more hent from the burner below. Finally, it enters a boiler in the centre of the geyser, from which it emerges through the outlet pipe and flows out into the bath or receptacles placed to receive it. A special typo of heater (describicd below) is connected by pipes to different points in the house.
The main gas jet should never be turned on unless the water is flowing through the geyser. and in most types this is provided for in the construction of the apparatus. The best way is by means of an automatic valve, so constructed that it is the flow of water which turns the gas on, and directly the water stops the gas supply is cut off and the flame dies down. A second way is by interlocling the gas tap with the water tap. This makes it impossible to turn on the gas before the flow of water has started, and renders it necessary to turn off the gas before the How of wnter can be turned off

Besides the geyser proper, illustrated in Fig. 1, there is another type, known as the pressure heater, and illustrated in Fig 2. It has a very tiny pilot light, not unlike the bypass of an ordinary incandescent burner, going continually, and whenever $n$ hot-water tap connected with it is turned on in any part of the house the main gas jot lights up and provides inatantaneous and continuous hot water so long as the water tap remains open. Immediately the tap) is closed, the gas Hame in the geyser dies down, leaving only the pilot light.
Roughly speaking, it may be assumed that the average rise in temparature required to provide $n$ hot bath is $40^{\circ} \mathrm{F}$. above that of the cold water in the main. For this purpose the gas used would be in the neighbourhood of I cubic ft. for every gallon of water heated. So that, if the average hath is assumed to require about 30 gallons of water, 30 cubic ft . of gas will be used in heating it up.
In choosing a geyser, the size is determined in terma of the number of gallons of water to be heated per minute. As the geyser is only capable of imparting a certain quantity of heat to the water in $n$ given time, it follows that the tem. perature of the water flowing out of the geyser will depend upon the rate at which it is Howing If very hot (or even boiling) water is required, the water tap


Geyser. Fig. 1. Geyser for the bath, with automatic valve and swing-out burner. Fig. 2 Automatic water heater for multi-point service. See text
pound. The metal ones are used in connexion with window boards, and should be mounted flush with the outside wall. The asbestos ones are mounted flush against the wall, the shank being cemented into the wall itself.

Ventilation. No gas-heated bath geyser should be fitted in a room without a window, and the window should be capable of being opened-preferably at the top. Where gashentell geysers are fitted in sma!! bathrooms, it is important that special provision should he made for the ventilation of the room, apart from that provided by the flue equipment of the gevser The special ventilation can best be provided by the fitting of a 9 in. by 9 in airbrick in an outer wall of the bathroom. If an ordinary air-brick is fitted, a deflecting board should be fixed over the brick on the room side, to protect the person using the bath from dranghts The smaller the room in which the geyser is fixed, the greater the need for special mesns of ventilation.

Safety Precautions. A cause of accidents has been the piroduction of explosions due to the application of a match to the gas jet after it has been fullo turned on for some time. This

avoided
following the instructions issued by the makers: but one or two general points must be at.tended to. Never turn on a gas tnp until you have a lighted match in your hand, ready to apply to the ssouing $g$ as. When selecting a geyser, ingist upon having one with either an automatic value or interlocking gas and water taps If the geyser is of tho type in which the burner withdraws from the heating chamber, never light the burner when it is inside the chamber. Always withdraw it first and apply a light to it outside. In most modern geysers of this type, the gas is not fully turned on until the burner is inserted bencath the geyser, so that only a small amount of gas is liberated when the burner is outside If the geyser is of the type in which the llow of water automatically turns on the gas and cuts it off when it ceases, do not turn on the water without lighting the pilot jet. If the pilot jet is alight and in position, no explosion can possibly ensue when the gas is autornatically turned on.

GHERKIN, Although it is, strictly speaking, the name of a dwarf-fruiting variety of cucumber, Cucumis sativus, the term gherkin is generally applicd to immature and discarded cucumhers of all kinds that are used for pickling and other purposes. The true gherkin can be grown in the open air from seedlings raised in pots in March on a hotbed, and transferred in Junc to well manured ground

How to Cook. Gherkins have various uses in cookery, and are excellent when pickled. 'They should be left to soak for 3 or 4 days in salt water, then dried and put into a clean jar. Pour into a saucepan enough vinegar to cover the gherkins, allowing to each quart of vinegar 1 oz of allspice and $\frac{1}{2} \mathrm{oz}$. of ginger Let these boil for 10 min ., then pour it over the gherkins, cover the jar with a plate, and leave it overnight at the side of the fire. In the morning drain off the vinegar, re-boil it, and pour it over the gherkins again. When cold cover the jar with a bladder. The pickle will be ready for use in ahout six weeks See Cucumber.

GIANT FGNNEL. The scientific name of these graceful plants, with umbrella-like effect of foliage, is Ferula. They are at their best in the spring in the wild garden, but are also remarkable in the summer and autumn, when the branching, flowering shoots reach a height of about 8 ft ., and bear innumerable ycllow blossoms. The giant fennels should be raised from seed, as they are not easily divided or moved with success Of several species, F. tingitana and F. communis are those which respond most. readily to the culture of the wild garden.

GIBLET : How to Cook. The giblets of a chicken, duck, goose, or other bird consist of the head, heart, liver, gizzard, neck, fect, and the joints of the winga. They are usually employed in the making of stock, soup. and pies, but may also be stewed. In stewing, wash and scald two sets of goose giblets, skinning the feet and removing the beak and the inside bag of the gizzard. Cut all into small pieces, and stew them until they are tender in enough water to cover then, seasoning them with salt, pepper, a minced shallot, and a little nace.
Then strain off the stock, and in a separate pan melt a lump of butter about the size of a hen's egg, stirring into it about 1 dessertspoonful of flour. When these are lightly browned, add the stock from the giblets and stir the whole until it boils. Put in the giblets, heat them up thoroughly and then serve.
Giblet Pie. The giblets of a goose or a pair of ducks, some short pastry, and one or two slices of slightly salted breast of pork are the ingredients required to make giblet pie. Clean and scald thoroughly the head, gizzard, liver, legs, the ends of the wings, and the neck, and stew them gently in a little water for about 2 hours Add 2 or 3 onions, hlack pepper, a limpl of butter, and a littlc salt, parsley, sweet marjoram, and thyme. When the giblets are iender take them from the fire to grow cold, then strain off the stock and remove any excess of fat Line a pie-dish with short crust, moisten the latter with beaten egg, and place the pork at the hottom, putting the giblets on top. Pour in a little broth Cover the pie with more pastry, and bake it in a moderate oven for about it hours, pouring in a little more stock before serving. See Fowl: Soup.

## Giddiness. See Dizziness

GHIDING. The process known as gilding consists in coating the surface of an objeot with an adhesive and applying to it a very thin film of gold leaf. When dry it appears as a solid gold surface The usual method is to apply gold leaf or metallic powder, the best results being always obtained with gold lcaf.
The tools required are the gilder's knife and cushion. The knife has a thin, narrow blade like a table-knife. The cushion is a board about 6 in. square, the upper surface padded with flannel and covered with wash-leather; three sides are shrouded with thin card to protect the gold leaf from the wind. The underside has a loop so that it can be held with the thumb and supported by the fingers of the left hand. The cushion is used to support the shcet of gold leaf and to facilitate the cutting operations.
The gold leaf is obtained in broks containing about 25 leaves approximately 3 in . square, each sheet separated by a piece of thin tissuepaper. The knife is used to cut the gold leaf; it must be kept perfectly clean and free from the slightest trace of grease The blade must never be touchnd with the fingers, but must be wiped from timc to time with a piece of clean rag. A gilder's tip, a long camel-hair brush, is em. ployed to transfer the gold leaf from the cushion to the work. Two or three camel and hog hair brushes will be useful for applying the size and manipulating the gold.

Gilder's gold size can be obtained ready for use, a small bottle covering a considerable
amount of work. Suppose that the work is already cleaned and prepared. The gold size is brushed over the part to be gilded, and it is absolutely essential that it should be applied thinly and evenly : if there are little mounds of size on one part of the work, and scarcely covercd prortions on another, the result will be failure. The next step is to protect the work se that no dust can settle. upon it.

The size should be fit to receive the gold after 12 hours, but no hard and fast rule can be laid down as to the right time to apply the gold leaf. If thesize is wet, it will worls through the gold leaf and result in a muddy appearance; if too dry, the gold will not adhere properly. It is best to make May. They grow some trials on an odd piece of work and to learn by experience. When the size is judged to be in good condition a little of the gold leaf is laid on with the gilder's tip, and pressed down lightly with a pad of cotton wool covered with soft linen. The surface of the gold is then brushed oves with a soft hog. hair brush, and if the gold remains in position and appears bright and lustrous, ill is well.
An actual piece of work can now be undertaken by taking a leaf of the gold and, with the nid of the knife, laying it upon the cushion. Do not touch the leaf with the hands, as any grease will spoil the contact. A strip of the requisite width is cut off with the knife, picked up with the tip and applied to the proviously sized work, preseing it into place and brushing over the surface of the gold, the process being continued until the whole is completed A sheet of clean white paper should be laid underneath to cullect any gold powder that falls. After being left in a warm, dry place for a couple of davs, the work is finished with ormolı size, a varnish of shellac and clemi, or gamboge, which can be bought ready for use.

Regilding a Frame. To prepare a gilt frame for regilding, after removing the picture the gilt work is washed in a weak solution of soda, in lukewarm water, rinsed with clean cold water, and thoroughly dried. Any cracks should be made good with a putty composed of whiting, yellow chrome, and size. When this is dry, paint the frame with a mixture of whiting and a red or vellow pigment to make a rich yellow-gold colour. Mix this with size to the consistency of thin paint, then strain it through a piece of muslin, and while it is still warm brush it on to the frame. Aftrr it is dry give it a coat of size, and the gilding may then be procceded with

Most frames are gilded in several different ways, and comprise a burnished portion, a matt portion, and modelled parts that have to be done with gold size. The burnishing is done with burnishers generally made of agate or bone. The framc is brushed over with gilder's burnishing size the consistency of thick paint, apread evenly, allowed to dry, and rubbed down with old sandpaper until it is perfectly smooth. It is then dusted and another coat applied. This is allowed to dry and rubbed down as before, after which the work is brushed to remove all dust.

The gold leaf is applied by wetting a part of the frame with water size, laying the gold upon it and blowing gently upon it to force it into contact with the work. If any craoks appear, or there are any portions deficient in
will, if too dry, the gold dainty hardy annual


Gilia. Delicate blooms and leaves of a
lay. They grow March and planted out in best are capitata, lavender; nivalis whitc; tricolor, lavender and white; and tricolor rosea, rose colour. The finest of all is Gilia coronopifolia, which is often grown as a biennial and raised from seeds under glass in June to provide flowering plants the next year ; it will, however, blooun in summer from seeds sown under glass in warmth in Febriary: The brilliant rose-scarlet flowers are on stems 2 to 3 ft . high. Pron. Jil'i-a.

Gill. Mcasure of capacity. It is the fourth part of a pint.

GILLYFLOWER. This is the old English name for carnation. It is sometimes applied to wallHowers and stocks. See Carnation: Wallitower.

GIMIETS. This is a woodworker's tool used for boring small holes, gencrally prior to inserting a scrow. It comprises a handle, and a steel rod pointed at one end, with a tapering screw thread of variable pitch. It is used by pressing it upon the work and rotating the handle in the manner illustrated.

The rotation of the gimilet causes it to screw its way into the woorl, and should cut the wood after it has entered a short distance. It should be kept clean and bright., with the edges of the cutting thread quite sharp, as a blunt gimlet. choked up with chips, will split


Gimlet. How this woodworker's tool should be held when in use the wood. A bell - hanger's gimlet is made with a long shaft, some. times 3 ft . in length. The extremity is formed like an ordinary gimlet, but the blade is larger in diameter than the remainder of the stock. It is employed for boring holes through thick joists, or at a considerable distance, and will be found useful in making holes through which to pass electric bell wires. See Amateur Carpentry; Boring.

GIMP. Flat ornamental edging used as a finish in upholstery is the commoneat form of gimp, and usually it is of a lonped formation Gimps nre quickly and cheaply made by machine to match the colourings of chairs, settees, or cloth ourtains, and can be had to order. Looped yarn for use in knitting shawls reccives the name of gimp from the presence of little loops or curls upon its surface. In lace the gimp thread is a braid or cord used to thicken or outline the pattern. Fancy braids for trimming are sometinies known as gimps.

GIN. Gin is made from maize and harley flavoured with juniper berries. There are several varieties. Old Tom has a small percentage of sugar; dry or unswectened gin has none. Plymouth gin is said to be the purest; genievre, well known in various European countries, is made from corn.

Gin does not improve much with age. It should be of whito colour, unlike old Hollands, which is of straw colour. Gin and bitters is a favourite appetiser, and gin forms the basis of many cocktnils, such as gin fizz, gin julep, gin sling, gin smash, and many others. Sloe gin can be made nt home with the juice of sloe berries. See Cucktail; Sloc Gin.

GINGER. Ginger is much used in cookery as a powder, when it is known as ground ginger, as preserved ginger in syrup, or as whole ginger. The Inst-named is also termed mont or stem ginger, and the pieces are a palc buff colour, toughi and fibrous. Whole ginger is usually bruised, i.e. well benten with a rolling pin or similar article, so that the flavour is more easily extracted.

Ground or whole, it is best to buy ginger in small quantites, as it soon loses its pungency. Preserved ginger is sold in jars of varying sizes Its main use is in the form of dessert, but, like ground ginger, it is also employed in the making of oakes, puddings, eto. The syrup in which it is preserved is used for flavouring purposes.

Medicinal Uses. The most important constituent of ginger is an aromatio volatile oil which gives it its well known tlavour. Ginger is chiefly used in medicine, dose 5 to 15 grains, for its stomachic and carminative effects It is also a common flavouring agent. Ordinary preparations are the syrup of ginger, duse $\frac{1}{\frac{1}{2}}$ to 1 dran, and the tincture of ginger, $\frac{1}{2}$ to 1 dram. Tincture of ginger is an oldfashioned and sometimes efficacious remedy for flatulence. See Flatulence : Indigestion.

GINGER ALE. Except that extract oif ginger is used in place of the root, ginger ale is made on similar lines to ginger hecr, but with the addition of bitter Havours. These include one or more of the following : tincture of capsicum (enyenne pepper), gentian, cardimom seeds, tincture of cinnamon, canomile, oil of rose, or geranium, etc. Sufficient caramel is ndded to give a golden colour. These matcrials are added after cooling and before fermentation.

GINGER BEER. This becr can be made from ginger root and pure cane sugar alone, but the addition of one or two other ingredients is an improvement. The simplest method for brewing it at home is the following : assuming the copper holds 5 gallons, a wooden tub of the same capacity is required. Get the copper quite clean and frce from grease, but do not scour it bright. Fill it with water and bring the water to the boil.

While this is heating weigh 8 oz . of ginger root and crush it by putting it in a linen brg and pounding it with a hammer on a stone. Directly the water boils add the crushed ginger root and draw a way from the fire so as to stop boiling. Let it stand for three hours, covered to keep the heat in, and stir occasionally.

Put 5 lb . white granulated sugar in the tub, then strain through muslin the hot ginger root
liquid from the copper on to this sugar, and stir it till disso!ved; cover the tub, and when the liquid is quite cold bottle it. In about three weeks the ginger becr sioould be brisk with gas and ready to drink. If it is wanted sooner, 3 oz. fresh brewer's yeast may be stirred into the tub dircetly the ginger beer is cold, and bottling done 24 hours later. The beverage will be ready to drink in a couple of days.
GINGER BISCUIT. Ginger biscuits are made by sieving together $\frac{1}{2} \mathrm{lb}$. Hour, $\frac{1}{2}$ teaspoonful ground ginger and $\ddagger$ terspoonful bicarbonate of soda and the same of salt. Rub into thesc $2 \frac{1}{2}$ oz. butter and mix to a stiff paste with golden syrup. Knead the paste together, roll it out on a Houred board to the thickness of $\frac{1}{2}$. Cut it into round biscuits and bake in a modorate oven for 15 minutes See Biscuit.

Gingerbread. See Cake.
GINGER CȦNDY. To make ginger candy, put into a pan over the fire 12 oz. sugar and $\$$ pint of cold water, and when the foriner is


Ginger Candy, a dellcious and wholesome sweetmeat
dissolved add 2 oz. glucose and a lump of butter about the size of a walnut. Boil these to $240^{\circ}$, then add $n$ small $\downarrow$ teacupful of preserved ginger in syrup, about 6 drops of gingerine or any ginger flavouring, and a dessertspoonful of ginger syrup. Stir the whole gently and continue boiling and atirring until it has reached $248^{\circ}$.
Pour the mixture into a bayin previously rinsed in cold water and leave it !or 5 min ., then stir it with a wooden spoon until it is thick and creamy. Cover it with wax paper and a thick towel, let it stand for about 20 min ., then knead it thoroughly with a spatula and the hands, finally patting it out between candy bars set on wax paper. When set it may be cut into cubes or any other shape desired.

GINGERNUT. To make these, take 1 lb soft flour into which has been sifted it teaspoonful bicarbonate of soda and the same quantity of cream of tartar. To this flour is added if oz butter or other good fat, $2 \frac{1}{2} \mathrm{oz}$. castor sugar, 1 teaspoonful ground ginger, and $\frac{1}{2}$ a teaspounfut powdered mixed spice. A stiff dough should be made with about 6 oz. warmed golden syrup. Roll this out about $\frac{1}{8}$ in. thick, and cut with small plain cutter. The biscuits spread a little, so inust be placed slightly apart on the shcet. This should be slightly greased, and then sprayed with a litt!e water before the biscuits are placed on it. Bake them in a moderate oven for 12-14 min. They are soft when finished, but harden on cooling. See Biscuit.

GINGER PUDDING. A steamed ginger pudding can be made in the following way: Mix together $\frac{1 \mathrm{lb} \text {. flour, } 2 \text { teaspoonfuls ground }}{}$ ginger, $\ddagger$ teaspoonful carbonate of sodn, $£ 1 \mathrm{l}$. chopped suet, 2 oz . candied pecl cut into small pieces, $\frac{1}{2} \mathrm{lb}$. breadcrumbs, and $t \mathrm{lb}$. Demerara sugar. Warin 2 tablespoonfuls golden syrup
and pour it into the centre of the dry ingredients, mixing the whole together with a little mill: and water to a wet consistency.

Beat the mixture well before turning it into a greased basin covered with greased paper, not a pudding cloth; then stand it in $n$ sauce pan half-full of boiling water and steam it for 2t-3 hours. Serve the pudding on a hot dish, with hot custard, if liked. This is sufficient for six persons.
GINGER ROCK CAKE. Small ginyet mok oakes arc made by sieving together $\frac{3}{} \mathrm{lb}$. Hour, 1 terspoonful ground ginger, $\ddagger$ teaspoonful powdered cinnamon, and level tcaspoonfut of bicarbonate of soda. Rub into these 7 oz . of margarine : then add 6 oz . white sugar, and a teaspoonful caraway seeds

Mix these ingredients to a stiff paste with a beaten egg and, if necessary, $\Omega$ little milk. Grease a baking sheet and drop the mixture on to it in small, rough henps, leaving a space betwcen each. Blanch 1 oz . almonds, stick one on the top of each heap, and then bake the cakes in a hot oven for 15 to 20 min

GINGER SAUCE. A good ginger sauce can be made by heating $\frac{1}{2}$ pint milk in a small pan over the fire, and in the meantime mixing the yolks of 2 eg gs and the white of one in a basin containing about oz. sugar. When the mill: is hot, pour it on to the contents of the basin, stirring all the time, and mix thoroughly. Return to the pan and stir it until it thickens without boiling. Just before it boils pour the sauce into a basin and add sufficient ground ginger to taste.

## Ginger Snaps. See Brandy Snap.

GINGER WINE. Ginger wine is made by boiling together for $\frac{1}{2}$ hour $3 \frac{1}{2}$ gallons of water, 12 lb . sugar, lb . good bruised ginger, and the thinly pecled rinds of 6 large lemons. Put the wholc when lukewarm into a clean, dry cask, with the juice of the lemons and $\frac{1}{2} \mathrm{Ib}$. sultana raisins. Then add 1 tablespoonful of thicts yeast, and stir the wine daily for 10 days. When it has ceased to ierment, add 1 oz. isinglass and a pint of brandy; bung the wine closely, and hottle in two months.

GINGHAM. Long is favourite for chilIren's dresses, house and summer frocks. aprons and overalls, gingham is a cotton fabric inade principally in check designs. The patterns range from siniple block checks up to elaborate plaids in two or three colours The cloth normally is finished pure, or with very little loading. The pattern is not printed, but woven from yarn usually dyed in fast colours. The general effect is bright and clean-looking.

The advantages of gingham led to its use in other spheres; for instance, as breakfart cloths, curtains for kitchen or cottage eascment windows.

Coloured ohecks are sufliciently showy in themselres, but an original touch can be added by oross-stitching simple designs upon some of the white chequerings. To ornament every white square is to invito an overcrowded appearance, and it is advisable to seloct squares at intervals for trentment in one or two colours: or a plain border in white or to match the colour of the check may be cm broiderd with the design. For example, $n$ daffodil yellow check ginghanı cloth could have a 6 in. white linen border with a crossstitch design in the yellow. When washing gingham which has faderl, add a little vinegar to the last rinsing water. This will help to revive the original colour. See Embroidery.

GINSENG. This is a plant of the genus Ariblia, from the root of which a drug is extracted. That obtained from the wild plant is regarcled as better than that ootaincd from the cultivated one, and the older the root the bettor the quality, so it is belicved. The drug, which is slightly bitter and aromatic to

He taste, was formerly belioved to possess wonderful medicinal powers, but the existence of these is now doubled. It is, however, widely drunk in China as a gpecific for all manner of bordily ailments.

GIRANDOLE. This is a branched candlestick used for $n$ cluster of lights. They are usually ornamented, the design being fre. quently made to imitate bunches of flowers. See Candelabrum ; Candlestick.

GIRDER. A girder is n principal and horizontal beam of wood, or more generally of iron or steel, which rests upon supports at oither end or at different positions throughout its length, to support a lond. The load may be distributed along its entire length or at different pointa throughout its unsupported length.

As a general rule girders are formed in what is known as the I shape, that is, in the form of the letter I, with Hanges at the top ind bottom, these being elightly thicker in section than the web or upright piece which connocts them. The modern girder usually is composed of special steel, and when rolled from one solid bar is known as a rulled steel joist. In enginecring practice a girder means a compound structure forming a beam to reccive a vertical load. It is marle up of several pieces, which are riveted tognther at the joints.

GIRDLE or Griddle. This cooking atensil consists of a circular piece of iron, about 12 in. in diameter, spanned by a strong metal handle. It is uscd in the making of girdle cakes, etc. The girdle is greased and heated over the fire, the dough being dropped on it when it is hot

Girdle Cake. These light teacakes, also known as Scotch pancakea ur drop scones, are made with batter and cookod on a girdle. To make then, beat together an egg and $\&$ tablesporonfuls of milk, add a pinch of salt and, if likod, a pinoh of sugar. Sift in enough self. raising four to make the whole into a batter stiff enough to drop, not run, from the spoon. More flour or more milk should be added until this consistency is attained.

Reat the batter woll, then grease the girdle and heat it over the fire. When it is hot, drop sponnfuls of batter on to it, so that they will form neat rounds sbout $d$ in. thick. When brown on one side (and they will take a very short time to conk), turn them over. This will snake about 18 small sconca. If there is no girdle in the house a frying-pan man be used, but great care is then needed to see that the cakca do not burin. They can be caten either hot or cold, and require plenty of butter.

GLADIOLUS. An indispensable garden flower, this is in full benuty in Iate July, August and September. Varieties of the cairiy flowering type grown in pots under glass bloom in late spring and early summer.

In recent years new types and innumerable new varictics of gladioli have bcen raised, and among them are many beautiful flowers. There ne two distinct types of late summerflowering gladioli, the large flowend, and the primulinus or small flowered. The recent astonishing progress in popular favour of this flower dates from the introduction of the gellow Gladiolus primulinus from the vicinity of the Zambesi Falls early in the 20th century; its fluwers are small and of hooded shape, and the growth is slender.

By orossbreoding between this specics and varietics of the lange-flowered gladioli a remarkable new race has been obtained which


Gladiolus. The primulinus type, which bears small
has slender, graceful growth and medium-sizod flowers of remarkable and varied colouringyellow, orange, salmon, primrose, apricot, roso, and other tints. Meanwhile the range of colour of the large-flowered gladioli has also been extended, and modern varieties have particularly fine spikes of bloom-one spike may bear seventeen or more flowers.

Both types are invaluable for garden display nnd for cutting. If the spikes arc cut when the lowest flowors are out the others will open in water indoors. It would servo no useful purpose to give the names of varieties, for thcy are innumerable, and many similar ones have different names. They are fully deacribed in the gmwers' catalogucs.

The cultivation of the gindiolus is a simple matter. The corms or ronte are planted in
 March or April, 2 in. deep and 6 to 8 in . apart, in well dug soil enriched with dconyed manure ; it is worth while adding leaf-mould and sand to clayey ground. Ashes from the gar. den bonfire are alsn beneficial. Gladioli look especinlly well in groups in the herbacenus border or in ${ }^{2}$ Hower beds carpeted with dwarf white alyssum or other low growing plants. In October, when the leaves begin to turn yollow the planta are lifted, and placed under cover for a week or two; dead leaves and soil are then removed and the corms are stored in paper bags in a frostproof place for the winter ready for planting in spring. By setting corms at intervals of 10 days from early March until mid-April a succession of bloom is assured.
The corms of carly-flowering gladioli nre potted in nutumn, kept in a cold frame for 6 or 8 weeks and then placed in tho green. holise. A temperature of 50 degrees is high cnough. Favourite varieties are Colvillei, The Bride, white; Blushing Bride, blush; and Salmon Queen, salmon.
Gladioli are propagated by seeds sown in a 10 in . deep box of soil placed under glase in March or out of doors in April : the seedlings should not be disturbed until the leaves have
died down in autumn. If planted on a reserve bed the following spring some of them will bloom in suminer, others may not do so until the next year
GLADWYN. This is the naine given to one of the iris family of flowers, Iris foctidissimn It is n native iris, with blue flowers, about 2 ft . in height, and is remarkable for the bright red seeds which make their nppearance after the flowering period is over it likes a moist soil. See Iris.
GLAND. Literally meaning acorn, this name is given to a collection of specinlized cells which manufacture certain substancos needed by the borly. Some discharge their fluid through a duct, and othem, the ductless glands or endocrines, pass it directly into the blood. Glands aro of many different kinds and are of great importance in the mainten ance of the health of the body.
Lymphatic glands are widely distributed over the body. They consist of masses of lymphoid tissue in connexion with the lymph vessels which collect used-up fluid from the tissucs and carry it bnok to the blood. They act as filters, stopping in some degree various poisonous matters on their way to the blood.
Intlammation and enlargement of lymphatic glands (lymphadenitis) is a common consequence of any irritating matter which reaches them through the lymph vessels. A wound in the hand may thus cause swelling of the glands in the armpit, or a wound in the foot or log of those in the groin.

Ono form is inflammation of the lymph glands of the neck, due to their invasion by the tubercle bacillus, and commonly known as "glands in the neck." A child with a constant cold in the head is liable to develop tuberculous glands of the neck. Eczema of the scalp, suppuration in the ear, decayed teeth, may all set up irritation of these glands and favour their infection by the tubercle bacillus. Treat. ment should bo directed to tho cause. Se Glandular Fever; Mumps; Tubereulosis.

GLANDERS. Also known as farey, this infectious disease of the horse, ass, and mule is communicable to other animals, including man. It is due to a germ known as tho bacillus Malloi. When the nasal cavity is affected the condition is known as glanders, but when the lymphatics are involved, and there are nodules under the skin, it becomes farcy, the nodules consisting of the farcy buds
Corchmen, stablemen, and others who have to do with horses are the persons most likely to contract the discase, and the danger is inoreased if they have cuts or abrasions about the hands. Anyone suffering from the disease can convey it to another.
The site of infection becomes red and in. flamed, and the inflammation spreads along the lymphatics to the nearest lymphatic glands, whioh become swollen and painful. There is fover and the patient feels ill. He may pass rapidly into the typhoid state, and his con dition will look like the form of blood poisoning known as pyacmia. Commonly there is a purulent discharge from the nose.
GLANDULAR FEVER, Children are affected chiefly by this infectious diseasc, which sometimes appears as an epidemic, attacking all or most of those in the house or in a school.
The neck becomes painful, tho glands of the neck enlarge, and some of then may become as large as an egg. Occasionally the glands in the armpits and in the groin enlarge. The temperature may rise to $103^{\circ}$ or $104^{\circ}$. Early in the second week the fever disappears; and thore may be diarrhoea The swollen glands then slowly return to their normal size, but may remain enlarged for weeks or months. Tho usual treatment for this diseaso is to apply hot fomentations to the glands two or three times daily.

## Glass and Glazing

## Choice, Cutting and Uses of Glass in House and Garden

This article deals whth glass as used for windows and general constructional work. It is followed by one on Glass Ware, while other entrics related to the subiect are Lended Light; Mirror ; Picture Framing: Window. Sce also Conservatory; Frame; Puity, etc.

At a casual glance all sheet glass may tops of dressing-tables and other places wher appear to be of substantially two forms, plain a clean surface is needed. The edges ahould or tranaparent, and obacure or rippled, but be ground and polished, and, if necesanry, there are in fact many kinds of sheet glass, with various properties rendering them suitable for specific purposes Ordinary sheet glass is made in three varietics, known as crown, sheet, and plate glass.
Crown glass is made by blowing the glass in such a way that it ultimately forms a shect with a boss, or bull's eye, in the centre. This method is not often practised nowadays, but the bull's eyes are valued for their decorative use in windows, doors of cabinets, and other positions. Ordinary sheet glass, such as that used for windows, is made in tubular form cut, flattened, and afterwards annealed. The usual size is up to 12 to 16 sq . ft. in area, while the weight varies according to thickness from 15 to 42 oz . per superficial foot.

By the aren of the glass is mennt the number of square feet it contains, and by the weight in oz. is meant the approximate weight of a piece of glase exactly 1 ft . sq., that is, 21 oz . glass means that 1 sq . ft . of it would weigh 21 oz Thickness and weight vary with different manufacturers, as does the grade or quality. Approximately, 15 oz . glass is a little over在 in. thick, and 21 oz . glass about ${ }_{2}^{10}$ in., while 42 oz . glass is about $\frac{1}{3}$ in

## Sheet and Plate Glass

The objection to sheet glass is that it always imparta a wavy, or broken appearance to the objects seen through it. For ordinary window purposes this may not be on objection, especially if a first-grade sheet glass be used, but for good class work, or in windows where the view should be unimpaired, polished plate glass should be used. Sheet glass can be purchased at so much per sq. ft. from pictureframe makers, or from builders' merchants, or ironmongers. This method is suitable when only a small quantity is required, as the sheets are out to the size specified.

If a quantity of glass is required, a case or hox may be purchased, which usually contains 200 or 300 ft . of glass, that is, a sufficient number of pieces of glass to cover an aren of 200 or 300 sq . ft . as the case may be. The sizes of the pieces and their thickness might either be uniform, as, for example, so many pieces of a certain size and all, say, 21 oz ; or it is sometimes possible to buy a mixed case, containing two or three different sizes, or varying in thickness. Many stock sizes are available, and particulara can generally he obtained from the local builders' merchant.

This method of purchasing glass is particularly economical for such constructions as greenhouses and garden frames, where quantities of glass of uniform width can be used, and if the nearest stock-sized glass be ascertained before fixing the bars in new work, it will be found to save considerable expense for glass-cutting. As regards thickness, shect glass of 15 oz . should only be used for small frames or for little pancs in windows; 21 oz . glass is generally recognized as the thinnest that should be used, and if the window is of any size, such as a sliding sash, a heavier glass is preferable.

Plate glass is made by casting, grinding, smoothing and polishing. Hence it is uniform in texture and thickness, and the objects secn through it are not distorted in any way. It is made in various thicknesses from $\frac{1}{16}$ in. upwands, and up to 100 sq . ft. or more in area. It is purchased according to fractional sizes, that is $\frac{3}{16}, \frac{1}{2}$, in etc., in thickness. Plate glass is used extensively as a covering for the
be ground and polished, and, if necesan y,
holes drilled near the comers for fixing the glass in place.

Plate glass can be bent by the makers to various shapes such as are required for the curved cnds of a cabinet or other furnituro, or for a window, but as a rule the amateur should avoid hent glass as it is very difficult to bring it to the exact curvature desired. For small areas, up to about 2 or 3 kq . ft., $\frac{3}{10}$ in. plate glass is satisfactory, but polished plate glass is generally about $\frac{1}{4}$ in in thickness.
Fancy Glass. Of the fancy or patterned glasses, those known as the rolled plate are perhapa the most uscful to the amateur, and are made in different patterns, some quite ornate and others softly wa ved and subdued in texture. They are used in partitions or places where light is nended but vision is to be obstructed. Prismatic glass diffuses light and gires better internal illumination; it is used for lighting basements and other dark parts of buildings. Coloured glass is generally in the form of ordinary sheet glass.

Of the apccial glassos, those made with wire nctting embedded in the centre and known as wired and cast, rolled, or polished glass, according to their methord of manufacture, are about $\ddagger \mathrm{in}$. thick, and are used for roofs, windows and doors. They cannot be cut with a diamond in the ordinary way, and therefore are partly burglar-proof. They are also to a large extent fire-resisting.

Another kind of glass is made up of several layers cemented tngether. It is used for all purposes where glass is liable to fracture, e.g. a motor car wind screen. The material will resist heavy blows without splintering.

A proprietary glass which passes the health giving ultra violct rays is coming into common use. for windows in houses, offices, and factorics. Its use entails only a comparatively small outlay to the houseowner.

When purchasing shect glass to fit into a specific size frame, it is customary to make an

allowance for the roughness of the edge of the glass, the amount of this allowance being determined by the width of the rebate in the frame. For example, if the frame is 24 in . wide and has a rebate in it, say $p$ in. wide. thus leaving a sight opening of 23 in ., the glass should be ordered as 238 in . in width. It is advisable to inforn the dealer of the purpose for which the glass is required.

Cutting Glass. The cutting of glass is carried out with a diamond pointed tool or with a hard stcel glass cutter. The former is expensive to buy, and requires considerable skill to manipuiate in an effective manner The steel cutters comprise a wooden handle with a stcel end-piece or block fitted with a small circular plate cartying two or three small steel wheels, one of which projects beyond the and of the head nnd docs the cutting. When it gets blunt the screw holding the circular plate is loosened and a fresh wheel brought into position by partially revolving the circula: plate and again screwing it up tight
To use either of thesc cutters they should be hold in the right hand in the manner shown in Fig. 1, with the handle between the first and socond fingers and the thumb behind them. The diamond is set at a certain angle in the end of a steel block, pivoted on the handle and freo to move through about $45^{\circ}$; this is to facilitate the citting of intricate shanes and to allow a certain amount of latitude when cutting long straight lines. The particular angle at which the diamond must be held varies with each individual stone, and must be learned by experience, the best cutting angle being judged by the sound. When cutting properly the sound should have n ripping quality ; when the diamond is wrongly held it is more like a scrateh. The tool is usually held in a nearly upright position.

For ordinary use in the home the wheel cutter answers al! requirements and will stand more rough treatment than a diamond. As an example, if n now panc is wanted for a window, and it is to be cut from a piece of odd glass, lay this on a firm flat table-top on which has been placed a piece of thick cloth, and place a steel or wood straight-edge on one side of the g!ass. Binging sufficient pressure to bear on the cutter, draw it once across the glass, guiding it by the straight edge. If the glass is thin it will rever easily if


Glass Cutting. Fig. 1. How to hold the diamond. Fig. 2. Bench arrangement of battens and nails How to cot a hollow, corved plece ol glass. Note criss-cross cots and nase of diamond to tap out the piecea
turned upside down with the line of the cut resting on the edge of the table, or upnn a clean straight batten, and the surplus glass pressed down. The end can now be cut. guiding tho cutter with a set square, or proferably a glazier's tee square: the opposite end and remaining side arc then cut. When placing the straight-edge as a guide for the cutter, be careful to allow for the thickness of the cutter block, otherwise the glass will not be the proper size.

The cutting of glass to fanoy shapes, such as those needed in leaded light work, is rather more difficult. One method is by preparing a full-size drawing of each picce of glass, then drawing a parallel line on each side of the outline. The distance between the outer lines represents the thicknoss of the heart of tho lead, and consequently the true shape for each picce of glass: it is to these lines that the glass is out. Another method is to out a set of thin cardboard patterns to the exact shapes of the glass, and to employ them as templates.
bad cut. A cut should be startôd and finished at the yery cdges. Extra thick glass should be tapped on the side away from the cut.

Glazing Windows. In the case of a broken pane in a winduw the first thing to do is to remove the hroken glass by gentle tapping and lifting out the fragments If the glass has been fitted by a wooden bead, it must be unserewed or prized out of its place with " chisel. Most windows, however, are secural by putty. This is best removed with a hacking knife, as shown in Fig. 5. The work must be done thoroughly: if any lumps of old hard putty are left in the frame, they will strain the glass and ultimately make it crack.

If the frame is shrunk and the putty exhibits small cracks, it should be removed by inserting the end of the blade into the cracks and levering the putty out. In exceptional cases it will have to be chipper, by tapping the back of the blade with a small hammer. As this work proceeds, remove the fragments of glass, taking care that those on the top part.
putty adhering to the glass or sine irame must be scraped off, the whole dusted over and the glass lefít clean.

In fitting glass to new woodwork, the latter must be painted prior to applying the putty, or the putty will be liable to siake and fall out soon after it hai set hard. In the case of a repair, the putty should be painted to match the existing woodwork as soon as it is dry, say 24 hours or so after its application. Where the glass has to be fitted to a frame and secured by a bead, the same proceeding is followed except that the putty is often omitted. The edge of the glass should be painted a dull black before inserting it into the frame.

Metal framed windows are glazed and treated in the same way as those with wooden frames
GLASS PAPER : How to Use. Shects of paper covered with glue and coated with powdered glass, sand or other abrasive are known as glass paper, or sand paper. They are made in many grades, the finest ranging from No. 0 to F2, medium No. M2 to S2, and the coarsest No. 2i to No. 3. Glass paper is used to work up a sinooth surface on woodwork, and to nssist in the shaping of curved surfaces; as for example when making a handrail, the top is rounded off by the planc, and the flats or ridges rubbed down with glass paper. Painted surfaces are prepared with glass paper prior to the applica. tion of fresh paint, as well as between each coat of paint. Glass paper is employed for some of the finishing processes in leather work and also on fibre, or any other material of a similar nature.

In using glass paper, a piece of suitable size should be cut neatly to shape and folded round a block of cork, wood or other suitable matcrial. The ordinary block is a flat picce of eork about l in. thick, 5 in . long, and 3 in .

A simplo device for eutting diamond or other panes is illustrated in Fig. 2, and comprises a lath of thin wood nailed to the bench. Two nails are partly driven into the bench at right angles, of at any required angle; the edge of the pieco of glass is rested against these. Tiwo other nails are also driven into the bench and a straight-edge laid against them, this acting as a guide for the culter. The method is effective when several pieces of the same size are wanted, as it avoids the need for repeated measurements. Ciroles are generally cut with a special tool known as a circular glass cutter. It has a central pivot, adjustable arm, and a wheel or diamond.

When cutting curves the outsido curve will come away easily, but a notch, or interior curve, will hare to be cut across and across, and the parts removed one by one somewhat as shown in rig. 4. To separate the glass when cut to curved forms, tapping is necessary. This consists in striking the baok of the plate of glase with the block of the cutter, carefully following the line of the cut. Steady tapping is important, and if the glass has been properly cut the fracture will run along it at each tap. Any ragged edges can be trucd up by grozing, a process consisting chiefly in biting off the ragged edges by means of a pair of pliers, using the jaws to squerze or bite the edge of the glass, as shown in Fig. 3.

Finally, the worker in glass should remember a few simple rules. The glass should be supported on a really tlat surface such as a drawing-board. If much eutting is to be done the barerl should be ruled with two sets of lines, $\frac{1}{4}$ in. apart at right angles, to divide it into a number of squares. This will save marking when the glass has to be cut on the square. When cutting properly the diamond makes a soft sound and leaves an almost invisible scrateh, while a large rough serateh shows a


Id putty with the hack knife. Fig. 6. Applying a uniform
of the window do not fall out instead, and eut the hands. If working on a first.floor window. care must be taken that fragments of glass do not fall on anyone beneath.

When all the old putty has been removed, the rebate must be measured. This should be done at the top and bottom and at both sides, in case the window-frame is not perfectly rectangular. A piece of glass may now be cut, slightly less than these sizes; in most cases about $\frac{1}{8}$ in. less will be correct. The putty must be worked up, softening it by rolling it between the palms of the hands until it is quite plastic. If it shows a tendency to crumble, moisten it with a few drops of linseed oil, and again roll it between the hands.

Place some of the putty into the comers of the rebate, and apply it with the finger and thumb to a uniform thickness all the way around the frame, as shown in Fig. 6. The glass is then placed on to the bottom part of the frame (Fig. 7), pressed in closely, and pushed into place. pressing it all round the edges into close contact with the putty. It may be further secured with the aid of a few brads driven into the framework with the heads just touching the glass. A pellet of putty is then pressed into the comers between the glass and the frame, and consolidated by forcing it hard up against the two with the aid of a putty-knife.

The remainder of the rebate is then filled, and to get a neat finish the knife is used with long sweeping strokes, if possible from end to end of the window, held at an angle to the glass, and with the blades Hat on the edge of the frame, to act as a guide for the knife. This should remove any surplus putty. The inside of the frame should be inspected, and all surplus putty should be removed with the putty-knife or glazing knife. This latter is somewhat thicker in the blade, but otherwise similar in shape to a putty-knife. Any surplus
widc. The proper method of use on a Hat surface is shown in the illustration, the movement of the hand being in a series of circles combined with a forward motion, the result being that it traverses the whole surface.

For finer work the rubbing is in a straight line with the grain of the wood, as, although the action of rubbing across the grain tends to produce a true surface, the scratch marks are more pronounced. For curved work the rubber may be hollow or otherwise shaped to assist in producing the desired shape ns quickly as possible. When glass paper has to be used on small holes, it should be wrapped round a circular piece of wool, a lead pencil, or the blade of a gouge.

The best grade of pajer to use on any particular jub will depend ujon the style of finish and the nature of the material ; but in general a rough grade such as No. $1 \frac{1}{2}$ or 2 will. b) used to commence with, following this with a medium grade like No. M2, and finishing' with the finest. It should be noted that a worn piece of paper is better to use than a new piece, as it does not scratch so deeply and produces a hetter result, being more mellow and pliable and not so harsh in action. Worn paper is always to be preferred for rubbing down coats of paint or varnish.


Giass Paper. How to use a rubber of glass paper

# Glass Ware: For Use and Ornament 

Beautiful Antique and Modern Household Pieces

This article first deals with collecting glass as n hobby, then with modern household sets and pieces, follow'ed by a section on the care and repair of glass, and finally with detailed insiructions for dainting on glass. The entrics on separate artiales such as Decanter; Finger Bowl; Vase: Wineglass, should be consulted, and also those on Flowers; Table Laying

The glasses used in the 17 th century were light and thin, never quite pure white nor of brillinnt lustre. They were mninly either of Venetian makie adapted to English patterns or were made in England by Venetian workers or under Venetian intluences. Towards the end of the century the English makers dis. covered or introduced a stronger kind of glass.
In the early part of the 18th century, glasses with narrow funnels and bowls with round bares were in use Thesc were succeeded by pirces with drawn trumpet shaped bowls and thinnish stems, and in little later appeated the glass with a plain bowl on a straight stem, which stem soon became quite a long one. These long.stemmed glasses, made sometimes with one small knop in the stem, appear to have been the commonest type for tavern use during the second half of the

Others tonk the form of goblets on shortish stems : thesc were of ribbed or plain glass, with square bares to the howls Some ol them, it is interesting to learn, were provided with lids, the reason being that in those days beer was often drunk when hot. The ordinary ale hlass held rather less than half a pint, but some were larger.

Cider glasses, which came into use in the middle of the 18 th century, are very rare, and therefore good specimens are valuable. The bowls of these are usually atraight sided, alnost rectangular in shape. Some of them are finely engraved, the design slown being usually apples, apple-trces, or cider barrela Their size varied considerably Mead glasses are equally rare Here the howl is generally incurved and it stands on a short, strong stem. They were usually made in coloured glass

Another special kind of glass was introduced about 1700 to hold punch. The earliest used for this purpose appear to have bcen narrow funnel glasses with a slight collar. Afterwards stemless glasses of the type immortalized by Hogarth and named after him were used for this drink (see Fig. 2). Later, tall glasses with extremely small howls and thin stems came into use for punch, and these re. mained in favour until nearly the end of the 18th century.
The art of glase cutting, rarely practised before 1740, was hrought from London to Stourbridge about

8th century, although those with wide funnels were employed side by side with them. A knop is a rounded protuberance.

There were other kinds of glass that have value or interest for the collector. Prominent among such is glars made especially for the Jacobites after 1688 and during the $18 t h$ century. used for drinking at their gatherings Examples of these are shown in Fig. 1. Most of these glasses are engraved, the engraving taking the form of reference to the Stuart family; for instance, the word Fiat, and various emblems such as the star, the rose with two buds, the oak leaf, and the thistle, associated with the royal exiles.

Of kindred origin are the glasses made in honour of William III and the battle of the Boyne. These date mainly from the middle of the 18 th century, but were reproduced after that time. The earliest of them are decorated with a portrait of the king, either as a bust or as a full figure on horseback. Other glasses are adorned with the words of a toast in honour of King William, words of contempt for his enemies being added in some cases.

In addition to these there are a number of special glasses that appeal to collectors, on account of their beauty or rarity, or both. 1'rominent among these are the ale glasses which were used for drinking ale or beer in the 17 th century. One variety had very widemouthed funnels, ribbed or plain, with short stems and large conical feet with wilted edges.
the glass by improving the colour purity and increasing the light refraction In old Irish glass the large percentage of lend oxide was responsible for the bluish tint and metallic lustre, which, though admired and sought after to-day, was reckoned by the makers $t o$ be a fault.

Wine Glasses. 'l'he tive main periods in the listory of English wine glarses are illus. trated in Fig 3 baluster stems dating from 168); the simpler knopped and plain stems from 1730; the transparent air twists in their many artistic and diverse variations starting about 1740 and extending to $17(00-1770$, the opaque white spiral stems from 1750-1760: and lastly the cut or laceted stems, early examples of which are occasionally met with, but whiclı generally were not in vogue until 1780 These extended to 1800 and a little later, glasses made after this date ceasing to be of interest to the collector proper.

The five main types of bowls found in wine glasses are shown in Fig 4. They are drawn trum pet; bell; straight sided ; ogee ; and double ogee Changes in these shapes frequently occur, and Fig. 5 illustrates six
 examples o

Tig. z. Horarth Giass. Eipht eenth century trnmpet shapos glass with buttonlike stem Geor

A good plan in collecting is to commence by getting typical examples of the various periods. When each main perind is illustrated, progreas can be made by representing each characteristic shape in the bowl of the glass. Endlesa forms of specialization will suggest themselves If it is out of the question to excel in each section, much pleasure can be ohtained by taking a certain type. such as double ogee glasses, and by paying special attention to the particular form. and embracing every opportunity of adding specimens that show some different feature, in time a section may be completed illustrating the evolution of the type from its earliest inception.

A collection of the many varieties of the opaque twist wine glasses is an interesting pursuit. Combinations of these stems are


Glass Ware. Fir. 3. Specimens of five main periods of English drinking glasses. Left to right: Baluster stem. 2. Plain stem. 3. Air twist. 4. Enamel or opaque twist. 5. Faceted atem

Courlest of Cecil lravis

decorated in the Chinese fashion with figures, flowers retc., in brilliant enamels reminiscent of oriental art. Millefiori glass paperweights are a study in themselves. The rare ones are the dated examples. The dates invariably found are 1847, 1848, and 1849, and these particular examples show quaint animal decurations. Thesc were made at Bristol, and many artistic specimens in festooned patterns of great variety occur Largor specimens showing less originality of design were made at Stourbridge, as were also ink-hottles.

Cameo Glass. Another variety of glass which is increasingly popular is the cameo glass, invented in England by Apsley Pellatt in 1819. Portraits and other decorations composed of chinn clay are encrusted in panels, on the sides and in the interiors of decanters, vases, plaques, etc., and these medallions present a brilliant surface, which is, morcover. impervious to the effects of nge and wear. A selection of these pieces is shown in Fig. 9. Similar cameo pieces were made in conteniporary times by the lirench and Bohemians, lut the English specimens are the liner in quality, and with their silvery appearance at once attract attention; the larger and more impurtant specimens of these are usually of Eng. lish matio.

French examples of the Legion of Honour and other Orders are to be found in enamelled colours encrusted in

## With regard to the carly pieces, great care the glass in the same manner.

has to be excrcised. for even in the early days continental copics of tine l rish glass were made, and they are atill copied, and sent over to trap the unwary. The early factories copied each the fine bluish metal that collectors of to day engerly seek and to sulnatitute white metal of greater brilliancy. This they succeeded in doing about 1815 , "hen the glittering step.cut pieces were first made. This glase was almost metallic in its brilliance, and the object of this manner of cutting may have been to simulate silver"are on the table. After this date, English and Irish
 other, nnd, except for the rare examples that are im. pressed on the hase with the name of the maker and factory, no one is able to assert positively the source of production

Old Coloured Glass. Anongst other varieties of old glass, the self.coloured Bristol blue. nmber. and purpleglass commendsitaclf to some, as well as the many shapes in small early cream jugs, bowls, etc. Freak pieces in the shape of hoots, hats, hellows, weather glasses, miniature animals, puzzle glasses, ctc., npieal to those who wish to collect curiosities. The splashed and striped Nailsea is of interest to those who like colour, and a cabinet of the quaint wine llisks makes a room gay even on a dull Novenber day, for the blues, pinks, and purples are of the brightest. The two Nailseal factorics near Bristol were famous for loottles, jugs and
metal and designs are very similar, and The beautiful it is impossible to assert definitely the opaque white nationality of such pieces. The tendency Bristol glass of was to increase the detail of cutting. Thus early period is made the bolder diamond cutting gave place to of such density that strawberry diamonds and fine and close at first sight one cutting, as shown in Fig. 7. In 1850 glass imagines the piece had to a great extent lost its simplicity of to be of porcelain. outline, and in the Great Exhibition held in An example of a London in 1851 the glass wares of Bohemia candlestick is and the European Continent were closely shownin Fig. 8. The copied in a style lacking in artistic insight. finest specimensare
to have made flint glass at Nailsea


Fir. 7. Water and cream jugs, ahowing the later diamond catting of about 1820


Fir. 8. Bristol opaque glass candlestlck enamelled In colours made for six or twelv persons. The ordinaty set will consist of tumblers, five kinds of wine glasses for sherry, claret, hock, champagne, and port, liqueur glasses, and finger howls. In addition, decanters, two or four, may be included, and smaller ones for liqueurs Some sets include custard glasses, a pickle jar, honey jar, salad bowl, celery glass, grapefruit glasses, water jug, and ice plates, while others may consist of fewer pieces, the types of wine glass being perhaps reduced to three. The liqueur glasses and decanters are often distinct from the other table glass.

Sets of six coloured tumblers with jug to match are obtain. able for lemonade. and many charming


Glass Ware. Fig. 10. Some beautiful pieces of modern Englisb hand-cut crystal table serfice
Courters of Welb \& Corbell
designs are to be had in cocktail shakers is added to the and glasses. Venetian glass is also attractive brilliant sparkle. Linen gives to gass a for dessert use. Crystal flower vases and to use for a glass cloth, though any amonth dishes always look lieautiful on the table. and absorbent cotton labric will do for this Cut glass does not lend itsclf to idle ornament. It looks far better in use, and very gond effects are obtained by substituting glass for silver or china dishes on a well-polished dining table or fine white clath. Some beautiful cut glass pieces of a modern tahle service are shown in Fig. 10. Good cut glass gives forth a clear ringing sound when tapped.
When buying colonred table glass in separatc lote, but for use together, cale should be taken that the pieces chosen arc of the aame tone. Opaque coloured glass is made in brilliant colours, but lacks some of the decorative quality of the clear metal. Black glass for candlesticks and dessert dishes looks effective on cerlain tables of modern type, while the Georgian styles of water and wine glasses in hand-cut crystal clear glass harmonize well when used with reproductions of Chelsea. Worceater and Spode china. Whole sets of glasses from large goblets to liqueurs are reproduced in the Georgian styles of the two examples seen respectively on thc extreme left and right of Fig. 5. Champagne glasses are frequently made in these shapes instend of in the former shallow style. Practical considcration is shown in mak. ing atcms of strong design.


Glass Ware. Fig. E. Examples of the Apsley Pellatt cameo-incrusted alass. Top row, left to right : 1. Cut-glass spirit decanter and stopper with whitecameo portrait of Robert Burns. 2. Cut-Rlass tumbler with inset of French Legion of Honour in coloured enamels. 3. Plain Rlass scent bottle with portrait of George III. 4. Moulded Rlass tomblar with inset of cock in coloured enamels. Bottom row, left to right: 1. Cotclass plaque with iortrait Rubg. alass Madonna and Child. 3. Rubs glass tumbler with white armorial inset. 4. Cut-alass patch boe with portrait inget

Courlesu of Cecil Davis

Caring for Glass. To water, the only possible cement is that made clean glass it should be with white lead or Hake white, which is white washed in warm, soapy lead in a pure and grit-free form This cement water, rinsed in cold is not affected by wates. either hot or culd, or water, and left to drain by chances of temperature. The white lead is before being dried and obtainable at any oil and colour shop, and the polished with a special Ilake white from an artist's colourman

The lead is spread evenly over the broken surface in order to cover every angle and crevice. The two surfaces are then pressed firmily together, squeczing out any excess cement. The mure thoroughly this is done the less the line of repair shows on drying. Only a very tine film of cement should be lelt, just sufficient to hold the pieces together. Any excess nust be removed hefore it hardens.

Two other cements are useful, but they will not stand very hot water. One is composed of a little white of egg mixed with enough plaster of Paris to make a thin creain, and spread on the broken surfaces before it can harden. Another cement consists of । oz. of g!!n noncin dissolved in water, strained, and mixed with as much plastar of P'aris as will make a tlin cream lBoth these cements must be sparingly used andwell pressed out when the broken sur. faces arc joined to. rether. Thc mended ar. ticle must be putina safe place for the cement to


Fig. 11. Persian alass beaker dating from the 14th century, decorated with paintings in Oriental designs From the Eumorfopoulas Collection
three dara being allowed for the comipletion of the process. Sometimes the weight of the broken pieces of glass keeps them in position. Failing this, two or threc elastic bands can be used, and the article tied up with taje.

Painting on Glass Warc. Painting on glass is a hobby in which artistic training is not necessary, though where talent is possessed it can be well employed by originating beautiful designs. Fig. 11 shows a lovely example of a Persian beaker dating from the 14th century. Such oriental hirds can be copied, or form the inspiration for some beautiful modern designs. Vases, Hower bowls, dessert services, cocktail sets, and similar articles can be ormamented according to individual taste in designs.
If the articles to be decorated are chosen with fairly large openings, a pattern or design, a picture or drawing cut from a magazinc, etc. can easily be inserted and pasted or even held on the inside, and the outline copied on the outside of the glass. Designs may be traced from copies on to tracing paper and affixed to the back of the glass, as shown in Fig. 12. The body of the design can be filled in according to personal taste and the colour acheme desired. The copy is washed off after the painting has been completed. In all cases the surface to be painted nust first be cleansed thoroughly to remove any possible traces of grease. I'his can be done by washing it in warm soapy water and, after tinsing in cold water and drying, by lightly sponging with methyIated apirit and allowing to stand for a few minuted. Nany plain glass articles can be purchased at a sixpenny store. These will scrie to make experiments on with various

the work unless removed instantly with the point of a pin

A very simple form of glass painting without brushes, which can be done by children and is a delightful indoor pastime, is executed with an Instunta outfit consisting of tubes of colours and rubher stamps with different designs. The latter are charged with colour and pressed on to the glass object which it is wished to decorate Flowers and leaves can be arranged to form groups or borders.

GLAUBER'S SALTS. The chief constituent of many of the aperient natural waters is sodium sulphate or Glauber's salts. They form a useful purgative for chronio constipation, particularly in persons of a gouty tendency, being taken in a small glase of warm water hefore hreakfast. Glauber's salts are often prescribed as a purgative for sufferers from liver troubles, particularly
designs and methods of colouring. Glass painting colours and bruslies can be obtained at a good artists' colourman.

No other prepara. tion of the surface is necessary, and the colours are supplied in bottles or tubes ready mixed for direct application. These colours possess great brilliancy and, at the same time, a high degree of transparency Very little colour need be used to obtain tho best results. The design is outlined in black first befone filling in
with the flat colours.
A No. 1 sable hair brush should be used for this The colouring may be executed with a No. 3 squirrel hair brush. Where shading is necessary, the colour must he put on quickly. The paler ahades are applied first, the darker being superimposed before the first colour is dry. Articles painted in this method dry almost immediately, and can be washed after a few days in warm water and a mild soap without harm. Soda nust not be used.
Should the first colour be allowed to dry, a hard line results. It is better to finish off a bird, animal, or flower separately rather than try to do a group at once. Simple designs are best, us there is less chance of overcrowding the effect. The colours should be lightly put on, or the transparent effect will be marred. A speek of dust or hair from a brush will spoil

Fig. 14. Simple design of lemons and rreen leaves for a lemonade set

gall-stones The dose is $\frac{1}{2}$ to 2 drams, where repeated doses are to be taken ; to $\frac{1}{} \mathrm{oz}$ when prescribed as a single dose. Effervescent sodium sulphate may bo taken in doses of 60 gr or more.

GLAUCOMA. Commonest after middleage, this disease is one in which the natural Huid within the eye accumulates, raising the intra-ocular tension and so stretching the coats of the eye. The disease may come on gradually, without pain, but with a loss of visional acuteness. On the other hand glaucoma may be found as an acute condition. Warning may be given of its imminence by a rapid loss of power to read small type, and by the appearance of coloured halos round lights, combined with dimness of vision An immediate operation is necessary. See Eye.

GLAZE. Meat glaze is very strong meat stock, boiled down until it resembles melted gluc. It is used when rewarmed to give a shiny and sa voury exterior to galantines, cold roast poultry or game, or to brush over raised pies. A small piece of glaze added to soups and sauces adds greatly tu their colour and tlavour. If stored in pots and kept in a dry cool place, glaze will keep for long, though an equally good way of preserving it consists of pouring a little "armed clarified butter or mutton fat on the surface and allowing it to set. To prepare glaze, put the strained stock into a
saucepan, and hoil it quickly till only about a quarter of it is left. In the meantime keep it well skimmed. When it has cooled slightly. pour the glue-like liquid into a clean pot and leave it till it is cold and hard. Eight quarts of stook will yield about $\frac{1}{2}$ pint of glaze.
Glaze for Vienna bread is made hy boiling a hout $\frac{1}{2}$ gill of milk with a piece of butter the size of a walnut. This liquid is then brushed over the bread and dried off for a moment in the oven. Sugar-glaze for buns, etc., is mado by hoiling 1 tablespoonful of white sugar with 3 tablespoonfuls of water for 2 or 3 min . It should then be brushed over the baked buns and dried off in the oven

To make egg glaze for pies, sausage rolls, meat patties, etc., beat a raw egg well, add 3 teaspoonfuls of cold water or milk, and brush over the surface of the pastry before baking it. See Bread; Galantine, etc

GLAZING: In Upholstery. Glaze of the right kind belps to prolong the life of certain fabrics, c.g. chintz and window blinds, by reducing their liability to hold dirt, thereby avoiding frequent washing. Glazing stiffens chintz, and is effected in course of manufacture by the use of heavy calendar rollers under a pressure of many tons.

Machines fitted with a flint polishing tool are used by dry-cleaning firms to rub a polish on loose oliair covers. To apply similar pressure by hand would be exceedingly laborious: the more practical method is to use heavy, heated irons, after starching the material with the addition of starch glaze. The latter can be made with three parts paraffin wax and two parts stearin, melted together, and this is boiled in with the starch, or applied lightly to the article with a cloth before starching.

Glaze that is produced solely by heat and pressure without the aid of starch disappears on exposure to moist air.

GLOBE AMARANTH. A half hardy annual with "everlasting" llowers of various colours, most suitable for cultivation in pots in the greenhouse. The hotanical numo is


Globe Daisy. Blue flowers of one of the varieties suitable lor the rock garden. See article below
gomphrena globosa. Seeds are sown in warmth under glass in February-March; the seedlings are potted singly in small pots and subsequently into others 5 inches wide in a comport of loam, leaf-mould and sand. If the Howers are cut before fully open they last well and are useful for vases indoors in winter.

Globe Artichoke. See Artichoke.
GLOBE DAISY. Known botanically as Globularia, this small genus of shrubs and herbs is suitable for the border and the rock garden in light lonmy soil. The species usually grown are cordifolia; a trailing dwarf shrub; nana, a low trailer ; nudicaulis, herbaceous, 6 in . high (alba, a white variety); and trichosantha, glaucous, 6 in . high, herbaceous. All have rounded heads of blue or purple-blue flowers. Propagation is by division in September or hy sowing smeds in a frame in spring. See illus. above.

Globe Elower. See Trollius.

GLOBE THISTLE. This is an attractive bardy plant with grey-green spiny leaves and round heads of thistle-like summer flowers of a shade of blue. They are easily grown in ordinary soil in a sunny position. One of the best is Echinops ritro, 3 feet high. The globe thistles are increased by division and by root cuttings in autumn or by sowing seeds out ol doors in April.

GLORIOSA. This genus consists of handsome hothouse bulbous plants belonging to the order Liliaceae. The best and most noteworthy, $G$. superba, known as the Malabar glory lily, is a very showy climbing plant which bears orange-red flowers in summer The bulbs are planted in spring in large pots filled with a compost of loam, peat, and sand Warm, moist conditions are necessary to encourage free growth. As the leaves fall, watering must be discontinued gradually ; in winter the soil should be kept dry. Propagation is by secds or by removing small offset bulbs. See Bulb; Flower Gurden.

Glory of the Snow. This is another name which is given to the Howering bulb known as chionodoxa (q.v.).

GLORY PEA. Also known as clianthus or the parrot beak flower, the glory pea thrives under cold greenhouse treatment in a compost of loam, peat and sand, and is useful as a basket plant. Dampieri, the best known species, may be raised from seed or cuttings under glass in spring. It is not an casy plant to manage. Puniceus, which bears crimson blooms, is also very showy. It is nearly hardy, but the best results are generally obtained when it is protected by glass.

GLOUCESTER CHEESE. Gloucester cheese, one of the principal British varieties, is milder than Cheshire cheese and for toasting purposes is one of the best. In shape flat and circular, it weighs from about 22 lb . upward. Double Gloucester is made of the whole mills: single Gloucester is made of skimmed milk, or nilk deprived of half its cream. Sec Checse.

GLOUCESTER PUDDING. These little batter puddings are made by creaming together $\ddagger \mathrm{lb}$. each of butter and sugar and two eggs. To these ingredients add 5 or $t i$ blanched


Globe Taistle. Hiut nowera and grey-green leaves ot Echinops ritro, a lavourite herbaceous border plant
and pounded bitter almonds and $3 \frac{1}{2}-4 \mathrm{oz}$. of fine llour. Beat all to a light batter; then pour it into some cups, half filling them, and bake the puddings in a good oven for about 25 min . They should be served with a sauce made thus: Melt a lump of butter about the size of a small cgg in a saucepan over the lire, mixing in smoothly half a tablesponnful of Hour. Move the pan to the side of the fire before adding a little less than a breakfastcupful of water; then replace it, and stir its contents until they are boiling. Put in a heaped tablespoonful of sugar and $\frac{1}{2}$ gill or $=$ little more sherry, and continue boiling for a few minutes before serving.

## Gloves: For Men, Women and Children <br> How to Choose, Repair and Make Them

In conjunction with this article, such entries as Chamois Leather: Dry Cleaning; Knitting; Leather; Mending may usefully be consulted

Leather gloves are made from a variety of skins, including kid, goat, sheep, lamb, reindeer, antelope, etc. Kid skin finished on the liair or grain side is known as dressed kid, and that finished on the flesh side is called undressed kid. Cape gloves was a term at one time applied exclusively to articles made from skins imported from South Africa, but it is now generally applied to all gloves with a nappa finish. Suede is leather dressed on the Hesh side, and mocha is a finish imparted to the hair or grain side, the grain being removed. Chamois is a leather usually from a split shecp skin specially dressed with oil, and makes a glove which is comfortable, and economical because of its washing properties.

Men's Gloves. Styles in men's gloves change very little from season to senson, and there is little ornamentation. For everyday wear the most useful and economical ones are of suéde, chamois, and docskin. These are, as a rule, fastened with one button or one fastener, and some makes are silk lined. More expensive gloves made in the same atyles are of deerskin, buckskin, reindeer, and similar materials. For winter wear there are deerskin and Cape gloves lined either with wool or fur. Others are of beaver lined with coney. Some have elast ic or sac wrists, others fasten with a strap.

For motoring the gauntlet type is favoured. These are of goatskin, bark, tan, nutria, coney, and other materials, and are usually lined with wool. Driving needs a different type of glove. Tan of one kind or other is popular, and nome have double palm and lingers where the friction of the reins is felt. For special evening wear there are white kid gloves.

In purchasing gloves, attention should be paid to quality as well as price, for a sound glove made from reliable skins, and with the best sewings, cannot be obtained at the price at which many cheap varieties are offered. Inferior gloves may split the first time they are put on, and invariably after a short time the stitching gives way.

Women's and Children's Gloves. Fashions in women's gloves change frequently, but usually the alteration is limited to some new form of decoration. White kid gloves, for instance, arc sometimes ornamented with gauntlets in black and white checks or stripes, while a similar contrast is achieved with white on black gloves. Fabric gloves are used both for women's and children's wear, grey, black, white and brown being the colours in which they are generally made.

Gloves of this kind are not so warm as those of wool, but they are cheap and wear reasom-
ably well. Mocha suède gloves, plain, fringed or edged with fur, and those of dark-coloured kid, are popular, while for children's sports and school wear woollen gloves are most usual. The mode of fastening women's gloves varies according to whether they are for evening or day wear. Those for the former лre usually 12,16 or 20 button length and are fastened with 3 buttons, while the latter usually bave gauntlet or sac wrists with short lengths of elastic on to which the wrist portion of the glove is gathered.
Babies' gloves are $k$ nitted so that the fingers are all in one piece and the thumb only is allownd a separate place. This allows free movement of the bands, and also dispenses with the difficulty of making a very small child put his fingers in the right stalls. These gloves arc usually worked with a series of holes at the wrist, through which riblon can be threaded for tying.
Care of Gloves. When putting on new gloves they should not be pulled violently at the wrists, but worked on gradually finger by finger. A glove stretcher may be used if necessary. In removing the glove the rame care should be observed in drawing it off the fingers and thumb, with the use of as little force as possible.
Suede and kid gloves when soileal are best treated with petrol, while stains on silk, woollen or cotton gloves will generally yield to ordinary washing. Petrol cleaning should not be attempted except in the open air or in a room without a fire or other naked light. If the suede gloves are white or of any delicate ahade, the petrol should be perfectly clean and not used beforehand for any other purpose. Pour the petrol into two bowls, placing the gloves in the first to soak for a few minutes. Then put them on the hands, and, in the case of long gloves, draw them well up the wrists and arnis.

Rals then together as though washing the hands and rub the finger-tips of one hand against the palm of the other. Pay upecial attention to any badly soiled parts, and when all marks have been removed peel off the gloves, squecze them well, and then rinse them in the second bowl of petrol. Squecze out the petrol, pull the gloves gently into shape and hang them up to dry. Dark coloured suede or kid gloves may be cleaned in the same petrol, but dark brown or grey doeskin or reindeer gloves generally require double treatment before they become thoroughly olean.

If a dry process is preferred, the gloves should be rubbed with a mixture of equal parts of finely powdered alum and fuller's earth. If, however, they are of white kid or suede. French chalk should be substituted for the fuller's earth. After applying the powder, leave the gloves for an hour or more, then brush and slake them well. A final application of warm bran or oatmeal should le given. White or light coloured kid gloves may also be cleaned with a piece of suft white india-. rubber. Put the gloves on the liands and, commencing with the fingers, ruh the leathes well with the eraser. If the surface of the rubber hecomes dirty in the process, rub it over new blotting paper until it is clean.

When splits occur in kid, suède, or wash. leather gloves, it is useless to stitch the leather together in the usual way, as this will only tighten the skin and cause it to split again. The most satisfactory repair is achieved by working round the hole with a buttonhole stitch, using silk of the same shade as the glove. When this is done, commence a second round, working this time into the loops of the first round of stitches, and continue the operation until the hole is filled. This mend is almost unnoticeable.

Discarled gloves may be worn to protect the hands while housework is in progress, or


Glove. Fig. 1. Woman's chamois reather Rloves of an easy fitting, pull-on snape. Fig. 2. Outline of patterns needed for the chamois leather Rloves. Fig. 3. Woman's auede gauntlet aloves. Fir. \& Right, pattern for making woman's gauntlet aloves; left, aimilar pattern for man's goatakin gloves shown in the next page
the fingers may be used as finger stalls in cases round piece of leather in circles and should of cuts, gatherings. etc. Two pieces of tape mensure about in. wide for glove trimmings. should be sewn on to the ends and tied to keep the covering secure Odd bits of old chamois gloves may be stitched together to form a pad for cleaning silver.

Making Gloves. A glove for placing pieces of con on the fire can he cut fiom black velvet or velveteen. To make, place the hand on a piece of paper and draw round it very roughly. A separale thumb covering is allowed, but the fingers are cut in one as for a baby's glove. Allow a generous margin when cutting the naterial and use one lhichness for the back of the glove. and two for the inside. Seam the cut edges together and hind them with tape

Thic skin gloves which arc illustrated in Fig I are of white washable chamois. The lieginner should experiment with an ordinary window lenther to get the correct way of cutting and fitting in the thumb and finger gussets.

1sesides the skin a leather-cutter's knife is required, a glove needle (which is three-sided), llax thread, and a pattern such as that shown in Fig. ?, which can be cut from a pair of old nappa gloves. Drawing pins with glass or cork heads are also required. A leather-worker's punch is an addition to the set, if it is decirled whave a faney gauntlet. A skin 12 in. wide by $2\left(0\right.$ in. long will cut a pair of gloves sizes $6 \frac{1}{2}$ to 7 , and a larger akin that will cut two pairs ja an economy, ns the gussets can be cut from odd corners Examine the skin when buy ing. and sec that there are no thin places that will break into holes when worn Thongs aro cut from a

To cut. place the pattern on the skin in such a position that the stretch of the glove will be ncross the hand Fasten the pattern down with draving pins so that each piece is quitc lant, or the skin will move in cutting. There are six pieces, nud they should all he placed on the skin hefore deciding to cut, so that the best position can he judged for cutting with. out waste, and to get the main part of the glove on the thickest part of the skin, the gussets being cut from the edges of the leather. Cut the straight lines and botween the fingers with the knife, but the tips of the fingers and the thumb gusset can be cut more easily with n sharp pair of embroidery scissors. When the six pieces for the right hand are cut, number them as shown.

The stitch used is known ns jab-stitch or atabbing, and is worked so that the cut edges of the skin are on the right side of the glove. This makes a strong edlge and one that is easy to miend if the thrend wears. To jabstitch. place the two erlges of skin together and puah the ncedle right fhrough the two picces, push hack again about $\frac{1}{8}$ in. nway. This is shown in the illustration (rig. i) with the

## Centre Back of Glove

glovers needle in position. Begin to sew


Fir. 5. Thongs for gauntlet glove. Dotted lines show direction of thong on back of skin. This trimming atarts in centre of gusset
at point No. :3, on to 2 and then 1 (Fig. 2), lollow right round the thumb and hand, setting this part in very carefully so that there are no puckers on one side. and continue the process right moind to point No. 4

To sew the first finger begin at the point marked with an asterisk and sew round the curved top. Take the finger strip marlied 1 and 2, place this in position so that the outward curve nt the centre, which is marked 3 , points to the hack of the hand and the end marked I nt the tip of the first finger. It will he noticed that each onc of these strips is a different shape, and it is important lo number them nccording to the fingers against which they will fit. In some gloves these strips are cut straight, with curves at the ends for the tips of the fingers, hut the centre curve shown gives a better fit, with much spring and much longer life to the glove.

Sew along both sides of the gusset to the point marked 2, which lits against the top of the middle or second finger. Join the other strips betwoen the second and third and third and fourth fingers in the same inanner, the tinal point markel 4 coming at the top of the little finger Now sew lown the outside of the little finger, down the side to where the gusset comes in. Place the gnsset in position, and sew along one side of that to the palm of the glove. and along the opposite side of the gusset to the back of the glove
The back of the glove has three very tiny tucks oversewn with black flax thread, or three lincs of running stitches (the centre one longer than the two side ones) can he worked down each of the three strips. Measure off the seallops with a sixpence or other small coin, pencilling round ono half of it, and cut out with embroidery scissors, then punch a hole in the centre of each scallop. If a straight edge is preferred, punch holes all round about $\ddagger$ in npart, and thread with thongs of tho leather, carrying this decuration right round the glove and up the sides of the gusset. It should be borne in mind that it is not necessary to sew the sides of the gloves helow the wrists if it is decided to thong them.

Gauntlet Gloves. In making women'e gauntlet gloves, such as those sliown in Fig. 3, it is a good plan to cut patterns for two hinnds. ns it is much easier to fit them on the selected skin. Good quality chamois, doeskin, suede, and Firench gloving suede are all suitable. They vary in price, but home-mnde gloves are much cheaper than bought ones, and are not difficult to make with some practice if the direction are carefully followed.

Choose a akin of a size that will cut the pattern without much waste. Before putting down the patterns finally, hold the leather up to the light, and mark all tiny holes or thin places with a pencil. Avoid these when cutting out the gloves. The next point is to deternine the right way to use the skin Stretch it carefully in lisith directions, and arrange that the way which gives the most is across the hand, otherwise the gluves will be tight across the hand and will neither fit nor wear well.

Lay the skin face downward on n hard surface, arrange the patterns, and go round the nutside first. Then lift up the lingers, one after the other, so $n$ s to mark down the side of the next finger to the one lifted up. Tailor's chalk is best for all dark colours, but for chamois a soft leal pencil may he used

If there is only one pattern, reverse it for the other hand. Always try and get a good piece of skin for the thumbs, and sec that the
leather stretches across them. Do not forget to roverse the pattern for the second thumb. Fig. 4. right, shows the shapes of the pieces needed.
Threeguaset pieces are required for each hand, half a clozen small dia-mond-shaped gus. sets for the base of the fingers, and two long gussets for the front of the glove.

Take one thumb, fold the tops togethor, and stitch. using twist. Follow the directions given in making a man's glove. Stitch in the gusset in the same way, but instead of a strap insert a piece of elastic from

the finger, continue and $a_{0}$ sct of four No. 11 steel knitting stitching to the end needlos Cast 52 stitches on the three of the seam. Push needles altogether, in the proportion of 18 the needle through on each of two ncedles and 16 on the third; the inside to the top of the gusset and stitch tho other side down to the base. It is important to make sure that the point 0 on the pattern comos exactly to the point of the fingers.
Do the other fingers in the same way, but continue down the outer side of the fourth finger about 7 in . Insert the end of the strap fastening betwcen the back and front of the hand. Stitch it to the back, and then continue the seam to the end. Trim off any surplus. Fix the steel to the corresponding 2 dots. Trim off the top bar to the small strap of leather by slipping of the glove when the gusset is lixed. Turn up it over the end and folding the two ends round the bottom about $\frac{1}{}$ in., stick it down together. Stitch close to the har and fix it with a little gum paste, and press it. Then to the glove. Put in the front gusset. Begin cut holes round the hem thus made. using a sewing at the bottom and work to the point thonging punch. Thread some thongs from the same skin, as shown in Fig. 5 .
Man's Winter Gloves. A pair of man's gloves in goatskill with fur cuffs, size 8, is illustrated in Fiy. ©. Cut out as explained for a woman's glove. The pieces needed are shown in Fig. 4, left. The stitching "p the back must he done tirst. 'This consists of three rows of stal-stitch. helow the fingers (Fig. 7).

Fold the leather and commence sewing from the top. The tiny ridge of leather made lyy sewing the two pieces together must be as small as possible, and the lines must he kept even. The line betiveen the first and sccond on the rightside


Fig. 7. Stabbing or jabbing stitch used in glove-making pone side, then from the point to the bottom of the other side. Nake the hottom even by turning off any unnecessary pieces of leather.
To put the fur inside the cufis, cut a piece of fur 3 in . wide and long enough to go round the bottom of the glove, noting that the fur is to brush downward. Place the fur
side towards the outside of the glove and stitch firmly all round the edge. Oversew the two ends of the fur together. Turn the top of the glove back sufficiontly, so that the fur can he turned over, and slipstitch the other and inside the glove Do not take the stitches through The fixing of the press-studs
 between the second and third 3 d in., and the half of the stud at the 0 nark shown on the
last one 3 in . Always avoid unpicking. If the strap. Then put the strap through the bar work does not look very flat, press it by leaving it between some hooks.
Sew up the seam of the thumb as far as the hottorn of the short side. Do not fasten off, but leave the thread hanging. Place point $C$ on the glove to point $C$ on the thumb and sew together seam CD. Continue the seam to B, and then on to ahout $1 \pm \mathrm{in}$. down the side of the thumb. Unthread the needle as liefore. Now thread the needle with thic first end left at G , join seam CA and continue $1 \frac{1}{2}$ in. down the side of the thumb. Fit the reniainder of the thumbihole and thumb by placing the edges wgether, taking great care not to stretch either colge. Should tho thumb seens too !arge, as is usually the case, trim off the hole, but on no account cut anything off the thumb. Do this very gradually until the thumb fits well. Continue sewing together, and when ready to fasten off pull the loose end through to the back, also the one which is being worked, and tie the ends together.

Sew the small shaped gussets into the bottons of each pair of tinger gussets, taking care that the point comes exactly in the point hetween them. Then sew the gussets marked 1 and 2 into the glove, the small gussot to he towards the inside of the hand. Begin sewing on the hack at the point up the first finger to a bout 1 in. from the top. 'Trim off the gusset at the top until it fits the middle of the top of
and fix the top half to the end of the strap with the top side of the press-stud underneath, so that when the end is brought over to meet the lower half the stuil will shut properly.

Be careful to put the strap through tho bar before fising the stud top, as this will not go through afterwards. Use good stout glazed thread or fine twist for uewing, and to not use too long a piece of silk. The edges are put together and sewn with stab-stitch, which is simply pushing the ncedle down through the two pieces of leather and bringing it up again, making a tiny stitch. It is not prossible to run gloves togethor.

Knitted Gloves. The pair of man's gloves, one of which is shown in Fig. 8, were knitted with a fairly heavy wool, and are for a size equal to No. 9 in kid. For smaller sizes uso No 13 steel needles instcad of those given. The materials required are 4 oz . of 3 -ply white heather wheeling varn, or the samic quantity of Beehive double linitting wool,


Fig. 8. Knitted glove for a man. Fig 9. Baby's gloves with crochet chain for securing up the sleeves
of the hand, and cast on tour stitches to come between the fingers. making 23 stitches altogether Knit one mund, knitting together the first and second of the six stitches at the bottom of the first finger, and the fifth and sixth of these stitches On the remaining stitches knit 28 rounds then finish of the top like the first finger. decreasing until there are only 10 stitches left, and graft them together.

For the third finger take six stitches from the palm end of the thread. pick up and knit four lonps at the foot of the second finger. take seven stitches from the opposite end of the thread and cast on three stitches, 20 stitches altngether. On these stitches knit 25 rounds, then finigh off the top like the first finger For the little finger take the remaining 13 stitches and pick up four lonps at the side of the third finger, making 17 altogether. Knit 20 rounds, and finish of the top like the ot her lingers.

The thumb can now be finished, so take the stitches of the safety pin and pass them on the needles. Pick up five loops where the stitches were cast on at the back of the thuinb, and $k$ nit one round on all these stitches. In the next mund knit together the second and third of the five cast on stitches. *Knit one mound plain, then decrease again over the two knitted together in the last round, then finish the round. Repent from * once. On the remaining stitches knit 18 rounds, then finish off the top of the thumb like the fingers.
The left-hand glove is worked exactly the same until the first finger is reached. Here take two stitehes to the right of the five cast on behind the thumb, and seven to the left of these stitches. This will reverse the hand, and the rest of the fingers are taken of in the order given for the right hand.

A Baby's Gloves. The linitted gloves shown in Fig. 9 have a thumb piece and the bag shape only for all the fingers.

The materials required are 1 oz . of 4 -ply Beehive Scotch fingering wool in white and a small quantity, about $\ddagger \mathrm{oz}$, of pale blue silveraheen for the edge of the wrist and top of bag, and the surplus for the crochet chain. Use No. 10 steel knitting needles, and work at a tension of about 7 stitches to the inch in width; the wrist portion will measure nearly $3 \frac{1}{2}$ in. wide when measured flat across the double portion, 3 in . across the palm, and 8 in . long from the wrist to the top of the linger portion. A No. 10 bone crochet hook is also required, and lyard of narrow ribbon to match the silversheen.

With the white fingering cast 45 stitches on the three needles in the proportion of 16 on each of two needles and 13 on the third. The lst round is knitted plain. 2nd round : * purl two stitches together, purl two single stitches, wool round the needle and back to front again to make a stitch, purl 1, wool round the needle, purl 2, purl 2 together: repeat from * all mund. There should be five patteris in the round The 3rd round is knitted plain, and the fourth is similar to the second.

Repeat the third and fourth rounds once, and Innit the 7 th to llth rounds all plain. Repent from the second to the lith rounds twice, then knit one round plain, increasing three stitches in the round at equal distances apart by knitting in the front and back of each of three stitches. Work 10 rounds in plain knitting but without any shaping.

In the next round make the ribbon holes for the wrist as follows: *nit one, bring the wool to the front of the needle so that it will pass over the needle when knitting the next stitch, then knit the next two stitches together: repeat from * all round. In the next round the wool that was passed over the needle will be knitted in the ordinary way, thus making a stitch and so forming the hole.

To form the hand, work 12 rounds in plain linitting: then divide the stitches for the thumb ns follows. Jinit the firat stitch, slip the next eight stitches on a asfety pin, and leave them until the hand is finished : cnst oll two stitches and knit the rest of the round Knit 16 rounds on these stitches for the hand, then liegin to decrease to shape the top. Forthe 17th round, knit 1, linit 2 together, knit 15, knit 2 together. knit 2. knit 2 together, knit 15 , knit 2 together, knit 1 ; and for the 18th, knit 1, knit 2 together, knit 13, knit 2 together. knit 2, knit 2 together, knit 13, knit 2 together, linit 1. Continue decreasing in this manner until only 18 stitches remain. Cast off the stitches and, with the silversheen crochet the top together. using a No. 10 bone crochet hnok.

The thumb is made by taking up the stitches that were left on the safety pin, dividing them on to two needles, and with a third necdle knitting up three stitches under the two enston stitches. Work 12 rounds in plain knitting, then knit 2 together until all the stitches are worked off, and with the silversheen work 1 double crochet into each atitch at the top of the gauntlet. Work the second mitten exactly the same as the first, as they are interchangenble on each hand.
GLOWWORM. Where the glowworm appears in the garden, usually on a grasay bank, it should be permitted to remain, for as a grub it feeds entirely upon snails. The male somewhat resenibles in form the common wayside heetles known as soldiers and sailors; the wingless female, the chief light giver, differs little in appearance from the grub. As a rule, she climbs a grass atem at night to make her light more visible to the flying male. The latter often flies into open windows where there is a light. Attempts to establish the glowworms in gardens are often made, but are doomed to failure unless the snail pest is already there.

GLOXINIA : How to Grow. With bell like flowers of innumerable colours and shades, the gloxinias are a family of very beautiful greenhouse or stove-flowering plants. They


Glue. Fig. 1. Applying glue to two surfaces simultaneously. Fir. 2. Rubbing the two edges of joint together. Fig. 3. Cramping un the joint; two
are tuberous perennials, hut are usually raised in the first instance from seed. The seed, which is very small, should be sprinkled in well.drained pans or boxes of light, sandy soil with which a little leafmould is mixed January and February are suitable monthe for sowing.
In an ordinary greenhouse heat, say of $55^{\circ}$ to $60^{\circ}$, the seed will germinate in less than a month, and as soon as the young plants, which grow rapidly, arc large enough to handle they should be pricked out. A change froin a 3 in . pot to one of larger size will be all that is required. Ordinary potting soil of loam and leaf-mould will suit them admirably. They will tlower in summer.
After the flowers arc over gloxinias should be dried off gradually by giving decreased supplies of water and finally keeping the soil dry in winter: the pots containing the roots must remain under the glass safe from frost. In early spring the tubers should be taken out, repotted, and started into fresh growth Gloxinias must be shaded from strong sunshinc. During the summer montlis they need little or no artificial warmth.
Gloxinia tubers are not much gond after the second or third year, but attempts may be made to perpetuate favourite sorts by cutting half-way through the mid-rib of one or more bealthy leaves, when the llowering season is over, and pegging them down to a sandy surface-soil with pegs or hairpins. In the course of time tubers will form at the bases of the wounds, and new plants thus procured may be grown in the ordinary way.

GLUCOSE. Grapes and other aweet fruits contain the colourless syrup known as glucose or grape sugar. It is found in the human body, in the blood and lymph, and in medicine it is added to nutrient enemata, being readily absorbed. Glucose is prepared artificially from starch, dextrin and canc-sugar. It is used in brewing, confectionery and jam making See Diet; Food; Jam; Sugar.
GLUE : How to Prepare. Gluc is an adhesive preparation, often in the form of impure gelatine, obtained by boiling down animal substances such as skin, horns and hoofs. It is mostly either of the cake type, such ns Scotch glue, or purchased in a tube, generally in the form of a patent preparation. Fish glue is sold in convenient form in a tin or tube. Various grades are available. Casein glue employed by bookbinders, is made by dissolving casein in a solution of borax. Dutch, Flanders or Cologne glue is a pale, strong adhesi ve bleached with chloride of lime. Elastic or flexible glue is obtained by combining glue with a preparation of glycerin, glucose, etc.

The preparation of Scotch glue is simple, but unless carried out properly results in par. tial failure. The glue is purchased in the form of rectangular blocks about 6 in. square, and one of these should be loosely wrapped in a
piece ol old paper, and broken into small pieces with a hammer. The contents of the paper are placed in the inner vessed of the glue-pot, covered with cold water, and left to soak for 24 hours at least. The glue-pot is then placed on a slow fire, gently brought to boiling point. and left to simmer until its contents are completely dissolved and ready for use

Glue should be dissolved by gentle heating : $f$ it is allowed to boil for any length of time it will darken, and much of the strength will be lost, and the same applies to reheating. It is, therefore, prudent to mix only such a quantity as will be used up without delay Never put new glue in a pot containing old hard pieces; the pot should be cleaned out, and fresh glue made as required
The glueing up of the parts is best carried out in a warm room, the surfaces to be united being warmed, and the adhesive applied sparingly but thoroughly ( Fig 1) to both surfaces. The two parts are pressed gently together, as in Fig. 2, to squeeze out all surplus glue and exclude air bubbles: the ultimate strength of the joint depending upon the closeness of contact between the two pieces of wood If this is properly done the joint will never come apart under ordinary uses Repeated testinga have shown that the wood itself will splinter before the joint will give way.

Another point is to provide means for cramping the parts together (Fig 3), as the joint should be kept in firm contact until the glue sets hard, and 24 hours is none too long for this esmential process. In some cases it is necessary to unite pieces of wood in such a manner that they can be parted without difficulty. This is accomplished by placing a piece of thin brown paper between the faces of the wood while the joint is made. When it is to be severed, the paper can be split and the surfaces cleaned up with a plane, and finally glued together. This class of glue-joint is in considerable demand for curved work, when several pieces have to be shaped, and for some reason separated, before the tinal completion of the work

When any considerable area has to be covered a short stiff brush may he used, hut on delicate work it is better to apply the glue with a thin atick of wood shaved at the ends to form a sort of knife blade.

Patent adhesives, such as the various liquid glues, are convenient for repair work and amall jobs, being applied direct to the joint faces They should be pressed close and cramped, although they set hard in a few hours. Similar remarks apply to most of the fish glues. A glue for metal may be made from fish glue and carefully prepared flour puste in equal propurtions.
GLUTEN. When mixed with water gluten has a gluey consistency, from which its name is derived. Gluten or vegetable albumen is one of the constituents of most cereals. It its weight of water till it is stiff and then continuing the kneading under running water, which washes out the starch

Wheat Hour contains ahout 12 per cent of gluten, and it is to this quantity together with the elastic nature of gluten in the flour that bread owes much of its light and spongy texture. The grains of other cereals, such as oats, rye, barley, that are deficient in gluten, will not by themselves yield a light, porous loaf. Gluten is sometimes used by itself, or with only a very amall quantity of starch, for making gluten bread, or gluten biscuits used in diabetes. See Bread; Food.

GLYCERIN. Obtained from fats, glycerin is a colourless, thickish, transparent fluid which readily diswolves other aubstances, and does not turn rancid or evaporate Consequently it is often used as a means of apply. ing other drugs to skin surfaces, or mucous
membranes. It is also commonly included for its soothing qualities as an ingredient of throat lotions.

Common glycerin preparations are glycerin of boraoic acid, sometimes called boroglyceride, for fomentations; glycerin of alum; glycerin of tannic acid, a useful astringent preparation ; glycerin suppositories, etc. A characteristic quality of glycerin is its power of absorbing water from any moist surface with which it comes in contact

When mixed with an equal part of plain water or rose-water, glycerin forms a good application for chapped hands and helps to keep the skin white and soft Used pure it is generally too irritating. Perspiring feet may be rubbed with glycerin and then sprinkled with borax with excellent results. Shoes that are to be put away temporarily should be rubbed with a cloth dipped in glycerin. This will make the leather soft and pliable and prevent cracks.

GNAT. The mosquito family of insects are also called gnats Many species of this fnmily. which brecds on stagnant water, carry nialaria and others carry yellow fever, dengue and filariasis. They are b!nod-sucking insects and they introduce infection in the act of biting. The common English gnat carrics nothing The irritation following bites may be trated by applying solutions of ammonia, bicarbonate of soda, or juermanganate of potash. See

## Mosquito.

GOAT. As a profitable animal costing little to keep, or simply as a childien's pet, the goat can be strongly recommended. It can be kept where a cow would starve, and its milk possesses high dietetic qualitics A goat takes up little space, and the stall of a disused stable will accommodate two or three lior breeding purposes a male goat should be hired. Goats firat come in season at a few months old, but 18 months is soon enough to put them to a male. To breed from a goat earlier ruins the milk yield

A goat-keeper, unless he has ample space, should kill the kids when they are born, that is to say, if he kceps a goat for her milk, fur the young will take it all ; and, unless of verv good pedigres, kids do not pay to rear. The flesh in tlavour is very like veal. The milk yield of a goat varies grently. An animal that will give four quarts when in full profit is a remarkably good milker, two quarts being nearer the average. Nilking qhould be done regularly twice a day, and the bag thoroughly stripped
The best food for goats in winter, when they have to be kept indoors, consists of leaves, grass, vegetablea, and a little hay and corn Out of doors they can subsist on a hedgerow, eating grass and leaves which would otherwise be wasted; and all through the spring and summer, if there is plenty of such food for them, they nced not cost a jeenny for their keep. They should, however, have some concentrated fond if they are milking. Anyone owning a beavy milker of a good strain will find it pays to feed the animal well in winter, atall feeding, as for cows, on hay, crushed or whole oats, bran and oracked maize.

A goat can very rarely be allowed its !iherty owing to its fondness for barking trees and the inquisitive disposition it manifests towards everything it can reach. It is, therefore, customary to tether it on a rope or chain with a swivel attached to a stout iron pin driven into the ground, moving it to fresh ground every day, or even several times a day. Goats are very hardy. The only thing likely to upaet them is a surfeit of wet greens. They have aversion to damp and heavy winds, and in wet weather should be confined to their stall and given a little hay.

Goat's Milk. Goat's milk is an exceedingly nourishing and valuable food for infants which cannot receive their natural nourishment Both the protein and the fat are greater than
in cow's milk, but there is less sugar than in human milk. An important reconimendation for goat's milk is that these animals do not suffer from tuberculosis For very young infants goat's milk is too strong If given at all it should be well diluted with water. For growing children it is an excellent and nutritious fond.

The following notes are taken from Leaflets $30 f$ and 383 issued by the Ministry of Agri culture :

Goat's milk is as sweet and palatahle ns cow's milk, richer in cream, and more easily digested Butter niade from it is white, anil may be coloured with nnnatto. Soft and hard oheeses of excellent quality can be made from the milk Two points to note in milking are that it should be done at reqular intervaly and done quickly, as the goat becomes impatient if the operation is delayed. The milk should be strained through a clean butter-cloth and stored in a cool place All utensils must be kept scrupulously clean by scalding with boiling water, and the hands should always be washed before milking.

Feeding the Goats. For feeding purposes the best receptacle is a metal pail. Variety of food is essential, but there should be no waste. Food of anv sort should never be placed on the ground. as the goat will refuse to touch it if it is in the least soiled or tainted Cabbages and similar green food should be hung up by the roots Hedge clippings, garden produce o all kinus. acoms, roots, weeds such as dandelions, sow thistles, and docks are all caten by goats ; but everything must be perfectly clean and sweet, or they will reject it. Milking goats may have two or three handfuls of corn or cake daily, and when the lactation period extends through the late autumn or winter months, some concentrated food such as grain, ineal, or cake is necessary if a satisfactory milk yield is to he obtained Mangolds and swedea may be given, cut in half and placed in the manger, or sliced or pulped and sprinkled with bran or middlings Good, sweet hay should form the staple food for winter

Dyed gaat fur is a cheap and pupular substitute for bearakin. It is used largely for trimmings, white 'Thibet goat providing an attractive decoration for evening wraps and cloaks See Fur

GOAT MOTH. The caterpillars of the goat-moth bore galleries in the stems of many trees. and render the wood of little or no use


Goat Moth Toe caterpillars attack tree stems by boring, thus rendering the wood useless for practical pur poses. The odour of the caterpillars and their burrowe has been compared to that of the goat The moth, which Hies at night, is large and plump, the female being $1 \frac{t}{2}$ inches long or nore, with asw-like antennae, brown winge mottled with grey and black, whitish rings on the abdomen. The caterpillar meas ures up to 4 in . in length, and more than 100 have sometimes been taken from one stem
Prees which are hadly attacked and are of no great value should be cut down and the larvae destmyed. When a tree is only slightly atiacked, or when it is of special value for shade or ornamental purposes, the following methods destroying the pest are recom mended in Leatlet No. 60 issued by the Ministry of Agriculture. Snıall quantities of
carbon bisulphide may be injected into the holes in the trunk, or small picces of potassium or sodium cyanide may be pushed into the holes. Whichever poison is used the holes must be thoroughly blocked with clay immediately after the "peration is completed.

## Goat's Beard. See Spiraca.

Goat's Rue. This is a variant name tor the perennial better known as the galega ( $\varphi$ v.)

GO BANG. This indoor game is played by two or four persons. The requisites are a board marked like a chessboard into 400 squares, 20 along each side, and 400 pieces. each 100 being a different colour. They are divided between the players, each taking 100 or 200 a a the case may be. The picces are all outside the board at the start, and each player in turn puts one on to any square he likes, provided it is unoccupied. The object of the game is to get five pieces in a straight line, straight in any direction, and the player who succeeds in doing this lirst wins.

A variant of the game is to place the pieco on the brard in turn as in the previous game, and to endeavour to surround an opponent's piece with thein. The piece which is surrounded is then talien from the board. The game continucs until all the pieces have been placed on the board, and the player who has then surrounded the larger number wins. Go Bang is also played on a board of 301 squares, 19 along each side. In this case 362 ccunters, or men, are used.

GODETIA. One of the most beautiful hardy annuals ; seeds are sown out of doors in spring where the plants are to bloom in
 summer. If sown in pots in Scptem. ber and grown in a slightly heate il greenhouse they will flowerin spring under glass. Thero are innu. merable tall and dwarf varieties with single or double flowers. The former as re sold chiefly by colour. Of the latter varicties the Azalea. flowered Lady Albemarle and Duchess of Albany are some of the best for the garden.

GODPARENT. Alternatively known as sponsors, these are the persons who, when $n$ child is baptized, make certain promises on its behalf and undertake that it shall bo taught the Christian faith. Godparents exist in the Church of England, the Roman Catholic Church and the Lutheran Church, but not among the Presbytcrians, W'esleyans, and other bodies. The Church of England ordains that each male child shall have at least two gol. fathers and one godmother, and each feinale child two godmothers and ono godfather.
GOFFERING. This is a laundry process, applied as a finish to lace, cambric. and embroidery frills and producing a fluted effect. It is used mainly for frilled pillowcases and muslin curtains, servants' caps and apron borders.
The goffering irons are made in various sizes for conrse or fine needs, ranging bet ween wide


Goffering Irons The patient feasible remove to another district if this is be builed, as the disease is duc perhaps to some poison or germ in the water.

The development of a simple goitre has some relation to the supply of iodine to the tissues of the body. The secretion of the thymid gland contains an organic preparation of iodinc, and the most obvious explanation of a simple goitre is that it represents an increased effort to maintain or increase the supply of iodine to the tissues One method of preventing the disease is to give small doses of iodine regularly. The administration of thyroid extract has proved successful in some cases, but this pewerful drug should never be used except under medical observation. See Exophthalmio Goitre: Gland.

GOLD : Marks and Qualities. It is com. pulsory for certain articles of gold to bear a hall-mark if they arc manufactured and offered for sale in the United Kingdom. The chief marks of the Goldsmiths' Hall for gold wares made in England is a lion followed by other letters or marks representing the particular ycar in which the hall-mark was applied, and the initials or registered trade mark of the firm responsible for the manufacture of the article. The principal marks of the IBirminghan Assay Office are an anchor followed by the marks which indicate the quality, the year of manufacture, and the maker.
The different qualities of gold that are halimarked are 9 carat, 15 carat, and 18 carat They are distinguished by the figures on the articles, as follows :

$$
\begin{align*}
& 18 \text { carat gold } \\
& 15 \text { carat }
\end{align*}
$$

The higher qualities of gold are cunsiderably softer, consequently articles which have to withstand hard wear are beat minde in the lower qualities. A 9 carat or 15 carat gold watch albert will wear considerably longer than one of 18 carat or 22 carat. In regard to gold cigarette cases these will wear better in $y$ carat than in 18 carat.

When disposing of old gold it will be found useful in calculating the price per oz. that ought to be obtained to take the average price of gold at $3 / 6$ or $3 / 9$ per carat, and mul. tiply this amount by the quality of the gold, 9 carat, 15 carat, 18 carat, or 22 carat, as the case may be. For example, old 18 carat go!d ought to realize 18 times $3 / 6$ or $3 / 9$, according to the market price. A small loss has to be incurred in the melting of old gold by the refiners

Gold jewelry of the quality 15 carats and upwarda will wear a soft ycllow colour through. out, but lower qualities ase usually gilderl. When new, these are the same colour as 15 carat or 18 carat, but after being in wear the
gilding will wear off and the gold will have more of a reddish tint or bright copper colour. This is not in any way detrimental, but it frequently causes the ouner to conclude that the article is not real gold. In the alloying of lower qualities of gold the base metal has the effect-of making it a reddish yellow colour, and it frequently happens that the colour of 9 carat gold appeary like bright copper before it is gilded and polished.

For cleaning gold there is nothing better than a paste of water and ordinary powdered rouge. This is brushed on to the article, or if the ornament has a sinooth surface the paste can be applied with an ordinary leather. A bright polish is obtained quickly. If any of the paste remains it can be removed with a damp brush No moist rouge paste should ever be allowed to come in contact with any stones such as pearls, turquoises, ctc., which inight be set in an article of jewclry; nor should any water or moisture be applied to any such articles, as this would discolour pearls or turquoises. For cleaning gold, jewelry, or ornaments set with stones other than diamonds, it is essential that $\pi$ stiff brush with dry powdered chalk should be used. See Brooch : Carat : Jewelry: Ring.

GOLDEN BUCK. Cheese and poached eggs are the main ingredients in this American recipe. To make it, put $\frac{1}{2}$ pint of inilk into an enamelled saucepan over the fire, and when it boils add $\frac{1}{\mathrm{tb}}$. of grated cheese, it teaspoonful of salt, and $\&$ of pepper. Stir the whole until the cherse has melted. and with it coat, 6 rounds of hot buttered toast. Place a prached egg on the top of each, dust. them with a little pepper, and serve them at once.

GOLDEN DROP. The name of golden drop is borne by a small family of hardy perenninls known technically as Onosma. They are excellent for the rock garden in thoronghly drained sandy loam, and may be propagated by seed or by cuttings. The plants should be covered in winter with pieces of glass, raised 2 or 3 in . above the plants by wire pers. The favourite kind is Onosma taurica (echivides). 8 -10 in., with golden ycllow flowers in summer

Golden drop is also the name of one of the best known varietics of plum. Se.e Plum

GOLDEN EYE. There are about a dozen British species of the delicate four-winged insect variously known as golden eye, lacewing. fly, and stink-Hy, but they bear so close a likeness one to another that the differences are evident only to experts. In the larval stage they feed entirely upon other insects, and these are usually some species of aphis or their near relations, which they suck dry, certain species piling up the empty skins on their back.

The eggs on their hair-like stalks may be seen standing like a cluster of pins on a roseleaf, and should be respected always. Each larva accounts for many aphides every day, as a few minutes' observation of its method will demonstrate. At the end of its scrvice it spins an egg-shaped cocoon in which it passes the winter: emerging next spring as an active pupa, it at once assumes the winged form. All the species should be treated as friends.

## Golden Feather. See Feverfew.

GOLDEN FERN. So called because the undersides of the fronds are eovered with a golden, powdery substance. Gymnogramme is the chief kind. See Fern; Gymnogramme.

GOLDEN PUDDING. Wash $\frac{1}{} \mathrm{lb}$. sultanas, dry them thoroughly in a cloth, and remove the stalks. Mix $\frac{1}{2}$ a level teaspoonful of bicarbonate of soda with 6 oz . Hour, and sieve them into a basin. To these ardd 6 oz breadcruinbs, 6 oz . chopped suet, the fruit, and a little grated nutmeg, and mix all well.

Whisk together a beaten egg and 6 oz. golden syrup and stir them into the dry
ingredients, with officient milk and water to make a fnirly soft dough Turn this into a greased basin, cover it with a greased paper and a floured pudding cloth, and steam it for 21/-3 hours.

GOLDEN ROD. A vigorous, linedy, her bacenus perennial which bears showy yellow Homers in late suminer and early autumn It flourishea in ordinary soil, in sunny or shady places, and spreads quickly. Propaga tinn is effected by division cither in autumn or spring 'The best is solidago Golden Winge, fs fect ligh.

GOLDEN SAUCE. This sance is made by boiling ingether for 5 min . 1 gill golden syrup, $\frac{1}{2}$ gill water, and a tablosponful of lemon juice

GOLDEN WEDDING. This term is applierrito the completion by both parties of 50 years of married life. Custom decrecs that presents given on such oceasions shall he of gold.

GOLD FISH. As n rule this heautiful cnrp is kept in a relatively small glass bowl, where its lidless cyes ennnot macape from the constant glare of sunlight or elect ric light, and where it is expected to thrive with little or no fool. It ahould be liept only in ornamental ponds or in aquaria proportionced to its size, with growing water plants which will nfford it shade and partial food Other food may include blondworms, very small earthworms. and crumbled biscuit Any unonnsumed lood should be removed. If gold tish are kept in a nond the Intter should have some protcction from frost in winter, a few boards laid across one end being usually'guflicient See Aquarium.

GOLD LACE. Fancy gold lace made in a manner similar to silk or cotton lace has been used as a trimming since ancient times, and there are periodical revivals of fashion for the article. Such lace need not be thmwn nway when tarnished. The original

colour can often be restored by brushing the lace gently with a soft hrush dipped in methylated spirit; the work is made much easier by first tacking the lace down upon calico.

An alternative method of freahening gold or gold and silk lace is to soak it overnight in weak acetic acid or even in white vinegar. The lace should then be gently washed in


Golden Rod. Flower sprays of a bardy perennial which is suited to a larke garden
tepid water with plenty of good soap, and it may be dricd by pressing it lightly between soft cotton cloths. If it is desired to stiffen the lace after wrahing, a dip into a weak solution of clear white gum arabie will give entisfactory results

GOLD-TAIL MOTH. In the southern and middle districts of England the caterpillars of the goldfail moth are $n$ pest. Fecding naturally upon hawthorn and various foreat trees. they show a fondness also for pear, apple nad plum trecs, likewise roses. The moth is a heautiful creature, with pure white antiny wings which, in the female, have a spread of $1 \frac{3}{3} \mathrm{in}$. The male is smaller and his forewings have a black spot. sometimes two spote. near the hind margin.

The body ends in $\Omega$ Huffy tuft of vellow, which the female uses for thatching hor batch of eggs. Thesc are laid in July or lugust, and soon hatch: the young caterpillars spin n web at the forking'of two twigs


Goll : the Midret rame. Floe pieces, selected from a set of nlne, sbowing variois bazard in this amusing rame. midget golt can be plaged either indoors or on a lawn Courlesy of A. W. Gamaye. Lid
in which they rest for the winter In spring they come out to feed. They are black in colour with a bright red stripe along the back divided by a thin black line: and there are tufts of fine black and grey hairs. Late in May it apins a cocoon. The moth emerges in July or the end of June.

The gold-tail moth should be looked for in July. when it will be found reating quietly all day on leaves. The winter nests of the caterpillars, usually not far apart, may bo seen on the bare twigs, and the awakened caterpillars may be seen sunning themselves on these nests in spring. Hand-picking :nd destruction is employed in cither case.

The very amilar brown-tail moth is re atricted in Britain almost to coast districts in Kent and Sussex. See Insectioide

GOLF, MIDGET. Within recent ycars great intercat has heen cleveloped in so-called Midget Golf, which strictly is not n game of golf at all and bears only the remintest relationalip to colf proper. In Anierica particularly Midget Golf had assumed by 1930 the propoitions of $a$ national craze and millions of money were invested in Midget Golf courses for public entertainınent. The game consiats entirely of hitting an ordinary golf ball with an ordinary putter into a variety of holes. the approach to which is made difficult by all sorts of ingenious contrivances.

To thosc unfamiliar with the game the illustrations which we give will explain it sufficiently. In most cases the hall is driven up a short incline, passes through n small opening, thence down into the scoring hole, usually placed in a difficult position. The complete set of holes may be cither 9 or 18 , the 5 which we illustrate being selected from a set of 9 . The obstacles can be laid down in any large room or on a turf lawn and the player has only to putt the hall into the hole as best he can. The one that takes the lowest number of strolies at each hole and has the lowest aggregate of strokes for the course is the winner

Many manufacturers have put on the marliet ingenious Midget Golf sets either constructed of wood or in the cheaper varicty of stout strawhoards, painted and decorated attractively. Such sets can be obtained at all sorts of prices, hut any handyman can construct them quite successfully for hiniself, and persons of inventive mind can very quickly improvise a set suitable for indoor use, as there is no limit to the devices for making entry to each hole difficult.

Much amusement and a good deal of cx. hilaration can be obtained from playing at Midget Golf, which is not to be confounded with Miniature Golf. The latter term describes those small golf courses often to be found associated with residential country hotels. They are laid out like ordinary golf courses, but designed for appiroaching the green by means of $n$ mashie, and they are, of course, outaide the consideration of the ordinary householder, who at most is likely to be able to turn some portion of his garden into a temporary Midgot course litted with obstacle holes somewhat on the lines of those here illustrated. See Clock Golf.

GOLOSHES. Waterproof rubber shoea made to wear over ordinary honts or shoes in wet weather are known as goloshes. Their chief foature is that they have no fastenings, but their elastic tendency allows them to he julled over the shoe, to which they fit closely. They can be obtained in various sizes, and are hard-wearin" if

Ireated with care, and require only an occasional rubbing with a damp flannel to keep them clean See Rubber.

GONG: For Bousehold Use. There is one principal type of gong, and from it most of the existing varieties have developed A round, smooth piece of metal is hung in or to a frame, and is provided with a beater, for which there is a resting place somewhere on the piece. The beater takes the form of a stick or bar, having a ball of some soft material, covered with leather or cloth, at the end that is used for striking.

One type of gong hangs in a heavy frame of oak or other hardwood, the frame, a square one, standing on the ground. A variant of this has an iron frame, while other metals may be used for them. Smaller gongs of the same type are made to stand on tables or other elevations, and are also suitable for use in the dining room.

GONORRHOEA. This disease is very contagious, and may be contracted indirectly from towels, sponges, clothing, etc. Symptoms usually appear on the third or fourth day after exposure to infection, though it may be rather earlier, or not for 7 or 8 days. The result of the widespread misconception as to the seriousness of the disorder is that ton frequently proper medical advice is not obtained. or if a doctor is consulted his directions are not carried out properly. No person who contracts the disease should be content until his doctor, after appmpriate tests, is able to assure him that he is clear of infection. Vaccines have proved very beneficial in some of the cases of joint affection.

GOOD EING BIENRY. The useful vegetable (chenopodium) popularly known as Good King Henry has varinus localized names, including wild spinach and perennial goose foot. The plant has two uses, as spinach by gathering its leaves, or as asparagus by earthing up the shoots

Seed may be sown 1 in . deep in drills 18 in. apart during April, thinning seedlings out to 9 in. in May. See Asparagus.

GOOSE. Anyone owning grass land or living near a common will find it profitable to keep gease, as, being persistent grazers, they need little else in the way of food. Swimming water is desirable when breeding.

Their housing is quite a simple matter, any shed or outbuilding sufficing so long as the roof and walls are sound and the floor dry. The floor must be covered with mugh-cut litter to form bedding material. The goose usually lays its eggs in rough nests in the corners of its house, the bird following her wild protective instinct by covering her egg with litter when she vacates the nest after laying. In breeding, well-grown geese are usually mated with a well-matured gander, and hatching may either be effected by a goose or a hen. The former. which will only sit on the neat she is accustomed to lay in, may be entrusted with from 10 to 12 eggs, but if a hen is used she will not be able to cover more than four. The period of incubation varies from 28 to 30 days.

Goslings are the easiest to rear of all poultry. Their first food should consist of hard-boiled egg, chopped up finely and mixed with biscuit meal, to which a little water or skim milk is added to moisten it. After a couple of days the egg may be discontinued and the birds placed upon a cheaper and plainer diet.

Wheat is a most useful food for goslings, but it should be given scaldel, not raw. A good method is to scald it for some hours, drying it off with ground oats or barley-meal. Ground oats, barley-meal, and toppings are all useful foods, either singly or mixed in equal proportions. When the goslings are eight to ten weeks old whole grain may be given, preferably wheat, and some bone-meal should be aulded
 breed, Vory popular in England. Above, dark grey Toulonse goose
hours. When it is ready for serving, take out all the skewers, lift it on to a hot dish, and hand with it some good gravy and apple sauce.

To braise a goose, pre pare and truss the bird as for roasting, and dust it over with a little flour. Melt 2 oz. margarine or bacon fat in a saucepan, and when it is hot put in the goose and brown it all over. Add a carrot, 1 or 2 sticks of celery, a sliced onion, a bunch of herbs, 1 gill white wine, 10 peppercorns, and a little salt. and cook the whole for a few
to the food. Green food, too, is necessary until they can forage for themselves.

To fatten geese for Christmas they should be confined about a month beforehand to a shed, preferably one with an open front covered with wire netting, and fed liberally on a diet consisting of barley-meal or Sussex ground oats for soft food, and barley or other good grain at night, greenstuff being supplied liberally. The goose is a long-lived bird, not arriving at maturity until its third year, and often reaching the age of thirty, but its period of usefulness does not extend beyond eight years.
Geese will continue to produce eggs profitably until an advanced age, and instances are known of geese 19 years old which still continued to lay an average of 55 egga each per year. For hatching purposes the eggs of mature birds are more reliable than those of young stuck.

How to Cook. The best way of cooking a goose is to roast it ; but geese ard also braised. To roast one, prepare it as for duck, singe it thoroughly, and then fill it from the tail end with sage and onion stuffing. Fold the skin over the opening and keep it in place with a small skewer. Turn the flap of skin at the neck under the body and fasten that in a similar manner. Truss it in the same way as a duck, tie a piece of greased paper over the breast, and roast it before a clear fire or in a quick oven, keeping it well basted. About hour before the bird is cooked take off the paper so that the breast may brown. A medium-sized bird should take from 11-2
minutes until the wine is reduced by half. Pour in enough stook to cover half of the goose, and cook over slow heat.

The time taken in cooking depends upon the age and size of the bird, but from 2-2 $\frac{1}{2}$ hours is usually required. Baste the goose occasionally with the stock, and when it is ready turn it on to a hot dish. Pour the liquid into a amaller pan, reduce it, and when it is of a rich brown colour skim it, pour a little round the goose, and serve the remainder in a sauceboat. Apple or cranberry sauce should accompany lraised goose. See Carving: Duck: Fowl; Poultry.

GOOSE : The Game. Known as the royal game of gorse, this is sometimes called the race game. To play it the figure of a goose should be drawn upon a piece of paper and divided into 63 eections, which are numbered. If desired, any other number can be chosen, but 63 is the usual figure. A draught-board or any piece of paper can be used instead of a gooso. A pair of dice and a dice box are also necessary, but no particular number of players is needed.

Each player has a counter. In turn each rattles the dioe, and according to the number thrown he moves his counter along the goose. The object of the game consists in exactly reaching the 63rd partition, and the player who does this first wins. For instance, if a player has reached the 56th partition he must throw 7 to finish. If he throws more, e.g. 9, he must go back 2, and this continues until he secures the number that carries him cxactly into the 63rd division.

## Gooseberries from Garden to Table

## The Cultivation and Cooling of this Useful Fruit

For other information on the subject of fruit culture the reader is referred to the articles Frult; Grafing: Kitchen Garden : Pruning; anol those on other fruits, e.g. Apple: Currant. See further Botling; Insecticide; Jam; Spraying; and the entries on Magpie Moth and other pests
This is the most useful of the bush fruits, for soil. An annual top-dressing of stable or under fair treatment it crops well and farmyard manure in February is beneficial. regularly, and the fruits are valuable both when green and ripe. Botanically it belongs to the same genus or plant group as the currants (ribes): its botanical name is Ribes grossularia.

The gooseberry flourishes in ordinary well. tilled land which is kept in a fertile state by adequate manuring. The bush form is the most profitable, but the single, double and treble cordons are useful for planting alongside a walk in the kitchen garden: they bear exceptionally fine fruits in limited numbers, and in addition the bushes are casily and conveniently managed.

The best time to plant is in November, but planting may be done at any time in mild weather between October and mid-March. The bushes ought to be set at 5 feet apart each way. The uppermost roots need not be covered with more than 2 or 3 inches of

Pruning is an important detail of management. Amateurs often make the mistake of pruning the bushes too severely, with the result that growth is vigorous but the crops are poor. Pruning should take the form of thinning out rather than severe cutting back. The branches ought to be so far apart that the hand can be passed between them conveniently, and to ensure this it is necessary to cut out shoots that tend to crowd the main branches. Parts of the old branches can often be cut out with advantage to make room for young shoots.

The tips of the branches ought to be out off, and branches which are so low down that the fruits would be spoilt by soil splashed up during rainy weather should be removed. The ideal gooseberry bush is one with a stem 8 or 9 inches high. After thinning out is finished the remaining side shoots should be shortened to within two buds of the base of the past
summer's growth. It is usual to defer the pruning of gooseberry hushes and cordons until towards the end of February, because the buds are so linble to be damaged by birds. In many gardens it is in fact necessary to net the bushes Scattering a mixture of soot and line over the branches affords some protection, su also does the practice of tying the branches lonsely together.
The pruning of condon gooseberries is perfectly simple, for it consists merely in shortening the side shoots to within two buds of the base of the past summer's growth. The lcading shoots, those which extend the branches, are pruned so as to leave about 8 inches of the past year's growth.
Cuttings provide a simple way of increasing gonseberrics; pieces of the previous summer's shoots 8 to 10 inches long are inscrted out of doors in October or November: a small straight-backed trench is dug out, sand is scattered along the bottoin and the cuttings are set at 8 inches apart, at least half ench cutting being beneath the soil. All except three or four buds at the tops of the cuttings should be cut out.

These are some of the best varieties of goose herries with large fruits: Red: Crown Bob, Lancashire Lad, Whinham's Industry Green Plunder. White: Careless, Shiner. Yellow Keepsake, Leveller. With small fruits: Red Ironmonger (first-rate for jam), Keen's Seed ling, Wrirington. Green: Langley Gage. Green Gascoigne. Yellow: Golden Gem, Ycllow Sulphur White: Whitesmith

How to Cook. In cookery, the gooseberry is employed in a variety of ways, pie-making, stewing, and bottling being among the most common. It is used for making jam, winc, chutney, and many different kinds of sweets, including compôtes, jellics, flans, puddings, etc. The amount of sugar required depends almost entirely upon the kind of gooseberries used, green, unripe ones naturally demanding more than the riper fruit. Directions for bottling gooseberries will be found in the general artiole on fruit bottling: goosebery recipea are dealt with undor their respective beadings.
Gooseberries for use as dessert may be either red or golden, the latter being generally preferred. There are hairy and smooth, varying from the size of a cherry to that of a small plum. For all ordinary cooking ригровен, unripe green gooseberries are undoubtedly the hest sorts to employ

To stew gooseberrics, top and tail them and wash thens if necessary, then put them into an enamelled sauce pan with 3 tablespononfuls of sugar to every pint of the fruit, and just cover them with water. Let then boil gontly until tender but unbroken, and serve them, hot or cold, with custard.
Gooseberry Amber. This sweet is made by melting 2 oz . of butter in a saucepan over the fire, and then adding to it 1 lb of trimmed and washed gooseberries and $\ddagger \mathrm{lb}$ castor sugar. Let theso cook gently until the fruit is reduced to $n$ soft, thick mass, then stir in 1 oz hrenderumbs
previously rubhed through a inire aieve and heat in well the yolks of 3 eggs. Turn the whole in a buttered piedish.

Bake the mixture in a moderate oven for about $\frac{1}{2}$ hour or until it seems set, then beat up the whites of the eggs to a very stiff froth. adding lightly to them 3 . level tablcspoonfuls of castor sugar and a few drops of vanilla essence. Heap this meringue roughly all over the top, and sprinkle a little more castor sugar over all. Put the dish in the coolest part of the oven. and let it remain there until its contents are crisp and pale brown in colour Serve the swoet at once.
Gooseberry Chutney. Gooseberry chutney is made by ohopping finely about 1 quart green gooseberries, ${ }^{3} \mathrm{lb}$. stoned raisins and if oz onion. Put these into an enamel pan, with $\frac{1}{2} \mathrm{~b}$ brown sugar, 2 tablespoonfuls nustard seed, 1 quart vinegar, $\frac{f}{2}$ saltsponnful turmeric, 1 good pinch cayenne, I tablespoonful ground ginger, and 2 small tablespoonfuls aalt ; then heat the wholo slowly, and keep it builing gently but steadily for 1 hour.

The chutney may be atrained through a coarse sieve or left unstrained, and when cold should he put into clean, dry jars, and corked and tied down tightly. It iniproves if kept for n time.

Goosebarry Cream. To make this sweet, tako about 1 lb . or $1 \frac{1 \mathrm{lb}}{}$ gonseberries, top and tail them, and put them into a saucepan with $\$$ pint water and 4 oz . castor sugar. When the fruit is soft ruh it through a hair sieve and addl a squeeze of lemon juice. Then melt $\&$ uz. ge!atine in two tablespoonfuls of water and stir this into the gooseberry purec. When this is quite cold, whip $\frac{1}{2}$ pint oream and mix it lightly in. Colour with a little green colour. ing and put into a mould to set.

Gooseberry Fool. Tup and tail 2 lb goose berries, wash them in cold water, then put them in a pan with olb. sugar and I gill of water Boil gently, and if the saucepan gets too dry add a little moro water, but aa little as possible. When the gooseherries are soft rub them through a wire sicve and measure the pulp. To each pint allow $\frac{d}{d}$ pint boiled custard. Mix pulp and custard well together, sweeten to taste, and serve it in a glass dish or in custard glasses, with whipped cream on top. Either cream or milk can bo mixed with the gooseberries in place of oustard.

Gooseberry Jam. To every pound of green fruit used in making this jam allow the same quantity of sugar and $\frac{1}{d}$ pint of water. P'ut


Gooseberry Cultare. 1. Cuttings with top bads retained. 2. First prunjng of malden plant. 3. Second year pruning. 4. Result alter pruning. 5. Good type of seedling. ©. Bád type with doable stem at root. 7. Good type of bush showing tip pruning. 8. Cordon wilth good lateral pruning

By apecial arrangement with Amateur Cardening
the sugar and water into a pan over the line, and hoil then for hour; then skim the syrup and add the gooseherries. Let the whole simmer gently for about hour, stirring all the time, and thon test the jam on a plate When it is done, pour it into jars and tie them down inmediately.
Gooseberry Jelly. To make this, take two quarts of green gooseberries, which should be washed. topped and sta!ked Two quarta will make a pint of juice, so if more is required moro goose berries can be taken Put them in a preserving pan and just cover them with cold water. Bring thein to the boiland aim mer then until they are broken and $p u l p y$, when they should be strained through n jolly lung or a clean cloth
 ticd on to tha legs of an inverted chair. After this has been done, they should be left to drip overnight into a bowl
The juice should he measured and put into a clean jar uith I lb of loaf sugar to each pint. Stir it until the sugar has molted ; then boil it fast for about 20 minutes, until the jelly sets when tested. Keep it well skimmed, after wands putting it into small pots, which should be covered in the same way as jam jara

Gooseberry Pudding. A boiled gooseberry pudding large enough for 5 persons can be made by sieving together $\frac{1}{2} \mathrm{lb}$ of llour, $\frac{1}{2}$ tcaspoonful of baking-powder, and a little less than that quantity of salt. Then add 40 oz of finely chopped beef suct. and mix the whole to a stiff paste with some cold water. Cut off two-thirds of the pastry, moll it out. and with it line a greased pudding basin. Wash about I pint of goorcberries, then top and tail them.

When the hasin is half-full of fruit, add 2 or 3 tablespoonfuls of brown sugar. then put in the remainder of the gooseberries, and lastly enough water to half-fill the basin. Roll ont the remaining piece of pastry to fit the top of the basin, wet the edges, and then press them together. Cover the pudding with a scalded and flourod pudding cloth, then put the basin in a pan containing plenty of fast-boiling water Let it hoil steadily for 2 hours, adding more hoiling water when necessary When the pudding is cooked, lift the hasin out of the pan and let it atand for a minute or two after removing the cloth, so that the steam may escape; then scrve it on a hot dish
GOOSEBERRY CLUSTER CUP. This is a disease that affects gooseberry bushes: the fungus forms bright orange patches on the leaves and fruit. The most satisfactory method of arresting its spread is by collecting and burning infected leaves and fruit

GOOSEBERRY MILDEW. The goose berry plant is attacked hy two distinot mildews, the European and the American. The former occasionally attacks red currant bushes.

The most obvious differencos between the two may be summed up as follows: Whereas in the Eumpean mildow the fungus occurs as $\Omega$ very de!icate mould or mildew on the leaves, the American mildew forms a dense whitc woolly mould which, though found on the
leaves, attacks ohiefly the shoots and berrics As the growth of the American mildew continucs, the white stage gives place to a light. brown woolly phasc, and finally to a thin dark brown felted mat, which is very conspicuous on the berrice and shonts. This condition is never found in European mildew.
The American mildew is a much more serious danger to the fruit-grower. There are two principal lines of treatment against it: spraying, to prevent and to destroy the white or summer state; and tipping, to climinate the brown or second stage.

For spring and sumnier spraying limesulphur is the minst convenient and eatisfactory substance. The strength usually employed is 1 gallon of lime-sulphur to 29 gallons of water. Three, or at least two, aprayings should be given. the first about the first week in April. the others at intervals of three or four weeks.

Tipping consists in the cutting away in autumn of all shoots which show signs of the presence of mildew ; they must be burnt. The ground under diseased bushes should be dug over in winter in order to bury the winter spores, and if only a few bushes are grown dead and fallen discased leaves must be burnt.
It is illegal to sell gooseberry or currant bushes affected with the disease, but the bushes may be sold after notification if all the diseased shoots are out awsy. Nuch of this information is taken from Leaflet 52 , published by the Ministry of Agriculture. See Spraying.
GOOSEBERRY MOTH. This pest, more commonly known as the magpie moth, is very destructive. It is only scen at night, as a rule, and can be easily identified by its creany body and wings prettily marked with ulack and white. The parent moth deposits its egge on both gooseberry and currant bushes, and these hatch out into voracions looper


Gooseberry Moth. Pest destructive to gooseberry bushes. Top risht, caterplllars attacking soung leaves
caterpillars, which are spotted black and creamy yellow, and about 1 in . long.

Remedies are forking a generous dressing of fresh lime and soot into the top soil around the bushes in winter, applying a winter wash to the trecs at the same time, together with hand-picking of the caterpillars. See Caterpillar ; Fruit.

GOOSEBERRY SAWFLY. The sawlly caterpillars devour the leaves and, in a bad attack, strip the bushes completely.

The adult aswtlies firat appear in April and May. Eggs are laid on the gooseberry leaves, and when the caterpillars are hatched they feed on the leaves. The two methods recom mended by the Ministry of Agriculture and Fisheries (Leallet 12) are hand-picking and spraying. Hatnd-picking is the simplest method in the case of a few bushes, but it must be done before the colonies of young larvae have scattered over the bush. Some prefer to pick the leaves on which the eggs have been laid.

Spraying is thoroughly effective; the chief difficulty lies in the fact that the beat washes are poisonous. Lead arsenate, 1 oz. in I gallon of water, may be used in the case of an early attack, where it can be applied before the gooseberries have flowered and also after the fruit hus been gathered. Hellebore, when fresh, and nicotine are also effective and, though poisonous, do not retain their poisonous qualities for long. They may therefore be used with safety if ain interval of three weeks be allowed botween the dates of spraying and picking. See Insecticide: Spraying.
GORE. A gore is a triangular piece of material sewn into a garment to enlarge the lower part when the material is not wide enough to cut the full width required in one piece. These gores are usually added to the lower ends of side seams.
GORGONZOLA CHEESE. This is the name of a lighly esteemed and excecdingly nutritious Italian cheese, considered by some to be superior to Stilton, which it slightly resembles. It is a round, flat, broad cheese, which when cut should be of a deep ycllowish cream colour, with rich green veinings.

GOSS PORCELAIN. The china produced by W. H. Goss was made at Stoke-uponTrent about 1860 . The name is sometimes used inaccurately to indicate the products of other heraldic potteries as Gosa name is usually but not invariand on ambitious pieces a rising falcon is used is a mark

## GOUDA CHEESE. Flat.

 with rounded cdges, Gouda differs from Edam or Dutch cheese in shape and also in colour, being of a dusky yellow. Its weight variesfrom 3 to 15 lb ., and some are larger.
GOUGE. A gouge is a curved chisel, the blado being curved transversely so as to be t.ough shaped instead of flat. Paring gouges are ground internally, and are intended for hand planing of grooves. Firmer gouges are ground čternally and are used for scooping out timber into hollows Gouges are made in various widths, but a ${ }_{8}^{5} \mathrm{in}$. firmer gouge is a useful size See Firmer Gouge.

GOURD. These are deciduous climbing and trailing plants, bearing large fruits of diverse shapes; they are useful for rapidly


Goure. Left to right, paring gouge, Grmer gouge, ront bent

Gooseberry Sawfly. Larvae of a destructive insect pest which attacks Rooseberry and currant busbes.
Top, left, female adult fy
on raised beds like marrows. The seed is sown in a greenhousc or frame in March, and the seedlings are hardened of and planted out in June in rich soil.

The following list of varieties suggests the many quaintly shaped and marked specimens which can he grown: 'Turk's cap, bislioj's hat, serpent, gooseberry. Hercules' club, gorilla, siphon, half moon, giant's punchbowl. These are large fruiting kinds. Arnong the smaller sorts are gourds resembling fig, cricket hall, thumb, cherry, hen's egg, pear, bottle and pumge.
G OU T. Gout is a disorder of metabolism in which uric acid nccumu. ates in the blood and lisaues and causes various manifcsta. tions.

Thetenclency to gout is often inherited and may be trans. $m$ itted through females who


Gourd. Calabash Rourd growing in a greenhouse
show no sign
Courtesy of Amateur Gardening of the disease themselves. Other oauses are an excessive consumption of rich food and of wines. A regular and copious consumption of nult liquor, even when the food supply is spare, results in what is called poor man's gout. Sedentary habits predispose, especially in conjunction with other causes.

An acute attack of gout is due to the deposition of crystals of biurate of sodium in the cartilages of a joint. A poor circulation in the part, some slight injury or something similar may be the exciting factor, but the exccss of uric acid in the blood and tissues, which is the essential fenture of gout, alone makes the attack possible. The painful joint should be treated by heat in some form; cold applications are dangerous. The best drug for relicving the pain is colchicum, either the wine or the tincture, in doses of $\mathbf{2 0}$ to 30 minims every four hours. until the pain ceases; but colchicum should only be used on medical advice, as it may cnuse depression. Water or gruel containing potassium bicarbonate should be drunk freely. On the night of the attack
it is as well to take a mercurial purge, say 3 or 4 grains of calomel, and follow this up with a dose of Epsom salts in the moming. The diet should he restricted to milk and barley water unless other directions are given

In chronic gout more joints are affected and there is a greater tendency to deposits in the soft parts ahout the joints and elsewhere, such deposits, or tophi, sometimes ulcerating through the skin. Because of their white, chalky appearance these deposits are some times called chalk-stones; they do not, however, consist of chalk, hut of sodiuin urate. In chronic gout there is a tendency to arteriosclerosis. The patient often has a sallow complexion and suffers from dyspepsia.

A person who is of the gouty habit should be moderate in eating, avoiding fats and rich food, meat extracts, sauces, liver, kidney and sweetbreads, and restricting red meat, starchy foods and sugar. Fresh fruit and vegetables may be taken, but, as a rule, tomatoes, cucumber, rhubarb, bananas, gooseberrics, currants and strawberries are unsuitahle. Potatoes may generally be allowed. Asparagus and beans and other pulses should be talien in small quantities only. Alcohol is best avoided altogether. Water should be taken freely.

An active open-air life should be adopted. Clothing should he warm and the skin should be kept active by regular haths and brisk friction witlı a towel.

When attacks have occurred, or there are manifestations of irregular gout, it inay be worth while to have a spa treatment at Bath, Buxton, Harrogate, Aix-les-Bains, Contrexéville, Karlshad, Homburg or elsewhere

GOVERNESS. A nursery governess is one who gives the ohildren simple instruction in addition to looking after them generally. Nursery governesses are almost nlways resident, but other governesses may be either resident or daily. Sometimes two or more fainilies combine to engage a governess for their children. Most governesses are expected to supervise the children's recreation or some of it, but the extent and nature of this duty should be clearly stated on engagement.

Unless she is able to secure exemption, a governess must be insured under the national health insurance scheme. Governesses can be engaged through the advertisement columins of the newspapers and through some of the teaching agencies in London and elscwhere. Nursery governesses can be secured sometimes through the ordinary registry offices. The remuneration, which varies considerahly according to duties and capabilities, is usually paid by the month. See Insurance.

GOVERNOR: Of an Engine. This is a device for maintaining a constant speed of rotation of the crankshaft under variable loads. It derives its motion from some rotating part of the engine, and is so devised that when the speed of the engine increascy the govemor reduces the power supply, and


Governor for regulating the speed of an engine. See teat
convenient part of the engine. Four links, L L L L L, connect two metal halls, B B, with the top of $S$ and with a weight, $W$, able to move freely up and down $S$. When the engine speed increases beyond that at which the governor is set to function, the fly-balls, B B, swing out, raise the weight, W, and a collar connected by lever $D$ to the thirottle, and olose or partly close the throttle, thus cutting off the supply of steam and reducing the engine speed.

The governor fitted to a clockwork mechan. ism (e.g. a gramophone motor), hrings a friction brake into operation when the fly weights swing out, thus checking the speed.

GRAFTING: For the Gardener. This useful gardening operation is best carried out late in March and in April, during mild, dull weather, when the sap is running frecly. The graft or scion is a piece of branch of the previous summer's growth cut from a tree of the variety it is desired th perpetuate ; the stock is the tree on which the graft or scion is inserted
Grafting deprends for its success on fixing a scion on the stock in such a way that the cambium layers (the seat of growth), which lie immediately beneath the bark, are in contact. It is neces sary that the scions or grafts he in a less advanced state of growth than the stock and to ensure this it is usual to cut them off the trees in winter, tic them in amall bundles, and half bury them in the soil of a sliady border.
There arc various forms of grafting. Crown or rind grafting is the inost useful, or it enables the gardener to refurnish old trees of worthless varieties with fresh branches of good varieties. depth as the tapering part of the scion, and is lifted to allow the soion to be pushed down behind it. The scions are then made secure with raftia, and covered with grafting wax or puddled clay to exclucle the air. Any shoots which develop on the stock (the branches of the old tree) should be cut off. When. in summer, the grafts or scions begin to grow, they should be supported with thin sticks to prevent their being blown out in windy weather.

When both stock and saion are of approximately the same width saddle


Whip Gratting. 1. Stock suitably pre pared: $a$, correct cat: b, seat lor tongue of scion. 2. Scion : a, tongue. 3. Stock and scion fitted iorether. same bound together. 5. Whold The hranches of the old tree are cut of a lighter colour and within 12 to 18 inches of the base in March. wood, as it is sofier, and contains more The grafts or scions (cut in winter from a tree moisture. The medullary rays radiating from of the variety it is wished to increase) should the centre carry nutriment and occur in every be 8 inches or so long and cut so that each one wood lut are not always visible; in oak or beech tapers to a point at the basc. Three or four they show strongly, when cut, in the form of grafts may be inserted in each large hranch. white layers which are terned the ailver grain, The bark of the latter is slit to the same as in Fig. 2. If the ends of a sawn oak log be
grafting is usually practised The top of the atock is cut in the form of a wedge and the hase of the scion is cut so that it fits over it exactly. The work is completed by tying and covering with grafting wax or olay.

Grafting Wax. Wax used for grafting purposes can be bought from seedsmen and others, but if desired it can be made at home from the following recipe :


These should he melted together and the liquid painted over all the cuts with a brush while it is still hot. See Apple: Rose.
GRAIN : The Measure. This measure of weight is chielly used by chemists, although it is also found in avoirdupois and troy weights In apothecaries'
weight 20 grains make one scruple, and in avoirdupois weight 7,000 grains go to the Ib The ounce in apothecaries' and troy weights consists of 480 grains

GRAIN: In Wood. The term grain refers generally to the character and size of the growth rings of timber. Beautiful grain is more naturally inherent in sorne woods than others; some woods depend for their figuring upon the annual rings, others upon the medullary rays, others again upon the juncture of a branch to the trunk.
Fig. 1 represents the section of a log. Every year a growing tree addla a fresh laver to the outsirle, thus forming a series of concentrio rings by which it is usually possible to tell the age of the tree. The outer part or sap-wond is in many woods of a lighter colour and is


Gralting. Method ol crown gralting. 1. Tree preparation at a. 2. Scions : $a$, correct : $b$ and $e$, badly prepared. 3. How scions are inserted. 4 Scions bound in position. 6. Final binding with krafting wax. 6. Section showing raffa binding onder wax



examined, they can be seen in the form ol narrow white lines

The boiards should te cut parallel to these rays. Fig. 4 shows a few methody of cutting in this way, $D$ giving the maximum amount of figuring, but it will be obvious that a certain amount of waste occurs batween the cuts, so that figured oak is always more expensive than plain. The latter (Fig. 3) is cut as in Fig 5, by which method there is no waste ; the centre board only will be figured. Fig. 6 shows the difference between two boards cut from the same tree in different places

A tree never grows perfectly straight, so that when the log is converted into bnards the undulations in the direction of the grain occur in the thickness of the wood by reason of the board being cut in a straight line (Fig. 7). This is the reason why, when planing a piece of wood, parts of it will tear up when planed in a certain direction Thesc waves or undulations occur with greater frequency in some woods than others. In pine they are sometimes hardly apparent, and in oali are generally large in proportion; in mahogany and sycamore they may appear as liddleback. This consists of a series of minute waves in close formation and when polished shows alternate light and dark atreaks running across the grain Fig ! shows n board cut through liddle-back mahogany

## How Curl Grain is Obtained

Another well-known variety of grain is that known as curl, which is obtained by cutting the tree at the juncture of a branch. The main direction of the curl usually is curved, and when veneers are cut the two adjoining leaves are almost identical, so that the most beautiful effects are obtainable by matching them. These curls are seldom cut into solid boards, partly because of their comparative rarity and cost, and partly owing to the fact that they are liable to twist and warp, the grain running in almost every direction.

Burrs, hurr walnut for instance, are the result of a out being made through a growth or excrescence produced on certain kinds of trees These growths are usually the outcome of the attack of fungi and result in the appearance of innumerable small shonts, the whole sometimes growing to a considerable size and yiclding large leaves of venecr. They are aliso to he found on the stumps of coppiced trees

When a pine log is cut as in Fig. 5 the centre plank does not contain the best liguring, ns the rings appear at each side in the form of narrow parallel lines of alternate light and dark stripes. In the outer planks the stripes are wider and have a $V$-shaped formation, the beauty of which is enhanced by the natural
irregularity of growth A method of cutting sawn log, so that for work requiring an for work requiring an attractive appearance absolutely reliable surface, on,y thuse running is shown in Fig 8, in which every plank runs diametrically should be used D, in Fig 4, is tangentially to the rings.

The question of cutting is important for oak the silver grain is also in evidence, the other reasons hesides that of figuring. Fig. 10 method is wholly desirable See Mahogany : shows the natural shrinking tendency of a Oak: Wood; Woodcarving.

## Graining and Marbling

## Suggestions for the Artistic Treatment of Wood Work

This article describes the surface treatment of white woods to simulate oak and other hardwood; it contains alzo a section on simple marhling. See also Wood, and the articles on other forms of ornamentation, e.g. Enamelling; French Polishing: Lacquer ; Painting; Varnish
The process of reproducing the colour and knife. Several sorts of brushes are needed. appearance of natural wood by a manipulation of paint in superimposed layers is known as graining, the grain being produced on the paint while it is still wet. Marbling is the cormesponding process to simulate marble.

Graining is essentially an art, results being gond or bad according to individual ability; success can come only with experience. The essential requirement is that the grainer himself shall be familiar with the appearance of the natural wood

The tuols required inclucle painters' brushes and combs The latter are made of steel in various widthe, and with varying numbers of teeth to the inch, usually from 6 to 15 ; others are made of leather, bone and other flexible materials. Old hairdressers' combs may be pressed into service. Leather combs can be made at home from a piece of stout leather, the teeth being cut tos shape with a pucket
 including a selection of overgrainers, mottlers, and shaders. A first-class badger hair softener is required and should be about $3 \frac{1}{2} \mathrm{in}$. Wide. A few camel hair, anble, and fitch brushes are necessary for the veining and similar work, together with a bone thumb-plate and a quantity of clean rag.

Imitating Oak Grain. The commonest form of graining is that which represents oak, ordinary deal doors being treated in this way. The ground is first prepared by stopping, priming, and undercoating, as if for ordinary paintwork; then the ground colour is a pplied. The tint must be the lightest that is to show on the finished work. The grounds will be composed of white lend, or other equally good white, stained with yellow ochre, or clirome, applied as ordinary paint, and finished with a slight gloss. The graining colour may be obtained by a mixture of raw umber or other colour, and should contain plenty of driers It is brushed thoroughly into the dour, after the previous cont is quite hard, and should not be applied thickly, but must be worked well in.

Apply the graining colour to one of the panels only at the start, having previously studied the style of graining to be copied Supposing it to be light figured oak, this will require a coarse leather comb to produce the straight part of the grain Then, next to this, the grain is worked in with a medium toothed steel



Graining : Stages in marbling wood. Left, wiping the veins with a thumb rag. Right, completing with a feather dipped in colour
improve the appearance. A little black or blue can be used sparingly. When the graining is complete the whole surface of the dour is varnished.
Finely-grained woods may be represented without combs, using brushes only. The grounds are prepared, and the graining colours diluted with beer, the graining being accomplished with hog nair mottlers, large sash tools, and the fitches and sable pencils. A piece of wash-leather, a sponge and some rag are of assistance, and two or more colours may have to be worked together.
on the comb, and using the whole width of it. The brushes are worked more or less dry, to The figure has now to be worked with the remove the unwanted colour, as a coinb. aid of a rag wrapped round the thumb, or by the use of the thumb plate, which is wrapped up and used like the finger tip. Perfect mastery of the thumb plate is necessary, using the broad part of the blade to wipe out the highest lights, and the narrow edue to work in the half lights and the finer markings. Treat all of the panels in a similar manner, but vary the grain The rails and stiles are then grained, but wil! not call for much ligure work as the wood is generally straighter in grain. Tho badger is used to soften the edges of the graining, and the mottler to soften the veins and to give a more woody appearance to the work. Fine veining can be worked with the veining fitch.

Knots and Surface Markings. The final proceeding is the overgraining and shading, the pigment is ground in water, the colour is spread on a palette and diluted with beer. The overgrainer is dipped in beer and the pigment worked into it. The brush ought to work itself into two or three parts; if it does not, it should be combed or worked with the fingers. The colour is applied with a continuous motion from top to botton Before the colour is dry work over it with the badger to break up the hard lines. Knots and other surface markings are worked in with the sable pencils and fitches, the whole idea of this part of the work being to enrich the colouring and

Bird's eye maple is grained with the brush, a command of the mottler being necessary. This brush is held so that the bristles separate and break up the straight end; it is held nearly upright, and wiped over the work so

Gramophones may be divided into three main groups according to the style of case or cabinet: portable models, table instruments, and floor cabinets. The method of sound reproduction may be (a) mechanical, or (b) electrical. In the former the movement of the needle as it travels over the track on the record imparts vibration to the metal or mica diaphragm of the sound box; the diaphragm in turn sets up oscillations of varying frequency in the column of air in tone-arm and horn, so that sound-waves are produced. In the electrical pick-up the needle movements produce electrical impulses of varying value in a circuit comprising a low. frequency amplifier and loud speaker.
The mechanism which causes the turntable to rotate may be a clockwork one or an electric motor. To test the quality of a
that it removes the colour in an undulating manner. Mahogany and walnut require the mottler for the graining cotour: the breadth of the veins is varied by altering the pressure of the fingers on the bristles.
Use of Transfers. Graining by means of transfers is a much cheaper method than hand graining, as tho one sheet will Live several copies of the design.
The transfer is cut slighitly larger than the actual size refuired, placed face downward on a clean dry table, and the back well damped with a half.wet aponge. The paper is allowed to saali for $\mathbf{3}$ or $\mathbf{4} \mathbf{~ m i n}$. until the graining print begins to have a glossy appearance. The surface of the material to be grained should be damped evenly by moans of a oponge and brush, and the transfer placed face downward on the moistened surface, the back being rubbed evenly by the brush. The paper is removed, and a soft paint-brush, or softener, passed over the surface while the latter is still damp.

Marbling. The processes of marbling are similar to those that are employed in grainieg, but as marble is a solid substance the colours employed in its representation must be opaque, and most of the effects have to be obtained by a manipulation of the brush. Two of the finishing stages in the process are illustrated.

The ground is worked up and the colourings applied to the surface, the harshness subdued with the badger, and fine veinings worked in with the sable and fitches. The colours may bc ordinary artists' colours in collapsible tubes, thinned with turpentine and linseed oil. The colours can be flattened and worked to represent soine classes of marble by rubbing them over lightly with a fine rag moistened with linseed oil

There are many varieties of marble with numerous colourings and surface veinings, all of which can be reproduced after a preliminary atudy of the natural material, or of reliable coloured photographic reproductions. The aniateur is advised to give a sufficient consideration to them until their appearance becomes quite familiar, and then to attempt the actual work on a trial piece of smooth board.

Marbled work should be finished by varnishing with a clear varnish, as a coloured varnish will never look well; the finished surface must be free from any suggestion of brush marks.

GRAMME. A gramme, or gram, is the unit of weight in the metric or decimal system. One gramme is equal to $15 \cdot 432$ grains troy. See Metric System.

## Gramophones: Their Choice and Care Mechanical and Electrical Methods of Sound Reproduction Explained

This article deals with the various types of instrument and the accessorics. A section on Radiogramophones is followed by one on the construction of a console type cabinct. Consult nlso
Pick-up and the various Wircless articles
gramophone motor it should be released at varying speeds, with a record on the turntable. A good motor is one which runs evenly, strongly, and without noise. By even running is implied the quality of revolving the turntable steadily, without jars and tremors: a strong-running motor is one that works vigorously, as though pushing against restraint. A good motor attains the desired speed quickly, and maintains that speed consistently without slackening appreciably towards the end of the spring. The sound box should always be tested by playing a varied selection of records, such as a march, a tenor solo, and an instrumental disk. The results from these records will demonstrate the range and power of the apparatus.
A floor cabinet, apart from its value as a musical instrument, forms a pleasing addition


Gramophone. Fig. 1. Garrard doable-spring motor Gramophone. Fig. 1. Garrard doable-spring motor
suitable for any gramophone. It is tested to play two sides of a 12 -inch record at one winding
to the furniture of a room. Both cabinet work and internal fittings require close attention, so that a model may not be purchased in which the quality of the mechanism is sacrificed to provide a handsome exterior. There is no danger of this if one of the well-advertised makes of instruments is chosen.
Types of Motor. A good type of doublespring motor is shown in Fig. 1, the chief parts being indicated as follows: A, main spindle; $B$, regulating disk and governor: C, winding spindle; $D$, spring cases; $E$, winding ratchet. A motor such as this will play the two sides of a $12-\mathrm{in}$. record with a single winding.
In many gramophones an electric motor is substituted for one of the usual clockwork type. Connexion is established very simply by plugging in to an electric-light or radiator socket. Two kinds of electric motor are illustrated, the universal and the inductively driven The first is suitable for all voltages from 100 to 250 , either A.C. or D.C. The second will run on alternating current only, and is supplied for $100-130$ or $200-250$ volts. Both comprise an automatic stop. The inductively driven motor has no commutator or brushes, and is thus free from sparking, which, in a radio-grainophone, might be liable to cause interference with reproduction.
Whatever style or quality of gramophone an owner may possess, it needs a certain amount of care if it is to do its work efficiently. In particular. the motor requires regular attention, otherwise it may knock, break down, or at least fail to revolve the turntable correctly. The motor should be oiled and oleaned at regular intervals, according to the quantity of work it has to do. The following procedure is recommended where a motor is in need of a thorough cleaning, which, in many cases, is due to the old oil in the springboxes becoming dirty and viscid.
Remove the motor from the case by releasing the turntable and the motorboard screws, the spring having first been allowed to run right down. The spring-box or boxes are placed intact in a vessel containing either paraftin, benzine or petrol, to remove all the old lubricant. If benzine or petrol be used, the operation should not be carried on near naked lights, and is best performed in the open air. If the spring-boxes are allowed to coak for about 24 hours, very little of the former lubricant will be left in the coils of the springe. Meanwhile, the other parts of the motor should be cleaned with a paraffin rag.
Then wipe all the parts as dry as possible, using a clean, non-fluffy cloth. Following this, the spring-boxes are filled with a compound of vaseline and graphite, which inay be purchased in a collapsible tube. The easiest way to introduce the compound into the boxes is by raising the cogged plates. The other parts of the motor are treated with a good oil
of medium thiokness. Light oil should be used for the governor bearings and heavy grease for the cogs. The springs should on no account be removed from their boxes for the purpose of cleaning, except by those who are thoroughly experienced, as it is a difficult task to get them back. When the motor has


Fig. 2. Example of a Garrard induction electric motor for use with A.C. mains. Fig. 3. Garrard
been assembled and returned to the case, it should be given a good run before the instrument is played, to allow the lubricant to be well distributed.
The Sound Box. This part of the apparatus is almost entirely responsible for the quality of the music, which is reproduced through the vibrations of the diaphragm, usually made of mica or metal. The box, although simple in construction, is necessarily a delicate article, and accordingly it needs careful handling. It should not, for example, be left on the machine when not in use. A good quality sound box rarely needs any adjustments, and if protected from dust, knocks, and harsh treatment generally, it will give good service for a considerable number of years.

Apart from tone, the characteristics of n good box are that the diaphragm is insulated with gaskets, or rings, of good quality rubber ; the back of the box fits closely, while the


Fig. 4. Columbia standard tabis grand. Fig. 5. Decca portable model, very useful for out of doors. Fig. 6. His Master's Voice acoastic gramophode
adjustment of the small bar which is attached to the diaphragm is exact, so that the bar does not press upon, nor pull away from, the diaphragm.

Cars of Records. The average record will play quite 100 times without showing appreciable signs of wear. A dustproof case is recommended, as, if records are left exposed to the air when not in use, dust fills the delicate tracks and may destroy the fine tones in reproduction. A flat camel-hair brush also may be employed. It is advisable to brush the baize of the turntable before commencing to play; this baize is a dust-trap which is often overlooked.
Records should be guarded from sudden changes of temperature. The disks should not be left exposed to the direct rays of the sun or within range of the heat of a fire, or they may warp. The turntable should be allowed to reach full speed before the needle is placed on the record, othervise the first tracks on the rim may become roughened.

Correct Speed. The speed at which records are played has a distinct bearing on the quality of the music, and whenever possible a disk should be played at the speed at which it was recorded. In many cases, this speed is noted on the record itself ; in others, it will be found mentioned in the catalogue of the firm concerned. Where the speed is not noted anywhere, 78 or 80 revolutions per minute is a good average to work on.

An automatic stop device is incorporated in some motors, and is also obtainable as a separate unit to be fixed to the motor board. It operates in conjunction with a spiral or elliptical "run-off" or finishing groove on the record.

Fibre needles may be recommended to those who like music with a soft, mellow tone. Fibres have the further advantage that they do not wear out the records as metal needles do. Steel needles afford greater satisfaction than fibre ones to those who like loud, brilliant music. Metal necdles, excepting the specially prepared, semi-permanent varieties, ebould never be used more than once.

Radio-Gramophones. These instruments are combined wireless receivers and electrical gramophones, designed either for battery or mains operation. The equipment normally comprises one or more stages of screen-grid high-frequency amplification, and a detector followed by a low-frequency magnifier. A switch is provided whereby the electrical pick-up can be brought into circuit when required, the apparatus then becoming a straightforward electrical gramophone.

Briefly the method of operation is as follows: With the switch in the position for "radio" the high-frequency stage or stages and the detector are connected by way of the low-frequency magnifier to a cone type or moving.coil loud speaker, the receiver then being employed for the reception of broadcasting in the usual manner. When the switch is placed in the "gramophone" position the high-fre quency amplifier is disconnected, and the pick-up is connected in circuit with the low-frequency magni. fier of the instrument

The movements of the pick-up needle in traversing the grooves in the record set up small voltages which are afterwards amplified by the low-frequency magnifier to a strength sufficient to operate the loud speaker

In the case of "all-mains" radio-gramophones the turntable motor is usually electrioally driven, and the total current consumed by the complete equipment is comparatively small. Electrical gramophones which incorporate a moving coil loud speaker possess definite advantages over other types from the point of view of realistic reproduction and volume

Easily-made Console Cabinet. The light cabinet gramophone illustrated in Fig. 8 is constructed from a parcel of "ready to assemble" materials sold by Handicrafts Ltcl., of Kentish Town, London, N.W.б. The home worker with few tools and limited time or opportunity for cabinct work, or one who doubts his ability to prepare his own timber, will find this type of parcel convenient. The idea is applied also to many useful and ornamental articles of furniture, such as bedroom suites, tables, cabinets, etc.

Accessories for the gramoplione include a tone-arm, sound box, and horn. Some form of motor will of course be needed, and suitable types arc illustrated on page 554. A good sound box should be purchased, since the performance of the instrument is dependent primarily on this part of the apparatus. The tone-arm also should be chosen with discrimination. and


Gramophone. Fig. 7. A typical example of a radio gramophone
needs to be fitted carefully. It should move quite easily across the record and must be free from shake or joggle. The internal horn may be built up from plywood, but it pays to purchase a scientifically-designed metal amplifier, which is a tapering horn up to 8 or v ft . long. folded upon itself to fit into the small compass of the cahinet. Great volume and pure undistorted reproduction are given by this type. The accessories can be had from most local dealers, or the constructor could write to the firm mentioned above for particulars

All the parts for making the gramophone have been prepared, the surfaces cleaned up and the joints cut. This leaves the amateur merely the work of glucing up and finishing. The main structure is put together with dowelled joints. The first step is to insert dowels in all the holes in the ends of the rails. The rails can then be regarded as having tenons. To simplify the assembling it is advisable to put the two sides together

later of wainut and mahogany, becoming more elaboratc as the years passed, until they became merged in the ordinary armchair.

An early type hns a bigh back which, like the seat, is padded, but the arms nre bare. The front legs are connected by a stretcher. Another example, also in oak, has padded arms. Its decorations include an arched top to the
independently, and allow the glue to set before adding the front and back rails An advantage of this method is that it enables one to treat the sides as complete units, and avoids the necessity of dealing with many joints in one operation.

Fig. 9 shows the two complete sides being put together by the addition of the front and back rails. When the glueing up is finished the work should be tested for squareness, except where the parts are sufficiently wide themselves, to ensure the whole
 Gramophone. Fir. 8. Console gramophone cabinet. Fir. 8. Assembling the main framework. Fig. 10. Sliding the front fret into position. Fig 11. The horn being fited into the centre compartment beneath motor board Courtesy of Handicrafls. Ltd
being square. A cramp (q.v.) is extremely high, narrow back and turned stretchers conuseful when glueing up, as it ensures tight joints necting the turned legs. Later some were and enables the work to be held firmly whilst made without stretchers, having cabriole legs. the nails are driven in. It is sometimes Grandfather chairs made in Queen Anne's necessary to put in nails to strengthen the time and style, when this type of chair was at joints, e.g. where wide rails are used with its best, have the graceful curvilinear ireatsingle dowels. The nails then prevent the rails ment so frequently found on pieces of that from twisting. Panels and front fret fit in period. At this time they were made mainly the grooves in the legs. These grooves are of walnut. See Armchair: Chair. outside the rails, so that the panels can be slid in after the main carcass has been put together. Fig. 10 shows the front being put in place.

The bottom rests on the rails, the corners being cut to fit around the legs. Partitions are provided to separate the motor and trumpet space from the record space at the sides. The back is nailed on. The lid consists of an edging made up from moulding, mitred together. A rebate is formed in the top edges, and the top fits in this. An idea of the interior arrangement is given in Fig. 11, which shows the trumpet being placed in the centre compartment. The motor board rests upon the interior divisions. Holes have to be cut in this to enable the motor and other components to be fixed. Their shape and positions depend, of course, upon the motor and components used. A suitable motor, with all the necessary fittings, may be obtained from a gramophone dealer.

GRANDFATHER CHARR. This term is applied to a type of antique easy chair found dating from the 17 th century, and also associated with Sheraton and Chippendale. In the form in which it is now known this chair was evolved from the one that was provided with ear guards as a protection against draughts. They were made of oak and


Grandfather Chair. Cnippondale mathogany wing chair covered with tapestry
ourlesy of Waring of Gillow, Lls:

Grandfather Clocks: Their Cases \& Works

## For Collector, Cabinet Maker and Mechanic

This contribution deals with the subiect from the three points of view enumerated above. For related information sec Clock; Pendulum, and the various articles dealing with woodworking

Long-casc clocks, or grandfather clocks, as they are called, were first made in England in the early years of the reign of Charles II. The earliest existing ones date from soon after 1660 , and those who possess a specimen of earlier date than 1700 are fortunate. Oak was the material first used for the clock case, but soon walnut came into favour for them, and some of the finest examples are in that wood. Marquetry was introduced into some of the earliest pieces, and there are beautiful clocks decorated in that way in the Victoria and Albert Museum and in other collections, both public and private. In some pieces the marquetry is arranged in panels.
The objects of these clocks was to take the swing of the pendulum, which varied a great deal in length, what were called royal pendulums being up to 65 in . long. The earliest long-case clacks went for a day or rather more, i.e. from 24 to 30 hours; but when the royal pendulum appeared, eight-day clocks began to be marle, and have remained popular.

It is common to find the dials of early grandfather clocks furnished only with an hour hand, though the minute hand was introduced about the year 1690. Clocks about this period which have both arc invariably of good make and finish. The single hand was sufficient for clock makers who produced ordinary utility work for at least 100 years after the introduction of the long case.

Most of these early clocks had square dials of rather small dimensions, from 9 to 11 in. across. Early in the 18th century an arched top was made, and this coincided with the form of the enclosing case, for grandfather clocks of the reign of Queen Anne had commonly an arched moulding. The arched top to the door of the case also appeared in the early part of the 18th century, and in some early cases a bull's-cye of glass was put into the door to show the pendulum swinging to and fro behind it, as seen in No. 3 below. to and fro behind it, as seen in No. 3 below.

A grandfather clock of the period of William III and Mary would be likely to have elaborate inlaid decoration in the door panel, and also in the base. This form of ornamental enrichment was brought from Holland, and conmonly consisted of a conventional rendering of tulips, birds, seaweed, and scrolls. Twisted columins fanking the dial indicate a period about 1700 or slightly earlier.

Many casen of grandfather clocks were lacquered from about the reign of Queen Anne, i.e. from 1702 to well on in the 18 th century. Straw. coloured lacquer is very rare, red is more frequently seen, and black is commonest. All have Oriental devices in gold. An example is shown in the first illustration.

Chippendale long-case clocks were usually of mahogany and often carved, but his best work "as not elaborate, thougb applied fretwork was seen in spandrils above the archerl dial. The hornshaped top to the hood is considered typical, a nd the pillars of the front corners of the case are Iluted, often having bases and caps of metal. Sheraton designed long-case clocks with delicate columns standing free of the main structure at each side of the dial: the ornamentation is usually of graceful inlaid work. The introrluction of cheap American clocks in the 19th century resulted in the practical extinction of the grandfather clock, except as antiques.

The Mechanism. Figs. 1 and 2 show the back and front of the earliest type of grandiather clock, which requires winding every


Grandiather Clock. Left to right: 1. Early 18th cent. red lacquer clock. decorated with Chinese figures, chased br ass dial. 2. Late 18th cent. clock with canted corners, crossbanded with mahogany, painted dial. 3. Quean Anne clock in walnut case, inlaid with floral marquetry.

Courlesu of Glll \& Reigate. Lt
day, a single weight, $A$, serving both for the going and the striking. In the illustration the two trains of wheels are side by side, but they also may be arranged one behind the other, the striking train being at the back. In some clocks an endless chain is used as shown, and in others a loose mesh rope. Attached to both main-wheel arbors is a deep grooved pulley $B$ with steel spilies set at equal distances, to which the chain or rope grips; the weight hanging on a pulley $C$ supplies the motive power to both trains. The winding is clone by the chain or rope. The pulley on the striking mainwheel is loose, with a click attached which works on the arms of the wheel. When the weight is puliing, the click butte against the arm, so pulling the wheel round.

There is no centre wheel and pinion in these clocks. The wheels for carrying the hands are geared up to the mainwheel arbor, forming a compound motion work. A large wheel D nttached to the mainwheel arbor works into a smaller one (behind G), which carries the minute hand, the protruding equare for the latter being lettered $E$. On the top of the
large wheel Disfixedan other small wheel, F; this gears into large wheel, G, that carries the bour hand, the combina. tion of the four wheels making a 12-1 ratio.


Grandfather Clock. Figs. 1 and 2. Back and front of earllest type olock requiring daily windin Courlesu of J. W. Benson, Lid.
The strik. ing meohanism, in this case, is a locking plate, that is, a disk geared up to make one revolution in 12 hours. and divid. ed off into varying spaces to mark the number of blows to be struck ( H ) The pins for raising the hammer are driven into the web of the main. wheol J. Thereare 13 of them, and 78 blows are struck in 12 hours, a ratio of 6 -1 from the mainwheel to the locking place.
Pivoted between the plates is a detent K ; fixed to it is a short arin which catches on a pin in the wheel genred next to the mainwheel and locks the striking train. On one end of this is a lever $L$, which as the hour approaches is raised by a projection on the minute wheel. This lifts the inside lever clear of the locking pin and sets the train in motion, but it is held again in check by a portion of the lever until the minute hand reaches the hour, when the lever drops and the train is free to proceed. The part of the lever in question passes through a slot in the plate ( M ).
On the back of the detent $K$ is fixed another lever $\mathbf{N}$, which operates on the locking plate. When the striking train is at rest this lever is in one of the slots $P$. When the clock
slarts to strike it is lifted out, and as the lock ing plate moves forward it holds the lever up until it reaches the next of the slots, which by their varying distances apart regulate the number of blows to be struok: when the lever N reaches the slot the lever falls, thus locking the truin.

Eight-day Movement. In the clock that keeps going for eight days, two weights are used. with gut lines in the older clooks and wire lines in the more modern. One of the latter is illustrated in lrigs. 3 and 4, showing hack and front respectively. Reference to the eight.day loracket clock movement illustrated on page 282 will show that the grandfather clock differs from the former mainly in that the motive power is derived from weights in stead of aprings. The timekeeping mechan ism and that whioh operates the striking gunt are similar to those of the Eriglish brachet clock.

Attached to the mainwheel arbor is a grooved drum, A. on to which the line is coiled when the clock is wound up. This is worked with a click and ratchet 13 . the latter cut oll the edge of the drum and the click and spring fastened to the mainwheel $C$. The winding is done by a key fitting on to the squared part of the arbor D.

The figures show a modern clock movement striking hours and half-hours on a gong. The half-hour striking is controlled by a lever E , which works on a cam on the minute wheel $H$ At the hour it raises the lever clear of the pin G, and nt the half-hour lowers it so that the rack can only use one tooth, striking one blow. There is also a lever 11 operated by means of an index $J$ on the dial, which shuts off the striking work loy holding up the rack at the pin G.

Many clocks arn fitted with a calendar

showing the day of the montls. sometines by a pointer on the dial: nore often there is a slot in the dial through which the date shows, being marked on a oircular slide. This slide is operated by a whecl geared into the hour wheel and making one revolution in 24 hours. On the wheel is a pin or nib that moves the slide.

The phases of the moon are shown on some clocks. The moon is painterl or engraved on a toothed disk, which warks behind the dial. part of which is cut away to show the phases. There are usually two moons on the disk, so that as one disappears behind the dial on one side the other starts to rise on the other side, one revolution of the disk giving the period of two moons. Other types of clock chime on gongs, while some play a selection of tunes.

Making a Clock Case. A grandfather clock case can he made by the amateur who has as on plan, and glue.blocked neatly in the ore skif in cabinet work. Oak is the angles liehind The top rail of frant framing, correct wood for the Jacobean style of case upon which the capping mould is mounted here illustrated (Figs . 5 to 11), but its choice for the highest class of work has been rare. Onk inlaid with mahogany or walnut and ebony lonndings is often met with and, at a later datc, lingvood, tulipwood and other fancy woods were introduced. Onk is also

iound veneered with walnut. Maple ant sycamore are sometimes met with, in addition to rosewood, pearwood and ebony. Oak inlaid ebony and ivory dice or herring-bone, if the detail is small, has a very neat effect A quartered oak treatment with diamond centre is also good.

The shaft or pendulum case may bo put in hand for a start, and some attention should be given to the jointing in order to assure a good stiff case as the prait sometimes has to withstand a considerable dead weight strain. The worker should select his movernent bcfore cutting the case sides or settling the major dimensions, which depend on the type of mechanism, length of drop for weights, swing of pendulum, etc.

The length varies, and it is possible to make a dwarf size granilfather clock to tinish about 5 ft . high. In the present case the shaft may be made 3 it. if in. long between A, Fig. 6, and B, Fig. 9, with a depth of $7 \frac{1}{2} \mathrm{in}$. The width of the shaft will be governed by the swing of pendulum, a hare clearance being all that is necessary. An average width is about 12 in . to 14 in. The moulding which caps the shaft is built up to n height of 23 in ., an enlarged section heing indicated at Fig. 7 d . For the shaft the material should finish ? in. thick for sides and ${ }_{3} \mathrm{in}$. or $\frac{\mathrm{z}}{\mathrm{g}} \mathrm{in}$. thick for the front framing.
A plangiven at Fig. 11 f indicates the sides as rehated for the hack to enter flush, or this may be merely screwed to the siden with brass round-headed screws, after bevelling away the edges for finish. The back is continued upivards hehind the hood, the latter sliding into prosition and reating on the moulding which caps the shaft. The sides of the
 of $f$ in net thicl: ness to form a rebate, and shut over the casefront framing. This mould is necessarily shal low, and must he very cleanly worked. It would, in another manner, he possible to rebate in a wider section mould, as in Fig. $7 c$, on solid 3 in. material, and afterwards rebate the door to close on to a front framing rebated to corre


Grandather Clock. Fig. 5. Jacobean style clock case in oak. Fik. 8. Unper part. Fig. 7. Mouldings used. Fiks. 8 and 8. Section and ele vation of lower part. Fig. 10. Alternative door. Fig. 11. Worklng detail
Bu urranuement urith Ebans Bros., IoId., Lonton
spond. A central diamond, bevelled allay to form four facets from a piece $\frac{t}{t}$ in. thick. is mounted on a panel of is in. thiokness, to be glued and fixed in position on door with needle points.

An alternative front is seen at Fig. 10, the central panel, whioh forms the door, having a shaped and moulded heading. This nust be sufliciently wide to give fair access to the pendulum, and is rebated (ns Fig. 7 b) to shut on to the panelled front. Special hinges for clocks are made with wide tlanges after the manner of Fig. $11 c$ and $d$.
The surbase, ns Fig. 5, shows 1 ft .8 in high over mould 13. An enlarged section of $t$ his mould is seen at Fig. $8 e$, the section being $2 \frac{1}{2} \mathrm{in}$. high and the projection ahout $1 \frac{1}{2} \mathrm{in}$. making the width of surbase 1 ft .4 in . full. The front is framed up of 3 in . by in . stiles and top rail, and has an applied rectangular panel, with ovolo-moulded edges, fixed to overlap the opening. I sunk panel could be fitted if preferred. The buttom rail should be sufficiently wide to reach the ground, about 7t $\frac{1}{2} \mathrm{in}$., the surbase being built out from the shaft sides, which also continue to the ground.

A douhle plinth 6 in. high is shown, with ovolo mould round each break, $\frac{1}{2} \mathrm{in}$. material
being used. A section to enlarged scale of the surbase is given at Fig. 8 . It should he noted that the shaft sides are tied by the cross rail behind the front of surbase, and a similar rail at back, in addition to $n$ bottom rail front and back, into which the case bottom is grooved and blocked under. Finishing depth of surhase is 9 ? in., and at ground the dimensions are 10 in. for the plinth

The finishing height for the hood, with $n$ 10 in . dial as shown, is 1 ft .6 in ., and width would be about 1 ft .4 in . An enlarged front elevation is seen at Fig. 6, hut, as already suggested, the movement had best be obtained hefore putting the clock case in hand The hood portion should project sufficiently beyond the dons to allow for the columns Twist columns are shown, and these will require neatly carving up, as they cannot be turned in the ordinary Inthe. Plain columns (as Fig. $11 a$ ) can be substituted if the twists present undue difficulty, but the effect will be appreciably less quaint. The columns may either be planted on door front to open with it, or can he fixed on pilasters so that the door can open between the columns.

The front and sides of the hood are preferably tongued together of in. material, or, in an inferior manner, may he merely glued and blocked toget her. In blockfitting is best to use sound and well. grain to aprecks, always cut with the to hold. The end of the hood may have a column at the back of the return (as at Fig. 11 a), or can finish plain, as Fig. 5, with the end opening glazed. The front opening is the same size as the dinmeter of the dial ( 10 in . by 10 in .), with a 1 f in . framing surround moulded $f$ in. ovolo. The columns are of $1 \frac{1}{2} \mathrm{in}$. by $1 \frac{1}{2} \mathrm{in}$. ansterial. The door will shut upon a similar frame of $\frac{1}{2}$ in. thickness, well secured in position by glue blocks behind The cornice mould can be $2 \frac{1}{8} \mathrm{in}$. high, and, with the frieze will finish a full $4 \frac{1}{2} \mathrm{in}$. high to the enlarged section Fig. 7 a. The carving on frieze is of simple gouge detail with n $3 \frac{1}{2} \mathrm{in}$. bevelled panel applied in centre as a break.

In mounting the movement, this is supported on a seat board or shelf indicated at Fig. II, $b$ and $e$. It is fixed across the upper extremities of the shaft sides, and must he cut out for the pendulum and weight lines. Often an old movement will have the sent board attached, which can be used as a template for marking out another. The movement is held to the board by a couple of hook bolts passing over the pillars of the movement and through the buard, where they are secured by nuts. Such bolts can easily he made from stont wire and a screw thread cut on one end.

The capping at top of shaft forms a ledge "pon whicl the hood slides when pushed home in position. A clusthoard should he rebated into the top of the comice. Scrolled detail could be carved on the frieze in place of the fiites shown, or the frieze could be left plain if nicely finished and not too wide. The Jacobean colour is a rich nut-brown, and inight be finished with a rubbed treatment.

GRANITE. On account of its hardness nnd durability and its excellent appearance granite is one of the most valuable building materials It is used extensively in roadmaking and engineering works as well as in the construction of houses, pillars, tombstones, memorial columns and for many other purposes.

Granite chippings or sand, mixed with Portland cement in the proportion of one of cement to six of granite powder, is useful in repairing a damaged part of a granite face. The anme or anme similar mixture is employed in the preparation of granolithic concrete, and finishes with a hard and durable surface, the colour of which will be determined by that of the granite used as the uggregate. See Cement: Concrete.

GRAPE. The grape is one of the most nourishing and wholesome of fruits. In illness it is cooling and refreshing. The content of nourishing sugar is very high in ripe grapes, ranging from 10 p.c. in some varieties to 30 p.c. in the richer kinds This compares with an average of 2 p.c. in plums, 6 p.c. in strawberries, and 8 p.c. in oranges. The grape contains $\frac{1}{2}$ p.c. of tartaric acid, as compared with l p.c. in apples and oranges and at raw berries. The acid is combined with potash, and has a slight axative effect; it also stimulates the kidneys.
In Switzerland the grape cure is $n$ long.established method of treating corpulence, bronchial catarrh, obstinate constipation, and catarrh of the inteatine. The patient eats from 2 to 8 lb . of grapes per day between meals.

Dessert grapes may be either hlack or white in colour, many varietics of both being grown, and vary greatly in size, the large ones being the best. The skin should be soft and the stones few in number, some varicties being obtainable without stones. A good buncli of grapes is very thicl: at one end, and tapers cvenly to a point.

Cooking Grapes. Small green grapes are most used in cooking. To get rid of the tough skin, dip the grapes for a moment into very hot water, after which it will be found to jeel off easily. The amount of sugar required depends upon the kind of grape used, and their ripeness. In early summer, when the bunches on the vines are thinned out. tiny unripe grapes are often on the market. These can be stewed, or made in pies, but as they are very sour plenty of sugar will be required.

Only sound grapes should be pickled, a simple method being to remove the stalks from the fruit and then put it into a clean jar. Cover the grapes with white wine vinegar; then tie them down with a bladiler and store them for four or five weeks in a cool, iry place.

Grape Jelly. Black grapes are best for jelly-making purposes if n pretty colour is desired, but green ones also give excellent resulta. Wash and atalk ! quaits of grapes, then put them into a pan and bruise them gently over a very low heat until the juice Hows freely. Strain without pressing the whole through a piece of muslin, passing the juice through two or three times to clear it. Then measure it, put it into a clean pan, and buil it for 20 min ., skimming it if necessary. Add $\frac{\mathrm{lb}}{}$. loaf sugar to every pint of juice, atir the whole until this has dissolved, and then boil it rapidly until it will set when tested on a plate. Put the jelly into jara, then cover and tie it down.

Grape Tartlet. These are made by lining some greased patty tins with short crust pastry, filling them with rice to prevent the pastry from rising, and then baking them until they are lightly hrowned. In the meantime, make a syrup of sugar and water,
making allowances for the fact that ripe grapes are naturally sweet. Flavour the syrup with a little sherry, then peel and stone the grapea, add them to the syrup, and cook the whole for 2 or 3 min . Take the rice out of the tartlct cases and fill them with the grapes and syrup, putting a little whipped cream on top of each. See Deasert: Vine.
Grape Scissors. Scissors suitable for cutting grapes are a useful accessory to the dessert service. The best are of silver, and good specimens of the 18th century are in existence. Some of these are beautiful examples of moulded work and chasing. A steel blade will be found inset in some pieces. To-day grape scissors are usually made to match the knives and forks used at dessert. See Scissors.

GRAPE FRUIT or Shaddock. Cirane fruit, which is procurable during most montìs of the year, is at its hest as a breakfast fruit:, to be eaten before the meal, and should be prepared in the following manner: first of all it is cut in half horizontally, using a special cutter or grape fruit knife. The pithy centre is out out and the pips removed, and finally the knife is passed round between the rind and the juicy fruit, and the latter cut into pieces of a convenient size.

Grape fruit is served in special glasses which can be cheaply purchased. Pointed grape fruit spoons are best used when eating this fruit, and can be obtained in sets. See Breakfast ; Diet ; Glass; Marmalade.

GRAPE HYACINTH. The popular name of muscari, a hardy bulh which bears some what grape-like clusters of Howers on stems $\mathbf{6}$ or 8 inches high in spring. It is very beautiful when massed in the shrubbery or rock garden: it makes a charming picture if planted beneath the golden bell shrub (forsythia), for both blonm together. Grape hyacinths Hourish in ordinary mil in sunny or slightly shady places: as the bulbs start to growearly they ought to he planted in September, 3 inches decp and about 4 inches apart The finest of all is one named Heav. enly Blue, a variety of Muscari conicum; the flowers are bright blue. Botryoides is another favourite, with hlue flowers; therereres are
whitevarieties of this and of conicum. Moschatum flavum is yel-
clasters of this hardy bulb low; monstrosum bears large inflorescences of pale hlue flowers.

## Grape Sugar. See Glucose.

GRAPHITE : As a Lubricant. Graphite is a form of carhon, very dark and soft, being one of the softest of minerals. It is employed in the manufacture of electrodes, pencils of the better class, and paint, also for making crucibles and for foundry facings, where the heat is intense; but its chief use is as a lubricant.

For this latter purpose ihe graphite should be of a very fine grade, so that it can enter between bearing surfoces without clogging, and be able to Hoat in the oil film between the bearing surfaces. The grade should vary


Grass. Example of a beautiful and decorative annual grass worth cultivating in a border Courlesin of Jumirs Maellonald, llurprndrn
according to the thickness of the oil, a coarser grade being used with greases and extra thick oils. Under the names of blacklead and plumbago graphite is employed with oil in lubricating slow-moving heavy bearings, cspecially cast-iron bearings, as it helps to smooth the surface of the porous metal. The best proportion appears to le a 4 per cent mixture by weight of oil and graphite.

Various branded and pmprietary mixtures of graphitc lubricants are on the market and suitable for use on cycle chains, for lubricating motor vehicle and other bearings, and in this form is convenient for domestic use. See Bearing; Lubricant, etc.

GRASS: For the Garden. For garden cultivation there are many sorts of giasses which are raised as easily as hardy annual Howers, and can be gathered and dried for ornamental purposes. The following table shows the principal sorts with their height in feet, all being annuals except the last six. which are perennials :


Stipe peunuta (Featlier grasa) graxs)
Of the 24 varieties in the above list 9 are staried as a special selection, 6 of which are annuals and 3 perennials, including Pampas grass. These are the cloicest and in most cases also the easiest to grow. Pampas grass (q.v.) is a conspicuous and beautiful object in autumn l'ennisetum longistylum is really a perennial, but generally receives the same treatnient as an annual. Most of the ornamental grasses succeed under the same treatment as hardy
annuals, sowing in rows or clumps in wellprepared soil outdoors in the early part of April. Most growers of ornamental grasses want to preserve some of them for vases and table decorations in winter, perhaps intcrmixed with everlasting flowers If so, care should be taken to gather them before the secd is ripe. As soon as the Howers have developed, the stems should he cut, hecause if left till they begin to drop they will not be durable. The stems should he laid out in a dry room for a few days. These grasses may readily be dyed any desired colour for ornamental purposes See Garden; Lawn.

GRASS CLOTH. Grass cloth is made from the long unspun fibres of a plant of the nettle species Light, fine and silky, but plain, it is a rarity and valuable, deserving of care,
although its strength enahles it to lesist tiard treatment. Unlike cotton or linen, it does not contract when it is wetted.
The same fibre of which grass cloth is made is spun and woven in Europe, and sold under the naine of ramie or China grass Often suggested as a substitute for linen, it tinds its chief use in incandescent gas mantles, which are knitted from the spun yarn, and then impregnated with minerals.

GRASS OF PARNASSUS. The heat known member of this genus is Parnassia palustris, a small plant with angular stems, each carrying one heart-shaped stemless lenf and solitary, white, green-veined Howers in summer it is found on the moors, and is an excellent subject for the bog garden or the rocky, where it should be given a peaty compost.

## Grates: TYPES FOR VARIOUS ROOMS

## Efficiency and Decorative Values of Kitchen and Sitting Room Types

All matters concerning domestic heating are dealt with in this work, and the reader should consu!t the articles on Adam Style; Central Heating; Chimney Piece; Elccıricity; Fireplace; Gas. See also Cocker: Flue ; Fuel : Hot W'duer Supply : Range, cic.

The beginning of the grate proper occurred fireclay. The tirebed is often of the well type when a basket made of iron was placed in between the two dogs in order to catch falling pieces of hurning wood and allow a suflicient air supply to reach them for the wood to burn out completely to ashes without smouldering. This form of dog grate or hasket grate is stil used for burning loge. Figs. I and 2 show two examples, as supplied by the Falkirk Iron Company. The small brackets on the front of the dogs are provided for carrying the spits, or long rods of iron, upon which joints of meat are spitted for roasting. The hasket underneath can also be used to hold the twigs and smaller logs used for lighting up the large logs in the first instance. Such a type of grate can also be used for burning coal, nnd is best suited for country houses with large fireplace recesses and an adequate supply of timber logs.

The immediate development of the basket grate was atill a dog grate. hut the fire hasket itself took the form of an oblong box with a solid back and sides, and an iron grating at thic bottom of the fire, with horizontal iron hars running along the front. A moderi stove of this type. huilt in the style of the lacobeat

period, but with the back and sides of the fire-box lined with firebricks, is shown in Fig. 3. There has been a marked tendency to return to the period form of stove, not only in the case of coal grates, but also with gas-fires and electric heaters, and dog grates of almost any period may be obtained for the use of any fuel.

The majority of sitting.room grates are now formed on the slow-combustion principle, and have no bars. In some there is no bottom grate, and the fire burns directly upon a solid block of
sunk below the hearth level. The back an i sides, made of specially prepared lirebrick. retain the heat and act as an rdded source of radiation. A barless slow combustion grate of the kind known as the heapled fire is shown in plan and elevation at Fig. 4, a picture of the grate as sct into a fireplace heing given in the article Fireplace (on page 459).
This utilizes the simplest application of the principle of slow comhustion, in the form of a metal plate which fits tightly around the front of the grate, and fills in the opening between the bottom grating, which carries the coals, and the hearth itself. It keeps the space under the firegrate hot and heats up the entering air hefore it reaches the glowing coals. When pushed close up to the grate the plate prevents practically any air from passing into the fire from underneath. In this grate the fire grating is unattached to the surrounding firebrick. It may be removed entirely during the summer, and be replaced by llowers or any other form of decoration. In other slow-combustion grates the front plate is fretted, and it slide allows the ventilation in be adjusted. Another type of grate is illustrated in Figs is and 1 i. The tire can be ignited by gas, and in summer may be replaced by an insert gas tire.

In Fig. 7 a "Pyramid" slow-combustion grate is shown, in conjunction with $a$ neat, tiled fireplace which is suitable for a bedroom. This type


Grate. Fig. 1. Llaht pattern wrought iron basket grate. Fig. 2. Wrourht iron basket grate in a heavy pattern. Fig. 3. Jacobean dog grate with cast iron bars and knobs Courlesy of Falkirk Iron Co., Led

wloth Use is of this polish should
ronember that hoth the blackromember that hoth the blackןітопоия
Another good grate polish is made by mixing $\frac{1 \mathrm{~b}}{\mathrm{f}}$ of black. lead with a tencupful of vinegar Apply this in the usual way and polish with n dry brush For polished grates, use n paste made of fireplace is from 1 oz soft sonap and 2 oz emery powder. made in many Laythis on the steel and rub it with a dry colourings and in wash-leather. a varicty of styles. Figs. 8 and 9 illus trate a convertible grate which normally burns solid luel, but can readily be converted to gras foroccasionnl use.
Grate. Fir. 4. Section and plan it is specially at a barless slow combustion designed for coke burning, having a damper which can be lowered to start the fire. A gas poker connected to a nearby plugpoint is used to kindle the coke. For the summer months the "insert" gas fire is placed in position and connected to the supply pipe.

An attractive sitting-room grate which, presents a checrlul appenrance and permits a fair ainount of cooking to be done is illustrated in Fig. 10. It comprisen a high-pressure hotwater boiler and an oven. Pots or pans may be placed on the hob plate. The ventilating fret, when lifted out and placed on the hob in front of firo, accommodates two extra sance. pans for hoiling. The handles for the con trolling dampers are on the canopy.

Grate Polish. A useful grate polish can be made as follows: Take a cake of blacklead and the same weight in bluestone crystals and mix both to a cream with warm water. When the mixture is cold apply it to the grate with a brush When the fire is lighted the copper in the bluestone will bake in the blacklead and so form a pernia. nent polish. It should be rubbed fromitime to time with a soft




Grate. Fig. 5. Plan and section of the Dipper sunk grate with raised bearth. Fir. 日. Diew of the barless grate shown sectionally above. Fir. 7. Pyramid fire with independent tile fireplace, suitable for a bedroom 5 unil 6 Courlesy of Teute Firepluce Co., Ltd., 7, IVell Fire id Fouadry Co LII

GRATER. In its simplest form, a grater is a small piece of tin through which holes have been pierced, close together, leaving jagged edges. The article to be grated is rubbed up and down the rough surface. Bread, nutmeg, lemon. nid cheese graters nre 1 hose most


Grate. Figs. 8 and 9. Convertible grate which normally burns solid fuel, especially coke, but wheb can readily be adapted to kas l'ath: Soil
commonly used, and frequently the three latter
are combined in one. In a cheese grater the holes are larger, and smooth edged, having a sharp lip at the base. Graters should be "nalhed in very hot water and dried at once on a soft cloth, as if once allowed to get rusty they are diflicult to clean See Checse; Lemon; Nutmeg.

GRAVEL: Its Various Uses. Gravel, or amall stones rounded and smoothed by the netion of water, either in rivers or the sen, is used largely in building construction as well ns for making garden paths. For the latter purpose shell gravel is frequently purchased, containing varying quantities of broken shell mixed with the stones or pebbles. Gravel is obtainable from builders mer. chants or direct from the pita, and is sold in several grades and qualities, such as fine river or coarse beach. The latter, being impreg. nated with sea salt, cannot be used with cement until it has been washed. Fine gravel is employed for the rough cast applied as a surface finish on modern cottages. Its use as an nggregate for concrete is dealt with under that head.
In commencing the work of path-making, mark out the path by means of lines secured to pegs and remove turf and top soil to a depth of about 6 in., until a firm foundation is obtained. The trench has to be filled with
brick rubbish and covered with a layer of comarse gravel It has then to be watered and rolled, care being tation to preserve a camber or curved surface This is covered with a decp lager of fine gravel and again rolled A certain elay like consistency ensures the path being properly compacted This ant be de tected hy the cye and by touch.

Gravel has valuable properties as a tiltering medium. A natural water supply such as that from a brook, when diverterl and passed through a series of excavations filled with cloan, coarse gravel, will emerge in n prac. tically pure state See Concrete; Garden

GRAVES. This is the name of wines grown on the gravelly soil of the Graves district of Ginonde, France. Generally of a lively and brilliant colour, with more borly than the wines of Médoc, it has bouquet and fineness. The white wines of Graves nie in excellent table wine, and are drunk with oysters and fish There are many varieties Amongst the most famous are Haut-Brion, Pape Clement. Carbonnieux, Laguloup. Ferrand and du Bouscaut. See Wine

Graves' Disease. See Exophthalmic Goitre.

GRAVY. With few exceptions, gravy is the juice of ronsted or braised meat, slightly: diluted and seasoned. sometimes coloured with browning. but not thickened. That in. tended for roast meat should be prepared in the following way: Pour off all the dripping from the meat tin, carefully
keeping back the sediment and rich brown particles that can be seen under the fat, for it is to these that the gravy owes its Havour and colour. Ardd a gill or more of boiling stock or water, according to the size of the joint.

Put the tin over the fire and let the gravy boil, stirring and scraping off all the brown pieces from the tin into the gravy with an iron spoon. Nkim off any grease, add the nccessary seasoning, and strain a little round the meat, serving the rest in a heated sauce turern. Any bones remover from the ment


Fig. 10. Soloovengrate, which compriscs an open Gre, blah-pressure hot-water boiler and an oven Courtesy of Sumuel Smilh \& Sonv, l.id
can be boiled to yield stock, but no other Havouring is used. The gravy for mutton and lamb may require a drop or tivo of caramel $f$ it is very light in colour.
Slightly thickened gravy is made as follows : l'our off all except about 1 tablespoonful of He iripping from the tin. Stir into This 2 teaspoonfuls flour, and brown it carefully over the fire, stirring it frequently. Mix in gradually $\frac{1}{2}$ pint of stock, and atir the gravy over the fire again until it boils. Skim and veason it, and strain a little round the joint, putting the remainder in a sauce tureen. This gravy must never be thicker than thin cream See Baling; Beef: Browning.
GRAYLING. The grayling is nt its best during late summer. For frying, the fish is first washed, scaled, and cleaned, and the fins and gills removed Dry it thoroughly in a clean cloth, then sprinkle it with seasoning and a little flour, and fry it in a pan of smoking hot fat. When the fish is of a golden brown colour, drain and dish it, using parsley ns a garnish, and handing round some melted butter sauce.

If it is to be baked, put the lish, sprinkled with seasoning, in a baking dish, place a few lumps of butter on top, and then cover the dish with a lich. Bake the fish for about $\frac{1}{2}$ hour, basting it occasionally, and just before serving make some sance by mixing the gravy in the dish with melted butter. See Fish.

GREASE. Properly speaking grease is soft, thick, animal fat, but the word is used for oily matter of any kind. The grease that comes


Grease banding round a fruit tree, with winter moths caurbt upon it
from the llesh of those parts of animials that are used for human food. e.g. mutton, is turned into dripping, while many kinds of grease are used for lubricating purposes.

Grease is useful to the gardener. Bands of greasc-proof paper conted with grease or some sticky substance are applied to the stems of fruit trees to entrap the winter moth. The female noth, which is unable to fly, crawls up the stems to deposit her eggs and is caught by the grease. The bands may be prepared at home or purchased from horticultural dealers. They are fixed on the trees in autumn.

Cart grease may be used, but special preparations made for the purpose are to be preferred. It is imporsible to put the bands very high in the casc of bush trees on short stenis, but on standards they may be placed at any convenient height between 3 ft . and 5 ft .

It is useless to band trees and leave stakes unprotected. The bands are left on until spring; the grease must be renewed occasionally in winter. See Clarifying; Gravy ; Lubrication; Oiling.

GREAT DANE. This is a useful dog for those requiring a guard dog that is also reasonably active. It is less heavily huilt than a


Great Dane. Champion of this atrong and learless
St. Bernard, mastiff, or Newtoundland A buyer should see that its legs are straight, back and front, cow-hocks being a common fault. A long back and weak loins are also to be avoided. The body should be deep and the thighs muscular. The height for dogs should be not less than 30 in . at the shoulders, and the minimum for bitches 2 in. less. The neck should be long and well arched, free from loose skin, and it should carry the head well "p, not proed forward.

The recognized colours are brindles, lawns, harlequins, blues, blacks, the first three being the favourites. When in action the movement ahould be free and graceful. Usunlly a Great Dane is docile, but much depends upon his training lle should be kept under control from the first and not spoilt. See Dog.

GREEN FLY. The pest known as green fly affects many garden plants. In the greenhouse the pest is easily exterminated by closing all ventilation and fumigating with one of many preparations sold for the purpose.

In the open air, spraying or syringing is the hest cure. The best mixture is made up of the extract from $6 \mathbf{o z}$ of quassia chips, 4 oz of soft soap, well mixed and added to 5 gallons of water. Paralfin emulsion and dilute parallin are also efficncious. Abol, Katakilla and many other concentrated insecticides provide convenient remedies See Insecticide; Rose; Spraying, etc.

GREENGAGE. One of the most delicious varieties of plum; it is self-sterile and uncertain in cropping. It does best on a sunny
wall and must be planted near other plumtrees. preferably cooking varieties
In addition to their uses as dessert, greengages are stewed and conked to form various linds of sweets, and are also totl led and made into jam. Generally all directions given for the cooking of plums can be safely adopturd

Greengage Cream. A good cold sweet is provided in greengage cream, which is preplared by first rinsing a pretty mould in cold water, and decorafing it with clear sweet jelly and fruit. In a basin $\operatorname{mix}_{2 \frac{1}{2}}$ gills sieved green. gages, 3 oz. sugar, and the juice of lemon. Dissolve $\frac{3}{3}$ oz. gelatine in $\frac{1}{2}$ gill warm water, and strain it into the fruit, etc., adding lightly $\frac{1}{2}$ pint whipprd cream, and, if
 liked, a few
drops of green vegelable colouring. Pour the mixture into the mould and lenve it until cold, when it is ready to turn out

Greengage Jam. Choose under-ripe cooking grcengages for making this jam. Put 6 Ib of cleaned fruit in the preserving-pan with 1 pint of water, and boil them until the fruit breaks. Remove the stones, cracking some of them and extracting the kernels. and to each Ib . of the pulped fruit add is Ib of crushed lonf sugar. Let the sugar dissolve, then boil the jam quickly, atirring all the time, until it jells when tested on a plate. Add the kernels about 3 min . before the cooking is finished. Pour the jam into warm dry iars. and fasten down at once.

GREENHEART. The wood known as greenheart is extremely hard, heavy, and tough, and close and even in the gritin. In colour it is of a dark greenish hue, varying to a very dark centre. Grecnheart is remark ably elastic, and is onc of the hest woods for salmon and trout lishing rods. Sep Wond

## Greenhouses: Making and Stocking

## How the Gardener can Make the Most of his Outfit

After some general considerations of design and arrangement, followcd by hints on management and lists of suitable plants, the rcader is told how to construct a useful greenhouse. Sce Conservatory Frame; Garden: Glass, etc.

The principal object for which a greenhouse s designed is for the housing of plants not harrly enough to withstand the rigour of winter conditions. Three good types are the warm house, in which a minimum temperature of $55^{c} \mathrm{~F}$ is maintained during winter; the unheated house entirely without artificial heat, and the greenhouse proper, which can maintain a minimuin temperature of $45^{\circ}$ by means of gas, oil, or hot water. A house of the latter type is considered in this article, giving scope not for the culture of ornamental plants alone, but also for the growing of such profitable crops as tomatoes, cucumbers, etc.

There is variety in the shape of greenhouses, and possibly the most convenient and generally useful type is that known as a span rouf, having its roof sloping downward from both sides of the ridge board at an angle of about $45^{\circ}$. Other kinds are the lean-to, a popular and useful structure, and the three-quarter span, a compromise betiveen the two. Each of these types is illustratel, while for the henefit
of those prepared to crect a home-malc house, constructional diagrams are given.
It should be noted that if a greenhouse is to remain a tenant's fixture it must rest upon the soil and not be fixed to anything built into the soil, neither must its woodwork or other parts be nailed or attached in any way to the brickwork, otherwise it automatically becomes the property of the land lord when the tenancy expires.

The greenhouse ought to be in a sunny position. A roller blind is usually fitted to provide shade in hot weather, or "Summer Cloud" can he appliod to the glass.

Artiticial heating is best maintained hy hot water, the simplest system being a loiler, plus a flow and return pipe. For small greenhouses a hot-vater apparatus heated by an oil lamp is servicenble.

Ientilation should be thorough. A glassformed structure such as n greenhouse readily udmits the sun's hent, but does not readily permit it to escape; thus its quantity must be

notting-bench. This may be 3 or 4 ft. long,
built at a heiglit suitable for comfortable
work. Underncath it should be boarded off
into four compartments, to contain leaf-soil, lonm, peat, and sand.
Watering and ryringing are both important. A safe general rule is to water sufficiently to reach every particle of root, and then wait until repetition is necessary. The best times for watering are morning and evening, pot plants that have become very dry being placed in a pail of water to soak until bubbles cease
With a warm greenhouse the garlener has opportunity to raise seedlings for the garien
regulated by ventilation, preferably at the apex of the house. Fresh air is essential to the wellbeing of plants. When weather is favourable, nir should be given freely, day and night, from late May until mid-Septemlier, but at other times it should be given only during morning, if conditions are fair, and
 for cucumbers and tomatoes or for plants. Above, left, span-rool greenhouse with wood base, suitable for growing plants of all kinds
Courlesn of Boulton \& l'aut. Lid withdrawn or re- proper : to forwarl crops of beans, peas salads, onions, etc. to mise early vegetables; to winter tencler plants; to grow cucumbers, melons, and tomatoes, and perhaps to cultivate a vine or peach tree with success.
Chrysanthemums and carnations are prime favourites in the greenhouse, perpetual.flowering varicties of the latter being invaluable. So also are begonias of duced in the early afternonn at latest. Top the fibrous-rooted type, such as Gloire-deventilators must be opened first, followed by Lorraine, and its varicties Turnford Hall and the lower ones, but they should be opened on Mrs. Lenpold de Rothschild; others with the same side of the house. Draughts are drooping growth for baskets, like Golden to be avoided Shower and Alice Manning; together with the
Staging, three feet high, usually consists of handsome leaved liex begonias. Among other wooden shelving. It is an alvantage to lay plants for the greenhouse are coleus, with its thin sheets of corrugated iron or slate on the very attractive foliage, fuchsias as pot-plants bench, covering with well-washed sand or gravel.

One of the most useful accessories is a potting-shed casily accessible to the house. It will be handy for storing garden para. phernalia apart from its actual purpose of putting plants into pots, but must contain a well-lighted

or climbers, hydrangea (hortensia), cherry-pie Lord Roherts; show and fancy pelargoniums for early summer and zonals for winter blooming, scarlet sage for display in autumn and early winter, primulas, cineraria (stellata).
Amongat shrubby plants there are roses Indian azaleas, genistas, spireas. as well as those old favourites the heaths; whilst ever. greens include the well known and easily grown foliage plants, Kentias, fan palms, and aspidistras. To these may be added maidenhair, and other ferns: greenhouse asparagus. sprengeri and plumosus; and the grevillea. Then there is the wide range of bulbs and corms. Lilies, winter-flowering cyclamen, gladioli, freesias, tulips, hyacinths, daffodils, narcissi, amaryllis, gloxinias, and the little. grown, but lovely, nerine.
Unfortunately, plants grown in greenhouses are particularly subject to insect pests, but an occasional fumigation will enable them to he kept in check. Or the planta may be sprayed with an insecticide.

Making a Greenhouse. Fig. l illustrates a greenhouse 9 ft . long and 6 ft . 6 in . wide, having a door at one end and a ventilation skylight in the roof. It is constructed by making six distinct frames, which are assembled together by coach-screws or nuts and bolts, and it can be removed easily when desired. The weatherboarding shown on the lower portion is nailed on horizontally, and is preferable to matchboarding nailed on the frames vertically. When natural decay sets in, this generally begins at the bottom of the greenhouse If the boarding has been nuiled


ront Edge gftzin Fis B


Greenhouse. Fig. 1. Lean-to greenhouse which can be made by following instraction3 given in the text. Fig. 2. Part of tront before weatherboarding is fired fig. 3. Fixing spar on wall to support back edge of frame. Fig. 4. Bottom corner of skylight frame showlag throating to turn water. Fig. 5. Curb as fixed la window opening. Fig. 6. Half of top frame showing joints and sections. Fig. 7. End trame with door. Fig. 8. End without door. The letter $S$ indicates latts of wood nailed to framing to provide rebates for the glass
on to the frames vertically, decay necessitates hastened. From a digestive point of view, the ,the most imposing, they frequently lack taking off and renewing practically the whole use of green tea is undesirable, as it usually of the boarling; whercas, if weatherboards, contains a larger percentage of tannin than with their joints running horizontally, have been used, the board nearest to the earth can be readily removed and a new one put in its place.

The foundation may be made of odd bricks, broken stones or slabs, granite chippings and concrete, and it should be the first step towarels building the greenhouse. The two end frames are built up out of squareerlged timber (that is, timber not rebated on one of its edgos). The portions marked $S$ throughout the drawings refer to strips or laths of wood, which are nailed on to the framing to form the rebates which hold the glass, and their width and thickness will be in correct agreement with the rehating of the sash bars.

The front frame, of which a portion is shown in Fig. 2, is built up in the usual manner by mortise and tenon or half-lap joints. It is stayed by two diagonal braces to prevent it from racking. The top edge will have to be planed or sawn on the bevel, so as to allow the roof frame to fit and bed upon it. At the back the roof frame is supported by a spar fixed to the wall, as shown in Fig. 3.

The roof frame (Fig. 6), of which a half-plan is shown, will probably be the mort . .lifficult for the home worker to make; but, after the experience gained in making the end frames, he will be more confident to tackle it. The joints and details are so clearly shown in the diagram that little in the way of a description is needed, except perhaps to :say that a space is left for the ventilator window. Into this space a box or curb is made (Fig. 5), and fitted and nailed in, so that its top edge projects about if in. above the noof frame. This is to throw off the water and keep it out of the joint of the window opening.

The skylight frame is made to project about 1 in. over the curb, and it is throated with a small groove, as shown in Fig. 4, so as to turn the water. The skylight is hinged to the back edge of the curb with butt hinges, and the usual stay rod from the inside of the greenhouse is provicled to raise and lower it. The whole of the timber framing should be given one coat of paint before the frames are sasembled. This will prevent the new timber absorbing the oil out of the putty, which would otherwise peel off and drop out. Do not forget to make the end frames handel, that is, one frame for the left hand and one frame for the right hand (Figs. 7 and 8).

GRFINS. This term is used for green vegetables generally, such as broccoli, cabbage, and spinach. Some people class cauliflowers as greens. See Cabbage; Caulifower, etc.

GRFEN TEA. Of the green teas hyson, young hyson, twankay, and gunpowder are the best known, and are chiefly used for blending. The characteristic colour of green teas is due to the particular processes to which they are subjected. These vary considerably from those employed for black teas. For green tea, the leaves of the tea plant are gathered and roasted off at once, before fermentation seta in, while the drying, too, is also specially


Grts Ware. Siegburg jug with raised Brilisht Museuma
black tea See Tea
GREGORY'S POWDER. The common GREGORY'S POWDER. The common
name for compound rhubarb powder is Gregory's powder or mixture, of which the purgative dose is 10 to 60 grains. It is frequently prescribed for acute indigestion in children and is also useful in diarrhoea. Adults sufforing from dyspepsia may benefit from small doses, as much as will lie on a sixpence, thrice daily before food.

GRENADIN. In cookery the term grenadin is applied to an oval or round cut from the fillet or cushion of veal. It is usually larded and braised, after which it is garnished and served with sauce. See Veal.

GRESWARE. This name usually stands for the old stoneware produced in W. Europe during the 16th-18th centuries. Because it was shipped mostly from Flemish ports it was called Grès de Flandres, although the bulk of it came from Cologne and other places in the Rhineland, and some of the best from Nuremberg, Siegburg, and other towns near.

It was essentially a fine salt-glaze stoneware, in greyish and other neutral tones, with designs in relief based on wood-cut illustralions in books, or the coats of arms of nobles and well-to-do burgesses. The surface resembled orange-skin, and the forms included cylindrical tankards, tall or squat, lidded and handled, sometimes with long oblique spouts.
Specimens of Rhenish origin are sometimes unearthed on old city sites in England, because they had a great vogue here until Fulham ware, and afterwards Staffordshire saltglaze, came in to displace them. There are modern potteries engaged in turning out, in the same local white clay, reproductions of favourite old designs. See Pottery; Stoneware.

GREVILIEA. The most popular kind is Grevillea robusta, an Australian shrub with decorative leaves, suitable for cultivation in pots, room and greenhouse. It is easily grown from seeds sown under glass in spring and good plants can be grown in 5 in . pots in a compost of loam, leaf soil and sand. The red Howered Grevillea rosmarinifolia, a bush 4 to 5 ft . high, is suitable for planting out of doors only in mild districts.
GREYBOUND. Through being regarded primarily as a sporting dog, with highly specialized functions, the greyhound is seldom kept as a companion, although there are many reasons to be urged in his favour. In outline he is exquisitely graceful, his movements being gentle.

The English greyhound is our representative of one of the oldest canine families. Many thousands are bred annually for the purpose of coursing and track racing. There are not many show kennels, but occasionally a greyhound is exhibited of such perfection that he can be fairly sure of winning the prize for the best of any breed in a show.

There are many colours, all of which are permissible. Although the bigger ones look
the power to turn quickly when coursing. Experience commends clogs of medium size, and some of the most famous Waterloo Cup winners have been small. See Dog; Italian Greyhound.
GREY MULLET. Of inferior quality compared with the red mullet, grey mullet is, neverthelcss, much liked by many, but needs to be very fresh when cooked. Most of the methods which are employod for cooking haddock may also be applied to grey mullet, but sauce should always accompany it. See Haddock; Red Mullet.
GRID: In Wireless. This is an electrode of fine wire mesh between the anode and filament (or cathode) of a thermionic valve. The ordinary threo electrode valve has only one grid, as distinct from a screen-grid valve, which has two, and a pentode with three.
The second grid in a screen-grid valve is usually called the acreening grid, and is joined to the pin on the valve base which is connected to the anode in the case of a three-electrode valve, i.e. the pin farthest from the other three. The screening grid is connected to a tapping on the high tension battery or eliminator having a positive potential of $80-90$ volts (depending on the anode voltage).
In a pentode valve, one of the auxiliary grids is connected internally to the filament, while the other (known as the priming grid) goes to a terminal on the side of the valve base, and requires a positive potential which may be the same as that applied to the anode.
Grid Battery. This is a small dry cell battery employed to maintain the grids of the amplifying valves (sometimes also the detector) at a negative potential in respect to the filaments, or cathodes. The grid bias value depends upon the type of valve (e.g. its impedance) and the high tension voltage. The correct figure may be ascertained from the maker's instructions accompanying the valve.
Failure to apply the negative grid bias specified will result in excessive anode current consumption, distortion, and possibly loss of emission, i.e., valve failure. Although a grid bias battery is not called upon to supply actual current, it should be replaced about every nine months, or the valve will be damaged.
Grid Leak. This is a high resistance connected between the grid of a wireless receiving valve and a point in the circuit having a positive or a negative potential in respect to the filament or cathode.
A grid leak may be employed to assist in the process of rectification-e.g. a leaky grid detector-or to maintain the grid of a valve at a suitable negative potential, as in a resistancecapacity coupled low-frequency magnifier. No definite values can be given, although 2 megohms is commonly chosen for a leaky grid detector and $0.5-2$ megohms for a resistancecapacity coupled magnifier.
A defective grid leak may produce crackling noises, distortion, and sometimes a choking


Greghound. Two priso-winning epecimens of the lamoas breed of sporting dos
effect on reception, which develons within a short period of switching on the set. See Anode; Cathode; Detector ; Filnment: Resistance Coupling; Valve.

GRIFFON. There are several different types of this wire-haired dog with its benrded and moustached countenance. There are long.


Grifion. Long-baired and pug-nosed specimen of this breed of small dog
linired and short-haired, red, grey, faim, hlack-and-tan; but the favourite is the long. haired red, with pug nose and large eyes. The smaller dogs should not exceed 5 lb . in weight, but the larger race may run up to 9 lb . They should not be bought younger than about three months old, for from the age of five to eight weeks their rearing is attended with anriety At three months the critical time is well over. See Dog.

GRILL. The term is used to diescribe both the appliance on which food is grilled and the cooked dish itself. Grilling is usually done under the griller of a gas-stove or by a grill or gridiron jlaced over or in fmnt of the lire For cooking over the fire, a single row of bars fastened at each end, with a long handle at one end, is used. For grilling in front of the fire, the iron has a double row of bars, enabling the food to he enclosed, while underneath is a shallow trough to catch the fat.

Electric grills on which breakfast, luncheon, or a complete dinner can be prepared are useful table appointments. See l3acon; Chop; Cooker; Liver; Mixed Grill; Sausage; Steak.

GRILLE : In Building. A grating or structure of iron or other metal bars, known as a grille, is placed over an opening or aperture generally to prevent any forced entry. Such a grille is made of $\frac{\mathrm{in}}{} \mathrm{i}$ diameter iron bars, to bolt over a basement window. Similar structures arc often made for the openings in gullies or drains.

GRILLING. Besides heing rapid in its operation, grilling is one of the most wholesome methods of cooking meat, which is exposed directly to the Hame. If the process is to take place over or before the lire, the latter must be clear and free from smoke. A gas or clectric grill should be made red hot before the meat is put undementh it. The bais of the griller inust be greased to prevent the ment sticking. Grilled ment shoukl not be overdone, otherwise it will harden and lose its Ilavour. It shou!d be brushed over with melted lat before grilling. After cooking, rub it on both sides with butter and season it to taste. The most suitable meats for grilling are stenks, chops, cutlets from the centre of a leg of mutton, and small birds, while the best fish for the purpose are cutlets of salmon, mackerel, tmut, and whiting. Fish for grilling should be wrapped in well-buttered thick glazed paper. When birds arc grilled they should be cut in hail and the inner side first exposed to the fire.

GRILL SAUCE. To make this, place a soup plate over a bosin filled to the hrim with hoiling water. Put 1 o7. of butter in the plate and, when it is melted, stir into it first 2 tenspoonfuls of inade mustard. then a dessertspoonful of Fiench vinegar, a teaspoonful of tarragon vincgar, and lastly a tablespoonfol of cream Season to taste with salt, pepper, and cayeune, and pour oves the grilled meat. See Bones; Gravy; Sauce.

GRINDING: Of the Tecth. In children grinding of the teeth during sleep is most commonly clue to indigestion, worms, or some irritaling inatter in the bowels. It also occurs in nervous dispases, such as St. Vitus's dance The treatment is that of the condition.

GRINDSTONE : How to Use. A grindatonc is an implement used for the sharpening of tools. It comprises a circular atone inounted on a spindle which is supported in a frame; it is adajted for driving by hanil or by a treadle. It is an advantage if the frame is enclosed at the hottom to form a trough holding a supply of water to keep the stone wot and to prevent tools from overheating while being ground. The best type of grindatone is one with a cast-iron frame and litted with a self-contained treadle, and is best fitted with a hood to prevent the water from splashing. Such a stonc should he a hout 2 ft . in diameter and 3 or 4 in . in width. Sinaller grindstones can be screwed to the bench, but they have to he worked by hand, leaving only one hand free to hold the tool heing ground.

Grinding Cutlery. Grinding is the prosess by which knives and other cutting implements are sharpened on a grindatone. In grinding. the stone revolves towards the worker, the tonl-rest being adjusted to the proper angle, and set as close to the stonc as possible. This prevents the tool from catching and being dragged down. The stone should never be tonched with the hands while it is revolving.

Fig. I shows how a chisel is ground. The method is as follows: Grasp) the blade in the
left hand, with the fingers uppermost, and grip the handle with the right. Incline the tool so that the angle of the bevel is about $20^{\circ}$. The rest should be set to this angle, and the chisel can then rest llat upon it. The tool is not held in onc place, but moved about across the rest to a void forming a groove in the stone Grinding continues until the bevel on the tool is llat and true. Ordinary firmer chisels are ground on one side only; turning chisels and cold chisels on both sides.

Gouges are ground on the outaide, and are held in a slanting position to the stone, as in Fig. 2. The gouge is twisted or turned so that the hevel is ground to a true curve.

Plane irons are trcated in the same way as chisels, except that, heing broader, they call for more care, especially to keep the edge square with the side of the iron. A spokeshave iron is held in both hands and the face of the iron is ground, very light pressure being needed. With axes and hatchets the head is held in the right hand, the shaft in the left: the head is rocked to and fro on the face of the stonc to produce the requisite curved cdge.

A valuable aid to correct grinding is the device illustrated in Fig. 3 and linown as a grinding rest, consisting of a roller and a tonl clamp. The tool to be ground is placed in the clainp and fastened by the clamping screw, "ith such an nmount projecting that when the tool and the wheel are both resting on the stone the angle so formed is that reguired for the tool. 'I'lic greater the plojection the flatter the angle, and vice versa.

## Gripes. See Colic.

GRIT. Hard, sharp particles of stone, known as grit, are given in kulk to fowls in order to enable them to digest their food. A fowl at liberty instinctively forages for and finds an unlimited supply of suitable material, but in conlined quarters the grit has to be provided. The best kind of stone for the purpose is llint, which must be broken to a hout the size of n pea for adult lowls, and somewhint sinaller for chickens. See Poultry.


Grindstone. Fig. 1. Method of placing bands to control a chisel bladz and obtain deslred cutting angle. Fiy. 2. Grinding back of a Rouge.
Fir. 3. Use of simple tool grinding rest. Fig. 4. Grinding a bill-hook Fir. 3. Use of simple tool grinding rest. Fig. 4. Grinding a bill-book which is beld obliquely across the stong

GROG. The drink known as grog is made liy adding a little cold water to spirits, no sugar being put into the mixture. Sometimes, however, hot water is used. and this nlso is called grog. The spirit most gencrally used in making grog is rum, and as the driflk is useful for maintaining the heat of the body, it is drunk by sailors and others whose duties compel them to face cold and inclement weather. See Rum
GROMWEL̇L. The English name of lithospermunn, a beautiful rock-garden plant (q v.), which is also known as borage-wort. The most useful species, prostratum, is a hardy evergieen trailer, with hairy stems and lance-shaped, hairy leaves, which covers itself with rich hlue llowers in summer. It is a benutiful plant for the rockery, where it carpets spaces between large stones, and looks at its best when hanging over them in broad masses.
There is a variety called Heavenly IBlue,
which resembles the species closely, but is rather lighter in colour. These beautiful trailers like a light, sandy, or chalky soil and a sunny position. They are lime-lovers, and are invaluable for hot, dry banks. Other desirable species are graminifolium, which has grassy evergreen leaves and clusters of blue, drooping flowers; canescens, a hoary herbaceous species with yellow flowers, height 9 in ; gastoni, also herbaceous, blue with white eye, an alpine growing about 9 in . high; purpureo-caeruleum, herbaceous, purplish blue, a trailer; and rosmarini-folium, evergreen, blue, 18 in.

The best of all for the rock garden is L. petraeum, a pretty little bush with greyish leaves, something like the lavender. It is about 9 in . in height, and bears purple flowers from May to July, the blossoms changing in colour to deep violet as they expand.
The gromwells are propagated by seed, cuttings, and divisions. Seed is sown in a frame in spring. Cuttings are inserted in sand soil in a frame in summer. Division should be practised in spring. See Rock Garden.

GROOM. A groom is a manservant who has charge of horses. He should understand the care of horses and be a good rider, as he is often expected to exercise the horses. His duties include, in addition to looking after the horse or horses, the care of the stables and the cleaning of the harness. In Great Britain a licence must be taken out for a groom; this costs 15s. a year. He must be insured under the National Health Insurance scheme. See Harness; Horse; Insurance ; Stable.

GROUND BEETLS. Although there are many kinds of beetles that live chiefly underground, the name is applied particularly to a


Ground Beetle. Oseful garden inseot which feeds on caterpillars group of 10 species of carabus. They are about lin. long, shiny black, in some cases with violet or golden reflections, and all wingless. The ground beetle is one of the gardener's best friends, and seeks and devours the fat caterpillars, such as that of the turnip-moth, which destroy vegetables at night. See Beetle.

Ground Ivy. See Nepeta.
Ground Nut. See Monkey Nut.
GROUND RENT. A ground rent is the rent paid for the land on which a leasehold house or building stands. Its amount is fixed when the land is let to the builder, and cannot be altered during the period of the lease, usually 99 years. The owner of the house, not the tenant, is responsible for paying this rent to the ground landlord, and he should deduct income tax at the usual rates from it when he does so. See Income Tax; Leasehold; Rent.

GROUND RICE. This is a fine flour-like preparation made from rice. Like rice flour, it is much used in the making of cakes, hot or cold puddings, and for thickening soups.

Ground Rice Cake. To make these, sieve together 3 oz . ground rice, 2 oz . flour, and- $\frac{1}{2}$ teaspoonful baking powder. Cream together 2 oz . butter and 3 oz . castor sugar, then beat in 2 eggs separately. Stir in the dry ingredients, mix all thoroughly, put the ingredients into small greased queen-cake tins, and bake in a quick oven for about 10 minutes.

Ground Rice Mould. For this, mix $1 \frac{1}{1} \mathrm{oz}$. ground rice to a thin smooth paste with a little milk. Put what is left of 1 pint milk in a pan on the fire, with 1 in . cinnamon. When the milk boils, add the ground rice together with 1 oz . sugar and boil gently for 15 min ., stirring
all the time. Rinse out some dariole moulds or small teacups with cold water. Take out the cinnamon and fill the moulds with half the rice. Colour the remainder a pale pink with a few drops of cochineal, and fill up the moulds. When set turn them out on to a glass dish and pour custard round. The mixture can also be set in one large mould.

Ground Rice Pudding. Baked ground rice pudding is made by rinsing out a saucepan with water, pouring in 1 pint of milk, and heating until it boils. Then stir in 2 oz . ground rice mixed to a thin smooth cream with a little cold milk. Continue the stirring until the mixture thickens, and then add 1 oz . butter, sugar to taste, and a little vanilla flavouring. Allow it to cool before adding 1 beaten egg. Thickly grease a pie-dish, pour in the mixture, and bake it gently until lightly browned. See Diet; Rice.

GROUNDSELL. The wild groundsel, called Senecio vulgaris, is a common weed which spreads very quickly by self-sown soeds. It should be destroyed by hoeing before it flowers. There are some valuable garden flowers in the genus senecio.

GROUSE. These birds, which are in season from Aug. 12 to Dec. 9, may be cooked in a variety of ways, but the most usual method is to roast them. They should hang for ten days to a fortnight before being plucked. All the methods of cooking described under the heading Game (q.v.) can be used for grouse.

GROWING PAINS. The ordinary process of growth causes no pain, and what in children are called growing pains are really manifestations of acute rheumatism and should be treated as such. If neglected, serious implica. tion of the heart may result. See Rheumatism.

GRUB : In the Garden. Various garden pests ane termed grubs when in the egg or chrysalis state during winter. They are usually just below the surface of the ground, or in the cracks and crevices of the bark of trees and shrubs. Methods of dealing with grubs are explained under the headings of the plants and shrubs which are liable to be infested by these garden pests. See Insecticide.

GRUSL. To make gruel, put into a basin 1 tablespoonful fine oatmeal and a pinch of salt. Pour over it 1 teacupful cold water and 1 teacupful milk. Stir thoroughly and let it stand for $\frac{1}{2}$ hour. Stir again, strain, put the liquid into a saucepan, stir till boiling, and boil for 10 min . Serve hot in a soup-cup.

A little cream added last of all is an improvement, and it may be sweetened with 1 teaspoonful of sugar. If wanted quickly, use 2 tablespoonfuls of oatmeal to the same quantity of milk and water. Stir and strain and make as above. The oatmeal that is left can be used for porridge. See Invalid Cookery.

GRUYERE CBEESE. This is a large flat cheese, distinguished from others by the presence of large holes, some of which are filled with moisture. It has a nutty flavour.

GUAIACOL. Prepared from creosote, guaiacol is frequently prescribed in consumption. It is given in the form of the carbonate of guaiacol. It has also been used successfully in the treatment of rheumatoid arthritis, but it must be taken for a considerable time.

Guaiacum resin is obtained from the wood of a West Indian tree, Guaiacum officinale. also called Jignum vitao (wood of life), on account of its high medicinal reputation in earlier days. The resin has a mild purgative effect. It was an ingredient of the electuary, known as the Chelsea Pensioner, formerly a favourite remedy for the pains of chronic rheumatism and gout.

GUANO. The valuable natural manure named guano is derived from sea-birds; the chief source of supply is the eastern coast of

South America. It is rich in ammonia, phosphates, and alkaline salts. Most of the guano which reaches Great Britain is dealt with in proprietary form, and instructions are issued with it. See Manure.
GUARANTEE. In English law a guarantee is a promise to be answerable for the debt, default or miscarriage of another. Examples are bank guarantees, in which one makes himself responsible for an overdraft or other advance made to another, and guarantees of debts of various kinds. A reference stating that a person is in a sound financial position is not a guarantee.

GUARDIAN : Eis Duties. A guardian is a person to whom belongs the care and custody of an infant (under 21). A father is the natural guardian of his child. He may appoint by his will a guardian to act after his death; but this guardian acts along with the mother.
The high court may always appoint a guardian for a child, though the rights of the father and mother are never interfered with, unless for the infant's benefit. If the father and mother separate, prima facie the father has a right to the custody of the children ; but the court will consider the interests of the child as paramount and may order the mother to have the custody.

A guardian controls the ward's marriage, to the extent of being able to forbid a marriage without his consent. Anyone who takes a ward out of the guardian's control will be severely dealt with by the court. A guardian must not make a profit out of his guardianship; and may not deal with the ward's property except for the ward's benefit. A guardian must render an exact account when the ward attains the age of twenty-one. See Child.

GUAVA JELLY. This can be bought in jars ready for use, or prepared at home from the ripe fruit. Guavas are cultivated under glass in Great Britain, but cannot be imported from the tropics in their ripe state. To make the jelly, peel and cut into quarters about a hundred ripe guavas, wash them thoroughly, then put them into a saúcepan with sufficient water to cover, and boil for about 2 hours or until they are perfectly tender, and will break easily when touched. Strain off the juice through a sieve, pressing the fruit so as to obtain as much juice as possible, and if necessary letting it drip for a day or so. Pour the juice into a preserving pan and boil it well, skimming it frequently. Add gradually enough sugar to sweeten it, boil it for a few minutes, then add the juice of ten large limes or lemons. Boil until all the scum has risen and the jelly looks clear: then pour it into clean dry jars, and cover when cold.
Medlars are sometimes used to make imitation guava jelly.

GUDGEON. A small, well-flavoured freshwater fish that is in season from mid-summer until late autumn. The fish should first be cleaned thoroughly, and the gills removed. Use a soft cloth for drying, then dip the fish in the yolk of an egg beaten up with a little butter, roll it in breadcrumbs, and fry it in hot fat. Alternately it may be dipped in milk, coated with flour and fried for 4 or 5 min . in hot butter. Drain the fish on paper, and serve them garnished with fried paraley. Anchovy or shrimp sauce makes a good accompaniment. See Anchovy ; Fish; Shrimp.

GUDGEON PIN. This is the name given to an axle which turns in a collar. An example is the gudgeon pin which connects the small end of the connecting rod in an internal com bustion engine with the piston. See Big-End; Motor Car; Motor Cycle.

GUELDER ROSE. The popular name of viburnum, a group of leaf-losing and evergreen shrubs of great garden value. The common


Guelder Rose. Flowers of one of the double varieties
GUERNSEY LILY. The popular name of Nerine sarniensis, a beautiful greenhouse bulb which bears rose-scarlet Howers in autumn. The bulbs are potted in August, and come quickly into bloom. The leaves develop in the autumn and winter months, so the soil must be kept moist during that period. The plants are grown in a sunny greenhouse in a temperaturo of about 45 degrees. When, in early summer, the leaves turn yellow, watering must be reduced gradually and finally discontinucd.
GUEST. The greatest compliment which a guest can pay to a host and hostess is to enjoy himself or herself.
When invited to stay at a house a guest should intimate beforehand the hour at which he intends to arrive, and hold to that arrangement. Throughout his visit he should do his best to enter into the ordinary family life, thus making his entertainment an easy matter. Tidiness in an easy matter. Tidiness in which bears roso-scarlet fowers
his bedroom and punctu-
ality at meals will add to his popularity with over the breas ality at meals will add to his popularity with the household. After his departure he should write a letter of thanks to his late hostess.

Guests should arrive punctually when invited to luncheon or dinner. At an At Home or informal evening party the time may be any convenient hour within certain limits set out on the invitation, but at a bridge party or concert a guest should arrive rather before the time named. See Etiquette.
GUILLOCHE. The form of carving known as guilloche is frequently seen on English oak chests of the 16 th and 17 th centuries. It is


Guilloche. Interiaced form of wood araring seen on antique English oak chests 18 another, with the wood cut to make the bands which form the rings go alternately under and over each other. In this way they are bound together in plaited formations of strapwork to simulate braiding. See Jacobean Style ; Tudor Style.

GUINEA. The Englisl gold coin of the nominal value of 21 s . is now obsolete. Guineas were last coined in 1813, and examples are valued by collectors. Pieces of t-guinea, 2 guineas, and 5 guineas were also coined. At the present day, although guineas are not used as coins, certain professional fees are reckoned thercin. A spade guinea is one,
an interlaced


Gaernsey Lily, a greenhouse bulb over the breasts and basting frequenty counteract the dryness. It frequently to I hour's cooking. Celery sauce makes a good accompaniment. See Chicken; Pheasant.

GUINEA PIG. Guinea pigs can be kept comfortably in a more confined space than rabbits, and are generally run in pairs. The period of gestation is 9 to 10 weeks, and the number of young at a birth seldom exceeds five. Little guinea pigs are very precocious. The dietary of a guinea pig consists of any

food a mixture of $\frac{8}{8}$ bran and $\frac{1}{3}$ sharps. They are also partial to bread and milk. Water to drink should always be within reach. Good animals of a prize strain have a fair market value. See Rabbit Hutch.

GUITAR : How to Play. The guitar is one of those instruments which have a fretted fingerboard, and are played by plucking the strings with the fingers. Its parts are, firstly the body, the back and the sides of which are of maple, ash, or cherry wood, and the face or sound-board of deal. The sound-board is pierced with a large round sound-hole in the middle of the narrowest part, or waist, of the guitar.

Secondly, there is the neck, the upper side or fingerboard of which is of some hardwood like ebony or beech: upon it are the frets, arranged so as to give a succession of semitones. This terminates in the head, holding the six tuning pegs, which are now metal screws, three on each side.
The strings are carried from these pegs over the nut to the tail piece, which is fixed at the farther end of the sound-board. They are six in number, the first three being of gut, the ot hers of silk spun over with fine wire, and they are tuned in fourths, except between the 2nd and 3rd, where there is the interval of a third as shown in the diagram. These are the real sounds, but it is customary to write music for the guitar on the treble stave, an octave higher than the actual pitch. Tune the sixth or lowest string to agree with the corresponding note on the piano, or whatever instrument is to be used in conjunction with the guitar, and


Guinea Pig. 8mall animals which are popular pets with children. A great variety of colouring and marting is obtainable in the short-haired breed
from that tune successively the other strings Let the thumb and first finger of the left hand encircle the neck behind the first fret, the other fingers suitably curved being held over the strings. The body of the guitar is kept in position Dy firm pressure with the inner part of the right arm. The little finger of the right hand rests upon the sound-board, midway between the tail-piece and the sound-hole, the other fingers being used to pluck the strings, the lowest three by the thumb, and the 3rd, 2nd and lst strings by the lst 2nd and 3rd fingers respectively.

Initial practice will consist in plucking only the open strings in varying order. When facility in thus finding the strings has been attained, it will be time to proceed to the stopped notes, to produce which the finger is pressed firmly upon the string just behind the
proper fret. A tahle of fingering is given in every tutor for the instrument; it is sufficient to say here that to reach the higher frets it is necessary to shift the left hand up the neck.

When the first finger is in its normal position behind the lowest fret, the hand is asid to be in the first position; when the hand is shifted so that the first finger is behind the second or third fret, it is in the second or third position respectively. It will be found best to shift after playing an open atring.
After use, wipe the instrument with a soft duster, to remove any traces of moisture from the warm hand, and put it away where it will be protected from dust.

GUM. Gum is a vegetable product from trees, which forms mucilage when dissolved in water. The chief gum is that obtained from the acacia tree, known as gum arabic. When dissolved in water in the proportion of gum I oz., water If oz., a thick liquid is ohtained which is employed as an adhesive. When the beat quality gum arabic is used the resulting mucilage is taken internally as a soothing medicine for scvere coughs and sore throats.

In making mucilage cold water is poured over the solid gum and allowed to remain for a few dnys, then, on stirring, the gum readily dissolves. If hot water is employed the mucilage soon becomes mouldy. To preserve mucilage intended as nn adhesive it is necessary to iuld to it a small proportion of clove oil or formalin.

GUMMMING. The formation of a semitransparent exudation upon the bark of fruit trees is usually a sign that the trees have been over-pruned and over-manured. The gum may be scraped away and the affected parts washed with soft water. See Fruit.

GUMS : Their Care. The hone of the jaw forms sockets in which the teeth are placed, and the gum is closely adherent to the outsides of this bone. When healthy it is of a pale pink colour, and its margin is firmly applied to the necks of the teeth. When inflamed it becomes somewhat swollen and deeper in colour, and is liable to bleed on being rubled with a toothbrush.
In ordinary cases trouble with the gums generally arises from neglect of the teeth.


Regular daily brushing and rinsing the inouth with $n$ teaspioonful of alum in $\frac{1}{2}$ pint of uater will somn restore the gums to normal health. In pyorrhoes the gums become chronically inflamed along the margin, the edge of the long sockets of the teeth become carious, and pus is formed.
Gum Rash. A pimply skin rash occurring in infante is known as gum rash, red gum, or tooth rash. It may consist of red pimples, or paler papules somewhat resembling Heabites. or circular patches developing chiefly on the facc, arms, and neck. The rash is usually due to some temporary upset of the digestion during tecthing-time. No trentment is required ot hier than strictest attention 10 the cleanliness of the baby's bottles and to the state of the howels. The child should not be allowed to scratch the pimples.

Gumboil. This is a painful swelling in the gum and generally occurs over the diseased

Gun. Fig. 1. Double-barrel shot gun. Fig. 2. Anson \& Deeley double-barrel hammerless gun Fir. 3 Simple type of sporting run
Courlexy of The Midland Gun Co. Birmingoliam
root of a tooth, and is caused by the exudation of septic matter from the end of the root.

If there is a cavity in the tooth it may be temporarily filled with a piece of cotton wool dipped in strong carbolic acid and well squeczed out. The squeezing should be done with a light wad of cotton wool to protect the fingers. If a gum hoil has formed the matter should be let out. Fomentations or a hot hag to the face may give temporary relief, but should not be persisted in for long. A dentist should be consulted. See Pyorrhoca; Scurvy; Teeth
Gum Tree. This is the popular name of the eucalyptus (q.v.).

GUN : For the Sportsman. The essential parts of a gun are the breech, into which the cartridge is inserted, the lock inechanism, ta explode the charge, the barrel or tube which directs the shot, and the wooden stock, which rests against the shoulder when firing and is held by the hands. Unlike the rille, with its spiral grooves, the barrel of the shot gun has a smooth hore, as scattering shot is generally employed.
Sporting guns arc made in two main types. These are the hammer guns, as in Fig. 1, which have exterior arms, known as hammers, which are cocked, or set in position for firing, by drawing back the hammer until a ratchet device holds it in position. It is releaserl by pulling upon the trigger: a powerful spring then drives the hammer forward and causes it to strike against the firing pin. The latter is driven against the percussion cap formed in the centrc of the cartridge, and thus explodes the charge. The other type is known as ham-

choked. that is, tapcred slightly towards the tip or muzzle. The first trigger on the gun is that of the right-hand barrel; alter firing this at a moving target, the left-hand barrel can be fired at a longer range. the choking of this giving the extra few sards required to make the shnt effcetive.
To prevent accidents, various devices have been adopted These generally consist of a trigger bolt fixed in a vertical position in the frame by pivoting it, and a slide attached to the upper part of the lever on the tang to the hack of the top lever which opens the hreech. As the slide is pushed, the lower end of the lever is brought close up agninst the triggers, thereby blocking them and proventing them moving when the safcty catch is in the safe position. When the gin is to be fired, this slide inust be pushed in the opposite direction an as to hring the lower end away from the triggers. Automatio deviaes are also employed to prevent accidental discharge.

Other types of aporting guns inolude a small rabbit, or salnon gun (Fig. 3), firing a B.B. cap consisting of a single-ball cartridge. These guns are often fitted with holt action. The cartrilge is inserted between the head of the holt (when the latter is withdrawn) and the entrance to the breech, and is placed in its firing position by pushing the bolt home.

When not in use any cartridges left in the gun should be withdrawn to prevent accident. Provided it is properly cared for a gun will last a lifetime. It should be conted with a fine film of oil and stored in a dry place, the nil being wiped off when the gun is required After use it should he taken to pieces. the fore end taken off and the barrels removed from the stock and thoroughly cleaned, taling special care to get the bore quite clean and dry. If the harrela are exceptionally dirty, pour hot water down them from breech to tip, and thomoughly clean and dry them with a pull-through or other availahle meane Gun repairing should be entrusted to a gunsmith

Gun Licence. A licence duty must be paid hy anyone whocarries a gun. The licence, which costs 10 s ., is obtainable at any post office. Certain persons are exempt, e.g anyone who has a game licence or certificate, and the owner or ocouplier of lands who carries a gun for the purpose of scaring birds or killing vermin.

By the Firearms Act. 1920, no firearms or ammunition may be possessed by anybody unless he holds a certificate granted by the chief officer of the police in the district where he resides. The certificate costs 5 s . for the first. and 2 s . 6d, suhsequently. It nust he renewed every three years. It should be noted that the possession of a police certificate does not absolve the holder from procuring a gun or game licence. No one may scll n firenrin to a person who does not produce a certificate for that kind of fisearm, and on any sale the vendor must take his customer's name and address and notify the police, ns well as keep a record in a special book.

A licence to shoot or take game costs a sum varying from £:3 to £1, according to the period for which it is required.

GUN METAL. This is an alloy consisting of ahout $(\mathrm{N})$ per cent of copper and ahout 10 per cent of tin, with small quantities of iron, lend and zinc. Originally liand for ordnance, gun metal is now employed for bearings and other mechanical parts it is extensively used in ships, in the manufacture of valves and other fittings which are exposed to the action of the sen. The amateur will find it of service in the form of small castings and rọls.

In miolel construction, gin metal forms the principal metal of which the amall castings for the different pints are made. It is also utilized in hydraulic fittings such as pumps. Gun motal is deep yellow in colour and is machined, polished or !acquered as for brass.


Gusich. Methods of inserting a piece of material to give strength. Figs. 1 and 20 8quare gusset Fige 8 and 4 Triangular gusset. Fig. S. Portion of leg seam 8quare gusset Diges 8 and 1 Triangular guseot. Pig.

GUNNERA. The two species manicata and scabra of this large-leaved, decorative foliage plant have enormous rhubarb-like leavce. The gunneras are nominally hardy, but it is desirable to cover the rootstocks with leaves or litter in winter. They like a deep, fertile soil, with plenty of moisture. The crowns can be divided in spring if more plants are wanted.
GURNET. This fish needs first to be cleaned thoroughly, and after the fins and gills have been removed it is placed in a pan containing boiling sulted water, and cooked gently until done. An average-sizod gurnet, which is sufficient for 3 persons, requires a bout $\frac{1}{\frac{1}{2}}$ hour's cooking. It may be served with anchoty, caper, parsley, or any other suitable sauce If liked, the fish may be stuffed with veal forcemeat before being boiled.

Baked gurnet is prepared by filling a oleaned fish with veal forcemeat, sewing it up, and then trussing it with the tail in its mouth. Put it into a baking-dish with one or two thin slices of bacon laid over it, and bake it for $\frac{1}{\frac{1}{2}}$ hour or more, acoording to size, in a hot oven. When cooked, it can be served with a sauce prepared as follows : Put 1 tablespoonful chopped onion into a stewpan with the same quantity of vinegar, cook these over the fire for a few minutes, then add 1 pint melted butter, 2 tablespoonfuls of ketchup, and the same quantity of water. Cook the sauce until it is reduced and slightly thickened, then season it with a little pepper and add the fillets of an anchovy cut into strips See Fish.
GUSSET : How to Insert. In dressmaking the piece of material termed a gusset is inserted at the junction of two seams of a garment to give more spring or freedom of movement at this point. It may also be in. serted at the end of an opening in a seam, to prevent any strain from splitting the seam open further.
There are two types of gussets which can be inserted at the end of an opening terminating a seam, such as at the base of the sides and sleeves of men's and boys' shirts, the most generally employed being the square gusset illustrated in Figs. 1 and 2. To make such a guseat, cut a piece of material from 21 to 3 in. square, turn down all the edges to the wrong side about $t$ in., then fold the gusset in halves, trianglewise, and crease the fold well. Open the guseet, set one point to the end of the opening in the seam, and neatly oversew the two sides of one half to the sides of the open. ing, which should first have been neatly

Fold the remaining poin reach the fold of the straight edge just mentioned, and crease the fold well. Open out the gusset, set the point to the end of the seam opening, and oversew the sides to the two edges of the opening as far as the crease; then fold the straight end of the gusset over at this crease, and hem all edges down, as in Fig. 4.

The gusset that is let into the junction of two seams to give more spring and strength is arranged in a different way. Such gussets as these aro often inserted into bathing suits and children's rompers of the combination garment
hemmed, as in type, at the base of the centre front and back, Fig. 1. Fold the where these meet the top of the short seams gusset over at the that run down the inside of the log parts. A crease-line, and hem the remaining two sides down to enclose all raw edges, as in Fig. 2.
The second type, known asa triangular guseet, is shown in Figs. 3 and 4. For this, cut a piece of material about $2 \frac{1}{\text { in }}$ square, fold it trianglewise, and cut through the fold to obtain two triangular pieces. Take one of these sections, and turn all edges down to the wrong side about $t$ in., turning in the cut edge first, then cut away the extend. ing side points of this edge, and turn in these edges.

## GutTers and Gutwering

## Matters of Economic Importance to Owner and Temant

This contribution belongs to a group dealing with the erection and maintenance of buildings. See therefore in addition to Bungalow; Cottage ; House, such entries as Drains : Eaves; Fiashing ; Roof; Water Supply

The purpose of the gutter is to collect rainwater and conduct it to a drain or other outlet. In domestic architecture the word is applied generally to a oast-iron channel fitted round the eaves or edge of the roof and connected by down pipes'to the drainage system. Land or surface gutters are found occasionally in domestio work, more especially in the country. With roof gutters the essential requirement is that the cross-sectional area should be large enough to deal with the water from the roof. A gutter about 4 in . wide is found satisfactory for small property, or where the roof area is small.

The gutter must be rigidly and firmly attached to the roof, and have a regular and steady fall to the down pipe. The ordinary span roof only requires eaves gutters, but where a part of the roof is joined to another roof at right angles to it the joint between the two roof coverings is known as a valley, and the gutter formed in it is termed a valley gutter. Such gutters are to be found round the roofs of many dormer windows, and should receive attention both during construction and, in the case of an older house, from the point of view of repairs. Many of the older houses, both in towns and in the country, are built with curb or M roofs, surrounded on all sides by a parapet. Gutters formed of sheet-lead or zino may have perished in the course of time and become porous. The most appropriate methods of repair will be apparent by studying their construction. Whatever may be the type, the water should flow down the gutter to one or more outlets, which should discharge into an open, cup-shaped fitting known as a
hopper, or rain-water head. This forms a funnel to the down pipe, which conducts the water from the roof to the ground level, where it should discharge from a shoe into the trapped gully connected with the drainage (Fig. 1).
Essential features of the down pipe and fittings include the following (oee Fig. 2) The down pipe should be truly vertical, attached to the wall by screws or rose-headed nails, passed through the holes in the ears or lugs cast for that purpose on an iron pipe. Lead pipe is secured by straps similariy attached to the wall. The pipe should not be fixed close to the brickwork, but project 2 in. to enable the back of the pipe to be painted or attended to at any time, for which purpose packing pieces are placed between the wall and the lugs on the pipe.

The standard cast-iron rain-water pipes are made in various sizes, from 2 in . in diameter upwards. One end is enlarged to form a


Cutter. Fig. 1. Down pipe awan-nook, and stop-ond


Gutter. Fig. 2. Essential components of a gutter syatem. Fig. 3. Fixing a gutter bracket to the fascia board. Fig. 4. Fixing putter bracket to feet of rafters. Fig. 5. Valley gutter, showing tiles cat back
socket, and the other is plain ength is 6 ft ., although shorter or lengths are sometimes available. The pipe hook at the end, or by the removal of the should be set with the socket upwards, the obstruction from the top, and through the upper length having the rain-water head fitted into the socket on the pipe. The bottom length of the pipe fits into the socket on the shoe. The proper size of pipe to use will be determined, as already explained, by the area of the roof, but a 3 in . or 4 in . down pipe is generally fitted to an ordinary eight-roomed house, and is used in conjunction with a 4 in . gutter. The 2 in . pipes are only suitable for amall buildings.
The fixing of eaves gutters should be carried out with care and thorough ness, for the reason that the gutters are naturally inaccessible, and once fitted ought not to call for further attention. Rigidity of attachment is essential to regularity of fall. The gutter itself is usually of cast-iron, halfround, O.G., or rectangular in cross section. The former is cheap, the latter more expensive and, inci-
dentally, more handsome, especially if used in conjunction with square rain-water heads and pipes. The O.G. is used most commonly, as it can be screwed directly on to the fascia board, or to the feet of the rafters, whereas the halfround and other sections have to be supported by the gutter brackets. These methods of applicntion are illustrated in Figs. 3 and 4.
The construction of a valley gutter is shown in Fig. 5, also parts of the roof covering and the disposition of the eaves guttering. It should be made of stout sheet lead, as this has a very long life, and once properly fitted seldom causes trouble. A tiled roof may have the gutter formed by the use of the special valley tiles, which are worked in by the tilers as they cover in the roof. The parapet gutter should be laid with shect lead or asphalt ; the former is the usual material, and was used almost exclusively when this type of guttering was chielly in vogue. The method of constructing such a gutter is shown in the diagram above (Fig. 6).


Gutter. Fig. 6. How the gutter is arranged How the gutter oossibe case of the down pipe, it may be weight, sharpened at one end. Attach this to a cord, and pull it up and down in the pipe. If it fails, the pipe will have to be taken down, the choked section removed, and the obstruction got rid of by driving it through with a heavy bar, or by clearing it with a screw at the end of a drain-rod.

GUY ROPE. The use of a guy rope is to support some upright structure, which may be a tennis-net pole, a flagstaff, the mast of a wireless aerial, or a tent in the garden. As the safety of the structure largely depends upon

| Light mast. Helght in feet | Tarred hemp rojeCircumference In in | Equivalent alze in plough ateel wire. Circumference in in. | Approximate breaking strain in tons |
| :---: | :---: | :---: | :---: |
| $\begin{aligned} & 90 \\ & 30 \\ & 40 \\ & 50 \end{aligned}$ | $\begin{aligned} & 11 \\ & 21 \\ & 3 \\ & 37 \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & 1 \\ & 1 \end{aligned}$ |  | one end shackled to the eye in the bolt and the other having a cringle or eyelet. the rope spliced round it, as in Fig. 2. The tension The tension

is obtained
When the gutters have been cleared out, a jug of water should be poured on the roof at the highest point of the gutter. If the gutter is in correct line and has a proper and continuous fall, all the water will run away. If it is found that the gutter sngs at one of the joints, nad a pocket of water remains, this indicates that the fastenings or the brackets are deficient in strength, and must be remedied. This is done preferably by fitting a new bracket, or, if that is not feasible, by inserting $n$ packing piece between the bracket and gutter, thereby eyebolt. See Aerial accident due to a dazzling light. gutter itself. In so doing, where the gutter has a separate outlet pipe discharging into an open hend, a piece of sack should be placed in the head to prevent dust and dirt falling into the down pipe, as this is very difficult to remove.
the guy ropes, it is important to use a rope of the proper size, which may be of hemp or jute, or a steel wire or stranded steel cable.
The number of ropes varies; for example, a single rope of about 1 in . circumference at each corner post will suffice for a bathing tent, but a Hagstaff requires more elaborate support. It may have one system of ropes from the ground almost to the top of the mast, another separate system from the ground to a point about $\%$ the height of the mast, and a third system still nearer the ground. Thesc are to give a distributed support for the mast, so that it will not bend in the middle. The accompanying table will serve as some indication of the use of guy ropes. In the examples given there are four ropes to each mast.
Guy ropes are set up, or tensioned, in various ways. A simple method is by the use of a tent-peg driven into the ground, and a wooden runner (Fig. 1)

For permnnent work, us in the erection of a flag. staff, the anchorage can be made to $n$ concrete block embedded in the ground An anchor bolt should be fixed in the block, and should point in the direc tion of the line of the rope. The rope can be attached to the anchorage by a turubuckle or wire strainer,
 with a spanner the rope having previously been stretched and tightened by a small purchase tackle hetween the rope and the

GYMNASIUM : In the Home. A simple gymnasium, with apparatus for all necessary exercises, can easily be fitted up in the house if a spare room is available. A suita hle size is a room 20 or 24 ft . long and 14 ft . wide, but a snialler one can be utilized. There should be nothing in it to give rise to dust. A good light is desirable, and one at least of the end walla should be without a window, so that the boys and girls can face this when jumping, and avoid

The apparatus for such a gymnasium should include a portable and adjustable double beam to span the room : this should be counterbalanced in order that it can go to the ceiling and so he out of the way when it is not wanted. Two or four climbing ropes, a small vaulting horse and a pair of jumping stands are other necessary articles, as are three or four sections of wall hars and one or two mats For men and boys a punch drum that can be fixerl against the wall is useful, and the gymnasium should also
contain a pulley-weight machine, boxing-gloves Indian clubs, dumb bells and foils for fencing

As regards dress, the following is suggested as suitable for men and boys when practising in the gymnasium. A tight-fitting jersey or vest, with short arms, a pair of white Hannel trousers, and a pair of canvas shoes with indiarubber soles and no heels comprise the neces sary garments. A jersey of this kind will allow the arms to move frcely. while for a like reason care should be taken that the trousers are not too tight at the seat They can be fastened with a belt if the buckle and strap on them are not adequate. A sweater should also be provided, and should be put on as soon as the exercises are over, or during a pause
Those responsible for the gymnasium should take special care that all the apparatus is properly fixed and fastened and thicrefore safe before being used This is especinlly necessary in the case of horizontal bars and other articles that can be raised or lowered. See Dumb Rells; Exercise; Indian Club; Parallel Bars; Vaulting Horse, etc.
GYMNASTICS : For Health. Remedial exercises mary be usefully employcd in a large variety of ailments either for their heneficial action on the general nutrition of the body or for a disability affecting some particular organ or part. Some involve the use of apparatus, a higlt or low plinth, bicycles, bars, etc., but a large number do not call for anything of the sort These exercises, as a rule, should be supervised by $\Omega$ doctor. General exercises are useful in cases of poor development, convalescence from acute diseases. obesity, indiges tion, etc. and should be done in the open air, when possible.
Breathing exercises are given for the cure of early and slight adenoids, for the develop. ment of the chest, to complete the cure after pleurisy and empyema by expanding the lung and stretching adhesions, and in various ot her conditions. S'ee Beauty Culture: Breathing Dril! : Dumb Bells ; Exercise.

GYMNOGRAMME. This is sometimes known as the golden fern, because of the golden powder on the undersides of the fronds of some sorts. A favourite is gymnogramme chrysophylla. They must be grown in a warm, moist greenhouse and need shade from sunshinc. See Fern.

GYPSOPHILA or Gauze Flower. Of these hardy perennial and annual herbacoous plants the most popular species is paniculata,


Gypsophila. Delicate blooms of Gypsophlla elegans. a rraceful annual very usefol for cutting
n beautiful spreading perennial growing about 4 ft . high. In summer it becomes a gauzy, Iace-like mass of small white flowers which are
in great demand for mixing with cut flowers Although it thrives in most soils, G. paniculata prefers a light, dry, chalky soil and a warm, sheltered site. It can be raised from seed, but the seedlings grow slowly. Once planted it should remain undisturbed The finest variety is one namied Bristol Fairy Gypsophila repens is a charming trailing perennial for the rock garden. Elegans is a dainty hardy annual which blooms in summer from secds sown out of doors in April.

HABENARIA. A family of native hardy Howering orchids, the habenarias are found in meadows in Great Britain and Ireland. The best known, the butterfly orchid, has greenish-white llowers in June and is fragrant it night. There arc other hardy species, which are suitable for the rockery, where they thrive in sandy peat. See Orchid.
HABERLEA RHODOPENSIS. An alpine plant from the Grecian mountains, this bears small, lilac-coloured. gloxinia-like flowers which spring from a rosette of lenves in June. It thrives best in a shady crevice in a compost of peat and sand. It may be raised from seeds in spring.

HABIT CLOTH. Plain, self-coloured woollens in medimm or light weight, suitable for riding habits, coats and tailor-made cos tumes, sell under the name of habit cloth. Some have the surface of wool velours, some are face cloths of a more glossy finish, and others spongy. Made customarily from fine, short wools, they have a softness of touch, with sufticient firmness and suppleness to hang well. See Riding.

HACKING KNIFE. This tool is used to remove old putty from window frames and plaster from ceilings, for the scraping of paint, and similar work in connexion with the redecoration of the home. It consists of $n$ steel blade with a piece of leather or wood riveted on either side of it to form a handle. It is pointed at one end, thick at the hack and tapering to $n$ sharp edge

In removing putty, the point of the hacking knife is inserted into it, held in a horizontal position, and forced downward by trpping the back of the blade with a light hammer. When cleaning the plaster round a cornice or in any corners, the linife can he used as a scraper. If the end of the blade be broken, the knife can he restored to usefulness by regrinding it to a pointed shape See Glass.

HACK SAW : How to Use. A hack saw is used for cutting metal, and consists of a blade carried in a frame. The hlade is made of harder metal than the ordinary saw for cutting wood, and is either of dead hard or glass hard steel. The latter is extremely brittle. The frame of a hack saw is provided with pegs to engage the holes in the ends of the blade, and has a wing-nut so arranged that the blade can be strained quite tight by its use. Frames are made which are adjustable to take any standard length of mau-blade, but a fixed frame to take 12 in . blades will meet most ordinary requirements.

The blades vary in length, width, thickness, and fineness of teeth. The pitch of the teeth varies from 14 per in. to 24 per in or finer.

The coarser saws are used for most purposes, but the finer are essential for cutting tubing and thin shcet metal
The blade is placed in the frame with the teeth facing ontward, and inclined forward so лs $t$ ) cut on the push stroke. The holes in the ends of the blade heing placed over the pegs in the frame, the wing-nut is tightened so ns to strain the saw quite hard. While tensioning the saw, care is needed to prevent the blade slipping off the pegs, and to see that the blade is not slightly tivisted owing to the

 Hack Saw. Fir. 1. Pistol grip back sam frame in use.
Fig. 2. Bench back saw machine, in use, the vice cutting nceded to ensure that the stroke is made along the direction of the cut, otherwise the saw will snap. Another cause of broken blades is allowing the frame to cant over to right or left during tho stroke; the frame should be kept vertical. The full length of stroke should always be used, otherwise the teeth in the middle will get worn before the others.

A drop of oil on the teeth is sometimes a help when cutting mild steel, but the majority of mechanics use n saw dry on all materials. See Saw.

HADDOCK : How to Cook. Hatdocks include the fresh, smoked and dried varieties, and also the specially cured finnan haddocks prepared near Aberdeen. Those caught in Dublin Bry and off the coast of Devonshire and Cornwall are said to be of the linest quality. Fresh haddocks, which may be served in various ways, should be cooked as soon as possible after purchase.

To boil them, place the fillets in a fishkettle or frying pan containing just enough salted boiling water to cover them, and siminer for about 10 min . or until the Hesh is tender. A little vinegar inay be added to the water. If steaming is preferred, cut the fillets into convenient-sized pieces, and place them on a greased plate on top of a saucepan of boiling water. Cover them with a piece of greased paper, and then with another plate, and stean them until the flesh is of a creamy appearance. This should take $f$ hour. The water in the pan must be kept boiling rapidly. Oyster sauce can accompany boiled or steamed haddock, and parsley miny be used as a garnish.

To grill haddock, fillet the fish, cut each fillet into two pieces. "ash them, coat them with. melted butter and dip them into 1 oz . of liuur seasoned to taste. Then place them on a greased
gridiron and cook them for ahout 10 min . turning them once only.

Biaked haddock malics another good dish. To prepare it, wash, clean and scale the fish. and fill the inside with veal stuffing, sewing up the opening with fine string. Then either truss it in the shape of the letter $S$ or put its tail in its mouth, brush it all over with heaten egg and cover it with breadcrumbs. Put it in a haking-tin with a good lump of dripping. Bake it from $\mathbf{3 0}$ to $\mathbf{4 0} \mathrm{min}$, basting it occasionally with the dripping. Serve it with melted butter or anchovy sauce.

To fry a haddock, wash and dry the fish. and with a sharp knife cut the Hesh down the centre of the hack, carefully separating it from the hone. Cut the fillet across into convenient-sized pieces, brush each over with heaten egg and cover with crumbs Fry them a golden brown in hot fat : drain them well, and serve them garnished with fried parsley. Alternatively the fish may be dipped in batter, fried, and then served with a good brown sauce.
Smoked haddock may be cooked and served in a casserole. Wash. dry, and trim the fish and cut it into quarters. Nelt 1 oz . margarine in the casserole, add $\ddagger$ pint milk and the same quantity of water, and lay in the fish. Cover the pan and let its contents simmer for ahout 10 min . or till the fish is cooked through, when it should he taken out. Then mix $\ddagger$ oz. Hour with another gill of milk and pour it into the bottom of the casserole, stirring all the time. Let the whole boil up and thicken, add seasoning to taste, and then serve. The sauce should be of the same thickness as cream.

Haddock Ball. A dried haddock miay he used to make balls or rissoles. Boil the fish in a fish-hettle or frying-pan until it is tender. Drain it, and separate tlesh from bones. Well pound the tlesh before adding 1 or 2 tablespoonfuls of grated Parmesan checse, a little chopped parsley, and seasoning. Bind the whole with one or two well-beaten eggs and 2 teaspoonfuls of Worcester or other sauce. Form it into balls and fry these in smoking hot butter. They may he served on small rounds of fried bread.

Haddock Fritters. These are inade by brating up the boned remains of a cooked dried haddock with an egg. coatting neat pieces with batter and dropping the mixture in spmonfuls into very hot fat.

Haddock Scallop. Melt 1 oz. butter in a small pan over the fire and add to it $1 \frac{1}{2}-2$ gills milk and 3 well-henten eggs. Stir these over the fire until they begin to thicken, taking care that they do not boil; then draw the pan away from the fire and add about 6 oz. cooked smoked haddock, hroken into Hakes, 2 teaspoonfuls anchovy essence, 2 oz. breadcrumbs, a dessertspoonful tomato sauce, the juice of half a lemon, and some sensoning. Heat up the whole thoroughly and turn it into scallop shells, the insides of which have been huttered and sprinkled with hrowned breaderumbs. Cook the scallops in a quick oven until they are of a golden brown colour; then serve them immediately, garnished with small sprigs of parsley. This mixture can be spread on squares of buttered toast if preferred.

HAEMOPTYSIS. Coughing up or spitting of hlood which comes from the air passages or lungs is termed hacmoptysis. It is one of the symptoms of consumption and inay also occur in pneumonin, plastic bronchi$t$ is, and other diseases. When bleeding occurs the patient should lie down and keep quite still until seen by the doctor. See Bleeding; Consumption.

[^5]HAEMOSTATIC. Certain substances used to stop bleeding are known as haemostatics or styptics. Cold, astringent salts of copper, tannic acid, ergot, and the perchloride of iron are all haemostatice, as they encourage clotting or cause the vessels to contract, and thus stop bleeing. See Bleeding.
HAGGIS: How to Prepare. This Scottish national dish is made chiefly from sheep's fry, chopped and mixed with other ingredients. To prepare it, procure the stomach of a sheep and wash the hags in several waters, rubbing them well with salt. Then scald them in boiling water, scrape them carefully with a knife, and soak them in a strong brine for 12 hours, trimming off any sinewy parts or pieces of gristle.

Wash the lights, liver, and heart, and hang them up to dry for 12 hours; then put them in a saucepan with plenty of water and boil them gently. Take the small bag with the windpipe atiached, wash it free from the brine.
put it into another saucepan, with the pipe hanging outside the pan and plenty of water, and boil it slowly for about tivo hours.
Rub about a third of the liver through a wire sieve, and chop rather coarsely thi small bag and 6 oz. mutton suet. Mix these with the liver, adding 1 heaped breakfastcupful of Scotch ontmenl, senson the mixture with salt and pepper, and moisten with about 1 hreakfastcupful of the liquor in which the lights, etc., were boiled. Let the whole stand for $\frac{d}{2}$ hour, then stuff it into the large hag and sew it up securely, using strong thread. Put the haggis into a large saucepan of boiling water, and place a plate underneath to prevent it from sticking to the pan. Boil it quickly for $1 \frac{1}{2}$ hours, pricking the bag uccasionally with a skewer to prevent it from bursting, and add more boiling water as the water in the pan diminishes. Serve the haggis on a hot dish as soon as it is taken out of the pan.

## Hair: Its Beauty and Hygiene

## How to Stimulate the Growth and Preserve the Natural Gloss

For other information about the hair sec the articles on Baldness; Beaurv Culture; Electrolvsis, The reader may also consult the entries on various cosmetics and washes for the hair, e.g.
Brilliantinc; Henna; Shampoo

To keep it in good condition proper care is required for the hair from earliest childhwod. Five ininutea' massage night and morning is excellent. It causes the blood to circulate more freely and brings the necessary nourishment to the hair follicles. It also loosens any dandruff, which is one of the worst enemies of the hair, and properly distrihutes the oily secretions. The last benefit is n particuIarly important matter in the case of fair hair, as any artificial oil at the roots has a darkening effect, and nature provides the necessary gloss. Masange with the cushions of the finger-tips, heginning by placing the fingery under the hair by the ears and with gentle pressure going over the whole scalp until it glows with the friction. Rub in such a mianner that the scalp is moved and kneaded. This daily hair drill is more important even than hrushing. Another method of stimulating the circulation is to take small strands of the hair and give them short, quick pulls, going over the whole head strand by strand. It is interesting to remember that whatever improves the circulation of the scalp will improve the complexion, as the muscles and tissues of the whole head are closely related.

The scalp should he kept scrupulously clean. This prevents blocking up of the hair follicles with dirt or dried schum. Every hair has associated with it a sehaccous gland. 'These glands secrete a greasy substance known as sehum, which is nature's lubricant for the hair. If the follicles are blocked the cscape of the sebum is prevented, and thus the hair is not only deprived of natural gloss, hut the damming up of the secretion in the gland may cause pressure on the delicate hair root and permanently damage it.

The head should therefore be washed regularly, and the hair dried properly afterwards. An infant's scalp requires washing daily and drying with great care. A child should have its head washed once a week, a man usually requires a shampoo as often, and a woman every ten davs to three weeks. Very dry and brittle hair should not he washed so frequently as normal or greasy hair.

Method of Shampooing. To shampoo the head the scalp, and hair should be thoroughly wetted, and then a good lather rubhed briskly on to the scalp, with the tips of the fingers. Cake soap should not be applied, as it is almost impossible to rinse it completely out. Pure castile soap may be shaved and dissolved by pouring hot water over it. This
is a suitable shampoo for voung children, and for fair or white hair. Tar aoap lather js recommended for dark hair. A good herhal shampoo is satisfactory, and obviates the danger of leaving any soap in the hair after rinsing. The importance of complete rinsing cannot be too much stressed. and the final rinse should he with cold water. If the scalp, is tender an cgg shampoo is beneficial. A little horax may be dissolved in the rinsing water. For fair hair the juice of a lemon may he added to the water for the penultimate rinsing, and a little washing blue to the final one for white hair When peroxide is employed to lighten the colour of hair, frequent rinsings in vinegar and water are advisable, as the vinegar counteracts the weakening cffect of the peroxide.

After the thorough rinsing the hair should be dried with warmed towels Artificial methods of drying hair. though difficult to avoid when time is a consideration, are not to he recommended. as they tend to make the hair brittle. A little brilliantine hrushed through the hair after it is dry will inıprove its appearance and replace the natural oil temporarily removed by the shampoo.
The hair should be combed daily with a comh of good quality having rather thickly cut terth. A comb, should not be used to scrape the scalp. and no conib should be allowed to touch a baby's head, as it may darnage the delicate skin.

Brushes and Brushing. The softest brush only should be used for a baby; stronger bristles will not injure the scalp once infancy is past, provided the brush is of gond quality. Stiff-bristled hrushes are good for strong crops of hair, but whalehone and wire brushes are scldom advisable. The hairbrush with bristles embedded in a rubber foundation is a comfortable and healthful type of brush to use for the average head of hair. Such a brush should be frequently cleaned with the smaller hrush usually sold with it for this purpose. The Iatter can he dipped in warm soapsuds, shaken frec of drips, and used to hrush vigorously across the hairbrush. Rinse by applying the cleansing brush dipped in cold water, and dry as quickly as possible in the sun, or in a warm place. hut not too near a fire. An ordinary wooden-backed brush can be washed by dabbing it up and down in hot water containing a little household ammonia. When clean rinse the brush in cold water, or the hristles will soften. As brushes are capable of conveying skin infection, they
should be kept porfectly clean, and each child or person should have his own brush. It is unwise to use other people's brushes. disinfectant, such as a few drops of lysol. should be used in the rinsing water for the brush, should the scalp be troubled with dandruff.

The following method a. stiffening the bristles is said to be successful. Dissolve 2 oz alum in $\frac{1}{2}$ pint of warm water. and then dip in the brush. Leave for a few moments and rinse in plain water. The operation of dipping in the alum may be repcated several times. should the bristles seem to require it.

For older children and adults, unless the hair is very brittle, a good brushing for five minutes at least once a day is beneficial. The scalp should feel slightly warm after this The brush removes particles of scurf, stimulates the scalp, and so increases the blood supply to the hair roots and distributes the natural oil along the whole hair shaft. Brushing enhances the glossy appearance of the head.

Treatments for Bad Conditions. Should hair of any shade have heen allowed to get out of condition through illness or ton much exposure to sun and sea winds, and the scalp be troubled with scurf, a special treatment may be given. The head should be well massaged once a week at night with olive oil which has been heated in a small saucepan. A towel should be placed over the pillow to protect it from the greasy head and the hair shampooed in the morning. Tar soap lather is recommended, a double application being often necessary to get rid of the oil. Rinse afterwards in water to which a little borax has been added. This treatment can he assisted. until the hair is in good condition, by massag. ing into the roots twice $n$ week an ointment composed of 4 oz . vaseline, 80 grains salicylic acid, and 60 grains boracic acid ; alternating with this some lotion such as one made from 6 oz . bny rum, 3 drachma tincture cantharides, and 1 oz . spirit of rosemary, which should be used as a cleansing stimulant. An oil shampoo is not advisable for dyed hair, as it removes the colour.

The natural colour should return to faded hair after a two-montha' course of such treatment, and it is unaise to brighten it artificially heyond the occasional use of a camomile shampono for fair hair and ondinary henna ahampoos for light brown or red hair. Brightening lotions which contain peroxide dry the natural oil out of the hair and thus contribute to premature greyness.

Any lotion or tonic treatment should be atarted just after the hair has been shampooed, and may be applied by means of a tiny sponge or cotton-wool swab on the end of an orangestick, after the scalp has heen thoroughly stimulated hy masrage. Tonics should be left off when the condition of the hair improves. Premature greyness of an hereditary nature seldom yields to treatment, but when due to dandruff, or some similar cause, may be corrected by the following pomade: Hydrochloride of pilocarpine, 2 grains; tincture of jaborandi, $\frac{1}{2} \mathrm{oz}$. ; lanolin, it oz. ; coconut oil, Ifoz.

The value of most hair restorers depends to a great extent on the massage which is given prior to or during their application. The best contain ingredients which increase the flow of the blood to the scalp and thus stimulate growth. The commonest ingredients are some preparations o! sulphur, ammonia, bay rum, pilocarpine, cantharides, capsicum, spirits of mosemary and quinine. A good tonic restorer is composed of liquor of ammonia (strong), $\frac{1}{2} \mathrm{oz}$. ; chloroform. $\frac{1}{2} \mathrm{oz} . ;$ oil of sesame, $\frac{f}{2} \mathrm{oz}$; oil of lemon, $\frac{1}{2}$ oz. ; spirits of rosemary, 2 oz .

Restorers which contain sulphur are useful in cases of loss of hair due to dandruff. They act by destroying the cause and at the same time stimulating the skin. In general terms it
may be said that the use of hair restorers is futile in cases of baldness where the hair papillae (the papilla is the active part of the
hair) have been destmyed : whereas if the hair papillae atill exist the stimulation of a good hair restorer may quicken the local circulation and the papillae may recover anme of their old activity.

Despite every care a child's bair may become infeated with parasites at achool. To get rid of the nits the hair should be thoroughly moistened with equal parts of vinegar and water and carefully gone over with a fine toothed comb. Care must be taken to see that all nits and scurf removed are hurned in the paper in which they are collected.

The simplest preparation for killing lice is paraftin oil. This should be rubhed into the head at night, a rag soaked in the oil placed over the head and covered with n rubber cap. The treatment should he repeatod the following morning and evening, and on the morning after the head should be thoroughly washed with soap and water. Paraffin is very inflammable and naked lights must not be brought near it. If there is any soreness of the scalp an equal mixture of olive oil and paraffin should be applied at night for the next ten days.
Alternative applications are the B.P. ointment of stavesacre, which is obtainable from any chemiat, or the following: white precipitate ointment, 60 grains; zino ointment to make 1 oz .
Brushes, combs and caps must he disinfected by being soaked in lysol solution1 teaspoonful to a pint of warm water-and then rinsed thoroughly in soapy water.

Hair Dyes. Hair dyeing and tinting is best performed by experts, and henna dyes are usually the most antisfactory and also the safest to use. Some of the preparations sold for dyeing hair contain powerful irritants which may cause akin trouble involving not only the scalp but the face and neck. Un. fortunately these dyes include some of the most satisfactory brown colourings. At a reliable hairdresser's an expert will experiment with a small portion of hair before applying such a dye over the whole scalp, in order to see if the customer is immune from possible bad results. Henna dyes for various shades of hair are sold with full instructions for use.
The henna paste is left on the hair for the time required for the particular tint, and then washed off with water. If using any form of hair dye at home it is advisable to wear rubber gloves and protect the skin of face and neck by smearing them with vaseline before apply. ing the dye. The troubles with dyed hair are that it is difficult to kecp the scalp in goorl condition owing to the effect of oil and tonics on the colour, that the white hair growing at the roots shows fairly soon and requires frequent touching up, that it presents a hard and lustreless appearance and that it can rarely be succesafully permanently waved.
Hair can be bleaclied to blonde shades if this is carefully done. The bleaching should be effected gradually or the hair will suffer. Some women go over the scalp after a shampoo with peroxide ( 10 volume solution), applying it with a small toothbrush specially kept for the purpose.
Superfluous Hair. Pernxide is particularly useful for blenching dark supertluous hairs on the face or arms, and rendering them less noticeable. It can be used in a treatment with resorcin soap, a cake of which is dipped in bot water and mbbed on the skin. Water will remove the stain of this soap, but it should be left on at night. After washing the face in the morning apply peroxide of hydrogen and ammonia in the proportion of 10 drops of peroxide to 1 of ammonis. The solution must be freshly mixed each time and applied with a pad of cotton wool. It may smart a little at first, but the skin will grow used to the treat-
ment, which should be persevered with. After some time the skin may be able to stand a stronger solution in the proportion of 5 drops of peroxide in 3 of ammonia. Apply cold cream afterwards if the face feels sore. This treatment should eventually not only bleach but kill the hair roots. For strong, persistent growths of superfluous hair on the face either electrolysis or diathermy is often employed. It is essential to have such treatments performed by a good operator. (See p. 416).

Waving the Hair. Home waving with ourling irons is always a difficult matter and apt to be unbecoming. The simplest method is to part the hair and wind it round rather thick irons. This gives big natural looking waves; but is only suitable for longer hair. Hair with the slightest disposition to a natural wave should be encouraged by being set in combs after a shampoo. Straight hair when beautifully kept to give it a smonth sheen is hecoming to women with well-shaped heacls.

Permanent waving solves many hairdressing prohlems. At the same time it is not a means of lessening proper care of the hair. The scalp should be in good condition hefore the hair is permanently waved, and the process should be considered as a decorative atep towarda a charmingly finished head ratioer than as an end in itself. Cheap permanent waving should not be risked. The best operators-and the operator is of more importance in this connexion than the system employed-are to be found at the hest hairdressing catablishments, or in such departments at well-known stores.

Where disappointment follows after permanent waving it is usually due to lack of experience on the part of the operator or to lack of subsequent care of the hair. If the scalp is dry the permanent wave will make it dryer. The hygiene of the hair, as described in the first part of this article, must be daily practised and foolish prejudices about disurranging the set of the waves by massage and brushing must be discarded if the result is to be worth the expense not only of the initial operation, but also of the aettings, necessary at least once a fortnight, to keep the waves from developing into a mere friz\%.
This setting can be done at home with a setting lotion and by careful adjustment of special combs or metal clips used after a shampon. A not should be worn over the head while the hair is setting. Some women wear a ahingle net over combs at night to keep their permanent waves sct, but the practice is not really good for the hair, which benefits by being left quite loose.
In dressing long hair the amallest number of hairpins, compatible with making the knot securely olose to the head, should be used. Slides for children's hair should be of nonintlammable material.
HAIRCLOTH. Mohair, alproa, camel-hair and other clothe made from hair as fine as or finer than wool are only terhnically haircloths. What are usually known by this name are such coarse fabrics as horsehair or crinoline oloths, used by tailors to stiffen the shoulders of jackets, or the hair interlining for making soft lapels. Haircloth is employed for interlinings because of its resiliency; when bent, it tends naturally to return to its position, thus keeping the garment in shape.
Crinoline cloth lent its name to the style of dress in whioh the skirt was distencled by the stiffness of the horsehair. Tail hairs of horses woven one at a time across a set of cotton or linen threads make both crinoline cloth and the horsehair seating to be seen on furniture. As chair-seating material, haircloth is immensely durable. Crinoline made from real horsohair for hat shapes has been largely replaced by $n$ form of artificial silk.

To make flexible canvas hair interlinings, Chinesc human hair, as well as goat and other
stmang hair, is used; the fabric resem bles a brown flax oanvas, but is more springy. The hair carpet sold for stairs and passages is made in the


Hairpin Work. Fig. 1. Showing how the frst pattern is worked on the prong. Fig. 2. Medallion of coloured raffia, a suitable trimming

Haircloths are made for atrainers for kitchen use, and for belts for driving machinery. In buying haircloth for interlining coats the resiliency may be tested by folding and creasing the sample, and noting how it recovers its Hatness.
HATRPIN WORK. This work is so named because of the fact that it is done on a twopronged fork which resembles a large steel hairpin. It is made in several sizes, and there is also an adjustable fork, the width between the prongs being regulated by a screw. On this implement insertions from 1 in to about 4 in. wide can be worked in thick silk, cotton, or raftia

Fig. 1 shows the first pattern in hairpin work, and it is on a prong measuring $1 f$ in wide. A steel crochet hook is also required of a size according to the thickness of the working thread. Make a loose crochet chain on the hook and draw it out until it is about as long as half the width between the prongs of the pin. Draw out the crochet hook, slip this loop on the left-hand prong, and see that the length of working thread is in front of the fork. Hold the pin with the thumb and middle finger of the left hand and the rounded part in the paln. Pass the thread round the right prong from the front, and put the hook upward, from the front, through the loop on the left prong. Catch the thread and draw it through the loop, thread over the hook and draw it through the loop which is on the hook, making a double emohet.

Pass the thread from behind round the left prong, and turn the latter to the right, so that the thread now surrounds the right prong. As the pin is turned, let the orochet hook pass between the prongs so that it will be in position to work from the front again. *Draw the thread through the loop on the hook, then put the hook upwards from below through the loop on the left prong, draw the thread through and work a douhle crochet as beforc. Repeat from * until the pin is full, then take the lonps off the prongs, and if more are wanted replace two or three of the loops at the top and continue working as before.

IVhen the work is taken off the prongs the little doops twist into a figure 8. To make an insertion, join the silk to the first loop by working a double crochet into it, inserting the hook from right to left all through to preserve the twist or figure 8. After the double crochet possible.
make one chain atitch, and continue all along, alternately working one chain and one double crochet in the loop. Work the opposite loops in the same way to complete the insertion. A ace can be made by working $\pi$ shell edging

Fig. 2 shows the hat trimming worked with raffia, and $a$ No 00 ateel crochet hook, on the small prong $1 \frac{1}{4} \mathrm{in}$. wide. Raflia can be bought in many colours, as well as natural coluur. Before working the raffia it is best to soak it in cold water for about 10 min . to make it more pliable, after which wipe the water off. Proceed as in Fig. 1 until there are 18 loops on euch prong : slip off the pin and cut the raffia, then tie this cut end to the end at the beginning of the work to form a ring. Run a piece of raffia through one mund of lonps and draw up so that it forms a Hat piece; tie and secure the raffia A piece of silk could be uscd for the latter purpose, as it is inside the loops and the ends need not show.
When a sufficient number of these ringa have bcen made in various coloury they can be arranged round the crown of a shady garden hat made of coarse straw. See Crochet : Raffia.

HAIR SPRING. This name is given to a small spring used in conjunction with the balance-u heel staff of n timepiece. Its function is to control the regular motion of the balance wheel. It is a very delicate spring and should never be interfered ith. See Clock; Watoh.

HAKE: How to Cook. Many consider hake to be superior to haddock and plaice, both in llavour, digeatihility, and nutritive qualities. To bake it, out four slices from $a$ inedium-sized hake, wash and dry them, and lay then, in a greased fireproof baking-dish. Dredge them with Hour and sprinkle over them a good seasoning of salt and pepper, a teaspoonful each of finely chopped paraley and onion, and 1 oz. butter cut into small pieces. Bake the fish gently for $\frac{1}{2}$ an hour, basting it occasionally; then place it on a hot dish, strain the liquor over it, and it is ready for the table.

Hake au gratin is prepared in the same way except that the parsley and onion are omitted and a tablespoonful each of browned crumbs and grated cheese used instead. Hake may also be cooked according to nny of the recipes given for cod. See Cod; Fish.

HALATION : Of Negatives. Halation is a fogging of negatives caused by scattering or reflection of light in the film. Thus if a window through which sunlight or a strong light passes is inoluded in a photograph, not
only will the window part of the picture be considerably over-exposed, but all round it a fog of light, without any detail whatever, will appear in the print.
Similarly, halation will appear when trecs against a bright aky are photugraphed. The trouble is largely overcome by coating the back of a glass plate with a preparation which absorbs the light passing through the film and prevents its reflection on the underside of the film. This is known as backing the plate. It has been found that unbacked plates coated with a matt emulsion hardly suffer from halation at all.

Films do not suffer from halation to the same extent as plates, but care should be taken not to over-expose if strong bigh-lights are in the picture. Where moderate halation occurs with over-exposed high-lights, the defect can be overcome to a certain extent by local reduction of the negative. The fngged over-exposed portion is treated with a weak reducing solution applied with a piece of cotton wool on a niatch-stick See lReducer

HALF TIMBER. This term is used to describe those buildings, chiefly houses, in which the framework is of timber, the intermediate panels being lilled with brick, plaster stucco, or other material of that kind. In some of these houses the masonry or brickwork rises through two storeys, and the half-timher work is confined to the gables. Many old examples were covered with plaster or stucco, but in some cases this has been subsequently removed.

This style, which prevailed in England in the 16 th century, when native timber was plentiful, has been much imitated in the 2()th century. Modern half-timher houses, however, differ essentially from the old ones, for in them the timbers are merely on the surface, heing only thin pieces of wood nailed to a brick hacking and lacking the solid look that real half-timber work can produce. See Architecture; Cottage

HALIBUT. Baked halibut is prepared in the same way as hake (q.v.), except that it is cuvered with thin slices of bacon or ham.

To stew halibut, wash and dry 3 to 4 lb . of the fish, put it into a stewpan, and barely cover it with milk. Add an onion with 3 or 4 cloves stuck in it, a bay leaf, and a little salt and peppuer, and bring all gently to bailing point. Mix together 1 oz. flour and 1 oz . butter; add this to the halibut and simmer the whole gently until the bones can easily be separated from the flesh.
Serve it on a hot dish and pour over it some of the liquor, to which has been added a teaspoonful of lemon juice and seasoning. The remainder should be sent to table in a satuce boat. This provides a specially good way of cooking the head and shoulders of halibut.

## Halls: Decoration and Furnishing

## Suggestions for Treatment in Various Styles

## This article concludes with a section on the construction of a hall stand. Sec also the entries on Carpet; Chalr; Chest; Chimncy Piece: Cupboard; Door-i Electric Light Fittings; Flowers: Fricze: Furniture; Grandfather Clack; Landing; Panelling; Settle; Staircase; Table

It sometimes seems as though the ball had colour, flooring and ligiating fittings are somebeen neglec ted in a sc heme of house decorstion; yet, npart from the fact that every corner of the liome should be well and suitably planned, the hall is also important because visitors take their first impressions of the house from the entrance. Therefore it is necessary to give the hall as hospitable and friendly on air as

This is especially difficult with the small narrow hall, which is still too often merely completed with an umbrella and coat atand, a hard wooden chair and $n$ hall table of unpleasing shape. For the larger type of hall it is easier to evolve a good decorative scheme, whether on classical lines or with comfortable lounge furniture; but here, too, details of
times not oarried out to a harmonious conclusion.

In furnishing much depends on whether the staircase opens directly out of the hall or from an inner hall, which may or may not be entirely cut off. A beautiful staircase npening out of the hall directly makes all the difference; it is an architectural feature which can only be molified or disgused at considerable cost if it is not well designed and executed when huilding the house

In some modern houses there is a square entrance hall, of which the fourth wall is left incomplete, leaving an open archway to the back hall from which the staircase ascends. If the hall is to be used as a lounge and living-


Hall. Fig. 1. Panelled and tiled hall, with Jacobean oak furnishing and beavy beams
room, it is convenient to have an inner glazed door, so that there is light and a view on to the garden. as the main door can then be left open. This is desirable, because it is rarely possible to secure more than one window in the hatl. A good example of such a door is scen in p. 37:3. The glass panels and wrought iron work of this type of door look part icularly well in a dignified hall with black and white tiling and one or two pieces of beautiful furniture.

In some houses the hall is converted into a lounge by removing the partition which separates it from the front roon. Here also an inner door is advisable, more for the purpose of keeping out draughts than for giving extra. light. In the absence of such a door, draughts may be avoided to some extent by the use of a leather screen
Suitable Furnishing. If there is a fine pavement, such as a black and white square, this is always effective. A composition paving which simulates stone, an oak plank or a good
parquet flooring, an inlaid linoleum to resemble the last, or rubber-tiled and marble lloorings are all suitable Persian, other Oriental, or modern rugs which introduce brilliant colouring in geometrical designs, give an air of comfort. For the long narrow corridor often met with in a flat, a strip of wide stair carpet in a good design is usually a better choice than intermittent rugs when the boards have to he stained. Plain carpet looks attractive but shows every footmark Hall door mats should fit neatly.

Where there is either an outer hall or a back hall the question of the position of the hall stand is solved. These pieces of furniture are not decorative, and conts, especially when they arc wet, are not henefited by being hung up on them. The cupboard, either built-in or movable, is a welcome alternative and serves also for an umbrella stand, when fitted with a rack for this purpose fixed to the inside of the door. In the small Hat wet coats and umbrellas are often accommodated, while drying, in the bathroom, a row of pegs being provided on the door for the former and the latter being left open till dry. In larger old houses and in most modern ones there is usually a cloak room off the hall where coats
and mackintoshes can he properly hung up.
In old country houses the open fireplace is usually an important feature of the hall. In the modern house, if there is no central heating, the most practical fireplace is the anthracite stove. Radiators can be cleverly hidden behind wiought iron or wooden gilles under the window or at a turn of the stairs.
A favourite style of furniture for the lounge type of hall is the Jacobean, or, if it can be


Fig. 2. Small oak furnished hall with panelled and carved oak staircasa and doors. Fig. 3. Lincrusta panelling to imitate carved oak surmounted by a frieze, suitable for a modern flat

2, Humphrey Joel; 3. Courlesn of Arthur Sanderson a Sons. Ltd.
obtained, Normandy oak Old oak chests for keeping requisites for outdoor games, a big oak cupboard for hanging mackintoshes and coats, a gate-leg table for ten, an oals bureau, high-backed chairs, some ensy chairs and a settce covered in velvet or in a printed linen of Jacobean design, a table for visiting cards, in post and out post, and in the country; should there be no electric lighting, another table by the staircase for bedroom candles and lamps-these are the usual picces of fumiture required for such a hall. As there are often many exits andentrances, n tall draught screen placed where wanted is a uscful addition.

For floral decoration much depends on the type of ha! and the taste of the owner. Formal orange trees in big tulss are picturesque in a


Fig. 4. Large hall, simply furnished, with low pillared archways and windows set near the cailing
hall with paved floor; in a country house such plants as hydrangeas, azaleas or geraniums in tubs or large pots. palins or small flowering trees or Japanese trees can also bo used with good effect. In many country houses a feature is made of this floral decoration of the hall, and it is transformed into a winter garden during the gloomy months. In the summer an arrangement of flowers on the hearth as described and illustrated in pages 472-473 gives a very inviting air.

The colour scheme must be carefully thought out, as the decoration of the hall is the keynote to the whole house. Where this is treated on modern lines, the furniture and decoration of the hall will, of course, fall in with it. Where there are panelled walls and an old wooden staircase the choice of furniture and flooring for the hall will not quarrel with the period. The latter type of hall needs few wall ornaments. Pictures should be scarce and oil paintings look best when let into a panel over the lireplace. Panels of tapestry also give good notes of colour.

The question of lighting is important. The choice of hall lillings is varied and many firms specialize in good designs suitable for various styles and periods.

Our Illustrations. A particularly charming old wrought iron lampl head fitted for electric light completes the newel at the base of the polished and uncarpeted stairs in the first illustration. This hall is furnished in a delightful style. Its dark panelling, leaded casement and heary beams demand plain furniture. The Jacobean table and stools accord perfectly with them, while the early 18th century grandfather clock is equally happy and the red tiled Hoor adds a rich note of colour. This is further enhanced by the azaleas and a few pieces of old brass.

Another inviting but smaller panelied hall is shown in Fig. 2. Here the interest is centred on the carved oak of the double doors into the sitting room and of the staircase. A

Persian rug on the oak boarded flonr makes a connecting colour link between the Oriental design of the silk casement curtain and the pottery on the shelf formed by the architrave of the door. An old settle is visible on the left and there is an attractive gong. This hall is warined by a radiator and lit by a hanging oil lamp.

Although imitations are seldom deceptive, quite a gond effect can be obtained by using lincrusta moulded wall covering, which simulates oak panelling. Made in rolls and fixed like wallpaper, some of the designs are exact copies of old English paneling. In flats or houses rented for periods of a fow years, most people would hesitate to pay the large sum necessary to panel a hall and staircase in real onk. These lincrusta wall coverings are useful in such cases especially when surmounted by an nnaglypta frieze with plasterlike relief, as shown in Fig. 3. The dark oak coloured cornice is a change. Both frieze and ceiling are distempered an old ivory ahade. The carved pedestal with its Chinese jar, the oak chair and the Oriental carpet are all well chosen to furnish this amall hut rather highly decorated town hall, which requires no heavy pieces.
A very different type of entrance is shown in Fig. 4. Here the black and white marbled tiling and pillared archways call for dignified and restrained furnishing. The white painted ataircase with its mahogany handrail has $n$ suggestion of Georgian style. Colour accents are supplied by the pieces of old china and the fowers on the table.
A difficult hall to decorate succersfully is the long narrow corridor type found in many llats. Fig. 5 shows a hall of this kind panelled in simple Georgian atyle in accord with the furnishing of the sitting rooms opening off it. The polished chest just breaks the straight look of the passage, the round mitror also helping to do this on the other side. Wherever an appearance of space is needed light selfcoloured walls should be chosen. A modern


Hall. Fig. B. A narrow hall treated in such a way as to give an effect of spaciousnes:
treatment for such a hall might he pale grey papered walls and a silver ceiling. Colour viould he introduced by the curtains and carpet.
For either Hat or small town house the treatment shown in Fig. 6 is suitable. The


Fig. 6. Wallpaper treatment with applied landscape motil on a varnished and marbled paper Arthur Sandersoll \& Sons. Led

Inndscape wallpaper motif is bought separ ately and applied with the framing of raised moulding. In a tiny hall, one such motif is sufficient, but in the case of a house the landscape night be repeated on suitable spaces on the landing walls. The paper used with the motifs has a marble tiled effect in grey-green colouring which is in pleasing harmony with the sky, foliage and water of the landscape.

Hall Stand in Oak. The hall stand shown in
Figs. 7 and 8 is inade from a set of prepared materials put up by Handicrafts, Ltd. Kentish Town, London, N.IV.5. Joints are already cut, and the difficult prortion of the work has been done.
The diagram shows the method of assembling thic component parts. The back is taken in hand first, the joints being glued up and the whole cramped and put aside for the glue to set. It will be seen that dowels are largely used, this method presenting little difticulty to the worker. The mirror and plywood panel fit into the grooves in the uprights (Figs. 8 and 9 ), a beall being mitred round the front to finish. The mirror is secured at the back as shown (Fig. 9), and is covered in by a plywood hackboard

The front of the stand is glued up, less the shaped brackets, and put aside to set hard. It is connected to the back by glueing up and fixing the top and botton rails. The hoard which receives the two drip pans is supported by slips glued to the sirle rails. The shaped brackets are added afterwards. The methods of fixing the capping and securing the plywood panel are shown in Fig. 9.

Hall Mark. See Silver
HALLOWE'EN. Hallowe'en, or All Hallowe'en, is kept on Oct. 31, the evc of All Saints' Day, and from the customs of pagan times some gamics lave come down to us.

Chestnuts are used for purposes of divination. They are roasted on the bars of the grate by different people in turn. If a girl is in charge slie names threc cheatnuts after men of her acquaintance, and the one that pops first bears the name of the man she will marry. The men name their chestnuts after girls with the same purpose. If two nuts are put on


Hall. Fig. 7. Hall stand, the making of which is described in the tert. Fig. 8. Details lor the construction of this useful piece of fernitury
work, and that the material is 3 in . wide and quantity of common salt, and 2 oz . of aaltpetre; 2 in thick First plane up the materinl on all rub the hams well with this mixture, and put sides, and square off the ends Then at a them in a vessel large enough to hold them. distance of 3 in . from the end square a line Leave them for another three days; then pour around three sides of the material, set the a quart of vinegar over them. Turn them over marking gauge exactly at half the thiokness in the brine once every day for a month, then of the wood, and mark a line on the edges of the pieces of wood, on buth sides, and the end where the joint is to be made

Place the wood horizontally in a vice, or rest it against the benoh hook, and saw actose the wood exactly on the line marked acioss it. and to a depth of half the thickness of the material. Put the material in an the material Put Halved Joint. Method of joining two pieces of wood
the material in an
securing the carefully Btted parts with glue or screws along the line cut by the marking gauge, sawing to the edge of the line. This will remove a square pioce of woud. 1 in thick, from the main portion, and if both are oarefully bavin, the result should bic a neat and accurate joint when the two piecea are put together.
The joint surfaces should he trued up with a sharp chisel, and the two pieces accurately fitted. The joint is completed by glueing, sorewing, or nailing the parta together. The same principle can be adnpted for oblique-angled joints, or for running jointe, as when joining the ends of two pieces together in a straight line.

HAM: Curing and Cooking. When selecting a leg of ham chonse one that has a short shank and a moderate amount of fat. and test its freshness by inserting the knife under the bone. The ham is good if the knife comes out clean and smella fresh, and had if daubed and of a rank. disagrecable nolour.

Hams may he cured at home by rubbing them well with common salt. leaving them to stand for threc days, and then draining of the brine. Mix I Ib. of brown sugar, the same



Halved Joint. Method of joining two pieces of wood
securing the caratully fitted parts with glue or screws
drain them well and hang them up to dry. When sufficiently dry put them in muslin baga to protect then from flies and dust After draining them from the brine, an alternative method is to smoke them over a wood firc, hanging them directly above it
To boil a ham, first soak it for nbout I2 hours, or longer if it seems very dry, wash it thoroughly and trim away all rusty parta. Put it in a pan with enough cold uater to cover it, and bring it gradually to the boil, remuving all scunn as it rises. Then let it simmer gently until tender. A ham weighing about 10 lb . will require 4 hours' gentle onoking. When done, take it out of the pot. strip off the skin, and sprinkle over it some browned crumbs or raspings. If the ham is to be served cold let it reinain in the water until quite cold, as this renders it more mellow.

A ham nay also be halied. To do this, first soak it in cold water for 12 hours, then wipe it dry and trim off all rusty parts. Make a crust of linur and water, thick enough to keep in all the juices, cover the ham entirely with this, put it into a baking tin in a moderately lint oven, and balie it for about 4 hours. Then remove the crust, and skin. Cover the top with raspings, and pin a paper frill mound theknuckle.
A favourite breakfast dish, fried ham and egga, is prepared by cutting the required number of slices and frying them. Cook the ham on both sides and then keep it warn while the eggs are heing prepared. Brenk thesc, one
at a time, into a cup and then cook them in the fat which remains in the pan, adding a little more if necessary Baste the eggs with the hot fat to set the tops. When set take up with an egg alice and lay them on the hana. Ham prepared in this way may also be served with baked or grilled tomatocs. Grilled ham may be cooked in a Dutch oven before the fire or beneath a gas griller.
Potted ham is made by minoing together Ib cold lean ham and 3 o7. cold roast veal, and then pounding them in a mortar with $\frac{1}{\frac{1}{3}} \mathrm{~h}$. butter; aslded by degrecs. When all are well beaten, sprinkle over them a mixture comprising \& teaspoonful freshly pounderl mace, a little less than quarter of a grated nutineg and a good pinch of cayenne. Mix all together, and then press the ment into pots, pouring clarified hutter over the top. If kept in a cool, dry place this ment will remain good for over a fortnight.
To glaze a ham, take off the rind, trim it and, after placing it in the oven for a few minutes, dry it with a cloth. Dip a paste brush into some melted glaze and brush it over the ham, giving two or three coats.

Ham 'Pie. To make this pie, buil 3 oz . of macaroni, allow it to get cold, and cut it into inch lengths. Mince $\frac{f}{2} \mathrm{lb}$. ham, and put a layer


Ham. Boiled bam sprinkled with breadcrumbs and garnished with parsley and a paper frill round the bone of this at the hottom of a pie-dish. Season with pepper and aprinklc over it some minced parsley; then add a layer of macaroni, some chopped onion, and some small pieces of butter Continue these layers until the dish is almost tilleal, and then add a little white sance, a layer of fine breadcrumbs, and some more pieces of butter. Bake the pie in a moderate oven until it is lightly browned.
Ham Souffe. A large cold ham souffić or several amall ones can be made as follows : Chop $\frac{1}{2} \mathrm{lb}$. lemn cooked ham, and pound it in a mortar with $\&$ pint hrown sauce, nfterwards rubbing them through a sieve. Whisk If gills of melted aspic jelly until it begins to set; then stir it into the ham mixture. seasoning it with salt, pepper, ground nutmeg and mace. Whip $\ddagger$ pint eream until it will just hang on the whisk; then stir it in, whisking it for abnut 5 min .

Have ready some small snufflé caser, tie a band of foolsenp paper round each, reaching about 1 in. higher than the top of the case. Put in the mixture, arrange in the centre a atar or other design out from truffle or chilli and pour over a little melted aspic. Leave the souffers until they are set : then draw off the hands of paper. See Bacon; Carving : Chicken: Glaze: etc.

## Hamamelis. See Witch Hazel.

HAMBURG FOWL. One of the most graceful and attractive of fowls, the Hamburg is a fine layer where a good strain is secured. It does better on a wide range than in confinement. The best known colours are the blacks, gold, and silver spangled, and gold and silver jencilled. See Fowl: Poultry.

HAMMER. The commoneat type fot metal-worker's use is that known as the enginecr's hall-peine hanmer, Fig. 1. These are made in all weights, from $\ddagger \mathrm{lb}$. to 4 lb . or more, the weight being that of the hend, or
metal part, of the hammer. which is of cast steel, with an ash or hickory handle. For use in ordinary wood work, a Warring. ton hammer or an Exeter pattern ham. mer is convenient. The former is similar to the engineer's cross peine hammer, but longer in the head. In the Exeter pattern (Fig. 2), the cross peine is set to the back of the head, and not central

## ${ }^{2} \mathrm{H}$ in the former case.

The Kent pattern claw hammer is useful in the house, the claw being handy for the withdrawal of nails. Riveting hammers are made with a small cross section and a long head with a cross peine. The ball-peine pin hammers (Fig. 3) are almost as suitable for riveting, and extremely handy for driving all classes of tine tacks, panel pins, and for suoh purposes as fixing the bead mund a window frame. The upholsterer's hammer (Fig. 4) is notahle for its great length of head, and is made in two forms, one with a claw and the other, known as a cabriole, with a narrow cross peine.
The hide-faced hammers comprise a wood handle, and a cast or wrought iron socket with inserted pieces of raw hide. They are used for sheet metal work, or on parts where hammer marks or bruises would be objectionable. A somewhat similar hammer is made of brass. Jeweller's or watch hammers are small and very light in weight : their use is necessary in this class of work.
Slcdge hammers are outside the scope of amateur work, except perhaps the 3 lb . hand sledge or smith's hammer, which is often useful for small forging jobs worked cold in the vice. A somewhat similar hammer is the mason's club hammer (Fig. 5). The lath hammer has a flat face for driving the nails, and a broad axe-like face for cutting the lath. Chasers or repouzsé hammers (Fig. 6) have a face large in diameter and a ball or other shape peine.

Fitting a Handle. When fitting a hammer head to a handle the end of the handle is shaped to fit tightly through the eye of the hammer. A slot is cut in the end of the handle, and a thin metal or hardwood wedge driven into it. Very often the hammer head and the end of the handle are first dipped into water, as this causes the wood to swell and makes the handle fit tight. Generally speaking, the lighter the hammer, the longer and finer the handle, a more effective blow being struck when the handle is resilient. Claw hammers and some others are provided with forged ears or side plates, whioh are fitted to the side of the handle.

After heavy wear a hammer may require regrinding to restore the smooth and true surface of the face, which is essential to accurate work. If the head gets slack on the handle it should be refitted, otherwise it is liable to fly off. No hammer should be used except when its face is clean and dry. Oil or glue on the face will cause the hammer to slip, and painful bruises may result. See. Amateur Carpentry ; Claw Hammer; Nail; Repoussé; Tool.

HAMMER TOE. In this condition the toe is bent upward at the first joint and downward at the second. The second toe is most commonly affected. It may be due to wearing short and narrow boots, and is often associated with hallux valgus, or displacement of the great toe towards the middle line. . Claw foot is usually accompanied by some degree of hammer toe. Corns form on the parts pressed on, with resulting pain and discomfort. In the early stages the condition may be rectified by


Strong ropes are fitted to the extremities of the rods, an eyelet or thimble being worked into the bight of the rope. The hammock is suspended by chains or ropes hooked into or passed through these eyes. Another style of hammock is made from separate strips of webbing, such as is used in upholstery work; a good plan is to make the stretchers first and to fix them on to the back of a chair, so that they are at the deaired distance apart. A sufficient quantity of webbing having been obtained and out off to the proper length, the outer pieces are applied to the stretchers, putting a double thickness of webbing at each side and securely sewing them together.

Other long pieces of webbing are then spaced about 1 in. apart, folded round the stretchers and sewn together at the joints. Those in the centre should hang down a few inclies helow the line of the side picces. The cross pieces should be placed underneath the long-way pieces and sewn to each of them. They may be spaced about 2 in apart. The hammock is suspended by ropes

Fig. 1 shows a netting hammock suspended between two apple trees. Any good-quality twine or string may be used, picture cord or stout cotton cord. The hammock can be miade like a net with shuttle and cord, and another method is to tie the cords together, using a reef knot. To make a hammock about 12 ft . long, which is the usual length, will requirc a set of cords each measuring 18 ft . long; these arc arranged in pairs, and 24 pairs are required. Work is com. menced in the centre by looping the pairs of atring round a stick such as a broom handle,

Hammock. Fig. 1. Hammock ot netting bunk between two trees. Fir. 2. Tying the frat row of knots in netting a bammock. Fig. 3. Close view of first stare in tying a knot. Fig. 4. Second stare, showing how reef knots are made. Fir. 5. Second row of knots in process of tying. Fig o. Simple stand for use with the hammock shown above
wearing well-fitting boots and perhaps a splint; but generally an operation is necessary. See Boots; Clawfont; Foot.

HAMMOCK. In the domestic sense, the hammock is a swinging seat fixed up in the garden, and may serve on occasion for a bed. There are numerous types, varying from the simple article made of cord or canvas and slung between two trees, to elaborate devices fitted with specially constructed stands, spring mattress and cushion beds, wind shields and awnings. Simple hammocks vary in prices from 10s. to 50s. A padded couch hammock with an adjustable canopy, and upholatered in gaily striped canvas, is considerably more expensive, especially a model with a patent adjustable tea tray.

A simple form of hammock may be made by taking a piece of stout canvas and turning a very strong hem at each end, inserting through each a 1 in. dianeter hardwood rod.

supporting this at each end on the hacka of chairs so that the stick is at a convenient height; the loose ends are hung up out of the way while the first half of the linotting is in progress, as in Fig. 2.

All the knots have to be made at the same distance apart, and to do this it is necessary to make a mesh aticl or post. The latter has a foot-piece that enahles it to be kept upright with the foot while the hands are inee to effect the knotting. Fig. 2 shows the first stage. The mesh stick is simply a post of wood about 30 in . high, $3 \frac{1}{2} \mathrm{in}$. wide and about 1 in. thick. The upper end is shaped to an
oval form, and half of it cut back to n depth of $\frac{1}{2}$ in. to serve as a guide for the first row of knots ; the other knots are tied around the thicker part. The shape of the top will be clenr from Figs. 3 and 4
Commence at the left-hand side of the centre post, and place the mesh stick against it, with the outer pair of strings separated by the mesh stick. The outside cord $A$ is taken in the left hand and placed behind the smaller notch on the meshistick. The cord B to the right is taken in the right liand, passed over $A$ and held by the left hand. $A$ is passed over and under B, then under and over $B$, and the result is a reef knot that will not slip. Figs. 3 and 4 show how all the cordsare tied with this knot.
After tying the first pair of cords the mesh atick is removed and the next pnir tied, and so on until all the 24 pairs have been tied once. The mesh stick is then used at its full width for all the remaining knots on the first half of the hammock, but instead of starting by tying the outer pair together, only tho inner one of the outer pair of cords is used, na the outer cord has to remain straight. The inner cord of the outer pair is tied to the outer cord of the next pair, and so on, as in Fig. 5, continuing to the other side of the hammock, thus leaving a single cord on the outside.
The knots that niake up the thind row are then tied in the same order as the first, and this procedure is continued until the netted portion is nhout 4 ft . long. The centre har is then removed by sliding the cords off it and the loops smoothed out; the stick is then placed through the original second row of knots and the other half of the hammock is tied as before, starting the first mow of the knots with the full width of the mesh stick. When all the cords are knotted in this way the ends are brought together and worked around the end rings, and the hammock is ready for usc, but can be embellishicd with n pendent fringe, if desired, attached to the sides of the hamnock. The hammock is suspended by chains or ropes, as shown in Fig. 6, or can, ns before stated, be slung between two trees See Garden Furniture; Knot; Netting.
HAMPER. A hamper is a large basket usually made of wicker or cane and fitted with a lid. It is used by laundries for conveying clothes, and also by many persons for carrying food to race meetings, picnics, and the like. See Basket: Picnic.
HAMSTER. Tlis fur, obtnined from the rodent of the same name, is clienp and of hard wearing quality. Short and shading from yellow to grey, with curiously shaped black markings down the back, it is used chiefly in the form of linings for winter coats. See Fur.
HAND. The utility of the hand mainly depends on two factors, namely, the power to oppose the thumb to the other fingers so that we can grasp implements, and the large amount of brain surface devoted to its surface.
A wound of the upper part of the palm may
free bleeding. It may be arrested by putting a firm pad of moderate size over the wound and making the hand into a fist over this; then applying a firm bandage nod supporting the liand, well elevated, on a lesser arm sling. If some difficulty is experienced in cheching the bleeding, the brachial artery sloould be compressed, an improvised tourniquet being applied if necessary
Care of the Hands. Well-shaped, supple hands with long, smoothly jointed fingers. nicely kept nails, and skin which retains its softness and delicacy of tint in all weathers are a rare but inportant ploint of beauty culture. Ilthough atructural shape cannot be altered, much can be donc to improve appearance and render defects less noticenble, but it is the constnnt everyday attention which counts ; spasinodic treatment is of little use
Unsightly hands are a drawback, causing a feeling of discomfort which renders their possessors self-conscious. Those who suffer from red, swollen hands in cold weather should pay particular lieed to general hygiene, as well as to local care. Regular massage and electrical trentment are beneficial in many cases. Vigorous scrubbing with a soft nailbrush when washing stimulates the circulation. and it is a good habit, after the use of hot water, to run the cold tap over the hands before thomoughly drying.
A pure toilet soap-that is, one which docs not contain frec alkali and is made of the best quality of fats-should be used to clennse the hands. A night treatment is started by washing and kneading them well in the soapy lather, drying on a soft towel, care being taken to press down the cuticle of each nail in turn, massaging a hand balm into the skin and leaving a liberal allowance of the emollient on the hacks of the hands, to be protected during the night by a pair of loose wash-lenther gloves from whiclo the tips of the fingers have been cut.
An excellent balm for this purpose, adapted from an old French prescription, is made by mixing 2 oz hydrous


Hand : stares in manicure. Fir. 1. The nails are first fled and the edges bevelled with an emery board. Fir. 2. The cuticle is then pressed down with an orange stick dipped in peroxide of hydrozen or lemon juice. Fig. 3. Polishing the nails by painting with simple tincture of benzoin. Fig. 4. Final treatment of the hands by rubbing in vanishing cream, working from the wrist upwards
olive oil and $\frac{1}{2}$ oz almond oil in a warmed mortar or in a basin placed over hot water; beat in 2 drachms zinc oxide and 1 drachm boracic acid until quite smooth, and then, while continuing to beat the cream. slowly add $\frac{1}{2}$ oz orange flower water with which 2 drachms of glycerin have been mixed

This balm has a smoothing and whitening effect on the skin, and should be applied at least three times a week. A little glycerin jelly may be massaged into the hands on other nights, or a bleaching lotion made of 4 oz . rose water and $\frac{1}{2} \mathrm{oz}$. each of hydrogen peroxide and atrained lemon juice may be used when it is desirable to reduce redness or tan from exposure, or freckles. Warmed buttermilk is a good and soothing bleach.
For chapped hands, clarified mutton fat, perfumed to liking, is a simple but efficacious remedy. Great care should lie taken, especinlly in cold weather, thoroughly to dry liands which are liable to roughncss. I little fine ontmeal rubbed over the skin after drying absorbs any moisture

Lnose gloves should be worn when doing mugh work, and nfter laundry or washing-up glycerin jelly should always be npplied. Stains are best removed by pumice-stone, which is also helpful for rubbing down hard skin on the finger-tips or palms of the hands. Lemon juice is of constant use. Half a cut lemion should always be kept on the wash-hand stand or by the sink. Rubhed over the liands and washed off with cold water, lemon juice tightens up wrinkled skin and removes dirt from nails when each finger-tip is thrust into the pulpin turn, and then thenail is carcfully cleaned by means of an orange stick, its point wrapped in a shred of cotton wool.
Before starting any work which may soil the nails it is a good plan to dig them into white

powder-corntlour will do-leaving it under the nails until the work is finished and then removing the powder with an orange stick, when the nails will be perfectly clean.

Perspiring hands are a great nuisance and a source of expense in the matter of gloves. Washing with formalin soaj: at night is often recommendell, or steeping them its a diluted solution of a reliable antiseptic. The following powder may be dusted over the palms after wash. ing, or before putting on gloves: Powdered starch, 2 oz ; powdered talc, 1 oz ; powdered alum, 15 grains.
If hands are kept in good condition, ten minutes devoted to them will further improve
their appenrance when deaired. The nails should first be filed and then nicely shaped by means of an emery hoard, cleaned and the cuticle pressed back with an orange stick dipped in peroxide of hydrogen. The hands are then washed and rubbed over with lemon juice, loose pieces of cuticle being removed with cuticle scissors after drying. The quickest method of polishing the nails is to paint them with simple tincture of benzoin, using a small camel-hair hrush and allowing the tincture to dry on, but a liquid enanel or paste and nail powder may be used if preferred. A little greaseless vanishing cream is then massaged thoroughly into the hands, working upwards from wrists to fingers until it is quite ahsorbed. See Bandage.
Hand. This measure of length, which is used for measuring horses, is one of 4 in . See Horse.
HANDBAG. Small hags that can be carried in the hand are of two main types, those carried by women for purses, travelling or shopping, and those carried by men. The former are made in a great variety of atyles and materials, and some are beautifully ornamented and fitted.
Handbags as carried by men have been largely supplanted by attaché or despatch cases, hut bags are still seen. These are mainly of leather, and are provided with a lock and key. When purchasing one care should be taken that the fasteninga are sound and the bag well lined and finished. The leather is cleaned as are other leather articles. See Attaché Case: Bag; Leather.

HAND BELL. Hand bells are still used to some extent in the home, although they have been largely supplanted by electric hells and gongs. The better ones usually are made of brass, either genuinely antique or reproductions of old designs. See Bell: Gong.

HANDKERCHIEF. Fine handkerchiefs are of pure linen with hand embroidered initials. Coloured varieties may be of linen, but are more usually of some thinner fabric, such as cotton cambric or a silk that may be boiled without losing the original colour. Women's fancy handkerchiefs are made of crēpe-deChine, silk, ninon, floral chiffon, or are lacetrimmed. Men's handkerchiefs are 16 in . to 18 in . square, and may be of silk, linen, or various cotton fabrics, white or coloured. Contrasting borders are frequent.

All handkerchiefs except the purely decorative varieties should wash readily and without losing colour. White handkerchiefs should be boiled or, if that is not possible, sonked in wnter and lemon juice for several hours to keep them white. Coloured ones need washing in moderately warm water. All kinds should be ironed damp. The hems, which are of doubled materinl and hold the damp longer, should be ironed first, otherwise the noisture from them will penetrate into the already ironed centre portion and spoil its appearance. When ironed llat they ahould be folded, and each fold ironed down.

Machine-made handkercluefs for everyday use can be bought so cheaply that few people make their own. Real silk and linen handkerchiefs, however, are worth the trouble. The following method involves the use of a very easy drawn-thread work, and is consequently only suited to materials with a thread that draws readily.

For a woman's handkerchief take a 12 in . square of linen, drawing threads to make sure the edges are straight. An inch from each edge draw a thread straight across, then draw the thread immediately inside this one just far enough to get an end long enough to tie. Take a strand of filoselle silk or stranded cotton at least 24 in . long, double it, and tie the end of drawn thread to the looped silk.

This done, draw the thread out gently and gradually from the opposite end. As the thread is pulled out from one end it draws the douhled coloured silk tied to it into its own place at the other, leaving a line of perfectly woven coloura
 stretchedncross the handker. chief. Two or three coloured threads $\frac{\hbar}{d}$ in. apart along each edge miake a charming decoration to the handkerchief, which is then hemmed down very nently to the
adapted for cutting or ripping timber in the direction of the grain, the teeth heing larger. The handle is held with the first finger of the right hand cxtended along the right-hand side of the handle and the right thumb along the left-hand side of the handle, as in the illustration. For ordinary household work, the crosscut saw will answer most requirements.

Another type, known ns the farmer's saw, is made with teeth of a different shape, a number of notches heing cut at regular intervals along the edge of the hlade, thus enabling the saw to cut wet timber. This type is indispensable where rough loga have to be sawn up, as for firewood. See Cross Cut Saw; Saw.

HAND SCREW : Its Uses. Hand sorews аге a useful form of cramp, used by wood and metal workers. They consist essentinlly of two blocks. which are drawn together by the rotation of two long screws fitted with hand grips. Those favoured by woodworkers are usually made of hardwood throughout. An improved pattern is made in pressed steel, and adapted for grasp. ing work that is tapering or of irregularshope. Hand acrews intended to lo used for metal work are generally smaller in size. These tools are employed on work such as holding one part to another to act ns a drilling jig or

Hand Saw : three types. Top, London pattern; centre, skow back: bottom, farmer's saw. Above, left, method of holding: note position of thumb and forefinger outermost line of colour, and may be embroidered in one comer if desired. Men's linen or silk handkerchiefs should be made in the same way, choosing suitable colours, and may have an enibroi. dered monogram in one corner.
Various methods of trimming coloured handkerchiefs are employed. Sometimes the whole handkerchief is coloured, with the merest line of white at the edge in the ashape of a rolled hem; while in other cases the guide piece while preparing a duplicate order is reversed, the handkerchief being white, bound with a colour. Wi,lely striped borders are used as well as veining edges in a pale colour, with small initials or monograms to match. Cross-stitch is introduced in others for ornamental corner designs.

The fragrance of fresh violets may he imparted to handkerchiefs without the use of scent. Tie a few pieces of orris root in a muslin bag and put the latter into the water in which the handkerchiefs are boiled. When dry they will be found to be delicately perfumed. See Hemstiteh; Initial; Laundry.
HANDKERCHIEF SACHET. The most servicenble sachets are those mide of fine white lawn, muslin, or linen embroidered or trimmed with drawn-thread work, as they can be washed repentedly.

More elaborate sachets are made of fancy and plain silk, crêpe-de-Chine, sstin, velvet and ribbon. These are usually padided and ornamented with embroidery. Silk cord and ribbons are utilized to form fastenings.

A simple sachet can be made by folding in half a padded length of satin 18 in . by $10 \frac{1}{2} \mathrm{in}$. The outaide can be made of embroidered satin, of talfeta, or of a tinsel brocade, and the lining of some pale self-colour. Gold or silver cord is sewn round the edge, and is also used to make fastening loops. See Drawn Thread Work; Embroidery.

## Handle. See Door.

HAND SAW, There are many types of hand saw, the straight-backed pattern illustrated being suitable for most work. These are made in various lengths, from 20 in . to 30 in ., with teeth of different shape. Saws with ratchet-ahaped teeth are preferable to those of the pyramidal shape, and the 26 in . size is handy for general use.

Hand saws in general are intended for two classes of work. The oross-cut saw is for cutting across the grain; the rip saw is better
'The woodworkers' hand screws are invaluable to the home worker. They can be employed to hold together the corners of a light frained building in course of erection. They serve as a clamp when glueing up joints, and another use is clamping a piece of work down to the work hench. They should always be kept in a dry place, otherwise the wood serews are liable to swell and work stifly; this can be remedied by coating the thread with blacklead. Unless they turn freely, much of the strength of the grip will be lost, and there is a risk that the screw will be twisted asunder.

The diagrann clearly illustrates the action of the appliance. A and B are the two blocks whose movement is controlled by the two screwa $C$ and $D, A^{1}$ and $B^{1}$ being the jaws or gripping faces. The serew $C$ passes frecly through a plain hole in A, but screws through B; 1) also screws through B, but the end of $D$ works freely in a hlind hole in $\mathbf{A}$; both screws are right handed.
In order to bring the jaws $A^{1}$ and $B^{1}$ closer together while keeping their faces parallel, C is screwed up while 1) is unscrewed by an equal amount. When the jaws have thus


Hand Screw: method of action. A key to the lettering will be found in the text
been brought near enough together the clamp is put in place and $C$ is screwed up and $D$ unscrewed at the same time, so that the jaws are home on the work. If the jaws are biting tighter at the throat than at the tips, C must be unscrewed a little and $D$ screwed up by a larger amount; if, on the other hand, the jaws are alack on the job at the throat and tight at the tips, D must be unscrewed a good deal and C screwed up a little. This method of adjustment also enables the tool to be used to hold jobs whose opposite faces are not parallel.

When the clamp has been adjusted to press evenly on the work, it is tightened by first screwing up $\mathbf{C}$ quite tight and then screw'ing up D as far as it will go; this order is adopted because $D$ has a bigger leverage on the job than C. To release the clamp, first unacrew (1) till it is quite free, and then unserew $C$.

HANDSPIKE. This is a long bar of wood about 3 in . in diameter, tapering at one end, the other shaped in the form of a shoe and

Mutton keeps better than beef, and all meat keeps longer in the carcass than in joints; but it should always be hung up in the larder and never laid on a dish on the shelf. Always remove the kernels if meat is to be hung, also the marrow, as both have a tendency to become tainted and infect the meat. The ilesh of young animals cannot be hung so long as that of older beasts. Foreign meat should not be hung. as it will waste; it is supposed to come from the butcher ready thawed and in condition for cooking. When the weather is frosty, however, all meat is better for lianging some hours in a warm place after being exposed to the frosty atmosphere during carriage. Pork and veal should not be hung longer than is necessary before cooking, us they taint very quickly.

The time varies for hanging poultry. In warm weather fowla can be hung only for a day, and that must be in a cool, well-ventilated place. In winter hang them for about 4- 6 days. Turkeys in very cold weather may hang as long лs a fortnight, but the time must be regulated by the weather. Geese should hang some days, pigeons for a few days only. In oold weather venison clothed with iron. Its general appearance is may be hung for 14 days, but it must be illustrated, and the implement has many ures examined occasionally. An old hare can be in the handling of heavy articles. The shoe should be inserted underneath the sack or other object, and it can be raised slightly by depressing the handspike.

For domestic purposes a useful implement can be made from ordinary deal about 4 in . wide and 3 in . thick, shaped on the lines illustrated. The iron shoe should be fitted if possible, as it adds greatly to the effective strength of the implement, and can be bent from a piece of wrought iron $1 \frac{8}{7} \mathrm{in}$. wide, $\frac{\downarrow}{}$ in. thick, and 18 in . in length. It may be secured by screws, or preferably by riveting with long rivets. See Lever.

HAND VICE. A small vice that can be held in the hand is a very adaptable tool that can be turned to many uses in the home. It is useful for a great many small filing operations, as it can be turned about in any direction. The ordinary black pattern is shown in the illuetration. Another type with wooden liandle and a parallel action to the jaws is useful for fine work, suchas model maling or clock repairing. In choos-
 ing a hand vice note that the jaws close up evenly, that they are free from shake, and that when closed they are quite true and level on the upper side, the faces in close contact See Amateur Carpentry; Vice, etc.

HANGING: Of Meat. The length of time required for lianging ment depends mainly on the weather. English beet and mutton, if kept in a well-ventilated larder gnd the weather is cold, may hang for - or even 3 weeks in carcass. In summer, on the other hand, meat should not hang more thais a week.
hung for 10 days, but a young one not more than a week, and neither should be paunched before 4 days have elapsed. Game may hang any time from 10 days to 3 weeks if the weather is cold, but neither venison nor other game is now eaten very high. Birds keep better if the feathers are left on and they are undrawn. It should be remembered that poultry is hung by the feet, game by the neck See Food; Game.

## Hanging Cupboard. See Cupboard ; Corner

 Cupboard.HANK. A hank is two or more skeins of woo!, thread or silk tied together. Silk, both real and artificial, as used for knitting, is often sold in hanks. See Knitting; Silk; Wool.

HAPPY FAMIIY. For this card game, which is best played by four persons, a specially prepared pack is necessary. A pack consists of 44 cards, each containing a fantastic figure representing a member of one of the eleven families. Each family has four members, Mr., Mra., Master, and Miss, and each is pictured with the implement of the family trade, e.g. a bone for the butcher. The names given to the families vary, but the most popular are as follows: Block the barber, Bones the butcher, Bun the baker, Bung the brewer, Chips the carpenter, Dip the dyer, Dose the doctor, Grits the grocer, Potts the painter, Soot the sweep, and Tape the tailor

The game consists in each player in turn asking any one of the others for a card he himself has not got, but he can only ask for a member of a family which is represented in his own hand. The player to the left of the dealer begins. If he asks for a card which the person aslecd possesses, it is handed over and heasks again, continuing until he aske for a card which the player asked does not possess. The latter thereupon answers " not at home," and it becomes his turn to ask. Each player aims at getting the four members of one family into his hand, and each family counts one trick. The player who secures the most tricks wins
The game may be continued as follows: The players in turn ask for whole families instead of for single cards, under the same conditions as before, and continue until all have passed into the possession of one player.

HARDBAKE. Hardbake is a simple form of toffee, its chief constituents being rugar and butter. Almonds or other nuts may be used to give it a Havour. Sce Almond Tolfee ; Toffee.

## HARDENING AND TEMPERING

 Tough though it is, tool steel in its soft or annealed condition is not hard enough to resist hard wear. Tools must therefore be hardened, after being made, by lieating them to the correct hardening temperature and plunging them into a quenching bath. Tool steel so hardened has the defect of extreme brittleness; this can be overcome by tempering, raising it gradually to the appropriate temperature and then plunging it in cold water. The process of case hardening is quite different, and is dealt with in a separate article.The art of hardening and tempering tool atcel consists in getting the correct hardening temperature for the particular steel, choosing the right liquid for the quenching bath, having in view the use for which the tool is intended. and getting the distribution of tempering temperature in the tool so arranged that the different parts of the finished article are all of suitable hardness and toughness for their particular work.

Tool steels vary considerably in composition, and ench has its own special colour of red heat for hardening Each steel that is used for thaking tools loses its magnetic qualities entirely at and above a certain temperature, whioh is identical with the ideal hardening temperature in every casc This fact enables the hardening operation to be carried out with certainty by the use of an ordinary pocket compass; but attention must be paid to avoiding complications from the presence of such iron articles na atoves, fenders, fire irons, etc., near the compass. In particular, iron or steel tongs or pincers must not be used for handling the red-hot tool.

The procedure recommended for hardening a tool is to hold it by tying a piece of stont copper wire round the middle, and place the pocket compass on the floor a yard or so away from any iron, but within convenient reach of the fire and the quenching bath, rernembering that if the bath is of tin or enamel it must not be too close to the compass. Any lire will do for the work if it is hot enough; a hot coal fire or a paraffin blow lamp is satisfactory, or even a gas ring if the tool is not too big. Then the tool is to be made red hot in the fire and tested from time to time by withdrawing it by the copper wire, and holding it close to, but at one side of, one end of the compass needle.

If the needle responds by a movement, the steel is not yet hot enough, and must go back in the fire; but when the steel is so hot that the needle disregards its presence, the tool is to be plunged at once into the quenching bath and moved rapidly about in it till it is cold enough to handle, when it may be withdrawn and wiped dry. When transferring the tool from fire to compass and from compass to batli, the movements must be smartly carried out to avoid any unnecessary cooling of the red. hot metal.
In heating it is essential that the tool should be of a uniform temperature all over. Evenness of heating is readily secured by tuming the tool about so that any part that is noticed to be at a darker red than the rest comes in a hotter place in the lire and so catches up to the general a verage temperature.

In quenching, a rapid agitation in the bath is necessary to secure even and rapid cooling. The bath is simply any kind of vessel containing enough of the quenching liquid to ensure that it does not get much heated when the red-hot steel is plunged in it.

Various liquids are in use. Cold, fresh water, soft, not hard, is satisfactory in most cases. If, however, it is found that a tool quenched in water cracks, oil should be tried, and any lubricating or other heavy oil will be found to overcome the difficulty.
Tempering. After hardening, the tool has to be tempered. This is done by raising it
slowly to a temperature which depends on the use to which the too is to be put, and then quenching in cold water. Stecl has the property that when it is clean and heated slowly in air a thin film of oxide forms on the clean surface, and the colour of the film changes progressively ns the temperature rises. First a pale strair colour appears and gradually deepens to brown, then the brown gives place to a purple, which presently clarifies into a clear violet; next the violet turns dark blue, and finally the blue fades out.

After hardening, therefore, the tool is first rubbed bright with emery cloth, taking care not to touch it with the hand, as tho slightest trace of grease prevents the proper formation of the temper colours; then, if it is required to be at the same temperature throughout, it is laid on an iron plate, which is placed over a flame. The succession of colours is watched, and the tool is quenched at once when the desired colour is reached. If by accident the colour changes have advanced too far before quenching, the tool must he hardened and correctly tempered all over again; but if the colours have not gone far enough, it may be repolished and retempered without hardening.
Most tools require to be of a certain hardness on the point or working end, but to be softer in the shank and at the handle end. This result is obtained by taking the tool by the middle in a pair of priers and holding the butt end in a flame such as a blow lamp or gas ring; the series of colours then passes along the tool, which is quenched when the desired colour reaches the point. If it is desired to keep the hard region near the point as much as possible, the butt end must be put well into a hot flame, when the successive colours follow each other so closely that the bulk of the tool is soft.
To obtain the reverse effect, i.e. a tool which is of progressive hardness over a considerable length of the point end, the tool is caused to warm up more slowly by occasionally withdrawing the butt end from the llanic; the colours then follow down the tool at longer intervals so that the hardness extends for some distance from the point. Slow tempering is preferable to fast tempering, as it is ensier to carry out accurately, and tools so teinpered are more satiafactory in use.

When tempering, a very pale straw colour is used for reamers; light straw for twist drills and tools for turning metals; dark straw for woodworking tools in general and for taps and dies for screwing metal; brown for hatchets and chipping chisels; and dark purple for springs. See Case Hardening.
HARDENING-OFF. This is the process of treating plants grown under glass to render them tit for planting out of doors; it is carried out by gradually inuring them to cooler conditions. They are transferred from greenhouse to frame; the frame is at tirst kept closed, and after a week the ventilation is increased gradually until finally the top of the frame is removed.

HARD STOPPING. Usually a mixture of resin and beeswax, hard stopping is employed to fill up small holes and defective places in woodwork, being first warmed and then worked into the cavity with a warm knife. I superior variety is known as beaumontage (q.v.). Various proprietary mixtures can bo purchased ready for use from the oil and colour shops.
HARDWARE. This is the name given to all kinds of houschold and other articles that are made of the baser metals, especially iron and copper. Among them arc the ordinary cooking and kitchen utensils, fire irons and tools of all kinds. See Baiking; Copper; Hammer; Ketfle; Lawn Mower; Nail; Poker ; Tool Chest, etc.

Hard Weter. See Water Softener.

HARDWOOD. The various woods are divided into two classes, hard and soft. Of the former them is a great varioty, but the softwoods are few in number and belong to coniferous trees. Those in common use are pine, spruce, fir, and pitch pine, the first threc coming under the general head of deal.
Chief among the hardwoods are oak, mahogany, walnut, elm, ash, birch, beech, greenheart; teak. They are moatly heavy "oods compared with ordinary deal, and more power is required to cut them with chisel or plane. The grain is often more curly than that of the soft varieties, and the cabinet maker has to linish with a scraper, hecause a plane tears up the grain in some kinds.

Hardwood of some particular kind may be selected because it is hetter adapted for the purpose required, or its appearance may be the main consideration. Colour or the ligure of the grain may make it desirable, though, as far as utility is conoerned, it nay be no better than cheaper woods. This is the case mainly in furniture. Hardwood costs more than soft, and some varieties of it cost far more than others. It is usually sold according to size, at so much per foot; in a few cases, where the wood is heavy and scarce, it is sold by weight. See IBeech: Elın; Oak; Walnut ; Woord. etc.

HARE. Caught in the leveret stage, hares, though by nature timid, are easily tamed, and will appeal to those who like a pet out of the common. They require a large roomy hutch, and may bc fed principally on greenstuff, such as lettuce and cabbage tops, and bread. The hare docs not breed in confinement.
How to Cook. It may be ruasted, jugged, braised, or cooked in other ways. After cleaning, wash the hare quickly in lukewarm water and dry it with a cloth.

Braised Hare. To braise a hare, skin and clean it, and line the inside with slices of fat hacon. Chop the lieart, liver, and kidneys, adding to them $1 \frac{1}{2}$ oz chopped calf's liver, the same quantity chopped fat bacon, 3 oz . breadcrumbs, a small chopped onion, and 2 teaspoonfuls each of chopped herbs and parsley. Season these to taste and bind them with 2 beaten eggs. P'ut the stuffing inside the hare, sew the latter up, and cover the back with a piece of raw fat bacon. Wrap the whole in buttered paper.

Cover the bottom of a long braising pan or fish-kettle with some bacon trimmings, 2 onions, 2 sticks of celery, a carrot, and a turnip, and lay the hare on these, adding a bunch of herbs, a pint of good stock, season. ing, and, if liked, 2 glasses of sherry. Cover the pan closely and braise its contents over a low fire for 3 hours, basting the hare ocensionally with stock and renewing the latter whenever necessary. When alnost cooked through, take out the hare, remove the paper from the back, and strain off the stock, at the same time skimming off any fat. Pour a pint of good brown sauce into the pan, put hack the atrained atock and the hare, and finish cooking. Serve the hare with the sauce poured over it, garnish with thin rolls of fried bacon, and hand round some red currant jelly.
Jugged Hare. A hare that is to be jugged should he cleaned, cut into joints, and the blood reserved. Wash the head, heart, and liver in cold salted water, and put them into a sancepan with the blood and bones. Idd 4 pints of cold water and a teaspoonful of salt, and bring the stock to the boil. Remove the scum, add a few mixed herbs tied in a piece of muslin, a little powdered mace, and pepper to taste. Scrape and wash a carrot. and add it to the stock with an onion, yeeled and stuck with 3 or 4 cloves. Simmer the whole for 3 or 4 hours, keeping it well skimmed.

Dredge the joints of hare with flour and fry them to a light brown colour; then place them in a large brown jar or casserole Mix 6 oz flour to a smooth paste with water, and add it to the stock previously strained into another saucepan. Stir thesc well, boil them for a few minutes, and, if necessary, add a little browning. Strain the gravy over the hare, just covering it, and reserve about pint in which to cook the forcemeat balls (q.v.). Put the casserole in a noderately hot oven, bring its contents to the hoil, and then sinmer it for about 2 hours.
The forcemeat balls sliould lirst be rolled in llour, then fried, and afterwards put into a saucepan with the remainder of the hot gravy and simmered for about $\frac{1}{2}$ hour before the hare is ready to be served. Just before sending the lattor to table add a wineglassful of port wine.

Roast Hare. For roasting, a young hare is best, preferably under a year old First press some forcemeat inside, and sew it up with a trussing needle and fine string. Trusa as for ronst rabbit, tie n few pieces of fat hacon over the top, and cover with greased paper. Cook the hare in a moderately hot oven, hasting it frequently with milk and dripping. When it has almost finished cookilig take off the bacon and preased paper. dredge the back with llour, and continuc roasting. Untruss the hare when done, and serve it with the gravy thickened with Hour and flavoured with port wine and red currant jelly. Red currant jelly may also be served separately, and bacon rolls used as a garnish.
Hare Forcemeat. This is made by part boiling the liver, heart, and kidneys of a hare, and then adding an equal quantity of grated breadcrumbs, twice as much fat bacon. chopped finely, and a picce of butter a bout the size of a walnut. Mix these well, scason them with salt, pepper, nutmeg, a tablespoonful each of chopped thyme and parsley, and a little grated lemon rind, and bind the whole with a well-benten egg.

Hare Pie. To make this pie, soak a hare in warm water for 15 min ., then wipe it dry, cut it into joints, and season it with salt and pepper. Fry these until they are golden brown on both sides, reserving the head and any other inferior parts for the making of jugged hare, etc. Line the edge of a pie-dish with short-crust pastry, and arrange in it the joints of hare, the minced liver, a sliced onion, a teaspoonful each of chopped paraley and hyme, and seasoning to taste. Lay on these four rashers of bacon and pour over all $\frac{1}{2}$ pint of gravy to which $\frac{1}{2}$ glass of claret or prort wine has been added. Cover with some more short crust, and bake the pie in a moderately hot oven until the crust is brown. Then reduce the heat and continue cooking. In all, tho pie requires about $1 \frac{1}{2}$ hours. It is sufficient for about six persons.
Hare Soup. Half a roast hare may be used in tho preparation of soup. Cut the meat into small joints and slice 3 or 4 onions, 2 carrota, and a little celery, putting these into a pan with a bunch of mixed herbs, a bay leaf, "2 or 3 rashers of fat bacon, $\frac{1}{2}$ gallon of stock, and seasoning to taste. Boil the soulp for 3 hours before adding a tablespoonful of red currant jelly, and then put it through a fine sieve. Re-boil it, adding more stock if necessary, and pour in a tablespoonful of Worcester sauce or sance and ketchup mixed. Add also a few forcemeat balls and a glass of claret or port wine. Serve with fricd croûtons. See Game; Pastry.
Hare Fur. This fur, though not hard wearing, has soft, long fine hair and formas a favourte trimming for evening wraps. Generally it is dyed to imitate the more costly kinds of fur. The pure white variety is imported from Russia and Siberia Hare fur
may be c.eaned according to the directions givell in the article on furs See Fur.

HAREBELL. The common name of Campanula rotundifolia, a perennial herl of the order Campanulaceac. It is a charming wild plant with blue, bell-shaped fowers. It grows 10-12 inches high and is suitable for planting in the rockery

HARELIP. Children are sometimes born with this deformity, which consists of one or two splits or fissures in the upper lip. In about half the cases there is a cleft palate, a fissure in the roof of the mouth. Generally a child with harelip has a broad, flat nose.

A child should never be allowed to grow up with this disfiguring affection. The surgeon will advise an operation, and the best time to perform it should be left to his decision. In the case of strong, healthy children the operation is usually performed at the nge of six or eight wecks, but if the infant is delicate it may bic deferred a little longer. After six months, teething interferes with the success of the operation

HARE'S EAR. The popular name of bupleurum The chief kind of garden value is Bupleurum fruticosum, a shrub from Spain, 3-5 feet high, which bears umbels of yellow flowers in late summer. It should be grown against a wall except in mild districts. Propagation is by cuttinga in a frame in August.

HARE'S FOOT FERN. The best known hare's-foot fern is Davallia canariensis, whosc long creeping roots or rhizomes grip the sides of the pot or pan in which the fern is grown, and resemble or suggest the foot of a hare. I). bullata is sumetimes oalled the squirrel's foot fern. These ferns should be grown in pots or pans containing a mixture of peat, sand, and sphagnunı moss, in a warm greenhousc. A Japanesc variety of the hare's foot fern consists of roota, or rhizomes, of D. Mariesi, fashioned into the shape of monkeys, birds, crosses, coconuts, and other deaigns The planta arrive in Great Britain in the wintertime, when they are brown and dormant; in early apring, if they are hung up in a warm greenhouse and liberally watered with tepid water, they are apeedily covered with masses of delicate, vivid green fronds. See Ferncry.
HARE'S TAIL GRASS. This is the common name for lagurus, a hardy annual flowering grass, growing about a foot high. It grows in ordinary soil in a sunny border, and is useful for mixing with cut flowers. Seed miny be sown outdoors in March or April

HARICOT BEAN : In Cookery. Certain sorts of French and kidney beans which liave white pods and secds are known as haricot beans. They need no special culture, but, instead of being consumed when fresh, are usually dried and stored for future use, as they are highly nutritious, and are much used in cookery, either ns a vegetable or for soups and curries. They require to be soaked for ahout 24 hours before being cooked.
To prepare haricot beans as a vegetable, after being sonked they are put into a pan of cold salted water, brought rapidly to the boil with the lid on the pan, and then allowed to simmer alowly until they are tender. Strain them and return them to the saucepan to
dry, placing the latte at the side of the firc Add a small lump of butter or margarine and seasoning to taste; shake the whole over the fire for a minute or two, and then serse the beans in a bot vegetable dish, with a little fincly chopped parsley sprinkled over them

Haricot beans make an excellent addition to stews and other made dishes, for they serve both to thicken and to Havour. They also make an appetizing dish when curried and form the basis of vegetarian cutlets or rissoles.

Bacon and Haricots. Stewed with bacon, Stewed with bacon, haricot beans make an excellent dish. Soak Haricot mutton cooked in a hay box is and hoil a pint of beans as already directed, prepared in the same way except that aimmerand, while they are draining, cut $\frac{1}{2} 10$. of bacon ing continues for 10 min . only, instead of 2 into dice. Over the Intter pour some boiling Lours. The whole is then boiled quickly for water, let them stand for 2 or 3 min ., and then 2 min ., with the lid on the pan, placed in the drain them also. Put the bacon into a pan and hay box and left there for $2 \frac{1}{2}$ houra. See shake it over the fire until it is slightly brouned; Hay Box; Mutton.
then add to it $\frac{1}{2}$ pint of good brown gravy, previously thickened with a little flour, and a large, finely minced onion. Add seasoning to taste, and let the stew simmer for about 20 min . hefore putting in the beans. Continue simmering for another 20 min . or so , and then serve the stew hot. See Butter Beans; Parsley Sauce; Tomato Sauce.

## HARICOT MUTTON. This dish is

 generally prepared with a neck of mutton which has the breast attached, but the acrag is not used. If the dish is designed for an entre, only the cutlets are to be used.To prepare the haricot, cut about 3 lb . neck of mutton into neat pieces, removing all superfluous fat. Fry the meat till it is a nice brown colour, using a little good dripping to start it. A briak heat will be required. Re. move the meat and lay it in a stewpan, then pour off most of the fat and sprinkle over the hot pan about 2 tablespoonfuls of llour. Stir this over the fire until the Hour is well coloured and cooked, but do not let it burn. Moisten the whole by degrees with a quart of wellflavoured stock or water and keep atirring until the liquor boils. Pour the gravy thus prepared over the meat and set the atewpan on the fire, then add $\frac{1 b}{}$. carrots and turnipa, previously washed, peeled and cut into dice

$\underset{\text { Rare's Tail Grass. Ornamental }}{\text { Rrass bearing soit furry beads }}$
or neat slinpes, also 2 moderatesized onions and a bouquet garni. Searon well and let the whole simmer for about two hours.

Before dishing, skin off the fat, remove the bouquet, and place meat and vegetables neatly. If the liquor is too thin, dish the meat and boil thegravyquick. ly to reduce it. Haricot beans, ronked nind blanched. are sometimes added to this stew.

HARMONICS: In Wireless. These arc frequencies which are multiples of another frequency, called the fundamental. Thus frequencics of two, three and four times the fundamental frequency are known as tho second, third and fourth harmonics respectively See Frequency.

HARNESS : Its Care. A set of single harness, i.e. harness for one horse, comprises a bridle with blinkers; a collar, with hamea and traces nttached; n saddle, with turret ringe, back strap; crupper and breeching. The breeching is unnecessary, excepting in billy districts, though it always forms part of a set of harness, together with the reins. Its usc is to prevent the hind-quarters coming in contact with the vehicle. It is better to have a breeching atrap attached to the back part. of the ahafts, as this gives the animal more freedom of movement, and annoys it less. Moreover it only comes into operation when it is neciled.

The bridle is composed of a throat-strap, a brow band, cheek straps, and a bit, either single or double ringed, called a snaffle, or bit and chain. All the bridle straps bave keepers, so that they can be adjusted to fit properly. The proper adjustment of the bit and the curb requires to be carefully attended to. Many horses have had their mouths and manners permanently ruined through faulty bitting; the so-called hard mouth niay be produced in this manner. The curb chain ought to be so fixed as to allow it to lie looscly in the curb groove beneath the lower jnw.
The collar necessarily forms an important part of the harness, and unless it fits pmperly, its movement is very liable to bruise and chafe the skin, resulting in the production of the collar gall, just as a badly fitting suddle produces saddle gall. Leather-lined collars nre preferable to those lined with cloth; the carthorse's collar, lined with felt, is often used, but cannot be recommended. When a horse comes in from work the hames should he removed from the collar, and the latter allowed to remain in position for half an hour until the skin beneath the collar has had time to cool. Neglect of this precaution favours sore shoulders, owing to the sudden cooling of the skin. The same remarks apply cqually to the saddle.

The driving saddle is, prefernbly, lined with leather, and it ought to combine lightness with
strength. In addition to the turrets for the occasion arises. The thorough understanding reins to pass through, the stout shaft band forms part of it, and so does the belly band. In fitting on the suldle the belly band must not bo adjusted too tightly, whilst the shaft band is adjusted so as to sllow the points of the shafts to lie in a straight line just below the level of the points of the shoulders, nnd not tilterl. In the latter case the power of draught is greatly diminished and the appearance of the equipage unsightly. Sometimes a breastband is used in place of a collar, especially for trotting purposes. For n pair of horses double sets are sold.

Neither harness nor sarldlery should be kept in the stable, as the odour from the latter rots the leather. To clean harness, remove the mud by sponging, and as soon as the harness is dry rub it over with either black or brown harness paste, and then polish. Damp leather will not polish, themfore the harness must be thoroughly dry. Soft soap should not be employed as a substitute for paste, as it rots the leather. Take purticular care to have the lining of the collar and saddle clean and dry. Unfasten all buckles and keepers to facilitate cleansing of both. Every horsekeeper should insist that leathers and bright parts are kept polished and burnished with regularity, and repairel immediately if damagerd. See Horse.

HARP: How to Play. The harp has 47 strings. All but the 11 longest are of gut, each C being generally coloured red, and each $\mathbf{F}$ blue; the others are of steel wire wound over. The compass is from

and every note stands in the major scale of C flat.

The harp is now as it always has been, an easentially diatonic instrument, and the difficulty of making it available for use in keys other than that in which it atood was partially overcome by the invention of the single action, in which by means of seven pedals it became feasible to raise the pitch of the strings by a somitone Erard's invention of the double action, however. made $a$ tone us well as a semitone possible, so that notes of any pitch becane available.

The mechanian by which these modifications of pitch are effected is contained in different parts of the instrument. That part which stands upon the floor is the pelestal, or pedal box, which holds the pedals Rising from this, but in divergent directions, are the vertioal pillar in front, and the inclined soundbox at the back. These are united at the top by the curved neck.

Each of the pedals acts upon all strings having the same alphabetical name; consequently there are seven of them, $B, C$, and $D$ to the player's left, and E, F, G, and A to his right, the orler boing away from him. In the frame of the pedal box are two notches for each pedal When a pedal is fixed in its first notch, the pitch is raised by a semitone ; when in the second, by $n$ whole tone. A spring enables the pedial to return to its static position.

It will readily be seen that as each atring can thus supply the flat, natural, and sharp pitches of its alphabetical name, the key of seven flats was the obvious one to be selected. The mechanism by which the strings are shortened is placed within a portion of the neck called the comb, the connexion between it and the pedals consisting of metal mds concealed within the pillar. The tuning pegs are fixed in the neck, and it is very important to bear in mind that as the harp requires constant tuning, the performer needs always to have a tuning hammer handy for use when
of the pedals is of primary importance, as the harp can not only be set thereby in any key. but also so as to make it possible to play certain chords scale-wise or even glissando. Within the limits of space available, the possibilities cannot be fully set out here. Onr or two simple.examples must suffice.

Remembering that the fundamental key is C llat, it is evident that in onder to play in the kcy of C it is merely necessary to depress all the perlala to their first notches. To get the key of D flat or C sharp, it would be possible to fix them in their second notches, but it would be preferable to fix only the $\mathcal{F}$ and $C$ pedals in their first notches. Accidentals and modulations, if not too abrupt, can also be effected by means of the perals.

The tone of the harp is full and rich through. out the greater part of the middle compass, but the extremely high notes, owing to the shortness of the atrings, are dry and brittle in character. The Hat keys havo a more re sonant tone than the aharp leys, the reason being that in them the strings are more npen
Changes of tone
colour can be got in different ways. By damping the string with either the hand or the fingers Res soon as it has been plucked, a somewhat dry. sounding pizzicato, like that of the violin, is produced By plucking the


Harp. Above, diagram ol strings showing altered positions when playing, left, fat ; centre, natural right, sharp. Below, relative positions of the pedals when the strings are keyed as above
Courtesy of S. \& P Erard string $n e \Omega r$ the soun tonc is the result, similar to the guitar. Har- cerned, however, it was certainly not more monics are nnother beautiful effect. They arc confined to three octaves from :-
 limits they are very ineffective. The only harmonic used is that produced by lightly stopping the string at half its length, with the result that the note sounds an octave higher. An harmonic is indicatel thus :-
 but its sounds may be set down thus:A harpist plapa
 scated, and resta thic
hollow sound-box agninst his right shoulder, the instrument being tilted back to allow of this. The little fingers are not used in playing, but, owing to the closencss of the strings, a greater range of notes lies under the hand than with the pianoforte. Instead of an octave, a tenth may be regarded as the normal stretch. The perlals required to be set are indicated by their names heing given in brackets. For example, to set the harp) in D flat the indication would be
 ataves, as in piano forte music, are re quired for the notation, the F and G clefts being used.

Almost invariably chords are slightly spread; when that effect is not desired, the French word sec (dry) is used. The playing in suc. cession of two constituent notes of a chord is so characteristic of the harp, that it gives rise to the term but to chorde
The old single action harp in $E$ flat was at one time extremely popular as an in. strumont for ladies but the double action harp, which specdily rendered. it a predecessor obsolete, was never such a favourite
fingering was con cerned, however, it was certainly not more
difficult. It is rare now to meet with it in the drawing room, though it is atill an indispens able meniher of the orchostra. To those whn can afford its purchase as well as the time necessary to nvercome its diflicultios, the harp offers undeniable attractions, if only by way of change from the piano and the violin.

HARPSICHORD. The harpaichord was never atandardised Some had two keyboards, and stops whereby differences of quality were obtainable The harpsichord differs radically from the piano in almost every wry. The strings are plucked by quills attached to the jacks which rise from below the wires when the keys are depressed, and the action also is entirely different, so that the performer must employ a distinct kind of touch, firm but light.
The instrument has but $a$ very limited dynamic variety of tone, this deficiency being partially compensated for by the second keyboard and stops sponken of ahove, the effect of which on any individual instrument must


Harpgichord. English 17th century ingtrument in walnat case. It has cut and engraved brass hinges, two keyboarda kiving a range of five octaves, and lour dram stops. It originally atood in the chapel ol Ightham Moat, Kent $B_{\nu}$ permission of the Director, Vietoria \& Albert Museum
hediscovered through experi. ment. It has no stostained tone whatever, a circumstance which gave risc to the ntimerous graces and orna ments which are such a feature of 17th century music
Many old specimensexist in public collections and in private liands; they are more or less dell. cate in constitution and require to be handled earefully by an oxpert. Modern hinrpsichords of more
 arpeggio (in the harp style) in inusic. Repented notes are possible in rapid tempo on different stringer accord ing to the retting of the pedals, whereby enliarmonis unisons called homo phones are sccured on adjacent strings. The glissando is another cffect used. It is per formed by draw ing a finger rapidly over the strings, and it is applicable, according to the use of the pedals, not only to scales.
robust character are still inanufacluicd for those who indulge in the cult ol old world music played on the kind of instrument for which it was originally composed

HARRIS TWEED. This cloth is detined by the Harris Tweed Association as tweed hand spun, hand woven, dyed and finished hy hand in the islands of Lewis, Harris, Barra. and their several purtenances. and all known as the Outer Hebricles.

In working the wool before spinning it the crofters apply an oil, the effects of which are ton penetrating to be entircly removed by any subsequent process: the oil retains the characteristic odour of peat smoke. The tweed is woven mostly with a diagonal twill, which gives it a bulky appearance. Similar cloth, know"n as kelt, has long been made in the Hebrides from wool dyed with vegetable colours obtained from plants and blended into heather moorland tints.

Harris tweeds ure made in rather soft. handling wool not very fine spun or hard twisted and from single-ply yarn. They are about 28 in . wide, and 7 yd . are needed for a man's suit. Being hand-made and finished, they vary from piece to piece of what is nominally the same pattern, and some are heavier and more densely compacted than others A favourite pattern is the cassimere :will.
The pattern most to be recommended for wear is the herring-bone, or chevron formed by short zig-zag opposed twills.
Harris tweed is especially suitable for shooting, fishing, and golf suits. It makes good overcoats and cajes, because it sheds water better than tweeds of some other kinds
HARSLET. An alternative name for pig's fry, the word harslet is also used to describe a country dish prepared from the whole fry or a mixture of fry and pork. To make the latter, wash the liver and blanch the siwectbreads and pound $\% \mathrm{lb}$. pork to make it tander. Season all highly and flavour with a small chopped onion and $B$ sage leaves, chopped if fresh, and rubbed through a sieve if dricd. The liver and sweetbreads may be cut into slices or minced finely or left whole.

Mix these ingredients together with 3 oz . tinely chopped suct, place them in a cleansed bladder and sew up the end securely. The harslet may be either boiled or roasted, but if roasted it should be well basted and served with a rich brown sauce. The cooking must be gentle and will take from an hour to an hour and a half. When the whole of the fry is used, omit the rork, and use 4 oz suet. See Fry.
HART'S TONGUE FERN. There are many pleasing forms of this hardy fern, Scolopendrium vulgare, which will thrive in ordinary soil and prefers a damp shady position. If grown in pots they are useful for the cold gicenhouse and window. Ainong the best named varieties are crispum, cristatum, an.l laceratum. See Fernery.


Hart's Tongue Fern. Hardy fern with undivided
fronds, grown as a pot plant for house decoration

HARVEST BUG. The minute reddish. hinged the clasp, bent to shape from stout coloured beetle known as the liarvest bug is iron wire. Sitronger patterns are made like a often present in immense numbers in fichls butt hinge from stout wrought iron plate. and gardcns, especially in chalky districts. It Those of ornamental shape are more appromostly attacks the lega, childien lwing the priate for the door of a garage or for any greatest sufferers. Red pimples or wheals like those of nettlerash aprpear on the skin, and there is intense itching. As a preventire, cucalyptus ointment rubbed on the legs and fect some. tines is successful. When the insects succeed in attaching themselves, the rubbing in of weak sulphur ointment will destroy them. On the following morning after applying the sulphur ointment a hot bath with plenty of soap should be taken. The itching and irritation may be relieved


Harveat Bug. Minute beetle, sue bites is here highly magnjifed
by smearing with carbolic
HASH: How to Prepare. Bef hash is prepared by melting 1 oz good dripping in a stewpan, stirring in $\frac{1}{2}$ oz flour and frying it till brown. Add $\frac{1}{2}$ pint gravy or stock, and stir it over the fire until it boils: then put in a tablespoonful of Worcester sauce, a teaspoonful of made mustard, and, if liked, $\frac{1}{1}$ wineglassful port wine. Season well with salt and pepper. Cut $\frac{1}{2} \mathrm{lb}$. cqoked beef into neat slices, put them in the sauce and heat the hash very gently, without letting it approach boiling point. Serve in a hot dish, garnished with sippets of toast and small heaps of red currant or rowan jelly

To make mutton hash, cut 1 lb . cold mutton into neat slices, putting the bones and trimmings in a saucepan with pint water to make stock. Let them cook steadily over a moderate fire, and in the meantime wash and prepare 2 or more carrots and potatoes, sconping them into neat balls with a round vegetable cutter. Boil these until tender in salted water, then peel and slice an onion and a carrot, and fry them in a saucepan containing 2 oz . butter. Sprinkle in 1 oz . Hour, fry that also, and then add t teaspoonful vinegar, stirring all over the fire for 2 or 3 min . Strain in the stock and continuc stirring until it boils. Season the whole carefully, adding a tablespoonful of ketchup: then pour it over the inutton previously placed in a casserole. Put in also the potato and carrot balls, place the casserole in the oven and let the neat heat through very gently. Serve in the casserole. Cold veal or pork may be hashed in much the same way with the addlition of a bunch of herbs instead of the ketchup or sauce.

A rabbit makes a good hash when enriched with red-currant jelly and port wine. Cut the flesh from the bones, and season to tastc. Put the bones into a saucepan with a pint of water or stock, a slice of ham, a bunch of herbs, an onion, and a little seasoning, and let them simmer for about 1 hour before straining.
Melt a luinp of butter about half the size of an egg in a saucepan over the fire, add a heaped tablespoonful of Hour, and mix the I wo smoothly. Pour in the stock, stir the whole until it boils, and then put in the pieces of rabbit and cook it very slowly for $10-20 \mathrm{~min}$. Nmall forcemeat balls added shortly before it has finished cooking make a good garnish. The port wine and jelly, a wineglassful and a tablespoonful cach respertively, can be added before serving. See Casserole ; Stcw.

HASP : How to Fit. The hasp is a hinged fitting passed over a staple and secured by means of a padlock or other fastening. The usual pattern, as fitted to doors of out buildings, comprises a shect of metal plate, to which is
prominent position.
For security the hasp and staple should always be fastened from the inside of the cloor by passing a bolt through from the front, and securing it by a nut at the back of the door. A metal plate or washer is interposed between the nut and the surface of the door. To a void rusting, the joint should be well oiled when fitted, and lubricated from time to time. See Door.
HASSOCE. Froma remnant of carpet or felt a hassock or round or oblong footstool can be made at home and stuffed with shavings, the bottom being covered with coarse canvas. A small, semicircular tab of the felt or carpet, lined inconspicuously with a strong material, should be attached to either side to allow of the stool being easily handled. In certain districts of the north of England a hassock is known by the namo of buffet.

HASTX PUDDING. To prepare the cheaper variety, boil a pint of milk, salted to taste, in a pan over the firc. Immediately it boils sprinkle in gradually enough four to makc a stiff batter, stirring and beating all the time. Let it boil for a few minutes so that the Hour may cook; then put it into a dish with a few lumps of butter, a little grated nut.meg, and, if liked, some sugar. Golden syrup, jam, or any other kind of preserve may accompany this pudding. If a richer pudding is desired, two or three eggs should be added after the flour and milk have been mixed. The batter must be allowed to cool a little first, and must not be brought to the boil again, otherwise the eggs will be certain to curdle.

EAT : Choosing and Wearing. Although the best French designs for women's hats are acknowledged perfection in style, many English women cannot wear them without adaptation. Such modcls arc, thercfore, bought by inilliners in advance of cach season and copied in their workrooms; the original models are frequently obtained at sales for less than the prices charged for the adaptations and are, therefore, bargains for those who are lucky enough to be able to wear them. Expert nilliners are, however, employed in the workrooms to design and adapt models in order to give individuality to their productions, which are of the best inaterials and high-grade workmanship.
Straws and Felts. Straw hats are mainly manufactured at Luton in Bedfordshire. The kind of plait used depends on fashion, and much millinery straw is imported either ready dyed or natural. Crinoline or tagel plaits are classed as straws, though the former is usually mado of artificial silk and the latter of hemp. Pedal straw is largely manufactured in Italy. From Italy also are imported large quantities of straw hoods. A hood is the material of a hat, cither straw or felt, formed into an unstiffened, roughly shaped piece, ready for making into the required style. This piece may be woren as in Panama fabric and its imitations, or made of straw plait machined into shape, of felt, or of velours.

Felt hats are made from the fur of rabbits, hares or beavers in the better qualities. Cheap grades are of wool, sometimes finished with a fur veneer. liur felts are lighter and more pliable than wool felts; also, they retain their gioss owing to the bright hairs of the fur fabric. Although there are brushed wool
felts they cannot be said to initate velours successfully. Real velours is an expensive material, composed chiefly of hare's fur with sometimes a slight nixture of rabbit's fur. Many velours hats are imported, both finished and in the form of hoods, from CzechoSlovakia, Austria, Germany and Italy.

Hats for Men. The hats chiefly worn by men and boys are silks, stiff and soft felts, and straws.
The silk hat has a cylindrical crown made from several layers of muslin stiffened with shellac, covered with a silk plush, and sewn so neatly that the seam is invisible. From time to time hat manufacturers make slight alterations in the height and shape of the crown, or size and curl of the brim, so that a wearer should ascertain if his silk hat is of the style in vogue.
The most popular hats are the soft felts and velours, although the stiff black felt or bowler enjoys a very big sale. The cheapest varieties are those made from wool; they lack the finish and wearing capabilities of the fur hats, and are harsher to the touch. Quiet tones of grey, brown and fawn are generally fashionable in soft felts, which can be bought with wide or narrow brims, flat set or curled, bound or unbound.
Velour hats originally were made only from hare's fur. For a cheaper hat rabbit's fur is used extensively, but it is distinctly inferior, and anyone can detect the difference between velours made respectively from hare's and rabbit's fur by the feel. It is not possible to obtain the pile of the real velour made from hare's fur if inferior material is used. The velours is made on the same principle as the soft felt, the pile being obtained by repeated brushings during the stage of manufacture known as planking. Straw boaters are made with a saw or cable edge to the brim, and usually finished with a broad black ribbon.

Practically all hats have a sweat band of leather or other suitable material sewn into the crown, and this is the only part of the hat actually coming in contact with the head. This band should allow perfect adjustment to the head and at the same time permit ventilation.
When buying a stiff felt or silk hat obtain it from an establishment where care is taken in fitting. With a soft felt or velours fitting is a much simpler matter, but it is well to remember that all felt hats stretch slightly in wear. Hats of all kinds should be frequently brushed, and if possible kept in hat-boxes when not in wear. As a matter of economy it pays to buy a good quality hat, be it velours or soft felt, as it will stand the renovating process, whereas a low quality hat scarcely pays for the trouble. Most natters undertake the pressing of silk hats and the renovation and re-blocking of others, whether of felt or straw.
The sizes of hats are calculated by their circumference, measured just inside the crown, divided by $3!$. A ready way of reckoning is to add the length to the breadth, and divide by two. Thus, a hat measuring 8 in . by 6 in . is size 7. The sizes run in eighths, and the usual range of sizes for men is $6 \frac{1}{2}$ to $7 \frac{1}{6}$, the middle sizes predominating.

Hats for Children. Children's hats, except for their size, are almost identical with those worn by adults. Caps in the winter and straw hats or basin-shaped felts with pliable brims in summer are worn by boys, while for girls, berets may be of knitted or crocheted wool, and hats of felt, straw or velvet. Trimmings should always be simple.

Hat Bands. On men's hats black bands are noost usually worn. In the case of grey and other light-coloured velours or felts a band of the same colour is sometimes worn, but here, too, many persons prefer black.

Black loauds are ulso often seen on Panama hats and on straw ones. Many men, however, like to have on a straw hat a band of club or association colours.

With school children, of both sexes, hatbands striped with the school colours and completed by a badge in front are worn. Hat bands can be bought separately from most hatters.

Hat Box. Hat boxes arc of two kinds : the large square or oval boxes of stout cardboard in which hats are sent home from hatters and milliners, and the strong fibre or leather ones with handles in which they are carried in travelling.

A travelling hat box, if of fibro, has the merit of lightness over a leather one ; but it should be finished with leather corners for greater durability. For women more popular are the round hat bags made of American cloth, with soft lids, and straps which make them easily carried on the arm.

Hat Brush. Silk, felt, cloth, or real velours hats all require the regular use of a brush. A good hat brush, like the clothes brush, is everlasting, being similar in make and quality. but the shape is narrow, and curved to meet the requirement of rounded brims.

To brush silk hats, a soft mixture of bristle and horsehair will not disturb the even surface of the silk, which should then be finished with a plush pad. For all other hata, including ladies' hats, a pure bristle brush is the best, soft substitutes being less durable, and coarse adulteration like fibre may depreciate the quality of the hat. Both single and double brushes are made, the former having wellfinished backs of polished satin-wood, walnut, mahogany, etc. See Brush: Clothes Brush ; Headlining

BATCB. In one sense a hatch refers to a small gate or door, and especially to the lower part of a divided door. Hatches are put in houses, inserted in the dividing wall between the kitchen and the dining room, in order to facilitate the service of meals. See Dining Room: Service Hatch.

BATCRET : Varieties and Use. The hatchet is a small, short-handled axe, adapted to be used with one hand. Several varieties are obtainable, each comprising a steel head. or blade and a wooden handle or helve. For household use the Canadian or hunter's hatchet is handy for splitting firewood ; the carpenter's or Kent hatchet, slightly different in shape, is used for heavier timber. The shingling hatchet, with its broad cutting edge and short steel poll or hammer head, is useful for cutting timber for rustic work, one part of the head being employed for cutting, and the other for drivine nails. Apart from the preparation of


Eatchet. Showing how the tool is held when in use
not be damaged. The method of use is shown in the illustration.
The edge should be kept sharp and free from notches. This may be accomplished by grinding the blade on a grindstone and whetting with a whetstone, using this with a circular rubbing motion. The cutting edge is variously formed according to its purpose. Ordinary varieties are ground uniformly on each side of the face, and the cutting edge becomes central, but on the Kent squaring hatchet the grinding is restricted to one face, bringing the cutting edge to one side of the head, and is thus like the chisel. By this means work can be cut more square than would otherwise be practicable. See Adze: Chopper.

HATTER'S PLUSE. Specially made for hat coverings, hatter's plush is a light silk fabric with a laid, glossy pile which can be smoothed down by brushing in one direction. The support of a firm foundation is required to show off the principal feature of the material, which is made principally in black; brown and other colours are obtainable for millinery. Hats made of this plush need frequent brushing.

Haunch. The haunch of an animal is the fleshy part of the hip and buttock See Beef: Mutton; Venison.
havana rabBit. The Havana rabbit excels as a flesh producer, weighing, when fully grown. from $5 \frac{1}{2}$ to 7 lb ., and its ineat is


Havana Rabbit. Prize specimen ol a rabbit Largely bred for its beantiful fine brown far
of first-class quality. It is also bred largely for its fur, which is of a deep rich chocolate colour with a purple sheen. It is very hardy and does well cither indoors or in outside hutches. See Fur: Rabbit.
HAWK: For Plastering. The plasterer's hawk is a species of board with a handle projecting vertically downwards from the centre. It is held in the left hand, to support the plaster or mortar when carrying it from the inortar board. The diagrams show its parts, and give the necessary dimensions and details of construction. Although deal is generally used for this tool, a closegrained wood such as birch or beech is preferable, as neither is so liable to warp. Moreover, harclwood will stand rough usage much better than softwood such as deal.

The board picce, Fig. I, may be made from 9 in . by I in wood, and should be planed up, on both surfaces, and on all the edges. A tapered groove, with a $V$ :shaped undercut, is cut across the centre of the underside of the board, this being done with a tenon salw, by cutting the sides or shoulders and then chiselling out the surplus material. Into this groove is fitted a piece of 1 in . hardwood, planed and bevelled, so that it fits firm in the groove. This can be fitted by the aid of a plane, end to ensure proper contact the sides of the groove may be rubbed with blacklead or


Hawk. The correot way to hold and to use a plasterer's hawk
chalk, the wedge piece inserted, and on its remuval the high parts will be in dicated by the black. lead.

A perfect fithaving been obtain ed aty in. dinmeter hole is drilled into the centre of the wedge piece, Fig. 2, the hole slightly tapered, and a wooden handle, Fig. 3, prepared to the shape shown in the illustration. It is tapered at the end, slotted to take a hardwood wedge, and the whole glued and wedged into the hole in the tapered piece, any surplus that projects upon its surface being removed with a chisel or plane

The use of the hawk will be ap. parent from the illustration. The board slinuld always be kept clean and free from hard lumpe of plaster or mortar. These are scraped off with a trowel every time the supply of material is replenished, and at the end of the job the wcdge piece is knocked out of its place and the buard washed clean, the wedge replaced, and the hawk stood aside until it is again required. See Plaster; Trowel.

HAWEER. Enylish law does not distinguish very clcarly between a hawker and a pedlar, although one Act of Parliament defines a hawker as a man who goes about with a vehicle in which to carry the wares he has to sell, and a pedlar as one who goes on foot. In practice, however, there is no difference between the two.

A hawker, therefore, may be defined as one who trades by going from house to house, having with him, either on his person or in a vehicle, the grods he wishes to sell. He may be, too, one who seeks to secure orders for the ssle of goods to be delivered immediately, or who offers for sale his skill in any handicraft ; for instance, repairing chairs or grinding scissors.

Under an Act of 1871 a hawker or pedlar must take out a licence before he can carry on his trade. These licences can be obtained from the police authorities at a charge of 5s. each. The licence only lasts for a year, and must be renewed at the end of that time. An applicant for a hawker's licence must be at least 17 years old, and must have resided for at least a month in the district where he makes his application. He must be of good character, and must show that he really intends to tradc as a hawker. If he goes about with a cart or truck the words 'licensed hawker' nust be visibly and legibly inscribed upon it.

A hawker must show his certificate to any person on whose premises he happens to be, or to anyone to whom he offers his wares, if requested to do so. The police have also the right to examine the goorls he is offering for sale. If a hawker acts contrary to the
provisions of the law concerning hawking he may be punished by a fine or by the withdrawal of his licence. The latter penalty usually takes effect if a hawker is convicted of begging.
Dealers in certain commodities can sell their wares from dorr to door without a licence, and so in the eyos of the law are neither hawkers nor pedlars. Such wares inclucle fish, fruit, vegetables, and other victuals which, by their nature, are perishable. Coal can also be sold without a licence, while commercial travellers, canvassers, and others who seek orders for cluthing, books, etc., are also free. Hawkers, therefore, are chiefly confined to men who sell notepaper, matches buttons, boutlaces, needles, cotton, cheap jewelry, and other articles of that kind. Gipsies form a large proportion of the hawker class, offering for sale baskets and other articles of wicker, as well as lace curtains and rarious household requisites.

Many hawkers, especially in the ponrer neighbourhoods, do useful service by catering for legitimate wants, conferring a benefit on the busy housewife by bringing to her door the articles she needs. Others, however, are little more than beggars in disguise. They will offer some worth. less article for sale and when the goods are declined will beg for old clothes or a copper.
Housewives should firmly decline to buy frum hawkers goods they do not need and on no account should allow themselves to be intimidated. If a hawker refuses to gu away when told his wares are not wanted the police should be informed. See Hire Purchase System.

BAWE MOTR. This is the name of a group of twilight-flying moths, so called because their method of flight is similar to that of the hawk. They cannot be regarded as pests of serious importance in the garden. although one of their number, the death's head hawk moth, is sometimes the cause of damage on the potato plot. This member is not oflen seen, but may be identified by its large size, black and yellow hind wings, blackish brown marked fore wings, and the curious semblance of a skull upon its thorax. Its caterpillars appear from midsummer to autumn, measure about 5 in . in length, and have fat yellow bodies with violet stripes No special remedy is necessary beyond destroying the larvas and pupae if they are found when lifting crope

RAWEWEED. A hardy perennial of the daisy order, the hawkweed (hieracium) is not particular as to soil, but prefersasunny position on banks or ruckeries. The best is aurantiacuin, 12 in. high, with orange coloured Howers, easily grown from seeds.
RAWTHORN. A group of harly ornamental trees of which the commonest is Crataegus oxyacantha (hawthorn, whitethorn or "may"). There are many varieties of this
species, some with double, others with single Howers which are beautiful in May. The variety praecox is the Glastonbury thorn. The whitethorn or quick forms an excellent hedge Some of the hawthorns introduced from other countries are splendid garden trees, valued for their flowers in May and their ornamental fruits in autumn. Two of the best are the scarlet haw, coccinea, and the cockspur thorn (crus-galli). The firethorn (Crataegus pyracantha) is deecribed under its correct name.

## Pyracantha.

HAY. Apart from its use as food for cattle, hay is of value for other purposes, both in the house and the garden. In the poultry yard it is common as a nest lining for sitting hens, although its tendency to turn fusty perhaps reduces its value when compared with short, broken straw. Whichever may be used, either for nesting or as litter in house or run, it must not be allowed to get damp or dirty, and the poultry-keeper should scattor hay or straw loosely, so that grain may sink into it, and thus compel the birds to scratch about for food. Hay, especially clover hay, may also be used as a substitute for fresh areen food, being steamed for some hours until it swells to something resembling its uriginal state.

The keeper of small livestock should, without trespass, endeavour to secure free hay from lane and hedgerow, gathering clover, grass, and herbage, and exposing thens to sun and wind until dry and swect for use in winter. Cutting is best done when the majority of the grasses are in Hower, and should always be completed before seeds begin to ripen, otherwise the stems become tough and dry.

Hay also has its use in the garden, being handy as a mulching medium ; stuffed into a small flower-pot as a trap for earwigs, especially throse attacking dahlias; or as a substitute for manure in making mild hotbeds for plants such as vegetable marrows. In the latter case it must be very firmly trodden and damped before use. In the home, pillows stuffed with hay are esteemed as a soporific for insomnia, while hay boxes are used for cooking purposes.
HAY BOE: To Use and Make. In using the hay box, if it is intended to cook two dishes at the same time, the pans must be put in and taken out together, or two separate cushions made so that one pan can be removed without causing loss of heat to the other. Soups, stews, ןorridge, puddings, etc., may all be cooked by the hay box method. Suet puddings are best cooked in a basin with a screw-down lid, and put into the hay box in a pan of boiling water. For stews prepared in a hay box the meat must be perfectly fresh

All food must be actually boiling when put into the box, and most will require to be partly cooked in auddition. The pan must not be uncovered until it is to be removed, and its contents must be reheated before serving. The main advantage of a hay box is that it effects a great saving in fuel and gas, and needs no attention during the cooking process.

A rough and rearly hay box can be prepared at a cost of a shilling, or less. Procure a wood


Hawthorn. Plowaring apray of this fragrant wild tree which, under the name of whitethorn or quick, is used for bedge planting
box, say a sugar case, and line it with seven or eight thicknesses of newspaper to keep out all draughts. A useful size, which will allow of two divisions, is about 22 in . by 15 in ., and 15 in or 16 in . deep. A box for only one stew-pan will do at ahout 14 in . cuhe. The size depends on the cooking vessel used. At the bottom of the box there should be an allowance of 6 in. for hay, and a minimum of 3 in . of hay at each side. Above the pan it is necessary to allow 4 in for a cushion filled with hay.
About sixpennyworth of hay will fill the larger-sized box. This should he paoked as tightly as possible. Cushions to place above the stewing-pan can be made of linen. These are tightly stuffed with hay, and should be of n size to fit the divisions closely. Any ordinary saucepan can be used, hut as beginners find the handles in the way, it is better to commence with either aluminium pans with a small handle on either side (aluminiam holds the hest well), or enamel cans with a handle over the top. An ordinary brown stewing-jar will serve equally well. These jars can be hought for a few pence, are cleanly and can be placed over a low gas flame.
The stew-pan, with the food, is hrought to the boil over a gas-ring (or a fire) and is then placed in the box. It rests on the hay; hay is all around it, and the hay cushion is put above, being held down either with a weight or with the lid of the box. The water remains practically at boiling point for many hours, and in this way food may he cooked without requiring the usual constant attention. In many cascs it may be cooked over-night.

HAY FEVER. This is an acute inflamma. tion of the mucous membrane of the nose, eyes, and air passages. It usually appears in Gieat Britain between May and August and affects about twice as many men as women.

The cause of hay fever is the pollen of certain grasses and other plants, the pollen containing a poisonous principle. The pollen of rye is particularly rich in this poison. But pollen or any other irritant is capable of producing the affection only in certain susceptible subjects. In some people dandruff from horses or other animala, in others some particular food, and in others still the inhalation of a larger variety of substances, is the exciting cause.

The symptoms are much like those of a severe cold. There is violent sneczing, and a copious watery discharge from the nose and eyes. Itching of the palate and the back of the mouth hecomes troublesome, and therc is not infrequently a hard, dry cough, and perhaps anthmatic pasoxysms with wheezy breathing. The sense of smell may be lost, taste impaired, and hearing more or less affected. The patient suffers from depression and low spirits. There is usually loss of appetite, a feeling of lassitude, and often sleeplessness

When practicable, a person who suffers much from seasonal hay fever should go to live at the seaside or some mountain resort during the summer. As the specific irritant varies in each case, an effort must he made to find out which is responsible. The patient's own observations may be very helpful in such an investigntion. Where it is not possible to ascertain the cause, inoculation with pollen extracts or vaccines may be successful in preventing or mitigating the severity of the attacks.
The general health must be kept up. Locally a simple spray miny he used, such as weark boric acid solution, 3 gr . to the oz of water; a solution of 2 gr . bicarbonate of soda and 2 gr common salt in 1 oz . of water; a 1 per cent solution of protargol. Very often some defect within the nose favours the occurrence of hay fever. Sufferers should therefore be examined by a surgeon. See Asthma.

HAZARD : A Card Game. This is a game for four plnyers, two being partners against the other tivo. The pack consists of 25 cards, all the cards below the nine in an ordinary pack being thrown out, and the joker added for the 25th card. Playery cut for partners, the two lowest playing against the two highest, nces counting high in cutting. The player cutting the loweat card deals.

The joker is the best truinp, then the jack of the trump suit, then the jack of the samc colour, and then the ace, king, queen, ten, and nine. The cards of suits not of the saine colour as trumps rank ace, king, queen, jack, ten and nine.
Six cards are dealt each player, three at a time. The last card is placed by the dealer on the table face downward, and must not be looked at till the game is over. Eldest hand has first bid, and he names or hazards the number of the tricks he thinks he can make, without, however, naming any suit as trumps. Each player in turn either passes or bids higher, the highest bidder naming trumps and leading the first trick. Each trick counts one point, and for each trick he fails to make on his bid the player is set back a point. Ten points constitute game.

In the double-pack game, two, three, four or six players may take part. The pack consista of a double pack of ordinary cards from which all cards below the nine have been removed. The joker is not used in the double-pack game. If duplicate carda are played on a trick the first one played takes the trick. With two or three persons playing, each plays for himself, with four, two against two, and with six, three ngainst three. Four cards at a time are dealt. The lowest hid allowed is six tricks. If a hidder thinks be can win all tricks he may name the trumps and discard two of his own cards, asking his partner for his two best cards. The bidder then plays a lone hand.

If the game is four-handed his side scores 24 if he succecds, and is set back 12 points if he fails. In a six-handed game his side scores 26 for the win or is set back 8 points. Normally each trick counta 1 point, and 62 points constitute game.

HAZEL. The hazel is a native British tree that grows plentifully in the home counties. The timber, which is a reddish white in colour, soft and highly elastic, is not sufficiently durable for good cabinet making, but it is employed for crates, barrels, and fencing stakes. Charcoal is also made from it, and the water diviner uses a hazel twig.

Hazel Nut. The hazel nut is the fruit of the hardy shrub Corylus avellana, which flourishes in ordinary soil. The golden-leaved varicty, aurea, is ornamental. The purple-leaved varicty of another hazel, Corylus maxima, is also showy. Propagation is by setting the nuts in autumn out of doors or by layering in summer.

HE. This name is sometimes given to the popular children's gaine known also as touch, tag, or tick. See. Touch.

HEADACHE : Its Treatment. An occasional headache is due generally to some purely temporary cause such as overwork or stomach disorder, but if it is persistent medical advice should be sought, as more serious troubles may he involved. In children especially a headache requires attention. Women always suffer more


Hazel Nut. Fruit and leaves ol a decorative tree which can be trained to form a garden hedge
than men and very often do harm to them selves by the excessive use of drugs which produce temporary relief.
Eye strain, decayed teeth, adenoids, ear rouble and disense in the nose are all possible sources to be considered Headaches due to cye strain are common in children. The eyes should be examined by a reputable oculist. and suitable glasses provided. The commonest causes of the condition in women are constipation, neurasthenia, and anacmia In men, overwork, work done at high pressure, and particularly when distracted by noise or poisoned by bad air, excessive smoking and drinking, with its usual consequence, catarihal dyspepsin, are very common causes Heavy indigeatihle meals, drinking strong ten or coffee, wearing tight and heavy hats, sleepiun in ill-ventilated berlrooms, sleeping too long, using heavy impervious bedclothes. any kind of inental strain, may, any of them, give rise to troublesnme headaches.
Where disorders of the stomach are at the root of the trouble the pain is felt towards the front of the skill and equally on both sides. The pain of the anaemic headache is most severe on the top or at the hack of the head The congestive form in which the brain is overloaded with blood, is accomprnied usuilly by throbling in the head and it flushed face Alcohol and strong tea or coffee should be avoided. Aperients such as 5 grains of hlue pill inay be taken twice a week at bed-time, and the diet should he light and digestible. To relieve an attack, put the patient's feet and legs in a hot mustard bath, bathe the forehead with ice-cold water or put an ice-bag tos the head The safest remedy for a nervous headache is to rest in a darkencd room.

Certain drugs are much used, to the great injury of the patients. The doclor whould be asked to prescribe, as harm may resull from frequent resort to headuche powders.
HEADER: In Brickwork. The word healer is used to describe a hriok that is set horizontally with its greatest length at right angles to the face of the wall. The proper arrangement of hricks, and the relative placing of headers across the wall and bricks laid in the sance direction as that of the wall and called stretchers, is known as bond, or bonding A hender course is a row of bricks set at right angles to the face of the wall. See Bond: Bricklaying.

HEAD-LINING. Material shaped to fit the inside of a hat is called the head-lining. Such things are usually of silk and are quite simple to miske, hut a correct fit is important as they wear or tenr quickly if too tight, heaidea being uncomfortable on the head.

A strip of material, cut on the cross or straight as desired, measuring $23 \frac{1}{2}$ in. or 24 in. long and about $6 \frac{d}{d} \mathrm{in}$. wide, must be cut, and an oval-shaped picce, as shown in Fig. I, is necessary to line the top of the crown Place the oval piece into the crown, catching it through with long stitches to the outer part (Fig 2). Pin the straight piece round the inner edge of the hrim so that it fits exactly. Leave 1 in for turning at the ends. which must he joined up. Run a slot, $\frac{1}{2}$ in. wide, along the outer edge, leaving eyelet openings on each side of the join so that $a$ China ribhon may be threaded through; this enables the lining to he drawn up to fit the head. Should the hat he of a soft material the
head-lining may vcry easily be sewn in as shown in Fig. 2, leaving a gond 1 in margin in case the material shuild fray: but if the hat is straw, the needle should be pushed right through to the outer side, making very tiny stitches on the outside and long ones inside, which will not show when the lining is turned over them.

EESALTE: Its Essentials. Speaking broadly, health consists in all the organs and parts of the body performing their functions quite comfortably and with such vigour as to allow of our doing the day's work, including reasonable strain without undue fatiguc.

In addition to the sudden and great danger frum infectious disesses and footious diseases and physioal injuries, suffer no great health may be undermined by personal habits works his heart. which are hygienically wrong. Amongst the many things casential to bodily and mental welfare, there are three which aro ton frequently inadequate, viz. fresh air, exercise, and sleep.

Lack of exercise is usually associated with a lack of fresh air. and the results may be rickets in young children, anaemia, constipation, a sluggish digestion, and an inelasticity of mind and spirita, partly due to the bodily state and again reaoting upon it. Late hours, especially when too many of them are filled with feverish excitement, are also undermining factors, and as life becomes more strenuous a sufficiency of slecp becomes all the more necessary.
Much ill health is due to want of knowledge and judgement in the use of food. It is now recognized that vitamins play an essential part in nutrition and that the foods containing thesc, such as fresh milk. butter, meat fat, eggs and fresh vcgetables, cannot be neglecterl with impunity. Almost as important for our nutrition is the possession of sufficient teeth and propor habits of eating and drinking. The abuse of alcohol, tea, tobacco, and other drugs are dangers to be avoided.
It has been noted that most people who live an unusually long span of years have been characterized by cheerfulness of dis. position. See Breathing Excrciscs: Diet; Drill ; Exercise ; Insurance ; Ventilation ; etc.
HEARING. When anyone finds his sense of hearing becoming in the least defective, he should at once consult a doctor. There are some affections of the ear which can be cured when treated at an early stage, but which, if noglected. may result in onmplete loss of hearing The ear is one of the most delicate and complicated of our organa, and when affected in any way it is imprudent to practise self-treatment. See Deafness; Ear.

Hicart: Structure and Disease. The main organ of the circulatory system is the heart, which is divided into four chambers, the two upper ones being termed auricles and the two lower ones ventricles. The two great veins, through which passes all the blood returning from the body, open into the right auricle. From this chamber the blood flows into the right ventricle and passes along the pulmonary artery into the lungs. Having been recharged with oxygen in the lungs, the blood is carried into the left auricle, then to the left ventricle and, passing into the sorta, is then distributed to the body. The heart being s group of four pumps, each of which is emptied
in the same way as is a rubber bulb when it is squeezed, valves exist at the openings to maintain the flow in one direction. The sounds audible when the heart beats are made chiefly by the closing of these valver. The average number of bents per minute in an adult is 72 .
Diseases of the Heart. The great majority are valvular diseases, and these are of two main kinds, stenosis, or narrowing of the valve, which obstructs the blond flow, and incompotence through leaking of a valve. In the treatment of ralvular disease the main objects aro to lessen the work of the heart by remoring resistance and avoiding strain as far as possible, to strengthen the heart itself and to relieve distressing symptoms when they appear in the later stages. Valvular diseases may, for this purpose, be divided into two main classes, those in which compensation is maintained and those in which it is failing or has failed. In the former the patient will discomfort unless he over-

## A boy or girl suffering from valvular disease

 cannot safely join in violent games such as football. The clothing should be warm, the diet nutritious, and everything indigeatible should be strictly avoided. At schonl study should not be carried to the point of mental exhaustion, and excitement must be avoided. With adults similar precautions should be taken. Slight ailments such as colds, bronchitis. etc., must be taken more seriously than in people with healthy hearts. It is of great importance that the mouth be kept clean, carious teeth being removed, and pyorrhoes dealt with energetically: the same applies to sopsis anywhere.Functional or nervous disorders are very common, and are frequently referred to as D.A.H., or disordered action of the hcart. They are not duc to organic disease, but to some outside influence acting usually through the nerves. Thus excessive use of tobacco, tea. or other drugs, as well as hysteria, ncurasthenia and dyspopsia, may give rise to irregular heart action. The condition may follow acute disorders such as influenza, rheumatism. trench fever, malaria, etc. A septie mouth or sepsis elsewhere in the body may also cause the symptoms, or these may be due to ansemia The treatment of D.A.H. will vary to a large extent with the cause.

Angina pectoris is a disease due to morbid changos of the heart muscle, and is generally characterized by agonizing paroxysms under the breast-bone, accompanied by a feeling of suffocsation. No person who has suffered from angina should ever bo without the small glass phials of amyl nitrite (two to five minims each), which any chemist oan supply. At the first sign of an attack he should break one of these phials in his handkerchief and inhale the fumes. The doctor should bo summoned at once, and meanwhile a lot-water bottle may be placed over the heart and sips of hot water and brandy should be given. After an attack the greatest care must be taken to avoid physical and mental strain.

Like any other muscle, the heart may be weak without being actually diseased It then gives rise to distressing symptoms and often causes needless siarm. Tobacco smoking, drinking strong tea, and other habits may cause weakness of the heart, which is always curable by removing the cause. After an attack of inlluenza or any of the infectious fevers the heart may be weak for come time, but this passes away as the patient grows well
and strong. It sometimes occure that the hoart becomes weak in middle-aged people, solcly because they eat and drink ton much and do not take sufficient exercise.

BEART: In Cookery. The heart of $n$ bullock, calf or sheep makes a savoury dish if properly flavoured and masted. Two or three shocp's hearts are generally required. Wash them in soveral waters, warm for proference, removing any clots of blood remaining in the oavitios. Cut off the lobes, remove any cartilage or gristle and separate the cavilies iuside the heart. Then stuff it with a wellliavoured forcemeat, skewer or stitch up the opening, and tie greased paper over it.

Roast or bake the heart in a tin with plenty of dripping, and baste it well, but do not let it cook too quickly or the flesh will be hard. As soon as the stuffing is set remove the paper so that the surface of the heart may brown evenly, and turn it over in the tin from time to time. Serve it with brown gravy, to which should be added the sediment left in the tin after the fat has been poured off. Remove skewers or thread.

A bullock's heart takes from $2 \frac{1}{2}$ to 3 hours to roast, a sheep's heart about. I hour, and a calf's heart if to 2 hours See. Forcemeat.
HEARTBURN, A burning sensation in the gullet and stomach behind tho lower end of the breast bone is known as heartburn, but it is in no way connected with the heart. It results usially from the presence of excessive quantities of acid in the stomach. When some of this is forced up the gullet it causes a scalding sensation in the throat.

Relief can usually be obtained by using one of the following remedies, but none of these remove the cause, to which sppropriate trestment should be directed. Perhaps the best remedy is a powder of menthol, of gr., carbonate of magnesia, $10 \mathrm{gr} .$, and bicarbunate of soda, 12 gr ., taken in tumbler of hot watcr. Another uscful remedy is a powder composed of 10 gr . subnitrate of bismuth and 10 gr . of the compound tragacanth powder, three times a day. One or two sodamint tablets $\frac{1}{2}$ hour after meals often give relief. See Gastritis: Indigestion.

HEARTH : Its Construction. Literally the hesarth is the firepromf flooring immediately in front of the fimplace, of which it is a part, and various forins of decorafive treatment are applied to it. On the ground flowr level, if the floor is solid, the hearth may be built up with concrete, coverod with tiles, stones, or brickwork, but is mostly constructed of one material.
In most small houses the ground floor is built up of timbers, and to protect this woodwork a little wall of bricks is built around the fireplace opening, filled with rubble, and ${ }^{\circ}$ con creted to a level surface. This terminates about 1 in. below the flow, so that when faced with tiles the hearth will be level with the floor.


Hearth. Construction of a hearth on an upper loor, showing how the trimmers are arranged to furnish the necessary support

In a cheap, construction, the hearth may be floated off with granolithio concrete and worked to a smooth, trowelled surfnce
On an upper Hour the floor joists are trimined to form a framework about 2 ft awny from the fireplace opening and extending to the sides of the chimney breasts, or to the width of the mantelpiece. A fillet of wood is nailed round on the inside of this framework, near to the bottom of the joists, and the uperture temporarily closed by rough boarding supported on props to the ground floor. The box-like structure thus formed is filled with concrete strengthened by reinforcing bars of iron about $? \mathrm{in}$. in diameter, disposed according to the structure of the building. The concrete is then allowed to set thoroughly hard, and finally the wooden props are removed. The surface of the concrete is left about 1 in . below tloor level, flonted over with granolithic concrete, and trowelled to $n$ smooth surface, tiled or otherwise finished.
When it bccomes worn or cracked a concrete henrth may be repaired by chipping off the surface and floating off with new concrete composed of one part of Portland cement and one part of fine granite chips.

To clean a hearth, remove the cinders with a shovel and brush up the cshes that remain with a hearth brush. If it is tiled, wash it with warn, soapy water; then rinse and dry it, and finally polish with a suft cloth or chamois leather. Stone hearths should be washed with warm, soapy water and then rubbed with hearthstone. See Chimney Piece : Concrete; Fireplace ; Floor ; Grate, etc.

Hearth Brush. Brushes of this kind are emploved to sweep up the ashes from the hearth and to remove the soot and dust from the back of the grate. They have handles which are usually minde of brass or of oxidized metal to match the fire irons.

A neat type of hearth brush is fitted with a cylindrical brass case which slides up and down the handle according to the position in which the brush is held. When the latter is hang up, the case slips to the bottom of the handle and so acts as a covering for the brush. Hearth brushes aro sometimes included in sets of fire irons which hang on small stands nnd are con veniently placed beside the fire. See Fire Irons; Grate

Hearth Cloth. Employed to protect that portion of a carpet surrounding the fire. place when the latter is being cleaned, a hearth cloth can be made of any coarse material such as sacking, felt, etc. While the cleaning is being done, the fire irons, sticks. and cleaning materials mny be placed on the cloth. Care must be taken in laping the latter that the clean side is always placed underneath.

Hearth Stone. This is a preparation sold in block form for cleaning stone hearths, steps etc. It is made by mixing equal parts of whiting and plaster of Paris with enough water to turn them into a stiff dough-like mixture. The latter is then placed in moulds to set.

## Hearth Rug. See Rug.

HEARTSEASE. This lovely old-fashioned Hower may be treated as an annual, biennial, or perennial. It may be raised from seed sown in July in light, leafy soil, in pots or pans, and placed in a cool spot. It may also be increased by cuttings or by layers. See Pansy.

HEATH. The botnnical name of heath or heather is orica, a genus which contains many beautiful hardy flowering and greenhouse plants. By planting a collection of hardy heaths it is possible to ensure flowers almost all the year round. They prefer peaty or lealy soil but will Hourish in lime-free ground to which mould has been added freely: they do not thrive in limestone soil. Planting is best done in early autumn. Cuttings placed in pots of sandy peat in a frame in August provide


Heatb. Greenhouse variety bearing spikes of white fowers in Rreat profusion
the beat means of propagation. The only proming needed is to cut off faded flowers, but the tips of young plants should be pinched off to make them branch out.

These are the best hardy heaths for general cultivation-carnea, reddish, spring; darleyensis (mediterranca hybrida), rose red, Novem-ber-May: maweana, red, August-September ; cincrea, the common hillside heather, purplish, Septemher; vagans, the Cornish heath, pinkish, August-Sieptember. Arborea and lusitnnica, the so-called tree heaths, grow 5 fect or more high, bear white flowers in spring and need a sheltered place.
For cultivation in the greenhousc the fol lowing are some of the most attractive heaths : caffra, white; Cavendishiana, vellow: gracilis reddish: hyemal is, red and white ; and melanthera, white. They must be potted in welldrained sandy peat and grown in a temperature of about 50 degrees. After llowering the shoots should be cut hack lightly. Heaths in prots must be watered very carefully; the object should be to keep the soil uniformly moist. If it becomes sodden or is allowed to get dry the plants will fail. In summer they should be placed out of dours or in a cold fraime.
HEATHER. This name is usually given to Erica cincrea, which covers large tracts of country in various parts of the British Isles and is very beautiful when in bloom in September
HEATHER MIXTURE. Cloths, usually tweed, in colours closely resembling the heather of the moors, and known as heather mixtures, are employed in the making of sports and other outdoor costumes and lints. Stocking wools in heather mixture are made by blending in differing proportions wools which have been dyed brown, red, green, and purple. See Tweed
HEATING: Some General Directions. In this work the various methods of heating a house are described in such prinary articles as Central Heating, Electricity, Gas, and Oil Reference should be minde also to Anthracite, Coal, Coke, Fireplace, Grate and Stove.

An open fire radiates heat from the incandescent coals, coke or logs useri as fuel. The heat travels out in rays from the glowing sur. face, heating only the solid bodies upon which
the ray's impinge and pasoing through the in tervening atmosphere. Such heat is analogons to that given off by the sum Modern well designed gas fires furnish nost of their heat by radiation, nud in clectric fircs the same end is aimed at. the fircelay back plate being shaped so as to reflect into the room the heat emitted by the glowing element

Here it miny be pointed out that the term " radintor," used loosely for tubular warming appliances heated by steam or hot water, is not a good onc, as these function mainly by convection, not radintion it is true that the casing radiates heat. but owing to its shape only a comparatively small purtion of its surface area can effectively send out heat waves into the npartment. A steam or water-heated appliance, or an air warmer, of the electrio type illustrated on page 413, heats the air in contact with ite walls or casing This heated air expands and rises, giving place to colder air, which in turn becomes warnied, so setting up a circulation of heated air in the apartment. This is walming by convection

Another type of convection heater is the cylindrical slow combustion stove. The fireclay lined iron walls become heated and thus warm the surrounding air. Disadvantages of convection heating are that the air in an apartment may hiccome stuffy, and the air currents set up tend to cause draughts. There are difficulties also in suitably ventilating the room without unduly cooling it.

Radiated heat, on the contrary, passes through the air in rays (i.e straight lines), and after impinging on walle, furniture and other solid bodies, is partly absorbed and partly reflected It does not warm the intervening air to any great extent, although air in contact with the walls, etc, which have absorbed radiant hent, gradunlly becomes heated by convection

An apartment warmed mainly by radiation is generally more comfortable than one in which a convection system is employcd. The contrast can he renlized by comparing the enervating heat of a Turkish bath, provided entirely by convection, with the bracing warnith of sunshine (radiant heat) on a day when there is it slight but coul brecze -blowing.

If it is desired to heat uniformin throughout. particulnrly if aconstant hot-water supply is to be maintained, the merits of central heeting should be considered. The economy of labour and finel effected by this method is considerable, and the atmosphere of the housc is kept at a uniform temperature throughout On the other hand, central heating exhibits a total lack of those cheerful qualitiee nssociated with the open coal or log fire. The chief objection to open lires is that they cause a certain amount of extra houscwork as well as smoke and dirt ; but these factors have been reduced practically to a minimum by the modern forms of slow combustion grates.
Those who, while insisting on the cheerful effect and other qualities of the open lire,
dislike the extra labour and absence of scrupu. lous cleanliness agsociated with coal and other solid fuels, should investigate the claims of the gas fire and the electric fire. If neither of these is available, there remains the oil stove: it is seldon realized what strides have been made in the design of heating apparatus for consuming oil.

HEAT STROKE. Fsposure to cxeessive heat may cause heat stroke, a condition having some resemblance to an apoplectic seizure. When following exposure to the rays of the sun the condition is described as sunstrolie, or insolation, but exposure to the sun is not the only way in which heat st roke may be caused. it may occur in stokers and others similarly placed. Its occurmence is faroured by alcoholic habits, innbility to sweat frecly, and by ton heavy clothing.

The patient may suddenly fall unconscious, or there may be preliminary symptoms, such as headache, giddiness, romiting, and sickness Usually the face is flushed, the pulse bounding, and if the temperature is taken it will be found to he very high, perhapa $107^{\circ}$ to $110^{\circ} \mathrm{F}$.

The immediate treatment for heat stroke is to take the patient into the shade, or the coolest place available, strip the clothing from the trunk, and souse the trunk and head with cold water. As sonn as possible he should be taken home or to a hospital, where an effort witl be nade to lower the temperature by rubbing him over with ice or giving an iced pack or bath, and possibly an iced enema. See Fever.

HEDGE. Certain leaf-loaing and evergreen shruhs are suitable for planting as hedges.

In ellsure satisfactory growth. In the spring following planiling che shrubs ought to be cut back to within 8 or 10 in . of the base to make them branch out. In future years it is wise to keep the top narrower than the basc Clipping is usually done in spring and early autumn. Privet requires to he cut frequently to keep the hedge neat.
Holly and yew are the best evergieen hedge shrubs. but they grow rather slowly. Plants not more than $2-3 \mathrm{ft}$. high become establiahed most quickly and surely. April and September are the best times to plant evergreen hedges. Clipping should be done in April and August. The pliznts may be set 15 in . apart in a single row, or if necessary in a double row. A comparatively new hedge shrub that is strongly to he recommended is an evergreen honeyanckle named Lonicera nitida: it bears clipping well, and can be kept low or allowed to reach a height of f it Cupressus lawsoniana, Cupressus macrocarpa, common laurel, Portu. gal laurel, and thuya (arbor vitap), are other evergreen hedge shrubs, and box may be planted though it grows slowly. Cupressus macmearpa makes quick progress and soon forms a tall hedge.
Escallonia macranthn, tamarisk nand hardy fuchsia, make aplendid hedges ir mild dist.ricts, especially those near the sea. Berberis Darwinii, and Berberis stenophylla, two Howering evergreen ahrubs, make attractive informal hedges, so do the Penzance briars and other vigorous roses. The best dwarf hedge is provided by lavender.
The Legal Aspect. The ownership of a hedge is frequently a matter of dispute, but in strict law where a hedge separates twin ficlds it

Among the former are privet, whitethorn or quick, beech, hornbeam and myrobalan plum.

Beech makes $\Omega$ first rate boundary hedge, for the dead leaves remain on the branches most of the winter. Planting may be done at any time from November to Mnreh, though early autumn planting is to be preferred. A uscful herlge results from planting n double row, the plants in one row alternating with those in the other and being set at 12-15 inches spart. Thorough soil preparation is essential
belongs to the owner of the field on whose side there is no difech. Where there is no ditch on either side. the ownership of the hedge is established by evidence of acts of nwnership, e.g. where one owner's family has tended it throughout a long period.

A liedge which has a ditch on Unth sides is the property of the owners on each side, who are equally responsible for ita upkeep. A person must not cut a herlge or any portion of it that does not helong to him.
Hedges in town and suburhan gardens


Hedze. Cut gew hedge, a feature of great beauty in the formal type of garden. Above, evergreen bedges which make an effective background to flower borders
should be kept well pruned. Failure to do so may lead to a passer-by being injured by straggling branches and to consequent liability for damages. Where a garden adjoins pasture land care must be taken that the trese or shrubs forming the hedge are not of a noxious nature. Yev trees, for example. ahould never be planted under these circumstances, as cattle may eat the leaves, with injurious and perhape fatal consequences, and the owner of the hedge may be held liable.

A tenant is not permitted to grow a herlge that will damage the landlord's pmperty, as for example, loo near a window-sill, blocking out light from a window, or allowing its ronts to develop so as to onuse settlement, and so on. Overhanging leaves and branches of a hedga in a neighbour's property may be lopped by the person whose land they overhang, though it is usual first to request the nwner to cut them. On the other hand, fruit growing on branches averhanging a neighbouring garden is the property of the owner of the healge See Box; Concretc: Fence; Garden: Holly: Privet; Yew.

HEDGEROG. There is no pet that is less trouble to keep than a hedgeliog. Housewives who are troubled with black beetles or cockroaches in the kitchen will find in the hedgehog a valuable ally, for he will effert a speedy clearance. Young hedgehogs can be bought at bird and animal shops

HEDGEHOG CACTUS. Mont kinds of echinocactus require cultivation in warm and dry greenhouses, but one species, Simpsoni. can be grown in a sunny position out of drors in gravelly or sandy soil if protected from rain in winter. Propagation is by cuttings or offsets taken with a sharp knife and placed in n sunny spot until cuts heal and ront growth begins. At this stage they may be potted in a mixture of fibrous loam, finely broken lime-rubble, and sand.

HEDGEHOG CAKE. A hedgehog cake ís so called because of its shape and the numher of browned and halved almonds used to decorate it. The ingredients and method of making are the same as those described for almond cake, but a morc rounded appearance is given. When cooked, the cake is coated with almond paste, brushed over with a little yolk of egg, and placed in a hot oven till of a golden brown colour. The almonds are then stuck into the paste to suggest hedgehog spines.

HEDGING TOOL. This is a tool adapted for cutting hedges, and especially for hedges of considerable size and not easily trimmed with an ordinary hedging knife or bagging hook The tool comprises a long handle, or shaft, 3 ft or more in length, and has a steel blade lixed to the end, shaped in much the same form as a billhook. See Billhook

HEEL BALL. A composition of tallow, or beeswax, and carnauba wax, coloured with drop black, is employed under the name of heel ball in the repair of boots and shoes, for colouring and polishing purposes. It is also used for taking impressions of coins, brasses, and other incised decorations. This is done by placing a piece of white paper over the object, and rubbing upon the surface with a lump of heel ball, with the result that the high parts of the design are reproduced in black, and the incised lines appear on the paper in the form of white spaces. See Boot Repairing.

HEIRLOOM. This word is used for articles, e.g. plate, furniturc and pictures, which go with a settled estate. Since 1925, these may be settled in the same way as land so as to make it diflicult, if not impossible, to dispose of them apart from the land to which they are attached More generally the term is employed in order to denote articles of value which have been for some time in possession of the same family.

HELENIUM. Hardy perennials which are of great value in the Hower border in summer nnd autumn. They flourish in ordinary soil, are easily propagated by division in spring and autumn and bear large. daisy-like flowers. The best kinds are Crimson Beauty, 2 ft., July, crimison-brown: pumilum magnificum, $2 \frac{1}{2}$ ft., July, golden ycllow; Riverton Beauty. 4 ft., Aug. Sept., yellow, and Riverton Gem, 4 ft., Aug. Sept., reddish.

HELIANTHEMUM. The name belongs to a pretty family of dwarf flowering planta, popularly known as the sun roses. The flowers of different varieties are white, yellow, pink and crimson in colour, ind the plants a verage ahout 12 in . in height. Sun roses ane useful for the rock garden; they thrive beat in light soil. They are raised from seed in spring. The conmon kind is helianthemum vulgare, of which there are numerous varieties, some with single, others with clouble flowers, in many showy colours.

Relianthus. This is the botanical name of the sunflower (q.v.).

Helical Gear. See Gear.
HELIOPSIS. Of the small genus of hardy derbaceous plants known as heliopsis and


Reliopsis. Flower head and leaves
of a single form of the scabra variety sometimes as orange sunHowers, which they much resemble, only laevis and its varieties pitcherinna and acabra are much grown. These arc showy plants with rough. toothed leaves and large yellow flowers in summer; height 4 to 5 ft . The method of propngation is either by seed or by division of the root-atock in autumn or apring. Heliotrope. See Cherry I'ie.
HELLEBORE. This group of hardy plants contains the Christmas ruse (Helleborus niger) and the Lenten rose (Helleborus orientalis), whioh are valunble winter and spring Howers. They flourish in partially shady places in deeply dug and manured soil which does not dry out in summer. The best time to plant or transplant is in July. Small pieces hecome established quicker than large ones.

There are some beautiful varieties both of the Christmas and the Lenten rosc. The finest Christmas rose is one named altifolius (maximus), which bears large white flowers Of the Lenten roses some of the most henutiful are Isolde, pale rose; Faerie Queen, blush marked with crimson; Snowdrift, white; and Robert Froebel, crimson. Propagation is most easily effected by division of the clunips in summer.

HEM : How to Make. A hem is made by folding over an edge of material on to the wrong side to any required depth, its extreme


Helenium. The dalsy-like flowers
make effective indoor decoration
cdges turned in and prevented from fraying by being sewn down to the outer part. The line of sewing slould hardly show through on to the right side, if the stitches are small and evenly made. Hems which are made to neaten the raw edges in lin. gerie, or in scwing very fine silk, should be as tiny and llat as possible, while hems to answer the same purpose in heavier materinls are usually made $\}$ in. wide so that they can be pressed down flat.
The depth of a hem varies according to the demands made upon it, and the material. A very deep hem several inches wide is often used to give weight, helping to make the part of the garment upon which it is placed hang evenly and well. If the material is too heary to be turned up to any depth, or if not enough material has been allowed to make a deep hem, 1 in. or more may be turned up and a facing or false hem made with oome lighterweight material of the same shade, to give the appearance of a deep hem.

The edges of a hem made in very thick material should not he turned in, but one edge of a Paris binding should be sewn well over the part which is likely to fray, the outer edge of the binding being firmly liemmed down to the outer part of the garment. The hem will then press quite flat with no unnecessary thickncss. In turning up the hem of an unlined coat the edges are usually bound by a crossway strip of material or binding before heinning to the outer part The hein of a lined garment is kept in place by the lining, and is not sewn down to the outer part at all. Hems made in cloth which is not likely to fray are sometimes turned up and herring-bone stitched flat.

To hem the material, which is done from right to left, hold the hem over the forefinger of the left hand and under the middle finger, holding it down with the left thumb, and keeping the inner fold towards you; then, pointing the needle outwards, pick up a few threads of the inaterial just below the inner fold and push the needle up through the edge of the fold itself. Draw the needle through, and repeat. All the stitchea should be made uniform in size, slant and space. If the innterial is not too thin, the needle can be passed through the upper aurface of the fabric, so that practically nothing is seen from the right side.

HEMLOCK : The Drug. Both the fruit and the leaves of the hemlock, or conium, are used in medicine, but the drug and its preparations arc not officially recognized by the medical authorities. The diug is rarely prescribed to he taken internally, as its action is uncertain. Conium ointment has been found of much use as a cure for itching and fissures about the anus.

The chief symptoms in hemlock poisoning are heaviness in the legs, staggering gait, and finally complete loss of power over the muscles. The eyes become fixed, the pupils dilate. the breathing becomes more and more difficult, until finally death ensues from asphyxin. After an overdose of hempock an emetic should be given at once, and then strong warm tea freely The patient should be kept warın with hot water bottles and blankets. If the heart tlaga. or bnenthing becomes very laboured, atimu. lants should be given and artilicial respiration should be carried out. See Emetic.
HEMP AGRIMONY. This is a hardy perennial suitable more particularly for a large
garden, owing to its coarse growth There is one species, however, which may be recom mended for smaller gardens, namely, Eupatorium ageratoides This makes a fairly compact huah about 3 ft . in height bearing pure white flowers and requiring a sunny position in ordinary aoil. Propagation is by division o! ronls in spring or autumn, or by seeds sown outduors during April.
HEMSTITCH. This is used chielly on house- linen, when it actually holds down the hem, but it is employed also on dresses and lingeric
On a teacloth a hem is turned. usually about 2 in. wide, tacked down, and scveral threads drawn just under the cdge of the hem: the number of threads to be drawn depends on the texture of the linen or other material in use for the cloth. The stitch then proceeds as in drawn thread (q.v.).

HENBANE. This is the popular name for hyorcyamus. It grows wild, especially on and around licaps of old rubbish, hut in sone places it is cultivated becauso of its use medicinally Every part of the plant is poisonous, particularly the root, which is often mistaken for chickory or parsnip. The leaves are oval, lobed or toothed, the upper ones clasping the stem The flowers are large, shaped like a funnel, and in colour a dull yellow veined with purple. The fruit is a many-sided capsule with a dis. tinct lid. The whole plant has a somewhat unpleasant amcll.

The leaves and flowering tops of the plant are used for maling its various medicinal preparations, the leaves being of most value in their second year, or in the autumn of their first. Its actions resemble those of belladonna and atramonium, and it is frequently used as a sedative in bladder affections, and combined in pills with purgntive drugs to prevent severe griping.

HENNA : For the Hair. Henna is a small shrub, the lenves of which, when dried and powdered, are used to make a reddish-hrown dye In small quantities it makes an admirable shampoo for brunettes, giving brightness to the hair after washing.

In using the hair dye ahout 7 oz of powder are required for one application. This quantity is divided into two portions The first part is mixed with a pint of hoiling water, allowed to stand for a short time, hut whilst still hot applied to the hair by means of a brual. The second portion is made into a moderately thick paste with water and applied to the hair, being kept in place for about half an hour by wrapping a towel round the hair. The hair is then rinsed in tepid water. Re-colouring is necersary in abnut a month See Hair

HEPATICA. Belonging to the anemone family, hepatica is a spring-flowering primiroselike plant which loves the slinde.

There are single and double varieties of white, blue, and red colouring. Hepaticas need rather light


Hemp Agrimony (Eupatorium) which bears large heads of whlte flowers in late summer leafy soil in a partinlly ahaded place and should be left undisturbed for years ns they dislike being moved. in time they may become overcrouded and bloom sparsely then lifting and replanting as soon as the lcaver have died down is recommended.

HISPPLEWETITE: The Style. This style in English furniture is named after George Hepplewhite, a cabinct maker and designer who worked in London until his death in 1786. The general lines of his furniture, like those of Sheraton, show the Adam influence, and the pieces are in good taste, with the ornament dignified and restrained

Hepplewhite used carving to ornament his chair backs where Sheraton generally relied for decoration upon marquetry or painting. His wheat-ear shield-back chairs, those with the Prince of Wales's feathers, and others with carved festoons of drapery, or a vase forming the centre, to which the husks or drapery were attached, are now highly valued by collectors.

HERACLEUM. Also known as the giant parsnip. Heracleum gigantcum is only suitable for the wild garden or shrubbery, by reason of its exceedingly robust growth. It bears very large lobsd leaves and umbels of creamywhite Howers; under suitable conditions it will reach a height of 10 ft .
Heracleum can be grown in any ordinary soil, and is best planted in autumin. Prc.paga. tion is by seed sown in spring, or by division of roots in October or March. The plant is sometimes called the cartwhecl flower because of its huge heads of bloom. Pron. He-rak-le-um.

HERB : In Cookery. Herbs are omployed in cookery for flavouring many dishes. The best flavouring is afforded by freshly gathered powdered herbs, but thero are one or two special mixtures of preserved herbs on salc. The ordinary sweet herbs sold by grocers contain about two parts parsley, the remainder being made up with thyme, and occasionally marjoram.
The herbs most fre. quently employed include sage, thyme, marjoram, mint, parsley, hyssop, chervil and coriander, the cultiva. tion and uses of which will be found described under their separate headings.

Among all the herbs marjorant may be said to excel in flavour. Marjoram is an excellent addition to soup, meat and fish, and can be used in stuffing.

Like Sheraton, he favoured square, tapering legs, but these were ornamented by flutings or grooves, into which he often introduced carved husks. The friezes of his sideboards and the console or pier tables of the time he ornamented with carved paterae of rosettes, which sometimes were alternated with vases and scrolls: occasionally the masks of lions, rams or guats were introduced. Some of his mirror frames were designed for gilding, and these are generally sinilar to those of the Adam style.

One of his specialities was enamelled or painted furniture, and for this he used beech or birch, which was first covered by an enamel lacquer, generally black, white or ivory colour, and then decorated with painted flowers, or occasionally with camco-like medallions. Some of the titles of his furniture now strike us as peculiar, e.g. cabriole chair, which in his casc meant a stuffed back and did not refer to the curved form of leg; bar-backed sofa, which was a settce for three or four people, formed likc chairs joined together side by side, with an arm at either end; tea chests; knife urns and some other terms which have since gone out of general use.
The knife urns are distinctive and attractive accersorics, sometimes in the form of Etruscan vares, often made of richly figured Spanish mahogany. They stood upon the pedestals which, together with a side table, formed in combination the sideboard of the period. Some of Hepplewhite's oval trays are inlaid with marquetry, generally having a centre ornament surrounded by festoons of husks. Like Chippendale and Sheraton, whose books of designs furnished the patterns for contemporary makers, Hepplewhite has got the credit for a great deal of furniture which actually was made by his contemporaries. See Antique Furniture; Armchair; Knife Box; Mahogany ; Settee; Sheraton; Sideboard.


Hepplowhite. Chairs in walnut, with gilk apholstered seata, and backs showing desigas characteristic of this maker's style By permisation of the Director. Victoria and Albert Museum, S. Acnsington
once established the herbaceous border needs only superficial attention, provided it has been well prepared in the first instance. The border should be dug out to a depth of 2 ft . and enriched with manuro.
The best periods for planting perennials are spring and autumn, the more robust plants during October and November, and the choicer kinds in March and April.

By planting a careful selection of kinds and varicties it is possible to ensure a brilliant display of bloom throughout the summer and autumn months. It is usual to place the plants in groups of three, five or seven, according to the size of the border, rather than to set them singly. Charming colour schemes can be arranged by grouping the plants according to the colours of the Howers. The most effective arrangement is to start at each end of the border with white and pale blue, and follow with pale yellow, rose, mauve, and purple, working up to crimson and scarlet in the middle of the border.
Some of the chicf hardy herbaccous peren. nials are the following: Lupin, delphinium, Shasta daisy, phlox, paeony, pyrethrum, oriental poppy, sea holly (eryngium), globe thistle (echinops), heuchera, Michaelmas daisy, golden rod (solidago), Japanese anemone, purple sage (Salvia virgata), day lily (hemerocallis), and summer starwort (erigeron). To fill spaces between the permanent plants, annuals are sown and gladioli, lilies, and montbretias are planted in spring and dahlias are put out carly in June. See Border; Flower Garden.
HERB GARDEN. The cultivation of herbs on account of their medicinal properties and as a flavouring in cookery is one of the oldest forms of gardening, and herb gardens are still to be found in many parts of Great Britain. Herbs most usually found in gardens include mint, thyme, marjoram, hyssop, peppermint, borage, dill, fennel, angelica, sorrel, tarragon, chervil and coriander. Although strictly not an inhabitant of the herb garden, lavender is often to be found therein. The best position for the herb garden is between the flower and litchen gardens.

The majority of herbs are propagated by slips taken in the autumn, or, in the first place, by sced sown in the early spring. They may be arranged in drills or patches, and the plants should remain undisturbed, except for thinning.

HERMITAGE: A French Wine. There are three variet ies of hermitage, which is a highclass French wine of the Côtes du Rhóne, and is cither red, white, or straw colour. The red wine, when it is of the first quality is not bottled until it has been four or five years in cask. It has a bouquet recalling the raspberry, and has a remarkably clean, fresh, full vinous Havour, great firmness and softness, and a rich deep purple huc.

White hermitage, which is made of white grapes only, has been described as the finest white winc France prodnces Its colour should be a pale yellow. Its bouquet is like that of no other known wine, tich and

HISRBACEOUS BORDER. The herbaceous border consists say, plants the foliage of which dies down in the autumn, but which comes up again season after season. The plants may be left permanently where first estab. lished, but many benefit by being dug up and transplanted every 3 or 4 years.
Plants which in crease too rapidly may be separated in the spring. When


Hepboceous Borders which provide a display of bloom in summer and antumn
spirituous in flavour and perfectly dry The straw colour hermitage is rare and expensive It is noted for its freedom from all acidity, its smoothness, and marrowy richness of flavour.
Hernia. See Rupture
HERON'S BILL. A plant somewhat similar to the hardy geranium, and sometimes called stork's bill: its hotanical name is


Heron's Bill. Geranium-like flowers of a plant asefal in the rock parden
erodium It flourishes in light, sandy soil in the rock garden. Some of the best sorts are guttatum, white, $(\mathbf{i}$ in. ; Reichardii, pink nnd white, 2 in ; and macradcnum, white and violet, 6 in.
HERPES: A Skin Disease. Simple herpes, fever blister, or cold sore is an acute inflammation of the skin, accompanied by the development of small blisters. Beyond lightly covering over the spot or sore with cold cream or a little zinc ointment, no treatment is required, the eruptions tending to heal themselves spontaneously. See Shingles.
HERRING: How to Cook. The usun way of cooking herrings is to fry them. After it is cleaned the fish can either be slit open or can be cooked as it is. Heat a little dripping in $n$ frying-pan, and fry the herring in it, turning it when one side is done.

To broil the fish, gut and clean them, but dry them well. Score the fish across each side, seasorr them, and dredge a little flour over them ; then cook them on a well-greased gridiron. Before dishing, brush the fish over with butter, which shonld be ready melted in a small pan. Sprinkle them with lemon juice and a little coyenne pepper, and garnish with fricd parsley.
Another method is baling. Remove the heads and tails, gut the fish and clean them. Grease n pic-dish with good dripping and lay the fish in it. Add one or two chopped shallots and a little chopped parsley, thynie and marjoram; a bay-leaf may also be laid in the dish Scason well, and put more dripping on the fish Cover the diall with greased paper, and bake it in a moderate oven for 15 to 20 min . Each lish should be laid separate, not one on top of the other. Serve with mustard sauce.
To souse herrings, clean and bone them, roll them up with a sniall piece of onion in each, and pack in an enamel or fireproof dish. Cover with vinegar and water, adding 2 or 3 cloves, 3 bay-leaves, some black peppercorns, and salt. Bake in a hot oven 20 to 30 min . Serve cold These are known as " Mops" in some parts of the country.
When cured, herrings are known as bloaters and kippers. Blonters are salted whole, then strung on thin piles and amoked with wood smoke until dry, and the curing process is completed. Yarmouth bloaters have always been considered the best. Kippers are herrings salted and smoked, but before curing they are split open and gutted. They can be cooked by the same methods as bloaters.
Roe of the Herring. The roc of the herring, either fresh or salted, can be served in a variety of ways, and makes a savoury or a breakfast
dish This is one method of cooking soft roes: Fry lightly in butter 3 or 4 roes from fresh herrings, lay them in a greased pie-diah with two tablespoonfuls of chopped mush. rooms, 1 tablespoonful of chopped paraley, and 2 shallots. also chopped Bone and fillet 3 anchovies, add these with a gond squeeze of lemon jnice, nnd season well. Pour over the roes the butter used in frying, and cover with brown sauce Put a greased paper over the dish and bake for 5 min

The roes may also be served plain. Blanch them, cut thein in convenient pieces, cook them a fow minutes in butter, and serve on crouttes of tonst. A better Havour is given if, before serving. a little lemon juice is sprinkled over the rocs and they are seasoned with salt and cayenne. The roes may be left whole

Hard roc may be boiled, pounded, and made into potted ment if mixed with butter, flavoured with mace and well scasoned. See Bloater : Cod's Roe; Fish; Kipper

HERRING-BONE STITCH. This stitch is chiefly used for seams on Hannel and similar materials that are too thick to be turncd under, the raw edge being herring-boned on the wrong side. It takes the position of the ordinary hemming stitch. It is sometimes called Figure 8 work, and reference to the illustration vill show the similarity.
W'ith a little care nad a good eye for measurement., it is not necessary to space out the


Herring-bone Stitch, used for catching down the raw edge of a seamin a thick material
actual places for the stitches, but, for the beginner's guide, dots can be placed along an innaginary top and botton line, which will decide thic depth of the stitch For an ordinary hem this is $f$ in., and each stitch is $\ddagger$ in. apart on the rame line. Dots can be marked with a lead pencil at equal distances a part, or on loosely woven materials a thread can be drawn at the top and bottom of the space to be covered, and an even number of threads taken up and missed on the material, The work proceeds from left to right, and thie stitch is taken up on top and bottom lines alternately, as shown in the illustration.
HESSIAN: A Canvas. Common canvas, or jute hessian, employed for packing bnles and making a foundation for oilcloth and linoleum, is sometimes known as burlap. The material has sundry household uses, such as making coarse aprons, ovencloths and underlays for mattresses to preserve the ticking from contact with the wire springs of the bed Hessian can be used for wall decorations; for example, in making panels or friezes. The natural colour is buff, but it can be dyed a deeper shade, black, dull green or blue quite successfully. Pictures look well ngainst n background of burlap or hessian, and advantage is often taken of this at exhibitions.

The material is cheap and obtainable in different widths and qualities. It is often stencilled or embroidered in simple designs and used for short curtains, garden cushions, blotters and work bags. It is effective, when dyed black and enibroidered in bright coloured wools, for a writing table set and in buff for cushions. See Woolwork.

HETERODYNE. When alternating currents of two different frequencies flow together in $n$ circuit they combine to form a new
frequency (called the " beat " irequency) which is equal to the difference between the original frequencies.

The superimposing of two sets of alternating currents or oscillations of different frequencies is known as "heterndyning," and the method may be used in wireless for the reception of continuous wave (C.W.) transmissions (heterodyne reception) and also for the measurement of wave-length.

The formation of a "bent" frequency in the manner described ahove constitutes the principle upon which the superhaterodyne receiver is based

Heterodyne Interference. This is the interference caused by the carricr-wnve of a broadcasting station beating with that of another atation working on a slightly different wavelength or frequency, this producing an audible heat note in the receiver. The interference can be remedied by spacing the stations farther a part in wave-length. See Oscillation: Superheterodyne; Wave-mcter.

HEUCHERA. Alum root is the popular name of this invaluable hardy border plant, which produces long, graceful sprays of bloom in rose, crimson, blush and other colours in May and June. These add to the charm of the garden in early summer and are most useful for cutting. The plants, which form low, leafy tufts, may be planted in spring or autumn; it is wise to leave them undisturbed They thrive in ordinary well-drained soil in a sunny place. Propagation is by division of the plants in nutumn, or by seeds. There are now many beautiful varieties with long flowering stenis Some of the best of thesc are Enge Hal!, rose-pink; Rose Cavalier, rose-cerise; tiarelloiden, blush; and Pluie de Feu, red; sanguinea, coral-red, which is an old sort, is also a beautiful and useful variety.

HIBISCUS (Mallow). This is the name of $\pi$ group of shrubs and her baceous perennials some of which are hardy, while others are suita ble for the greenhouse. The Syrian maliow (Hibiscus syriacus) is the best of the hardy kinds; it is a shrub 5 ft. or more high which bears inallowlike Howersof various colours in Aug. ust There are double and single varieties. For cultivation in the warin greenhouse, cocoineus, red, manihot yellow, and rosa sinensis, red, are to be recommended. They may be grown in large pots or planted in a horder of a soil of loan and peat

mallow (Hibiscus syriacas)
HICCOUGH: How to Check. The commonest exciting cause of hiccough is indigestion. Children who bolt their food are especially subject to it. Drinking very hot or very cold liquids inay cause it. It occurs in hysteria, gastritis, appendicitio, alcoholism, sleepy sickness, etc.
There are many ways of bringing an ordinary attack to $n$ close, among which are the following: (Give a teaspoonful of raw whisky, a teaspoonful of lemon-juice in which n pinch of salt is dissolved, or a teaspoonful of sal volatile with very little water. Put a pinch of salt on the back of the tongue A tablespoonful of peppermint water or of cinnamon water, or a few drops of apisit of
chloroform in $\frac{1}{2}$ tablespoonful of water, are also good remedics.

In the case of children with overloaded stoniach an emetic, such as $\frac{1}{2}$ teaspoonful of mustard in a tumbler of warm water, may be very useful. When the hiccough is severe and prolonged, a doctor should always bo consulted

EICKORY. This wood resembles English ash, and is used for much the same purposes. It is slightly superior to ash in hardness and toughness, and also heavier, but it is not very durable in moist, warm, and exposed condi tions, $n$ it is liable to be attacked by insects and worms. Hickory is close-grained and nearly white in colour. In boards it shrinks and warps. Its flexibility adapts it for bending and for purpoees where it will be subjected to shock and vibration. Hickory is used for hammer, axe. and agricultural implement handles, for the hoops of casks, in vehicle building, for the spokes of wheels and backs of chairs, for oars, etc. See Wond

## High Chair. See Baby Chair.

HIGR FREQUENCY (B.F.). This is a term applied to alternating currents or oscillations having a frequency above approxi mately 10,000 cycles per second, as distinct from alternating currents of low or audible frequency. High frequencies (radio frequencies) are employed for broadcast transmission purposes. See Amplifier; Choke ; Low Frequency: Resistance; Transformer; Wave-length.

HIGRILAND FLING. In the Highland Fling the dancer, while hopping on one foot, inakes a series of rapid movements with the other, and finishes with a complete turn. The arms may be held akimbo, but it is usual to raise one arm above the hcad, and this is invariably done in turning.

The dancer begins by pointing the right foot to the side while hopping on the left. The next motion is to bring the right foot behind the left leg, then in front of it just below the knee, and again behind it. These noveinents are repeated with the left foot while hopping on the right, theu again with the right, and again with the left, finishing with a complete turn to the right. The whole series of steps is repeated, beginning with the left, and finishes with a turn to the left.

In the second step the dancer hops on the left foot and points with the right, brings the right up behind the left leg, points with the right again, then brings the right up in front of the left, just under the knee. This is repeated three times, with alternate feet, finishing with a turn to the right, and the whole is again performed beginning with the left, with a turn to the left.

The third step resembles the first. $1,2,3,4$, fling movement 3 times with the right foot, finishing complete turn to the right. Repeat over again, beginning left. In the fourth, while hopping on the left foot, the right is pointed as before, brought up behind the left leg, pointed in front, and kicked out in front, then the dancer rocks from leg to leg, beginning on the right. The step is repeated three times, on left, right and left feet alternately, each of the four steps taking eight beats instead of four.
The other steps are similar, but the hecl and toc movement is introduced as a variety, the dancer touching the ground first with the toe, and then with the heel, instead of bringing the foot up before and behind the leg. There are variations also in the times and number of turns. Each step takes 8 bars, or 32 bests of music. In the first, second, third, and sixth steps the turn is on the fourth and eighth bars, while in the fifth step it is on the second, fourth, sixth and eighth bars.

In the seventh step the first four beats are the same as the second, then the right foot is slipped behind tho left leg, brought to the ground, and as the weight is transferred to
the right leg the left foot is passed in front o right shin. 'This back step is repeated with the left leg, then the right, then the left, and the whole is then repeated from tho beginning, with left, right. left. Like the fourth step, this stop is done four times only, and with no turning.
In the eighth and last step after the first four beats as in the lirst stop, left toc and heel are pointed in front, and the same movements are made with the right fort and repeated with left and right, turning round to the right with tho left foot working round the right leg The movements are then repeated, toe and heel once only this time, finally turning round 10 the left twice on the left leg.

HIGH TENSION VOLTAGE. This is the voltage which is applied to the anode (riate) of a wireless receiving valve, and may be derived from a battery of dry cells or accumulators, or from the mains by way of an climinator. Tho high tension voltage necessary depends upon the type of valve and its position in the set.


Hinge: various types. Pig. 1. Back-tiap. Pig. 2. Parliament or
shutter hinge. Fig. 3. Bkew or rising butt. Fig. 4. Trestle-joint hinge

Suitable values are given on the leatlet supplied by valve makers.

High tension batterics of either the dry cell or accumulator type comprise a number of cells connected together in serics. Tappings are provided to enable the required voltages to be obtained H.T. dry batteries employed with receivers utilizing three or more valves should be of the large capacity type. Hatteries of the ordinary type, having smaller cells, require more frequent replacement.
H.T. accumulator batteries are equally suitable for small or large sets, but inust be re-charged at regular intervals. Sulphation will rapidly occur if the cells are allowed to remain in a discharged condition. Care should be taken never to short-circuit the high tension battery. Sce Accumulator; Battery; Eliminator.

## Himalayan Poppy. See Mcconopsis.

HIMALAYAN PRIMROSE. This is the popular name of Primula denticulata, a beautiful hardy plant which bears lavendermauve blooms in spring. It is suitable for the rock garden or Hower border, and should be planted in luamy soil in partial shade.

## HINDQUARTER. The

 hindquarter of meat consists of the leg and loin either of beef, veal, mutton, or lamb. That of beef is always divided into joints. ()f these the shin is used for boiling and stewing ; the topside and silverside for roasting, boiling, or pic meat; the aitchbone for roasting; the rump for roasting or steaks ; and the sirloin for roasting. l'art of the thin Hank also belongs to the hindquarter of becf, and this piece is suitable for braising.The hindquarter of veal, like beef, is cut into joints.


Eimaiayan Primrose. Bosette of leaves and lavender-mauve fiower heads of a beautifal rock plant

The top portion of the leg is divided into the fillet and cusbion, which is the part used for roasting and cutlets, and the lower half is the knuckle, suitable for boiling or stewing. The loin is usually roasted, but sometimes, is braised in a casserole.

The hindquarter of mutton is either cooked whole, when it is called the haunch, or it is divided into the leg and the loin. The leg can be boiled or roasted, the loin roasted, braised, or divided into chops. The hindquarter of lamb is frequently cooked whole, and is called hindsuarter, not haunch; it can be cut into leg and loin, and trented as for mutton. See Aitchbone; Becf: Joint; Mutton; Veal.

HINGE. A hinge is a movable joint, whereon a door turns, in relation to a frame or other fixed portion. Types vary from a tiny ntetal litting to one weighing several lb. The form in common use is the butt hinge, made in brass, cast iron, or stecl. The kinds here illustrated include back-flap hinges (lig. 1) made of steel or wrought. imon with welded butts, and useful for an object that is long in proportion to its breadth. CounterHap hinges have two scparate centrea about which they turn, so that the hinge is Hush with
 hinges (Fig. 3!, are those
in which one
element of the hinge is adapted to rise and fall upon the hinge-pin, by cutting the faces of the butts at an angle instead of having thein square. As the door rotates the hinge lifts, and the door with it. This enables the door to clear the carpet, and where the floor is not quite level it may obviate the necessity of cutting a part off the bottom of the door. Where it is desired to remove the hinged member from the fixed portion or frame, the lifting butt is of service ; one part of the hinge may be lifted from the other.

Parliament or shutter hinges, shaped as in Fig. $\because$, are made so that when the shutters are open they fall Hat against the surface of the wall. Trestle-joint hinges (Fig. 4) are in malleable iron, for stepladders or trestles Cranked chest hinges of wrought iron are specially for the lids on chests or boxes. 'T hinges (I'ig. $\overline{\text { J }}$ ) are for hanging dours, as are the cross-garnct, similar in pattern. 'The tumbler ' I hinge, or cellar-1lap hinge (Fig. (i), is for hanging the Hap of trapdoor: the trap can rest upon supporting battens and relieve the
linges of their weight. Large doors, as in stables nnd garages, are made with a gnte hinge or hook and ride. Collinge's patent spherical gate hinge is fitted with a hall-shaped pin, and the hinge or ride has a cup which forms a hearing for the ball, furnishes a receptacle for oil, and is fitted with a leather washer, which renders it watertight. Ballandeuparespecially hardened, and this type is very useful for heavy doors or gates.

Table-finp hracket hinges are handy forsupporting llaps or hinged hrackets; they act as n supporting bricket, and cant be folded hack with the flap. Draught-screen linges (Fig. 7) are used for fokling draught screens and similar pur. poses: by their nid the hinged niember can turn in two directions. Brass centic hinges (Fig. 8) the pain increasing and the leg hecoming are used for atruts and similar supports.

Fitting Hinges. When fitting hinges the pins minst be true and in line The llap should sit fair and square in the recess cut for it in the frameworl:. This recess must be so shaped as to preserve the alinement of the hinge pin, otherwise the hinges will quickly bind and break away, even if the door can be induced to turn umon them. When hanging a door or a casement window, it should be placed in the frame and wedged up off the ground, the positions of the hinges being marked on door and on frame, and from them the outlines of the hinges are marked upon both, squaring them off A recess has then to be cut in the frame and in the door for the flanges of the hinges, which may be fixed temporarily in place. The door is then tifed, and if all is correct the remaining screws are driven home. It is important when screwing the hinges in their place that the door be wedged up, otherwiso its weight will cause the hinges to sink, and the door will jam at the hottom It is also imporiant to see that the door is plumb and upright, or, in the case of refitting the duor, that it fits closely against the door stopping.

To reinove old hinges when the screws are rusted in is often troublesome. The difficulty may be met by tapping the hinge itself, especially round the parta where the screwheads are countersunk. This will often free the head of the serew and allow it to be withdrawn l'aint should be chipped away, or hurned off with a painter's blow lamp, which will lonsen the screws. When all elso fails, the pins may be punched out and the llanges of the hinges chipped out with a cold chisel and hammer Inother plan is to drill out the heads of the screws and then cut them away with a countersink. See Casement ; Cross Garnet Hinge : Door.

HIP DISEASE. Generally hip discase means chronic tuberculous disense of the hip joint. This is not uncommon in children. In the early stage the affiected leg is apparently longer than the sound one, the muscles show wasting, and the buttock becomes Ha!tened. The jcint grows stiff and the child limps,


Hinge. Fig. 8. Brass centre binge. or HIPPEASTR Tuberculosis. in in the greenhouse, where it hlooms in latc bloumg and early summer. The lauge lily-like blonms are very handsome, and the modern
varietics are of brilliant colouring; they vary from white through rose to crimson. The best time to make a start is in winter or early spring. The dormant bulhs are then potted singly in 5-inch or 6 -inch pots in a rich soil compost consisting of loam two-t hirds and leafmould and decnyed manure one-third, together with a scattering of sand. I temperature of $50-55$ degrees is suitable. Watering must be carried out very carefully until the bulbs start into growth, so that the soil does not become sodden.

When the Howers are over and the leaves begin to turn yellow, "atering must be discontimued gradually, and, finally, when all the lenves have fallen, the soil is kept quite dry. The pots of bulhs are placed on their sides in a greenhouse or frame, where they will be safe from frost. When in winter or early spring the bulhs start to grow again, some of the old soil should be removed and replaced with fresh compost. It may be necessary to repot some of the largest bulbs, but annual repotting is not necessary.

HIPPED ROOF. In building this is the name given to a roof in which the adjacent sides are inclined and form salient angles. It is a more diflicult construction than the
ordinary lean-to or span roof, and is used in gable construction or where a more ornamental roof is required than the ormal span roof See Roof

HIRE PURCHASE SYSTEM. The hire purchase agstem has to day taken the place of the old tally trade and has increased enormously of recent years it is now very frequently adopted not only for the purchass of luxury articles, such as motor cars, gramophones, furniture, and wirelcss sets, but also for the supply of lusiness machinery and plant I'robably 50 per cent of motor cars soles, 50 per cent of lurniture sales and 10 per cent of jewelry salos are made under hire purchase ngreements
The system enables the purchaser to obtain the use of goods on payment of a small deposit, the rest of the price being paid in instalinents out of his future earnings If properly used it is undoubtedly of gient value, hut the temptation to acquire some article at once for a small prayment is apt to lead the hirer to incur liabilities in the way of future instal ments beyond what he can casily pay. A period of illness, bad trade, or lors of employment may then follow and the hirer will be unable to keep up the payments; the goonds will be scized and the payments forfcited

The Agreement. A hire purchase ngrecment is in form an agreement by which the owner agrecs to let goods on hire for a period to the hirer, who agiees to pay a rent. If the hirer punctually pays the rent and keeps all the terms of the agreement, he is ultimately given the right to purchase the goods by payment of a further nominal amount (c.g. one shilling). The hirer is usually able to terminate the agreement at any time by handing hack the goods and forfciting the instalments prid. He may also buy thic goods before the end of the period by paying the instalments in advance On any breach of the agrecment the gourls may he scized and the instaliments paid forfeited. In addition the hirer may be liable for any loss in value in the goods since the commencement of the ngrnement.

Until the linal payment has been made, the goods remain the property of the owner and the hirer cannot sell or pledge them in any way. If he attempte to do so he automatically terminates the agrecment and the persons to whon he hands the goods acquire no right to them. Persons should exercise great care in purchasing second-liand cara, gramophones or furniture, for if the goods have been held on hire purchase they will lose both the goods and their money Goods held under a hire purchase agreoninnt may he raken by a landord on distress for rent.
Ithough, as stated, the law allows a firm when a hier is unable to keep up his


Hipneastrum. Brilliantly colonred flowers of bippeastrum of amargllis, a favourite rreenhouse plant
payments, to take back the goods, without making any allowance for the sums already paid, in practice many firms act in a more generous manner. If a hirer is unable to keep up his payments, they take back the goods, but allow him a certain proportion of the money he has paid for hire. A practice adopted by somc firms in this business is to give an insurance policy with the furniture or motor car purchased. In such cases, if the hirer dies before he has completed his payments the articles become the property of his wife or children without any further payment. See Agreement.

Bives. See Nettlerash.

## hoarseness. Com-

 monly due to laryngitis (q.v.), hoarseness is readily produced in some people by exposure to dam $\mu$, cold air, by fogs, loud talking, or living in damp houses. Those subject to it should keep the fect warm, and should be careful to breathe only through the nose. Inhaling steam gives relief. A hot bran poultice or a cold compress may be applied to the neck at night, precautions being taken next day against catching cold.Gargles are sometimes of use, but less so than inhalations and sprays (q.v.).
HOB. In the house the hob is a part of the fireplace; in the workshop it is a tool used for shaping gears, chasers for screw threads, and other mechanical purposes.
Some of the older houses are fitted with register stoves made of cast iron with hobs at the side. They are picturesque, but uncconomical compared with the modern barless fire. An example is the Sussex grate, having two hobs with a fire basket between them.

In many cottages the hob grate or fire is a central feature, being either constructed of bricks or tiles, or cast in concrete and coloured. An existing fireplace with an iron register stove can be removcd, and a modern hob fire constructed of brickwork, and fitted with a dog grate or barless fire, can be fitted. A typical example is illustrated in Fig. 5, p. 459. The hob provides space whereon to rest the kettle or saucepan. See Fireplace; Grate.

HOCK: The Wine. The generic name for a number of Rhine wines, mainly white, is hock. It is derived from Hochheim, a town in Germany in the Prussian province of HesseNassau. Johannisberger has the reputation of being the finest Havoured wine in the world. Other well-known hocks are the Steinberger, Rauenthaler, Geisenheimer, Rudesheimer, Marcobrunner, Niersteiner, Hocheiner, and Liebfraumilch. There are also various makes of sparkling hocks. A few red hocks of the Aar district have some reputation, and are recommended for insomnia. French hock is procurable from Alsace-Lorraine.

Hock Cup. There are several recipes for hock cup. It is particularly good for garden or, tennis parties, and should be served in a laige glass jug. The following is an excellent recipe: Put a large lump of ice in a big jug. and add 1 liqueur glass of curacao, 2 liqueur glasses of brandy, I bottle of hock, and 1 bottle of soda-water or Perrier. Stir well and add borage and a few slices of cucumber. A simple form of hock cup is made from a bottle of hock, one of soda-water, 2 tablespoonfuls of castor sugar, and 2 slices of pineapple. Put these into a glass jug and place it on ice for an hour or more. Just before serving put some small pieces of ice in it. See Cup; Dinner; Glass; Ice; Wine.

HOCB: In Cookery. The term hock is usually applied to the fore end of a side of bacon, and represents the shoulder. It weighs about 10 lb . The gammon hock, which is the next cut, is of higher value. The hock is suitable only for boiling. See Bacon; Gammon.

HOCKEY STICK. The choice of a hockev stick is not a difficult matter, since its size and other properties are defined and limited by the rules of the game. The few details which can differ, such as a let-in rubber grip for the hands. etc., are a matter of personal choice, and must be considered when buying the stick, together with the most suitable weight and various nther details.

HOE: In the Garden. The gardening implement known as a hoe is used for breaking and loosening the surface soil of growing crops, in order to admit air and warmth to the roots, and also for eradicating weods. Hoes are divided into two sorts, draw and thrust.
The draw hoe is pulled towards the operator, and in travelling the sharp edge of the blade not only breaks up the soil, but cuts through any weeds it encounters. The hlade is solid. The Dutch or push hoe lias a flat blade, attached to the handle by two metal arms which together make the shape of a horseshoe. The edge of the blade goes into the earth with a cutting motion, and removes the weeds, leaving them lying on the surface.

Hoes are made in all sizes, from 3 in . to 10 in . acruss, and the handles are 4 ft . or 5 ft . in length. See Gardening: Weeds.
HOGMANAY. The night preceding New Year's Day is known in Scotland as Hogmanay. It was formerly the occasion of widespread festivities in the north of England, as well as across the border, and it is still customary to give parties on this night, the guests remaining to welcome in the New Year with song and dance. On the stroke of midnight the dancing is interrupted, and all join hands and sing a verse of Auld Lang Syne.

The custom of exchanging gifts has been superseded largely by the Christmas observances, but it is still a feature of many gatherings. Another old custom which is widely practised is for children to go at night from door to door singing and receiving presents of money and fruit, after the fashion of the carol singers in England. They are known as guisers, and usually wear masks or blacken their faces, wear borrowed clothes nad otherwise disguise themselves.

HOLD ALL. In form this is a straight length of waterproof canvas, lined with some strong material and bound with leather. The lining has various pockets in it, designed to take sponge,
etc., slippers, and all the small things which have to be packed at the last moment. getting mellow, and has Hoo. Fig. 1. Dutch hoo. Fig. 2. become well saturated with linseed oil, which should be rubbed in with a soft rag every few weeks, or When this has been done, umbrellas, walkingoftener. During the summer months, when sticks, etc., are placed in the middle and the the hockey stick is out of action, it should be hold-all is rolled round them, so that they are wrapped in an oily rag and kept stored where held compactly with their ends protruding. it cannot get too hot. It should periodically A strap with a handle is then adjusted to be unwrapped, and, if the wood shows signs of secure the whole, and the parcel is complete. becoming too dry, a little oil should be rubbed in. Ses Luggage.

## Holidays and Holiday Making <br> Touring Abroad and Seaside and Country Vacations

For further interesting information on this subiect see Boarding House; Furnished House ; Lodgings ; Packing; Tent, etc.
Apart from the question of expense, several cases mentioned is attained by the combinaconsiderations enter into the choice of a tion of lake and hill. Much of Scotland forms holiday resort. Persons with young children a popular holiday resort of this nature. The will usually select one that does not involve Trossachs, the islands of the west coast, the a long railway journey, while they.will want glens of Perthshire and the border country to go where the sands are good and safe. afford sone of the finest holidays that the Personal tastes largely determine the choice. active body and brain can desire. In addition An increasing number of persons play golf to these special areas, there are all round the on holiday, so they will look for a place with coast, as in Enyland, watering-places varying in good golf links.

Of those who go into the country for a Scotland, and there the tourist is less amply holiday, many simply seck change and quiet, catered for, but the scenery in the west, both and as long as these are secured the exact spot in Kerry and (ialway, as well as in Donegal chosen matters little. Others will select an and elsewhere in the north, is not inferior to area which is pre-eminently a holiday ground. that of Scotland.
such including N. Wales, the Iake District and Holidays Abroad. A continental holiday Dartmoor. These attract the lovers of wild is becoming increasingly attractive. Switzerand beautiful scenery, which in two of the land, mainly but not solely loved by the
mountainecr, has long been visited by thousands. Others go to see the architectural and other glories of the cities of France, Italy and the Netherlands. The beautics of the Rhine and Tirol attract others, while an excellent holiday can be spent in the Ardennes, or in Brittany. Apart from these holidays, which are rather in the nature of tours, people can take their families to French and Belgian resorts, where are all the advantages of the ordinary seaside holiday, and gain in addition some insight into the specch and customs of a foreign land Such visits cost little or no more than holidays at home.

As regards accommodation, holidays may be divided into tours, where one journeys from place to place, and those passed all in one spot. In the former case some persons go from one town or village to another, trusting to find board and lodging when they arrive. Many of these are motorists, for whom the hotels cater, but others are walkers who may desire humbler and cheaper quarters for the night. The addresses of such quarters can usually be obtained from the police and the post office, while many will turn to a village inn.

## Motoring and Foreisn Tours

Motoring tours are arranged by companies for an inclusive fec. These holidays involve constant movement and staying at a different hotel every night, during the period of the trip, but enable persons to see a great deal of the country at a minimum of trouble to them selves and in a very short space of time. One drawback is that as seats must usually be booked some time in advance, the holiday may be taken in unfavourable weather.
The advantages of personally conducted tours arranged by various tourist agencies for an inclusive fee are more obvious when they are taken in foreign lands than when they are taken at home. In both cases the tourist is as ved trouble, but in a foreign coun try this is much greater. He may be ignorant of the language, or at least imperfectly acquainted with it; he probably knows little or nothing of the charges made by the hotels and pensions, or of their suitability or the reverse; while the business of getting from place to place presents other difficulties. Moreover, he need only carry with him a comparatively small amount of foreign money.

Under the direction of qualified conductors tourists can go in parties to the lakes and cities of Italy, the cities of the Loire, the Rhine land, Belgium, Holland, Provence, Brittany, and many ot her districts further a field. The fees for these tours are paid in advance, a small sum being required when the tour is booked and the balance just before leaving home. The fee does not include the cost of travel to Indon, or wherever the trip starts from. The intending tourist should acquaint himself with the conditions, and will be justified in assuming that the fee only provides for those items that are specifically atated as covered by it. For instance, on some tours teas are not provided.

Holiday Accommodation. For persons who take their holidays at the seaside or in the country there is a choice of accommodation, but this depends largely on the money avail. able. Many persons go to hotels, where the charges are usually so much a week, and for those who can afford it there are many advan tages in this kind of accommodation. The names of hotels can be obtained from a railway guicle, or the advertisements in the newspapers. It is well to write beforehand and inquire the charges and also to book the rooms required.

Many persons go to boarding houses where they are accommodated at a fixed price per week. These are usually less expensive than hotels. Hydros, turned from their original purpose, cater especially for visitors who wish for social life. In these cases, as with hotels,
charges should be ascertained beforehand and the rooms should be booked, especially if the season.
The majority of visitors to the scaside, how ever, go into furnished rooms or apartments Here the usual method is for the visitors to pay for rooms and attendance, but to ן,rovide their own food They pay according to situation, size and ot her matters, usually so much a week. The local paper and also papers circulating in large towns generally contain the addresses of persons who let apartments, and the railway companies issue lists in their guide books. Most watering places also issue guides, obtainable from the town clerk.
Persons taking apartments should see that the terms of the contract are clearly stated in writing so that they may know what to expect from the landlady. Farmhouses arc specially attractive to some persons who like a country holiday, and some of them take in visitors, much as boarding-houses do: but their number is not large. Such addresses can be obtained from the guides issued by the various railway companies.

Another inet hod is to take a furnished house. This has some advantages, especially for a large family, but it entails much work upon the mistress of the house and her assistants, who have not only to do the catering, as in apartments, but also the cooking and other houschold duties as at home. On the other hand the fainily can do as they like, being free from the restraints of an hotel or boarding. house. Furnished houses are usually taken through an agent at so much for the week or month Here particular care should le taken about the contract. The person taking the house should know exactly what is provided and what is not, while the understanding ns to breakages and the like should be clearly set out. Furnished cottages and bungalows can be taken on similar lines. They can be obtained through the advertisement columns of a newspaper or from a local house agent.
Safeguarding the Home. Before going away for the suminer holiday the householder has to arrange for the security of the house during his absence; the longer he is away the more necessary it will he either to shut the house up or put in a caretaker. Caretakers are usually married conples of the working class, but of late years many ex-service men have undertaken this kind of work. They receive a fixed sum per week and very often gas and coal in addition.

Sometimes two families living in different parts of the country exchange houses, to thair mutual advantage, particularly if one house is at the seaside and the other in some inland town. Such arrangements are not confined to friends, but are carried out through the medium of advertisements, which bring people living in widely separated areas into communication. The result is a holiday for both parties on more economical terms than is possible under ordinary conditions.
If the house is to be shut up during the absence of the family, the chairs can be assembled with other articles in the centre or in a corner of the various rooms, and covered over with dust sheets. Carpets and linoleum are seldom touched even when the holiday is a long one, and mats also may be left to protect the carpets, although sometimes these are beaten and put a way, sheets of paper being laid over the carpets.

Curtains need not be taken down, as a rule, nor are blinds always drawn; hut in rooms that get much sun the blinds are better drawn, if only to save the carpets. This, however, has the disadvantage of indicating to those who may be on the wateh to rob an empty house that it is in that condition.

It is when clearing up prior to a holiday that the housewife realizes the value of cup boards. Into them will go the vases and
ornaments that need not be left out to collect the dust; they also talie in the glass and china, together with a miscellaneous collection of other goods. Cooking utensils should never be left dirty, but be thoroughly cleaned and dried so that they are ready for use when the family comes back. The bright parts of the kitchen range and the gas cooker, as well as the grates and fenders in the other rooms, may be rubbed with vaseline to prevent rusting.
Where poultry arc kept it is usual for a neighbour to undertake the task of feeding in return for the eggs Another plan, which many prefer to make, is a business arrangement with some trustworthy person living in the neighbourhood who for a weekly sum will take charge of the birds, and dispose of the eggs at the market price. When all these things have been attended to, turn off the gas and water, and see that doors and windows are securely fastened. The post-oflice should have been apprised already of the new address, which is also commmicated to the police when the keys are entrusted to their keeping; and they should be informed of the time during which the house will remain without an occupant. Any specially valuable plate or jewelry is sent generally to a bank for safe custody, but if in a safe at home, this fact should also be made known to the police.

HOLLAND. Made chiefly for use as window blinds, hollands are medium-weight linens or cottons, plain woven, stiffened and glazed in finishing to fill up the texture of the cloth, the hetter to exclude light and prevent the lodgment of dust. Unglazed, plain brown linen sold for children's dress, overalls, etc, is known as holland. Holland may be washed according to the directions given for white cotton goods, and if of a yellow-brown colour. a little tea should be added to the final rinsing water. Holland should be atarched and ironed in the same way as prints.

HOLLANDAISE PUDDING. To make this, is custard, Havoured with ratalia, is poured over 4 small sponge-calies and $15-20$ ratatia biscuits broken into sinall pieces After this 3 oz of mixed preserved fruits cut up finely and $1 \frac{1}{2}-2 \mathrm{oz}$. of sweet almonds. blanched and shredded, are stirred in and the pudding poured into a mould.

HOLLANDAISE SAUCE. To prepare this 3 tablespoonfuls white vinegar, 2 oz. butter. 2 yolks of eggs, and salt and pepper are required. Boil the vinegar to reduce to one tablespoonful. then add two tablespoonfuls water and pour over the egg yolks. Melt half the butter in a small basin and add the egg mixture. Put the basin in a pan containing boiling water and stir until thick. Add remainder of the lutter away from the fire and stir unlil smooth. If too thick add a little hot water.

HOLLY. This, the finest native evergrees is invaluable for herge planting, and the


Holly. Berry-bearing twig of the
common British holly tree ornamental varicties are admirable lawn trees. It grows slowly and is long lived, therefore it pays to dig the ground deeply and to fore planting Plant holly at the correct season, otherwise it mayfail, especially if theplants ste large.

May and September are the proper times for larity is imparted tu any clothes made from this work. If the weather is dry the soil them. Hence homespun has become a name mugt be kept thoroughly moist by watering. and it is beneficial to spray the leaves with water in the eveninge of hot days

As the male and female flowers of holly are on separate trecs it is neccsaary to plant trees of buth sexes to ensure a crop of berries. The correct time to clip holly, whether grown tas a herlge or as a specimen tree, is in April or carl! May and in August. In order to preserve tho symmelry of isolated holly irees, long atraggling shoots should be cut out in summer Propagation is by cuttings inserted in sandy soil in a frame in August or by seeds sown out of doors in autumn. There are many fine varicties of the common holly (llex aquifolium). These are some of the best: Golden Queen, aurea marginata, Silver Queen and Handsworth Silver (all of which have coloured leaves), camelliaefolia and altaclarensis

HOLLY FERN. This is the popular name of a British fern (Aepidium fonchitis). It


Holly Fern grown as a pot plant for indoor decoration
makes an excellent pot plant for a room window or may be grown out of dloors in shade.
BOLLYEOCE. This stately old plant, of which the botanical name is Althaea rosea, is a general favourito and invaluable for planting towards the back of the herbaccous horiler, where its tall spikes of bloom are conspicuous in summer. It needs rich, reeply dug soil to be seen at ita best. Planting inay bo done in autumn or in spring, preferably at the latter neason, on heavy soil.'

Although the hollyhock is a perennial it is usually most natisfactory when treated as a biennial and grown from seedn sown each year out of doors in June : the seedling are planted finally in October or if necessary aro potted and kept in a frame during the winter. Both single and clouble varieties may be raised from seeds. If it is wished to perpetuate any specially fine variety, cuttings of basal shoots may be inserted in pots of sandy suil in a frame in August If hollyhock seeds are sown in a heated glasshouse in Janu. ary and the scedlings are planted out in May they will be in full bloom in August. The fig-lcaved hollyhock (Althaea ficifolia). with ornamental leaves and yellow flowers, is not commonly seen.

## Home Safe. See Safe.

HOMESPUN. Home. spun yarns are normally thicker and more lumpy than factory spun, and this irregu-


Hollyhock. Tall flowering spikes of
different coloured single varieties
chicfly for woollens of a rough character.

Wool and Hax are the two materials must capable of being homespun, but whether cloth is any better, apart from its rasitu, in being homespun is to be doubted.
I)issatiafaction has been expressed with the durability of cloths admittedly homespun, and too much should not be expected of them The fact that they have been made by hand does not neccssarily gualify them for good service Tho quality of the raw wool, the fineness of the thread. and the tightness of its twisting decidle the question of durability. Homespuns rightly command a higher price than machine-made articles, and are valued for their individuality more than for any other feature.
HOMINY. The coarse kind of flour known as hominy is prepared from the inner portion of the maize : it is not considered so wourishing as preparations made from the whole grain It is used principally for the making of porridge.

Some recipes allyocate cooking nearly all day after soaking it over night in boiling water. But if well soaked and boiled slowly it should not take longer than an hour to cook. Add salt before boiling, and more water if necessary After the grain is conked drain away surplus water and add a lump of butter, salt or sugar, and cream-some people prefer selt and pepper to augar. Hominy cooked thus will make a good pudding for children, and it can be served with iam, honcy or treacle. Siee Flour.

HONE: Its Uses. The word hone is often applied to an oilstone, which to a large extent it resembles, except that a hone is a fincr-grained stone, and adapted to the sharpening of the keenest tools. It is made from a block of compact stone having a smooth surface, or very fine grain such as novaculite. Other varieties are made from a soft. smooth, yellow slate known as German hone. The oarborundum is made from the finest hand-washed abrasive powders, and produces a very keen edge. For general instrument sharpening the carborundum is good ; for razor work the yellow, er Belgian rock, hones are preferred.

HONESTY. This is the popular name of a hardy bicnnial plant (Lunaria biennis) with purplish Howers in spring which are followed by the silvery seed pods so much valued for vase decoration in the home. Honesty will flourish in poor soil and in sunny or shady places : it is grown frum seeds sown out of dours in May cach year. Once it has been grown in a garden there are usually numerous selfsown seedlings to be found. The white varicty, alba, is very attractive

HONEY. The honey produced by the bee consists chiefly of levulose and dextrose, the former being the Huid portion. Its Havour depends to some extent upon the Howers visited by the bee when a particular section of the comb was being filled.

The finest iliquid extracted honey is bright and clear, of a light amber colour, and delicate in flavour and aroma. Extracted honey, when granulated, should be of fine, even grain, creamy white

Havour There are many grades of medium and dark-coloured honeys which fail to rearh this standard, but which are excellent in Havour and aroma ; and in some localities these will sell more readily than the lighter samples. Colour does not affect the cating qualities. For instance, heather honey commands the highest price of all. It is in a class by itself, dark amber in colour, gelatinous in consistency, and redolent of the moors buth in aroma and Havour.

Honey Cakes. The ingredients required are 4 oz. honey, 8 oz . Hour, 1 tenspoonful ground cinnainon, it teaspoonful carbonate of soda, 4 oz. sugar, 4 oz . butter, 1 egg a little milk.

Sieve the flour with the ground cinnainon and carbonate of soda. ('ream the butter and sugar. Separate tho egg yolk from white. and beat the yolk into the creamed fat and sugar. Then add the honcy gradually. Stir in the flour with a little milk as required to make a fnirly stiff inixture and mix all together lightly Whisk the egg white to a stiff froth and fold into the mixture. Half fill some small baking tins with the mixture, dredge the top of cach with castor augar, and bake in a hot oven. They will take $1{ }^{i}$, to $2(0)$ minutes.

Honey Pudding. Four cggs, ipint milk, a tablespoonful honey, and some slices of bread are required to make honey puilding. Cut the bread into cubes, put these intc a buttored mould, and pour over them a custard made with the milk, eggs, and honey. Allow it to soak for 15 min ., and then steain the pudding gently for I hour. When set, turn it out of the mould and dust it with eastor sugar.

Medical Uses. Apart from its use as a foorl, honey is employed medicinally. It serves as a demulcent and a laxative, but large doses


Honeaty. The flat, white seed pods used for indoor winter plant, much used for indoor winter decoration should be a voided, as they may cause flatu. lence and griping. It is frequently used as a vehicle for administrationof drugs. as an addition to gargles and an external a pplication to ulcers. Because of its soothing propertics. it is excel. lent for relieving a flections of the throat, and, mixed with lemon juice, forms a cure for coughs. ()ne recip? for this preparations is as follows: lour the juics of a lemon over two terspoonfuls of honey and mix well. A teaspoonful of brancly in addition is useful as a corrective, and assists in cutting the phlegm. Honcy is also employed to make soaj, and in cookery. See 13ce; Bechive.
HONEY SOAP. This is made by cutting 2 lb . of common yellow or white somap into thin shavings, and puiting them in a pan over the tire with just enough water to keep them from louruing. When they have melted, adl $\& \mathrm{lb}$. of honcy, and st:r the misture till it buils. A few dropas of any perfume may then be added, and the soap poured into a deep dish to cool. See Soap.

HONEYSUCKLE. There are both climbing and non-climbing honeysuckles, but the former are the chief favourites The climbing honeysuckles are first rate summer-flowering plants for covering arches and trellises.
 climbing plant
planted against a hot sunny wall they often become disfigured by the attacks of greently: The plants should be pruned when the llowers are over by cutting out some of the oldest shoots : if this work is neglected overcrowding and sparse blossoming will result. Propagation is hy cuttings inserted out of doors, or in sandy soil in a frame in autumin. Plants set in autuinn or spring in deeply dug and manured soil grow quickly.

The common woodbine or honeysuckle (Lonicera periclymenum), with reddish-yellow, fragrant llowers, and its varieties belgica and serotina. which bear reddish blooms, are valuable climbers; so, too, is Lonicera caprifolium, creann white and scented. Two evergreen varietics of the Japanese honey suckle (Lonicerar japonica), named Hexnosa and halliana, which have pale vellow Howers, are other good climbing plants: the variety nureu-reticulatn is grown for its pretty green and vellow leaves. The scarlet honeysucklo (Lonicera sempervirens) is less hardy than the others named, and except in mild districts is better sulted to greenhouse cultivation. Ionicera fragrantissima, with white swect scented Howers, and Standishii, with creamcoloured blooms, are two of the best shrub honersuckles: they blooh in carly spring and should be planted in a sunny place.
HOOK: In Dressmaking. The hooks used in dressmaking are usually sold on cards, together with an equal number of eyes to match. They can be had in black or white and in various sizes Hooks and eyes aro frequently replaced by patent fasteners, which are neater.
HOP. The common hop (Humulus Lupulus). which is perennial, and the Japanese hop (Humulus japonica), an annual, are vigorons, quiok-growing climbing plants for covering arches and arbours. Both thrive in ordinary well tilled soil. The perennial hop, which may be planted in autumn or in spring, is decorative when laden with its fruit clusters late in the summer. The stems are cut down in winter. The variegated leaved variety
of the Japanese hop is more ornamental than the green-leaved one and is usually grown in preference to the latter. Seeds of the Japanese hop are sown in the greenhouse in March, tho seedlings being planted out of doors in May.

HOPSACK. Hopsack cloths are nimost invariably wool and of a single colour, though they may be striped or checked, presenting ia neat dranght-board or chequer appearance. In a perfectly plain cloth the threads go under and over each other one by one; in ia hopsack squares of four, six, or eight threads go alternately over and under. Hopsack woven in sma!! squares is stronger and firmer than when the cheyuers are large. The cloth feels rather fuller than if the same materials had been plain woven.

HOP SCOTCH: The Game. The children's game of hop scotch can be played on any Hat stretch of ground, provided the sulface can be marked with chalk or a similar substance The only implęment required is a Hat stone, an oyster shell, or something of the kind, called the clipper. It can be played by two or four: players. The space is marked out into squares or oblongs, the number, arrangement and size of which varies to a considerable extent. Scven oblongs make a simple gaine. They are numbered I to 6 , the top one being known as the pudding. More nest-building.

lines. The clipper must not lie across a line when it is kicked. The player must kick the clipper in proper order through all the compartments. If any one of thesc rules is broken, the player who is placed ncxt in turn takes up the game.

HOREHOUND. The dricd leaves and Howering tops of Marrubium vulgare, or horehound. contain a volatile oil which is utilized in bronchial affections mainly as a constituent of lo enges and cough syrups. and also a bitter principle which has tonic properties. See Bronchitis: Cough

HORN: In Decoration. Handlos for sticks, umbrellias, knives, and other cutlery articles are sometimes made of carved horn. It is also occasionally used for beads and pendants and freguently for spectacle frames in place of tortoiseshell.
A cement for horn consists of shellac dissolved in methylated spirit to form a mixture of the consistency of thick cream The horn should be warmed, thinly coated with the cement. and the parts bound together and left until the cement has set hard. See Spectacles.

HORNET: Its Sting. A member of the wasp family, the hornet is not: common as a depredator of gardens, but sometimes it strips the skin from dahlia shoots to use as material for ment may be used. The ground plan is called the scotch.
Standing a little way from the first compartinent, the players decide who shall play first by throwing the clipper to the pudding. The one who lands it neinest a circle in the centre of the pudding plays first. Each player in turn takes the c!ipper and throws it from the point marked $A$ into the first compartment. He then hops to it, and while hopping kicks it with the foot which he has on thic ground back towards $A$. 'This done, he pitches it into the second compartment and, again hopping. kicks it again towards A. This process is repeated until all six compartments have been reached and the clipper kicked back each time compaitment by coinpartment to A, provided the player has not lost his turn for one of the reasons given later.

When compartment 6 , or whatever is the highest number in the gime, has heen reached, the player pitches the clipper into the pudding compartment. Then, hopping to it, he sends it with one lick straight down to $A$. A turn may be lost in various ways. The clipper when pitched must not lic across a line. It must not he pitched into the wrong compartment. The player when hopping must not put down the raised foot until he has kicked the clipper out of the compaitment. His foot when hopping must not touch one of the


Bop. Spray of the common hop. shoiving leaves and scaly green fruit. avoiden, as the bites are rery painful. When be extracted. and if solution of alin it should be extracted. and if solution of ammonia or bicarbonate of soda is at liand it should $b$ : applied, the latter as a paste Pain may be relieved by fomenting with a hot solution of bicarbonate of soda. See IBite.

HORNET MOTH. This insect is usually seen about the beginning of June, and its larvae, whitish-yellow with blackish-brown heads, during
autumn and winter fecd on the stems and roots of poplar trees. Sughested remedies are spraying in February with a caustic soda wash


Hornet Moth. Insect pest which made of $2 \frac{1}{2} \mathrm{lb}$. of caustic soda and 10 gal . of water. Uncovered portions of the body should be smeared with vaseline and gloves worn, dusing use, to avoid hurns from the solution. Juring autumn spray the infested trees and dig in deeply around them a mixture of one part naphthaline to tivo parts of fine ashes. Sce Insecticide; Spraying.

HORS D'OEUVRES. Savoury small dishes are served under the name of hors d'ocuvres at lunchion and dinner before the soup, with the obicct of giving a zest to the appretite. These dishes are prepared from various fancy sausages, smoked lish or lish, preserved in oil, choice salad herbs, olives, gherkins, foic gras, caviare, oysters, and hardboiled eggs, which serve as cases, the volk of the egg being stuffed and the white forming the case.
The snusages are skinned and cut in very thin slices, and the fish, if in oil, must be dressed: that is, the oil should be strained off, the tish wiped, nud fresh ail poured over, with ą little white wine or thavoured vinegar and a seasoning of salt and cagenne. Anchovics are soakod in cold water to remove the salt, and they should be boned. Sardines also should be boned. Smoked fish is served


Bors d'Oenvres. Typical dish of hors d'oeuvres, six favourite varieties being
served in separate compartments
in alices or small portions, according to the character of the fish Russian and mayonnaise salads are always popular. Beetroot or potato for salads ahould he diced. Cucumber is aliced and dressed with oil, vinegar, and seasoning. The yolk of hard-boiled eggs is pounded with anchovy butter and chopped gherkin to make fillings for the halved whites.

Scalloped rounds of fried bread make dainty hors d'ocuvres with either a teaspoonful of caviare clecorated with savoury butter or a fillet of anchovy wrapped round a ball of egg yolk which has first been moistened with tomato sauce placed on them. Celery may be dressed with mayonnaise sauce. Tomatoes may be dipped in boiling water, skinned, sliced, dressed with equal quantitics of oil and vinegar, and sprinkled with finely chopped party, comprising potato salad, sliced bcetroot marinaded in vinegar and oil and sprinkled with minced parsley and onion, prawns (excellent tinned prawns are obtainable), truffled liver sausage thinly sliced, stuffed olives and sardines. An equally good choice would be Russian salad, egg mayonnaise, fillets of sinolied herring. Spanish olives, tomato salad, smoked salmon on buttered canapés. Grape fruit and melon are also served as hors d'oeuvres.

Butter should be attractively made into sinall pats, balls or curls, placed in a glass dish on the table. Kolls, crisp bread, and toast should be also offered with this first course at luncheon or dinner. Special scts of knives and forks are obtainable, or fish cutlery can be

## Horses for Driving and Riding

## Hints on Buying a Horse and Its Maintenance

Our work contains ortic.es on Bit; Groom; Harness; Stable and other subjects assosiated with the horse, and also entries on the several vehicles drawn by horses, eg. Landau:
Victoria. See also Curry Comb

The horses that are chiefly in demand to day are saddle hacks and ponies used for riding A horse of this kind should stand still when being mounted, possess a snaffle mouth and be easy to ride. For general utility, the best horse is the hackney, but this is more suitable for the harness than for riding. A good hackney can be of any colour, but bay and chestnut are the most favoured.

Buying a Horse. Perhaps the heat method of purchasing a horse is to write to one or two studs and state requirements, or to insert an announcement in one or other of the stock breeders' journals, stating the wants in the advertisement as to age, sex, colour, pedigree, and whether perfectly broken to harness and frec from any form of vice or ohjectionable habits, either in the stable or in traflic. The best age to buy is five or six years, and the best colour is dark bay, but this is a matter of individual choice.

Do not let colour prevent purchase if the animal is sound and suitable in all other respecta. Previous to purchase have the animal examined by an experienced veterinary surgeon; the fee ranges from one to two guineas for each horse examined. The intending purchaser should satisfy himself first of all as to the suitability of the horse in all other respects. Many buyers purchase at the horse repositories either in London or in the provinces, and some high-priced horses are bought and sold through these channels.

The animals can be examined prior to sale, but the opportunities for examination and trial are not always very satisfactory Anyone visiting a repository should read the catalogue carefully, as many of these announcements are liable to deceive the unwary buyer Many animala carry a specific warranty, such
as sound in wind and eyes. In some instances these two fentures are about the only qualitications that the animal does possess.
If a horse purchased does not comply with the catalogue description, the buyer should proceed to have it examined and ocrtified by a veterinary surgeon. The horse, together with the veterinary surgeon's certificate, should be inmediately returned to the auctioneer, accompanied by a letter from the buyer stating the reason for its return. The horse repositories have regulations providing for the return of an animal that does not conform to description; thercfore if the buyer complies with stipulation he should have no trouble whatever concerning the return of his money, together with any reasonable expenses incurred
The foregoing remarks apply to all classes of horses, both light and heavy, ponies, cobs, hunters, etc., purclased at repositories Horses bought at farnıs, markets, repositories, eto., without any warranty are purchased under the legal rule of caveat emptor (let the buyer beware). and cannot be returned unlass the transaction has been a fraudulent one. If buying from a private person the buyer should endeav our to obtain theanianal
lection for $n$ small
parsley and onion Salads for hors d'oeuvres can be made out of any left-over vegetables, such as caulithower, beana, carrots, peas and potatocs, and dressed with salad cream or with mayonnaise.

How to Serve. Long glass or china dishes arc obtainable for hors d'oeuvres with separate compartments for from 4 to 10 varieties. The one illustrated contains a good sc-
 time. The shoeing of heavy draught horscs in winter, especially if there is ice on the roads, necessitates roughing or sharpening the toe and heel caulks. Shoeing with pads and leathers should be avoided if possible, as they are liable to damage the feet.

Care of the Horse. Regular exercise, good Care of the Horse. Regular exercise, good
grooming, and a liheral allowance of food and water, with a comfortable bed of straw and well ventilated, properly drained stables, are necessary for the health of all horses. When in the stable a horse requires feeding three in the stable a horse requires feeding three
times and a liberal amount of hay between meals.

Oats, either whole or bruised, should be the staple food, but these can he mixed with dry bran, chaff, beans, peas, lentils, etc. Punies
thrive well on 6 lb . of oats per day if these arc thrive well on 6 lb . of oats per day if these arc mixed with chaff, and $\frac{1}{2} \mathrm{lb}$. of some other cereal such as maize. The amount of oats per day ranges from 6 to 15 lb ., the latter for heavy drauglat horses. The condition of the animal and the work it has to perform must be taken into consideration. If turned out to graze, it is an advantage to give 2 or 3 lb . of oats daily, and a little linseed cake, say, 1 lb ., as grass flesh is much too soft for working purposes.

Horses with long coats require clipping several times a year. The whole of the body and limbs may be clipped, or the hair corresponding to the saddle and that on the limbs may be left untouched. In the winter a heavy woollen rug or two should be put on whilst the animal is in the stable, after it has been clipped, with or without bandages on the lower part of the limbs. Never put rugs on a horse directly it comes in from work, but allow its body to cool tirst. Again, do not allow its body to cool first. Again, do not for the same reason. A couple of quarts of


Horse. Prize-winning hack, with names of the various parts
on a week or ten days' trial, this being a reasonable request when the parties are known to eacli other. When a warranty is given, it is better for the buyer to have it in writing, though a verbal warranty and the presence of a "itness is quite good in law. The price paid for a horse, no matter how high, has nothing whatever to do with its soundness or otherwise
Necessity of Shoeing. All horses require to be shod regularly, say, every three weeks, but some carry their shoes several weeks longer than others, whilat the same animal may wear out two sets of fore shoes to one set of hind ones, or the converse. The feet should never be allowed to become long, as this predisposes to stumbling. Shocs must be removed every three weeks to prevent this.

During frosty weather frost cags should be fitted to the shoes, but the farrier will usually see to this matter if instructed at the proper and limbs may be clipped, or the hair corres-
cold water will help to cool the body, and this never does any harm.
The general-purpose horse is generally kept steadily at work, and is therefors stabled and not run at grass. But an animal that is well and carefully fed and driven will stand an immense amount of work without suffering. It must be fed according to the work it is doing. Enforced rest and rich feeding will produce swollen legs and other troubles. It must be remembered that the stomach of a horse is small, and that it works best with its stomach about two-thirds full. It is not well to leave a horse for more than five hours without a feed. In any case, it must never be worked hard on top of a full fecd, as that treatment invariably results in brolien wind A horse should be watered before it is fed, but it is a great mistake to allow it to drink freely of cold water when it is sweating. Ifter severe exertion warm gruel should be given

After a horse is taken in from grass the ration of oats should be small at first. Oata nnd beans are the strongest diet, and a horse of 15 to 16 hands which is in steady work will require 12 lb . of oats daily besides hay. But no rule can be laid down, for horses vary considerahly in the matter of appetite. When a reduction of dict is necessary bran mashes should be given instend of oats.

Next to feeding, good grooming is most important, and it tnkes a man an hour daily. The implements required are dandy brush water brush, curry comb, mane comb, and hoof pick. Many grooms use the curry comb on the horse's hody, but this is a mistake; as the curry comb is for cleaning the dandy brush. When a horse comes in hot it must be rubbed down first with $\pi$ wisp of twisted straw, afterwards, if necessary, with a cloth. No attempt must be made to use the brush until the animal is quite cool. The feet of a horse are usually its weakest point. If a horse's feet are neglected, or if it is allowed to stand on wet bedding, cracked heels and the ailment called grease will supervene. The feet should be cleaned with the hoof pick three times a day. In the harness-mom a bottle of antiseptic should be kept for cuts or galls.

Good bedding is essential, and wheat straw is the best material. If moss litter is preferred, 1 cut. should be put down to begin with, and it must be renewed at the rate of about 6 lb . per day. If sawdust be used, the depth over the stable Hoor must be 4 in. Jracken makes good bedding, but the stiff stalks should be removed.

HORSE CHESTNUT, The common horse chestnut (Aesculus hippocastanum) is a native of Greece, though it has been largoly planted in Great Britain. Chestnut Sunday is the day on which the famous chestnut trees forming an avenue in Bushey Park, Hampton Court, are in full bloom. This leaf-losing tree attains a large size and grows quickly. Propagation is by seeds sown out of doors in antumn: named varieties are increased by hudding in summer or by grafting in Maroh The red-flowered horsc chestnut (carnea) is to be, recommended for planting on a lawn. Other chestnuts are flava, yellow-flowered (the American sweet buckeye), and parviflora, which grows only 10-12 feet high and bears white flowers in August

HORSE FLY : Its Bite. In cases of this kind bleeding should be encouraged, and then a solution of ammonia, bicarbonate of soda, washing soda (weak) or permanganate of soda (strong) applied. After, a dressing of moistened boracic lint covered with gutta-percha tissue or oiled silk may be used. See Bite.
HORSEEAIR : In Upholstery. This is the best stuffing material for furniture and inattresses. It is procured from the tails and manes of horses, that from wild horses being the most highly prized. Very little is
obtained from England, the greater proportion containing jusl enough vinegar to cover them. used in the upholstery trade in Great Britain Keep the jars air-tight and in n cool, dry place. being imported from the Continent, China, the Argentine, Australia, etc. It is the shorter hair that is used, and of this there are several qualities, judged according to springiness, length, and curl The curl, or spiral form imparted by the manufacturer, emphasizes the buoyanoy which makes horschair so valuable in upholstery. Adulteration with other hair often takes place.

Besides its resilienc!, horsehair is light in weight, and when made up with skill it enables furniture to preserve its shape and comfort for many years Even after half a century's use, when renovation may be essential, the horschair stuffing can be reteazed or carded, and replaced almost ns a new material. The cost makes it an expensive medium, but the buyer will be repaid by the comfort and durability of the furniture in which it is used, and by a good return of capital so spent in case of re-sale.

Articles upholstered entirely with hair are necessarily more expen sive than when made up with $\Omega$ mixture of hair and other materials. In the latter case, the first stuffing of the piece of furniture is either of fibre or wood-wool, or a mixture of hair with these or with Hock, the second stuffing, or that which comes immediately under the outer coverings, being alone of pure hair. It should be borne in mind that although quite serviceablc, articles atulfed.in this way cannot he expected to equal in ease or durability those made up with horsehair jet, and an attachment to connect to the alone. See Mattress; Upholstery.

HORSERADISH. The way to grow good horseradish, which is so much liked ns a Havouring, is to plant a few roots each year in January or Fehruary in deeply dug soil; they should he set at 10-12 inches apart, the tops 6 inches below the surface. The only trentment required during the summer is to keep down weeds by hoeing between the rows. In autumn and winter the roots may be lifted ns they are wanted, or all can be taken up and stored in sand, ashes or soil. For replanting, choose some of the straight pieces of root. The horseradish bed is often left undisturbed for years, with the result that it becomes a very difficult matter to get rid of the roots

Uses in Cookery. In cookery, the horse radish, with its atrong, mustard-like taste, is used mainly as an accompaniment to roast becf. When required it should be washed and scrubbed, left to sonk for an hour in cold] water, and then scraped into shavings with a sharp knife. It may be served separately in a glass dish or used to garnish the meat. Horseradish inay be atored in powder form in tightly corked bottles. The sticks should be sliced and dried in a cool oven before being pounded.

To make horseradish butter, clean and scrape a stick of horseradish, and pound it in a mortar with a lump of butter ahout twice the size of an egy, $\frac{1}{2}$ teasponnful of chilli vinegar, a few drops of lemon juice, and cayenne. Pass the mixture through a fine sieve before spreading it on a dish to set. Serve with grilled stenk.

Horseradish Pickle. A pickle may be prepared by scraping off the outer skin firmm some horseradish roots, cutting the latter into short lengths, and then putting them into jars

Horseradish Sauce. To a grated stick of horseradish add $\frac{1}{2}$ tenspoonful of made inus. tard, a teaspoonful of castor sugar, a tablespoonful of vinegar, and a pinch of salt. Slightly whip $\frac{1}{4}$ pint of cream mix it in and keep in $\pi$ cold place until required
HOSE PIPE. The term hose pipe is applied to rubber, canvas, and other tubing adapted for watering purposes Varietics include the ordinary ruhber pipe, made from india-rubber, and a similar type made with an internal lining of canvas A stronger pattern has an extemal nrmouring of coiled wire, that acts as a protection. Suction hose is so constructed as to be non-collapsible Hose pipe for fire extinguishing purposes is made of canvas or leather
The ordinary garden hose is made in three sizes, $\frac{1}{2}$ in., $\frac{8}{8}$ in, and $\frac{8}{4}$ in in diameter. The usual stock length is $\mathbf{6 0} \mathbf{f t}$., with a branch and


Hose Pipe. Various tgpes of union joints and fittings

EOTBED: In Gardening. A hotbell is used looscly to describe the top portion of a made by heaping up fresh manure which stove where conking is donc. Plates usel for provides "botton heat" and so helps the covering food to keep it warm at meal-times development of plants grown in the soil are also sometimes known as hot plates. placed on it. The usual proceduro is to make up a bed of manure about 2 feet deep and of

An electric hot plate is a useful table appoint-


Hotbeds of various types. 1. Base plan showing hotbed extension and frame. 2. Economical manure compost : a, grass or leaves ; b, horse manure. 3. common hotbed. 4. How to baniz with fresh manure. B. With covering of soil (a) lor planging or outside forcing. 8. Brick frame with interior hotbed $B y$ apecial arrangement will Amateur liardening cooking accommodation is limited. It can be used in any room by fitting the plug into the nearest lamp socket and switching on the current. This stove will fry bacon and eggs, toast bread or crumpets, boil the kettle, heat an iron or sharing water, and also conk vegetables. On a double-burner hot plate, two vessels can be used at once. See Cooker.

HOT POT. The following is a winter recipe: Soak $\frac{1}{2} \mathrm{lb}$. haricot beans overnight and half cook them. Butter beans, lentils, or dried peas might be used. Cut up $1 \frac{1}{2} \mathrm{lb}$. middle neck of mutton into neat cutlets, cutting off some of the fat, if there is too much of it. Then cutinto slices
such a size that it projects 12 inches all round beyond the garden frame placed on it. Sifted soil to a depth of 9 or 10 inches is put inside the frame. Numerous vegetables and flowering plants can be raised in spring by sowing seeds in the sifted soil.

To make the hotbed, fresh stable manure is neceasary : this material must be turnerl several times to allow some of the rank stcam to escape before it is heaped up to form the bed: the manure nust be trodden down fairly firmly. Seeds should not be sown until a few days after the soil has been put on the manure and during that period the frame must be ventilated slightly. In a few weeks the temperature will decline, but it can be maintained by adding fresh manure outside the frame. Hotbeds are also made with manure and dry leaves, the latiter being used in the proportion of one third of the bulk. See Frame.

HOT CROSS BUN. This is a special bun eaten on Gool Friday. It is a spiced bun, made as described in the article luun, and on it a cross is marked with a knife or made in candied pee! before cooking.

HOTHOUSE. This is a glasshouse in which a minimum winter temperature of ifo degrees is maintained to allow of the cultiva. tion of tropical plants, or for forcing plants into early bloom. See Greenhouso.

HOT PACK. The merlical treatment known as a hot pack consists in stripping the patient and rolling him in a blanket wrung out of water at a temperature of about $110^{\circ}$. Two or three other blankets are wrapped outside this, and the patient is kept in the pack for 20 to 30 min . He is then quickly dried with soft, warmed towels, and put in flannel night clothing. A warm drink may be given while the patient is in the pack. The mat tress should be protected by a waterproof sheot, over which a blanket has been laid.

The hot pack is often prescribed as a means of inducing free perspiration in conditions such as Bright'sdisease and otherkidney complaints. See Cold Pack; Nursing.
HOT PLATE. A short-legged iron cooking table or stove with one or more burners is known as a hot plate, but the term is also
$1 \frac{1}{\mathrm{~L}} \mathrm{lb}$. potatoes, 2 moderate sized carrots and one turnip, and chop $\frac{1}{2} \mathrm{lb}$. Spanish onions.
Put all these ingredients, in layers, in a casserole, or fireproof baking-dish, with a layer of potato on top, and cover with stock or water. Cover the dish and bake the hot pot in a good hot oven for abut 3 hours, adding seasoning $\frac{1}{\frac{1}{2}}$ hour before serving, and removing the cover of the dish so that the potatocs may brown. This should be served very hot in the dish in which it was cooked.
For a summer hot pot: Cut 2 lb . neck of lamb into chops, put it in a casserole with enough water to cover it, bring it to the boil, and bake for about 1 hour. Then add a little salt, $\frac{1}{2} \mathrm{lb}$. new potatoes, $\frac{1}{2} \mathrm{lb}$. young carrots, $\frac{1}{2} \mathrm{lb}$. young turnips, $\frac{1}{2} \mathrm{lb}$. spring onions, some sprigs of caulithower, and it lb. green peas. Do not cut the vegetables unless they are large. lake the stew gently until every thing is tender, then add more seasoning if necessary and serve with the meat in the centre, the vegetables round it, in the casserole. See Casserole; Mutton; Stew.
HOT WATER BOTTLE. Hot water bottles are made in a variety of shapes and sizes and in several different materials. Of these the two most commonly in use are rubber and atoneware, while occasionally they are found in copper, aluminium, or tin.
Stone bottles should be heated before they are filled. This inay be done either in the oven, providing that it is not too hot, or with hot water. In very cold weather only the latter method is suitable, and the water should not be too hot or the bottle will crack. Boiling water should be used for the final filling, and should be joured in until it runs over the toll. This will ensure the exclusion of air and cause the heat to be retained as long as possible. If the bottle is only partly filled, the resulting steam may cause it to


Hot Water Dish, with lid for retaining the heat of cooked food

## HOT WATER SUPPLY IN THE HOME

Comparative Advantages of the Various Up-to-date Systems
The article on Central Heating may he consulted in this connexion, since some heating systems
are arranged to furnish domestic hot water. Reforence should also he made to Anthracite;
Boiler; Geyser: Grate; Oven; Range; Water Supply

A cood supply of hot water is one of the essential domestic services. A common method is to draw hot water from a boiler nssociated with a fire in the kitchen range (sec Boiler), or from one of the many types of combination ranges The heated water is conducted from the boiler to a reservair or container at a sufficient beight to supply the highest point at which it is desired to draw off the hot water, this being taken to the various points by means of ordinary piping.
A combination boiler of the type illustrated on page 213 , designed primarily for a central heating system, will also furnish hot water for domestic uses, a very convenient arrangenient for a sinall house. Fig. 1 shows a useful type of combination cooking range and boiler for hot water supply. Another system employs a separate aud independent hot water boiler


Hot Water Supply. Fig. 1. Combination cooking range and hot water boiler Courtes, of National Radiator Co
heated by a solid fuel fire, which is kept a light day and night when a constant supply of water is desired. Boilers of this kind are illustrated on pages 20 and 115 . For really ample supplies of hot water at a low cost the coke or anthiacite fired independent boiler is without equal During the cold months it will help to warm the room in which it is installed.
In warmer weather the nerits of a gas or electric system are more apparent, a voiding as they do the need for stoking, and the unpleasant warining of the kitchen. There is no reason, however, why the householder should not install a dual system, using a gas boiler or an electric immersion henter for summer service, when the coke fired boiler or the cooking range is shut down.
Gas-heated Systems. Gas provides a medium for heating water ly two miain methods. In one of these the gas bumer is kept constantly alight and hents a small boiler known as a circulator. A heater of this kind is illustrated at Fig. 17 on page 521. In another type, shown at Fig. 2 on this page. the heater is combined with a storage tank and forms onc complete unit. Heat losses are prevented by lagging the cylinder with insulating material, so that a relatively sinall consumption of gas at the burner suffices to maintain the water at the desired temperature, once the contents of the cylinder have heen heated up.
two-thirds of the total water tap automatically sctting the geyser in operation A small pilot burner remains alight under the geyser and this ignites the larger heating burners as the automatic gas valve is caused to open by turning on the distant water tap. The in stantanenus henter shown controlled by a thermostat.

For a small house tho thermal storage heater, as this type is named, might have a capacity of 12 gallons, the size being governed by the proliable maximum demanc at one time. By menns of a device known as a thermostat the gas llame is raised or lowered by the temperature of the water The mani num consumption of gas is 10 cu . ft . per hour, and when all the water in the cylinder has been heatel up the thermostat automatically cuts lown the consumption to ahout one.fifth of the maximum. The temperature of the water is raised to about 140 deg. F. For a warm bath ahout half water from the cylinder and half cold water would be needed; for a hot bath the cylinder would he called on to yield

The other system of water heating by gas is represented by the instantancous type, commonly known as gcysers, from which n steady llow of nearly hoiling water is obtained within a fow minutes of lighting the burners. These are dealt with in detail in a separate article They are available hoth for local use (i.e. over a single basin or a bath) and for multi-point service. In the latter arrangement hot water may be drawn fiom a number of taps in different parts of the house, the opening of any


Fig. 4. Electric immersion beater for ftting into an existing bot water tank Courlesil of Belling \& Co on page 531 is suitable for multi-point service. A small water heater titted nver a sink is illus. trated at Fig 16 on page 520 . This may be had in sizes to hold \& gallon to $2 \frac{1}{2}$ gallons, and is

Electric Water Heaters. Water is heated electrically by means of a heating 'element' enclosed in a tube. The element is fixed in the tank so as to lie inmersed in the water, so that all the heat generated is utilized.
Self-contained electric water heatery are male in various sizes suitable for all house-
a paratinn oil burner of the vaporising type Oil fird independent boilers arc exten. sively used abroad for domestic heating and
hot iwater supply, and it is now possible to sively used abroad for domestic heating and
hot water supply, and it is now possible to obtain automatic equipment of this limd suitable for the medium sized house Heary fuel oil is fed as a line spray into the firebox of the bniler, where it is ignited and hurns with an intenscly hot llame The pressure pump
is electrically driven, and is controlled by a an intenscly hot llame The pressure pump
is electrically driven, and is controlled by a thermostat which, when the water reaches the thermostat which, when the water reaches the
desired temperature, switches off the pump

hold requirements. from the small $1 \frac{1}{2}$ or 2 gallon water henter, useful for supplying a washhand basin or sink (see Kitchen), to an installation of 30 or 40 gallons capacity capah!e of providing ali the hot water required in the largest house. Fig. 3 shows an electric storage heater fixed in a hathroom.

In sina! houses where there is no unduc length of hat wnter piping. it is possible to convert the present hot water tank into an electric water heater by fitting an electric: thermostat and heater into it ( Figs 4 and 5) and by surrounding it with suitable packing of cork or other non-conducting material so that the heat is not wasted when no water is being used. If the capacity of the hot water tank is at least 20 gallons, and the conversion work is carried out by explerienced engineers, satisfactory results should be obtained.

The installation of an electric heater is a simple and inexpensive matter. Only a small amount of plumbing is necessary, and the heater itself can be fitted at the most con venient point in the pipe line. In some cascy the old heating systein may be retained $\mathrm{F}_{1}$ ) that during the winter months when the fire or coke builer must he lit the water heating is done by this method, the electric heater heing automatically switched un when the fire dies down. This is a very economical method

Oil-flred Boilers. When neither gas nor electricity is available, and it is not convenient to use solid fuel, it is possible to utilize an oil-heated geyser Most of thesc employ


Hot Wator Sapply. Fig. 5. Diagram showing dual installation comprising coke-Ared boiler and electric immersion heaters. Ejithor may be used at will. A. expansion pipe. B, cold water storage tapl. C. cold water inlet. $D$, hot wator servioe pipe. E , hot water tank. F, immersion heaters. $G$, cold water foed to solid fuel Are. E, hot water retarn from Are. J, solid fuel Are Courtesy of Belling $\&$ Co.
motor and shuts off the fuel. Conversely, when the temperature falls the pump is set working again and the oil spray is ignited by an electric spark. The apparatus is entirely automatic and is silent in action.

Choice of System. The re!ative merits of the various systems must be determined by individua $/$ circumstances, but points for consideration are, that when the solid fuel system of the cooking stove is used, the fire must be adequate to meet all demands, irrespective of the temperature of the kitchen or the cooking requirements. The system works well when used in conjunction with a inodern portable range, if only intermittent supplies of hot water are needed for baths, etc., and will furnish at other times plenty of water for washing up and similar purposes. The range may be
adapted to burn coke or anthracite coal, or otherwise arranged to remain alight over very lengthy periods.

There are several reasons why the older type of kitchener soldom functions satisfactorily or economical!y as a source of hot water supply. The boiler at the back of the fire absorbs a great amount of heat whether hot water is being used or not, and it has been catimated that this wasted heat may be as much as one third of that given out by the firc. The reader is referred further to the article on Range.
In choosing a water heater it should be borne in mind that, although yas and electric systems when properly installed cost little if any more to run than a coke fired boiler, it is important that heat losses by radiation from tank and pipes should be prevented. Unless the pipes, etc., are lagged with insu'ating material the cost for gas or electricity inay be very largely increased The hot water storage tank should be enclosed within a casing, and the insulating material packed in the space betwcen tank and casing. Where the tank is situated in and heats an airing cupboard, the top of the tank may be left cxposed, as this purtion will give off enough heat for airing purposes. The space between tank and walls of airing cupboard may be filled with the insulating material, and no casing is necessary.
Tank or Cyllnder. Fig 6 shows the arrangement of a hot water system as fitted to a solid fuel cooking stove of the ordinary portable type with a side boiler. This is known as the tank system, because a storage tank is situated above the higheat level of the taps. In the cylinder system, the storage tank is below the level (Fig. 7).
Most hot water systems comprise a flow and return pipe, and to ensure that the hot water should rise always up the same pipe, the flow pipe is situated at the top of the boiler and the rcturn pipe at the bottom. When a tap is turned on some of the hot water ascends from the boiler and some descends from the cistern, to flow out of the tap.

It is not difficult or expensive to convert a system utilizing the kitchen range to one employing gas or independent heating. It is merely neressary to disconnect the flow and return pipes from the cylinder to the boiler of the kitchen range, and connect them to those on the new heater. The boiler should be removed from the range and the space filled


Fig. 6. Tank system of hot water supply fitted to a portable caoking
Draw off for Boiler emptying Cistern
in with firebrick This arrangement will be found to overcome most of the difficulties associated with the failure of the ordinary system as installed, otherwise immediate attention should be given to the How and return pipes of the boiler and the hot storage tank. If the circulating pipes are choked up


Fig. 8. Indireot eylinder ased on combined central heating and hot water systoms Courtean of National Radiafor Co.
they will have to be cleared by one of the solutions sold for the purpose, or in bad cases the whole of the pipes must be taken down and cleaned out with a scraper.

Comblned Heating and Hot Water Supply. As mentioned earlier, it is often possible to combine these services. There are several points to notice, however. If water were drawn direct from the central heating system (after circulating through distribution pipes and radiators) it would probably be found to be discoloured by the corrosion of the latter. In a systern primarily designed for hot water supply, it may be possible to attach a couple of small radiators, and so warm rooms from the hot water boiler. The arrangement will only function properly in districts where the water is hard and does not corrode the interior of pipes, radiators, etc.

A central heating system intended to furnish domestic hot water also should have a boiler designed to that end (see page 213). The water for radiators is drawn from an inner cylinder enclosed within the storage cylinder and connected to the boiler. The domestio hot water does not mix with that used to heat the radiators, but comes from the outer cylinder, being warmed by heat transmitted through the walls of the inner cylinder (see Fig. 8). $A$ is the hot water flow, and $B$ the boiler How. C is the cold water feed and D the boiler return. E is plugged.

HOUR GLASS. An hour glass, or sand glass, as it is sometimes called, is an old form of timepiece, being planned to measure time. The early ones wore made to measure an hour, hence the name, but afterwards others came into use for shorter periods of time. One consists of two glase bulbs fitted to each other at the narrow ends and having a tiny passage between them. Glasses used for eggs contain sufficient sand to pass from one bulb into the other in the time which is required to boil an egg. Hour glasses are sought by collectors, and good specimens are valu. able. Some of the most coveted examples formerly stood in churches. being used to mark the length of the sermion. The glass gilt stand, c. 1590 bulbs were usually en- Brilish Museum closed in a frame of wood. in some cases curiously and beautifully carved. Glasses of the same kind, known as log glasses, were used on board ship for measuring time. See Egg Boiler.

## The House: Its Planning and Construction

 With Important Legal Points Clearly ExplainedOther important aspects of home-making are considered under Architecture: Bungalow . Cottage ; Flat Several hundred articles also deal with the building, repairing and furnishing of the heme. These include Brick; Carpet; Colour; Decoration; Dining Rocm ; Drains; Lease; Paperhanging: Roof

A broad classification divides existing houses then become very much more a matter for into three types, detached, semi-detached and terrace house. The first of these is only possible for most penple where land is comparatively cheap. The semi-detached and terrace houses are the ones most frequently seen in towns, whether in the poorer or the richer quarters. The structure of terrace houses, even in the best neighbourhoods, shows at a glance that there land is costly. They usually have a basement and a comparatively narrow frontage.

The semi-detached house is a compromise between the two. The fact that one side is exposed enables the house to have a certain amount of land, even if it is only sufficient for a passage at the side, while there is an economy in building two houses together The arrangement is convenient, too, where it is desired to build a garage beside the house

A growing artistic sense leads more people to desire houses that are attractive to the eye, both externally and internally. To a large extent homes to day are planned to save labour. Gone are the basements and some of the long llights of stairs; gone, too, are many forms of lloor and window coverings and other furnishings that demanded constant attention, or, if left alone, were harbourers of dust. Light and air are allowed to penetrate to the fullest extent rooms designed to take advantage of them

Period Styles. The builders of old days adopted ways that were always direct and real, arising out of local conditions and suited to these. Thus, when timber was plentiful there amse that manner of building which is cafled half-timber, i.e having a stout oaken framework, with a filling of plaster, brick. or other material. This is essentially constructional work; modern imitations of the style fall far short of the original, the apparent timbers being merely on the surface, thin pieces of wood nailed to a brick hacking, and having none of that solid look that real half-timber alone can produce.

In a later age, when brickwork came into general use, particularly in the eastern and southern counties of England, there was a new expression of building, exemplified in the Tudor atyle, and much later in the Georgian. Tudor houses were largely the product of craftamen working in traditional ways of building; they were not houses built to any precise drawings, but rather the outcome of individual fancy and free craftamanship. That is a point to bear in mind when a Tudor house is attempted to-day.
The old work has all kinds of variations in it; for instance, the brick walling is not meticulously exact, either in its surface or in its jointing, and the bricks themsolves are full of variation and colour, and have a texture quality. These variations are often copied to-day with auccessful and artistic results. Window and door openings in the front of the house may vary in shape and size quite appreciably, while maintnining a general balance. To-day these are set out on the drawing-board, and while it is pure affectation to imitate some of the vagaries which sprang from tha original craftsman's fancy, it is equally true that anything like mechanical precision in the work will inevitably produce a hard, unsympathetic-looking house. The quality of craftsmanship in house building cannot be too strongly commended

In the Georgian style of building that was common in England thrnughout the 18th century it is seen that though design had
the architect than for the craftsman $t 0$ deter mine, the huuses of the perind still exhibited a marked sense of cinftsmanship. Within the last half century there has been general appreciation of the qualities which constitute the charm of our old houses. Anyone proposing to build a house to-day should have at least some little perception of these qualities, and so long as the essentials of good house design are kept in viel and sound work is demanded in every case, there is the basis for satisfactory results.

Choice of Site. Soil and aspect are two important factors. Tho former is discussed at some length in the opening paragraphs of the article Architecture, which should be read in conjunction with the present one.

As regards aspoct, an endeavour should always be made in the placing of the house and in the planning of it to get as much sunlight as possible into the rooms. A room that gets no sun is not necessarily unhealthy, but it is distinctly less healthy and less pleasant than one that has been planned to get abundance of sunlight.

A living-room which is used for the best part of the day should have a sunny aspect, preferably facing south and west, while in a kitchen a north-easterly aspect is suitalile. Bedrooms should be placed so that they not only secure sunlight, but also cross ventila tion. In this connexion it may be noted that where ventilation through openings in outside walls is not possible, good results can be obtained by the provision of fanlights, which enable cross currents to pass from the outside air into the landing, staircase, and hall.

The combining of the kitchen and the scullery, provided that the room thus made is of a goord size, making it into a proper donestic worksliop, is a modern expedient that has
great merit when a maid's sitting room is provided. Above all things space should not be saverl on tho kitchen quarters in a house, however necessary this may sometimes be in a flat. A kitchenette for family cooking is inadepuate. The inclusion of a service hatch, with handy store cupboards adjacent, saves a great deal of walking to and fro in the serving and clearing away of meals. Consideration may also be given to the inclusion of built-in fitments. This applies both to rooms upstairs and down. In the dining room such features as a built-in sidehoard and cuphoards may lie included; while upstairs commodious built-in wardeobes are excellent fatures.
Very desirable in the equipnient of the herlrooms are fitments with hot and cold water services These also can be huilt-in, preferably in an enclosed recess having a small outside window Fitments of this kind involve a good deal of expense, as plumbing is always a big item, and they mean long runs of piping. There can, however, be no question of their convenience and merits

Dealing with the Architect. Some hazy notions exist as to what an architect actually doen and what his fees are. Anyone desimous of getting precise and full information about this matter should apply to the Secretary of the Royal Institute of British Architects, 9, Conduit Street, London, W.1, for a copy of the institute's profossional scale of charges, the price of which is 3d. ; but it may be of service here to sct down hrielly the chiof items.
An architect's fees are 6 per cent. on the total cost of building on jobs of $£ 2,000$ and over, and on a sliding scale varying from 10 per cent. to 6 per cent. when from $£ 100$ to $£ 2.000$ is spent. This sum includes working out the acheme, making an estimate of tho cost, preparing detailed drawings and specilica tion, arranging malters with the builder, issuing certilicates, and generally supervising the erection of the house, assuming this is within a rcasonable distance. If the job is far away, extras must he incurred for travelling, out-of-pocket expenses. and time occupied.

The henefits of calling in an architect are


House. Charmingly designed house at Byfleet, showing the modern use of thatch in conjunction with weatherboarding and plastered brick walls. The upper afores projects over the lower one

Designed bll $\boldsymbol{G}$ Blair Imrie and T $\boldsymbol{C}$ Angell



House. Left, ground-floor plan and indication of garden of the modern bouse illustrated below. Right, top, first-floor plan; note the large cupboards and basin fitments in bedrooms. Bottom, north elevation, showing front entrance and kitchen premises, leaving the southern aspect for the living-rooms
site and that many labour-saving ideas may himself that the work hal heen carried out to shall be exposed on the face, then it is inperabe introduced into the building that are his drawings, would approve these payments tive to use a good brick, one with not too practical and inexpensive in themselves and to be made indue course by the client. The smooth a surface, and with a play of colour
the ultimate means of saving cost of living and ensuring comfort.

The remarks on page 35 regarding builders tenders and the arrangement of contracts may usofully be referred to. Assuming the joh to bo procceding normally, the builder would ask for payment on account from time to time and the architect. having ratisfied
drawings, specifications, and other documents
relating to the house remain the architect's property, but it is a customary arrangement for the client to have copies of the drawings for his own private use on payment of an agreod fee

Brick or Stone. The question of the materials to be used for the construction of a house is influenced by local conditions. The golden rule is that what is native to the soil is right ; that is to say, a stone house is right in a stone county, as, for example, in the Cotswolds or in the York. shire dales, just as brick and tiles. or wentherboarding and thatch are of the soil and right for many districts A well-(lesigned house that would quickly look st home in old. world surroundings where thatched roofs are to be found is shown in our first illustration. There nre two or three points ahout a brick house that should be noted. If it is proposed that the brickwork
smooth a surface, and with a play of colour
in it. Attention should be given to the jointing. In some kinds of houscs, more especially those which follow the frecr style of the Tudor, walling with thick mortar joints looks best, the mortar being wipod off llush with the trowel: but in a house of Georginn character a finer joint is more suited to the design, and if struck in cement it gives a thoroughly watertight result.

Exterior Details. The details of houso design aro so numemus and diverse that no attempt to denl with even a tithe of them can he made here. A few points, however, may be noted. Take, for example, the front entry. It is most desirable that this should have some solt of protection either in the form of a hood or of a porch. Neither of these structures need be cumbersone.

There are old houses up and down the country dating from 100 years and more ago which have quite slender hoods, lead-coverod, and supported on delicate brackets, and the fact that they are still sound today after so many years of exposure is proof that a cumbersome hood is not needed.
The colour used for painting outside woodwork and plaster is another point worthy of remark. Drab and dirty colours should be eschewed. For a house in the country nothing looks better than decp cream for plaster work, and the colours chosen for the front door gate. window frames, stc., should he in pleasant contrast to the surrounding landscape. V'ivid shades arc more suitable for town terrace houses, where the surroundings are dull. Thus, if a stucco house is painted cream the door and windlow frames may be painted light green, red, orange or

House. South elevation of a well-planned modern bouse. It is of oblong House. South elevation of a well-planned modern bouse. It is of oblong shape and the exterior is oi brick, the upper balf being fnished in roughcast. Casement windows form square bays on the ground floor continuous with the
rool of the brick-floored logia porch. The upper windows have deep-cut sun louvres which keep the rooms coal notwithstanding their southern aspect Designed b" 11 . M. Poller. L.M.I.B.A.
blue without risk of providing a violent or unpleasant contrast, provided that it is in some harmony with the houses on either side.

Painting is a considerable item in upkeep, and it may he considered desirable to eliminate it as much as possible ; as, for instance, in a house which has brick-framed windows filled with lcaded lights in steel frames that are built-in: oak doors that can be safely left to look after themselves; and enves forined of tiles in projecting courses set in cement. Such a house involves practically nothing in the way of paint cost for maintenance.
Interior Design. As with the exterior, so with the interior: there should be gool design and sound workmanship. Above all, it is essential not to attempt make-believe. not to introduce features which, however appropriate in a haronial hall, are ill-suited tu, a little place perhapa not 10 ft square. Take. for example, the matter of fireplaces. These are frequently incongruous. In the majority of cases a simple mantel enclosing a hearth fire is all that is needed, with perhaps a panelled picture or a mirior on the chimney breast above. In a room of average size this will be a far more satisfactory arrangement than the introduction of a pretentious chimney piece.

In this matter we suffer from the exploita tion of what is callerl the Jacobean style. It should he realized that many things perpetrated in that name are not Jacobean at all, and even if they were they would have no proper relation to our onfi day. The Jacobean style, if we may so call it, was coolved in the first half of the 17th century, and was a mingling of the then new Italian manner with the lingering Gothic tradition. In the original work it is interesting, as any genuine old work is, but to copy all its quaintness. and to do so in a mechanical way according to standardized factory inolels, is often merely to produce travesties. Something simpler and more direct, as indicated above, is what we should seek to attain.

As a finish to the house walls, distemper is excellent, especially for a house that has been newly built, for every house must have its time to dry out, and this may take the best


Dining room, showing the brick-arched freplace and the panelling effect produced by Lroad oak-stained splats, which also serve in place of a frieze banding, running in an unbroken line round the room
part of a year For this reason it is always preferable to distemper a new house, even though the walls may ultimately be papered. Floors offer a wide range of choice, from deal boarding to parquct, and from jointless composition floors to tiles and rubber floorings. For the service quarters and passages there is linoleum, which should be inlaid and not surface printed, to withstand long wear. The following point, however, should be noted ahout linoleum: if ground-Hoor rooms are tight-covered with it, there is a risk of dry not being sct up. The risk is small, however, when the floor is well ventilated underneath.


House. Dining room and living-room of the house described in the previous pages, showing bow sliding partitions run into the bookshelves and thus avoid the disadvantages of clumsy folding doors

The Plan. The house shown in the plans and the accompanying photographs is an example of the excellent icsults that can be ohtained lyy intelligent and close co-operation between owner and architect. It has some intercsting and ingenious features, a number of which were worked out by the architect at the owner's suggestion. It occupies to full advantage a comparatively small site in a seasidc town. As the plans show, it is of an ohlong shape, a form which has many advantages in a house of moderate size. This shape involves a some"hat large frontage, but the present relativo cost of land and building, especially in the smaller country towns, makes larger fiont ages more economical than formerly. In a house of this type an extra outlay upon land of $£ 25$ would, hy reason of the more attrac tive planning thus jermitted, add quite $£ 160$ to its ultimate value.
The basis of the design is the continuous dining room and large lounge living room, separated by sliding doors which run into hook. shelves. The two rooms can thus be thrown into one without the disadvantages and a wh ward appearance of folding doors, while the dining room portion is easily and completely separated from the living room in winter. or at any other times when desired. On either side of a built-in sideboard in the dining room are service hatches, one opening directly into the kitchen, and the other into the scullery, so that the dishes are in one movement placed ready for washing up immediately the monl is tinished The fireplaces in both iooms are set in brick arches with raised brick hearths. Both rooms are well lighted with tive leaded case ment lights, built out to make roomy and comfortable window seats, the proportions being carefully dosigned. The space between the two bays is utilized for a brick-floored loggia porch, supported on two concrete columns with a fat lead roof continuous witl the roofs of the two bays.
An excellent panelling effect is ohtained by the usc of broal splate tieated to give the effect of dark oak. It will be noticed that the splat which is carried round both rooms in the place of a frieze runs exactly along the tops of the square window bays and of the lireplace, so that a continuous and unbroken line is given This idea of panelling with broad splats and
continuous frieze lines is carried out through out the house, the obvious difficulties in hall and staircase being ingeniously overcome

A warm colour effect is obtained throughout the interior by the use of sunny-coloured distemper for panels, and a lighter shade for ceilings and friezes. The staircase is particularly well designed, having a very easy rise There are 16 rises 7 in wide with II in treads in a total height of 9 ft .3 in . from hall to upstairs landing: the treads are 3 ft 2 in wide The main flight is kept down to 10 rises by disposing of the remaining steps as follows, two reaching the landing at the hottom, onc on the half landing, and three in the thickness of the upper floor and beams.

The Bedrooms. Four bedrooms, including a maid's room, are provided, with a bathroom and a boxroon. Each bedroom has two ample cuphoards built-in on one wall, with space hetween, which is occupied by a hand basin with hot and cold water; a convenience which great/y reduces the amount of work to be done by the maid in the bedrooms. On the opposite wall two wardrobe cuphoards are built-in to provide recesses for casement windows, which open inward for easy cleaning All windows are casement with leaded lights Those in the hedrooms have outside shutters with exceptionally deep louvres, giving wider spacing and effective shelter from rain and light Two of the rooms liave brick built arehed fireplaces similar to those downstairs.

As will be seen from the plans, practica!ly all the rooms, both ground Hoor and first floor, face south, only hall and kitchen downstairs, and bathroom and one hedroom upstairs, being on the north side. The kitchen has no range, but in its place are supplied a large gas stove and an independent stove for hot water supply to hedrooms and bathroom Both these are placed under a canopy communicating with the chimney, an arrangement which ensures the removal of all fumes from the kitchen Spare heat from the back of the independent boiler may be allowed to pass into the hall through a low arched opening.

Legal Considerations. He who proposes building a house must first of all secure the land. He may either purchase or rent a picce of freehold or leasehold land. In either case the contract should be in writing signed by the seller or landlond.

It is usual on the sale of land to have a formal contract drawn up by solicitors, and the solicitor for the vendor inserts many provisions by which the purchaser, to save expense, is to waive his objections to various points in the title.

When anyone is about to purchase land, whether frechold or leaschold, and the solicitor for the vendor asks him to sign a contract containing a number of clauses about the title in advance, he should take it to a solicitor for investigation After the title has been investigated the land must be conveyed by a deed under scal

Building sites can also he secured on lease for a ground rent, particularly in the neighbourhood of London. Sometimes, in addition to the ground rent, a lump sum or premium for the land will have to lic paid. In some cases the landlord renta the land to the lessee, who covenants that he will put up a house within a certain time. In other cases the lessor enters into an agreement that if the lessec will put up a house on the land named a lease shall ve granted to him after the housc is put up.
There is a great deal of difference between these methods if the lessee is unable to carry out his bargain, for if a person partly huilds a house on land of which he has not yet got a lease, and then is unable to carry on, the owner of the land can take possession of the land again and confiscate whatever has been put upon it. If, however, the lessee has actually got a lease of the land, he will prob. ably be ahle to get somebody else to finish the house on terms, or to transfer the land with the house partly built at a price sufficient to cover most of what he has spent upon it.

In nearly all cases the lease contains a clause that the lessee shall erect the house or houses of at least a certain value upon the


Honse. View of hall and stalrs in the house illustrated In the previous pares. The staircase, which is in oak, is cleverly designed to give an easy rise, and is a decorative feature. Like the rest of the bouse. the ball is beamed and the panelled effect of the walls is carried out here also
site, such value to be prime cost of labour and materials. In very many cases also, the plans must he passed by and the work done to the satisfaction of the Inndlord's architect and surveyor This means that it is to be done to the "reasonable" satisfaction

The purchaser of a site should make sure what restrictions there are upon the usc to which the land may be put. For instance, he may be prohibited from building $\Omega$ shop.

The next thing is to make a contract with a builder The -intending house-owner may get an estimate from the builder and submit it to an architect: He will do better still to employ an architect to make a plan of the house and obtain tenders from several huilders. Builders almays make specifications, i.e detailed estimates of huildings, showing what they intend to put into them, and conclude with a statement of the prices to be charged If something which is not in the specification is required, it will become an extra, for which the builder may charge a reasonable sum.

## Payment of the Builder

When a tender is accepted, it should be subject to the builder entering into a written contract drawn up by a solicitor or by the architect. This ought always to contain a clause that the builder is not to he paid unless and until the architect certifies that the work has been properly done. An architect who has to certify in this fashion must give his cortificate honestly. Most building contracts stipulate that the builder shall he paid by instalments: so much when he has cleared the site, so much when he has put in the foundations, so much when he has huilt the walls, and so on, the amount generally heing calculated at, roughly, two-thirds the value of the work done.

A date for the completion of the work may be fixed and for every day beyond that time during which the building is not finished the huilder may be required to pay a penalty. Other clauses ought to be that if the builder is unable to carry out the work to completion, the employer may take it over and employ another builder to finish it, and only pay the lirst builder for what he has actually done

Care should be taken not to order extras, for this will get rid of any stipulation as to time of completion. It is best to have a clause that no extras shall be put in by the builder unless they are ordered in writing If a substitute of one thing for another is anggested, and the owner does not intend to pay extra for it, he should make it perfectly clear to the builder in writing that the substitution is to be cffected without extra charge or delay in the work.
No house can be built except according tu the requirements of the local authority with regard to the matcrials to be used, the drainuge system and the like. All plans have to be passed by the local council, and once passed the building-owner must not deviate from them without the consent of the council. The drainage system must also lee inspected before it is covered up.

When building, the owner should he very careful not to interfere with his neighbour's ancient lighte, or he may find himself involved in legal proceedings.

When a person builds upon a plot of land which is his freehold. the land and the building are his for ever; but if he builds upon leasehold land, at the end of the lease the house and everything on the land revert to and become the pinperty of the freeholder from whom he held his lease. Moreover, building leases usually contain stringent clauses that the lessee shall he responsible for the repair of the house and for painting and the like. These covenants are not very strictly enforced by the landlord for the first part of the lease,
but as the lease draws near to its conclusion the holder of the lease will find himself frequently subjected to requisitions by the landlorl to carry out considerable repairs.

Buying a House. Every contract for the purchase of a housc, whether freehuld, leasehold, or copyhold, must be evidenced in writing signed by the party to be charged. To this rule there is one exception, that is if a contract for the sale of a house has been partly performed in such a way that the parties cannot really be put back into the saine state again.

In making a contract to buy a house, it is well to employ a solicitor, because such contracts very often contain clauses which have a bearing upon the title which is to be accepted by the purchascr. Particularly is this caution necessary when buying a house at an auction sale. There is always a set of conditions of sale, which are sometimes printed and circulated in the auction room. Anyone who purchases a lot has put in front of him what amounts to a contract to buy the house subject to the conditions, and it is well to have a solicitor to sce these conditions.

Contracts for the purchase of $n$ house in. variably contain a stipulation that the completion of the purchase, i.e. the execution of the conveyance and the payment of the money, shall take place on a certain date. If, however, the venclor or the purchaser is not ready on the exact date the contract does not go off, but an allowance must be made always of interest to the vendor and sometimes of the rent and profits of the land to the purchaser.

When the contract has been made, the next thing to do is to invertigate the title of the vendor, which is done exactly as in the case of a sale of land, and should always be done by a solicitor. The next thing is the conveyance, which should also be prepared by a solicitor, and is always by deed.

The lense should be exainined. If there are repairing covenants, it should be observed whether they are vary onerous or fairly light. Notice should be taken of any restrictive covenants. Suppose that Brown contracted to sell Jones a leaschold house. Jones is not obliged to take it if, on looking at the title, he discovers that there are any restrictive covenants upon the use of the house or the land-e.g. forbidding it to be used as a hotel or boarrling-house-unless Brown told him beforehand that there were such covenants.

## Oblisations of the Leaseholder

The purchaser of a leaschold house is bound to covenant in the purchase deed to indeminify his venclor against all breaches of covenant. This means that he undertakes to pay the rent and carry out the covenants contained in the head lease, and that if he does not do so, and the lessor compels his (the purchaser's) vendor to make it good, the purchaser will in turn make it good to the vendor: The original lessee of a leasehold house for, say, 99 years is responsible to the landlord for the payment of the rent and the performance of the covenants during the whole 99 years of the lease. although he may have assigned (i.e sold) the lease to someborly else, and it may have pussel through some fifty hands.

But an assignee of a lease is only liable for such breaches of covenant as occur while he is the holder of the lease himself. For cxample, X grants a lease for 99 years to $A$ in the year 1900. In 1910 A assigns it to B . In 1915 B assigns to C , and so on until in 1998 the then owner assigns to $\%$. The lease contains a covenant to keep the house in repair, and in 1998 X finds the house in disrepair. He can sue A and A's heirs and executors or he can sue each person who has held the lease in respect of the disrepair during his period.

Before buying a house, whether freehold or leaseho!d. it is well to have the drains examined
by the sanitary inspector or to employ a surveyor to do it
On the conveyance of a house stamp duty must always be paid on the conveyance, varying according to the amount of the purchase money.

Taking a House. A tenancy may be either under a lease for a period of yeary fixed or a tenancy from year to year, or from quarter to quarter, month to month, or week to week. A contract to let i house must be in writing; but the letting as apart from the contract to let need not be in writing, unless it is for three years and upwarl. This means that if A goes to a landlord or a house agent, and he verbally agrees that he will let him a house on a yearly or monthly tenancy. and afterwards refuses to carry out the contract, A cannot sue unless he has some acknowledgment of the contract in writing signed. But if he lets $A$ into the house, and an actual tenancy has begun, A is not obliged to have any writing to prove what the terms of that tenancy are.

At the same time, it is hetter to have the main terms written down. These main terns are: the rent, the nature of the tenancy, whether quarterly, monthly, or weekly, and the notice required to terminate same

In entering into the more formal agreements of tenancy by written agreement or by lease, the householder should always be careful to sec that the document really contains all the terms, for otherwise the landlord will not he bound by them. This should be specially noted with regard to repairs, for it is one of the peculiarities of the English law of landlord and tenant that nohody is hound to do any repairs except by agreement.

Grounds for Annulling a Lease
Another thing a tenant should always he careful about is to stipulate that if the house should be accidentally destroyed, or rendered uninhabitable, except by his (the tenant's) own fault, he, the tenant, shall not be bound to go on paying rent for it. In the absence of alleh a stipulation, a tenant is bound to go on paying rent for the house so long as his tenancy has not come to an end hy lapse of time or due notice, even if not one brick should be left upon another.

In leases for more than three years, it is usual for the tenant to agree to do the repairs. The nost reasonable kind of repairing covenant is a covenant to keep the house in good and tenantable repair and condition. This means that the house is to be kept in such a state that a reasonably minded tenant would accept it to live in. What is reasonable in this connexion depends upon the class of house, neighlourhood, and the sort of tenant who might he expected to want a house of that kind.
If a tenant agrees to keep a house in repair and does not do so, the landlord may make him paty whatever it would cost to put the house in repair according to the covenant. It is also usual for landlords to insist upon the insertion in their leases of a proviso for for feiture and re-entry. This means that if the tenant breaks any of his covenants, the landlord can put an end to the lease and forfeit the remainder of the term which has to run. A landlord cannot enforce such a forfeiture without first giving the tenant notice of the breach of covenant complained of, and requesting him to remedy it, and to pay compensation for the breach if compensation is required.

To this rule there are some exceptions. For instance, if the landlord is entitled by the terms of the lense to forfeit the tenancy if the tenant does not pay his rent, he can forfeit the lease without notice. But in this case the tenant can always esenpe the forfeiture by paving his rent and the costs up to date.

So also, if a Inndlord has given a tenant notice to do certain repairs and he has not done
so, and the landlord consequently brings an action to recover possession of the house, the tenant can at the last moment come to court, offer to do the repairs, and have the case stayed for a. certain time to give him an opportunity to perform his obligation. Then, on paying the costs to which the landlord was put. he is relieved of the forfeiture.
Subletting. Unless there is an agrecment to the contrary, a tenant may always assign his tenancy or sublet the premises or any part of them. But it is quite common for Iandlords 10 insist upon a clanse in the lease that the lenants shall not assign or sublet without the landlord's consent.

No tenant should ever enter into such a covenant as this unless it is qualitied by the words : which consent shall not be unreasnnnbly withheld in the case of a respectable and responsible tenant. The tenant who encounters an unreasonable refusal can bring an action asking the court to declare that the lindlord's refusal is unreasonable, and if the tenant proves his case the landlord will have to pay the costs It is not reasonable for a landlord to refuse his consent to ant assigninent or subletting on the ground that he, the landlord, happens to want the premises for himself.

HOUSE AGENT. House agents are middlemen who bring together those who have hunses to let and those who wish to rent them. Many of them are also auctioneers and valuers. A house agent charges a fec or cominission for the work done. If he lets a house, he charges the owner a percentage on the first year's rental, 5 per cent being the usual charge. The tenant pays nothing.
The house agent lets furnished flats on about the same terms and collects rents for persons on commission, 5 to $7 \frac{1}{2}$ per cent on the amount collected If he is an auctionecr and valuer he will sell and value goods, 5 per cent on the amount collected being usually charged House agents also sell houses by auction or by private treaty. Sce Agreements: Furnished House.

HOUSE DOG. Some breeds of dogs are suitable only for the house. Among these may be mentioned most of the loy varictics and all which come under the heading of lap dog Sporting brceds, however, often make excel lent house dogs provided that they are given sufficient exercise and otherwise kept in good condition. The smaller terriers are universal favourites, English, Scottish or Aberdeen, and Irish. Their house manners are admirsble, and they enjoy their privileges as family pets ; but persons adopting them as such muet be prepared to give the dog at leavt one goorl walk a day, and must not imagine that it is suflicient for him to be taken the round of the shops.

Most of the larger brecds have excellent qualities as house dogs, but their size is a drawhack except in the larger honses. Great Danes. wolf-hounds, setters and St. Bernards occupy considerable room in a sinall house. and even the Airedale is at a disadvantage in this respect, though as a family pet he is a grent success It is, however, not diflicult to make a house pet of any breed. See Airedale; Dog, etc.

## House Fly. See Fly.

HOUSEHOLD BREAD. This term is used to describe loaves that are moulded in two parts like cottage loaves. They differ from the latter, however, in that both parta are the same size, or the top slightly larger than the bottom. They are packed closely together in the oven so that there is orust on top and hottom only. See Bread.

HOUSEKEEPER : Her Qualifications. There are various openings for the trained housekeeper whotakes up this work as a means of earning a livelihood. A great advantage of
this calling is that it a gir marries she reap. the full benefit of her truining and can always return to the work in case of adversity or widowhood. It is also often the best openiny for the woman no longer young, and proficient in running a house

This last type of woman untrained but with years of practical experience behind her, will most easily find a post in a private family rither supervising a maid or maids, or in many enses undertaking the conking herself

For housekeeping work on a larger scale, such as that in a hotel. boarding-house hospital, school or other institution, training is almost always necessary to give the requisite knowledge of catering and cooking, the soience of domestic economy. the management of staff, accounts, and the care of linen. Eisen
if thr lonurckepper has no conking to do as is probably the case in an institution. it is casential she should know the subjoct in orler to be able to supervise the conk and check waste-a very important point in a large place. Cookery and domestic management generally may be learnt at manly domeatic science centres in all parts of the country courses varying from 6 to 12 months. Salariep are now excellent in this kind of work

The woman who intends to earn her living as a housekecper, besides having the technical qualifications mentioned, must be willing to take responsibility. should be enough of "t teacher to direct assistants clearly. and must have sufficient tact and personality to get on well with the variety of people who live under one roof in any institution. See Servant.

## Housekeeping: Modern Methods

## Advice on the Management of the Eome

The reader may also consult the articles Accounts; Clothes; Cooker; Diet; Food; Furniture; Kitchen ; Labjur Saving ; Larder; Laundry ; Llinen ; Mending. Refrigerator; Servant ; Spring

The woman who has to save her pennies usually gnes out marketing herself. The economy of buying over the counter and paying on the nail is undoubted, and she obtains the advantage of variety for the daily menu. All large stores have bargains in food just ay they have in dress. An abundant supply of salmon, a large consignment of asparagus or of strawberries or orangea, sufficiently inexpensive to encourage jam and marmalade making, lobsters, ducklings, and other luxuries at the price of commonplace foods, are the reward of those who look for them.
If there is room in the home for a store cup. board, it will prove an economy. Soap and candlea, for instance. harden with keeping, and do not waste as new soap and candles will when put into use; rice and other commodities of this kind are cheaper if bought in bulk, and in all such and other cases, as there are several prices for different grades of the articles, personal shopping tells advantageously. It is well to have in reserve a few emergency commodities of which the kitchen may run short at a critical moment.
In these days of informal entertaining it is also most useful, whether living in town or country, to have an ample provision of bottled or tinned soups, fruits, and vegetables. Those who are fortunate enough to possess large kitchen gardens are sure of supplies, either fresh or home-bottled, for the extra vegetable or fruit course that will supplement the menu in the event of an unexpected guest; others should have no difficulty in doing this if they keep a certain number of tins of vegotables and fruits in the store cupboard. Such vegetables are easily and quickly prepared, ana if reliable brands are purchased they make safe and varied additions to meals. Beetroot, tomatoes, asparagus, peas, beans, and corn are a most useful selection of tinned vegetables. Pineapple, grapefruit, cherries, loganberries, peaches, aprioots and pears, either bottled or tinned. will furnish the chief ingredients for many kinds of sweets. Sardines and other tinned fish, tongue, sausages and potted meats may be stored at the housewife's discretion according to her likely requirements.

## Importance of Early Training

A point that the really capable housewife who likes to do everything herself often overlooks, and that the undomesticated mother minimises the importance of, is the value of early training for girls in gond housekeeping It does not matter what a girl is going to be or do in after life, she is handicapped unless she really knows how to keep house. This does not mean a return to domestic slavery, but the emancipation of taking a live interest in the thinga she ought to know. On no account
should good housekeeping be presented as drudgery, but as a real and exciting achieve. ment. Nearly all children, often boys as well as girls, delight in a cookery afternoonarranged for them preferably when the eook is out-and not only to be allowed to make toffee and other aweets, but to concoct a whole menu or propare the dishes for Sunday supper.

Pleasure in doing this is chiefly a matter of clever suggestion. Many girls have been turned against domestic accomplishments for life by being forced to do housework, needlework, or cookery as very dull lessons, instead of having all these things made to appear so interesting that they ask to be allowed to do them, as they will ask to do gardening or painting. Just as children are taught to put away their playthings, so ther can be taught to clear up after cookery or any other domestic pursuit. Equally important is it to see that things arc clone in the right way from the beginning instead of allowing wrong or slipshod habits to be acquired.

Well-balanced menus are the aim in good housekeeping. Diet is now a matter which is more scientifically considered, and the old haphazard method of choosing meals no longer satisfies the careful housewife, who wishes her family to live on a dietary capable of producing the best results of physical fitness. The most important dopartment in housekceping is the provision of proper food, which includes not only its purchasing and cooking, but also its serving in an appetizing way.

Business-like Methods. If there are books to pay, it is better to have them sent in weekly than monthly. All the slips sent by the butcher and fishmonger with their goods, stating the weighte delivered, should be kept for reference after the goods have been weighed and the books checked.

Women who like to manage the family exchequer in a business-like manner prefer a certain sum of money to be placed quarterly or monthly to their own banking account, and it is generally understood that any surplus that accrues goes to pay for breakages, to renew the stock of household linen, and so forth. The sums for servants' wages and the dress allow. ance of wife and children, if paid to this account, simplify matters considerably. When it is neither possible nor desirable to follow this plan, so much a week may be paid to the housewife for marketing and current expenses. Every item should be entered in a book as paid for and the money made to balance daily or weekly.

In domestic management a time for everything and everything at its proper time is a good rule. Kitchen orders given at the same hour each day and regular supervision in cleaning processes create between mistress and
maid the reciprocity that makes for harmony and efficiency in the home Any labourarving inventions that have been tested and approved will help the smooth running of the establishment The mistrese who takes pains when changing servants to engage those with a good personil character is the one who, in the long run. saves herself trouble It is well to remember, however that oven the least ex. perienced of maids may be trained, if willing intu a valuable help when the mistress is herself an adept at conking and domestic economy: in gencral.

House pride goes naturally with good house keeping The woman who possesses it in full measure takes a personal joy in cleaning and polishing, in making her glass sparkle and her silver shine. There is, again, a great feeling for beauty. and an orderly, well-arranged home is one of its best expressions

It is good economy to replace glass and china as it is broken, thus proventing the necessity of buying a complete outfit in course of time, or of using pieces that do not match. The wiso housewife to-day does not hoard. She has ton great a sense of the value of space-saving to lumber up the home with useless articles

A periodical attention to the linen cupboard and personal underwear of the household is another necessary duty, so that gaps in sup. plies can be filled as they occur. In this connexion a careful scrutiny should be kept of what goes to and what is returned from the laundry ; and the plan of putting away all napery and lingorie at the bottom of its pile, instead of at the top, should be observed, so that each item may be used in its turn, thus preventing the premature outwearing of one or two.
The housewife who prides herself upon all. round efficiency makes a point of being a good hostess. This can be achieved without much expense owing to the simpler standard of entertaining. Short meals and light are the rule. costly wines are not looked for, but attractively laid tables, good cooking, wellmade tea and coffec, appetizing little extra dishes, and the consideration of individual tastes are what constitute successful housekeeping from the angle of the visitor

EOUSELEER. The houseleeks, of which the botanical name is sempervivum, form rosettes of thick, fleshy evergrcen leaves: these when well developed produce spikes of flowers, chiefly of reddish or yellowish colouring. After having flowered the rosette diea, but propagation is easily effected by detaching small pieces or offsets, which develop freely. Houseleeks will flourish in rock crevices, on house roofs, and in walls, and need little or no soil, though when planting a little soil should be pressed round them.

Some of the houseleeks have most orna. mental leaves; the most distinct is the cobweb houseleek (arachnoideum), with a white cobweb-like covering to the leaves. which ought to be protected in winter by a covering of glass if the plant is grown out of

doors; it makes an excellent pot plant for the cold greenhouse. Others are the redleaved houseleek (triste), hen and ohickens houseleek (globiferum), calcareum, with reddish brown leaves, and the common houseleek (tectorum). The Madeira houseleek (tabulaeforme) is sonietimes used as a summer edging to flower beds: the plants must be lifted in autumn and stored under glass for the winter.

BOUSEMADD. The most important part of a houremaid's duty is regular sweeping and dusting, as well as the periodical turning out of rooms. This includes the cleaning of the grates and the lighting of the fires. She is also responsible for calling the household, distributing hot water, early morning tea, etc., making the beds and doing up the bedrooms, and preparing the bedrooms at night.
In large houses where a first, second and perhaps third housemaid are kept, they will divide these duties between them, as they will where there is a housemaid and an underhousemaid. In smaller ones the housemaid may be expected to lay the table and do some of the washing-up. In many households the two servants kept are tbe cook and the housemaid. In such cases they divide the household duties between them, the housemaid doing practically all outside tbe conking and the care of the kitchen. In many situations she will be expected to do some of the mending, and may also have charge of the linen; but such duties should be stipulated for when she is engaged.

Housemaids, like other servants, should be insured under the national health scheme, and also against accidents that may happen to them in the course of their work. See Insurance : Parlourmaid.

HOUSEMLAD'S BOZ. This receptacle for brushes, rags, polishes, and other things necessary for cleaning up ashes, laying fires. polishing grates and eimilar work can be carried from room to room, and the lower part of the box is reserved for the ashes, which can thus be conveyed to the dustbin, or wherever else the refuse is put. The top of the box is fitted with a tray in which there are compartments for brushes and other utensils.

Fig. 1 shows a box with a movable tray. The main box is made from $\frac{\mathrm{s}}{} \mathrm{in}$. deal, and the tray from $\frac{1}{2} \mathrm{in}$. deal, and involves no elaborate iointing. The four sides of the box should be first cut from a $10 \frac{1}{2} \mathrm{in}$. wide board to their full length, and as the slope of the box is the same in both directions, there need be no waste at all in the cutting. Notice that as the short sides fit into a rebate, Fig 4, they will be cut short the thickness of the lap left on the long sides. This rebate is now cut to a depth equal to the thickness of the stuff, and having trued up the ends the four sides may be glued to. gether and nailed, the nails being driven askew to form a dovetail grip. When dry, plane down top and bottom edges square, and screw on the bottom. All sides are then oleaned up.

The handle is made from two pieces of 1 in. by $\frac{1}{2}$ in. stuff, with a piece of $\frac{8}{8} \mathrm{in}$. dowel


Housomaid's Boz Pig. 1. Compact receptacle with tray for grato-oleaning requisites. Fig. 2. 8ide of box, with measurements. Fig, 8. End in section,
showing method of attaohing tandle. Fig. 4. Sides joined by a rebate showing mothod ol attaohing randle. Fig. 4. Sides joined by a rebato
parts rubbed off with sandpaper, or preferably left clean from the plane The depth of the groove is marked on each edge of the upright with a marking gauge. and the exact width of the groove scribed across the face of the upright with a sharp cutting point. Two saw cuts are made with a tenon saw, keeping very closely to the lines, made with the scriber, and the material between the saw cuts is removed with a chisel. working first from one side and then from the other, and levelling the bottom of the groove with a router. The board should fit tightly intes this groove and may be secured with glue. by screws from the outside, or by fine nails driven from the inner anglo.
The stopped hous. ing is similar to the plain, but instead of

Housing Jointe in course of constraction. Fig. 1. Plain joint. Fig. 2. Stopped dovotall housing joint the groove passing right. across the upright, it gtops short of the front face, the board being notched out the corresponding amount The groove in this casc is cut out with a chisel or router, as the saw can only be used at the open encl.
The dovetailed housing may be stopped as shown in Fig. 2, or plain : either of these definitely resists any tendency for the upright to separate from the board. The latter has a dovetail formed kneecap and khe condition may disappear after painting with strong tincture of iodine and firm bandaging with a woven elastic bandage. In severe cases the bursa must be tapped.
ROUSING JOINT. This joint is one in which the breadth and thicknoss of the one part is recessed into the other part of the two members, which together form the joint. The simplest example is found in the construction of a bookcase, where upright side pieces are grooved acmss to receive tho ends of the board forming the shelf.
To make the plain joint for a bookcase, the end of the board for the shelf is first cut square across, the ends planed up true, and any ragged
 and iske it fit tightly. box by means of screwn (Figs. 2 and 3). The tray is made in a similar way, except that grooves are cut across the sides to take the divisions, the centre one of which forms a handle. They are glued in and nailed. Small slips should be screwed to the main box to support the tray. See Box.

BOUSEMAID'S KNEE. What is popularly known as housemaid's knee is a swelling of the bursa, a small sac or bag of fluid situated on the kneecap. The medical term is bursitis. It occurs in occupations which involve much kneeling. A kneeling pad or mat, with a cavity for the knee, relieves the prossure on the d


Housing Joint. Fig. 3. Diagram showing details of a draw-bolt joint ased in framed timber work on it by sawing across and carefully chisclling out the surplus material. The groove is cut in the upright with a tenon saw. except that instead of making two cuts. at least three are required. two to form the sloping sides of the dovetailed edges, and the third between these two. The wood is cut nut with a chisel not wider than the narrowest width of the groove. If this precaution is not taken, the overhanging part of the wood at the dovetail side is liable to be torn as the chips come away, but by cutting down the centre of the groove the chips are better able in free themselves.

A type of housing joint that is of use in framed timber work, such as is required for outbuildings, etc., is the draw-bolt housing, Fig.3. The horizontal member is grooved into the upright as already deacribed A hole is drilled through the upright, and lengthwise into the horizontal member for a distance of at least three times its minimum thickness. The dis. meter of the hole is slightly larger than the brolt to be inserted in it.
Another hole is then drilled at rigbt angles in the horizontal nember, until it meets the bolt hole. This second hole is cut out square and deep enough to admit a square nut. This is dropped to the bottom of the hole, the joint put together, the bolt pushed through the bolt hole, screwed into the nut, and tightened up tightly with a spanner. See Joint.
ROVER FLY. One of the gardener's friends is the hover Hy, so named because it hovers above plants during bright sunshine,
seeking a spot infested with aphides or plant-lice, among which it deposits its eggs. These produce larvae of a whitish colour which feed on the aphides. The method by which the aphides are killed is by means of hooklets in the mouth, with which the larvae pierce the bodies of their prey, afterwards suck. ing them dry. The parent Hies are of yellowish colour. shining and metallic, marked with bands of a. different shade of ycllow, or orange. They live upon the juices of flowers, and are perfectly harmless See Green Fly : Insect.

HOVIS BREAD. To make this bread it is necessary to use Hovis patent Hour Take $3 \frac{1}{2} \mathrm{It}$ of the Hour and over $1 \frac{1}{2} 0 \%$ of yeast. $\frac{1}{2}$ teaspoonful of castor sugar, and about $1 \frac{1}{2}$ pints of warm water. Warm the mixing bowl before putting in the flour, cream the yesst with the sugar, and stir in sufficient water to make a thin liquid.

Make a well in the centre of the Hour and pour in the remaining water, which should be hotter than that used in making white bread. Add the liquid yeast, and make up into a smonth soft dough. Well Hour the hands and board when moulding the bread as this dough is inclined to be sticky. Make four loaves out of the quantity, place them in greased tins, and rise them for half an hour. Bake them from $25-35 \mathrm{~min}$. No salt must be used in this bread. See Bread ; Dict ; Food.

HOW. WHEN AND WEERE. In this indoor game one player leaves the room while the others decide upon a word, preferably a noun with several meanings, such as chest. This done, the person outside is asked to enter the mom. He has to find out what the word is by asking queations of the company in turn. These must take the form of. How do you like it? When do you like it ? and Where do you like it $\boldsymbol{y}$ He continues this until, aided by the answers, he is able to gucss the word. when another player leaves the room.

HUB. The central part of a wheel is the best known form of hub. That part of a lock through which the spindle passes is also termed the hub, and the word is applied to the peg on to which the rings are thrown in the ganie of quoits. The hub of a wooden wheel is generally of hardwood, shod with iron or steel hoops; a bicycle wheel has a tubular type of metal hub. Sce Ball Bearings ; Bicycle; Brake; Coaster Hub; Wheels, etc.
HUB BRARE: For the Bicycle. Thesc take two forms, the coaster brake, operated by back-pedalling, and another type operated from the handle bar of the machine. The latter resembles the internal expanding brake used on motor vehicles, in which two shoes are forced outwards against the inner surface of the brake drum. See Brake; Coaster Hub.

Hub Gear. See Three Speed Gear.
EUCEABACE. A favourite material for towelling, huckaback has a thick, spongy texture which makes it more absorbent than plain, smooth fabrics. Linen huckabacks are to be preferred both on the grounds of absorbency and strength. See Linen; Towel.

HUMANIZED MOLR. For the purpose of infant feeding humanized milk is propared from cow's milk by many of the large dairies. In cow's milk, as compared with human, there is about the same amount of fat, about twice the quantity of proteins and of salts, and only ? the amount of carbohydrate, in the form of lactose or milk sugar.

In a mixture of equal parts of cow's milk and water tho protein will therefore be right, and also the salts, but the fat will be halved
and the sugar will be further desired amount. To rectify this, as much good cream should be added to the mixture as is obtained from the amount of milk used, cg. $\frac{1}{2}$ pint or more as the case may be in making up the mixture, and milk sugar should be added in the proportion of rather less than $\frac{1}{2} \mathrm{oz}$. to a pint of mixture. Even then there is a difference from human milk, notably in the relative proportions of the two kinds of protein found in milk, viz. from that which is coagulated by heat and that coagulated by rennet. But the method described, though rough and ready, is easily done at home, and the results are usually good. Strict cleanliness must be observed. See Baby; Milk: etc.

HUMEA. Humea elegans is a vigorous greenhouse plant which has large fragrant leaves and in summer produces panicles of amall reddish blooms on stems 5f. or so high. It is raised from seeds sown under glass in June and will bloom the following summer. When the seedlings are large enough they must be potted in small pots, using a compost of loan, leaf-mould and sand: repotting must be continued as becomes necessary until in spring the plants are put in 8 in . or 9 in . pots. During summer they are grown in a cold frame. Decayed manure should be mixed with the compost for the final potting. During winter the plants should be kept in a temperature of 50 degrees. After having flowered, the plants are use!ess.

## Hump Back. See Curvature: Spine.

HUNDREDWEIGET. This measure of weight, used for coal and other heavy substances, contains 112 lb .; 20 hundredweight make a ton. The usual abbreviation, cwit., is used thmughout this work

HUNT TEE SLIPPER, For this children's gaine, more suited for indoors than for outdoors, the players, who may number 20 or more, though 8 or 10 can play it, sit in a circle, except one who stands out. They sit with the feet drawn up and the knees raised,


Eyacinth Cultare. 1. Water culture: $\boldsymbol{a}$, charcoal ; $\boldsymbol{b}$, height of water. 2. Too much water. 3. Shading to encourage root growth. 4. When to
 6. Roman hyacinths in a pot : $a$, compost $; b$, aand ; c. crocks. 7. Potted
bulbs planged in covered box of abre: $a$, ibre ; $b$, shingle. 8. Pot of bulbs excluded from light by means of another pot
so that the slipper can be passed from under the knecs of the participants.

The object of the game is to pass the slipper from one to another in such a way that the odd player who is on the outside of the circle does not know in whose hand it is. His object is to find that person and to touch him when in possession of the slipper. When he does this he takes his place in the circle and the person touched becomes the hunter.
HUNT TEE TRMMBLE. For this game an ordinary thimble is produced, and one member of the party undertakes to hide it, while the others leave the room. It may be hidden anywhere in the room. provided that it is visible without necessitating the removal of anything. When it is hidden the party is summoned into the room, usually with the formula :

## Hot beans and inelted butter : <br> Talles and gentlemen, come to supper.

They enter, beginning their search from the moment they are inside the door. The hider may direct them when they are warm. hot, or cold, according to their proximity to the thimble. When somebody secs it, lie or she moves quielly away and sits down, taking care not to betray its whereabouts by word or gesture. The game continues until each member of the party has discovered the thimble, when the first finder becomes hider.

HUSBAND : In Law. In all matters of property a hushand's interests arc now separate from a wifes. He has no more claim to her property than she has to his, He is not liable for her debts, except that he is bound to provide her with necessary food, lodging, apparel and other things according to his position in life ; if he does not provide them, or give her the money to buy them, she can order them on his credit. This right vanishes if she runs away, or if he is obliged to turn her out for misconduct.
A husband is liahle for the consequences of his wife's torts, i.e. wrongs, such as libel and slander, negligence and the like. A wife may, for her benefit, insure her husband's life.

In Scotland a wife is entitled to a life interest in one-third of her husband's property in land and a husband to a life interest in the whole of his wife's property in land. In addition a surviving husband (or wife) has a right, which cannot be taken away by will, to one-third of the movable estate if there are children of the marriage, or one half if there are no children. In Eng. land a husband (or wife) may make a will completely disinheriting the surviving spouse and children of the marriage. See Divorce; Intestacy: Separation; Wife.

HYACINTB.
The hyacinth is a favourite spring. Howering bulb suit. able for planting in Hower beds and borders out of doors, or for cultivation in pots of soil in the greenhouse and in bowls of fibre in the home. The bulbs should be planted out of doors in October, 3 inches deep and 8 inches apart. If several
varieties hre grouped in one bed, care should be taken to choose those that llower at the same time The follow. ing groups of varicties bloom together: Queen of Pinks, pink. I vanhoe, violet hlue, L'Inno. cence, white, Primrose Per. fection, pale yellow, and Gertrude, rose pink. Grand Lilas, palc lilac blue, Schotel, pale blue, Lady Derby, salmon pink, Duke of Wink, Duke of


Hyacinth. Bloom of one of the large-flowered hyacinths grown in fibre in a bowl
purple, Marie, dark bluc, and City of Haarlem yellow. Hyacinths in pots of soil are invaluable for the greenhouse in spring
The bulbs should be potted separately in carly autumn in 5 in. or 6 in. pots in a compost of loam with which sand, some leaf-mould and a scattering of bonemeal have been mixed. The bulbs ahould be just covered with soil, which must not be made ton firm, or the bulbs will be forced upwards. The pots of bulbs should be watered, placed on asphalt or somc other hard hase out of doors, covered with old sifted coal ashes and left there for 6 or 8 weeks: by then they will be well rooted Ashes fresh from the fire must not be used. After the pots of bulhs are taken from the ashes they should he shaded for a few days before being exposed to full light in the greenhouse.
The earlicst hyacinths are the Roman, hulbs which have been specially prepared for forcing, and the cynthelia or small-fowered sorts. Bulbs of these should be potted in August and September, those of the large-flowered varieties in October, to ensure a succession of bloom. They must he grown in a greenhouse heated sufficiently to keep out frost. The same sorts are suitable for cultivation in howls of fibre indoors. They should be kept in a cool dark place for 6 weeks before being set in the room window. Care must be taken that the fibre does not hecome dry.
Hyacinths may also be grown indoors in wide-mouthed glasses filled with water; there should be a space of $\frac{d}{}$ in. or so between the base of the hulb and the water. They must be kept cool and dark until roots have formed. See Bulb; Flower Garden: Galtonia.

HYDRANGEA. This splendid flowering shruh (Hydrangea hortensis) is hardy in southern counties and in other mild districts, wherc in sheltered places it forms a large hush. It is also a great favourite for cultivation in tubs and large flower pots for the greenhouse, veranda and terrace; it flowers in late summer
The normal colour of the flowers is pink; there are also white varieties. Bluc hydrangeas, which are the most popular of all, are obtained by the application of a blueing powder to the eoil; this can be obtained from nurserymen with directions for use. Some varieties, when treated with blueing powder, produce true blue flowers; others turn mauve or mauve blue. In some gardens, where the soil is ferruginous, hydrangeas bear blue flowers without any treatment.

Propagntion is by cuttings of Howerless shoots taken off in August, inserted singly in small pots of sandy soil and placed in a frame. If grown in a heated greenhouse and repotted
in 5 in pots in January many of these small plants will blonm the same year.

Hydrangeas are easily spoilt by incorrect pruning. When the bloons of pot plants are over, thin weakly shoots should be cut out; the tips of other slionts may be cut off if they are unduly long. Big bushes of hydrangen planted out of doors need little pruning.

Hydrangea paniculata grandifiora striking liardy shrub which bears large heads of creanl white bloom in September. This needs quite different pruning; in spring the past summer's shoots should be cut back to within 3 or 4 in . of the base.

HYDROCEPHALUS. Popularly known ns water on the brain, hydrocephalus is a condition in which a large amount of fluid collects within the brain through blocking of the drainage channels.

In children the disease is recognized easily. The head enlarges, sometimes to such a size that the child cannot raise it from the pillow. The eyes are sunken, there is inflammation of the optic nerve, sometirnes followed by blindness. Convulsions are common. As a rule the child is mentally weak or imbecile. Death usually occurs before the fourth or fifth year. Pron. Hy-dro-sef'-al-us.

HYDROCHARIS. A native water-plant, also known as frog-bit, the hydrocharis has white flowers and leaves, horne on the surface of pools where there is no flow or motion. It may be collccted in the spring and introduced into cultivated water-gardens, and is propagated by division. It is of value in collections of aquatic plants. Pron. Hy-droch'a-ris.

HYDROCFILORIC ACID. Strong hydrochloric acid is known as spirit of salt, and if swallowed acts as a corrosive poison.
The acid is used in medicine in the form of the dilute hydrochloric acid, dose 5 to 20 minims after meals. This is frequently prescribed in sluggish indigestion where the natural hydrochloric acid secreted by the stomach is deficient in amount.

In the type of indigestion accompanied by heartburi and acidity, when the acid is due to an excess of the natural hydrochloric acid, dilute hydrochloric acid given before the meal tends to check the abnormal pouring out of acid into the stomach, and so relieves the disagreeable symptoms. See Indigestion.

HYDROPHOBIA. The infectious disease known as hydrophobia, or rahies, is communicated to man mostly by the bite of a rabid dog. The poison travels up the nerves


Bydrangea Culture. 1. Saitable culting, properly trimmed at a. 2. Same, correctly potted. 3. Sec-
tional diagram of cuttings plunged in frame, with tional diagram of cuttings plunged in frame, with
to the spinal coid and hrain, and produces spasm of muscles, particularly those of the pharynx and larynx, paralysis, and generally death if not properly treated. It has been said that only 15 per cent. of those bitten by mad dogs are attacked by hydro. phobia. The incubation period usual. ly is one to two months. Children are the most common victims. On being bitten by a suspected dog immediately tie a cord round the limb above the wound to promote bleeding. Suckthe wound and squeeze as much blood as possible out of it. If hot water is at hand bathe the wound with it to encourage bleeding. Send for the doctor, or go to him immediately, as the wound should be cautcrized at once.

This cauterization should be done as soon as possible: if not done within twenty-four hours after the bile it is probably useless.
The patient after this first-aid treatment should be sent as soon as possible to an institution where the Pasteur treatment can be ohtained. In Great Britain this is carried out at St. Thomas's Hospital, London. Unless a bitten person comes under Pasteur treatment before the disense fully develops, the case is generally hopeless. The dog should not be destroyed at once, but should be shut up and kept under observation to see if it is really rabid. If it is suffering from rabies it will be dead within ten days; if it survives this period, a bitten person need have no fear of hydrophobia.
HYDROQUINONE. Quite a slow-acting developer, hydroquinone is particularly useful when negatives with maximum contrast are required, ss in copying drawings in line, lettering or similar hlack and white subjects. For ordinary purposes it is usually made up with another developer, metol, as describrd under metol-hydroquinone. A one-solution formula is made up thus :

> Sodium sulphite
> 50 gr .
> Sodimm silphite
> Winter to make
> $10^{\frac{1}{4}} \stackrel{0}{\circ}$

Dilution with water up to 20 oz . will give softer results. The following two-solution formula with caustic soda gives a more quickly acting developer:


For use take 1 oz. of each so!ution and add 2 oz . water. Where pure black and white results are wanted the uddition of formalin gives excellent results, as in the following formula :

| Hydroquinone | $\cdots$ |  |  | 65 |
| :---: | :---: | :---: | :---: | :---: |
| Sodium sulphite | $\cdots$ |  |  | 3 |
| Fornalin | . | $\cdots$ | $\because$ | dr |
| Water to ninke |  |  |  | 10-oz. |

The Watkins factor for hydroquinone in the first and third formulas given above is 5 ; ic
the second it is $4 \frac{1}{2}$ In all developers containing hydroquinone the temperature must not be allowed to fall below $60^{\circ} \mathrm{F}$. or action will cease almost entirely. The solution must be fresh and contain the full quantity of sulphite, or stains will result. Between developing and fixing, negatives should be well rinsed. See Developing: Metol-hydroquinonc: Quinol.
Hymenocallis. This is a bulb plant suitable chicfly for cultivation in a hothouse The correct name is pancratium (q. $\mathrm{v}_{\mathrm{i}}$ )

HYMENOPEYLLUM. This is one of the filmy ferns. It must be grown in a closed case in which the atmosphere is kopt thoroughly moist. See Fcrn.
Hyperacidits. See Acidity : Indigestion
HYPNOTIC. Drugs used to induce sleep are termed hypnotics. All, while useful when taken under the direction of a doctor, are more or less dangerous if self-prescribed. The patient in many cases becomes so dependent upon the drug in order to get a night's rest that finally he cannot slecp without resort to it. Hypnotic drugs lose their efficiency as the patient becomes used to them, so that larger and larger doses are taken, until finally the safety limit is passed. See Insomnia.
HYPO : For Fixing Negatives. Hypo or hyposulphite of sodium is used for fixing negatives and prints in photography, and should not be less than the average strength of 4 oz . to 1 pint of water; it may be more, up to 8 oz . to the pint. For bromide and gaslight prints it may be half strength. Too strong a solution will blister some bromide papers.

A convenient and rapid method of dissolving hypo is that described and illustrated under the heading Developer. Solution is further hastened by using warm water.

Hypo solution kceps reasonably well, particularly if an acid solution such as the following is used :
Hypo
Potasslum metablsulphite $\qquad$ . 20 oz.

This bath should not be used for the P.O.P papers printed by daylight Fresh hypo solution should be used for every batch of plates or prints fixed. It is very cheap, and prints and plates are then certain to be properly fixed. A strong stock solution which can be diluted for use is a very satisfactory way of storing hypo Dissolve $\mathbf{l} \mathrm{lb}$. of hypo in a pint of hot water. When cool add water to make it up to 32 oz . Then every 2 oz . of the stock solution contains 1 oz . of hypo, and any strength of solution required for use is readily calculated.

Do not allow drops of hypo sulution to fall on the dark-room table or floor without mopping them up, or particles of the dried chemical float in the air of the dark-room and cause spots and blemishes on negatives and papers. See Film; Fixing; Washing.

HYPOCELOROUS ACID. The name is given to a liquid with a penetrating odour which is used for removing ink-stains from paper or white fabrics. In ink-erasers hypochlorous acid is generated by adding acetic acid or vinegar to a solution of chlorinated lime. To prepare a liquid ink-eraser mix chlorinated lime or bleaching powder, 4 oz ., with water 15 oz ., shake together for an hour and strain. To the strained liquid add acetic acid 6 oz ., and bottle at once. For removing ink-stains the liquid is sponged on the stain, repeating until the stain has disappeared, then rinsing the spot with clear water. See Stains.
HYSSOP. The hyssop is a hardy evergreen herb, the shoots and flowers of which are used for medicinal and perfumery purposes. The common hyssop, Hyssopus officinalis, bears blue-purple flowers and grows to a height of 2 ft . It thrives best in well-drained soil. Planting may be done in April or May, 1 ft .
apart each way. Propagation is by secd sown outdoors in April, cuttings of shoots in summer, or by division of roots in spring or autumn. For distilling purposes flowers should be gathered when opening.

As Medicine. The dried flowers and shoots are infused for medicinal purposes. The infusion forms an aromatic bitter, and is taken as a tonic and for flatulence. It may also prove beneficent in cases of chronic bronchitis See Bronchitis; Flatulence.

HYSTERLA. The symptoms are many and varied. A person may be potentially hysterical without ever exhibiting any symptoms. If, however, a person is subjected to some exceptional degree of stress or strain, his normal element of control may become weakened, and then the hysterical condition develops. Very many examples of severe hysteria were seen among soldiers in the Great War. In civilian life grief, fright, disappointment in love, anxiety, prolonged overwork and sudden unexpected physical shock may be the immediate cause of hysteria.
In cases of hysteria paralysis of one or more limbs is not uncommon. Disturbance of sensation is frequent. Twitching of muscles or groups of muscles may be seen, leading to spasmodic movements of the face or limbs. The special senses, hearing, seeing, tasting, smelling, may all be abnormal. Stuttering is frequent. Some patients exhibit convulsive seizures or fits which may lead to a diagnosis of epilepsy. Mentally, there may be depression, emotional instability, as evidenced by frequent outbursts of tears, nervousness, irritability, dreamy atates, unreasonable fears, and attacks of acute anxiety.

Treatment. The treatment of hysteria may be palliative, i.c. directed towards relieving the obvious symptoms, or radical, which aims at discovering the fundamental psychological cause of the condition. In mild cases simple measures such as rest in the country, a sea voyage or change of occupation may be sufficient to restore the normal degree of selfcontrol. Paralyses, loss of voice, stuttering, and similar symptoms may be removed by a course of treatment consisting of physical exercises, which are, however, in effect a vehicle for suggestion.

This treatment, however, while removing the physical symptom, is not likely to improve the mental condition, which may indeed become worse after the physical symptom has disappeared. The extreme form of suggestion is hypnotism, and in certain cases this line of treat ment has been known to be of great benefit.

Undouttedly, the most satisfactory and radical treatment of hysteria is an investigation of the patient's subconscious mind, with the object of finding out the suppressed motives which, in conflict with the conscious mind, are really responsible for the condition. One of the chief methods of investigating the subeonscious mind is by psycho-analysis (q.v.). This method of treatment usually gives the best results in the casc of persons below middle age. It is not suitable for elderly people or for those of poor mental development.

HYSTERICS. The fits or convulsions which occur in hysteria are popularly known as hysterics. They occur most commonly in young women, and are usually preceded by emotional disturbances, bouts of weeping. alternating, perhaps, with wild and unnatural mirth. Sometimes patients complain of feeling a ball rising in the throat, as if it wou!d choke them. There is great restlcssncss, or the patient may fall down and have a fit which has a close resemblance to an epileptic one.
The patient should be laid comfortably on her bed, all tight clothing being loosened. The room should be cleared, as the presence of a crowd of excited and sympathizing friends tends to foster symptoms of hysteria. A douche of cold water on the face, and an intimation that this is to be frequently repeated, sometimes has a good effect in hysterical attacks. The ammoniated tincture of valerian in dram doses, every 3 or 4 hours, is a good remedy.

BERIS. This is the botanical name of the popular hardy perennial and annual tlowers that are better known as candytuft ( $q$ จ.)
ICE : Domestic Uses. Ice is often impure, and may contain germs of disease, especially of typhoid fever. When used to allay vomiting, to cool beverages, etc., it should be obtained from a reliable sourcc. 'lo keep ice from melting roll it in thicknesses of llannel. It can be chipped with a strong needle or ice pick.

Iced water and other iced drinks should be used moderately, otherwise dyspepsia may result. A sinall piece of icc allowed to dissolve in the mouth is a good remedy for thirst, and proves very grateful in fevers.

Ice is used largely for keeping food cool in hot weather It should not be placed in direct contact with fish, but may be used with advantage if the latter is first placed in paper bags and fastened down. See Frozen Food; Refrigerator.

## ICES AND ICED DIShes

## Recipes for Plain and Fancy Varieties

## See also the articles on Coffee; Custard; Freezer; Genoese Pastry; Icing; Mould; Refrigerator

Generally speaking, ices can be divided into cream scoop should be used for serving the ice two classes, cream ices and water ices. Cream cream in neat portions (Fig. 1). ices form the foundation of many dessert dishes such as mousses, coupes, sundaes, ice puddings, moulded fruit ices, etc.

To be correct cream ices should consist of equal parts of sweetened cream and fresh fruit purée; or flavouring essences, such as coffee, chocolate, vanilla, orange or lemon, can be used. In winter, when fresh fruit is not obtainable, jam or bottled fruits can be substituted. These should be made into a purée before adding to the ice. As cream is often highly priced a good rich custard may be substituted, wholly or in part.
The necessary equipment for making ices consists of a freezer and a wooden spatula or bone paper knife. There are many inexpensive freezers on the market for making small quantitics of ices. (See Freezer.) The vacuum freezers freeze the mixtures without the usual churning. Ices can also be made in electric or gas refrigerators without churning. An ice

To make ices in a freezer a freezing mixture is necessary. This consists of seven pounds of rough ice to one pound of freezing salt. Table salt is no good. The ice should be broken up very small. Pack the ice and salt in layers in the ice container, very solidly, and fix in the freezing vessel while packing, so that a tight fit is obtained. When pressed for time the mixture may be frozen more quickly by increasing the proportion of salt, but when this is done the ice melts more quickly and must be renewed.

Make the ice cream mixture as directed, put it into the freezing pot and close the lid firmly. Then rotate it in the ice. After a few minutes wipe the lid carefully, take it off, scrape down any mixture frozen to the sides of the pot, and beat the mixture until smooth. Use a wooden spatula, or bone paper knife, for this. Put on the lid, churn the freezer again and repeat the whole process until the mixture


Ice. Fig. 1. Ice cream scoop, a simple device used for serving small circular dortions of ice cream. Fig. 2. Ice pudding mould, which may also be used for moulding ice cream into a lancy shape
is evenly frozen all through. Keep the mixture in the freezer until needed and cover it with a piece of wet flannel. Irain off the water now and again, and, if necessary, pack in more ice and salt. If using a vacuum freezer this churning will not be necessary

A substitute for a freezer can be made with a pail and a vessel with a well-fitting lid to contain the mixture. A two pound golden syrup tin with a lever lid is excellent for the purposc. Put the mixture in the tin, cover securely, stand it in the pail on a bed of ice and salt, pack the ice and salt well around it, and with the handle of the pail twist it round for a fow minutes Repent the process as described for the proper frcezer. When the mixture is thoroughly frozen, cover it tightly and put a piece of blanket, or felt, over the top of the pail, with the ends resting on the ice to absorh the brine. Repack with ice and salt, if necessary, and allow it to stand at least an hour hefore using.

Facts to Note. Here are a few rules that will make the ices n success :

Never put warm mixtures into the freezing veasel: they take longer to frecze and melt the ce surrounding it.
Too nuch gligar makes the mixture slow to freeze, sonctimes preventing freczing altogether: on the otlicr hand, too littic rugar calases the lee will take to congeal.
Take take to congeal.
Tom comery possible care to keep the freezlang salt ronl coming in contact with the fer mixture
Use peevter br be blended with the custard
Use netvter or aluninitum vesacla whenever use coppier moulds for ice puldings as they give an unplensant tlavour and are dangerous to health.
For dessert, cream ices are often packed into fancy moulds of pewter to represent fruits The ices should then be coloured to correspond with the fruits they represent. If no moulds are available the ice can be made into oblong blocks and served on glass plates (Fig. 3), or the ice can he formed into halls and rolled in chopped nuts or coloured desiccated coconut (Fig. 4). Serve ice cream wafers or petits fours with all forms of dessert ices.

Sponge cakes, or Genocse cakes, are often given a filling of ice cream. The cream is shaped ira high round tin, either fluted or plain. The centre is scouped out and just hefore serving it is filled with well-Havoured ice cream A round uf cake is placed on the top, and on this is piled some kind of firm fruit which has been previously cooked and kept on ice Pour sume of the syrup around the cake and serve at once.

Vanilla Ice Cream. For this take one pint of rich custard. half pint whipped cream, vanilla to taste Allow the custard to get cold. and favour it with the vanilla, put it in the freezer and half freeze it. Then add the cream, heat it well in, and continue the freczing as directed. Fur an economical ice crean the cream may be omitted or less used
Strawberry or Raspberry Ice. To a pound of fresh strawberries, or masplocries, allow half n pint of cream, four ounces castor sugar, lialf tablesponinful lemon juice and cochineal to give gand colour. Ruh fruit through a sieve; mix puree with lemon juice and castor nugar. Whip cream and stir int: add cochineal. Freeze as directed. Apricot cream ice is made in the same way, using fresh or tinned apricots
Coffee Ice. Take half a pint of strong goffee, half a pint of good custard, quarter pint cream and quarter pound loaf augar. Mix the coffee, hot custard and sugar. Half frecze when cold: then add cream and finish freezing. Serve in separate glasses.

Neapolitan Ices. These arc composed of various kinds of icc cream frozen separately and then packed into oblong moulds in equal portions. When these are hard they are removed from the moulds and served without cascs on small glass plates, as shown in Fig. 3. Mloulds can be bought for inaking these ices The Neapolitan misture can also he made into an ice purding.

Mousse. The mousse is a light ice crean mixture usually composod of well-flavoured fruit symup, or puree, with crean that has been highly whisker. It is then fmzen in plain large or small moulds lined with paper. The ligh whisking makes it light and frothy in appearance. The top should lee decorated with berries or pieces of fruit and chopped nuts.


Fir. 3. Ice cream tor dessert shaped into oblong portions and served on glass plates, with wafers
Sundaes. Cream ice and fruit sundaes are served in individual glasses. These are almost filled with the cream ice and freah or tinned fruit in small pieces added The fruit syrup is then poured over and chopped nuts sprinkled thickly over all. If fresh Iruit is used, such as strawherries or raspberries, it should be aprinkled with sugar and allowed to atand for a time. The syrup thus formed can then be poured over the ice cream

Coupes. The coupe is another form of fruit ice, made from either water or cream ice. It is usually served in glasses.

Coupe à la Milanese is a lemon-water icc Havoured with cherry brandy, and mixed with enough brandied cherries to allow a hout threc to each portion of ice. Another form of this fancy icc. known as coupes d'abricots, is
prepared in this manner. Mix a pint ol apricot cream ice with 4 tablespoonfuls of tinned apricuts cut into small cubes. Flavour them with ome liqueur and serve in glasses, putting in first a small spmonful of the ice, then a light layer of powdered ratafias, then more ice, and so on until sufficient ice has bren used for a portion. A layer of the ice sliould be put in last and the top decarated with shreds of hright green pistachio nuts

Coupes aux marions are prepared by aoaking some brokan marrons clacés in a little liqueur, and putting small tablespoonfula of them into some glasses Fill them up with vanilla ice cream, and decorate the top of each :vith a marron glacé and a little whipied cream
Another similar swect, known as coupes Jacques, is prepared by half-filling sume elass cups with fruit anlad, flavouring it with kirsch, and then covering it with one layer of vanilla and annther layer of strawherry ice cream Decorate tho top with a grape or cherry Nome slight variation can be provided bv using different liqueur for llavouring.
Pêche Melba. This is nother form of fancy ice, made with ciram ice and peaches The peaches are divided in halves and stoped and stceped in liqueur and a sprinkling ol sugar added, or tinned peaches can be used They are served with a surmounding of rich ice cream and garnished with whipled crenm arranged in the centre A little syrup is boured over. Other Melhas are made in the same way, substituting pincapple. strawherrics or pear's for preaches.
Lemon Water Ice. This requires carc to be successful. In lemon water ices the juice of the lemons must he added after the syrup of sugar and water is made and must be perfectly incorporated. Take ${ }_{3}$ pint water, the juice of thrce lemons, a teacupful of lonf sugar, and the whites of two egge. Wipe the lemons, then rub some of the lumps of sugar over the outer parts of the pecl to get the essence of the lemons. Boil the sugar and water for ten minutes till it forms a thread hetwcen finger and thumb. Allow it to cool, then add the strained lemon juice. Pour the mixture into the freezer and half-frecze it, take it out and add the beatell whites of the eggs and beat thens well in. Return to the freczer and freeze to the desired consistency. In all water ices the chicf point is to draw out the particular Havour of the fruit usell. Orange water ice is made in the same way as lemon water ice, substituting oranges for the lemons.

Sorbet. This is a water ice flavoured with liqueur and with fruit added. It is served in a goblet in the middle of a formal dinner just before the roast. Russian cigarettes are usually handed round with it.

Ice Pudding. Half freeze one pint of rich custard and add 2 oz mixel glacé fruits.


Fig. 4. Ice cream tormed into balls and rolled in chopped nuts or coloared desiccated coconat
cherries, apricots, oranges, etc., a few finely chopper almonds, pistachio nuts, a dessertspoonful chopped preserved ginger, 2 teaspoonfuls maraschino and half a pint whipped cream. Half freeze as before. Wet the ice mould (Fig. 2) and decorate it with nuts and fruit. Pack in the frozen mixture, put on the lid and cover all the joints, cracks, lid opening, etc., with lard to prevent any salt coming into the mixture, and then wrap the mould in two or three thicknesses of paper. Bury it in the ice and salt and freeze for two to three hours. To unmould, first remove paper and lard, dip mould in cold water, remove lid gently and slip the pudding on to the dish.
Iced Food and Drink. Certain foods and beverages, though not ices in the accepted sense of the terin, are subjected to a freering process and are therefore said to be iced. White coffee may be ioed by placing it in a jug resting on ioe, and lenving it until it to icy cold. Black coffee is similarly iced, except that the jug is put deep into the ice, a little brandy added, and a lump of ioe put in just before serving. Tea that is to be iced should be freshly made and poured off the leaves as soon as it is ready for drinking. Leave it to $\mathbf{c o o l}$ and then pour it into a glass containing some frozen ice, a thin slice of lemon and a little sugar to taste.
ICS BAG: Its Medical Uses. A con. venient means for applying continuous cold to any part is provided by the use of an ice bag. Ice is broken up into very small pieces and put in an india-rubber bag, so as to half fill it.
In typhoid fever, in the presence of pain or haemorrhage, an ice bag may be ordered to be placed on the abdomen. It proves useful also in early appendicitis, and as the weiglt of the bag would tend to increase the pain, the bag is slung from a bed cradle so as just to rest on the skin, but no more. An ice-cap or bag to the head is often of great use in lessening the pain in severe headache, such as migraine. Care has to be taken against leaving an ice bag ton long in contact with the skin, especially in the old, as a sore may be produced. See Cold Pack.
ICELAND MOSS. This lichen may be cooked in the same way and used for the same purpose as Irish muss. It has a somewhat bitter taste, but this may be partly remedied by adding a pinch of soda to the water in which it is soaked. See Irish Moss.
ICSLAND POPPY. This very beautiful hardy plant (Papaver nudicaule) has longstemmed Howers in orange, yellow or white, which appear in May and June. In recent years new and improved types with large and more richly coloured bloome have been raised, e.g. the Sunbeam and Coonara poppies. In the latter the flowers are of salmon, fawn, biscuit, apricot, etc. All these varieties are treated as biennials : they are raised from seeds sown out of doors or in boxes of soil in May to produce flowering plants next year. Before the seedlings become crowded they must be sot on a reserve border at 6 in. apart until finally planted in October where they are to bloom.


Ioeland Poppy, showing the number of graceful flower that are prodnced by one plant
Conrtesy of Amateur Gardenino


Pig. 7
Fig. 5

Bottom of
outer case outer case
tap


Ice 8afe. Fig. 1. Simply made safe for storing ancooked food. Pig. 2. Onter oage in part seotion with one end removed. Fig. 3 . etail of ontor lid. Fig. 4. Detail of inner lid. Fig. B. Bottom of case with draw-ofl tap. Pig. 6. Lid. Fig. 7. Inner dinc lining
wine cooler. In the shape of a pail, it was made in silver and Sheffield plate, as well as in the cheaper metals. After a time pieces were de.
o make the who die one piece, lid and hen included. Screw the whole together, box and saw of to this line, the meeting corated, ornament surfaces being planed up true and flat.

The zinc lining, Fig. 7, may be made from separate pieces, riveted at the ourners and soldered. If a large sheet of zinc is obtainable the lining can be made in one piece by bending up the bottom angles, the vertical edges being Hanged, riveted, and soldered. The upper part is turned over at right angles, mitred at the corners, and soldered. In the centre of the bottom a tap, Fig. 5, is fitted by soldering a bush piece into the bottom of a brass cup, such as can be made from the top of a bedstead knob. This is soldered on to the bottom of the zinc lining, and the tap into the bottom of the recoss.
The zinc above the brass cup should be pierced with small holes about $\frac{1}{8}$ in. in diameter, so that it will act as filter. A hole is cut through the bottom of the wood casing to allow the tap to pass through, and fillets are screwed to the inside of the wood case for the zinc lining to rest upon, as in Fig. 3. The space between the zinc lining and the outer case should be packed with insulating material.

To make the zinc-lined lid, fit a fillet round the opening at the top of the zinc case and round off the edges; then make a plain wooden inner lid that will just fit into the space inside the fillet. Prepare a zinc lining similar to the casc, but smaller and only 2 in. deep. Turn a Hange on to it and temporarily screw it to the underside of the inner lid (see Fig. 4). Hinge the lid to the top of the outer case, and see that packed with slag the lid to the top of the outer case, and see that
wool, sawdust, or the lining on the lid closes into the case and taking the form of reeding, usually round the body about a third of the way from the top. The best specimens were made in the 18th century and the early part of the 19th.

ICEPLANT. This is another name for Mesembryanthemum crystallinum, a showy annual for hot, dry places. mesemoryanthemum is known also as fig marigold.

ICE SAFE. Un. cooked foods may be stored safely for several days in an ice box with about $\frac{1}{2} \mathrm{cwt}$. of ice. It consists of an outer case enclosing a zinc box, the space between them being
sonse other material that is an equally good non-conductor of heat
The example illustrated shows the component parts and variousdetails, the dimensions being suitable for a small household, but may be increased or diminished to suit requirements, and the form of the box can be modified. The ice can be obtained from any good-class stores, or sometimes by arrangement with the fishmonger or hutcher, who will deliver supplies regularly.

The outside wood case can be made with 1 in. tongued and grooved boards dovetailed together at the comers, or nailed together and reinforced with little straps of iron screwed over the corners. The bottom is of similar material, screwed to the sides. The dimensions are given in Fig. 2. The feet may be turned or made of 3 in . square deal planed to a alight taper, so that they are about $2 \frac{1}{2}$ in. square at the bottom. These are screwed to the bottom of the case with wood-screws passed through from the inside. A plinth of deal, 3 in . wide and 1 in . thiok, is glued and sorewed round the outside of the bottom, the corners being neatly mitred and the edges chamfered.

The lid of the case, Fig. 6, is floor-board and a framowork of deal, 4 in . wide and 1 in . thick, screwed at the corners or dovetailed. If they aro acrewed, they can be reinforced with iron angle plates screwed to the outside. The lid is hinged to the baok of the box. An alternative method is
lits closely The meeting surfaces round both inner and outer lids can be covered with a good close-grain cloth, as this assists in keeping the joint tight The interior of the lid lining has to be filled with non-conducting material, for which purpose it must be removed, packed tightly, and replaced

Internal fittings will be determined by in dividaal requirementa, hut one or more shelves of perforated zinc on a framework are essential. These are readily made by cutting the parts to size and maling soldered joints. The shelves are supported on anyle pieses soldered to tbe sides of the inner lining Sufficient space must be left for the ice, and a practical arrangement is to have the shelves just a little less than onethird the width of the lining so that they can be arranged in the most advantageaus way, omitting the centre one if the block of ice is at all tall and narrow The whole interior has to be cleaned thoroughly with warm water to remove all traces of the soldering acid.

A good way to finish the exterior is to enamel it, as a coating of paint is an effective method of protecting the woodwork from the effecta of the relatively conl interior and the hot, dry exterior. Another advantage of the enamel finish is the ease with which the whole can be kept clean. The ice aliould be wrapped in a piece of clean sacking or cloth, as this is of nssistance in protecting it from the effects of the rush of heated sir when the lid is opened. Sep Refrigerator
ICHNEUMON FLY.
This insect is beneficial in the garden, as it is des tructive to caterpillars and other pests. Actually the flies deposit their eggs in the bodies or eggs of other insects, hatching out larvae which devour the body or egg in which they were developed The tlies may be readily iden tified by their long, slender, blackish-brown bodies, and are about $\frac{1}{2}$ in in length. See Caterpillar; Insect

achneumon Fly. Usesui дasuen insect which belps to keep down the cater- pillar plague fringed paper. and other designs
coats лne aumetimes used in cakes of all elnbor. ate character, but one coat must always he allowed to dry before anotlier one is put on Large cakes are sumetimes iced only on top, the sides being tastefully decorated with ribbon or
leing on birthday or party cakes may he of one, two, or even more colours and Havours, but if intended for children it should not be ton rich. Additional decorations on iced cakes niay be supplied by birthday, Clıristmas, New Year, or other greetings, or any appropriate design, carried out in icing of a contrasting sliade Forcing pipes will be necessary for this process, which, though more difficult than ordin ary icing, merely requires careful practice.
The Forcing Pipe. These are made in the form ol syringes with detachable lunnels of different sizes and designs 11 it is desired to ornament the cake with words of greeting, a funnel is placed on the mouth of the syringe. which has a small round hole. If piping o coloured icing is desired, or a lattice or scroll design, the same funnel is used. A funnel with a serrated edge is used for making rosettes or roses of icing, and a funnel with a Hat opening for making ribibons of icing, bows, garlands

The icing, which should be of a firm, creamy consistency, not thin enough to run nor stiff enough to stand, should be placed inside the syringe, the handle of which is unscrewed at the top The syringe is about half filled The handle, with the pump pulled out as lar as possible, is screwed on, and then sently pressed downward The ioing is forced out through the funnel, and cakes the shape for which the funnel is designed A revolving stand is supplied with some icing sets, and chis is a great help in icing a cake evenly The syringe should be held immediately over the spot where the decoration is to fall if roses
ICHTHYOL. The drug used in medicine or rosettes are desired It should be slanted under the name of ichthyol is a dark substance obtained from a bituminous quartz containing the fossil remains of fish. The dose internally is 10 to 30 gr ., and the drug proves useful for rheumatism, bronchitis, etc. A convenient way to take it is in tablets containing $2 \frac{1}{2} \mathrm{gr}$.
Ichthyol ointment, 5 to 10 or more per cent, spread on Hannel is a soothing and heatreducing application in sunburn, burns, and other inflammatory conditions of the skin.

ICING. There are various kinds of icing, differing somewhat in make and consistency They include almond paste, butter, or Vienna icing, and fondant, glacé, and royal icing. In some of these the method of application varies, both glace and fondant icing, for instance, being usually poured over the cake ; while butter icing, which is used sparingly because of its richness, is allowed to get hard and cold before use, and then apread over the cako, smootbly and evenly, with the that of a knife.

If glacé or fondant icing is not used in the manner auggested, the cake is dipped into it and coated in this way. Almond paste or icing is used in a thick layer, which is shaped with the hands before being smoothed with a wetted knife. A little marmalade is used to make the paste adhere to the cake.

Royal icing, for which almond paste frequently serves as a base in rich wedding cakes, is hard and white. It can be coloured pink with a few drops of cochineal, or other colours with vegetable colouring extracts. Only one drop at a time must be used, as these are very strong.

Instructions for making royal icing are given under the heading Cake Two or three
for writing or ribbons of icing.
If a forcing bag is used, the icing mixture is put into the bag, half filling it, and the fummel pressed through the bottom The icing is then squeezed by the band through the opening into the funnel Royal icing, butter icing, or whipped and Havoured cream, can all be used for ornamenting dishes in this way Entries and savoury dishes are sometimes decorated with savoury cream by means of a forcing set

Glacé Icing. This is made with $\frac{1}{2} \mathrm{~b}$. of icing sugar and about half a gill of tepid water Crush the sugar and put it into a basin, add the water slowly and atir sanoothly but de not beat The icing should coat the back of a spoon and settle smoothly into that in the basin If necessary, add a little extrawater Colourings andfla vourings, such as vanillaor almond, call be added if it is desined
Furan
orange or

lcing. Forcing machine used for lancs iclng. Dpon the syringe is a lunnel for making ribbons of icing, Of the two detached funnels, that on the left is for rosettes, etc. ; that on the right lor greetings
lemon glace icing use the strained juice of lemon or orange instead of the water, and colour if necessary with a few drops of saffron colouring.

Feather Icing. This is used when a rough surface is desired on a cake to give the effect of snow To make it, prepare 8 syrup trom $\frac{1}{2}$ pint of water and 2 lb ol loaf augar and hoil it to $240^{\circ} \mathrm{F}$ Then pour it on to the slightly whisked whites of 4 eggs, add any colouring required, and whisk the mixture until it thickens A smaller quantity can be made provided that the same proportions are naintained This icing is sometimes known also as mountain icing. See Almond Paste; Cake; Chocolate Icing: Coffee lcing; Decoration; Fondant, etc.

## Icterus. See Jaundice

Idiocy. Idiocy is extreme mental deficiency which shows itself after birth or develops in very early childhood See Insanity

ILLEGITIMACY. An illegitimate child is one burn out of wedlock Such children are made legitimate if the parents marry after their birth, provided that the parents were free to marry at the time of the biath. This bas long been the law of Scotland and in 1926 it was made the law of England also.

An illegitimate child usua!ly takes the name of the mother, but has no legal right to any name Apart from social disadvantages illegitimate children are in a somewhat peculiar position before the law They cannot inherit anything from an intestate relative, and must pay legacy duty at the wame rate as strangers in bluod On the other hand illegitimate children are recognized as dependents under the Workmen's Compensation Acts

The mother of an illegitimate child can compel the father to pay towards its maintenance A child of a married woman is regarded as legitinate even it the tather is not her husband, the law being that auch is born in wedluck. The law, however, can declare such a child illegitimate if the husband can prove that it is not his See Affiliation Order: Child : Father: Income Tax; Mother.
1 LOVE MY LOVE. This is an old game, and can be played anywhere with any number above two. It consiats mercly in filling in a form of words with the necessary epithets, all of which nust begin with the same letter. T'lie form runs as follows: I love my love with an A because he is amiable: I hate him with an $A$ because he is argumentative He took me to the aign of the Arrow and fed me with anchovies and asparagus His name is Archibald and he lives at Angmering

When one person has done this satisfactorily the next takes up the tale, either repeating it with A and aupplying a different word for each epithet, or, if pre ferred, continuing with B The game goes on until the entire alphabet has been exhausted. X is omitted, and $\%$ will seldom last for more than one player It can be played either in the masculine or feminine gender. IMARI WARE. The Japanese porcelain shipped from the port of Imari was at first painted in underglaze blue on white, and afterwards in enamel colours and gold. This old porcelain was freely copied in Delft ware, and then in English china, esprcially at Bow, Derby, and Worcester Chrysanthemums, peonies, and other boldly drawn and richly tinted blossoms, often highly conventionalized, with dragons, birds, and diaper patterns, are favourite styles They are painted in
grass-green, dull red, lilac-blue and gold. Modern Imari does not equal the old ware, which fetches very high prices, but it is an effective foil to other Eastern furnishings, especially the beakers, square vases, and shallow dishes. Imitation Chinese marks are sometimes used. There is much inferior work, both old and new. See China.
Immortelle. This is an alternative name for rhodanthe. See Everlasting Flower.
IMPEDANCE. This is the opposition offered to the flow of an alternating current round a circuit, and is dependent upon the values of resistance, capacity, and inductance. Impedance varies with the frequency of the alternating current, except in cases where the circuit constitutes only a pure resistance. Impedance is expressed in ohms.
IMPERIAL DRINE. For feverish patients a beverage known as imperial drink is often prescribed. One simple method of making it is to add cream of tartar to freshly made lemonade in the proportion of a teaspoonful to the pint. The following is a usual recipe :
$\begin{aligned} & \text { Saccharin } \\ & \text { Oll of lenion }\end{aligned}$
Oll of lenion
Potasslum tarirate
.. $\quad .-1$ dram
$\begin{array}{lllll}\text { Bolling water to make } & \cdots & . & 1 \text { pint } \\ \text { Another recipe consists of } & \frac{1}{2} & \text { oz. } & \text { cream of }\end{array}$ tartar, the rind of a lemon, a heaped teaspoonful of sugar, and 3 pints of boiling water.

IMPETIGO: A Skin Disease. Impetigo is a highly contagious inflammatory skin disease, characterized by the formation of scattered blisters on the skin, which become filled with matter and dry into crusta. The face, particularly about the mouth, is the commonest site of the disease. There is little or no itching. The disease is chiefly noted among poor and dirty children.
The crusts should be softened and removed with soap and warm water, or, if necessary, by soaking with oil or applying starch poultices, after which the following ointment may be applied to the patches:

Ammoniated mercury . $\qquad$ .. | 5 gr. |
| :--- |
| 1 oz |

Pctrulatum
To prevent new crops of blisters appearing an antiseptic lotion should be frequently sopped on the affected skin and adjacent areas, e.g. saturated boracic solution or corrosive sublimate lotion ( 1 in 3,000 ).
INARCEING: Of Plants. This is a form of grafting which is not often practised in gardens. It is useful, for example, if it is wished to replace a worthless grape vine with a better variety without disturbing the roots of the former.

The method is as follows. A vine in a pot of the variety wanted is purchased. When growth has started in spring the pot must be raised so that the fresh green shoot can be brought into contact with another green shoot on the old vine. A piece, $\frac{1}{1}$ in. to $d$ in. deep and


Inarching. Lett, young and old plants joined toRether : $a$, bandaged junction i $b$, where to divide
when cohesion is established. Right, showing at $a$, preparation of stock and scion
about 2 in . long, is cut out of the side of each
green shoot, the two shoots are tied together with raflia so that the cut surfaces are in contact, and finally the raffia is covered with moss, which must be secured in position.

The moss is kept moist by syringing. If the work is successful the two shoots will unite. When it is obvious that union has taken place, during the summer the stem of the young vine should be severed very gradually just below the green shoot. Subsequently, as the new variety of vine makes vigorous growth, the shoots in the old vine can be rubbed off gradually, and eventually the branches may be cut away, leaving the new variety firmly established on the old stock.

INCARVITLEA. This plant has thick brittle roots, large leaves and trumpet-shaped flowers in sunımer. The favourite is Incarvillea


Incarvilles. The rose-red trumpet-shaped flower of this hards herbaceous plant
Delavayi, with rose-red bloome. It should be planted in well drained sandy, loamy soil in a sunny place. In cold districts the soil over
the roots should be covered with old ashes in autumn, when the leaves have died donn. If an increased stock is desired it is best to sow seeds in a frame in spring.
INCR. For ordinary purposes the inch is the smallest measure of length, though for special purposes, scientifio and other, it is divided very considerably. Twelve inchen go to a foot, and the standard inch of the United Kingdom is $3_{3}^{3}$ of a yard. 144 square inches make a square foot and 1,728 cubic inches make a cubic foot. For it the usual abbreviation is in., which is used throughout this work.
INCINERATOR. The best method of dealing with household refuse, which is usually placed in the dustbin, is to burn it on the kitchen fire. In the hot weather the range or independent boiler may be out of use, so that some other way of consuming the refuse must be arranged. In such a case the best way is to destroy it in an incincrator. In one type, which may be installed in kitchen or scullery where a thue is handy, the heat is provided by gas. An incinerator of this kind is perfectly safe to work, and needs no attention beyond feeding in the refuse, giving it an occasional poke, and afterwards emptying the ash. By this agency refuse, wet or dry, tea leaves, egg-shells, vegetable stalks and scraps, rags, cooking waste, etc., can be converted quickly into a relatively minute quantity of ash. This can be deposited in the dust bin or used in the garden as a fertilizer. The use of the appliance for half an hour daily will dispose of all the domestic refuse and the cost for gas is negligible.

A galvanized iron incinerator is handy for use out of doors. It is a cylindrical structure resembling a dustbin, and having a grating, lid, and central thue. A fire is kindled with pajer, etc., and the refuse is placed inside See Dustbin; Gas; Rcfuse.

## INCOME TAX: THE LAW EXPLAINED

## How the Tarpayer can Compute Bis or Ber Liability

By the help of this articie Income tix payers can ses for themselves he amoun's they are liable to pay. Other aricieles that deal wilh the financial liabilities of the householder Include Emp:oyers' Liability ; Rates. See also Insurance ; Surtax

This is a tax of so much in the $£$ on every $£$ of income, with certain allowances intended to relieve small incomes. In addition to the income tax proper a surtax or super-tax is levied on larger incomes, i.e. those over $£ 2,000$ a year.
In Great Britain the existing scheme provides for a certain amount of inoome being free from tax: for the payment of a lower rate on the next $£ 250$, and for the payment of the full rate on the balance. In addition, there are various allowances and abatements, so that the actual rate of tax varies, not only with the income but with the responsibilities of the payer. In fact it can be said that each payer has his own rate of tax.

The tax is in most cases payable in two instalmenta, due on Jan. 1 and July 1 during the year following the one in which the return is made. By a change introduced in April, 1931, three-quarters of the amount due on earned income is payable on the former date and the remaining quarter in July. Weekly wage earners can be assossed half-yearly and pay the tax every half year. This concession does not, however, extend to journalists, clerks, typists, and others, even if they are paid weekly, but is confined to manual workers. If the income for the year in question cannot be ascertained exactly, a provisional return should be made and the matter adjusted at the end of the periorl, or as soon as possible.

The Procedure. To ascertain his liability the taxpayer must know the rate of tax and the amount of his taxable income, this being his total income less certain deductions. In

1930 the rate, the standard rate as it is called, was raised from 48. to 4s. Bd. in the £, and at this figure it remained in 1931. The first $£ 250$ of taxable income, however, is only charged at the rate of 2 s . in the $£$, but the balance bears the full or standard rate.

In April or May the taxpayer should ascertain his total income for the year ending March 31 and fill up the form which is sent to him. If this is accepted as correct by the authorities, he will receive a demand note for the amount, which he must pay during the following year. If his return is not accepted, the authorities may ask him to make another one or to present them with certain explanations. They may, too, assess his income at a figure higher than the one he returned and leave him to prove that it is incorrect. Persons who are not liable to tax must also fill up the form if one is sent to them.
The Five Schedules. The income must be entered under one of the five schedules or classes shown on the form. Of these A relates to income from land and house property in Great Britain and Northern Ireland, and includes the annual value of the house in which its owner lives. B relates to income from the occupation of land and is charged on the annual rental value. This chiefly concerns farmers, who, if they prefer, can be assessed on their actual profits for the year preceding. C relates to income from war loan and other securities, the interest on which is paid out of public funds.
The majority of taxpayers prohably pay, as far as the bulk of their income is concerned,
under the two remaining headings. I) relates to profits from every trade, profession or rocation, farming excluded, and also to bank interest, loan interest, interest froin foreign and colonial securities and on stocks and shares. In this class, therefore, fall the incomes of all who are in business for them. selves, and of those having holdings of stocks and shares in public and private companies. In E fall all ealaries, pensions, etc., whether paid out of public funds, or by public and other companies or by private firms.
Reliefs and Allowances. The income ascertained and ontered, the taxpayer should next find out what relicfs and allowences ho can clain, and by deducting these from his total income he will oltain what is known as his tavable income.
The taxpayer can get relief for the pait of his income that is earned, earued in this sense including pensions. This is an allowance of onesixth of the income in question: but the totnl relief must not exceed $£ 250$.
No income tax is payable on the first $£ 135$ of assessable income in the case of a single person or on the first $£ 225$ in the casc of a married man living with his wife, or wholly maintaining her This makes all incomes under these amounts free fiom tax. No tax is payable on wound and disability pensions granted to persons who served in the forces during the Grent War, or on war gratuities, or on cllucational scho!arships and exhibitions, even if they exceed the limit of $£ 135$. Casual and occasional profits and gains, such as that from a swocpstake or from a deal in shares, arc not liable to tax, ncither are gifts and ammities that are not payable under a deed. In the case of gifts of this kind the tax is home by the payer, who gets no a!lowance for such.
For purposes of income tax the reparate incomes of husband and wife aro added together; but there is one moditicntion of this. If a wife earus an income she is entitled to an abatement thereon of a sum equal to fivesixths of the amount of such carned income, but the reliel is limited to $£ 45$. In other worde, a married couple in this pusition can claim relicf up to $£ 270$ instead of $£ 225$.
The next relief is for children. There is an allowance of $\mathbf{E} 60$ for the first child and £jo for each other. Such. children, however, must he under the age of 16 on April 6 of the year for which the claim is made, except in the casc of those who arc in full time attendance at school or college, for whom there is no agc limit. This allowance cannot be claimed for any child who has in his or her own right an income of £60 a ycar or over. Child in this sensc includes a stepehild and an adopted child, if such child is maintained by the taxpayer.
Allowances for Dependents. Allowances are also made for dependent relatives. One of $\mathfrak{£}: 5$ is granted in respect of any relative who is dependent on the taxpayer or his wife, prorided that such dependent is incopacitaterl by old age or intirnity from maintaining himself or herself and that his or her income from all sources does not exceed $£ 50$ a year. If two or more sons or daughters join in maintaining a dependent they are entitled to divide the relief of $£ 25$ between them. Whien the dependent relative is a widowed mother the condition of incapacity is waived. The anme relief is granted for a danghter on whose services the taxpayer depends by reason of old age or infirmity.

Allied to this is the allowance granted to widows and widowers for a housekeeper. Re. lief to the extent of $£ 60$ is granted to a widower in respect of a female relative or some other fenale who resides with him for the purpose of looking after his children. $\Lambda$ widow in n corresponding position can also clainn it. If an unnmaried person has living with him a widowed mother or any other female relative
main:ained by him to look after his brothers nd sisters ho can chaim an allowance of f 60.
An allowance is also granted tor prenniums on life assurance pulicies. This amounts to an allownace of 7 per cent on the capital sum insurcd. up to one-sixth of the total net in. come from all sources on all sums paid in premiums on his own life and on that of his wife. It is also allowed in enses where a wife takea out a policy on the life of her hushand. There are, however, certain limitstions on this form of allowance

Trade and Professional Expenses. Allow. ances are also granted in respect of certain trades and professions. Ordinary tralesmen and other business men are allowed to deduct all the expensos wholly and exclusively incurred for business purposes. The auditors will usually decide what expenses can rightfully be included in this category, but their decisions may be questioned by the Inland Revenue authorities, who mny call for the production of the hooks of the business. In these cases much depends upon the nature of the busincss and sperial circumstances of all kinds; but the authorities will certainly question heavy expenditure that is not proved to he purely for business purposes.

When an individual reaides on the premises at which he earries on his business he is entitled to charge againat his protits a proportion, not exceeding two-thirds, of the rent, ratos and other outgoings incurred in connexion with the said premiscs. Other traders, e.g. painters and joiners, who conduct their business from their homes are also entitled to all allowance of the same kind.
Medical men, dentists, and those solicitors who do part of their business at home, are also allowed to deluct from their incones something for that part of their house that is used for professional purposes. In the case of a clergyman or minister of religion an allownace not exceeding one-eighth of the rent or annual value of the house in which he lives is allowed.
Journalists are allowed an amount up to EfO in respect of professional expenses such as the cost of typew riting and stationery. Artisans and othery can obtain allowances for expenses on the touls necessary for thicir livelihood. Expenses incurred in getting to and from anc's work are not allowed as deductions from the amount liable to income tax. A commer. cial traveller, howover, can ohtain a deluction for expenses of travelling incurred for his business, provided no allowance is made to him by his employers for expenses of this kind.

When a person sustains a loss in any trade, profession, or vocation he can, upon giving notice in writing to the local inspector of taxes, within twelve months after the year of assessment in which the loss is incurred, apply for and ohtain an adjustment of his liability to income tax by setting the loss ngainst his assessed income of the year and hearing the tax on the balance. When such loss exceeds the arsessed income the balance of the luss can be carried forward and set off against the income of succeeding years.

Two Examples. To illustrate the working of the income tax laws two instances miny be taken, one very simple and the other somewhat more complicated. A married man with two children under 16 has a sa!ary of 1750 a year, his wife has a private income from investinents of $£ 40$ and hiniself onc of $£ 20$. He pays $£ 20$ a year in insurance premiums. The total income is, therefore, $£ 810$, and the deductions are:

Onc-sixth of earned incoine
tllowance for relf and wite
Allowance for two children

| $i$ |
| :---: |
| $1 \geq 5$ |
| 205 |
| 110 |
| $4+00$ |

i40)
He can alsu claim 28. 3il. in the $£$ or $£ 25$.
on his life. He should therefore deduct $£ 460$ from : 810 , leaving a balance of $£ 350$ ) on which he is to bear tax. Of this $£ 250$ is charged at the lower rate of 2 s . in the $\&$ and the balance at 4 s . Gd. His total lax will therefore be $\mathbf{\$ 4 7} 100$, less the $£ 2$; 0 mentioned, or £4.5 50 . Of this $£ 22100$ represents the full rate of 4 s . id . in the $£$ on the last $£ 100$ of his income. He has, however, already paid fil3 100 , as this amount has been deducted from the dividends or interest paid to himself and his wifc, and so the actuol amount due from him in cash is reducel to $£ 31150$, of which three-quarters is duc in Jonuary and the romaining guarter in July.

In the other case a prufessional man returna his earnings at $£ 1,440$ for the year In addition he has a privato income of £il8, and his wife has one of $e_{2}(j 0$. This gives him a total gross income of $\{1,878$, from which there are various deductions, in addition to the main ones of one-sixth of his earned income and $i 225$ for himself and his wife.

This protessional man has three children: one son is over 16 years of age, lut as he is still at school the father can claim an allowanco for him. He contrilutes $£ 100$ a year to the suppiort of his widowed mothor, so can claim relief on $£ 25$ in respect of this payment.

His abatements and nllowances may ber summarized thus

## One-sixth of earned income <br> Self and wife <br> Dependent mother <br> 210 205 210 2.5 <br> 1650

This amount is deducted from the total income of $£ 1,878$, making his taxable income £1,22s. He pays 2 s in the $\{$ on the first $£ \geq 50$ o! this and 4 a. (id. on the lonlance of $£ 978$. Thus lic is linble for a payment of $£ 245 \mathrm{ls}$., but as he has already paid, hy deduction at the source, $£ 98$ /1s on the incomes of himself and his wife, he need only find in cash 5146 l Hs .

Taxing at the Source. In these two cases and in many others the taxpayer does not actually himself pay over the whole of the tax due from him. This is due to the fact that he may ohtain part of his income from interest and dividends of various kinds. These uneqraed incomcs, and also certain classes of earned incomes, are taxed at the source, or before they reach their owner. In other words, the company pays the tax direct to the national exchequer and deducts it from the nmount of the dividend.

The same is dune by the Bank of England and other hanks when paying the interest on consols. war lonns, corporation stocks and other securities of that kind, and also by those who pay interest on mortgages. The only important exception is certain classes of war loan. On some of these the interest is paid without deduction of tax, leaving the recipient to pay the tax if ho be liable, while others are in the real sense tax frec or tax compounded. The holder of stocks and shares is obviously not required to pay a second time. but he is required to show such income in his declaration of his total income to the tax authorities.

The principie is exactly the same when a company pays its dividends free of tax, ns it is called. This simply means that it is paying a higher rate of dividend. To take a simple example : a company that pays 5 per cent free of income tax is really paying something over 6 per cent gross, when the rate of tax is 4s. fid. in the .f. The gross dividend inclusive of $\operatorname{tax}$ must he entered on the return by the iaxpaycr. He must not enter ilo, or whatever sum he actually reccives, but that sum plua the amount deducted.

In the case we have assumed, that sum is $£ 1218 \mathrm{~s}$, because the tax on $£ 1218 \mathrm{~s}$. nt 4 s . Gd.
in the $£$ is $£ 218 \mathrm{~s}$, which leaves a halance of
£10 for the taxpayer to receive. He is really taxed, therefure, on £12 Iss and this is the amount of income which he is assumed to have had This matter is important from the puint of view of the inland revenue authoritice, as the larger amount will, in certain cases, make incomes, utherwise free, liahle to surtax. It is also impurtant from the puint of view of a taxpayer who claims repayment because he is entitled to reclaim tax on $£ 12$ 18s. instead of on only $£ 10$.
Claims for Repayment. These deductions from income aro obviously made irrespective of the amounts of the incomes of the various persons concerned, which amounts those making the deductions cannot possibly know. Hence it comes about that many persons with small incomes, e.g. all thuse below $£ 135$ a year and those who, although they have incomes a bove that a mount. are entitled to allowances of various kinds that are equal to or greater than the income itself, find, when they receive their dividends, that they have paid a tas from which legally they are free. Others who are liable to pay momething find that they have paid more than they should have done. For instance, a man may be liable for a tax of $£ 10$. but $£ 20$ may have been deducted from his dividends Cases of this kind are very frequent.
To remedy this effect of deduction of tax at the source provision is made for returning the excess of tnx so deducted Persons, therefore, who have paid more than they are liable for should take the following steps to recover the amount whether they arc totally exempt from tax or only partially so Inmediately after the end of the year, which for this purpose is April 5, a claim for repayment should be forwarded to the local inspectur of taxes. For this purpose a special form is provided, which can be obtained from the inspector, whose address will, if required, be given by the local collector. This form should be filled up carcfully, all the particulars required being clearly entered. It should then be sent to the inspector for examination and verification. Questions may be asked about one or more of the items, but if the claim is in order the overpaid $\operatorname{tax}$ will be returned in the course of a few weeks. No claim will be admitted unless it is made within six years from the end of the year to which it relates. This is an important pmenso.
Sending in the Claim. With this claim should be forwarded the vouchers which are sent with dividend and interest warrants, certifying that the tax in question has been paid. For other kinds of incone the authorities will require receipts and letters from the payera certifying that the amount stated has actually been paid by them to the revenue authurities. When an income consists entircly or mainly of dividends on which income tax has been deducted at the source, repayment will be allowed every half-year. In other cases it will be allowed only once a year.
Relief from Double Income Tax. A certain measure of relief is allowed to persons who are linble to two income taves on the same income, provided that the two income taxes are charged within the British Empire. For instance, a man may reside in England and reccive most uf his income from property in Ontario In such a case the authorities will allow relief from the tax charged in Great Britain and will compute the relief on the amount of the Dominion income charged to tax in Great Britain. The relief thereon will be at the Dominion rate in the $£$, or at one half of that person's appropriate rate of tax in Great Britain, whichever be the less
This arrangement covers the case of the Irish Free State, which, since it came into existence in 1922, has levied its own income tnx. On its part the liree State has lairl it down that frum April 6, 1923. income tax will be declucted trom dividends and interest on the stucks, shares, bonds, etc., of any
government and company, oulside the Firer State, including British Government securities where payment of such dividends and interest is made by or obtained through a bunk., paving agent or other person in the Frec State

Exemption from Irish Free State income tax in respect of such dividends or interest is however, allowable when the owner of the stnck, shares, etc., is not resident in the Free State or in the case of those Britial Government securities which were issued exempting them from taxation of this kind, where the heneficial owner is not ordinarily resident in the Frec State: and payment of the dividends or interest without deduction of Irish income tax can be obtained by persons entitled to suoh exemption upun the com pletion of declarations on the correct forms
The Free State has decided, ton. that no deduction of tas will be made from intereat on holdings of 5 per cent war Ioan, 5 per cent national war bonds, 4 per cent war lonn, tax compounded and 4 per cent national war bonds, tax compounded, registered or inscribed in the books of the Bank of Ircland
in Dublin: but such interest will he charged with the tax by direct assessment on owners who are liable to the income tax levied by the Free State.

Protection for the Taxpayer. A society exists for the protection of income tax payers, and ita nefficials are willing to give expert advice to persms who are unable to reoover overpaid income tax and to those who have difficulties with their assessment. Advice on these and kindred matters is also given for a fee by accountants, some of whon speoialize in this subject, and by agencies that make a busincss of recovering overpaid income tax In the great majority of cases. however, the taxpayer can dcal with these matters himself, and any information and assistance he requires is usunlly civen quite willingly by the inspecturs and ot her officinla who are responsible for collecting the tax In case of serious dissatistaction with his assess. ment he can appeal to the commissioners or to the courts of law.

## Incontinence. See Enuresis.

## Incubators and Their Mechanism

## Care and Attention Needed to Secure the Best Results

As the keeping of poultry is a uomestic industry, our work contains many artic'es o interest to the poultry keeper. Such include Brooder; Poultry House. Sce also Chicken; Duck; Eggs; Fowl; Poutry, etc.

The mechanical stages in the use of a hot that when the cap is down, the whole of the water incubator are as follows, assuming that hot air will pass to the hot-air chamber and the instrument is in perfect working order: water container, and then be carried into the First the water container is filled with hot atmosphere. wnter, until it runs out of the overflow pipe or appears at the top of the filler pipe. The lamp reservoir is then very nenrly filled with kerosene oil of good quality, the wicks adjusted so that the name burns brightly without smoking, quite steadily and quietly, and generally about $\frac{3}{8} \mathrm{in}$. in height.

The lamp is inserted in place under the flue opening. To do this the spring base has to be depressed to allow the lamp glass to pass the top of the opening in the chamber. The resultant spring upon it forces the lamp upward, and the top of the glass makes contact with the bottom of the flue and thereby prevents any air getting into it except through the air passages in the burner and the independent air supply separately provided.
The egg drawer is then closed and the thernometer inserted into place. The accuracy of the thermometer should be tested against another of known eractitude, and, if yatis. factory, may be put into service. The lamp is then left burning day and night, until the temperature has risen to alout $104^{\circ} \mathrm{F}$., at which temperaturc the capsule should expand and lift the control lever. This control lever hns, on its outer end, a cap or disk, which hangs over one of the hot-air flues, with the reault


Incubator lor hatching hen's ergs. A, water lank, heated by lamp, H. C, egr tray with, beneath, water tray to keep air molst. D, thermostatic capsule, which expands at a prearranged temperature and, by means of a rod and lever, raises damper, E, rrom chimney. F. permitting bot air to escape without passing throngh incubator. When temperature drops,
capsule contracts and lowers damper
Courtcyy of Spratts latent, Lfd

When the cap is lifted by the lever and ex pansion of the capaule, some of the hot air can escape direct to the atmosphere : and consequently the temperature of the incubatur falls a few degrees, the capsule contracts, the lever falls, and the cap is autnmatically replaced at the top of the flue opening. The critical adjustment of the capsule regulating screw governs the temperature at which the lever will rise. By screwing or unscrewing it the lever is raised and lowered. A sliding weight is also used on the lever bar, because with the increase of tempernture not only does the capsule expand, but the pressure in it increases with further increase of temperature, hence the moving weight is useful : as by sliding it along the lever a line adjustment is possible. This will have to be made on the spot for each individual incuhator, and the incubator should be run for a suflicient period until the temperature remains constant for 48 hours before the adjustments can be considered safe, as with a hot-water incubator of this type several hours must necessarily elapse before changes of tempera ture become apparent.

Preliminary Experiments. The water tray will have to be refilled with water from time to time, and various other operations performed when the incubator is at work, according to the period of incubation. When adjusting the incubator for the first time, it is as well to open the drawer occasionally, as if about to turn the eggs, and for about the same length of time requisite to do this, so that an appreciation of the temperature change and the time it takes to recover the normal hatching temperature is ascertained, as a knowledge of this item is very important during the actual hatching.
The care and attention that should be given to any incubator includes the placing of the incubator in a dry position where the tempera. ture can be maintained at an equable degree. This is a very important matter, as much of the success of incubation depends on the incubator itself heing placed in some situation where it will be free from draughts or any violent change of temperature. The incubator should stand upon a firm support, either upon four stout legs with a framework, or upon brackets or any other arrangement that is


Incubator. This apparatus bas an egg capacity up to l20 ben eggs. The wate: tank is heated by an oil !amp which is controlled by a thermostat Courtesy of Spratl's l'alent. Lid.
firm and entirely free from vibration. This is a mintter requiring careful attention

As regards the apparatus itself, the only attention during the hatching period is to refill the lamp and see that the wicks are clean and in good order at regular intervals, say, about every 24 hours After the lanp has bcen in use for some time, remember to see that there is sufficient wick to reach well to the bottom of the container, otherwise the lamp may go out unexpectedly. The asbestos or other washers used to make the airtight joints around the inspection glass and the base of the flue should be examinel, and if worn or broken be replaced by new, as any ingress of cold air at these points tonds to reduce the heating value of the lamp.
The internal air passiges, or flues, should be cleaned out from time to time with a stiff. bristled brush with a flexible handle. The regulation of the capsule has alrcady been described, and when it is functioning properly it should not be disturbed, as it depends upon chemical action for its functioning, and the action will always take place at the same time in every case. Therefore, when the regulator is properly adjusted it is hest to leave it alone, except to sce that the pivot bars have not worn and to keep them slightly oiled, so that they may work perfectly smoothly.

If it is deaired to vary the temperature, as, for example, at the beginning or near the end of the hatching, the lead adjusting weight may be moved in preference to altering the adjusting screw for the capsule. The drawer, egg tray, water tray, and drying compartment should be kept scrupulously clean and be washed out between every hatch, preferably with hot water, with a small addition of disinfectant, followed by a washing in clean water.

The outside of the cabinet will keep in better condition by the application of a little furniture polish or an oily rag, as this preserves the wood in good condition and makes it Icss susceptible to atmospheric changes. The little nir vent holes should he kept clear, and the water tank examined and the water-level tested between each hatch, making good the deficiency with bot water. After a year's hard work, the water tank should be emptied to free it from sediment which might accumulate.

INDIAN CLUB. The practice of various exercises with Indian clubs helps to develop the chest and the muscles, and enables the performer to acquire an ercct and graceful carriage. The exercise or drill is well adapted for musical accompaniment if desired. In shape the Indian club resembles a slender, jong-necked bottle with a knob at the end.
l'lese clubs are usually made of willow or elm
The wrist plays an important part in the exercises, which consist of a serics of $t$ wists and swings. The clubs are made to turn in circles by the wrist action while they are swung from the shoulders with wide, swecping movements to right or left. There is an outer and an inner swing. ln the former the clubs are raised and swung downward away from the body and back to the starling point: in the latter he swing is upward
INDIAN CORN The variegated. leaved varicty of Indian corn or maize (Zea mays) l:as long been a popular plant for use among others in summer flower-beds, but improved varieties of the common kind are being increasingly grown for the sake of the cobs, which are cooked in the way described in the article on Maize. This plant needs rich, deep soil and copious watering in hot weather. Seeds may be sown under glass in March and the seedlings set out of doors in May, or seeds can be sown out of doors in the latter month. The rows should be about 2 ft . apart, and the seedlings thinned to 10 or 12 in . from each other. See Maize.

INDIAN CRESS. This is a popular name for the common or garden nastur. tium It is a familiar and easily grown annual which bears showy flowers in many shades of red, yellow, orange, scarlet, and terra-cotta. The climbing varieties. See Nasturtium.

Indian Fig. Popular name of the Opuntia cactus (q.v.).

INDIAN GRASS. This is a liardy perennial grass of pretty tufted growth, attractive in mixed horders, and is sometimes known as lavender grass. It will grow in good ordinary soil, in any position, and may be plantel rom March to June, or during autunin. It hears smooth, rigid lea ves of delicate green, variegated with white, 8 to $1: 2 \mathrm{in}$. in height. Propagation is by simple division of the roots in spring or autumn. See [3order.

INDIAN PINK. This is a popular name of Dianthus chinensis, known also as Chinese pink, a favourite summer flowering plant with large fringed blooms in many colours. It is commonly treated as a biennial. Seeds are sown out of doors in June, the scedlings being transplanted once to give them room for development : in October they are put out where they are to bloom the following year. Well-drained soil and a sunny situation suit them best. From seeds sown in a heated greenhouse in January or early February the plants will Hower in tho summer of the same year if planted out of doors in May or early June.
Indian Shot. Alternative name for the canna, a large and handsome summer bed. ding plant. See Canna.

INDIA-RUBBER PLANT. This is the popular name of Ficus elastica, $\Omega$ favourite room and window plant witl large, handsome deep green leaves. The variegated leaved varicty is even more attractive. Both thrive if potted in a compost of sandy loam Careful watering is necessary, as with all room plants. When the soil is just moderately dry the pot should be filled to the rim with water. An occasional sprinkling of guano or watering with soot water has a beneficial offect on the growth of the plant.

INDIGESTION. Pain of discomfort is caused to many persons in consequence of $a$ disturbance of digestion in the stomach or boirels. This may assume an acute form, with headache, nnusea, vomiting, and scvere piain in the stomach. If the voniting is not free, the stomach may be relieved of its contents by tickling the back of the throat and giving large draughts of tepid water. The bowels should also be cleared, and for this purpose $\frac{1}{2}$ oz of Roclielle salts or 2 oz . of enmpound inixture of senna (black draught) may be taken. The pain over the stomach may be relieved by a hot-water hottle or by a large mustard plaster

No food sliould be given for at least 12 hours, but warm water with from time to time a pinch of bicarbonate of soda in it may be given. Milk, diluted with hot water, soda water, or lime "ater, may be commenced if the stomach has properly settled; then beef tea, chicken soup, stcamed white fish, and so on to ordinary diet.
In the chronic form of this complaint, as in the acute, it is neccessary always to bear in mind the possibility of the stomach symptoms being due to some disorder of the digestive apparatus calling for special treatment, or to some general disease. When dys pepsia begins in a middleaged person whose digestion has hitherto been quite good medical advice sbould be obtainerd.
Causes and Prevention. In most cases if inquiry is made as to the state of the mouth,
ndian Corn Leaves of the variekated maize, a plant much grown or its decorative va!ue and the habits are brought under review Iairly obvious reasons can be found for the protests which the stomach is making. The mouth is often very septic, and this is lesponsible for a variety of mischicf. Not uncommonly in people who suffer from

shronic catarth of the nose, pus is continually being discharged from the back of the nose and is then being swallowed.
The teeth may be too few for the mastication of ordinary food, leading to the free use of liquid at meals to make the swallowing of the large, partially chewed masses possible. The same result will follow when, either from hurry or reading at meals, sufficient care is not taken to reduce the food to a soft, semiliquid pulp. The strain on the stomach is increased in the case of the man who feeds with his eyes always on the clock. For half an hour after a meal other functions should be made to go easy. If oircumstances dictate a hurried meal it should be small and easy to digest. Taking a meal dry and leaving any beverages to the end greatly helps to promote better mastication.
Meals should be regular, and casual food between meal times is to be deprecated. Many people err by taking too many meals, or, even if they take a reasonable number, they load themselves with too much food. The manner in which food is oooked is im. portant. It may be said that thingg that are fried, that is, conked in super-heated fat, may strain the digeative powers too much, and the same applies to meats stewed in the ordinary way in a saucepan or baked in pies. All such and pastries of any kind, should be oschewed by the dyspeptic Grilling and roasting, or stewing by the French method on a water bath, are the methods whioh favour digestibility. Pork, salt or corned meat. cheese (uuless of the mildest description), shell fish, nuts, pickles, vegetablos if fully grown and tough and stringy, now potatoes, and new bread will do harm.
Inlemperance in tea, coffee tobacoo or alcohol may be responsible for dyspepsia The diet should be as varicd as it is possible to make it, and should include some fresh food, tender salad, and a little fresh, ripe fruit if possiblc, avoiding plums and the stringy parts of oranges. But if theso disagree a frequent ration of squeered orange-juice should be taken for the sake of its vitamins.

## Importance of Avoiding a Chill

It is important to keep the abdomen warm, and much benctit may be derived from wearing a flannel binder. especially in cold and in damp weather. The fect should also be kept warm, and this fact applies very especially to infants and young children. The general fitness should also be advanced by a sufficiency of open-air exercise. The bowcls should be kept regular, and for this purpose nne of the preparations of cavoara or aloes may be employed. Where there is much distross after a meal a small teaspoonful of the following powder may br taken in a little milk 20 min . before or half an hour after meals :

If Hatulence tends to be a troublesome symptom, a wineglass of peppermint water with a pinch of bicarbonate of soda or 1 or 2 soda mint tablets will relieve it.

It is not infrequent for pain to come on in the night. This is known ns the hunger pain, and it may be relieved by taking a leaspounful of bicarbonate of suda or of this combined with bismuth. But as this symptom is char. acteristio of an excoss of hydrochloric acid in the gastric iuice, with which a duodenal uloer is apt to oocur, anyone who suffers in this way should put himself immediately in the hands of his duotor.
Wher bottle-fed babies are not digesting their nilk well, as shown by the appearance of curdled milk in the stools, 1 grain of sorlium citrate may be added to each no.. of milk used. In older children the starch and sugar con. sumed may have to be reduced. and a meal or
two of Benger's food each day may be a useful way of mceting any difficulty in digesting starch Flatulence may be relicved by sips of hot water, a teaspoonful of dill water, or a crushed soda mint tablet. Sec Constipation ; Diet ; Digestion : Eating ; Hydrochloric Acid : Stomach, cte

INDIGO. 'The blue dye known as indigo produces a dark blue colour on woollen cloth that is fast to light, and on this account the dye is used for all the dark-blue oloth employed in the navy and for dress materials and suitings, etc.. of the better qualition in the shade known as navy blue.
The dye bath is a mixture of indigo, lime and fermentable substances such as bran. In this form a colourless liquid is formed. After cloth has been soaked in the dye bath, it is exposed to the air and the blue colour develops. Much of the indigo now used is prepared artificially. See Dyeing.

INDIGOFERA. The indigo of commerce is supplied by Indigofera tinctoria, an Fast Indian plant. Few species of indigofera are grown in gardens: the most important is gerardiana, a shrub which bears rose•red, pealike flowers in late summer. It is often planted against a sunny wall where it will reach a height of 10 ft . in the course of time. If planted in the open garden the branches should be cut down each spring to force the development of frash ones which will reach a height of about 3 ft . Often the branches are cut down by frost. This shrub thrives in ordinary soil in a sunny place and is increased by cuttings inserted in pots of soil in a frame in Septemter.
INDUCTANCE. This is that property of an electrical circuit which tends to oppose any change in the current flowing round the circuit. A conductor is stated to possess inductance when the flow of electric current causes a magnetic field to be set up and to become linked with the conductor. The inductance value may be incroased if the conductor is made to take the form of a coil, and is greatly increased by.winding the coil upon an iron core.

If one inductance is arranged so that its magnetic field (magnetic lines of force) becomes linked with a second inductance, the two inducfances are then "coupled" and " mutual induotance" is said to exial between them.

Any flow of alternating curment in the firat inductance will induce a sionilar current in the second inductanze, the value of this inducel current depending upon the efficiency of the "coupling " between the two circuits. The unit of inductance is the henry.

Inductance Coll. This is a length of wire or other conductor arranged in a particular manner so as to produce a definite amount of inductance

In a wirelesq reoeiver it is the name usually given to the tuning inductance, e.g. serial coil, grid coil, etc.

The most efficient tuning coils are those of the single layor type, but in certain cases it is


Inductance Coil. Simple coil with three tappinga
necessary to adopt special methods of winding, e.g honeycomb, lattioe, duolateral, etc, in order to keep the dimensions within reasonable limits A well designed coil should have low distributed capacity and its high frequenoy resistance should be small.
Binocular and astatic ooils employ a method of winding which reriuces the external mag. netic field, thus minimising the danger of instability due to interaotion in high frequency amplifiers. See High Frequency: Low Frequency; Selectivity: Tuning.
INDUCIION. When a body charged with electricity produces an eleotrio oondition in a neighbouring body not directly conneoted with it the result is termed induction. A similar effeot is observed if the body be charged with magnetism, in which case the magnetic condition is induced in the neighbouring body. Should an electric current be flowing tinrough a conductor, it will induce electricity in anot her wire brought near.

In internal combustion engines the word induction is used to describe a phase of the suction stroke, and particularly refers to the state of affairs which exists in the pipe or passage connecting the cylinder to the carburetter, generally known as the induction pipe. The difference between the pressures in the cylinder and the oarburetter induces a How of gas from the carburetter to the cylinder. See Internal Combustion Engine.

INFANT. In English law an infant is one under 21 years of age. An infant is not held responsible for ail his actions: for instance, contracts made by him to repay money or pay for goods are void unless they are for ncoesaities. The definition of a neceesity depends on the social position of the infant. An infant is not liable to pay a bill of exchange, oven if it has been drawn for necessities.

An infant under seven is not capable of colnmitting a crime in the eyes of the law. It is an offence to send printed matter to infants inviting them to borrow money or to bet Infants cannot aot as trustees or execu. tors, nor be made bankrupt. In an allied sense the word is used for a baby. See Baby: Child: Guardian ; Juvenilo Ogender.

INFANTILE PARALYSIS. The infeotious disease named aoute polionyyelitis is morc generally known as infantile paralysis It is a serinus and not uncommon complaint in childhood, especially during the first three yaars The onset may be sudden, with hcadache. vomiting, fever, and perhaps convulsions. After a few hours, in some cases, the child shows evidence of paralysis, involving the limbs, and perhaps the trunk. The paralysis passes away from the greater number of musoles, but remains permanently in one limb or part of a limb, sometimes in two or more. The paralysed limb becomes shorter: deformities such as club foot may be produced, and the limb is blue and oold.
The disease most commonly ocours in the hot summer months. It is due to the entrance of a germ into the body. the source of which is not quite clear It may oocur in epidemics, and when this is the case milk should be boiled. All cases of this disease should be isolated. Treatment will be in the hands of the doctor. Paralysed limbs must from the beginning be placed in positions which will avoid any stretching of the muscles, and the doctor's direotions on this head must be carefully followed.
INFECTIOUS DISEASE. Any disease which is transmissible from one person to nnother is said to be infectious. Some in. fectinus diseases, such as tuberculosis and ringworm, may be derived from the lower animals A disease is infectious because it is due to a living organism which can multiply
in or about one person, and be discharged and thecome parasitic in or on another person

Some parasites, like those of a common cold or influenza, are discharged in the breath, eapecially when coughing or sncezing. and in such diseases as tuberculosis and pneumonia the sputum terms with organisms which may be dispersed by coughing, or as a fine dust when the sputum dries. The dried crusts of smallpox and chicken-pox are in. fective, and their dust contaminates the air.

The parasites of other diseases, such as typhoid fever, dysentery and cholera, are chiefly spread by contaminated water, and these ane therefore often described as waterborne diseases Not only may infection come from drinking such water, but from utensils or fresh vegctables or fruit which have been washed with polluted water. Milk may be charged with parasites by being kept in such vessels. or by dilution with the water. Icecream may also convey infection.

Other insects convey infcction when they bite; or infected faeces of an insect may be inoculated into the skin by scratching. By the last method typhus, relapsing fever and trench fever are disseminated by the louse. Mosquitoes, by biting, spread malaria, yellow fever, dengue and filariasis; the flea transmits bubonic plague; the bed bug. plague and possibly leprosy and other diseases; the tsetse fly, sleeping sickness; the sand-Hy, threc-day fever; and the tick, relapsing fever.

Articles of clothing, books and other objects which have been in contact with an infected person may carry the infection, and are referred to as fomites.

Not only may a person actually suffering from a disease be a source of danger to others, but also some who have recovered but still retain a focus of infection in the body. Such a person is called a carrier.

A person suffering from an infectious disease should be isolated until all danger of communicating the infection has passed.
It may be possible to isolnte a patient at home, hut if there is any difficulty in doing so, and especially when the disease is one of the more serious infections, the patient should be sent to an isolation hospital.

## Room Chosen for the Patient

The room chosen should be at the top of the house, and should have a fireplace. A sheet wrung out of lyeol solution, a teaspoonful to the pint of water, or somc other antiseptic, and hung over the door, has the advantage of emphasising the fact of the isolation if it does nothing mure. Carpets, heavy hangings, and all unnecessary furniture should be re. moved before the patient goes into the room. Feeding and other utensils used by the patient must be kept for his separate use.

Some person must be told off to attend to him, and should wear an overall when outside the room. Books should not be allowed to leave the sick-room When the perind of infectivity is over, the patient must be properly washed all over and dressed in fresh clothing, and the room and all its contents must be dealt with as described under the hcading Disinfection.
Not only must the patient be isolated, but also anyone who has been in contact with him, the duration of this quarantine being regulated by the incubation period of the disease, and estimated from the last date of exposure to infection.

Some infectious disenses must be notified to the Medical Officer of Health for the district, and this should be done immediately the diagnosis is made. A list of such diseases is given under the heading Notification. Reaponsibility for notifying falls both on the doctor in attendance and on the head of the house or any other person in a similar position, but in practice the notification of $\Omega$ doctor
usually suffices. The fine for failure to notify is 40 s . The Act applies to boats, tents, vans or sheds used for human habitation, as well as to houses and other buildings. See Disinfection; Fever; Fly; Quarantine: Rash.
INFIRM PERSONS: Care of. Elderly people left by themselves, either through gradual mental decay or neylect. often get into n dirty and soinetimes verminous condition Particularly is this so where they have only one or two moms in a house ; they then become a nuisance or danger to themselves and the other inmates of the house by their insanitary ways. The position is $\Omega$ very diffioult one, and calls for tact on the part of the landlord or chief tenant of the house. In such circumstances the first step is to communicate with the reantives, if any can be traced, and get them to act and make provision for someone to look after the person and to keep them and the room and contents reasonably clean.

If such friends or relatives cannot be found the next step is to communicate with the relieving officer of the local Public Assistance Committee. He will interview the persons and thy and persuade them to go into the local infirmary or hospital and be taken care of properly It frequently happens that they will not consent, but prefer to continue in the old ways and kecp their independence and muddle along, to the detriment of themselves and the other inmates of the house
In such a case the only remedy is to notify the local sanitary inspector, who will make inquiries and refer the same to the modical officer of health. Lindon and some of the larger cities and towns have acquired powers to deal with this problem. After examination of the person, the medical officer of health gives a certificate in writing that he or she is aged. infirm, or physically incapacitated. and resides in promises which are insanitary owing to any neglect on the part of the nccupier, or is living under insanitary conditions, or is suffering from any grave chronic disease and is unable to get proper care and attention. Then the medical officer of health makes an application at the police court and gives evidence to the mingistrate as to the danger to health and fire to the person and other inmates of the house.
Most of the Acts make the period of detention and maintenance in the hospital or infirmary under the magistrate's order at three months. Application must be made to the court for an extension of this period : ample provision is made to protect the liberty of the person, and every means is taken to get into touch with relatives and friends of the aged person, for it has to be remembered that the person becomes a charge upon the rates.

Before application is made to the court for the removal of the person, three clear days' notice must be given by the medical officer of health of his intention to apply to the court for this removal, and should any relatives be found who will come forward and take care of the infirm person, then, even after the order has been made, the court has power to make a rescission order and allow the person to be taken under the care of relatives and friends. Sec Old Age; Old Age Pensions.
INFLAMMATION. When any part of the body is irritated by an injury or the presence of bacteria, there is an increased flow of blood to it, producing the four characteristic symptoms of heat, redness, swelling and pain.
Diseases whose names have the termination "itis " are inflammatory diseases, e.g. appendicitis, bronchitis.

In the treatment of inflammation the first thing to do is to remove the cause, if possible ; for example, removing a foreign body from the eye. The part should then be put at rest.

Pain may be relieved by lessening the amount of blond in the part; by keeping the part raised up, eg. a whitlow in a finger; by applying cold applications which contract the blood vessels or by using heat to dilate blood vessels at some distance from the site of inHammation, and so draw blond awny from this point, as when a poultice is applied to the chest wall to relieve congestion in the lung.
INFLATION. In the econonic life of motor tires, and also pedal cycle tires, in. flation, which is distending or filling with nir. is an important factor. Tires must lic kept inflated to the correct pressure as stated by the makers if freedom from trouble, e.g. chafing at the beads, is to be avoided See Tire.
INFLUENZA. Due to a germ, there is good evidence for believing that the influenza bacillus of Pfeiffer is the one primarily responsible for this disease, although other germs have been found in association with the disease, and may be responsible for at lenst some of the complications.
The onset of influenza is sudden, and occurs from one to four days after exposure to infection. Running at the eyes and nose may suggest a bad cold, but usually the fever is higher, there is considerable headache and pain in the back and limbs, and more prostration. Often the throat is sore, and there is a dry, irritating cough. The tongue is furred, and therc may be nausea and perhaps vomiting. The brunt of the diseasc may indeed fall on the digestive organs, and the symptoms be so sudden and severe as to suggest food poisoning. In some instances, it may be added, the onset of the disease is unusual as, without feeling noticeably unwell, a person has dropped unconscious in the street.

Ordinarily, after having persiated from three to five days, the temperature drops, suddenly as a rule. Some complication, however, may supervene. Bronchitis may become severe, developing into bronchopneumonia Sometimes the lobar type of pneumonia develops pleurisy, heart disease or Bright's disease. Apart from legacies left by some of its complications, even an apparently simple attack of influenza may have troublesome sequelae, such as considerable mental depression or neuralgia.

The chance of recovering from an nttack of intluenza is, gencrally speaking, good except where young children or aged or debilitated persons are concerned. The general treatment is that of the state of fever, but special emphasis must be laid on the necessity for rest in bed, abundance of fresh air, and of sufficient time for convalescence. Aspirin in 10 -grain doses is useful for relieving muscular pains and headache. This or salicin, sodium salicylate or quinine may be given at intervals in order to combat the toxaemia of the disease. The patient ceases to be infectious in three or four days after the temperature has become normal.
The infection of influenza is mainly spread by the breath of an infected person, and the danger is increased by his sneezing and coughing.

During an epidemic an infected person should be given as wide a berth as possible. It is a prudent thing ta walk to business, for example. or go on the top of a bus rather than in a closed vehicle, and rooms and offices should be especially well ventilated.
It may help to lessen the risk to gargle the throat and spray the nose with a weak solution of permanganate of potash twice daily. Should suspicious symptoms make their appearance, 15 drops of essence of cinnamon or of spirit of camphor taken on a lump of sugar may cut them short. Mixed vaccines, containing the influenza bacillus and other germs associated with the disease, are of definite value. See Cold: Cough : Fever.

# Ingle NOOKS and Their Construction 

An Old-World Feature Adapted to the Modern House

This article, aided by further information under such headings as Corner Seat; Cortage: Joint; Stain; Wood, tells how on amatcur can make an ingle nook for his house. See further the entries Chimney Piece; Fireplace; Settle

The ingle nook may be described as a large splaying the jambs and building in a barless opening fitted with i scat or with two scats, fire at the back.
one on either side of a fire and within the A false oak beam could be fitted across the chimney breast of the fircplace. Such are only possible in the large fireplaces of Tudur and Stuart times, or in those built in imitation thereof.

In some ingle noolis the sents are built into the walls, but if they are not, the nook can be completed by pircing a wooden seat on one or hoth sides of the lire, care being taken that the rlistance hetween it and the fire is sufficient to leave the sitter in comfort Obviously the seat must not be trimmed in any way.
The construction of an ingle nook will have (u) lic determined as regards ils size and detail, accorl ing to the geography of the roum in which it is to be construct al, and the purpose for which that roon is required As the ingle nook is a chiaracteristic of the old style honse, the construction should be on anlid lines, and trated in such a manner that it will retain these characteristics Generally this is accomplished by the use of rough-hewn oak posts and simple, direct methods of construction. As a typicalexample, the illustrations, Figs. 1 to 4 , show how an ingle was formed in the dining room of a modern house, and suggest a miethod of construction which may be adopted elsewhere.

The Work Described. In the case illustrated the fireplace was a brick recess, spanned by a heavy oak beam and nccommodating a wrought :-on basket fire mounted on a basc of brickwork: but where that arrangement cannot he followed it is, for example, often possible to remove a cast iron register stove and to face ably higher at the front than the back, and up the opening with narrow facing bricks, if the rest, or back, be similarly sloped and


Ingle Nook. Fig. 1. This is built in the dining room of a modern house. The fireplace, a wide brick recess contaling a basket grate, is flanked by comfortable settles, with sloping backs and seats
rightly adjusted, a really comfortable sent is the result. On no account should the scat and the hack be at right angles, for the seats will not then be comfortable.

The next step) is to prepare 1 in tongued and grooved floorbaards and nail them on the top of the framework, thus forming the sent. Oral brads should be used for this work, and their heads punched well below the surface. The front of the seat or that part of it which faces the length of the room. is prepared from similar boards sawn to the desired shape, lengths of floorband heing cut as nearly as possihle to match the curicil shape, which may afterwards be worked up by saving it with a pad saw and linished when in place both with a spokeshave and sandpaper.

These pieces should not be glued together, but should he simply secured by 2 in oval


Ingle Nook. Fig. 3. This shows the iraming in place, with plywood facing in position on wall
brads to the face of the framework, or preferably by screws passing thmugh the framiowork into the side piecea A dummy upright post, comprising a rough hewn onk plank attached to the wall, may either be grooved to reccive the side members or thesc may be secured in position by heads on each side; the latter is the simplest way for the amateur.

The next step is to cut a sufficient number of pieces of $\frac{3}{3} \mathrm{in}$. matchboard to the length requisite to form the back, and to bevel the upper and lower edges so that they are a good lit on to the top of the seat and on the mugh ground attached to the wall, respectively. A single crossbar is fixed between the front part and the wall, and also two rough picces inclined at an angle and attached respectively to the "all and the side piece of the seats, to form a foundation to which the back can be nailed. A capping is then fitted to the top of the front picce and a simple moulding run around the wall on this line, across the back of the seat along the sides and terminating at the great benm over the fireplace.
To cover the nail heads and make a neat finish around the seat, sides, and back, a simple $\$$ round moulding is glued or pinned in the corners. The whole of the woodwork is stained dark oak colour.
Dummy Timbering. If it is desired to fit dummy timbering, a heavy plank about $\mathbf{6} \mathrm{in}$. wide and about 2 in. or so thick should be rough hewn to represent a beam spanning the two uprights of the back and sides. This is firther supported by two roughly shaped and curved members, rising from the capping on the top of the sides and terminating about a quarter the length of the heam from the walls. The false timbering on the ceiling is easily arranged with rough hewn strips of oak, or even plain deal stained to a dark brown colour,
and secured to the rafters by oval hrads. driving these right through the plaster into the rafters or floor joists
When two small windows are in existence or can be provided one on cach side of the fireplace, they add a great charn to the ingle and have a real value in providing light for tho seats. They make reading or sewing a practical proposition, as uaually the corner by the fire has a tendency to be dark. The ingle can he further decorated by a few judiciously applied strips of rough hewn oak attached to the wall to represent old timbering.
INHALATION. The method of inlalation is used for many drugs, mostly in the treatment of respiratory disorders. Creosote, eucaly ptus oil, compound tincture of henzoin (Friar's balsain), menthol, camphor, ete., may be administered in respirators, inhalers, volatilized in steaming water or on respirators, while sonie drugs to relieve asthma are smoked,

The simplest method of giving medicated steam inhalations is to fill a large jug with a pint of boiling water. 2 parts, cold water, 1 part, add a proper quantity of the drug, cover the head with a towel, and place the face over the jug. One teaspoonful of Friar's halsam used in this way will sometinues cut short a cold, if no time is lost after the first symptoms appear.

INITIAL: How to Work. The usual custom of initial embroidery is to choose the first letter of the surname, but this is often varied as occasion demands. by working instead the first letter of the Christian name, or for a more elaborate device, taking both the first letter of Christian and surname, and grouping them together attractively.

The Stitches Used. When working initials it is important to prepare the ground by padding the outline, in order to give a raised effect that is particularly attractive The simplest method of doing this is to cover the inside part of the outline with rows of rumning stitches, all of an even length, and fairly close together as shown. It is possible to buy at most fancywork shops some attractive initials made in papier niaché that will form a pad. ding, and only require to be placed on the material and closely covered with satin-stitch


Ingle Nook. Fig. 4. The seat complete and ready for staining. See opposite page
to secure them in place: but these are not to be recommended for garments that are to go to the winsh.

Another method which is very good for fine work on such things as linen handkerchiefs or underivear is to emplay a thick thread or fine cord, and lightly sew this to the outline of the initial before covering it with a close oversewing stitch. Satin-stitch should always be worked ncross the shorter way of the shape to be embroidered It consists of perfectlystraight and even stitches, that sliould be made to lie quite closely together.
A more elaborate result miny be olitained by "orling the
 and sal-ammoniac in $\geqq$ pint of water. The zinc should be thoroughly cleaned before the ink is applied.

Marking Ink. Marking ink is mainly metallic in conposition and is usually prepared with aniline salts, which produce a deposit on the surface of the article markod It is generally used for marking names or initials on linen, cotton and clothing. The deposit may be obtained by passing a hot iron over the writing, but in sonte varicties it is possible to dispense with this process.

Other Special Inks. Sipecial inks are made for other purposes, copying and drawing among them Any ordinary iron gall ink will yield a copy for some time after writing, but in order to get better re sults a larger proportion of
tian ladder work, and in this case the padding is un. neccsanry, as the centre of the shape is cut awny. The whole outline is first closely covered with a finc running stitch, and the ladders that connect it from side to side are worked in buttonhole. stitch. With very fine scissors cut through the centre of the shape and turn back the edges to the line of the running stitches. Now closely work round the outline in fine over-sewing or in but-tonhole-stitch as desired. Carefully cut away the raw edges of the material when the embroidery is finished.

Another device for embroidering large initials is to cut out the outline in a contrasting material, and appliqué it to the article. Blanket-stitch is a good medium to use for securing it in place, and it is advisable to choosc a materias for the lettering which is not easily inclined to fray. Another plan is to embroider the initials in satin-stitch on a fine piece of net, and then to insert the net, shaped into some fancy device such as a circle, square, or oblong

Jasy to make and very suitable for towels is the initial worked in cross-stitch as shown in diagram. The stitch is made by taking up equal strands with the needle in a slanting direction, and at right angles to each other, each pair of cotton strands forming a single cross-stitch. It is advisable to work this embroidery on very coarse threaded material, as this helps considerably when the threads havo to be counted in orcer to keep the stitches regular. The simplest way to obtain an outline for the initial is to sketch one on finely squared paper, and then count the squares that are thereby oovered, making each square represent a stitch. It will be quite easy to follow this guide on the actual linen. See Cross Stitch; Embroidery.

INK: Its Varieties. Ordinary black writing ink is made by mixing ferrous sulphate with 'Turkey or Aleppo galls, which contain gallo-tannic acid, and adding a little gum arabic. There are many recipes, the proportions varying in each, but the best results are said to have been obtained with one part of the sulphate to about 3 parts of the galls. A good black ink may be made by boiling 8 oz . of galls in a gallon of water and adding 6 oz . each of ferrous sulpliate and gum, or 6 oz . of galls and 4 oz . each of the sulphate and gum in 6 pints of water.

A special ink is required for the zine labels used by gardeners. This is made by mixing
$\frac{1}{2}$ oz of lamp-black with 1 oz. each of verdigris
ferrous sulphate, galls and dye should be used. With this should be mixed a small amount of n substance such as glycerin, to prevent the ink from drying too rapidly.
Drawing inks include sepia, Indian ink, and the so-called waterproof ink. Indian ink is composed niainly of fine lamp-black and glue Waterproof ink consists of a pigment or colouring inatter suspiended in a liquid nedium, e.g. a solution of shellac. Typewriting inks frequently consist of a solution of methyl violet with a thickening agent, such as glycerin or oil. For writing on bottles a suitable inls can be made by dissolving (6) parts of borax by weight in 250 parts of water Warm the borax and add the water to it, stirring all the time. For colouring, one part of methyl violet can be added.

INKSTAND. The inkstands sought by collectors are chielly articles of silver or Sheflield plate dating from the eighteenth century. They appear to have been lirst made in England about 1700, and the styles are many. ranging from the boat-shaped one with its pair of silver-mounted bottles to massivo silver pieces that are heavily moulded. A popular style is the box-shaped one, which has corners of heavily stamiped metal, and in some silver pieces four cast feet. One beautiful silver example, dating from 1770, stands on four claw and ball feet. The tray has a gadroon border, and there are three pierced cages for the threc bottles, which are of crystal with silver mounts. Many of these old inkstands are provided with a sandhox, a waferbox, penwiper, and a taperholder in addition to the bottles.

Inkstands are included sometimes in modern writing desk sets of lacquered or painted wnod. Opayue glass in a brilliant colour is effective for inkpots, pen tray, ash tray and candle aticks. Other charming inkstands are of flowered china mounted in ormolu with holes at each side of the inkwell to accommodate quill pens in harmonizing colours

## Inlaying: The Art Explained

A Pleasing Decoration for Pieces of Furniture
Those interested in this subject should consult the articles on other forms of wood decoration, e.g. Fretwork: Graining; Marquetry; those on the various picces that are inlaid, e.g. Calbinet; Furniture; Hepplewhite; Jacobean Style: Sheraton
The art of inlaying consists in cutting away measuring anything from $\frac{1}{\text { o }}$ in. to $f$ in thick or recessing a given ground work to receive a is required and is cut at a different angle. substance cut to a corresponding shape, the Figs 1 and 2 show the two methods emploved inlaid portion being of either different material or different colour, so that it will thus show in relief against the ground work Its use. for the main part. is a decorative one, though it san be employed to advantage in a theoretially constructive sense.
The more advanced work naturally requires a good deal of skill in its execution, and can hardly be recominended to the amateur as a branch of work within his range but among the more simple trpes of inlaying there is a

great deal of scope, and there is no reason whatever why he should not make his work more interesting by decorating it with a simple form of inlay. The nethods employed in inlaying may be roughly divided under two headings, that of inlaying a given ground and that of applying a surface piece, already inlaid, to a ground work This latter is in many respects similar to the method employed in marquetry work, but differs in that marquetry is made from veneers and requires a special cutting arrangement, known as a donkey, and is cut at a right angle to the work; whereas in the method to be explained here a surface
to give the same effect. Fig. I heing inlaid directly in the ground, and the other formed on an applied surface The former is the inlay proper, and is often the only method which can be practicably employed
Simple Inlaying. Fig 3 represents an inlaid pattern of holly and ebony for an oak ground. The design should be first carefully drawn full size on a piece of paper and an indication made of which portions are to be in holly and which in ebony The shape of each inlaid portion is then marked out on the corresponding pieces of wood for inlaying (these being about $\frac{1}{1}$ in thiok) by means of carbon paper, and carcfully cut out with a fine fretsaw: all the pieces are assembled on the drawing and fitted together, care being taken to get close joints. Any straight joints may he trued up with a plane, while for the shaped parts a spokeshave or rasp will be uscful They are then all glued to the drawing and together, and another piece of paper glued to the other side. the whole then being laid between two flat boards and cramped and allowed to set When dry the drawing is stripped off the back and any surplus glue cleaned from off the edges, and the inlay placed in position on the ground work and scribed round the edges with a pointed tool

The ground is now cut away to a depth slightly less than the thickness of the inlay, to allow for oleaning off This is done with chiscls and gouges and must be as clean as possible. the bottom of the recess being porfectly flat and equidistant from the surface all over. In the larger portions this is better acoomplished with a muter.
The inlay nust now be made perfectly flat quite cheaply. They sre made in great on the undersides the best way to do this is variety, some being shown in Fig. 15 For the with n toothing plane, which not only levela


Inlaying. Egamples of modern pieces. Above cabinet in figured oak with inlaid lines and applied marquetry panels. Below, osk sideboard inlaid with lancy banding in ebony and satinwood

Rowlel Gallery, Kinsington

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the work. but makes a scries of fine acratches which enable the glue to hold better It may then be glued in and cramped and left to set for as long as possible, and then claaned off If insufficient time is allowed in the setting, it will be found that the inlay will sink

The same method is followed when it is desired to inlay it piece of marquetry in a solid ground, such, for example. תs Fig. 4, which shows a mahogany tray the centre of which it is desired to inlay with a Sheraton ornament, as Fig. 5. These can be bought cut in the form of marquetry

To begin, the two axes are marked on the oval and the corresponding centre lines on the tray These will give the exact position for the oval (Fig 6). It is then proceeded with as before It will be found that the marquetry has a piece of paper glued on one side: this must face upward so that the glue will grip the plain wooden side Glue the inlay in position and heat a Hat block of wood large enough to cover the inlay, and cramp this down on to the inlay with a piece of paper between to prevent the block from stioking to the work. The heat of the block will thus re-liquefy the glue and allow the inlay to be presed right down.

Bandings and Lines. Bandings may be male by the worker, but they can be bought



Inlaging. Fig. 1. Direct inlay. Fir. 2. Surface inlay. Fig. 3. Inlaid pattern in bolly and ebning. Fir. 4. Mahorany tray ready for central inlay. Fig. 6. Sheraton ornament for tray. Fig. 6. Method of marking position for inlay. Fig. 7. Edge removed for a wide
banding. Fig. ©se of cutting gauge for inlaging lines at edge inlaying of these a special tool is required known as a scratoh. This is easily made by the worker and is of the form given in Fig 16. It consists of a block of wond shaped as shown, cut in two and then screwed together again, so that the two pieces may be loosened at will. A piece of steel for the cutter is then filed to the width of the inlay to be used (a piece of an old saw blade will do) and inserted between the two parts of the scratch at the required distance from the shoulder, and the screws tightened. To use it the shoulder is kept tightly up againat the edge of the work and worked up and down (Fig. 17) When working across the grain it will be found adviss ble to cut in the two sides of the groove with a outting gauge or chisel to prevent the wood from splitting up.

For wide bandings to be put round the edge it will be found better to out round with a cutting gauge and then remove the surplus, as in Fig. 7 , with $n$ bull-nose or shoulder plane; while for a line to be put at the edge, a gauge may be used on both edges (Fig 8). The bandings are glued in and pressed well down with the back of a hammer (Fig. 18). In a rectangular shape the corners are mitred. When two lines cross, put the
narmw one in first, and scratch the other across it when dry To put a line round a circular or oval ground such as a mirror frame, the edge is gauged round to form the rebate for the line, as is shown in Fig. 8.

When glueing. put a screw in the inside of the frame and tie a piece of fine string to it and the atring to it and linto hen put in the line ceed undinding the string round as you prohe line is the starting point is reached, when the line cut off, as in Fgs . The joint in an shape so that the line will not be so apt to spring out. The string, having been damped, will pull the line in tighter. It is then cleaned off in the usual way.

When inlaying a line a little distance from a circular edge, a good plan is to use a gauge having two projeotions fastened to the fence, as in Fig. 10, to keep the gaugo held rigidly in the correot position.
When a line or banding has to be inlaid in such a position that it is not possible to use a gauge or soratch from a parallel edge, as in Fig. 11, a straight-edge should be held down in a line with the required inlay, and the groove soratched out with a narrow chisel or bradawl the same width as the inlay, while for shaped inlays a template of the shape is out, and this used as a fence against which the tool may be worked, or in the event of the shape being a oircular curve it is sometimes better to file one of the leg points of a pair of dividers for a outter to the width of the groove and use these, the other log acting as centre. This is only praoticable when the shape is a quiok one. It is sometimes necessary when glueing the line to steam it to render it sufficiently pliable to bend round a quick shape. In all cases of lines or bandings use the glue as hot as possible, work in a hot room and proceed with it quickly.
An example of inlay not used for a purely decorative purpose is in the case of a veneerod surface, when an inlaid linc is put across the

tafaying. Pis. 15. Lines and bandings emplojed will cover. holding the saw tilted at a slight angle so as always to underout the inlay, as in Fig 14. The tilt of the saw must be always in the direction of the inlay, so that when this is put in position a close joint will show. Having out the pattern, the two thioknessea are separated. the paper removed from the underup in the usual way. making the draw. ing on papor, the ground is prepared, planed perfeotly truc, and toothed. Now take the limits of the inlay, i.e. the extent of ground it

Next prepare the wood for the inlay the same thickness as the background, and with thin glue and with paper in betweon apply it to the background in a position to cover all the inlay. When dry, mark out the design from the drawing with carbon paper (Fig 13 shows the two pieces marked out), and with a fine saw cut round the design, side of the inlay and the two portions tried together. They aro then glued down on to the ground, oramped between two flat boards and allowed to set, and, when dry, cleaned

Fig. 15 shows some lines and bandings used in inlaying. A and $\mathbf{B}$ are lines usually made of either box



Fig. 10
Fig. 13 or satinwood; C and D, of ebony or of a cheaper wood stained black to represent ebony. $E$ is a combination of the two. $F, G, H$, and $J$ are bandings made in various fancy woods, such as kingwood, rosewood, tulip wood. etc. The lines at the edges are not only decorative but strengthen the inlay, binding the whole together.

INOCULATION. The act of introducing a disease germ into the body through a breach of the skin or the mucous membrane is called inoculation. The microbe of tetanus may be inooulated; for example, through treading on a dirty nail or through a out. Vaocination against smallpox is an in.


Pis. 17
Inlaying. Fis. 16. Romo-mado scratch or making groove: the steel cutter is fled to the width of the inlay to be used. Fig. 17. Making the groove in which the inlay fits. Fig. 18. Gluaing in the inlay by pressing with the back of a hemmer

Inlaring Fis 9 Method of hinding in elaed Hines Pis 10 Geage 0 or
 with a cireular edse. Fis. 11 . Lethod of uring straight edge for diagona line inlays. Fis. 12. Drawor tront with inlay to prevent rencer from ohisping. of saw out in maling a surface inlay
stance of preventive inoculation, the virus of cow-pox being introduced through the scarification of the skin so that by passing through the milder discase a person may be protected against the more serious. Inoculation is performed by soarifying the akin and rubbing with virus, or, alternatively, by the use of a syringe. See Diphtheria: Vaccination

INQUEST. In England an inquest or inquiry by a coroner, with or without a jury, may be held into the death of any person whose dead body is in the district, but no inqueat is hold as a rulo if a medical man given a certificate stating the cause of death It is therefore employed in the case of death from violence and also in the case of sudden death when no doctor has been in attendance, and is intended to find out whether or not there


has been anything liko foul play Instead of holding an inquest the coroner may now order a post mortem examination to be made, and if he is satisficd with the report no inquest is necersary. In Scotland the above duties are discharged by the official known as the procurator-fisoal.

Before 1927 it was necessary for a coroner to have a jury to assist him in his inquiry. This is no longer obligatory, unless there is reason to suppose that the death is caused by murder, manslaughter or infanticide, or by a street accident, or that it took place in prison. The jury must number at least 7, but not more than 11. See Death; Funeral.

INSANITY. The term insanity covers a great variety of mental disorders which differ in their causation, treatment and outlook for improvement or recovery. The following are the principal forms: manic-depressive insanity, which includes mania and melancholia; acute confusional insanity, a disorder that may follow exhaustion resulting from influenza and other diseases, surgical operations, child-birth, severe anaemia and excessive mental or physical fatigue ; paranoia, in which the pationt suffers from systematized delusions; dementia, a general loss of mentaloapacity; general paralysis of the insane, the primary cause of which is syphilis ; and opileptic insanity

Heredity plays an important part in the oausation of all forms of insanity, and other factors aro infection with syphilis and addiction to aloohol A large amount of mental disease is preventable. That due to heredity, however, could only be prevented by suitable marriage Any person with a neuropathic inheritance should be a total abstainer. Public health measures, by diminishing
diseage generally, and educational and eonnomic measures which raise the standard of comfort of the poorer classes and lessen the stress of their struggle for existence, will be beneficial
Some insane persons can safely be kept at home, but when restraint and skilled nursing are nceded the expense and worry involver usually makes institutional treatment neocs. sary. This has the further advantage, how ever, that the routine of an institution generally has $a$ tranquillising effect on a disordered mind. The legal procedure in volved in putting an insane person under restraint in an asylum is dealt with under the heading Lunatic. See Delusion; Fceble minded: Hysteria: Neurasthenia.

INSECT: In the Garden. The policy of the average gardener is to make an end of all insects he sees, prompted by his belief that they are his enemics Such an attitude is to be explained only on the ground of ignorance. But no real gardener is justified in remaining ignorant of the forces that help or hinder him in his chosen work.

All the butterflies and moths pass through a eaterpillar stage, and with few exceptions all caterpillars are plant-enters. But all the butterflies and moths do not leavo behind a batch of eggs from which the all-devouring caterpillars will issue. Out of more than 60 butterflies on the British list, only the largo white and the small white are pests.

With the moths it is different; though some may have come from neighbouring woods and hedges, many of them may have developed in the garden at the expense of the plants.

All caterpillars found upon p!ants are there for purposes of plunder. The forwardtapering, somewhat flattened larva of the hover-fly may be mistaken for a kind of caterpillar, but the observation that should precede drastic action would show that it feeds exclusively on plant-lice (aphis) and is to be encouraged. The grubs of the numerous species of sawfly aro very like caterpillars ; but any mistake in this direction dlees not matter, for these are all enemies. The larvae of the lady-bird beetles are often mistaken for plant-fceders of some sort, but the error is a disastrous one. They are sluggish creatures of slaty hue spotted with red. blue and black. Their sole food consists of plant-lice.

Any other beetles that may be seen upon foliago should be regarded with suspicion They gnaw shot-holes in the leaf, not eating them from the edge as most caterpillars do The large cockchafer and the smaller summer chafer are great delinquents in this matter continuing the injuries they have inflicted during their long life as grubs underground The beetles that live in the ground during all their stages may be regarded as valuable allies, for they prey upon foes the gardener may never see.

Dragon-flies, including the large falsely called horse-stingers, are to be welcomed, for their food consists of other insects. The legion of two-winged flies (diptera) are a very mixed lot and require nice discrimination. On the one hand they include the pernicious onion-Hy. celery-fly, lettuoe-fly, and crane-fly. or daddy longlegs ; on the other hand, the helpful hover-tlies, already mentioned, and a number of species whose grubs are internal feeders in caterpillars.

Beneficial Insects. The inseots with four transparent wings (hymenoptera), including bees, wasps and ichneumon-waspa, are, with the exception of the sawflies, beneficial. Bery of all sorts, when they visit flowers for nectar and pollen, are also assisting in the production of fertile seeds by the transfer of some of the pollen; and wasps, though they attack over ripe and daniaged fruit in autumn, are engaged
all the summer in destroying noxious insects for the nourishment of their helpless grubs Over 1,200 British species of ichneumon-wasps carry out similar useful funotions, though in a different way, laying their egge in or on caterpillars and nther insects that their grubs may flourish by consuming the internal sub. stance of the gardener's foes.

Of opposite nature are the bugs (hemiptera) of all kinds, including plant-lice, froghoppers and scale-insects; being all sap-suokers, they are, as a tribe, noxious. Farwigs, though they damage cortain flowers by gnawing the potals, also feed partially on insects

The gardener who wishes to be sure as to the identity and the friendly or unfriondly nature of insects should keep in a pocket of his garden jacket two or three of the glassbottomed boxes used by entomologista. In those he can imprison insects that are unknown to him, observe them elosely and in detail, and arrive at a decision as to his attitudo to that species. See Beetle; Moth, otc.

INSECTICIDE. Insecticides are fluids for dostrnying certain inseot and other pasts, and so protecting trees and plants. They may be divided into two classes, one used against suoking and the other against hiting insecta.

Washes of the poison type act by poisoning the food of the insects, and are used for all the leaf-eating pests. Arsenate of lead in paste form is recommended, and the formula for making it is $\frac{1}{\mathrm{lb}}$. of lead arsenate pasto to 5 gallons of water. The wash should be applied in a fine spray, the aim being to wet all the leaves without drenching them, so that when they have dried they will be oovered uniformly with poison. Contact insecticides, which are aprayed on to their objective, kill insects, not by poisoning their food, but hy contact with their bodies. To attain this, the washes should be applied with as much force as possible with a coarse spray. A wash containing nicotine is advised.

The formula for nicotine soap wash is 홓 oz. of nicotine to $\ddagger \mathrm{lb}$. of soap and $\overline{5}$ gal. of water. Both the water and the soap should be soft If, however, the water is hard 1 lb . of soajp should be used. Dissolve the soap in hot water, dilute it. to the required strength, and the nicotine, and then stir it well. Hard soap can be used if soft cannot be obtained.
It should be noted that niootine and lead arsenate are very deadly poisons. Lead arsenate should not be used where vegetables are grown underneath fruit trees, or on gooseberry bushes if the fruit is to be picked green. If nicotine is applied, a fortnight should bo allowed to elapse before the vegetables or green fruit are gathered. Empty nicotine bottles must always be destroyed. See Apple : Currant Sawfly ; Fruit; Gouseberry: Green Fly: Spraying: Syringe, etc.
INSERTION: In Needlework. An in. sertion is a narrow strip of lace with straight edges on both sides, which distinguishes it from a lace horler.

The original ure for an insertion was to join two pieces of material together, as its French name of entre deux, that is, betwcen the two, inıplies. In this way it was used to
 Repeet from now. Repeat from lst row
for length required for the work.

Crochet Insertion. 'i'he example illustrated was worked with No. 26 ordinary crochet cotton and a No. 5 steel hook. and measures nearly 2 in. wide. Begin by making 45 chain stitches for the foundation. lst row : 1 treble into the ninth chain from the hook, 2 clain, miss 2 chain, 1 treble in
the next stitch, making n space; repeat from * four more times, then 1 treble in each of the next three stitches, 0 spaces, 5 chain. Turn
2nd row: 3 spaces (putting the first treble on the second treble from the hooki, 6 treble, 3 spaces, 6 treble, 3 spaces, 5 chnin. Turn. Turn each row with 5 chain throughout the pattern, and this will form the first space of following row.

3rd row : 3 spaces, 9 treble, 1 space, 9 treble, 3 spaces. 4th row: 4 spaces, 6 treble, 1 space, 6 treble, 4 spaces. 5th row: 6 spaccs, 3 treble, 6 spaces. Gth row: 4 spaces, $G$ treble, 1 space, 6 treble, 4 spaces.
7th row : 3 spaces, 9 treble, 1 space, 9 treble, 3 spinces. 8th row : 3 spaces, 6 treble, 3 spaces, 6 treble, 3 spaces. 3th row : 6 spaces, 3 treble, 6 spaces. Repeat from the 2nd row for the length of insertion required.

Machine-made embroidery insertions can be inset by machine when the insertion is tacked to thie material on the right side and machined down close to the edge of the hem. Then a narrow hem is turned on the wrong side and if hand sewn the stitches will be practically invisible. When sewing lace insertion on a fine inaterial the latter can be rolled and whipped to the edge. See Crochet; Knitting; Lace.

INSOMNIA. Sleeplessnces may arise from any of the following minor causes : cold feet, bad ventilation of bedroom ; uncomfortable bed, too heavy, too warm, or insufficient bedclothing, a hot room ; hunger, a full stomach, too high or too low a pillow, noise, too much light in the room, tea or coffee taken late in the cuening ; mental or physical overwork and exhaustion, want of exercise, worry, financial anxiety, domestic troubles; retiring at irregular hours, and from many other small errors which can be corrected.
Habitual insomnia may result from a prenccupation of the mind with the worries and chagrins of the daily lifo; but it may result also from repressed experiences, whether or not thesc assert themselves in dreams, arousing the patient to unensy wakefulness. In these cases psycho-therapy may be of service.

In relief of the condition the following precautions should be observed
See that the ronm is well ventilated. It should have a fireplace or an efficient ventilator.

The window should he wide apen, or the top sash lowered 8 to 12 in . The best temperature for a bedroom is a bout $60^{\circ}$.

Let the bedclothes be light, but sufficiently warm. For most picople a pillow 3 in . high is safisfactory. It is often a good plan to raise the head of the bed about 2 in . by placing blocks of wood under the legs at that end This tends to prevent any undue filling of the brain vessels with blood. Never go to bed with cold feet.

As a rula it is well not to eat a substantial meal Inter than three or four hours hefore bedtime. On the other liand, the want of food may banish sleep. In this case a glass of warm milk with a few biscuits should be taken at bedtime. Sometimes when one wakes up and cannot get off to sleep again, munching a biscuit proves effective. Strong ten or coffee taken late may prevent sleep.

It is best to cease both mental or physical work at least an hour before bedtine. A tepid bath just before getting into bed is another good remedy, or a hot foot-bath may be effective. A brisk walk is an excellent producer of sleep, even when one is already tired. Massage is one of the best remedies. Sometimes the change from a hard to a soft bed, or vice versa, will effect a curc. Go to bed at regular hours, and just before getting into bed sponge the face with tepid water, and then brush the hair for a few momenta. Repeating poctry, counting numbers, picturing peaceful scenes, and many other such devices sometimes succeed in mild cases; and autosuggestion may be useful.

Drugs should only be used when other measures fail, especially in habitual insomnia, and then should never be used except when under the care of a doctor, or a drug habit is formed and difficult to break. See Sleep.

INSULATOR. This is a substanco which offers an oxtremely high resistance to the passage of an electric current. Insulators are used to prevent the flow of electric currents between conductors, or bet ween a conductor and earth. Such substances as glass, cbonite, bakelite, mica, glazed porcelain, vulcanite, etc., are good insulators.

Insulin. See Diabctes.

## INSURANCE: LIFE, FIRE AND ACCIDENT

## Protection for Property and Provision for Death

This arilcle deals with the whole subject of Insurance as far as it affects the houschalder. Insurance agalnst lll-health, the national scheme, is explained In the succecding article. See Burglar Alaım; Fire; Fire Alarm: Motoring
Insurance is a 日ystem whereby for a con-insurer can prove that something material sidcration, usually the premium, an insured person has made good for him, up to the limit of his insurance, loss or damage befalling him through an event insured against. Insurances are usually carried by companies, but sometimes by individual underwriters, and occasionally by mutual associations. The operations of those carrying on insuranco are contmilerl by various Acts of Parliament, so that the interests of the public are fully protected in every way.
Kinds of Policy. Practically all the offices now transact all classes of business, varying according as the policy is a fire policy, a life policy, a marinc policy, or an accident policy ; and, as the accident section of the business includes all the miscellaneous classes of business, the accident policy conditions vary accorling to the class of risk insured. Policy conditions are in the main an epitome of conmon law bared on common sense.
Those who are insured should appreciate two of the principles lying behind these considerations, viz., good faith and indemnity. Good faith requires that notling material to the contract into which an insured may enter sliall be withheld from his insurer, and if the
to him to know has not been disclosed, the policy issued by him is void.

A policy of insurance is a contract of indemnity, i.e. an insured is only indemnified against any loss or damage sustained by him through the happening of the ovent he has insured against, but no more. If he were to securo more, he would convert his loss into profit, and this by many legal decisions has been beld to be contrary to public policy. Personal accident policies and life policies, however, are not strict contracts of indemnity, the sums payable under them being determined by the amoment of the insurance, and not, as in contracts of indemnity, by the loss, but always within the limit of the insurance. Insurable interest is also necessary. Possession does not of itself constitute insurable interest, though the householder's comprehensive policy, including, as it does, the property of himself and his household (including his servants), might suggest this.

Practically every contingency to which human life and property are subject may be covered by insurance. The following. apart from the more usual types of insurance, make
somenppuen to the householder ; key insurance,
live stocl: insurance (for other than fire ot lightning damage), plate glass insurance, public liability insurance, baggage insurance (a form of marine insurance), and some of these are included in the householder's comprehensive polioy described below.

A Comprehensive Policy. Originally com. bined policics for the houschold were confined to the risks of fire and burglary. Later, when accidents to servants were included under the Workmen's Compensation Acta, a householder's liability in this respect was added to this combined cover, other miscellaneous riske being also included. Now a householder ean obtain what is callerl a comprehensive or "all-in" policy, covering the majority of the risks and liabilities to which he is exposed.
A perusal of the prospectus of any reputable insurance company will give full details of the cover granted by such n form of policy. The polioy may cover building or contents or both, and the rates charged are, as regards buildinge if all the risks specified are covercd, 2 s . 3 d pet cent, if certain risks (cartliquake, alorm and tempest and others) are cxcluded, la. 9d. per cent, or if the cover is limited to fire, explosion, lightning or thunderbolt, is Gd. per cent Contents policies may be obtained in respect of private divelling houses, fints, residential chambers and private dwellings forming part of business premises, but for the last an increased premium may be required. From the contents insurance are excluded motor vehicles and accessories, livestock other than horses, and such things as deeds, stamps, manuscripts, etc., unless specially stated in the policy.
A condition of the policy is that the full value of the property shall be insured, and the insured is required to sign a declaration which he agrecs shall be the basis of the contract ; if the sum insured is less than the value, his declaration is false, and in this case the policy can be made void

Proving a Claim. An insurance of this description has for the householder, besides its inclusive cover, the added attraction of one policy, one promium, one renewal. In the ovent of a loss arising, an insured person should promptly advise his insurance office, and they will tell him what to do to prove his claim. In this, as in the cffecting of the insurance, the essential thing is that he should observe good faith with his insurance office. In effecting an orlinary fire policy, however, covering fire only, an insured is not required to make a declaration as to value, so that it is possilile for him to recover any loss up to the amount insured
Life Assurance. Policies of life assurance differ from other insurance policies in that the latter are in respect to events which may happen, wherens life assurance policies have relation to an inevitable event death-the common lot. There being no escape from this, the prudent man will provide against it, and this for the man of limited means can best be done by means of life assurance

In the casc of ondinary asinga, all that is sccured at any time is the actual capital represented by these savings, and any interest accrued, but in the casc of life assurance one premium secures a capital sum of from 20 to 40 times the amount of the premium, nccording to the age at which the assurance is effected. this capital being available at the death of the assured for the benefit of his dependents. Security is thus obtained through the working of two principles: the average duration of a number of lives, ascertained by mortality tables, and the combination of insured lives, so that by regular payments of adequate premiuns there is formed the fund from which to provide the capital sums assured as these will necessarily fall due

Two Kinds of Policy. The two most usual forms of life assurance are whole life assurance and endowment assurance : the former nrovides
tor the payment of the sum assured at death, and the latter provides for the payment of this aum nt a given age, or at death. if this takes place carlicr. In the early years of life assurance the latter form of policy was rare or unknown, but to-day, for every whole life policy issued, two endowment policies are sasued. The premium on the whole life policy may be paid annually, half-yearly, quarterly, or in sume cases monthly. If it is imperative that the premiums in parly years ahall be as low as possible, half premiums may be paid for the first five yarrs; or if the policy is with profits the ordinary premium may be reduced by discounting the bonuses.

The premiums on an endowment assurance may also be paid by yearly or other inatalmients as agreed. and it may be so arranged that for the first five years the promiums are on the scale of a whole life policy. with the option of having the assurance converted into an endowment assurance after five years on pryment of the required premiums.

Premiums masy also be arranged to be paid for a limited term of sears in respect of whole lite policies, these policies, if with profita, still sharing in profits, after all the premiums are paid. Such policies carry special privileges ao regards surnender values and paid-up values. each premium securing a proportion of the original assurance.

Thus, if the premiums are limited to 20 payments and the assured for any reason docs not wish to continue the assurance, assuming he hiss paid say, five premiums. he can obtain a paid-up polioy for onefourth the original assurance, and to this is added any bonusey which have accrued The surrender values of such policies are similarly higher, and the asme is true of endowment assurance policies also, both as regards paid-up values and surrender values

Term assurances may be taken out to meet special circumstances which may terminate after a certain number of years. and such po!icies, if for a sufficiently long term, carry with them the right of having an ordinary assurance, with appropriate premiums for the age without further medical cxamination.

## Relief from Medical Examination

The provision relieving from medical exnmination is of importance. considering that health itself is uncertain. Other assurances are double endowments. securing to an susured a sum double the sum proposed if the life attains the age proposed; if denth takcs place earlier than the age proposed only the sum originally proposed being paid. Leasehold insurance is of importance to the houscholder having only a leaschold property. enabling him for $n$ comparatively small premium to provide the capital sum required for the renewal of his lease; pure endowments are endownents only, i.e. payable only if the age for payment is reached. Usually there is a provision for the return of the premiums if death takes place earlier. Children's endowments are usually of this type

Since the Grent War the volume of life assurance business transacted has notably increased, but even now it is probably not on $\Omega$ scale sdequate to the needs of the indivilual hnuscholder So often at tho death of the breadwinner the only provision is a life policy, but this. unfortunately, quite in: adequate It his been suggested that the lifo nssurance policy taken out should amount to, say, five times the annual income.
Some of the newer types of policy endeavour to overcome this by an income plan polioy, which can be arranged whether the assurance is whole life or endowment It provides, in the crent of death within 20 years of the date of the policy, for the pryment of a capital sum, plus an income of one-fifth of the capital sum for the balance of the 20 years.

Schemes in connexion with the operations of building societies and staff asaurance and pensions schemes have helped to swell the total busincss transacted. There lias also been n notable advance in recent years in the honuses declared by life offices. pmbably mainly becanse of the incrensed rate obtained by offices on their investments. Many intend ing insurers are still attracted to the without profits policy because of the immediate maximum cover secured for the premilm They may be paying : for many it is still worth while to take out with profits policy

The rebate for income tax increases the value of a life nssurance polioy and this is obtainable in respect of premiums on policies on a man's own life or on the life of his wife. The tax payable is reduced by as sum repre senting tax at half the standard rate up to onesisth of the total income, but if premiums exceed 7 per cent of the sum assured there is no relicf in respect of the excess

Benefls for Children. Other assurances of special benefit for children are clucational assurance and deferred assurance The former may be on the father's own life and provile for payment of a certain sum in the later school years of the children, and it can be arranged that if the father dies earlier the premiums cease. The most rocent form of polioy combines, with educational benefits for children and family protection, income on retirement and remission of premiums during illness Children's deforred asaurances provide, for comparatively low premiums policies which may be whole life policies or endowment policies available for the child upon attaining his or her majority.
l'roof of aye should be submitted at the time a policy is taken out: then all that is necessary to secure payment of the sum assured is the proofs. The pmofs of death usually requined are registrar's certificatc of death, certifionte of death signed by the doctor whn attended in the last illnese, and a certificate of identity from some intimate friend.

A number of policies are taken out for the express purpose of paying death duties, the sum assured being paid over to the inland revenue authoritics before the issue of probate. This arrangement makes it unnocessary to realize for the purpmse of paying death duties any of the property left by the deceased.

Accident and Sickness Assurance. There are throe classes of policics, one confined to personal accident only, one combining personal accident with certain specilied
discases. originally confined to such as are notifiable to the medical officer of health but now extended to about fi0 in all and one combining personal accident with all sickness or disease Disease must he something pronounced and manifest. and sickness means any illness requiring the attendance of a doctor. There are two systems of policy in respect of sickness insurance, one into which the age does not enter, except that policies are not issued to persons over 60 (in some cascs over 55) ; and the other strictly actuarial, age and other factors being taken into account. Certain risks, suoh as motorcycling, etc., are only covered by special agreement : the policies. excent as atated. are annual contracts and terminable by the office on formial notice, and a pin rata return of premium for any part of the year of insurance that is not expired
Risks from suicide, intoxication, war, invasion, riot and civil commotion, military or naval service, racing, or aviation, are ex cluded; also in the case of a disease and sicknesq oontract. venereal diseases. drug taling. nad insanity. Medical expenses are payable under the disease and sickness contract, and there is a system of cumulative bonuses inoreasing the original sum insured by 5 per cent at cach renewal up to 50 per cent should a policy remain continuously in force
Claims should be notified within 14 or 21 ditys. Women are eligible for this olass of insurance if engaged in some wage-earning profession or occupation, at higher rates than are charged for men, and ordinarily such policies exclude risks arising in connexion with child-bearing

Industrial Assurance. For the working man. industrial life assurnnce may be ob. tained through the collector at a cost of a few pence per week the policy securing at lenst a sum available for funeral expenses, the limit of the assurance, which is without medical examination, being $£ 100$. Policies can also be taken out on the lives of children, but the amount of such is limited to $£ 15$.
Newspaper Insurance. Mention should be made of the insurance against accident which is effected by means of a subsoription to some of the daily papers, notably The Daily Sketch. The Daily Dispatch, The Daily Mail, and The Daily Exprese. By giving an order for the paper to be delivercd and filling up $\Omega$ form the subscriber is entitled to certain benefits in case of accident or accidental death Full details as to the exact nature of these will be found in the paper concerned.

## Insurance: The National Health Scheme <br> Payments and Benefts that Affect Millions of British Workers

## Thls subcer is of interest both is the cm:ljyer and employed. Other articles that deal in one <br> way or another with their relatlons are Emp'oycrs' Liability; Servant. See also Accidents and

the entry on nsura cee against unemployment that follows
In Great Britain and Northern Ireland since atatutory company that provides benefits for 1911 the great majority of the workers have its employees that are not less than those given been insured by the state against sickness, and since 1926 this scheme has beon linked with the one giving pensions to insured peraons and their wives on reaching the age of 65, instead of waiting until they are 70. The scheme also provides pensions for the widows of insured persons and allowances for fatherless and orplaned children. All these benefits are covered by a single weekly payment.

The Exceptions. In general all workers hetween the ages of 16 and 65 must he insured Certain classes are excepted, the chief being all non-manual workers who are in receipt of a salary of over $£ 250$ a year. Manual workers, whatever their remuneration, must be insured, unless they belong to certain excepted employments. Excepted employment, in this sense, is service under the crown a public authority, or a railway or other
under the national scheme. A certificate of exemption can be obtained by a non-manual worker who has a private income or is otherwise independent. In these cascs, however, the employer must pay his share of the weekly contribution. Otherwise he would be under a temptation to give prelerence to persons who can obtain exemption from the insurance payments. Peraons who need not be compulsorily insured can insure as voluntary contributors. Such pay a smaller weekly premium, as they are not entitled to medical benefit.

Contributions. The ordinary rate of health and pensions contribution is ls. Gd. a week for men, and ls. ld. a week for women. In Northern Ireland the rates, until 1930, were lower (1s. 4d. and 11d.), but they are now the same as in Great Britain. The contribution
is paid by affixing a health and pensions insurance stamp to a contribution card. Contributions at the above ratcs cease to be payable when the insured person reaches the age of 05 . Where, however, a person is insurably employed after the age of 65, a weekly contribution of 9 d (man) or 7 d . (woman) is payable by the employer.

In the case of an employed contributor, a contribution is payable for every contribution week, i.e. from Monday to the following Sunday during the whole or any part of which the contributor is employed or for which he receives wages, but no contribution is required to be paid for any week during which the member is prevented by sickness from working, whether he receives wages or not.

The whole of the contribution is payable in the first instance by the employer, and must be paid by stamping a card at or before the time of payment of wages for the week for which the contribution is due. The employer is then entitled to recover by deduction from the wages the employee's share of the contributions so paid. The employee's share is ordinarily 9 d . in the case of men, and 6d. in the case of women, but in certain cases of low wage earners the employee's share is less, as explained on the contribution card. No part of the contributions payable for employed persons over 65 is recoverable from the employee. An employed contributor is entitled to be excused arrears for weeks of genuine unemployment if he furnishes his society with satisfactory evidence of his inability to obtain entployment.
The Benefits. The ordinary benefits to which insured persons are entitled in return for contributions in respect of health insurance aremedical, sickness, disablement and maternity.

Medical benefit consists of the provision of medical attendance and treatment, including treatment and attendance for tuberculosis and the provision of proper and sufficient medicines and such medical and surgical applianoes (and chemical reagents) as are named in the regulations made in the Minister of Health. It does not include medical attendance or treatment in respect of a confinement, which is the subject of a separate benefit.

Sickness benefit moans periodical payments during incapacity for work caused by some specific disease or bodily or mental disablement of which notice has been given, commencing ordinarily on the fourth day of such incapacity and continuing for a period or periods not exceeding 26 weeks in all. Disablement benefit is a continuation of the periodical payments at a lower rate in respect of incapacity after the period of sickness benefit has been exhausted. The right to sickness and dissblement benefits ceases when an insured person reaches the age of 65, but, subject to the nccessary conditions having been satisfied, a contributory old age pension then becomes payable.
The ordinary rates of sickness benefit are 15s. a week for men and 12 s . for women, but until a person has been insured for 104 weeks and 104 weekly contributions have been paid in respect of him, sickness benefit is payable at the reduced rates of 98 . for men and $7 \mathrm{~s}, 6 \mathrm{~d}$. for women. The normal rate of disablement benefit is 7 s . 6d. a week for both men and women. All these rates are subject to reduc. tion when the member is in arrears with his weekly payments.
Maternity benefit consists of the payment of a sum of 40 s . On the confinement of the wife (or, in the case of a posthumous child, of the widow) of an insured man, or of a woman (whether married or unmarried) who is herself insured. The benefit is paid by the approved society concerned. If a woman is herself insured, she is entitled to maternity benefit from her society in respect of her own insurance. and in the case of a married woman this
is additional to any maternity benefit payable by her husband's society in respect of his insurance.

Sickness, disablenent, or maternity benefit is not payable to any person in respect of a period when such person is an inmate of a hospital or similar institution supported by a charity or by voluntary subscriptions or out of public funds; but it can be devoted to the relief of his dependents or to defraying the expenses of the hospital or accumulated until he is discharged.

Married Women. An insured woman who marries is required to give notice of her marriage to her society within eight weeks thereafter, and any woman who fails to comply with this requirement is liable to a penalty. If owing to the failure of a woman member to notify her society of her marriage more sickness benefit is paid to her than she is properly entitled to receive, the society is entitled to deduct the excess from any benefits which may subsequently be payable to her.

An insured woman who marries and who, immediately before her marriage, had already completed eight consecutive weeks of unemployment, or who completes that number of weeks of unemployment within the year im. mediately following her marriage, comes under special provisions as to health insurance benefits on her marriage or on completion of the eight weeks of unemployment (whichever first occurs). In reckoning this period of eight weeks no account is taken of weeks of siokness of which the society is notified at the proper timo, or of weeks during which the woman shows to the satisfaction of the society that she was available for, but unable to obtain, employment.

The Insurance Card. Every insured person is required to obtain a contribution card from his society or from the post office, and his employer can demand its production at any time. It must be delivered to the employer on the commencement of an employment and whenever he may reasonably require it for the purpose of paying contributions, or for production to an inspector or to any other authorized person.

There are two methods of arranging for the custody of the card during its currency. The first is for the employer and worker to agree that the employer shall keep the card, in which case he is responsible for its safety; he must stamp it regularly at the proper times and must return it to the worker upon the termination of the employment, or, if the worker leaves without notice, within 14 days, upon the expiration of the period of currency of the card or within six days thereafter; and where the worker at any time so requests, within 48 hours after the receipt of the request.
The other way is for the worker to keep the card, and this must be done unless the employer and worker agree that the employer shall keep it. When the worker keeps his card the employer must, on each occasion of stamping, return it to him as soon as he has stamped it. On the death of a worker whose card is then in the hands of his employer, the card should be forwarded to the insurance department of the Ministry of Health as soon as possible.
Joining a Soclety. To obtain the full advantages of insurance it is necessary to join an approved society. An insured person can join a society at any time. A list of approved societies, giving the addresses of their secretaries, may be seen at the office of the local insurance committee, or at any employment exchange, or district office of the Ministry of Health, Insurance Department.
To join an approved society the first step is to ask the secretary, or agent, of the society selected for a form of application for membership. After this is filled up and sent in, the applicant should receive within a reasonable
time a notification from the society that he has been accepted or rejected, as the case may be, and he should make further inquiry if he does not receive notification within one month after application. An insured person who doek not join an approved society within a certain time becomes a deposit contributor.

At the end of every half year an insured person must send up his contribution card to his society, or, if he has not joined a society, to the Ministry of Health, Insurance Department, or to the Welsh board of health, according to the instructions printed on the card. No credit can be given for the contributione until the card is received by the society or the Insurance Department.

INSURANCE: Against Unemploy-
aent. The national scheme for insuring ment. The national scheme for insuring duced in Great Britain in 1911. At first it was confined to certain specified classes of workers, but in 1916 many munition workers were brought in. In 1920 there was a large extension, and the scheme now applies to all employees between the ages of 16 and 65 , except non-manual workers who receive over $£ 250$ a year, and certain other classes.

Exempted Classes. Apart from these nonmanual workers the chief classes of persons who need not be insured under this scheme are agricultural labourers and domestio servants. Employees of local authorities, of railways and other publio utility undertakings, and also persons with rights under statutory superannuation schemes, are exempt if the Minister of Labour grants a certificate. Other industi ies can set up insurance schemes of their own, and if the minister thinks these are satisfactory the employees therein can obtain exemption from the national scheme. To be satisfactory these schemes must give benefits at least equal to those of the national scheme.

Weokly Contributions. The contributions to this scheme are paid in the same way as contributions to the national health insurance scheme. Every week the employer must stamp a card for each employee insured. Part of the cost of this stamp falls on himself, but part he can deduct from the wages of the employee. The weekly contributions are as follow:
Men
$\begin{array}{ll}\text { (is to } 21 \text { ) } & \because \\ & \because\end{array}$ Women
Boys
Girls $\underset{\substack{\text { Boys } \\ \text { Girls }}}{\text { Con }}$

| Employer | Employee | Total |
| :---: | :---: | :---: |
| 8 f . | 7 d . | 18. 3d. |
| 7d. | 6 d. | 1s. 1d. |
| 7 d . | 6d. | 18. 1d |
| Od. | 51. | $11{ }^{\text {d }}$ |
| 4d. | 31d. | 7 dd . |
| 3td. | 3 d . | $61{ }^{\text {d }}$ |

Contributions cease to be payable when the employee reaches the age of 65 , as he or she is then qualified for an old age pension. If, however, the employee continues to work, the employer must pay his share of the joint contribution.

Rates of Benelit. The benefits are at the following rates :


In addition there are allowances for depen dants, these being 98 . for an adult and 28 . for a child. Thus an unemployed man with a wife and three dependent children will draw 32s. a week. No contributions are required during periods of unemployment.
To obtain the benefit the unemployed person must prove: (1) That not less than 30 contributions have been paid in respect of him or her as an insured contributor in respect of the two years immediately preceding the date on which application is made. (2) That he or she has made application in the prescribed manner, and proves that since the date of the
application he lias been continuously unemployed. (3) That he or she is capable of and available for work. (4) That, if so required, he or she has duly attended an approved course of instruction. The Act of 1930 repealed a condition in the 1924 Act, "that the applicant is genuinely seeking work, but unable to obtain suitable employment."

Disquallications. A claimant is disqualified for receiving benefit if it is proved by an officer of the Ministry of Labour: (1) that he or she has, without good cause, refused or failed to apply for or refused to accept a suitable situation notified to him or her as vacant or about to become vacant; or, (2) that the claimant has, without good cause, refused or failed to carry out any written directions given him or her, with a view to assisting him to find suitable employment.

A worker is disqualified if he or she is unemployed owing to a stoppage of work which is due to a trade dispute, or if he or she has left his work through misconduct or without just cause. He or she is disqualified, too, if the inmate of a prison or workhouse, or if in receipt of an allowance under the health insurance scheme.

The benefits are paid out at the employment exchanges, or, if the insured prefers, through a trade union. The officials of the exchanges are responsible for verifying the claims made. Disputes are settled by courts of referees. Both employers and employees have reprementatives on these courts and the chairmen are appointed by the Ministry of Labour.

INTARSIA. This is a way of inlaying wood which is now practically identical with marquetry. In its origin intarsia was the inlaying of one or more colours upon a lighter or darker ground, while marquetry proper is composed of pieces of thin wood or other material of equal thickness laid down upon a matrix and fastened with glue. See Inlaying; Marquetry ; Mosaic.

INTENSIFIER : In Photography. When a negative, whether on glass or on a film, is too thin to give a satisfactory print, it may be subjected to a process of intensification whereby, in suitable cases, a negative which gave a hat print with poor detail may be made to give a quite satisfactory silver print. The amateur, however, should be extremely cautious in using any of the intensification processes detailed below, particularly if the negative is one which is valucd.

The mere re-wetting of a negative is frequently attended with risk of stain or other damage. Under the best conditions some intensifiers, particularly those containing mercury, are liable to attack the gelatine, causing holes or reticulation, i.e. a series of wavy cracks in the gelatine of the negative. They also shorten the life of the negative.

Every effort, therefore, should be made to obtain satisfactory prints before resorting to intensification. If it is decided that a negative must be intensified, first make the best print that can be obtained on vigorous gaslight paper to keep in reserve.
It is useless to attempt to improve the printing strength of a negative which gives Hat prints because it is fogged; the intensifier will simply increase the fog and make the result worse. If the negative is freo from fog the edges which have been held in the dark slide will be seen to be perfectly clear. Make certain that the plate or film has been thoroughly fixed and properly washed; a trace of hypo left in the negative is almost bound to cause irregular stains after intensifying. See that the surface of the negative is free from smears, stains, or a chalky appearance, the latter indicat ing insufficient washing.

One of the safest processes is the following : The negative is first placed in a solution of 20 gr . of alum to 1 oz . of water to harden
and clear it, leaving it in the solution for a bout $\frac{1}{2}$ hour. It is then washed and placed in a solution made by dissolving 30 gr . of potarsium bichromate in 3 oz . of water and adding 1 dram of hydrochloric acid.

The hydrochloric acid should be the pure acid obtained from the chemist, and not spirits of salt ; 60 drops can be counted out if a dram cannot be measured. The negative will quickly become white, and the action should be allowed to continue until the bleaching is complete; it is then washed until the whole of the yellow stain is removed, which will take anything up to an hour.

When it has been thoroughly washed the negative is re-developed in a non-staining developer, such as amidol or metol-hydroquinone. When it will darken no more, wash well and dry. This intensifier is best suited to cases where the negative has been properly exposed but is under-developed, i.e. it is clear and bright, but thin. If the amount of intensification is insufficient, the process can be repeated, omitting the alum bath.

For a negative that is thin through underexposure and has not been seriously overdeveloped, uranium intensifier will give good results, provided the negative is absolutely free from hypo. The solutions are :


Mix 1 or. each of $A$ and $B$, and add 1 dram of acetic acid. After intensitication wash in several changes of water (not running water) until all stain is removed.

For a plate that is over-exposed but not over-developed, i.e. it is thin but has a veiled and flat appearance, the mercury and ammonia intensifier may improve matters. It is liable to cause pinholes and discoloration after a time; as explained above, it should be used with caution. The bleaching solution is macle up of :
Mercury perchloride (corrosive subli-
mydrochloric acld
Water to
50 gr.
5 oz .
The hydrochloric acid is dropped on the powdered mercuric chloride, and the water then added.

Note that the solution is extremely poisonous.
The negative, being soaked as before in clean water, is placed in the above solution and the dish rocked until the back of the plate appears quite whitc. Wash thoroughly in running water for about $\frac{1}{2}$ hour, and then blacken in the following solution :
A mmonia (strength .880 ). . 20 min It may also be blackened in hydroquinone, pyro-ammonia, or ferrous oxalate developer. See leveloping; Fix ing; Hypo; Wash. ing.

INTEREERENCE. In a wire. less receiver this is the intecruption caused by unwanted signals, c.g. undesired broad. cast transmissions, atmospherics, induction from electrical machin. ery, etc., on the
wave-length to which the set is tuned. See Selectivity.

INTEREST. Interest is money paid for the use of money. It is calculated at so much per cent, i.e. per hundred, and varies according to the standing of the borrower, the state of the money market, and other matters.

As it is occasionally necessary to calculate interest in household matters-for instance, when a house has been bought or built by the aid of a mortaage-the following method mav be found useful: Divide the amount of thi loan by 100 and multiply the answer by the rate of interest. Thus, if a man borrows on his house $£ 450$ at $3 \frac{1}{4}$ per cent., he should divide $£ 450$ by 100 , i.e. $4 \frac{1}{2}$, and multiply the $4 \frac{1}{2}$ by $3 \frac{1}{2}$, i.e. the annual interest will be 15 , i.e. $£ 15158$. It is well to remember that 5 per cent is exactly $q_{\text {a }}$ shilling in the $£$, and $2 \frac{1}{2}$ per cent is sixpence.

Interest is usually paid half-ycarly or quarterly, and the borrower is usually entitled to deduct income tax from the amount he pays. Income tax, however, is not deducted from the interest on bank overdrafta, but the amount paid can be deducted from the income when the return is sent in. Interest on these overdrafts is charged quarterly. See Banking: Building Society ; Mortgage.
INTERNAI COMBUSTION BNGINE. There is an essential difference in the working of the internal as compared with the external combustion engine. With the latter, the fuel may be consumed away from the engine, which is the actual power producer. In the steam engine, for instance, fuel is consumed under the boiler, thus raising the water to a sufficient heat to give off the steam, which is conveyed to the cylinders.

With the internal combustion engine the conditions are entirely different. The fuel is gaseous, or is rendered so by vaporisation, and is burned in the engine. We may tako the petrol enginc as the type. Through the medium of the carburetter the fuel is drawn into the cylinder in a semi-liquid form composed of a mixture of air and sprayed petrol. This is turned into a highly explosive petrol gas as it enters the engine, and is exploded through the medium of the high tension spark that is caused to jump the points of the sparking plug at precisely the right moment.

Fig. 1 illustrates the Otto, or four-stroke cycle of operations. The diagram shows the four strokes of the piston that go to produce one power impulse, namely, induction, compres sion, explosion or power st roke, and exhaust. As the piston has to descend and ascend during one complete revolution of the crankshaft, two complete revolu. tions of the crank go to make one cycle of operations No matter whether the engine has one or a dozen cylinders, the cycle of operations will be the same for cach; the only difference is the firing periods.

In the cycle of operations the chief factor is the valves, two of whichare cmployed, an inlet and exhaust valve, for each cylinder of the engine. The inlet opens at the commencement of the induction stroke and closes at the
end : the exhaust valve remnins on its seating. Both valves remain closed during enmpression and the firing or power stroke. Finally the exhnust valve opens on the exhaust stroke, the inlet valve remaining on its scating; at the end of the exhaust stroke the inlet valve again opens, and so the operation gees on. The valves are operated by the camshaft. Igni-

INTESTACY. An intestate is a person who dies without having made a valid will disposing of all his property. The property of an intestate is used first in payment of the funcral and other expeases and debts, and the residue is diatributed in accordance with certain rules. In English law no distinction is now made between real and personal property
share on attaining the age of 21 or marrying before that age If a child of the intestate has predeceased him or her, any children of that child living at the death of the intestate will takic the share to which their parent would have been entitled had he or she survived.

If the intestate leaves no descendants the following classes take in order, subject to a


Fig. 2. A. induction and compression : B. transfer to cy!inder ; C. explosion ; D. exhaust
tion is carried out usually by a high tension magneto, driven at crankshaft speed, or by a coil and accumulator

Two-Stroke Cycle. The difference betwcen the two-stroke engine and the four-stroke is that the former has one power stroke at every downward atroke of the piston, and the latter at every alternate down stroke. There are lirec main working parts, the piston, connecting rod, and crankshaft, no valves, timing gears, camahaft, and tappets being required. The half-compression valve or decompressor shown in the dingram is provided to facilitate starting the engine.

The cycle of operntions is shown in Fig. 2. The initial induction and compresaion of the fresh charge takes place below the piston and in the crankcase. There are four ports positioned in the cylinder walls and controlled by the movement of the piston, the sequence of operations being as follows :
The piston rises and creates a partial vacuum in the crankcase. On rising further, the inlet port is uncovered, thus allowing the fresh clarge to enter, assisted by the vacuam crented. On the completion of the up stroke the piston descends and compresses the charge in the crankcase, and just bcfore the stroke is completed, uncovers the transfer ports, allowing the compressed charge to pass via these to the top of the piston.

After the piston has risen a little way the transfer ports are closed, and the further tise of the piston compresses the charge that is now on top of the piston in readiness for the explosion to take place immediately the piston commences the down stroke. During the down stroke the same cycle of operations is going on below the piston in readiness for the opening of the transfer ports. This cycle is cominon to all two-stroke engines.

As the fresh gases enter the cylinder when the burnt gases are passing out through the exhaust ports, a certain proportion of the fresh gas is hound to mix with and pass out with the exhnust residue. This fault is guarded against as far as possible by the provision of a bafle cast on the piston head that tends to deflect the fresh gas to the top of the cylinder, thus keeping it for as long as practicable from coming into contact with the exhaust. Figs. 3 and 4 show a two-stroke stationary engine. See Big-End; Camshaft; Carburetter; Crankshaft; Lubrication; Motor Car ; Motor Cycle, etc.

If the intestate leaves a husband or wife he or she takes all the personal chattels of the intestate-i.e such things as furniture, silver; jewelry, motor cars and the ardinary contents of the home, and in addition a sum of $£ 1,000$ absolutely. After this payment has been niade any residuc left over will, if the intestate has left no descendants. be he!d in trust for the husband or wife for life-i.e. he or she will receive the intereat on the money, but not the capital sum.

If there are descendants the husband or wife will get a life interest in half only of this residue and the descendants will take the whole residue subjeot to that life interest upon what are called the statutory trusts. 'Jhat means that the children will divide the property cqually, each becoming entitled to his or her


Internal Combustion Engine. Fig. 3. Petter 3 B. H.P. © Universal ' parafflo or netrol engine. Fig. 4. Secetional view. A. Fuel lank base. B. Crankshaft (tywheel removed). C. Governor thrust block, D. Oil drain cock. E. Air inlet plate. F. Connecting rod. G. Gudgeon pin. H. Cylinder jacket draincock I. Piston. J. Exhaust port. K. Inlet port. L. Cylinder. M. Water hopper. N. Sparking plug. O. Water jacket. P. Fuel nozzle. Q. High-tension cable. R. Fuel clamber. S: Fuel regulator needle. T. Throftio U. Magneto. V. Fuel delivery pipe. W. Fuel drain pipe. X. Fuel pump diaphragm. Y. Governor lever. Z. Fuel filler cap

Courlesj of l'elfern. Lid. Yeovll
the wall of the caecum. It communicatea with the bowel, but is closed at the other end. The important role of the intestine in the processes of digestion is dealt with under that heading

The intestines are subject to a large number of diseases. Inflammation may attack the intestine as a whole (enteritis), and also involve the stomach (gastro-enteritis), or affect only a part of the intestine, as the capcum (typhlitis), the colon (colitis), the appendix (appendicitis), the rectum (proctitis). It may be acute or chronic, a mild catarrh, or a severe ulcerative form.

Improper diet is one of the chief cauces. Tainted meat, unripe fruit, bad beer, the frequent use of irritating purgatives, chilling of the abdomen, may all set up inflammation. The common symptoms are griping, colicky pains, diarrhoea, thirst, nausea, and loss of appetite, leadache, languor, and prostration.
In cases duc to errors in diet two to four grains of calomel may lie given at once, or else from two teaspoonfuls to a tablespoonful of castor oil, with ten minims of laudanum added. Let the patient rest in bed. The food must be warm and liquid-skimmed milk, boiled arrowroot, well-beaten eggs, strained gruel. To relieve the pain, a iarge mustard plaster, fomentations or linseed poultices may be placed on the abdomen until the pain is easiet. If diarrhoea is severe or is prolonged, a doctor should be called in.

## Sagging and Obstruction

Sagging of the intestines is known as enteroptosis, and is generally associated with descent of stomach, kidneys, and sometimes liver and spleen. The common causes are poor development, a rapid loss of fat, tightlacing, many pregnancies, etc. Flatulence and constipation, neurasthenia, and a large variety of other symptoms may be present. Keep the bowels regular by means of laxatives such as two to four grains of cascara at night or liquid paraffin. A well-fitting abdominal belt often gives relief. Strengthen the abdominal walls by massage.
Obstruction of the intestines may arise from a large number of causes outside, in the wall of, or within the intestine. In an acute attack severe pain is suddenly felt, perhaps after a violent muscular effort. At first the pain comes in spasms, and commonly in the region of the navel; then it becomes continuous and agonizing. Vomiting soon appears; at first the stomach contents, then of bile, and finally of faccal matter. The doctor must be summoned instantly. Purgatives are most dangerous, and should never be given.
Tuberculosis of the intestine may occur through infection by ingested milk or other food, or may accompany tuberculosis of the lungs. It occurs frequently in cascs of the latter. The prominent symptoms are colicky pains and diarrhoen, with perhaps some blood and pus in the stools.
Duodenal ulcers occur, as a rule, in males between twenty and forty years old, and are upually preceded by months of more or less constant dyspepsia. Pain, three or four hours after meals, may lie felt in the stomach region. It frequently assumes the character of hunger pain, which comes on just as the patient is beginning to be hungry, and is relieved by taking food. There is generally blood in the istools, though it is not always obvious. Vomiting is common, and the vomit may contain blood. In somo cases medical treatment may be advised instead of operation. See Appendicitis; Colitis; Constipation; Diarrhoea; Digestion; Piles, etc.
INULA. These vigorous hardy herbaceous plants, rather coarse in appearance, bear large yellow daisy-like flowers in late summer. They flourish in ordinary sbil and are increased by division in autumn or by
seeds sown out of doors in May Glandulosa, Honkeri and royleana, all about 2 feet high, are the best; cnsifolia, 9 in . high, is suitable for the rock garden.
TNVALID COOKERY. The actual diet will be prescribed by the doctor, but the cook must be able to present it attractively and with sufficient variety to tempt the patient's appetite. Hot food must be served really hot, and cold food quite cold.

Much depends on the serving. A patient may refuse a dish which, if more attractively served, he would cat with enjoyment. Jellies, puddings and moulds are more appetizing scrved complete than as a helping, and soups, etc., more attractive in a dainty bowl than in a cup or soup plate. Highly Havoured things are to be avoided.

It is a mistake to send up large quantities of food to a sick-room, as the patient's appetite will probably disappear at sight of it.

Low diet consists of slops, and it is almost entirely fluid. A little bread or toast will represent all the solid part of it. For such diet the cook should send up some kind of liquid food at two-hourly intervals, varying her menu between milk, beef tea, gruel, Benger's food and such things. A liberal supply of barley water and lemonade is generally appreciated.

Light diet is usually understood to include fish, eggs, chicken, and milk puddings, thus giving the cook a wider scope for her ingenuity. Lightly-boiled or coddled egg and poached egg are suitable for invalids, while scrambled eggs are appetizing as well as wholcsome. Both fish and chicken are best steamed, but as the patient progresses he may have the chicken roast and the fish baked..
Full diet will include everything eaten by the normal person, with the rescrvations mentioned at the beginning of this article.

Among vegetables suited to invalid diet are potatoes (most digestible when mashed or baked), caulifower, vegetable marrow, wellboiled onions, spinach, asparagus, stewed tomatocs, and stewed celery. Of meats and fish the most digestible are chicken, turkey, pheasant (the breast especially), most kinds of birds, mutton, lean, tender beef, whiting, brill, soles, plaice, halibut, trout, turbot.

With specialized diets for definite diseases such as diabetes, chronic rheumatism or certain forms of heart disease the doctor will issue detailed instructions, for the cook to follow implicitly. See Beef Tea; Diet; Gruel; Imperial Drink, etc.
INVENTORY. An inventory is a detailed list in writing of furniture and other goods, usually drawn up for a particular purpose. When a furnished house is let it is usual to make an inventory of the furniture and utensils left therein, and when a house changes hands an inventory is made of the fittings, etc., which the incoming tenant is taking over. Such inventories are best made by an estate agent.

Sometimes an inventory of property and other possessions is made in connexion with the proving of a will, while an inventory of the personal possessions of the borrower must be attached to a bill of sale. See Executor; Furnished House; Will.
INVISIBLE MENDING. This term is used for a kind of mending which not only repairs the rent or hole, but removes all traces of its presence. It is generally left to tailors and others who make a speciality of it, but can be done, with varying degrees of success, at home. See Mending.

INVITATION. All formal invitations are written and answered in the third person. The usual form runs as follows: "Mrs. S. requests the pleasure of the company of Mr. and Mrs. K. oll Saturday, Nov. 10, at such and such a time." If an anziver is required it is
usual to put R.S.V.P. in the right-hand corner; but in any case it would be extremely bad manners not to answer.

The reply would run thus: "Mr. and Mrs. K. have" (not "will hare") " much pleasure in accepting Mrs. S.'s kind invitation for Saturday, November 10," or "regret they are unable to accept." It is to be noted that an invitation should be answered to the person from whom it is sent as designated by hinn or herself. For example, if it comes from Mrs. Arthur Walker, the reply should be addressed to Mrs. Arthur Walker. The reply should be prompt. Much inconvenience is cansed by people who forget or neglect to answer invitations until the last moment.
Wedding invitations are sent out by the bride's family. They are sometimes printed in silver, and are usually on a folded sheet of good notepaper. The wording is as foliuws: "Mr. and Mrs. Arthur Walker request the pleasure of Mr, and Mrs. Robinson's company at the marriage of their daughter, Mary Elizabeth, with Mr. Richard Kent, at St. Peter's Church, Eaton Square, on Saturday, Norember 10, at 2 o'clock." If the wedding is to take place out of London some people add a note in the corner giving times of trains, the nearest stations, etc. See At Home; Bridge Party ; Dance; Dinner Party; Etiquette; Erening Party; Wedding.

IODINE. A non-metallic element occurring in dark lustrous crystals, and procured largely from the ashes of burnt seaweed, is called iodine.

As a counter-irritant the tincture, the strong tincture, and the ointment are frequently used in chronic inflammations of the joints, swollen glands, pleurisy, etc. Painted on a bunion or chilblain, tincture of iodine sometimes markedly reduces the pain and swelling. The colourless tincture of iodine or iodine ointment is suitable for exposed parts.
Iodine is a powerful germicide. Accidental wounds may be painted or daubed with tincture of iodine, the surrounding skin also being dealt with. There is some smarting, but this quickly passes off.

For iodine poisoning gire an emetic (q.v.), and immediately send for the doctor.
It is uscful to remember that a weak solution of photographic hypo will remore iodine stains from clothing.
I.O.U. An I.O.U. is a piece of paper in this form

March 1, 1931.
To Mr. John Smith
I.O.U.

Twenty pounds.
(Signed) W. Jones.
This is an acknowledgnent of indebtedness only, and is very strong evidence that Jones owes Smith $£ 20$, but not that the transaction was necessarily $a$ loan. But it is not a contract or agreement. Nor is it like a bill of exchange or promissory note, which is negotiable; nor does it need to be stamped, as those documents do. If the I.O.U. goes on to say, " I promise to pay you the money on the lst of June," it is a contract or promise to pay, and must be stamped as a promissory note or with a sixpenny agreement stamp, or as a promissory note. See Promissory Note.

IPECACUANHA. The dried root of a Rrazilian plant yields the drug ipecacuanha. The dose of the powdered root is one half to 2 grains when used as an expectorant, 15 to 30 grains when used as an emetic.

Ipecacuanha is a reliable emetic, but it acts slowly. As such, one of its chief uses is to clear out the clogged-up air passages in chest diseases in children who have not yet learned to cough. The vomiting induced by the ipecacuanha, together with the expectorant effect of the drug, causes the accumulated mucus, etc., to be thrown out of the bronchial
tubes. The compound powder of ipecacuanlía iris (atylosa) (Dover's powder) is frequently prescribed as a diaphoretic in slight fever

IPOMOEA. These are quick-growing climbing plants. Some of them may be grown out of doors, while others are suitable only for a heated greenhouse. Ipomoea rubro-caerulea, which bears beautiful blue flowers in summer, is raised from seeds under glass in spring and may be grown in the greenhouse or planted out of doors in a warm sunny place in late May. Coccinea, bright red, and versicolor, red and yellow, are others that may bo grown in a similar way. The correct name of the common Morning glory (Convolvulus major) is Ipomoea purpurea. Horsfalliae, rose colonred, and Tearii, blue, must be grown in a hothouse Bona-nox, white, is suitable for the greenhouse

IRESINE. This plant, which is grown for the salie of its coloured leaves, is a favourite for summer bedding and is also useful in the greenhouse. It is easily increased by cuttings of the young shoots in spring in warmth under glass; if subsequently potted in 3 -inch pots they will be well rooted by early June when, after having bcen hardened off, they may be planted out of doors. A compost of loam, leaf. mould and sand is suitable. The favourite linds are Herbstii and Lindenii, with dark red leaves, and aureo-reticulata which has red and vellow leaves.

IRIS. This is one of the most important groups of garden plants; a selection of the best kinds will pro. vide flowers from early spring until late summer. The chief types are the May and June flowering bearded irises; the beardless irises and the Japanese irises which bloom in summer; and the early and late bulb irises which are at their best in spring and summer respectively.

The bearded flag irises are beautiful plants dist inguished by sword-shaped leaves and large flowers of brilliant and varied colouring, in May and June. The common purple flag iris (germanica), the best known of these, will thrive in partial shade, but the finer varieties need a sunny place. They may be planted from June to September in well dug soil to which lime has been added if necessary ; they do not Hourish in soil which lacks lime. An application of superphosphate of lime, 2 oz . per squaro yard, to the soil is beneficial. Care must be taken not to bury the rhizome or root stock deeply: it should be only partially covered with soil.

A few of the best of the numerous varieties now a vailable are (May-flowering) Florentina, white, Kharput, purple, Zwanenburg, bronze and yellow, Queen Flavia, pale yellow, and Charmant, blue purple. Of the June Howering varieties these are exceptionally fine: Rhein Nixe, crimson purple and white, Alcazar, mauve and purple, Archevêque, purple, Albert Victor, lavender blue, Caprice, rose-red, Iord of June, lavender-blue, Standard Bearer, rosecrimson, Ma Mie, white with blue margin, Ambassadeur, crimson bronze, and Darius, yellow. The dwarf bearded irises which bloom in March, April and May are valuable plants for the rock garden and for sunny borders.

Among the beardless irises (which have no crest or beard on the falls or lower petals) are the lavender blue Siberian iris (sibirica), aurea, yellow, Monnieri, yellow, orientalis, blue, the common yellow Hag (pseudacorus) and the monspur varieties of several colours; all these like deep moist soil and are auitable for borders and the watersicle. The beautiful Algerian
which bears lav ender blue blooms in winter is in this group; it should he planted in spring at the foot of a sunny wall in well drained soil containing mortar rubble.

The Japanese irises (Kiemp. feri) bear large, Hattish, brilliantly coloured Howers in summer; they should be planted in moist soil by the waterside and must have a sunny place.

Bulb Irises. Among the bulb irises the Spanish and English are hear blue, white yellow flowers in June, shades of mauve, purple and rose. The proper time to plant the bulbs is in Octoher, those of the Spanish irises being set 2 inches deep and 4 inches apart, those of the English irises 3 inches deep and 8 inches apart. The minia ture bulb irises which are in full beauty in spring are very charming in the rock garden or for cultivation in pots in the cold greenhouse : reticu lata, violet, Danfordiae, yellow, and histrio, blue, are some of the best. The bulbs should be set in rather light well drained soil in September.
In addition to those named many specics or wild types are cultivated and the oncocyclus or cushion irises which need apecial treatment-a sunny position, a raised bed of well drained gritty soil and suitable protection in ny admirers.
Iris Diaphragm. See F. Number; Stop.
IRISE HEATH. This is a beautiful flowering shrub about 15 inches in height, with drooping, crimson-purple flowers. There is a beautiful white variety, alba. Its culture is the same as for the heaths. Its butanical name is Dabnecia polifolis. See Heath.

IRISH JIG. Each of the 9 steps in the Irish jig takes 8 bars, and with repeats 16 bars It may or may not be danced with a partner. The jig step starts by striking one foot againet the back of the other leg while turning in a circle, this being repested seven times, finish. ing by stamping twice with each font. A shuffle is done in the next step, first with the right foot and then with the left, and repeated. The dancer next steps to one side and hops, while striking one foot against the other leg, finishing


Iris. Left, early-flowering Spanish ; right. Jacquiniana or common \#lar
favourites. The former with $\Omega$ douhle shuffle Other movements include turning in a circle while carrying one leg raised in front, and tapping one foot against the heel of the other finishing with the single shuffle and stamping of the feet. The last atep is similar to the second. but brisker at the finish. A shillelagh is often carried

IRISH MOSS. Irish or Carrageen moss is best known as $\Omega$ remedy for ohest complaints, but it also possesses certain nutritive properties. It should be washed thoroughls and should be soaked for several hours before being cooked It is usunlly taken is a drink. which is prepared by siminering $\frac{1}{2}$ oz of moss in a quart of cold water for about 4 hours Then strain the liquor, sweeten it to taste. and, if liked, add a little lemnn juice.

Irish moss is used as $\Omega$ substitute for isinglass in blancmange and jellies and is also employed in making sizing and lager bcer

IRISH STEW. This popular dish is very cheaply and easily made. Cut 1 lb . neck ol mutton into chops, and put it, with 1 lb . sliced onions and $\frac{1}{2}$ pint water or stock, into a stewpan or casserole, and simmer it for about 1 hour.
Then add $1 \frac{1}{2} \mathrm{lb}$. potatoes, whole, if small. or cut into thick slices, and salt to taste. Continue to simmer the stew for about an hour, when it will be ready to serve. If conked in a casserole three hours should bo allowed in all, and the stew should be served in the casserole.

IRISE TERRIER. This rough-coated dog is most devoted to his own people, and can be trusted fully with the care of little children, whose exigent demands upon his attention are not resented. He should be wholly of some tint of red, save for a black nose, and,


Irish Terrier. Prize-winning specimen of a favourite breed of house dog perhaps, a spot of white on the deep chest ; the head should be long and squarelooking, carried on a fairly long neck, which broadens to the shoulders and the straight back.
The small, in. telligent eyes are of a dark hazel colour; and the small V-shaped ears fall forward to the cheeks. He wears a thin beard. The hard, wiry coat is straight and Hat, and, in spite of its length, neither shaggy nor curled.

He is smallet than the Airedale, and his weight should not exceed 24 lb See Dog; Terrier.

IRISE WOLFHOUND. The Irish hound attains a greater stature than any other dog, some having been exhibited that measured 37 in at the shoulder Assuming that Oliver Goldsmith measured to the top of the skiull

arisu Woflnounu, the largest breed of sporting
dog. much valued as a guard
instead of to the shoulder, as we do, he may have been right in putting the height at 4 ft .

The Irish wolfhound is powerful and active, with a wiry coat, similar in colour to that of the deerhound The few breeders find a steady and remunerative market in the United states and the Dominions, the dog being prized as a guard or for hunting wild animals, his size and strength making him incomparable. See Dog

IRON : General Uses. Iron in its simplest form is known as wrought iron, and is obtain. able in large shects, strips, round, squared, and tlat str:ps, or bars, angle irons, or " $L$ " shaped section bars, and similarly in "T" shaped and other various sections. Thin strip iron is used for packing-cases, being known as hoop iron, and also used in a similar way for securing the staves of a barrel.

Vrought iron can be welded or brazed without difficulty, and in addition can be
drilled, or cut with a hack saw. It is inlerior to stecl, both as regards strengtl। and the ease with which it can be tumed in a lathe.

Iron, whell melted and poured into a mould, is moulded to most intricate shapes, and is then known as cast iron, being used in this form in the making of innumerable articles, but, as it necessitates a high temperature to melt it, the process of making iron castings is scarcely practicable to the amateur See lient Iron Work: Casting: Forging: Soldering Stecl, etc.
IRON: Medicinal Uses. In the maintenance of health iron is of the greatest importance. It occurs in hacmoglobin, the ied colouring matter of the blood, which is necessary to the carriage of oxygen throughout the body. In order to maintain the stock of hoomoglobin iron must be taken in food, the argest quantities being found in yolk of egg, red meat, ontmeal, and spinach.
It is, therefore, in annemia that the adminisIration of iron preparations is obviously necessary. In dehility such as follows acute discases, or resulting from overwork or strain, or in chronic diseases such as tuberculosis, iron may be given with happy results.
The astringent preparations ol iron, the perchloride and the sulphate, are used to arrest bleeding. When taken internally they may upset the digestion, produce constipation, headache, and irritability of the bladder. To avoid this they may be combined with purga. tives, e.g magnesium sulphate, or, if necessary, a change may be made to a blander form, such as the citrate of iron and quinine or of aninionium. Iron also tends to blacken the teeth, and the astringent forms may injure them. For this reason it is a good thing to suck liquid iron mixture through a glass tube.
Among the most popular and widely used preparations of iron for its tonic effeot are Blaud's pills, the scale preparations, and Easton's syrup. A course of any of these preparations following on convalescence after any illncss or when in a generally run-down state frequently gives most gratifying results.
Iron may also be taken in natural iron waters, such as are found at the chalybeate springs at Tunbrìde Wclls, Harrogate, and other places.

## Irons and Ironing in the Home <br> Describing Electric, Gas-heated, and other Types

For re:ated information on this subiect the reader is referred to the article on Laundry. The
entries on Box Iron: Clothes Line; Coppra; Gas: Gofering; Labour Saving: Mangle:
Pressing, should also be consulted Pressing, should also be consulted
The irons in general use include the flat iron, and sprinkled with powdered bathbrick the iron heated by gas, and the one heated by electricity ; but there are also other varietics, such as the fuel-charged box, the spirit iron, and special goffering and polishing iron.

Fint irons weigh, as a rule, from 2 to $S \mathrm{lb}$., the heavicst being used for pressing such materials as tweeds. For ordinary purposes, gizes 5, 6, and 7 are the most useful, though it should be remembered that the larger and heavier the iron the longer it will retain the heat.
Flat irons may be heated over a gas ring, on top of a stove, or before an open fire. In the last case the iron is placed in an upright position against the bars of the grate. Irons should never be put on the fire itself, for this tends to blacken them and also to destioy their smooth surface. Special stoves for heat ing irons can also be obtained, but thesc are not necessary unless a great deal of laundering is done. But, whatever the' method of heating used, an iron slipper or shield should be fastened on immediately before ironing to prevent the clothes from becoming soiled. When this is not done, the iron will require careful cleaning by rubbing it on a thick sheet of trown praper nailed to a board or lable
and sprinkled with powdered bathbrick A
little beeswax may then be applied with a soft cloth, and the iron finally polished and dusted.
The heat of an iron may be tested by dipping the finger into water and then dabbing it lightly on the surface of the iron. If the water dries immediately and leaves no mark, the iron is hot. Old pieces of cloth may also be used for testing. During ironing a stand or trivet should be placed on the table so that the iron may rest upon it when not in use. This will prevent unnecessary scorching of the ironing cloth. In iron holder, thick enough to prevent the heat of the liandle penctrating through, must also he provided Irons should be put away in a dry place, for danip rusts them. The gas iron (see p). 520) has a tube attach. ment which connects it with the burner and a tap for regula. and the heat. Tue


Iron. Left, adjustable voltage iron for use during holidags or travelling. Kugbt electric iron which concentrates additional heat in the point Courtesy of Hotpoint Electric Appliance Co., Ltd.; and al Edison
and to prevent scorching a damp cloth may, for the first ironing, be placed between the material and the iron. Keep all frilis that have been set in pleats carefully ironed to their original state. Use goffering tongs for the narrow lace edgings and frills of clothes and bed linen. Lace collars should be ironed lightly on the wrong side with a cool iron, and there should be a piece of muslin between the iron and the lace. Then iron again without the muslin, having previously pulled the edges into shape. Finally pull out with the fingers any raised flower petals, and so forth, that there may be in the design.
When ironing a pleated garment tack the pleats in place or iron them carefully two at a time, placing a damp cloth between the material and the iron. Pressure and a very hot iron will probably be necessary.
Men's linen collars of the turned-over type and the straight are ironed flat, first on the back and then in front. Some men like their turn-over collars glazed both back and front, in order that the tie may slip easily between the folds. They have preferences, too, in the case of the shirt collar-band, some calling for a stiffened band and others a soft one, for which reason the laundries have a plan of using coloured threads that denote exactly the fancies of their customers.
To keep irons polished and clean is an absolute necessity, and the ironing board cover should be washed, especially if iron-moulded, for this mark is catching and can be communicated by the iron to a fresh fabric.
Ironing Board. A board can be prepared for irouing purposes by taking a smooth piece of wood 3 or 4 ft . long and about 9 in . wide and covering it with blanket or felt. This material must be stretched tightly enough to produce a smooth surface, and over it a length of white linen or cotton material should be pinned when ironing takes place.

A specially shape.i board of this kind is used for ironing skirts, petticoats, and frocks. It should be narrower at onc end than at the other, 80 that the garment can be fitted over it. Other boards shaped so as to facilitate the ironing of sleeves and shirt fronts are covered in the sante way
Ironing Cloth. The blanket and sheet used to cover a table while ironing is in progress are together known as an ironing cloth. They may be of one, two, or more thicknesses, but the main point is to see that they are perfectly smooth and free from creases. If preferred, a piece of felt may be used instead of the blanket. The sheet must be white, otherwise thore will be a danger of damp clothes ironed on it taking the dye.
Ironmould. This is a stain produced by ink or rusty iron. It can be removed from most mnterials by means of powdered oxalic acid or some salts of lemon and hot water, but if either of these acids is used, the article so treated nust be washed immediately afterwards to prevent the acid from causing holes. Salts of lemon may be applied two or even three times on strong white materials, but oxalic acid needs to be used more sparingly.

If salts of lemon is used on coloured materials it should be made into a fairly weak solution with hot water, and the affected part only dipped into it and taken out again before the colour begins to fade. Then put the material into a basin of cold water to stop the blenching action of the salts and the stain should have disappeared. This process may be repeated, if necessary, but it must be done rapidly and the cold water used afterwards on each occasion.
IRONSTONE. This is an impure iron ore with a heavy proportion of clay. In districts where it can easily be obtained, it may be used for decorative purposes in the garden. It is also used in the pottery industry for the manufacture of some classes of cooking utensils and earthenware.

ISINGLASS. The purest kind of gelatine is known as isinglass. Colourless and without smell, it melts quickly in hot water and is used mainly for jelly maling, etc. It is often adulterated with ordinary gelatine, and may he tested by dropping some of it into cold water or vinegar. In cold water, isinglass becomes white and cloudy, while gelatine remains clear; in vinegar it swells and becomes jelly-like, while gelatine hardens.
An invalid dish made from isinglass is prepared by dissolving an ounce of isinglass in $\frac{1}{2}$ pint hot water, and adding $\frac{1}{2}$ gill white wine and the juice of a lemion. Sweeten all to taste ; then add the beaten yollis of 3 eggs, and thicken the whole over the fire. Pour it into a basin, and when cool, but not set, turn into a mould. See Gelatine; Invalid Cookery.
ISLE DF WIGHT DISEASE. This discase of bees, a very destructive one, is caused by a tiny parasite. Various symptoms have been noticed, among them being the following The bees lose their powier of tlight, either gradually or suddenly, and also the use of one or more pairs of legs. Sometinies they are very vicious and use their stings freely, but at other times they are quite the opposite. The combs may be soiled with excrement.
Bee-keepers who notice any of these symptoms, or indeed any general indication that their bees are disinclined to work, should at once examine their stocks and if they have any doubts should consult an expert or communicate with the Ministry of Agriculture.
No certain remedy has been discovered for this disease, but in Leaflet 253, the Ministry of Agriculture and Fisheries gives a few suggestions for preventing its spread and mitigating its severity when it appears. Cleanliness is of great importance in this connexion.
After an outbreak of disease, the inside of the brood chamber and the foor board of all movable comb hives should be charred with a painter's lamp. All skeps, quilts, combs and honey that have come in contact with the affected colony should be burnt, together with all dead bees, and the soil round the hive should be sprinkled with petrol and ignited. After the fire has subsided the ground should be dug over and covered with quicklime.

Bee-keepers should endeavour to see that no stagnant water is left in the neighbourhood of their apiaries, especially when there is any disease in the neighbourhood, and should endeavour to supply their bees with a pure supply at a short distance from the hive. The drinking fountain should have a sheltering board about one foot above it to prevent the flying bees from soiling the water with excreta which they void when on wing. In the spring very thin syrup could be given in the ordinary feeders, as this lessens the demand for water. Some authorities advise supplying them with salt water, especially in the spring.
Bee-keepers who live in districts which are free from disease should on no account purchase swarms or driven bces from an infected district. There is no surer way of spreading disease than to transfer bees from one district to a nother, for swarms, even from apparently healthy stocks, sometimes develop disease when placed in new hiver. See Bee.

I SPY. This outdoor game is a variant of hide and seek. The player chosen to be the spy stands with closed eyes at the place fixed upon for the goal, while the others scatter and hide. He counts up to 100 or some other agreed figure and then starts upon the chase, going warily lest n player should dart out and reach the goal before him. As soon as he catches sight of a player, he must shout his name, run back and touch the goal.
The player who has heen scen, however, has also this right, and if he touches the goal first he is not caught. The other players can also run for the goal, but if they are seen
and named the spy may bo able to get there before them. If the spy calls out a wrong name, the player wrongly named and also the one whose name was actually called are both free to return to the gonl.

A game ends when all the players are caught, or all have succeeded in reaching the goal. In some parts of England this game is known as lurky and there are other localized names for it in various parts of the country.
ITALIAN CREAM. To make this sweet, prepare a custard with a pint of milk, the yolks of 3 eggs, and sugar to taste, Havouring it with the thinly peeled rind of a lemon and a little cinnamon. Stir in $\$ \mathrm{oz}$ gelatine previously dissolved in a little water and a dessertspoonful of strained lemon juice. Let the whole stand until it cools and begins to set; then add the stiffly beaten whites and put the mixture into a mould rinsed with cold water. When firm, it may. be turned out and served with stewed fruit made into a purée.

ITALIAN GARDEN. Although there are cxamples of this style of gardening to be found in England, its principle of subservience to architecture is too pronounced for English tastes. The free and natural growth of plants, which nowadays is such a feature of British gardens, is absent ; the stately Italian garden, is distinguished by stereotyped beds of glowing flowers and ornamental plants, balustrades and statuary.

The design is tormal, with carefully ordered beds laid out in geometrical shapes. Paths intersecting the beds are paved with stone, or loosely gravelled. Effort must be made to maintain a succession of the most brilliant flowers from spring to autumn, but difference of climate makes it almost impossible to grow many of the striking trees and plants prominent in the gardens of Italy.

Agares, yuccas, aralias, and dracaenas can be brought into the scheme during summer months, together with specimens of topiarian art. Sculpture, in the form of an ancient wellhead or Venetian cistern, a fountain or stone scat, if possible, should find a place.

Modern gardening regards the plants as of most intercst, but old Italian gnrdens were designed as an ornainental extension of the architecture of the house. See Loggia.

ITAIIAN GREYHOUND. This miniature edition of the Enylish greyhound has the appearance of great delicacy and fragility, and in consequence has been treated by its owners too often as one of the expensive pets of the drawing room. Gentle and affectionate, of exquisite form and beautiful colour, some shade of fawn, he should be given proper opportunity for exercise.

The head sliould be long, flat, and narrow, tapering to the fine muzzle and dark nose, set upon a long and gracefully arched neck and
 of the breed of strong but frapile-looking doz
long, sloping shoulders; back curved to the hidden on the surface by n close texture ol hind quarters and the long tail; fore-legs line Botany wool, which lends warmth to straiglit with small bones; feet long and the garment. In poorer qualities less wool is hare-like. The small, soft cars should come used, and in the larger part of Italian cloths close together behind the head; the cyes there is no wool at all. large, bright, and expressive. For show purposes there a re two classes: those under 8 lb . in weight and those of heavier build. See Dog.
ITALIAN LINING. Available in many qualities and in colours to tone with all the materials ordinarily used in tailored clothing. Italian lining is smooth faced, and is the chief lining used for men's coats and waistcoats. The best qualities liave a strong cotton warp, its natural strength

## Italian Renaissance Work

## Modern Simplified Form of an Interesting Old Handicraft

The articles on Gesso Work and Lacquer Work should be consulted in connexion with this, as there are points of resemhlance in methods and materials employed. See also Lampshade; Leather W'ork; Papier Mâche; Stencilling
The original method of applying this orna- transparent oil colours. The panel on the mental craft was a long one and entailed blotter in Fig. 4 is a photograph of a well great skill and patience. It was largely known picture, those on the tea caddy in employed in the interior decoration of churches the same illustration were cut out from a and other buildings and many famous examples are to be seen in Italy. As with gesso work, a paste is employed, and this was used thickly, layer upon layer, and when hard the design was carved out and gilded or coloured. In this article the work is only dealt with from the point of view of the amateur, for the decoration of small articles, but in its antique form it enriched large surfaces.

It is not practicable on metal or glass, but can be used on wood, papier maché, and even cardhoard. As the paste fills in cracks and dents it is an excellent method for re-decorating a wooden box or blotter, or for book ends which have become shabby. It is also largcly used for decorating white wood articles, which-are obtainable in great variety in most good art departments, together with the materials required for this work.

If the article to be decorated is old it should first be thomughly cleansed with soap and water and dried. A woolen surface, if smooth, may be sandpapered quickly and just sufficiently to roughen it. A coarse sand paper should be used, or the surface inay he acratched up with a pointel instrument.

Method and Materials. A sniall box is a simple article to hegin experiments with in this craft. which is an ideal one for quickly making decorative objects for a bazaar stail at little cost A special form of paste, called renasco paste, is employed for the raised decoration. It is easier to apply than harbola paste, which requires expert modelling to obtain good resulta, or than gesso, used for lacquer work, which requires to be exquisitely smooth. Decoration may consist only of the raised paste work done in conventional scrolls all over the article with a spoon-shinped modelling tool supplied with an outfit. Practice is required, but the work in its simple modern form is especially suited to those who cannot draw or paint.

More effective work is done by utilizing a panel as shown in the examples of finished work in Figs. 3, 4. Such panels may le original designs drawn and painted by the worker, in which case the craft may be raised to the atandard of an art, or a picture may bo cut out and glued to the article and coloured with barbola colours. Photographs and picture postcards can be used and tinted with

colour The actual painting of the panel is left until the remainder of the decoration of the box is finished. While the panel is drying the rest of the box is covered with the paste, using a hog hair brush. Apply the paste unevenly, covering any strips of cardboard or of wood which may have been glued or nailed into, position round the panel. The paste should not be allowed to spread on to the latter.

This first coating of paste is left to set for $t$ welve hours, unless the weather is very damp, when it may take longer. For the sccond cont the paste is used of a consistency which, when the brush is raised, flows from it in sufticient thickness to make coils. Only the paste is allowed to touch the surface of the first coating, not the brush. which is kept moving in circles, figure eights, or leatlike formations to cover the box with raised decoration. The scroll work design on the right-hand box of Fig. 3 is done with a spoon-shaped modelling tool instead of the brush.
Gilding and Colouring. When the second conting of the paste is dry, the whole article, except the portion reserved for the panel, is gilded and coloured. A squirrel hair brush is hicst used for this purpose. Gold bronze mixed with the special medium is painted over the paste (l'ig. 1); when this gilding is dry it is in turn painted over with vandyke brown oil colour thinned with turpentine. This is allowel to dry for a short time and then with a piece of clean rag the colour is reduced in places to give an antique look (Fig. 2). A greenish shade may be obtained by mising emerald green oil colour with the vandyke brown.

By the time all this has been done, the raised portion of the panel design will be quite dry. Barhola colours look well on this work as they are somewhat suggestive of the old tempera colours used for this form of decoration in the time of the renaissance. Sable brushes are best for painting and water for thimning. As little shading as possible should be used, the colour heing applied, except for details, in Hat washes. When raising, the paste should he used more thinly than for the rest of tho decoration. Gesso powder is quite suitable for this purpose as applied to the handkerchief hox described in p. 529. The object in the first case is to provide a smooth surface in very slight relief; in the second, a mugh surface in bolder relief. For raising the panel design use a salile brush and twist it to avoil brush marks and to make the paste lie correctly. Instead of cardboard strips the framework round the panel can be formed by drawing the paste nlong and turning the lirush while working it is important to remove or raise the lids of boxes before applying paste.
panels and strips of cardhoard which may lee utilized to form a raised framework round the panel and should be affixed hefore the renasco paste is applied. Such a framework has heen used to surround the photograph panel onthe blotter:
To decorate one of the hoxes illuatrated in Fig. 3, the space which the panel will fill must first be decided on and then the design must be drawn, traced, or the photograph, card or picture must be glued into place. Where it has been decided to decorate this panel design with barbola colours, portions of the design, trees, birds or figures can he slightly raised with the paste reducel with water to the consistency of a thin cream, and allowing it to dry hefore applying any


Italian Renaissance Work. Fig. 1. Gitding the paste : a squirrel brush
is used and the gold powder is mixed with renasco medium. Fig. 2. is used and the gold powder is mixed with renasco medium. Fig. 2. Removing excess of oil colour with a clean rag Contrext of ivfusor Aeicton, hed.

The edges can he trimmed with a sharp penknife when the paste is dry.

Candlesticks and wooden table lamps can be successfully decorated in this method. On the white wood blotter and tea coddy illustrated in Fig. 4 the panel pictures are mercly coloured and no raising paste has been applied to them. After glueing on the panels a rubler roller should be employed in order to remove ang bubbles which spoil the appearance of the work.

For the blotter thin strips of cardbonrd are glued round the panel to form the frame and the back of the blotter is gilded all over. Paste is not used for this as the back is required to lic flat on the table. A pretty effect is gained by mixing silver with the gold bronze powder for painting the paste nind introducing a little vermilion and vandyke brown oil colours, wiping the latter off, as shown in Fig. 2, so that the metallic lustre is not lost. When the paste work on the front is painted, the photograph is coloured with
 transparent oil colours, using megilp as the medium for this decorntion.

The white wood ten cadily is decorated with fire pictures cut to fit sides and top. When these are limmly glued to the wood the box is covered with the paste. Opening the lid, do the sides lirat and the top last. Bron\%c powders are used to colour the paste, a good effect heing gained with copper instend of gold, the brown oil colour being left only in the unraised portions. If picture postrards are used to decorate the loox, they must be tinted with oil colours; if drawings or cutout line illustrations, these can be worked up with barbola colours.

Many of the materials in the various handicrafts to which the render is referred can he utilized to make varicty of designs and colourings when the worker gains experience. and in this way original pieces are produced. Barbola work, for instance, in a floral design could be used instead of a panel, or for an edging on a box deccrnted with renaiseance work. Stencila can be employed when painting small panels at the hasc of candlesticks covered elscwhere with relief work.

ITCHING. Itching of the stin, or pruritus, may be transient and easily controlled, but it is sometimes so severe and continuous as scriously to affect the general health. It accompanies many akin disenses. It may also be the result of irritation by tleas, lice, scabies, or hy coarse wonllen underclothes. In netilerash or hives, often found in indigestion. the chief symptom is intense itching.

Wherc the sensation is localized, bathing the part with a one in forty solution of carbolic
acid sometimes gives relicf. Another useful
lotion for sopping on the skin to relieve localized itching is the following: Carbolic acid.

- 1 dram Bismuth carhona lectitled spirits of wine $\varrho$ " oz. Wuter, enoush to make 8
Make into a lotion, sop on to the itching skin, and allow to dry. These lotions are pmisonous if taken internally.
General prorituswithout apparent causc may be benefited by Turkis! baths (if the doctor approves) or hot baths, and to the latter might be added bran or oatmeal. 2 lb ., or carbonate of soda, 2. oz., to the 30 gallons. See Scabies.

IVORY. There are four linds of ivory: Indian, African, walrus, and
 1 o ndion other designs.
Articles miade of walrus or vegetable ivory are inferior in quality and nppearance. Vegetable ivory is chietly used for buttons, and although it is generally described as ivory. the material aclually is cut from a nut, the nut ivory button industry being quite large in certain lialinn manufacturing districts Theso articles of nut ivory are easily distinguished by their whiteness and almost bone-like colour, and the absence of graining such as is seen in tusk ivory. The walrus ivory is mnstly


Ivory. Walrus ivory tau-head fixed to the top of a walking-stick. Northern Europe. 12th century B" permission of the Director. Fieloria a Albert Nuseum. S. Kensingion
obtained from the tusks of the Baltic sea lions, and as these are small the chief usc for this ivory is in making bead necklets and othor small articles. It is nore fragile than clephant ivory; also it has not the lustre, and it cracks verv easily. It is usuad for it to he bleached, and the chemical action frequently causes cracks to a appear.

It is advisable when purchasing ivory goods of any description to inquire whether the ivory is elcphant. wnírus, or innm. moth. The last two are comparatively cheap. From the description given ahove it should be possible to dis. tinguish the finc qualities from the less expensive.
lf ivory is to be silvered, put it into a weak solution of nitrate of silvor and leave it there until it has nequired $n$ deep, vellow colour.

Then wash it with water and exprose it to th sun for about three hours. or until it turns black. Vigornus rubbing will then produce the desired silvery effect Preparations. together with directions for slaining ivory red, blue green purple. yellow. and othri colours can be obtrined from mosl chemists
Antique and Decorative Pieces. Fol the purpose of home decoration the classes of ivory earvinge most readily available are


Ivory, warnese statuette, 17th century



IVY. The common ivy (Hedera helix) is an invaluable evergreen shrub of climbing or trailing growth it is one of comparatively few self-clinging climbing plants and is thus often used for the purpose of covering walls If planted in auch a position it should be cut hard back annually in April to get rid of the old leaves and straggling shoots iv thrives in ordinary soil and is propagated hy cuttings set in a frame in August or out of dours in October
The varlegated ivies are more attractive than the common green leaved form: a few ol the best are Crippsii, Lee's Silver and varic gata elcgantissima. The golden leaved ivie too are favourites, and there are some distinct varieties among the small-leaved ivien, such as Caenwoodiana, crenata and gracilis. Some ol the best large-leaved ivies are canariensis (Irish ivy), dentata and amurensis The leaves of purpurca are green in summer but ake on a purplish tint in autumn
A curious irait of ivy is that as soon as it reaches the top of its support it loses it climbing or trailing form of growth and becumes what is called a tree ivy It develops a bushy habit of growth and bears flowers and fruits lvy malies a gond ground covering beneath trees and in very shady places where little else will grow
IVY LEAVED GERANIUM. The type ol pelargonium known as the ivy-leaved geranium is useful in the garden in summer flower bed: and in vases. It is valuable for covering green house walls. for hanging baskets under gless Western market They are often tawdry alld house wals. for hanging baskets under glass
for window boxe
lacking in attrac-
tiveness. because balconies. tiveness. because they do not interpret native focling.
I vory carvings which retain the mellowness of age should not be washed. but polished with soft leather A bath of turpentine. followed by ex. posure to sunlight for a few days, is sometinies advan tageous and quite harmless Some forms of artificial diacoloration can be detectel by apply. ing a danip cloth. Old specimens zhould be bept under glass, away from the sun


Propagation is by outtings taken in August iand kept under glass until spring, when they нre transforred singly to 4 in pots, points of main shoots being nipped a few days later to make stocky plants and to cusure prolifio flowering. Madame Crousse, pink, and Solivenir de Charles Turner, carmine ruse. are two favourite varieties See Pelargonium

IXIA. This is a bulb plant which bears flowers of many brilliant
sunmer. It is not very hardy and should be grown in pots in the greenhouse or he planted in well-drained soil in a sunny sheltered horder preferably at the foot of a wall The bulbs are potted or planted in September if out of doors they should be covered with 2-3 inohes of soil and protected by old ashes in winter. If grown in pints they inust be dried off gradually after the Howers are over and re-potted in autumn. The green and black ixia (viridiflors) is very handsome . numerous wthers named in catalogues have blooms of warlet, rose, crimson. and yellow. They are propagated by offyets.
IXIOLIRION. This is a rather uncommon hulb plant from Peraia which, when grown in British gardens, needs a sunny sheltered placo II a well-drained compost of loam. leaf-mould and sand The bulbs should be set in autumn 1-2 inches deep, a covering of old ashes should be put on the soil early in winter Pallasii (tataricum) is the only kind usually grown : it bears blue fowers in early summer

IXORA. These are beautiful hothouse shrubs, known also as the West Indian jasmine. They form bushes of glossy foliage, surmounted by lovely panicles of Howers, either white, yellow or red Ixoras like a compost of two parts of rough loam, one part leaf-mould, and one part fibrous peat, with a good sprinkling of sliarp sand.
Propagation is effected by means of cuttings. For this purnose fairly mature shonts which


Ixora Flower uead and glossy foiliage of the
show no signs of bloom should be inserted singly in small pots, in sandy peat, and plunged in a propagator. After the cuttings have been rooted, remove the tops, as this will conduce to a bushy habit. The plants should be potted on until 6 in . pots are reached. After flowering give the plants a rest in a temperature of from $55^{\circ}$ to $65^{\circ}$ during the autumn and winter months. The tinc for repotting is when growth is just starting.

ABORANDI. Dried jaborandi leaves are important in miedicine because they contain ceitain akaloids, especially pilocarpine. Both jaborandi and pilocarpine are largely used as outward applications to the hair to stimulate and promote its growth. Taken internally, they cause an increased flow of perspiration.

JABOROSA. A hardy perennial plant allied to the mandrake, this is one of those curious freaks of hortioulture which are said to shriek when their roots are torn from the ground. Jaborosa grows in any warm soil in


JACINTH. This semi-precious stone is I ransparent and bright in colour, varying from a dark red to orange. The best stones have a lustre and are pretty, but not valuable.

JACK: For Lifting. A jack, or a lifting jack, is a mechanical device for raising weights or for exerting great pressure. It usually takes the form of a strong metal casting, broad at the base and tapering towards the top. Through its centre prases a rod with a square sectioned screw-thread cut upon it. A steel nut with actuating handle turns upon this rod and rests upon the top of the body of the jack. Consequently, when the nut is rotated the steel rod is forced upward, and the head, or pad piece, which is affixed to it bears against some convenient part of the ohject to be lifted, thereby forcing it upward.

When using a screw jack for lifting operations, it is important to see that the foot of the jack rests upon a solid base; if it is tilted to one side it is liable to slip when the load is brought to bear upon it. Similarly, the head of the jack should bear upon some firm, solid part of the object to be raised, the essential thing being that the pressure is exerted in a straight line.

A jaok is very convenient if it is desired to force an object along for a few inches, as the jack can generally be laid in a horizontal position, with the foot bearing upon a solid piece of wood which butts against the wall of the house, or any other sufficiently strong resistant structure.

A convenient type of jack has a worm and wheel to rotate the screw-nut, and this permits of still easier operation of the jack, and, to avoid the necessity of approaching near to the jack, a long extension handle may be employed to rotate the worm, as in Fig. 1.

A lifting jack is an indispensable part of the equipment of the motor car, and there are
$\square \mathrm{w}$ workers in wood, as by its aid the rough and uneven wood is planed to a true surface.
Jack planes are made in several sizes, vary ing in width from 2 in . to $2 \frac{1}{2}$ in., and from ahout 14 in . to 15 in . or so in length. Most are made of beech rood. This type of plane is generally sold with an open or single handle, others have a try plane type of closed handle, another variety has a single handle or horn at the front, but the most usual has the handle at the back, and this type is to be preferred for amateur use. They are to be had with a single or a double iron, the latter being preferable, as it is easier to use.

The iron is secured by a wooden wedge. which has to be removed to withdraw the iron for sharpening purposes. This is accomplished by grasping the plane in the left hand with the fingers on the face, and the thumb in the throat pressing on the iron ; a blow is then struck on the top front of the plane; this is repeated if necessary, and releases the iron, which is then withdrawn, the two parts separated by unscrowing them, and the cutting iron sharpened on a grindstone in the usual way. The iron is replaced and secured by driving the wedge back into its place with a hammer. See Amateur Carpentry; Plane; also illus. above.

JACKDAW. No bird is more easily tamed than the jackdaw, and once it gains the affections of its owner, it will attach itself firmly to him. It has a strong partiality for bees and bectles, and will devour mice.

The food usually provided for the bird in captivity consists of bread and milk, oats,


Jack Plane. Sectional drawing showing construction insects of all kinds, and scraps of meat. The jackdaw may either be kept in a cage, which should be large, or allowed the run of the house. As it has thievish propensities, bright objects, such as rings, brooches, etc., should be kept out of its reach.

JACK PLANE. This name is given to a JACK PLANE. This name is given to a
ype of long plane used to prepare the surfacea f timber It is an indispensable tool for all .





Jacobean Style. Fig. 1. Beautifully carved oas table, dating rrom the 17ta century. The top is $\forall x e d$ ana ine bulbous legs are supported upon stretcher rails
Ay dermission of the Director. Victoria \& Albert Museum. S. Kensington
of these set on stands and were the earliest attempts at sideboards. A court cupboard and a livery cupboard would be found in the dining hall of the day, a courting seat, or double armchair, might be seen there towarda the end of the Jacobean period. A bible box and a mirror, pillows, tapestries, curtains, and carpets were accessories and amenities which softened the otherwise austerely utilitarian appearance of the wealthiest home.

Panelling was extensively used for interior decoration, and plaster work of great heauty is seen on friezes and ceilings of the period. Examples of rooma can be atudied at the Victoria and Albert Museum, South Kensington. The small oak panel of the Jacobean period had sometimes an inlay of coloured wood and the moulding of its frame was often elaborate Small pancls were also a feature of the heavy onk doors

Inlay and Carving. Iacobean furniture is not cabinet maker's work as now understood. It is the work of a joiner, and is very sinuply put together. Its main appenl is on account of the decorative treatment, which is distinc tive and easily recognized. Where inlay was used it was in geometrical or Horal patterns. Sycamore, holly, and box were favourite woods for inlay; and sometimes ivory, hone, and mother of penrl were used on chests and more elaborate pieces. On these and on wall panelling relief carvings are alao seen; otherwise carving in the main is incised. Guilloche strapwoik and arabesque ornamenthwere frequently carved on cheata, settles, and buffets. Architectural shapes were given to panels by applied mouldings. Relief carving enriched this style and, where genuine, the piece decornted with it is of great value

Jacohean styles continued to be made in oak and cheaper woods for the furniture of middle.class homes and farmhouses well into the 18th century, and often where the carving is somewhat crudely incised on a genuine antique this may be found to be a later piece of farmhouse furniture, the decoration having been done by the joiner and not by a carver.
For these comınonet pieces perfectly straightforward patterns were incised into the wood by the V-tool and gouge. It was a common custom to sink the ground and leave the pattern flat, with a little relief introduced by gouge and V-tool veinings. Many chesta of the period have a diamond form incised in the width of the panels, and a few gouge cuts put in the corners or centre or on the edges of the rails give a little relief. Frequently a date occurs on a chest or court cupboard, but many plain chests of the Cromwellian period and later have had earlier dates put on, so that it is unwise to take dated fumiture at face value.

Rails enclosing panelling were not as a rule mitred, and the upper moulding was often scratched on.
. lacobean carving of this type has usually an amateur look. It is conmon to see furniture of the period carved all over the front-in the case of chests, huffets, and dressers-and only a little plain space left here and there. Welsh, settles and chests are seen quite crudely treated in this way, the ornaments being often merely a that, conventionalized dragon or the acanthus leaf form.
The arnachair of the period was a very clumsy article. It consisted of hcavily turned lega and arni supports, a square panelled back finished sometimes with a crest rail,
 letected by fabrics the the back and face of the cloth are a perfect replica, but in reversed colourings
The name has nothing to do with the kind orgrade of material, for silk, wool, cotton, and linen may all hic woven by this means. Using fine enough thread and a suniciently elaborate jacquard machine, portraits and coloured pictures can be reproluced quite success fully and faithfully in woven cloth. See Loom; Wea:ing.
and rails connecting the lower part of the legs and occurring immediately bencath the plain, tlat, wooden seat. The hack sloped back a little, and it was common for ornamentation to he inroduced in the form of incised leaf orna. mentalion and possibly strapwork.

JACOBINIA. This South American tropical plant requires ordinary hothouse treat. ment. It is propragatei: by cuttings taken in spring-time, and necda a compost. lonm, peat


Jacobean Style. Fig. 2. Oak gate-leg table, 17th century ; beight 2 ft .3 iz in. width, 3 ft . 2 in. Fig. 3 . Oak stol, middle 17 lth century; height, 1 ft .101 in. ength, $1 \mathrm{lt}$.8 ln .; width. 1 ft. $1 \mathrm{in}$. and panelled back 4 . Oak settle with finely carved and panelled back
Fios 2 and 3, buverniesion of the Director Fictoria \& Albert Museum:

JADE. Jade is a very hard mineral, and appears in various shades of green, greenish white, and yellowish grey. Jadeite is brighter in colour.

Large quantities of jade and of its imitations are now used in Europe. It is worn in the form of carved ornaments and beads and is chiefly valued on account of its brautiful colouring. Gcnuine carved Chinesc pieces of gond workmanship and colour are, however, intrinsically valuable.

JAM. Jam can be made from many kinda of fruit, although some kinds are more suitable than others. Some fruit, e.g. the apple, goes well when mixed with certnin other fruits, but does not itself make good jam.

Dried fruit is sometimes used, but fresh fruit unakes a much better article. When jam is made from dried fruit, the fruit must be soaked overnight in water which covers it well, and fruit and liquid boiled together the following day.

The chief fruits used for jam making in Great Britain are raspherries, strawberries, gooseberries, currants (red and black), plums, damsons, and apricots. Rhubarb is used chiefly to mix with other fruit, and apples go well with blackberries. Quinces, pineapples, and cranberries are among the other fruits used. Marrow jam is made, and ginger is also used to Havour other fruits.

For jam the fruit must be sound, and most of it should be rather under-ripe. The jam will not keep or set well if over-ripe fruit is used A mixture of one-third ripe and twothirds unripe fruit will produce a janm of good flavour and good setting qualities Green gooseberries are used. The colour may be intensified with a little green vegetable colour. ing, or the jain may he reldened with cochineal.

The Process Described. The preparation of the jam depends to some extent upon the kind of fruit used. Gonseberries must be topped and tailed, currants must have their stalks removed, raspberries must be hulled, and so oll. All bruises and blemishes must be removed. Some fruits are stoned for jam, but this is not essential, even in plums. All fruit, except soft fruits suoh as raspberries and strawberries, should be washed in cold water. These should be tossed lightly in a olean towel, to remove any dust. Iron or tin utensils should not be allowed to onme in contact with raw fruit. It should be prepared with a silver or stainless steel knife; stirred with a wooden spoon and boiled in an aluminium or enamel-lined preserving-pan All fruit should be weighed hefore boiling.

This done, the fruit should be put into a thoroughly and recently cleaned preserving pan. If it is liard fruit, sufficient water must be added to start the cooking, but if it is soft fruit no water is required. In the former case about a pint of water to 10 lb of fruit is an average quantity, but very under-ripe fruit may require more. As for sugar, white granulater should be used, and from $3_{3} \mathrm{lb}$. to 1 lb allowed to each pound of fruit. The sugar should be warmed before adding to the fruit. Ripe fruit requires slightly less sugar than unripe. Gonseberry jain, for instance, will require 1 lb . of sugar to each pound of fruit in order to bring out the flavour of the berrics. This jam is also an instance of one which requires more water, $\frac{1}{2}$ pint being necessary to each pound of fruit.

The fruit should then be boiled. First atir it over a moderate heat until its texture is broken down. Then add the sugar and atir the fruit until all of it is dissolved. The jam should then be boiled rapidly until it sets when tested. The preserving-pan must be large enough to allow of rapid boiling without fear of the jam boiling over. The jam must be stirred in order to prevent burning. Scum should he rewoved after the sugar is added.

The jam should be tested frequently by fitted is known as the reveal, for the reason placing a little of it on a cold plate If, on that the jamb is visible or revealed. The cooling, the consistency is firm, it has boiled sufficiently. If it is boiled ton long it will not set, and it will he syrupy. When it is boiled, pour the jam into heated jars, and place on its surface, while still hot, wax japers, and tie on a cover of parchment paper. Store the jars, when cold, in a cool, Iry place.
Some fruits, such as strawberries and some of the sweeter varietics of raspberies, require the addition of a small amount of citric or tartaric acid, or of acid fruit juice, for instance, that of red currant, to produce a jam that will set An average amount of acirl is $\frac{1}{2} 07$. to every 8 lb . of fruit It should be dissolved carefully in as small n quantity of water as is possible, and should be mixed thoroughly into the jain before the sugar is ndded. If acid fruit juice is used, about a pint should be added to every 4 lb . of fruit.

If less than lb . of white granulated sugar is used to each lb. of fruit, or if it is insufliciently boiled, it will not keep, nor if stored in a damp cupboard or in too warm a place.

Although usually made from fresh fruit. jam can also be made from fruit pulp which has itself heen made from the fresh fruit. The advantage of this pulp is that it can be kept until it is required for the jam Apples, plums, dainsons, goose berries, and mapberries are especially suitable for pulping Fruit pulp can be bought from any large store, so that it is possible to make jam all the year round.

Jam Containers. Containers for preserves good, well-drained soil, and reaches a hoight are obtainable in various sizes to hold 1 lb ., of ahout 3 ft .
$2 \mathrm{lb} ., 3 \mathrm{lb} .$, or 7 lb . ; larger sizes are also made, particularly for the marmalade. These jars or pots are minde of glazed earthenware or ginss, the latter being preferred by many, partly for ita appearance, and also because it enables any trace of mould on the preserve to he detected without removing the cover.

To prevent the jars from cracking while the hot jam is heing poured in, make aure they are absolutely dry, and warm them a little beside the stove Of the various kinds of patent covers used to keep jam jars airtight, the most easily adjusted are those with clips or fanged rims or screw tops If bladders are used, the jam should first be covered with a round of white paper, the bladder washed in warm water, partly dried and then stretched across the top of the jar and tied down tightly with string. Parchment paper or greaseproof paper can also be used. Packets of tissues and gunimed covers can be bought in various sizes to fit the jars. See Blackberry. Gooseberry, etc.

Jamaica Pepper. See Allspice.
JAMB. This term is often used in architecture and building construction to describe the side posts of a doorway, the side of a window opening or of a fireplace. The word is better understood if it is rememhered that, in substance, the door, window frame, or grate is jammed or compressed into the opening of the surrounding hrickwork, alt hough the framing may be built into position

The part of the wall that remains visible after the door frame, for example, has been


Jamesia. Hardy shrub called after an American botanist. It is allied to the hydrangea, and is very effective grown in a large sunny parden Courtess of Amatcur Gardening

Plant from autumn to spring, and when necessary prune directly after its white Howers have died down. Propagation inay be by seed, but the best method is to insert cuttings of ripe wood in sandy soil under a cold frame during autumn.

JAM PUDDING. Some suet pastry and jam of any kind aie needed to make the following jam pudding. Use a little of the pastry to line a basin, put in a spoonful of jam and then cover it with a round of pastry. Continue these lagers until the hasin is full, making the last layer one of pastry. Cover the pudding with a greased paper and steam it for $2 \frac{1}{2}-3$ hours.

A baked jam pudding is made by mixing together ? lb of llour, $\mathrm{f}_{\mathrm{i}} \mathrm{oz}$. of siogar. a teasponnful of baking powder, 6 oz. of finely chopped suet, and the grated rind of one large or two small lemons. Work in gradually 2 well-beaten eggs and $\frac{1}{2}$ pint or more of milk. Have ready a greased piedish, and into it put 4 tablesponnfuls of jam Pour the mixture over it, and then hake the whole in a moderately hot oven until it has risen and is quite firm. This is arfficient for ahout seven jersons.

JAM RISSOLE. To make these 2 oz of margarine. $\frac{1}{2}$ teacupful of water, 4 teacupfuls of tlour, and a little jam are required. Melt the margarine in a saucepan ; then add the water and bring them to the boil. Move the pan to the side of the fire and let its contents oool till they are just warm ; then work in the flour


Jam Rissole. Dish of a isvourite swieet somewhat simllar to donghnuts
with castor sugar, and the other side is spread with warm jam. The oake is then rolled up quiokly and left on a wire stand to cool. This is sometimes nlso known as a Swiss roll.

## JAM ROLY POLY

 This favourite kind of jam pudding is made by rolling out some suet pastry to an ohlong shape and apreading it and mix all to a frirly soft paste. adding more water if necessaryKnead the paste on a Houred board until it is smooth, ro!l it out to the thickness of $\ddagger$ in., and eut it into rounds with a tumbler. Put in the centre of one round about one teaspoonful of jam, damp the edge of the pastry all round, and lay another piece on top of it, pinching the edges well together Have ready a deep pian half full of smoking hot fat, put in the rissoles and fry them to a golden brown oolour. Drain them well on paper, roll them in castor sugar, and serve at once They oan be made with far less trouble from a good short pastry

JAM ROLL. This roll is made necording to the directions given for jam sandwioh, except that the mixture is poured to a depth of $\frac{1}{d}$ in. into a flat oblong-shaped tin lined wit ${ }^{1}$ paper When baked, it is aprinkled on une side

## JANUARY

## What to do in the Garden

| Flowers |
| :---: |
| ant leaf-losing |
| di shribine in |
|  |
| Press down m! out- |
| the ground liy uction |
| ol frost |
| Plant roses in open |
|  |
| Pateh bald |
| Protect turtum |
| nut |
| Make alteration |
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| Sow secaly of tuberour |
| konia and sloxinia is |
| rreenhouse |
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| Sow secds of sweet |
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| akecittings of |
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Maillain a mblninnuin
cemperalure of $45^{\circ}$ to $60^{\circ} \ln$ the greenho ase in cold weather
Give werantums slifft into larger pots Keep the holloouse at a minimum tennerature of $50^{\circ}$ ut olght. $70^{\circ}$ maximum by day. The ordinary beated greenhouse may be at least $10^{\circ}$ lower with sulcty

## Fruit

Epray Pruit trees out of doors with one of the taroll washes or with caustlc Modn molution
Prune fruit trees out
of doors and vines under ulasy
l'hant frult trees and luashes when the weather lo mild
in summer vinea ahould

| Fish |
| :---: |
| Batbel ; bream ; brill; |
| p; cad; dory; cels ; |
| Nounders; kuruet ; had- |
| dock; hake; lalibut; |
| herring ; ting ; mac- |
| kerel; pereh; pike; |
| plaice ; mulce (red); |
| salmon (Dutch and |
| dian); skatc; nmelta; |
| k.les; sprats; tench; |
| turbot; whitebait |
| whintidg |
| Sheitiis. |
| Crab; crayfish; lobster ; mussels ; oyster ; prawna; scallops shrimps |
|  |  |
|  |  |
|  |  |

## Food in Season

| Beef; |
| :---: |
| mutton; |
| venison | pork; lase lamb;

veal;
Game \& Poultry

Artichoties (globe, Japanesc and Jerusnemi): Brucetroly sirouts

## Vesetables <br> how seeds of onion

 under glassSow carrots and ra diahes in a frame Early potatocs inap be started it! framea
Give the asparagus bed $n$ top dreasing of farmyard manure, avaliable
(lo over storel root regetnbles carefully, and remore all apecimens Which show eymptoms of decay
look ull all vegetafule urticles in this Encycloolituln early cropa
enlibage: canrdoons carrots; celerinc cel ery; chervil; chicory ;
 radish; : leeks: iettuce masiohrooms (cultivated) minhrooms (cuitivated) tutues; radishes; salthtues; radishes; sal-
sify; anvoys: Scotel knie; tomiatoes: turnlps; turnip tops: win ter spinach

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be started Into krowth In a temperature of $45^{\circ}-50^{\circ}$ Striawberiles in pois to provido parly frults should tie placed jinder glans

 round Wet the edges and moll up the pastry Wrap and tie the pudding securely in a scalded and floured pudding cloth, and boil it for about $1 \frac{1}{2}$ hours dam roly poly is also baked, but in this case a short pastry is used
JAM SANDWICH. The cake known as a jam sandwioh is made by whisking together for 15 minutos 6 oz of oastor sugar and 2 eggs Into a separate basin sicve $\frac{1}{2} \mathrm{lb}$. of Hour and I teaspoonful of baking-powder and in a naucepian over the fire mett 2 oz . of butter Fold the flour lightly into the eggs and sugar, and add the melted butter and the grated rind of half a lemon
Grease two sandwich tins, pour half the mixture in each, and bake them in a very hot oven for 10 min . Place them on a sieve until they are cold : then split each sandwich and spread it with jaın. Sprinkle castor sugar over the top and cut each cake into eight pieces and serve.

JAM SAUCE This sauce is especially well suited to baked and boiled suct pud dings. To make it hlend a tensponfula cornllour with a little water, and boil whit remains from $\frac{1}{2}$ pint ol the latter with 2 table spoonfuls of any jam Pour these on to the corntlour, and boil all for 5 min . Add the juice of a lemon, and then it is ready 10 serve Syruportraacle sauce oan be made in the same way, two tablespoonfuls of syrup or treacle being used instead of jam.

JAM TART. Small jam tarts can be made by lining some patty pans with short or puff pastry, filling the cases with rice in order that they may not rise, and then baking then in a hot oven until they are lightly browned Theymaythen be filled with warm or cold jum of any kind. and served either hot or cold A large open jain tart oan be made in the same way, the pastry lining being pricked with a fork. If liked, some narrow twisted strips of pastry may be laid acrose the tart, but in a case of this kind the jain should be put in before the tart is bnked.

JAM TURNOVER. Make 8 oz Haky prastry and roll out ahout $\ddagger$ in thick Shape it into small rounds with a fancy cutter, and on half of each place a teasponful of any kind of jam. Damp the edge of the ronnd and then fold over other half, pressing edges well together. Brush the turnovers with milk, and bake them on a grensed haking shect in a hol


Jam Turnover. Dish of the appetising pastry sweet sometimes known as jam ontt
oven for about 15 min The pastry should be made according to the dircotions given in the article on that subject. See Pastry

JAPANESE ANEMONE. This valuable, hardy. herbaceous perconial beary white or coloured tluwers on stems 3-4 ft. high in September. It should be planted in autumn or apring in deeply dug and manured soil in sunshine or partinl shade ; it becomos esta blished slowly and should remain undisturbed for lears. It is a good plant for the shady border The botanical name is Anemone japonica Some of the finest varibliea aif


Japanese anemone. Lellicate, long stemmed blooms of the autumn-flowering white variety
alba, white; Queen Charlotte, rose-pink Mont Rose, rose: Lord Ardilaun, double white; and Lorclei, double rose pink

JAPANESE CUCUMBER. This type of cucumber is very similar to the ridge varicty It is perhaps more productive, and may orsily be raised from sced. It should be grown in rich soil in a sunny place out of doors, from sced sown in May.

Fruits grow up to a foot in length but, as the habit of the plant is really a olimbing one help must be given with branches or stakes so that tendrils may linve good support. A fourfoot trellis is excellent for the purpose. It must be understood that this variety does not compare with the frame oucumber either for quality or size. See Cucumber: Frame.

## Japanese Gardens and Gardening <br> With Instructions on Making a Dish Garden

The articles in this work that deal with the garden in one form cr another include Garden Italian Garden: Rock Garden. See also the entries on the various plants; also Path

Ample space and a congenial position are tamiliar full-moon bridge, erected in a sem essential to secure an artistic Japanese garden The ideal position is near a running stream. Artificial hillocks and knolls or pools and shallow waterways may be constructed when missing from a position otherwise desirable

Harmony must be maintained by using furniture and material of Japanese character for such adjuncts as a summer or tea house or n bridge over a lake. Typical Japanese trees and shrubs in pots and tubs will be altractive, with gmups of the dwarfest kinds planted here and there in hillocks and linolls Quaint bridges should span narrow waterways, the shallow parts of which may be crossed by causeways of grey stepping-stones, while footpaths wander deviously through varying heights of ground. Where the soil itself is of a moist character. irregular slabs of stone should be placed to form a path. Aquatic plants are one of the greatest charms in Japanese gardens, and a home for these waterloving specimens, together with a pool for water lilies, must be included in the general scheme of the garden.
Screens and Hedges. The wistaria and Japanese roses should be utilized, as these are indispensable for covering structures, or bedging out an undeairable aspect. A boundary or acreen of Japancse llowering trecs, hardy bamboos, and evergreens is necessary where a natural one does not already exist. Near the centre of the garden there should be a dominant hill, with lesser hillocks, banks, and knolls, suitably placed in the picture. The path, perhaps, may complete a circuit. winding in and ouf, up and down, until eventually it rejoins at the point where it began, with a connecting path run. ning to the centre True circles and straight lines must rigidly be excluded from any ground plan

There should be a lalie consisting of two pieces of water joined by a narrow, curving bottle-neck channel and as much of the charm of a Japanese garden is derived from its quaintness of detail, this bottle.neok. spanned near its middle by a bridge approached by an informal setting of grey. llat stones, may very well be one of the most fascinating spots. When excavation is necessary to make a lake, the soil removed niay be used with ad vantage to form rising ground

Bridges play an important part, and there are many curious and effective examples in wood and stone. Some are elaborate like the ronfed bridges with their clustering wis. taria, others just simple strictures of faggot and bamboo covered with soil or turf An. other type is the


Japanese Garden. Corner of this artistic and fascinating type of garden,
with stepping stones leading between aquatic plants to the miniature pagoda
circle, the reflection in the water bencain completing a circle, and thus creatin. the iden of a full moon. Where the water course is very narrow a simple slab of stune may be used

At one end of the lake rockwork with alpines should be placed, while along its banks aquan tics and water-loving plants may find their home. If possible, a garden well should be included, also a guardian tree of either bamboo pine, or plum. An attractive adjunct is the square or octagonal lantern

The lake, in most cases, will be the chief difficulty, but beyond a good deal of hard work, its formation is not insuperable ; and being in close proximity to the proposed hill, or hillock, in the top left-hand corner the soil excavated may very well be used in order to form the rising ground

Miniature Japanese Gardens. A fascinating pursuit which children can enjoy is laying out a little Japanese garden in a llat dish. Such a garden may measure anything from 6 in . to 2 it. or even more across. A shallow brown earthenware baking dislı measuring, say, 12 in by 7 in., is a useful size with which to make a start. The dish may be oval, oblong, square, or round, but an oblong is easiest to plan out successfully The first thing is to decide on a rough plan of the garden: for instance, on the position of the little hill on which the pagoda is to stand, and the lake or pool, without which no Japanese dish garden is entirely complete.

Fill the dish with finely sieved and welldampikd garden mould to just above the rim.
pressing it down firmly, and arrange a good hillock on one sids Next start out armed with a basket and a short, blunt table-knife in seareh of some tine vivid green cushion-mos, with which to turf it An old wall, or bridge will often yield just the specially line kind reguired. Add some tufts of rather coarser moss to serve as bushes and a few minute Howering plants. Low growing Alpine rock plants sold at 6d. cach are suitable. Moss can also be bought if it is not possible to obtain this on a country walk; quite a large piece is obtainable for $2 d$ Tiny imitation pine trees can he bmught cheaply
Children who live in the country can seareh in the shrubbery for minute seeding linllies or firs The paddock or hillside will often produce tiny, dwarfed oak trees and beech trees, with miniature leaves, where the acorns and nuts have sprouted on very poor soil-just the thing for the dish garden. Failing these, a small asparagus fern. costing sixpence, stripped of its wower fronds to leave a single tall stem, makes an excellent Japanese acacia trce while a small plant of fine white heather will suggest a bush of white flowering broom

A slab of rock such as is used for a rock garden, which can be flaked with a blunt knife. will provide flights of stone steps and miniature mocks beside the water's edge Stones may be utilizod taken from the roadside or garden

## How to Arrange the Garden

First thoroughly damp the moss, and, having damped and drained the mould in the dish (which, of course, has no bottom drainage), plant any trees with good balls of their own earth round their roots, and proceed entirely to turf the landscape, running the moss right up to the stems of shrubs and trees, and to overhang the lake or pool in the garden. Press it well down and make any necessary undula. tions in the surface. The trees should be perched up on the hill, to give it height, with the pagoda just beneath their shade.

Arrange a winding flight of steps down the hillside to the water's edge, and one or more finely gravelled patha to meander between moss bushes and flowering shrubs round the outside of the garden. Shell gravel (procur able at any bird-seed shop for a few pence a tiny sack) scattered from a penny pepper pot with rather large sprinkler, or sand spread from a picce of paper made into a cone-shaped poke and used as if icing a cake, allowing the sand to trickle out of the hole at the end, can be used to make a level surface for the paths

If space allows, place a rocky island in the centre of the lake, cementing it to the botton of the small oblong glass or china dish used for this purpose, which must be lined with dull green plasticine ( $a$ penny stick will do) and covered with shell gravel before the water is poured in, planting a tuft of rushes beside the tiny landing stage formed of a serap of rock half embedded in the turf.

Connect the island with the mainland by an arched bridge made of a short atrip of straw berry punnet, stained dull green with water colour paint, or formed of several minute brown twigs, wired with dull brown florist's wire to lie side by side. More claborate bridges can be bought.
For a larger garden a real Japanese dwarf tree is often employed, and the tea house is placed under its shade. More elaborate gardens can be made in a corner of a conservatory and built up on a large tin tray

If real water for the lake is objected to, substitute a piece of clear glass (a well-polished stripped negative glass does) over the top of the prepared hole, in which a minute toy goldfish has been arranged, with a tiny moss water plant, to add a touch of realism, or make no excavation, merely pressing a strip of lookingglass on to the soil at just below dish-level,
bringing the turl right over on to the suriace to make irregular green banks. A bridge thrown over the water and a tiny, flat


JAPANESE MAPLE. A number of lowgrowing $t$ rees or shrubs, varieties of Acer iaponicum and Acer palmatum, are known as Japancse maples. They are suitable for planting out of doors except in cold districts, for the rock garilen, and for cultivation in pots in the greenhouse. The spring and autumn leaf colouring of some sorts is very benutiful The following are some of the best valicties. Of Acer aponicum-aureum and laciniatum. Of Acer palm. at um -rosea-marginatum, sanguincum, Osakazuki, septemlobum and dissectum are noteworthy Miniature trees of the Japanese maples are sold by dealers See Divari Trecs.
JAPANESE QUINCE. This is the popular name of Pyrus japonica (sometimes called japonica), a hardy shrub whiclı bears red flowers in spring. See Pyrus Japonica.
hottomed punt afloat upon the lake or pool complete the illusion.
Swinging lanterns are ensily made from a vivid-coloured oval bead, with a smaller bead of contrasting colour on either side of it, arranged to swing from an iron stake formed of part of a bent hairpin.

Tiny ligures, birds, tea houscs, pagodas, boats, steps, aummer houses, red bridges, and a variety of suitable tiny plants can be bought at a sixpenny store

A fountain which will play in the centre of the real water lake is an additional attraction to the garden. For this a small oblong tin makes a good tank, with a hole bored in the bottom, to which a length of fine indiarubber tubing long enough to go from the bottom of the tank (fastened to the wall, or to the top of a stout garden stake, thrust into a flower pot, at least eighteen inches a hove the level of the water), and passed over the edge of the dish and under the turf along the bottom of the lake, to emerge from the centre of a tiny rockery (made from scraps of rock cemented together), with the nozzle of the glass tube (bent at right angles) fitted to the end of it, the join being carefully plastered with plasticinc to prevent leakage. When in play the fountain will throw a water jet scveral inches high into the air.

To cut the glass tubing to the necessary length saw it half-way through with a threesided file-it will then break easily at the point required. Point the end to be used as mouth. piece for the fountain by holding it obliquely in the flame of a powerful lamp, or in a gas jet, twisting it round and round in the fiame, so that it may thicken evenly all round as the glass melts, and continue this until only a tiny hole in the centre of the tube remains To bend it at right angles, hold it straight across the Hame at the point at which the bend is needed; as it gets hot it gradually melts, and, bending with its own weight, falls downward at right angles

For a waterfall make a second hole in the tank, with a second length of tubing concealed beneath the turf to appear at the top of a rocky gorge, beside the pagoda, down which the waterfall can play. The mouthpiece of glass tubing must be melted to a fine point, as for the fountain, but need not be bent. The garden must be watered with a dolls' watering pot, and then tilted to drain about every other day, 10 keep the mossy turf green

Japanese Golden Bell Flower. This is the popular name of forsythia ( $y v$ ), one of the most beautiful spring-flowering shrubs.

## JAPANESE SPANIEL. This little snub

 nosed, straight-haired, silky dog is a comparatively recent introduction to the list of ladies toys in Britain, but in Japan they have enjoyed popularity for centuries. It bears a certain resemblance to another type of Eastern dog, the Pokinese, which has also found favour in England. It has a relatively large, broad head, short, wide muzzle, large, dark, lustrous eyes far apart, and simall, V. shaped and feathered ears. The body is short and square-looking, the dog's length being equal to its height, which is about 10 in . at the shoulders.The spaniel has a profuse, rather ailky coat, the long straight hairs with a tendency to st and out The small legs, thighs, and tail


Japanese Spaniel, a popular toy breed with a long, straight-haired, silky coat
arc well feathered, and there is a thick ruff around the neck. The colour is clear white, with patches of black or some bright tint of red over the body, cheeks, and ears. It should weigh between 4 lb . and 9 lb ., the lighter weights being more highly esteemed than the heavier. Its constitution is by no means mobust, and great care is needed in the feeding of it. See Dog ; Spaniel.

JAPAN LACQUER. This is a liquid made of shellac, or some similar resin, metallic oxide, turpentine, and linsecd oil. It is used to a considerable extent as a medium when grinding and mixing colours, and as a drier to hasten the setting and hardening qualities. It is reputed to have originated in Japan. Virtually a hard black varniah, it is applied as auch, and dies with a glossy and smooth surface. See Lacquer; Varnish

JAPAN WARE. Articles treated with an application of Japan lacquer are known as Japan ware. The latter is used in the home in the form of tea-trays, bread-pans, candlesticks, etc, its main virtue being the ease with which it can be kept clean. Lulie warm water ahould be used for washing, and a soft cloth for drving and polishing. A smeared surface caused by grease should he sprinkled with a little Hour and then rubbed with a soft cloth; hot water should not be used, as this invariably produces cracks

JAPONICA. This old and favourite shrub usually inay be found in nurserymen's lists either under Cydonin japonica or Pyrus japunica See Pyrus Japonica
JAP SIIK. A great deal of silk is made in Japan and consequently that country is noted for the supply of cheap, plain and usually undyed silk, which is used very largely in Great Britain for blouses. dresses and linings, and for cutting and sewing into handkerchiefs and many other articles.
This silk is made in standard widths of 191 $, 22 \frac{1}{2}, 27$ and 36 in. and in pieces mostly 50 vards long. The weight is designated by nommes, a Japanese unit of weight; the thinnest are 2 mommes and suitable for lining hats: 5 mommes silli is medium, and the heavier kinds run $8 \frac{1}{2}$ mommes and upwards.
The fabrics are mostly handwoven and made from comparatively unworked silk. When thicker silk is wanted the threads are not twisted together, as is usual in European cloths, but are gummed together and woven.
After weaving the cloths are boiled and the gum and paste are thus taken out of them, so improving the colour; they are made a still better white by being dricd in the sun They are sprayed next with gelatinc to stiffen then, and are ironed or calendered bet ween heated ateel rollers They are often irregular, containing minor defects, but are so cheap that small imperfections are overlooked. The sillis arc graded according to their quality.

When Japanese silk is washed for the first time some loss of weight and substance may be expected, consequent upon the removal of the gelatinc stiffening. This cannot readily be replaced in a made-up garment, and the attempt is likely to lead to cloudy patclies Soda in more than very small quantities is bad for silk and weakens it. The best snap should be used for washing, and if a good heary quality of silk is bought the lost weight will not be missed. A little vinegar should be used in the last water. The whiteness will be increased by drying outdoors.

Jap silks are dyed extensively in Great Britain by professional silk dyers and in colours to suit the demands of the season. Before dyeing, the pieces are well washed to remove the gelatine, which would cause une venness of shade. They are treated, after dyeing, generally with some kind of starch to make them feel fuller, and so that they shall not be too stiff the starching is broken up by rubbing and brushing the cloth by machine. If a garment is to be redyed at home it slould be beaten lightly to remove dust, be washed perfectly clean, and silk dye should he used on it. Jap silks are often printed in colours in Britain or in France, to befit them for dress materials, linings, and hat and neck trimmings. See Dyeing ; Silk.
Jargoon. This translucent, colourless or smoky variety of zircon, found in Ceylon, is sometimes used to make imitation diamonds.

JASMINE. Two of the most popular hardy climbing plants are Jasminum nudicaule, which bears yellow fragrant flowers in winter, and Jasminum oflicinale, with white, sweetsmelling flowess in summer. The former is suitable for a sunny wall; it should be pruned
as soon as the flowers are over by shortening the side shoots of the past summer's growth to within an inch or 80 of the base. The white jasmine should be planted to cover a trellis, arch or porch. It is difficult to prune this shrub systematically, because its long, slender shoots intertwine freely, but these ought to be thinncd out in spring.
Both these jasmines flourish in ordinary soil, and ss they are grown in pots they may be planted at any time, preferably in spring or autumn. They are propagated by cuttings in a frame or out of doors in autumn Other climbing jasmines are Beesianum, red ; primulinum and revolutum, yellow. They are
 suitable for planting against a sunny wall Gracillimum, white, must be grown in a heated greenhouse. This opaque stone, a variety of quartz, is widely used for orna. mental purposes. Several kinda are known, some being red, hrownor yellow, while others $h$ avc various markings, such as stripes and spots.
JASPER WARE. The hard, dense and vitrified biscuit ware which Josiah Wedgwood perfected in 1776 and called jasper is one of the triumplis of English pottery. For twenty years, until his death, the output was very large, especially of tiny cameos, generally portraits and olassical scenes in white relief usually on a blue ground, although in various tones. A number of other colours were also employed as backgrounds.
Cameos were often set in gold and steel mountings for finger rings, brooches, buckles and other personal ornaments. Larger medallions, tablets, and plaques sometimes as much as 27 in . wide, were separately framed, or inserted in the fronts of cabinets and mantelpieces. During his last ten years Wedgwood produced some superb vases, whose exquisite finish was due to lapidary work after the firing. Of this the collector can hardly hope to secure the larger examples except at a substantial outlay.
Wedgwoorl jasper is still produced in the original designs, and may be recognized by some differences in the mark, such as the addition to the word Wedgwood, after 1891, of the word England. In 1907 the date was fixed by a mark consisting of the ligure 3 , to denote that it was in the third of the alphabetical cycles started in 1846, with a capital letter for the workman and another for the year, that for 1907 being J. The old mark Wedgwood \& Bentley used on plaques, medallions and portraits during the period 1768-80 is not found on pieces with an olive, sage, pink, lilac, yellow or black ground, and not on blue-ground vases.
Jasper ware should be kept clean with soft leathers and a sparing use of plain water, because otherwise the unglazed surface tends to become streaky and discoloured.
Some of Wedgwood's pupils and rivals turned out jasper more or less according to
his designs and recipes Of these collectors purchased in a prepared form fiom chemists, prize the work of John Turner, whose blue or made up at home in the following way : ground is rather violet, and also of William Shake together in a bottle 30 oz of water and Adams, whose descendants still produce a 2 oz . of chlorinated lime or bleaching powder jasper-looking semi-porcelain Foreign imita- and, when they are well mixed, add a solution tions and counterfeits of old jaspet are usually poorly done and readily recognized. See Wedgwood.
JAUNDICE. This is a condition in which the colouring matter of the bile circulating in the blood gives a yellow hue to the skin, the mucous membranes, and also to the urine and other secretions. Jaundice is not itsell
a disease, but a symptom for which a cause must always be sought. The yellow colour is at first noticeable in the eyes.

It may be caused by gall stones or parasites obstructing the bile ducts, or by a tumour of the stomach, pancreas, or liver, etc., pressing on the bile duct. A very cominon
 jasper ware, beight 12 in.

British Museumi consisting of 4 oz . of carbonate of potash (pure pearlash) and 10 oz of water.

When the mixture has been allowed to stand for a fow days separate the clear liquid from the sediment by means of filtration. White olothes only should be treated with javelle water, since the latter contains certain properties which destroy colour. For bleaching purposes about a cupful should be added to a copperful of water, and the clothes should soak in the solution overnight.

If used for removing stains, either from clothes or paper, the liquid whould afterwards be washed off with clean "ater, otherwise the material may rot. Grass and ink stains and scorch marks on tion is catarrh of the bile ducts, and this linen or cotton goods may be treated with may be produced by indigestible or ill- javelle water; but in the case of a scorch masticated food, a chill, excessive consumption alternatc applications of oxalje acid solution of alcohol, etc. This catarrhal form of are required.
jaundice may pass away in a fortnight, and it rarely lasts more than six weeks.

Jaundice may occur in fevera and in poisoning by phosphorus and other substances. It may follow a severe fright, or a fit of anger, or other violent emotion, in which case it comes on suddenly and goes as quickly.

The treatment of jaundice will obviously depend on the cause, and the diagnosis should be made by a doctor. See Gall Stone; Liver.

JAVELLE WATER. An excellent bleach ing agent prepared from chlorinated lime and pearlash, javelle "ater is much used for whitening discoloured clothes, and also for removing various kinds of stains. It can be

JAZZ. The word is of American negro origin, and refers more to the music which is played in syncopated time than to the ateps of a dance. There was nevertheless a rolling step known as the jazz, which formed part of the fox-trot. There wns also $n$ straight jazz tep which was really a three-step
A jazz band is composed chietly of piano, banjo, saxophonc, drum, and at intervala the voice, while various other instrumenta are often added. The musio is played in syncopated time.
JEAN: The Material. Overalls can be made in jean which is an especially strong cotton twill used in lining leather boots and

## Jellies and Their Making <br> <br> Strawberry, Lemon and Other Attractive Varieties

 <br> <br> Strawberry, Lemon and Other Attractive Varieties}Recipes for other swects for the table are given throughout this work under such heading; as lecs ; Tritte. See a'so Cherry Jelly: Children's Party; Mould: Sweets

Jelly is the name given both to the fruit jelly uscd as conserve and to the moulded table jelly To make jelly the general prinoiples are as follows:
The fruit should be on the under-ripe side. as pectin, the jellifying substance, is only fully present in under-ripe fruit. As pectin will only work in conjunction with acid, very oweet fruits should either have oitric acid or the juice of more acid fruits such ns apples, lemons, rhubarb, added.
The fruit, carefully picked over, should be put in a preserving pan with just enough water to keep it from burning. Very slow hent should be used to extract all the juice. Boil it gently until the fruit is pulped, then pour it into a jelly-bag, and leave it overnight in order that the juice may drip through into a busin. Do not press the bag or the jelly will be oloudv.

Measure the juice back into the preserving pan, and add the sugar. the proportion of "hich varies with the kind of fruit, but is usunlly about 1 lb . to 1 pint of juice. It is important that the quantity of sugar should be exactly right. With too much sugar the jelly will not set ; with too little it will be tough, so test for the quantity with a small amount of juice. If the jelly will not set, add a little citric acid or lemon juice until the desired consistoncy is reached, and then add the acid in the same proportion to the juice in the pan.

Boil the syrup ngain until a little jellies when dropped on a cold plate. If it is boiled too long, the jelly loses Havour and becomes dark and sticky ; if not boiled enough it will not set. Poui it into warmed jars and tie down at once. Tho pulp left after the juice is abstracted
can be mixed with apples or some other juicy fruit for making jam.

Jelly Bag. This devico for straining the juice from the fruit in the making of jelly is a cone of folf. or of strong flannel, with loops of


Jolly Bag for straining amall quantuties of jelly
clean coarse cloth is often tration A of flannel
A stand can be obtained to which the jelly bag is fastened, but can easily be improvised at home, the loops on the bag being liung on to the backs of two chairs. A quickly im. provised jelly bag can be made as follows: Turn a kitchen chair upside down on the edge of the table, then tie the corners of a square of strong, new flannel to the four legs. A large bowl is then stood upon the inverted seat to catch the juice. The jelly bag must always be moistened with hot water before the fruit is poured in.

The jelly bag illustrated is very useful for making small quantities of jelly. An ordinary basin is placed on a table where it will not be disturbed, and the jelly bag fixed over it.
A jelly bag should not be washed with soap. As soon as it has been used put it into a basin of boiling water, and stir it about with a stick. Change the water once or twice as it becomes dirty, then add some cold, and wring it out. Rinse it well, then dry it in the open air, but be sure that it is quite dry before putting it away.

Table Jollies. These are made either with gelatine and fruit Havourings, or by pouring boiling water on to a preparation obtained in crystal or powder form. or as a lump of very solid jelly, which is cut up into squares.

In making a fruit jelly of the first kind, the quantities and methods of preparation vary with the different fruit. The following simple recipes give some instances:
Strawberry Jelly. Strawberry jelly is made without boiling the fruit. One pint water and $\frac{1}{2} \mathrm{lb}$. loaf sugar are boiled with $\ddagger$ pint red currant juice, and this syrup is then poured over $\frac{1}{\frac{1}{2}} \mathrm{lb}$. carefully picked straw berries. When cool, I oz. gelatine. dissolved in a little water, is added, and the whole is poured into a mould.
Lemon Jelly. Lemon jelly is made thus: Dissolve $\frac{1}{\frac{1}{2}} \mathrm{oz}$. gelatine in 1 pint water, then add the grated rind of 4 lemons and the juice of 2 , nnd $\frac{1}{2} \mathrm{lb}$. loaf sugar. Then, to clarify the jelly, add the white of an egg, and the shell, crushed in the hand. Put the whole on the fire and whisk it continuously until on the point of boiling. Then strain it and pour it into a wet mould to set. This jelly is usually clarified. Orange jelly is made in the same way, but needs only 5 oz . sugar.

Wine Jellies. To make wine jellies, such as claret, sherry or port wine, use 1 oz . gelatine to one bottle of chcap wine and $\frac{1 \mathrm{lb}}{1} \mathrm{l}$. loaf sugar. Simmer until gelatine and sugar are melted, and then boil for 5 min . Add a little carmine or cochineal in order to give a better colour if necessary. Strain into a mould and leave to set.

To decorate a table jelly with fruit it is paper. Several of the cakes can be cooked necessary to line the mould with jelly to keep it in place, before the bulk of the jelly is put in This is done by taking two moulds of the same shape and pattern. but one slightly smaller than the other. Let a little cool jelly mixed with fruit set in the bottom of the larger mould. Then put the smaller one inside it, and fill up the spaces with fruit and jelly. When this is quite set pour a little hot water into the inner mould. which can then be removed without difficulty.

In making a packet jelly with the addition of fresh fruit it should be remembered that less water is needed; fruit and water together should measure only a pint

Jelly Mould. There is a large variety of moulds for table jellies, both as to shape and size. They are made of tin, aluminium, china, or glass, and are usually ornamented with some raised design which is reproduced on the jelly. Frequently the design is of fruit, and in that case it is desirable to use a jelly of the same flavour. A pineapple jelly, for example, may be set in a mould decorated with a pineapple, and a jelly flavoured with port or claret in a mould with a bunch of grapes upon it.

The nould should not be very deep in comparison to the width, or the jelly may break ujon being turned out. Some moulds are made with a deep indentation in the bottom, the corresponding hollow in the jelly being then filled with whipped or clotted cream or with chopped fresh fruit or a purée of fruit.
Before using a jelly mould, make sure it is quite clean, then fill it with cold water and let it stand for a few minutes. When the jelly is ready to pour into it, empty out the water. but do not dry the mould.

Jelly Fingers. These quickly prepared sweets are made from half a dozen sponge fingers, a pint of raspberry jelly, and an ounce of almonds. Pour a thin coating of the jelly in a shallow glass dish, and when it has set arrange the sponge fingers on top, leaving about 1 in . of space between cach.

Soak them with a small quantity of jelly, and cover the top with the almonds, blanched, skinned, and each split into three or four pieces. Pour over the remainder of the jelly. taking care to keep the biscuits in position, and leave it to set. Then cut out the fingers with a sharp knife and arrange them tastefully on a glass dish.

Jelly Trifie. A trifle made from sponge cake and jelly, and decorated with almonds and whipped cream, is prepared thus: Cut 4 large sponge cakes into halves, and arrange them in a dish with the cut sides downwards. On the top of them stick 1 oz . of blanched, skinned, and halved almonds, and pour over a pint of strawberry jelly. Leave the whole until it sets, then decorate it with a gill of whipped cream, sweetened to taste. A layer of pineapple or sliced peachcs may be placed under the sponge cakes and the creant ornamented with crystallized violets and angelica strips.

JERSEY WONDER. These fried cakes are made as follows: Rub 3 oz . butter into 1 lb . Hour, and then add 3 oz . castor sugar, and a little ground nut meg, ground ginger and grated lemon peel, and mix to a stiff dough with 4 well-beaten eggs, and, if liked, a few drops of brandy. Turn the dough on to a floured board, and roll it out to a thickness of about $\frac{1}{2}$ in., and then cut it into oval shapes, about 4 in . by 3 in .

Two slits should now be cut down the centre, not cutting through the ends. Pass one side of the cake through the slit in the other side, and drop it at once into a pan of boiling fat. Turn it in about 2 min . time, and in another 2-3 min. it wil! be done, and nicely risen. Take it out with a fish slice, and drain on kitchen

Jerusalem Artichoke. An easily cultivated plant belonging to the sunflower family, with edible roots. See Artichoke.
JERUSALEM SAGE. This is the popular name of Phlomis fruticosa, a half-shrubby plant about 3 ft . in height, with sage-like leaves, and yellow flowers in summer. It thrives best on light soils, and is propagated by seod sown in spring, or by cuttings during the summer.

JET : For Wear. The best hard jet is very tough, and can be carved and then polished with jeweller's rouge. Formerly almost the only jet ornaments available were massive and funercal-lonking brooches and necklets. For modern neck ornaments jet is often used in bead form with crystals.

Imitation jet is really a variety of coal, cannel coal, highly polished, and so skilfully cut that it is difficult on inspection only to detect the difference between it. and the more costly genuine jet.

Besides being made into jewelry, imitation jet, which is a composition of black glass, hard black wax and other substances, is used for trimming dresses.
To clean jet, wash it in warm, soapy water, and drv in sawdust, but if it is regularly brushed with a soft brush each time after use it will not be necessary to wash it very often. This is an advantage, because although the jet itself is not affected by washing, the material on which it is threaded deteriorates when wet, so the process should be avoided as much as possible.
JEWELRY. Fashion plays a great part in the wearing of jewelry. One year it is correct to wear precious stones in the daytime ; anot her year, except at the smartest afternoon functions, they will be seen only in the evening. In any casc good taste is governed by a certain simplicity. Pearls and coloured stones are seen to best advantage without any mixture except diamonds. For instance, a sapphire and diamond pendant should not be worn with ruby or emerald bracelets or brooches, or it will lose its distinction.

Where a particular gem is liked, it is a good plan to collect the various pieces of jewelry to form a set, choosing a simple artistic design unlikely to go out of fashion, and the stones themselves for colour rather than size. If a large piece of oriental or modern art jewelry introducing a number of coloured gems set in filigree gold or worked silver be worn, it looks best, as brooch, clasp or pendant, without other ornaments.
The same isolation may be observed with carved Chinese pendants of chalcedony, amber or jade, into which further colour is often introduced by the threading of amethyst, coral or carnelian beads on to the loop of the pendant ; also with the long chains of semi. precious beads which in themselves provide a trimıning for a dress.

Pearls are always fashionable, either real or countcrfeit, many of the finest imitations and artificially cultured specimens defying detection except by the expert. Single pearls, or pearl hoops and tassels, are favourite forms of earrings, and old seed pearl ornaments look well worn with a black evening dress, though they need careful handling.

For modern jewelry French set tings are, as a rule, most admired. - Yellowish or greyish tinges in diamonds detract from their value ; sapphires should be of a rich royal blue or they lose their beauty at night, appearing to be black. The finest Burmese rubies are of the coveted pigeon blood colour: emeralds are rarely without a slight flaw. These four stones are well imitated in paste, some of the old French examples being set with exquisite
finish, and in the case of coloured paste often mounted with real hrilliants. Modern paste has a fine lustre when new, but it deteriorates, and it can always be distinguished by the expert on account of its comparative softness Another form of innitation gem sometimes sold in cheaper jewelry is the doublet, a thin piece of real stone cut to form the front, while the hack is paste

Ruhies, sapphines and emeralds are cut in the same ways as diamonds or en cabochon that is, with a rounded surface, which has a beautiful effect in rings when the coloured stone is surrounded by brilliants. For opaque or semi-opaque stones such as turquoise, cat's eye or opal, the cahochon form of cutting is always used. The beauty of turquoise lies in its lovely blue colour, hut it is liable to turn green and the stones should be kept from contact with grase or perfume. The opal suffers from the persistent superstition that it is un lucky, but a fine specimen possessing brilliant flashes of fire always holds its place in public favour. The opal is a soft gem and easily dulled by scratching after much wear. This defect can be removed by $\Omega$ jeweller and the surface brilliancy entirely reatored.

Victorian Styles. Many of the less precious coloured genis are exceedingly beautiful, such as peridots of soft, transparent green; topaz, pink and yellow ; aquamarines, sea-coloured as their name implies; tourmalines, red, pink green and brown. Victorian pieces of garnet jewelry have returned to favour with the cameo and onyx. The last named, which is chalcedony stained to a hlack, has been used with diamond workmanship for exclusive designs in jewelry of all kinds.

Earrings are probably the most valued of Victorian pieces of jewelry, as many of these show fine quality of workmanship. Filigree or chased metalwork settings for black or hlue enamel or turquoise are sought after. Much Victorian jewelry was made of, or set in, pinchbeck, a metal which was composed of a mixture of zinc and copper and practically untarnishable. Pinchbeck was an invention of a 17 th-cent ury jeweller of that name. Only those pieces of pinchbeck jewelry made before the 19th century have value for the collector.

Amethysts, never out of fashion, are best when of a deep purple. The alexandrite possesses the quality of appearing by daylight a rich green and by artificial light changing to red. Moonstones with their silvery semiopaque shimmer are very pretty set in conjunction with coloured stones, eapecially red. In the 20th century the fashion has been for geometrical designs in the setting of jewels rather than the copies of hirds, insects, Howers, etc., favoured during the latter half of the 19th cent ury

All kinds of semi-precious stones and also ivory, amber and coral are formed into beads for necklets and long chains. Lapis lazuli is popular on account of its deep blue colour, and it is imitated in stained agate. Jade, either green or white, is not imitated so successfully. Jet, though chiefly used for mourning jewelry, is effective when combined with crystal for necklets. Jewelry for men, now that the wristlet takes the place of the watch chain, resolves itself into pearl studs for evening wear, cuff links, and a signet ring. See Bracelet; Brooch; Diamond; Emerald; Earring; Pearl; Ring: Ruby.

JEW'S MALLOW. This is the common name of Kerria japonica, a hardy Chinese shrub, about 3 ft . high, which has yellow flowers in spring. The double variety, which bears much larger flowers, is more vigorous and an excellent wall shrub; it is one of the few shrubs that do fairly well on a wall facing north. It thrives in ordinary soil and is increased by cuttings placed in sandy soil in a frame in August. Pruning should be done as soon as the flowers have faded by cutting out
the oldest hranches or parts of them. If grown in pots, the Jew's mallow is very useful for the cold or alightly heated greenhouse in spring.
JIGSAW PUZZLE. To make one of these puzzles it is bert to start on a small puzzle for practice. For this a suitable coloured picture on thin paper can, as a rule, be found in an old magazine or weekly paper. A picture with a shiny surface should be chosen, as dull-surfaced paper becomes so quickly soiled with handling when fitting the puzzle together
The more definite the picture the easier it will be to put together. A puzzle with a wide expanse of clouds and sky, or of aoftly shaded fields, for instance, is much harder than one with a scene depicting huntsmen and hounds in full cry, or a dog st udy.

Experienced jigsaw puzzle solvers delight in a really difficult puzzle. One of the most succesaful ways of gratifying their desire is to choose a large figure subject which fills most of the picture, and to cut away the hackground, leaving the puzzle solver no clues in the shape of straight-sided horder pieces and the eagerly sought-for corners
Making a Puzzle. The tools neerled in jig. saw puzzle making are few. A small fretsaw and firame, a set of extra hlades, and a wooden cutting-tahle-a metal cutting-table is apt to hlunt the blades-and clamp, to enable it to be fastened to the edge of any convenient steady table It is essential to use proper fretsaw wood on which to mount the pictures, as other kinds will he found to split. Good quality 3 -ply wood is the right thing to use. Satinwalnut wood is also excellent, and there are other kinds of good thin wood which fretwork material outfitters will recommend. From ${ }_{16} \frac{3}{}$ to $f$ in. thick are the best widths.

To start, make anme good strong paste from a tablespoonful of Hour, mixed to an absolutely amooth cream with a little cold water, and made up to half a pint by the addition of boiling water, poured in slowly, stirring the mixture all the time. The paste should gradually thicken and clear, becoming semi-transparent if necessary, turn it into a small saucepan, and stir over a low flame to attain this result. Set it aside to cool; when cold it is ready for use. Trim the picture carefully, removing any white margin, and, placing it fnce downward upon a sheet of clean, white kitchen paper, brush it over with paste, and then leave it for five minutes to expand.

Brush it over with paste a second time and, lifting it up carefully by the two top corners place it face upward upon the fretwood, and press it down until a hsolutely smooth with a pad of white cotton rag. Make sure that it lies
absolutely flat, and that any air buhbles have been smoothed out, before placing a sheet of white paper over it and putting it under a pile of heavy bonks to press until it is quite dry Meanwhile, fix the cutting-tahle to the edge of any steady tahle of convenient height for fretsawing, and when the picture is a haolutely dry proceed to cut it out to the exact edge of the margin.

Now take a pencil and, placing the picture face downward, mark out the pattern of the jigsaw picces into which you intend the puzzle to be cut. In doing this, remember to avoid sharp points or too thin waists to the individual pieces, as these are liahle to break off when the puzzle is in use. Count the number of pieces marked, and note down the number
For the first attempt it is as well to keep the pieces of fair size, and of not too intricate a pattern. Place the picture face downward on the cutting-hoard, and proceed to twist it a hout with the left hand to bring the line to be cut into contact with the cutting edge of the saw, which works up and down perpendicularly in the hole in the cutting-table provided
When once the knack has been obtained, the work usually goes very swiftly, and soon the puzzle is cut out. Gather the pieces up carefully, counting them to make sure that none arc missing, and mark each piece on the back with the same small device-a star, a heart, an arrow head-in water colour, 80 that if accidentally mixed with the pieces from another puzzle they may easily be re-sorted. Pack them into a small cardhoard hox, upon the lid of which a label should be neatly pasted, giving the title of the picture and the number of pieces it contains.
When mounting a picture that is printed on rather thick paper it is a good plan to well damp the back with a sponge squeezed out in cold water, leaving it for five minutes and repeating the process a second time, and again leaving it fully to atretch before brushing it with paste and mounting it in the usual way. If a picture is brushed with paste and mounted without waiting for it to stretch, it is apt to dry into countless minute wrinkles which it is impossible to smooth away, and the picture is ruined See Fretwork.

JOB'S TEARS. The name of Job's teare is given to a half-hardy flowering grass, Coix lachryma, 2-3 feet high, which is attractive when mixed with cut flowers by reason of its drooping clusters of pearly seeds. It requires rich light soil and a sunny position. Seeds may be sown in a temperature of $60^{\circ}$ in spring, transplanting seedlings during May.

John Dory. See Dory.

## Joinery : ITS General Principles

## The Choice of Materials and the Tools to Use

A knowledge of joinery is jndisoensable to those who wish to make the many woodworking articles about which dircetions are piven in this wrerk, such including Burcau: Cabinet; Cupboard; Dresser and many others. Seealso Amnteur Carpeatry : Bench; Joint; Wood, etc.

Joinery is that branch of woodwork concerned with the preparation of the more ornamental parts of a huilding, and partioularly the art of joining woorl to form a strong structure, durable and pleasing in appearance. Joinery is allied to carpentry; but although many of the tools used are common to hoth, carpentry is, generally speaking, a rougher class of woodwork.

In addition to a knowledge of the various timhers in common use it is necessary for the joiner to know the limitations of his material. Joinery becomes ineffective in general for three particular reasons: first, by warping or aplitting of the material ; secondly, owing to failure of the joint due to the expansion and contraction of the wood; and thirdly, as a reault of the natural process of decay. In gnod joinery all parts should he framed together in such a wiay as to allow for shrinkage or
expansion, at the same time proportioning the thickness and breadth to prevent warping. Another point is that the work should he put tngether so that no end grain, or the minimum of end grain, is exposed to the weather The end grain is the most liable to attack, because it virtually consiste of a series of amall pipes conducting moist ure to the interior. To reduce shrinliage, all exposed paits should be as narrow as possible, this applying mostly to those members which happen to be framed up.

Choice of Material. It is a counsel of perfection to specify that all material should be thoroughly seasoned : that the wood should be chosen from the heart of the tree, and that sapwood, the portion of the tree whicl surrounds the hearlwood, should be rejected

Wood employed in joinery comprises battens or scantlings, measuring from 2 in . to 7 in ., hoards ranging from 7 in . to 9 in wide and up
to 2 in thick, and planks, that is, stuff wider than 9 in. Deal is the name given to rawn timber 9 in wide and from $2 \frac{1}{2}$ in. to 4 in thick. The name does not necessarily apply to yellow deal only, and the term is frequently used to distinguish different kinds of timber, though it properly only means any timber cut to the sizes specified above Thus the name white deal is commonly used to mean spruce, because this tree is cut into deal for export Quartering is another name by which certain sizes of eawn timber are known: it is applied to stuff approaching the square in section, as 3 in . by 3 in. or 3 in. by 2 in. All timber should be subjected to a second seasoning after it has been sawn into boards or planks, and from the joiner's point of view this second scasoning is the more important one.

A useful wood is American whitewood, which is obtainable in various widths and thicknesses and is free from linots. It is susceptible of effective treatment with stain and lakes a good poliah. Mahngany, walnut, and similar ornamental hardwonds are also employed, but for most work ondinary softwoods are used. Of these pine, particularly yellow pine, is the most serviceable for many purposes in the home

For the provision of panels and all places where large pieces of thin boarding are required, a useful material for the amateur joiner is plywood. Its use saves much trouble in planing, and it has the added advantage of not being liable to warp or shrink when in position

Tools for Jolnery. The tonls required by the joiner include planes and saws, together with a good selection of firmer, paring, and mortise chisels, and firmer and scribing gouges of different sizcs, brace and bits, hammers, pincers, and oilatone a well-equipped workman will need a quantity of special planes, such as a plough, a fillister, rebate planes and beads, moulding and compass planes, hollows and rounds Much joinery work is done by machinery. Accurate planing is done by thicknessing machines, moulding and beads are cut by formers, curves are cut by bandsaws, and mortises and tenons and dovetails are cut by special machines. The setting out of intricate pieces of work calls for skill and experience and the accurate use of the rulc, square, and bevel, even if the work is partly done by machine.

A solid work bench is essential, and should be about 6 ft in length and 2 ft . in width. $A$ heavy kitchen table provided with a bench top may be used; but the best work requires a properly constructed bench provided with a strong vice.

The amateur woodworker who talies up joinery should commence by making a careful study of joints and the methods of making the various kinds. Many of these are specifically dealt with under their respective headings, and a general article on the subject follows the present one. Aniongst them may be mentioned for special notice the housing joint, the mortise and tenon, the mitre dovetail, and the various classes of halved joints

It is an excellent plan to begin by practising on a piece of softwood, and in this way to acquire some degree of skill in planing and sawing to a line, for it is little use trying to make even the simplest joint unless the wond is accurately planed, marked out, and sawn. The tools inust be kept in the best condition The plane should be sharpened and set to take a fine shaving. The saw should be sharp, and the thickness of the eut made by it noted: neglent of this precaution will sjoil a joint Chisels should have keen, sharp edges, obtained by grinding and sharpening on an oilstone
Care must be taken to guard against bruising the wood, for which purpose the use of a mallet is preferable to a hammer. When knocking the paits of a joint together, it is helpful to interpose a rough piece of wood between the mallet and the joint. It is also desirable when erecting
the work to sec that it does not come into contact with the tools, as if the wood is badly bruised it will be difficult or impossible to eliminate any defects that are made

Generally the operations involved in joinery include sawing. planing, edge and end grain shooting, rebating, grooving, moulding. and mitreing, in addition to the construction of joints and frames. The proportioning of panelling is an important part of joiner's work, as are the relation of the panel to the width of stiles, rails, and muntins and the size and shape of the mouldings and beads, while the effect of light and shade on the surface calls for skill and experience. All joinery requires a good surface finish and neat.
accurate joints. The latter are obtained by careful workmanship, and the former by diligent scraping and glasspapring and leaving the work in a suitable state from the plane

Scraping is done with a specially prepared piece of steel, which is held at an angle to the work and operates by removing fine shavings from the surface. The use of the scraper is essential when dealing with hardwoods, because it is almost impossible to plane the surface without leaving some marks. With the exception of knots on tho surface of softwoods, it will generally be possible to obtain a smooth surface with glasspaper, but if the wood contains many

## JOINTS: IN WOODWORK

## An Important Detail of the Woodworker's Craft

Supplementary to this gencral article are shorter entries on the various ioints, e.g. Butt ; Dovetail ; Halved Joint; Housing Joint: Mortise: Rulc loint. Reference should also be made to the entries on Bookease ; Burcau; Cabinet Making: Drawer; Gluc ; Table, etc.

For the sake of convenience, many of the best-known and specific joints are dealt with in this work under their respective headings.
Joints are used in wondwork generally for one of two reasons. Either the size of the material available is insufficient for the purpose, in which case a joint is necessary ; or joints are inade so that the various components can be arranged to the best advantage from the point of view of the direction of the grain of the wood and the relative proportions of the various pieces. In the former case the joint is often effected by simply glueing both pieces of the material and clamping them together while the glue sets hard. The second case comprises all those structural joints, such as the mortise and tenon, in which one part is shaped to fit into a hole made in the other part Essentials of any joint of this character are (a) that the fitting surfaces of the wood shall be accurately shaped, so that when assembled the joint is virtually solid wond; and (b) that the one part is Hat or true with the other, since a very small error in the shaping of the joint faces causes the one part to take a different direction relative to the surface of the other, with tho result that the

nown as winding.
One of the simplest joints in woodwork consists merely of placing one piece of wood upon the other and glueing and screwing them together: or in the case of light work, sticking them together with an adhesive cement or glue. When these joints are effected by nails or screws, they are generally known as butt joints.

In constructional work, or when it is desired to effect a strong joint between two pieces that will be called upon to resist considerable strain, the joints are often effected by shaping the ends of the faces so that to some extent they interlock They arc further secured by means of nuts and bolts.

Still another series of joints is effected by cutting recesses or grooves to receive the other parts, and this series of joints is generally known as housing joints. Dovetail joints aro adapted to resist strain in certain directions, that is to say, the grooves or holes in the one part are ao shaped that the leg or end of the other part can be pulled out only in one particular direction. There are many varieties.

A form of joint extensively used is that in which the one part, such as a panel, fits in a recess or groove in a frame. In the former case a portion of the edge of the framework is cut away, either with a cutting gauge or with a rebating plane, the space so cut away being known as a rebate. The joint is in this case effected by placing the panel in position and securing it with a bead or fillet. When the panel fits into a groove, the latter is produced with a plough plane.

Sliding joints are sometimes necessary in woodwork to provide for the shrinkage or expansion of the material according to the humidity of the atmosphere. Thesc are all more or less in the form of a ploughed groove or a long slot of some kind, to hold the material from warping or twisting, but to allow it freedom of expansion and contraction in the
direction of its greatest breadth. The jointing surfaces of wood may be secured by an adhesive, by nails, screws, bolts and nuts, pegs, and also by means of a variety of special fasteners, such as corrugated fasteners and drawbolt fasteners. To tighten up the joint surfaces, a commonly used plan is that known as draw-boring (q.v.). in which a peg is arranged so that it draws the faces of the joint together very tightly.

Another class of joint includes the varictics known as hinged and shutting joints. In goodclass work the joint is rebated and provided with a dust or draught bead, Fig I, and is then a combination of several joints. When a door is hung on a centre pin, the joint surfaces have to be curved, as in Fig. 2.

Many pieces of furniture are made with interual hinging joints, such as the section shown in Fig. 3, which shows how each piece of nuterial has to be shaped to allow for the rise and fall of a flap, as in a bureau.

Among miscellancous joints is the device known as pocket screwing, Fig. 4, which consists in horing a hole obliquely through the rail or similar part, and gouging out a recess or pocket in the side of the rail. This allows the screw to be inserted, and provides a llat surface for the head to bear upon. This device is used for fixing table-tops.

Another type of joint is known as cleating or clamping. It is simply a batten screwed to the separate parts to be joined together. Fig. 5 shows a buttoning joint, which comprises a rectangular block of wood rebated to fit into corresponding grooves formed in the rail or fixed part of the construction. The button or wood block is then screwed to the table-top or elsewhere, bringing it firmly into position. It is an excellent joint for fixing a table-top on to the side rails of the table. Slot screwed is another form of joint which is easily carried out and effective in use. It consists of cutting a slot through one of the parts to be jointed and securing it to the other with a screw.

Dowelled joints comprise all those forins where the two jointing faces are flat, and kept in position by one or nore pegs fixed firmly into one part, with a portion of the dowel projecting, which fits into the hole formed in the other part of the joint. The dowelled joint may be permanent or detachable, as desired.

JOINT : Of the Body. Joints are fixed, as those of the skull; pirtially movable, as those between the vertebrac; or frecly movable, as the hip, shoulder, etc. In the movable joints the ends of the bones are covered with smooth cartilage, and the joint is surrounded by a sheath of fibrous tissue lined with the synovial membrane which exudes a lubricating fluid into the joint. Infammation in a joint may be synovitis, when it is mainly this membrane which is affected, or arthritis (q.v.), when all the structures of the joint are involved. Other diseases and injuries to which joints are subject will be found under appropriate headings. See Ankle; Dislocation; Elbow; Hil, Disease; Knee; Rheumatoid Arthritis; Shoulder; Sprain ; Wrist, eto.

JOINT : Of Meat. The parts into which animals that are killed for human consumption are cut up are known as joints. The names of the various joints are given under the hendings referring to the different animals. The names given are those in general use, but the names and the inethods of cutting differ somewhat with the locality. See Aitchbone; Bacon; Beef; Carving; Lamb; York; Veal, etc.

JOINTER. This term is used to describe two entirely different tools. In the one case it refers to a large plane, resembling a jackplane, used when planing the edges of hoards preparatory to jointing them together.

The bricklayer's jointer is composed of a cast steel blade, tapered at one end and having
a handle attached at n bout an angle of $45^{\circ}$ to facilitate its use in pointing in brickwork. It is used to smooth or finish the pointing or joints between briclework, particularly the type known as flush pointing. See Plane: Pointing.

JOINTING RULE This implement, used by plasterers and bricklayers, consists of a batten of wood about 5 ft . long, 3 in . wide and 1 in. thick, bevelled on one edge. It is used for floating or levelling the surface of plaster in the angle of a room, or for working the surface of a screed on a wall, or any ot her place where a Hat surface of plaster is to be built up. It is also used by bricklayers in the jointing of horizontal and vertical joints in brickwork, particularly in the pointing operations.
The amateur can easily make such a tool from a piece of ordinary clean deal, but it is imperative that it be planed up perfectly true and straight and sandpapered, as any roughness on its edges would be transferred to the ourface of the plaster. Its form and method of use are illustrated in the article on

## plastering.

JOIST. The word joist is applied to horizontal supports for floors or ceilings, and in domestic work joists are generally composed of timber, although the use of rolled stcel is common, especially in connexion with ferro concrete constructions. Joists are further described by the addition of the name of the part of the structure to which they act as a support.
For example, the floor joists support the floor, ceiling joists carry the ceiling, and sleeper joists are placed upon the honeycomb sleeper walls under the floor, and act as an intermediate support for the other floor joists. Dovetailed sleeper joists are oftell embedded in the concrete of a floor as a convenient merns of attaching the floor covering in the form of boards, which are nailed into the slecper joists.

The joists should be of adequate strength for the load they will be called upon to sust ain, and for the ordinary type of small house the ground Hoor joists, which are supported by sleepers at about 3 ft . centies, may be 4 in . deep and 2 in. in thickness. For an upper floor the joists must be much larger, dependent upon the span of the building. but in the case of an ordinary sized house where the joists have a span width of 12 ft ., a convenient size is 7 in. deep and 3 in. in thickness, or 9 in. deep and $\mathscr{O}$ in. in thickness. In the former case there is no necessity for intermediate strutting between the joists, but in the latter it is desirable to fix diagonal struts of light section, about 2 in . deep) and $1 \frac{1}{2} \mathrm{in}$. in thickness, to prevent the joists twisting sideways. The average spacing of the joists is about 15 in . for the ordinary 1 in. Hoorhoards.

Ceiling joists usually average 4 in . in deptl, and 2 in . in thickncss, spaced about 14 in . apart, and are streng thened and supported by longitudinal members, so that the span does not exceed 5 to 6 ft. See Floor ; Roof.

JOLLY MILLER. This game can be played either indoors or outdoors. Each mian of the party, with one exception, chooses a lady for
his partner. The excepted one stands in the middle of the room, while the others in couples walk round hinı singing :
There was a jolly niller who lived by himself: As the whecl went round he made his wealth: One hand in the colfer and the other in the bag, As the wheel went round he made his krab.
At the word grab everyone must change partners, and while they are doing this the miller tries to seize one of the ladies. If he succeeds in this, the man who is left without a partner takes the place of the miller and so the game continues.

JONQUIL. Bulbs of the common swectscented jonquil, a variety of narcissus, should be planted 3 in. deep and about 6 in . npart in autumn. They are equally valuable for forcing or for planting as a woodland flower. Double campernelle is a particularly noteworthy variety of this flower. There are several line modern varicties with large, bright vellow Howers, e.g. Buttercup and Golden Sceptre. See Daffodil; Narcissus. JUDAS TREE, This is a hardy summerdeafing, ornamental tree, Cercis siliquastrum, about 15 ft. in height, with pur-plish-pink, peashaped Howers in late spring. The flowers are out before the leaves have fully developed.
The tree is common in Judea, and Judas is said to have hanged himself on one. It is grown from seed sown in spring. Propagation by layers in autumn may also be practised if there are branches situated in convenient positions.

JUDICIAL SEPARATION. This used to be called divorce a miensa ot thoro (from table and hed), to distinguish it from divorce c vinculis matrimonii (from the bonds of matrimony). A judicial separation may he obtnined either by husband or wife for (1) adultery, or (2) desertion for two years or more, (3) cruelty, or (4) refusal to obey an order for restitution of conjugal rights. It is an a haolute bar to a suit for judicial separation that the petitioner has committed adultery since the date of the marriage.

Judicial separation orders may also be made by magistrates for cruelty, desertion, or such drumkenness or conduct as compels the wife to leare the husband. Coupled with such inagistrates orders are provisions that the husband shall pay anything up to $£ 2$ a week for his wife's maintenance. An order for judicial separation comes at once to an end if the husband and wife cohabit again. See Divorcc ; Maintenance ; Separation Order.

JUG. Among the jugs sought by collectors are the chocolate jug of Queen Anne's time and the winc jug of a century or more later, hoth types being fitted with lids. These jugs are usually of silver, hut they were also made in Sheflield plate.

Two heautiful examples are illustrated, the first heing a silver vase-shaped jug in an Adam design, and the second a Sheffield plate chncolate jug. These shapes are frequently reproduced to-day for hot milk jugs. In the chocolate jug shown in the illustration, the knoi in the centre of the lid is removable, thus enabling the contents of the jug to be
stirred without being cooled by exposure to the nir.
Some of the antique silver jugs copied to-day stand on three feet, while others have one circular base. Some of them are finely chased with scrollwork and other decorative features, including beading and gadroon A form of jug much sought after by collectors is the Toby jug Old lustre jugs are also valued. Antique brass, copper, or pottery ewers and pitchers form decora tive vases for flowers. See Cream Jug; Crockery Glass: Pewter : Sheffield Plate: Silver; Toby Jug.

JUICE. This is the name given to the liquid part of fruits, and also of vegetables and ineats Juice is extracted from fruit in the making of jellies, drinks, syrups. sweets, etc., and also, as is the case with lemous and oranges, ralie in a moderate oven, sprinkling the for flavouring purposes Lemon, etc.

JUMBLE CAKE. These small cakes can be flavoured in a number of ways. To make some, cream together 2 oz . butter and 3 oz . sugar, then beat in an egg and add the strained juice and rind of half a lemon. This is then thoroughly mixed with 8 oz sifted flour. Turn the dough on to a houred board, and roll it out lightly to a thickness of not more than half an inch. Cut it into fancy shapes, and

## JUNE

## What to do in the Garden

Flowers
Cut off faded ilowers to ensure a prolonged dis play the evening during in the evening during hot. dry weather
Spray plants with insecticide to destroy pests Hoe the soil requently protnote growth
protnote growth of pink,
Take cuting of rabls, yellow alysuun, evergreen candytuft, and other rock planta
Cut back vigorous rock plants which have passed out of blonm
Pot chrysanthemums In large pots for autumn blooms under glass
Hemove the faded Hemove the faded
blooms from rhomlodenblooms from rhododen-
dron ${ }^{\text {Prune the flowering }}$

currant, weigela, and Layer strawlerrles to inock orange when the provide plants in pots for blonsons are over.
If necessary, lift apring flowering bulbs when the
Cut rose blooms witl
Cut rose blooms with long stens to ensure
freal strong shoots which will tlower later
Place nzalca and other spring slurubs in pots outt oi doors for the summer
Stake and tie herbacous plants
Kecp surplus beddlug plants ready for making good lallures
Thln out hloots ol plants

Fruit
Spray fruit treen frequently to keep down

## Food in Season

Poultry 8 Game
Cawons: Capons; chickens: ducks and ducklings : fowls; gulnea-fowla: goslings ; hures: hazel hens: ortolans: plaeons : pullets : qualls : rabbits; rulfs and reeves; tu
wheatears

oreling Water fruit trees on Pull in int, dry weather Pull up surplus rasp)Sery suckers
entilate the vine
reely in hot weather
Mulch newly planted

## Vesetables

Plant winter crecns, celery and leek Cease cutting asmara-

## hum

Plant tomatoce on a warm border or againat a sumny wall or fence
Make a flam sowing of
French beans and dwari
early peas
Sow elldive, turnip, globe bectroot. and an
andy
cress; cucuinber: endive; horseradinh; leeka : letuce mushiruorns : omions; parsnlpa; lieas : potatoes (new) ; radishes; seakale; вorre ; spinach; omatoes; turitps wat creress

## Fruit

Applea: apricots bananas: chertiea; currants; Rooseberries ; grapes ; letnons; niclons nectarines: oranges peaches; pears; pline spple: raspberrles

Notes for the Month
collect sucli things as they feel disposed to send These need not be confined to clothes; almost any diacarded article, especially in the way of usable household goods and linen are saleable. If possible, it should also be arranged that all contributions will be called for a couple of days or so before the actual sale Boy Scouts or Girl Guides are usually only too willing to do this, and a message or postcard from the person having articles for sale will be promptly attended to

When all have been collected, the next task is to sort, tidy, and price the various things. The pricing should be as low as possible. It must be remembered that the sale involves no initial expenditure, but that every penny taken is clear profit ; also, that besides bringing in money for whatever charity fund is concerned, it may be a very real charity to provide poor people with good clothes for a few shillings, and will be far more apprecinted than if those same clothes were given away in the ordinary haphazard fashion.
Prices should be clearly marked on tickets and either sewn or gummed on the articles for sale. As far as possible, the garments should be arranged in stalls according to thicir nature ; if there is a large assortment of other things they may be divided into classes or put together on a rariety stall

The sale should be fixed for a day when it is thought that nost of the poorer women will be able to attend-probably the local early closing day will suggest itself-and should be open from the early afternoon until 8 or 9 p.m. Many people prefer to hire a hall for the occasion, but a jumble sale can be held very successfully in a large loft or outhouse if there are no suitable rooms in the house.

## JULY

## What to do in the Garden


#### Abstract

Flowers Plant the bulbs of meadow saffron. autum, crocus and the Belandonna lily and the corms of atutumn-flowering liardy cyelamen Bud rose trees on hriar stocks planted in the previous autumn or winter layer clematls. rainbler rose und other slurubs slurubs Save seeds of lupin, delphinium, reum, and other llowers and sow ay soon is they are ready Take cuttings of snaly Iragon, pangy, onalive catinint, and pink sow winter tlowering stocks for the greenliouse


Sow afeds of hollyhock, gaillardla. musk, bnapdragon, viola, and pansy border carnations
Stake and tie dahlias securely
Keep
Keep carpet bedding plants
closely
closely
cinso
Cleanse and paint
interiors of houss

## Fruit

Iayer atrawberrlea to ners for wer rooted ruliAugust planting in Destroy Aincrican bllght by inculns of a brush dipped in llusend ${ }^{\circ}{ }^{1} \mathrm{Cu}$
branclice of plum trees sumed by silver lear pear mer prune apple, pear, cherry, and plum trees
Prune raspberries as moon as the fruits are gathered

## Vesetables

Finigh planting celery and leek
Sow turnip seed to provide roots in autumn Finlsh the planting of Make the Ar
of spring cablat bowing of spreing cabbage

Sow seeds of early carrot to provide smail Cut mint and other

## Food in Season

| Bияs: | Fish |
| :---: | :---: |
| rp; | , dory'; eel ; |
| llounder | r ; glurnet ; haul- |
| dock; | hake; halibut; |
| herring | mackerel ; |
| mullet ( | (grey and red) |
| pereh; | pike ; plaice ; |
| salmon | mhad; soles ; |
| tench; | trout; turbut : |
| uhitebait | it ; whiting |
|  | Shellfish |
| Trabs: | : craytish: lob- |
| ster ; pra | cawns ; ghrimps |
|  | Meat |
|  | : laınb: inut- |
| \% ; vea | eal ; venison |

## Poultry 8 Game

 Canons: chickens ducklings: rowls: lings; hares; ortolans nigeons: Dullets; quails; rabbits; ruffs and recves; turkey poults; wheatears
## Vecetables

Artichokes (globe) : asparagus; aubergine ; bectroot: broad beans; rots ; canlillower ; chervil; cress; cucumber: endive; Freveh beans; horseradish; leek; let-
tuce; mushrooms; onion; parsinips; peas; potatoes; scarlet runners; spinach; tomatoes; turnips: regetable naw; watcreress

## Fruit

Apples ; apricots ; Dhamatas; charries; currants (red, white, and black): ligs; pooselons; nectarines; oranges; peachcs; jears pineipplele; pluins raspberries ; rhubarb strawberries

## Notes for the Month

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July 1-Dominion Day, Camada
JuLY 4.-Independence Day, U.S.A
JoLy 15.-St. Swithun's Day,
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JUNE BERRY. This is the common name of a beautiful small flowering tree, Amelanchier canadensis. It rcaches a height of 15 feet or more, has white blossom in April and May, and nutumn. tinted leaves. It thrives in ordinary soil and can be inoreased by seeds. A variety named oblongifolia grows only 5 or 6 feet high and bears white flowers freely in spring

JUNIPER. The juniper is a most important family of hardy evergreen shrubs and trees of many habits and ranging from 1 ft . to 40 ft in height They are particu larly useful as lawn tices and in shrubberies, while lovers of the rock garden should take special note of the dwarf varieties.
The junipers thrive particularly well in chalky soil, and are propagated by cuttings taken in jury. The name plants may also be raised from seed. One from this duty are peers, memhers of Parlia of the best for general planting is the Chinese juniper (Juniperus chinensis); surea, with golden leaves, and Fortunei, with grey-green leaves, are attractive varieties
'The common juniper or savin (communis) is a low bush, about 3 feet high, but the viriety hibernica, of slender column-like form, is a particularly graceful tree. The dwarf variety, hibernica compressa, is one of the most popular miniature conifers for the rock garden The red cedar or Anierican juniper (virginiana), which provides wood used in the manufacture of lead pencils, is an attractive tall tree; the silvery-leaved variety glauca is beautiful

JUNKET. This dish is made in the following way: Heat a pint of new milk to about $98^{\circ} \mathrm{F}$., which is its natural heat. Then pour it into a dish and add a dessertspoonful of white sugar and 2 teaspoonfuls of essence of rennet. After this let it set, the time necded for this being from $1 \frac{1}{2}$ to 2 hours. When it is set, sprinkle it with powdered nutmeg, and then cover it with a layer of clotted or whipped cream

The rennet for making the junket can be obtained in tablet or powdered form. In the latter case it is sold under the name of junket powder, and directions as to the quantities required are printed on the packet The powder is sometinies preferred to the liquid rennet because the latter varies in strength, more being needed to turn the milk at one time than another, as climatic and other conditions vary.

If the milk does not solidify with the first addition of rennet or junket powder it can be rehcated and more powider or rennet added. A pinch of salt should always be added. The milk used for junket sliould be perfectly fresh and sweet: if there is the least suspicion of sourness it will not clot, but form into flaky curds. The milk should not be diluted with water, nor fruit juice used for Alavouring. Spirits or highly concentrated essences should he used for this purpuse, but only sparingly, so that they will not have a curdling effect on the milk.

For flavouring junket brandy is often used, but either whisky or rum makes a good substitute, while on the top cinnamon may take the place of nutmeg. If spirits are not liked, soine such llavouring as vanilla or almond essence can be employed. It may be left to set in a room of ordinary or even warm temperature, a cool place such as is required for jelly being unnecessary and unsuitable.


June Berp. Walte spring Howers of this beautiful small tree

A bowl of junket must be handled carefully, as it sepa rates at once if shaken. It makes a light and nourishing dish at all times, but is especially suitable for inva ids who cannot eat solid foods. See Clotted Cream ; Invald Cookery: Rennut.
JURY:Liability to Serve. With certain exceptions, men and women who are qualificd as houscholders or property owners are bound to serve upon a jury if called upon to do so. Men liable are those between the ages of 21 and ( 60 who possess land of the clear value o. $£ 10$ per annum, or who are assessed in the valuation list for a house valued at not lesa than $£ 30$ in Middlesex and $£ 20$ plsewherc Women who possess the same qualifications are liable, but husband and wife must not serve on the same from this duty are peers, memhers of Parlia
ment, judges, clergymen, lawyers, ductors, officers of the army, navy and air forces and Territorial Army, and chenists

When a jury is required the sheriff or clerk of the peace chaoses the r.ames from the list of persons liable and sends by post notices to them. This inust be done at least wix days previous to the meeting of the court. Jurymen


Juniper. Specimen of the winter-flowering variety chinensis, eflective either in the sbrubbery or in a large rock garden
are required for assizes and quarter sessions, and rilso in Landon for the sittings of the central criminal court and for certain civil actions heard at the law courts. It is usual to summon more persons than are required. and if the reasons given are deemed adequate a man called can be excused from service. Jury men who fail to attend the court on the appointed day can be fined. They are not paid, except that small fees are given to common jurors and to members of coroner's
juries. In some cases rerreshments are provided at the expense of the sheriff
Juries are either grand, petty, coroner's special, or common. A special jury is one called to hear certain civil actions. Special jurors are taken from those who occupy houses above a certain rental value, usually a bout $£ 60$ a year Juries in Scotland and Ineland are similar to those in England, although in Scotland the methods of procedure are some what different: for instance, there are no coroners, and hence there can be no corcner's jury.

Women on Juries. By the Sex Disqualifica tion (Removal) Act, 1919 women u.e enabled and bound when summoned o sit on juries Thi presiding judge may however, cither at his own instance or on an application mude by one of the partics, order that the jury shall be composed of men only, or of wonien only A woman may also apply to be excuaed from serving on a jury in a particular case, and if the nature of the evidence to be given or the issues to be tred make it reasonab e that she shall he excmpted, the judge may exempt her If he thinks fit to do so

If a woman who receives a jury summons $i$. pregnant, or suffering from some feminine condition or ailment, she should apply to the summoning officer or the under-sheriff, enclas ing a medical certificate, and asking to be rxcused from attendance. This should be don: within three days after the jury summons has bcen received.

JUVENILE OFFENDER. In English law a juven le offender is une who is or appears to be under the age of 16 years. When such a person is arrested, the police superintendent or inspector must let him out on bail. unless the offence is homicide or some other grave crime or unless it is in the interests of the uffender to remove him from some reputed criminal with whom he is associating it he is not relcased on bail he must not be put in a prison but in some other placs of detention until his case can be dealt with. The object of these provisions is to prevent jupeni es from being expossed to the risk of contaninatoon from older criminals.

Juvenile Courts. Special courts ure held for the trial of juveniles. They may or may not be held in the ordinary police courts but if they are they must be held at difierent times from ordinary sittings; and from thesc courts ali are excluded except persons connected with the case and bona fide pressmen. Juveniles are not to be mixed up with ondinary prisoners. In London the Home Secretary appoints for each juvenile court, to assist the regular police magistrate, two other justices one of whom must be a woman.

In dealing with juvenile offenders, the powers of punishment are restricted. No juvenile con be sentenced to death or penal servitude. He may be whipped or ent to a reformatory or industrial schuol, or he or his parents may be fined, or he may be handed over to the care of a welfare missionary, or his parents may be bound over to see that he l,eliaves himself for the future He cannot. however, be sent to prison in default of paying a tine or the costs of the trial, ay an adult can 'The power that the courts have of fining parents for the offence of a chilid $i$ the only instance of vicarious punishment known to the English criminal law

A child under 14 cannot be sentenced to imprisonment, but for certain grave ofiences may be ordered to be detained for a period such as would formerly have been the period of imprisonment. If convicted of murder, a juvenile may be ordered to be detained during his Majesty's pleasure. If a juvenile is ordered to be detained, the court may make an order that his parent or putative father shall contribute to his maintenance See Child

KAFFIR LILY. The hulhous-rooted perennial plant known as Kaffir lily, or winter gladiolus (Schizostylis coccinea), has long, iris-like leaves, and scarlet flowers on a tall spike in carly autumn. It is not very hardy, and is generally grown outside in a sunny


Kaffir Lily. Scarlet blooms and irlslike leaves of the winter aladiolus
spring. There is a heautiful sheltered position, in a compost of loain, leafmould and sand. The bulbs, or rhizomes, may also he placed in pots in early spring. After being estahlished in the cool house or frame ther may be stood out of doors during the 8 nmmer months and taken in for an autumn display inside. Propagation is by division in pink variety named Mrs. Hegarty.
KALANCHOE. This is a greenhouse perennial flowering plant with thick fleshy leaves. The hest is Kalanchoc flammea from Somaliland, which bears scarlet flowers in summer. It should he potted in sandy loam and kept safe from frost in winter. The easiest method of propragation is by cuttings.

KALE. Of this hardy and useful green winter vegetahle there are many varieties, e.g. cottager's, asparagus, ourled and Drumhead. Sceds are sown out of doors in April, and the scedlings are planted out in summer at about 2 ft. apart. See Curly Kalc.


Kale. Fine head ol a varjety of this green vegetable known as asparagus kale

KALMIA. These beautiful hardy evergreen tlowering shruhs thrive in peaty or limefrce loany soil. The best is kalmia latifolia, the calico bush, which grows 3 to 5 ft . high and bears pale rose coloured flowers in iearly suminier. Glauca 18-24 in., and angust.folia, 2-3 ft., hoth have rose coloured blocoms An important detail of cultivation is to remove the faded flowers to prevent the developmient of seeds. These shrubs are propagated by seeds, though the seedlings grow slowly.

KALOSANTHES. This greenhouse plant, which is classed as a succulent because of its thick fleshy leaves and stems, is not very coinmonly grown, but one species, Kalosanthes
(crassula) coccinea is very showy. It grows about 20 in . high and hears clusters of scarlet tube-shaped Howers in summer. It should be potted in a compost of loam and sand and during winter needs a temperature of 45 to 50 degrees. Propagation is by cuttings in summer. Kalosanthes lactea hears white flowers in winter.

KAPOK. The vegetable down obtained from the thistle and other plants, and used for stuffing cushions, pillows, etc., is known as kapok. See Down.

KAULFUSSIA (Cape Aster). This is a pretty hardy annual from South Africa, which grows 6 in . high and hears small daisy-like blue, white or crimson llowers, according to the variety chosen. It is suitable for sowing as an edging. From sceds sown out of doors in April the plants hloom in sumner.

KEDGEREE. This is an Indian dish prepared mainly from rice ard fisl. To make it, melt loz. of butter in a stew pan and add to it $\frac{1}{2} \mathrm{lb}$. of hoiled rice, $\frac{1}{2} \mathrm{lh}$. of any cold cooked fish broken into tlakes, and the coarsely chopped whites of 2 hard-boiled eggs. Season the whole with salt and pepper to taste, make it thoroughly hot, and then pile it up on a hot dish. Garnish the kedgeree with the yolks of eggs ruhbed through a sieve, and some chopped parsley.

KEESHOND. Breed of dog, popularly known as the Dutch Barge dog. In some respects the Barge dog is similar to the pomeranian, chiefly differing in size and colour. The colour should be like that of the wolf, namely fawn, either light or dark, the long hairs being tipped with hlack, but the colour on the muzzle, around the lipe and on the legs


Keeshand. Specimen of this excellent breed of dog. closely resembling a Pomeranian
and tail are of a lighter shade. The coat should he very profuse excepting on the head, ears, and front parts of the fore and hind lega where it is smooth. The ears are erect, eyes dark, with a foxy expression, and the head of fox-like conformation. The body should be short and compact, the chest deep, and the tail carried over the back like a plume. The keeshond is about 18 in . in height, and makes an excellent companion as well as a good watch dog. It is a distinctly hardy breed.

KENNEDYA. This greenhouse climbing plant bears pea-shaped Howers in spring or summer. The favourite kind is Kennedya comptoniana, with purplish blooms in spring. Another is Marryattae, which hears scarlet flowers in summer. Theso plants, which are not often grown nowadays, thrive in layge pots filled with sandy loam and need a minimum temperature of a bout 50 degrecs. Pruning should be done after flowering.

## Kennels and Their Construction

## How to Provide Accommodation for the Watchdog

This article suggests a reference to the entry on Dops, ond also to thos: on the various breeds of dog, c. g . Bloodhound; Spanicl: Terrier. Sec also the cnirics on the materials uscd in the making of a kenncl, c.g. Board: Hinge; also Amateur Carpentry: Concrete; Shed

Kennels are of several kinds, but certain general principles are cominon to all. All alike should possess roominess and warmith and accessibility, the last mentioned quality being necessary in order that the kennel may he cleaned, as it should be, at least once a week. Attention should be paid to the situa. tion of the door, in order that the dog may escape dranghts, while, if possible, a south or south-western aspect should be selected. More necessary perhaps is it that the ground should be dry, for damp is very favourable to disease. Sunshine, fresh air, adequate drainage, and good ventilation are as desirable in the case of kennels as they are in that of houses.

If it is necessary to confine the inmate in the daytime, on no account put him on a chäain. A small run can he attached to his kennel, either of railings which are sold for the purpose, or very stout wire netting fixed to posts. Bedding may consist of straw, pine shavings, or sawdust. The latter is a good thing for long-coated animala in winter-time, because of the manner in which it will absorb the wet. The ideal arrangement would be to have an inner sleeping compartinent berlded with straw, and an oister compartment littered deeply with sawdust.

Making a Kennel. The kennel shown in Fig. 1 is suitable for a terrier or similar dog. Elevations with suitable dimensions are shown at Figs. 2 and 3, and details of the framework nt Fig. 4. Deal is a suitable wood to use throughout.

The corner posts (A) are 2 in. square, and the side and end rails ( $B$ and C) $1 \frac{1}{2}$ in. square. The rails may be tenoned into the posts, as in Fig. 5, or lapped, as in Fig. 6 . The joints in either casc should be painted hefore fixing, the tenons being secured with
wood pins, or the lapped joints with screws. The rafters (D) are $1 \frac{1}{d}$ in. square, half lapped together (Fig. 7) and nailed or screwed to the framing. It will be a good plan to paint the framework before fitting the bottom or covering the side and roof.

The bottom is of $\mathfrak{f}$ in. grooved and tongned matchboard, fitted around the corner posts, and nailed to the top edges of the hottom rails. The sides and ends are covered with similar boards. An entrance is arranged at one side, being about 1 ft . 2 in . high by 10 in . wide. It will be conrenient for cleaning purposes to have a door at one end. The door should be hattened together. as shown at Fig. 8, and hung with a pair of long flap hinges. The boarding ahove the door opening should finish in the middle of the top rail, so that the top edge of the door may shut against this rail as well as against the bottom rail. Weather boards are very suitable for covering the roof. They should overhang 3 in . all


Kennel. Fir. 1. Waoden isennel suitable for a
lerfiet or other dog of medium size
round, and the roof is finished with a rillge mall at the top. The kennel should be painted with threc coats, or treated with a preservative.

For a retriever or similar dog the kennel should be 3 ft. 3 in. long, and of the section shown at Fig. 9, while for a still larger dog, such as a St. Bernard, the length should be 4 ft ., with a section similar to Fig. 10. Their construction will be similar to that already described, only the framing and boarding may be stouter to correspond with the increase in size, and it may be advisable to add a couple of rafters across the middle of the roof.

EONTIA. This graceful palm is suitable for a heated greenhouse. It may also be grown in a room window during the summer months. Belmoreana and fosteriana are the favourite kinds, the former being less vigorous than the latter and better suited to cultivation in small pots. A compost of loam, peat, and sand suits these palnis, which need a minimum temperature of $50-55$ degrees in winter.

KEPHIR. This is a form of fermented milk, like koumiss. To make fermented milk, put boiled cow's milk into strong pint bottles, leaving a small purt enipty; adil $\frac{5}{4} \mathrm{oz}$. of white sugar and a amall piece of yeast about the size of two peas to each bottle. Corl:, wire, and place the bottles on their sides. Shake them every morning and every evening. The milk will be rearly for use in a reek. See Milk.

Kerosene. This name is used for the oil obtained from bituminous coal and petrolcum. It is used for lamps. See Lamp; Oil.

Kerria. Alternative name for the shrib better known as Jew's Mallow (q.v.).

KERRY BLUE TERRIER. In size this terrier stands midway between the red Irish terrier and the Airedale. They are rugged fellows with a shaggy, soft cont and dark, intelligent eyes.

They linve a reputation for high courage in tackling vermin and are devoted guards. With children they are said to be very gentle, and they are capable of retrieving or scenting


Karry Blue Tarrier. Nofa Jacobin, champion of this breed of shagry-baired dog
a wounded hare or bird. At present the term blue applied to this terrier admits of a liberal interpretation, the colour appearing in various gradations. See Dog.

KERSEY. One of the earliest woollen fabrics made in England, kersey is coarsespun, like blanket and twill-woven, and usually white or checked. Kerseys are used for horsecloths. Cheap kersey cloths are used for floor scouring.

KETCEUP. Ketchup is a sauce made from mushrooms, walnuts or cucumbers.

Mushroom Ketchup. To make mushroom ketchup, gather the mushrooms before the sun has discoloured them, and break them very small into a basin. Sprinkle them with


Kennel. Fig. 2. Side elepation. Fig. 3. End elepation. in corner dost. Fig. 6. Simpler method of securing Doop strangthened with battens. Figs, 9 and 10.
salt and let them stand 3 days; then boil and strain them. They must be simmered till all the juice is out. After straining boil up the Jiquor again with the whites of 1 or 2 eggs to fine it, and then strain. Return the liquor to the fire, adding to every quart of juice 6 shallots, $\frac{f}{}$ oz. whole black pepper, $f$ oz. ginger, 1 tablespoonful grated horse-radish, $\mathbf{6}$ or 8 allspice, and 1 laurel leaf. Simmer about \& hour; then skim and strain into bottles and cork them well.

Cucumber Ketchup. To make cucumber ketchup, pare the cucumbers and slice them as thinly as possible into an earthenware bowl and cover them thickly with salt. Cover closely and let them stand until the following day; then st rain the liquor into a stewpan. To every pint of liquor add $\frac{1}{2}$ pint of white wine vinegar and a teaspoonful of peppercorns, and simmer gently for from 20 minutes to $\frac{1}{2}$ hour. Then allow it to go cold, strain it into hottles, cork it tightly and atore in a cool, dry place.
Wainut Ketchup.
For walnut ketchup the walnuts must be very young, green and tender. To cvery 100 walnuts allow one quart vinegar, 3 oz salt, 4 oz . anchovies, $1 \cdot 2$ chopped shallots, $\frac{1}{2}$ stick grated horseradish, $\frac{1}{2}$ teaspoonful each of mace, nutmeg, ground ginger, ground cloves and pepper and a pint of red wine. Bruise the walnuts slightly, put them into a jar with salt and vinegar and let them stand for 8 days, stirring them daily. Drain the liquor into a stewpan, add to it the rest of ingredients and simmer very gently for 40 minutes. When cold, strain into bottles, cork and store in a cool, dry placc.
KETTLE: Choice and Care. Kettles are made in tin, aluminium and copper and enamelled ware, while more ornamental ones are in silver, electro plate and brass. The latter, however, are only for use with a small spirit stove, not for the ordinary task of boiling water on a fire. Kettles of aluminium, tin or
block tin are the cheapest and for kitchen purposes most suitable. They can be bought to hold $2,3,4,5,6$ or 8 pints, or cuen more. Copper kettles are more expensive, but their durability is much greater Some kettles arc fitted with wooden handles, which do not get as hot as the metal ones. Others in aluminium are fitted with patent insulated iron handles always cool to the touch.

An aluminium kettle is provided with a cup which fits over the kettle top and can be used to poach an egg in thic steam. Another kettle is obtainable with a grooved base so that it forms a lid to a sauccpan and serves a dual purpose. Square ket tles in aluminium economise space and gas on a gas cooker if used in conjunction with square saucepans. Both kettle and saucepan can be packed neatly together over one burner and no heat escapea between them to be wasted. Absolutely llat bottomed kettles aro made for use on electric cookers.

Another kettle is made to hang on a stand, with a heating apparatus in the form of a small spirit stove, while another rests upon a small oil stove. A kettle with folding handle is made for the use of travellers and picnic parties, some of these having a corrugated bottom as an aid to boiling. Bronchitis and fish kettles are amongst those which are made for particular purposes.

Kettles of enamelled ware should be of good quality, for the cheaper makes are apt to chip and to become a source of danger when used for heating drinking water. They may be washed in hot soapy water, and, in case of stains, cleaned in the same way as other enamelled goods. Electric kettles fitted with a heating apparatus and a cord for connecting with the electric wires can be used in any room containing a plug or lamp holder. They liave many advantages, among these being the fact that they are easily kept clean, and their contents may be heated on the tea-table itself and kept hot throughout the meal.

Kettleholders. These may be made of almost any non conducting material, from the ashestos ones, which can be bought at most ironmongers, to pieces of serge or woollen cloth from the scrap-bag. Among the most popular are those worked in cross-stitch with bright coloured wools.
Unless at least three thicknesses of material are allowed, the kettleholder will not serve its purpose efficiently. A small loop at one corner is useful, as the kettleholder can then be hung up on a hook by the stove: 6 in sq. is a satis. factory size for such an article. See Brass; Bronchitis Kettle; Electricity; Kitchen Silver: Soldering: Tin.
KEY: In Engineering. This is the name given to the specially shaped piece of cast steel that is fitted into keyways cut to receive it on the shaft and the part that is to be mounted on the shaft and secured from turning. The key shown in Fig. 1 is the type commonly used in general engineering. To fit this pattern the outer part is first driven home on the shaft with the keyways dead in line, and the key cut very slightly taper from the head on
 the faces marked $a$ and b. This taper will be cut to correspond to the amount of taper already given to the keyways. The key when driven home with the hammer should protrude from the shaft, as shown, by not less than $\frac{1}{} \mathrm{in}$. This point is essential, if trouble is to be avoided when removing the key
If a key is allowed to become slack, movement will take place between the outer part and the shaft, which, through friction, will very quickly destroy the smooth faces of each, making repair a costly matter. Fig. 2 shows a key properly fitted to a keyway in a shaft, ecuring a flywheel
KEY: In Woodwork. In joinery and woodwork, keys of various kinds are used in different varieties of joints, some of which are referred to under separate headings, but in general a key in joinery is a piece of wood which fits into a dovetailed groove to allow the framing to shrink but prevent it warping.


Key: in Woodwork. Showing a keyed joint in carpentry suitable for thin trusses in small roofs


Key : In Ensineering. Fir. 2. Close-up view ol a key flted to a keyway in a shaft, showing how it fits clogely into the boss of the fy-wheel
mitre They may take the form of thin strips converging so ns to form a kind of dovetail, or a thick piece known as a false tenon.

A keyed joint in carpentry suitable for thin trusses in small roofs is illustrated below; it shows a rafter keyed to a heam. The key is simply a piece of hardwood accurately fitted into slots cut in the meeting faces of the beams, which are usually further held together by a bolt or strap. See Joint.

## Key-cutting. See Lock.

KEYHOLE : How to Cut. This operation can easily and quickly be done with the aid of a small brace and bit and a keyhole saw. The correct position for the keyhole should be found, this being done by placing the lock case in position against the door, and passing a scriber or other convenient article through the keyhole in thi lock-case, and marking its outline on the woodwork of the door.

Having obtained the correct position of the keyhole, the next thing is to bore a hole of a aufficient diameter to admit the keyhole raw. All that is now required is to cut around the marked outline with the saw. Generally the keyhole is covered by an escutcheon, that is, a metal flap, hinged to the wood or metal work, over the head of the keyhole, so arranged that it can cither be lifted up or, as is more generally the case, pushed on one side. This should prevent draughts passing through the keyhole. See Door; Lock.

Keyhole Saw. This tool is specially adapted for the cutting of keyholes in wood. It comprises a narrow tapered saw with fairly fine teeth with considerable set, to ensure freedom in cutting to the various patterns. A wood or metal handle is used, the former being slotted to allow the saw blade to pass down through it. The blade is secured by set screws in the ferrule. The saw illustrated has a metal handle madc of malleable iron and provided with two clamps for holding the saw perfectly square. Spare hlades or blades of different lengths and fineness of teeth are procurable.

In using the key. hole sam it is necessary to push the saw perfectly in line with the blade, otherwise it is very liable to buckle or break. Too much pressure must not be put on the saw for the same reason, but if these two points are horne in mind the keyhole saw will be found extremely useful for cutting out all manner of shapes in wood up to about 1 in . in thickness. In ordinary work a hole is bored, through which the saw may be passed, and the variousshaped portions sawn away.

When working, it is particularly necessary to see that the saw-blade bc kept at right angles to the face of the work, otherwise the edges will be tapered and badly shaped. This saw can be sharpened and set in the ordinary wav. See Saw.

KID : Its Uses. A light kind of leather used for gloves, shoes, and fancy articles, kid is prepared either from goat or sheep skin.
Thornugh wetting in water shrinks kid Certain kinds of heavy kid gloves are sold as washable, but it is safer merely to sponge the surface while the gloves are on the hands. Special glove soap can be used on the sponge. After being semi-dried by rubbing with a soft cloth, sponged gloves should be taken off and left to dry slowly in the air. Rust and ink
stains on kid can be removed with oxalic acid applied with a fannel. See Glove.
KIDNEY: In Cookery. Both sheep's and calf's kidneys can be cooked separately and according to the same directions Sheep's kidneys, either grilled or stewed, are a favourite breakfast dish, and are also made into curries, pies, etc., while ox kidneys are used mainly for soup-making and stewing. Pig's kidneys may be broiled in the same way as sheep's kidneys, but will require nore time.

To prepare grilled kidneys and bacon, remose the rind and lightly fry 6 rashers of bacon. Then put them on a dish in the oven to keep hot while the kidneys are being cooked. Skin and cut 3 sheep's kidneys into halves, and remove the cores, place them in the pan with the cut side down, and cook them gently. turning them once. Dish the bacon, putting half a kidney on each piece; season and place a small lump of butter on each

Stewed kidney and bacon are prepared from the following ingredients: 1 lb . ox kidney, 3 oz fat bacon, 2 small onions, $\frac{1}{2} \mathrm{oz}$. flour, a seasoning of pepper and salt, and $\frac{1}{2}$ pint water. Cut up the kidney and wash it well. Place it in a saucepan with the bacon cut into slices, the water, and the sliced onions. Simmer all gently for two hours. Mix the flour, salt and pepper to a thin paste with 2 tablespoonfuls of cold water and add them carefully to the stew, stirring all the while. Boil up the whole. cook it for 5 min , and then serve.
Macaroni and Kidneys. Kidneys and macaroni make another savoury dish. Skin and halve 4 sheep's kidneys, sprinkle them with salt, pepper, and powdered herbs, and then fry them in a pan containing 2 o7. of butter. When they are cooked on both sides, pour off a little of the butter and add $\frac{1}{2}$ pint of tomato sauce to what remains in the pan. Heat the whole thoroughly; then turn it on to a hot dish and garnish it with a border of boiled macaroni cut into pieces an inch long. On each kidney place a quarter of a hard-boiled egg, and just before serving dust over the whole some grated cheese.
Mushrooms and Kidneys. Melt $\frac{1}{2}$ oz. of butter in a saucepan, stirring in 3 level teaspoonfuls of Hour, and then adding $\frac{1}{2}$ pint of stock. Stir the whole until it boils; then add 2 teaspoonfuls of chopped ham, 2 teaspoonfuls of chopped mushrooms, and a teaspoonful each of mushroom ketchup and chopped parsley. Mix these well, add seasoning to taste, and then 2 sliced tomatnes. Cook the whole gently for 5 min , and in the meantime skin, halve, and grill 4 sheep's kidneys. Add them, and then reheat the contents of the pan, but do not let them hoil. Turn the whole on to a hot dish with sippets of fried bread.

Kidney Cassolette. Cassolettes of kidney may be prepared by cooking 2 sliced sheep's kidneys in a little melted butter, adding a


Keyhole Saw, a tool specially adapted for cutting a keybole in a wooden door
finely chopped shallot and a few button mushrooms out into small pieces. When they have been allowed to fry for a few minuter, add a small teacupful of any good brown sauce and a little sherry. Conk the mixture slowly for 20-30 min., season it, and heap it into some small batter cases for serving.

Kidney Croquette. Croquettes of kidney and bacon are made by lightly frying 3 sheep's kidneys and 3 oz of streaky bacon, and then chopping them finely. Melt an ounce of butter in a pan, stir in smoothly $\frac{1}{2}$ oz. of flour, add $\frac{1}{2}$ pint of stock, and stir all until they hoil. Put in the bacon and kidney, season the mixture, and then turn it on to a plate to cool. When cold, shape it to form small corks, dip these in egg-and-breadcrumbs, and fry them a golden brown. The croquettes should then be drained on paper, and seryed with fried paraley and tomato rauce.

Kidney Soup. An ox kidney is used to make this soup. Wash and dry it, and cut it into small pieces, removing the fat from the centre. Dredge the pieces with flour and then put them into a pan containing 2 oz . of melted butter or margarine. Fry the kidney until it is brown. then add a large onion cut into dice, and brown that alan. Pour in 3 pints of cold water or atock, bring it to the boil, skim it, and then add a carrot and a turnip, cut into dice, and some green celery topa chopped up coarsely. Simmer the whole alowly for 2 hours, then atrain and return the liquor to the pan. Blend a tablesponnful of flour smonthly with a little cold water, add it to the liquor in the pan, and stir the soup until it boils. Simmer it for 5 min., season to taste, and then serve. If preferred, this may be served as a stew, with thick gravy and a border of rice or macaroni.

Kidney Toast. Either a calf's or sheep's kidney, previously conked, may be used to make kidney toast. Mince it finely, season to taste, and then heat it up in any good brown sauce. Serve the mixture heaped on slices of hot buttered toast. If liked a little chopped paraley and shallot may be added to the mince. A few small mushromms are alan an improvement to this dish, and a little sherry to flavour. See Batter; Steak.

KIDNEY BEAN. Varieties of French beans, the seeds of which are shaped like kidneys, are known as kidney beans. They are cooked according to the general directions given for French beans. See Bean; French Bean.

RIDNEYS: Functions and Diseases. Situated one on either side of the spine, the kidneys are partly covered behind by the last ribs. Their function is removal of the nitragenous waste products in the form of urea, uric acid, etc., and of other substances from the blood. The essential elements of the kidney are arteries to bring blood containing waste matcrial; urinary tubules to separate this latter, together with a large quantity of water, from the blood; and veins
 a karry hnd vein Charles Spaniel. Specimen of the silky-coated healthy kidneys separate blond. While the acid and certain salts from the blood, they do not allow sugar or albumin to pass. In disease they lose this selective power, and great quantities of sugar may pars into the urine in diabetes, and large quantities of albumin in Bright's disease and other maladies. of uraemia disagreeable effecta, as a rule fomentations or a large linseed poultice. nephritis, is described under the heading Bright's Disease. Septic infection may involve the organe; this is called pyelo-nephritis. Fmm such an infection an abscess may form. Tuberculous disense may affect one or both kidneys. The symptoms rather resemble those of as lady's finger (q.v.). Electricity ; Watt. intruders may be quite the reverse.

On the other hand, they may fail to remove Some of these points are hidden by the long the urea, etc., and thus give rise to symptoms

Abnormalities are sometimes found. There may be only one kidney, or the kidneys inay be united at their lower ends, forming what is called a horseshoe kilney. In some people, and expecially women, the kidneys may be more or less freely movable. This has no

A renal calculus, or stone in the kidney, may exist for a long time without giving rise to symptoms. A dull pain in the loin is common, however, and there may be frequency in passing urine and this may contain pus and blood. Should a stone of any size pass into the ureter it gives rise to renal colic, spasms of excruciating pain which shont down to the front of the thigh. Associated with this there is shock and vomiting. The doctor should be summoned and meanwhile the patient is placed in a hot bath for ten to twenty minutes. Friling a bath, apply loot

Inflammation of the kidney substancc, or stone in the kidney, but a proper examination of the urine will reveal the presence of tuhercle bacilli. See Bright's Disease; Diuretic, etc.

Kidney Vetch. This is another name for the hardy herbaceous perennial better known

KILOGRAMME. This is a measure of weight in the metric or decimal system. It consista of 1,000 grammer, and is equal to $2 \frac{1}{3}$ pounds avoirdupois. See Metric System.

KILOWATT. In electricity this is the name given to a unit of power. It is the commercial unit by which electricity is sold, and is the equivalent of 1,000 watt hours. See

KING CHARLES SPANIEL. Although bred in the present day especially as lapdogs, the King Charles were formerly used for sporting purposes, and they still make excellent house dogs. They are very gentle and affectionate, though their demeanour to

Under the name of King Charles are also included the varieties that breeders and fanciers distinguish as tricolour, Blenheim, and ruby spaniels; but the difference between them is only one of colour, and it is quite possible that one litter might comprisc examples of each. The following points apply to all of these varieties.
The head has a semi-globular dome, the turned-up nose is ahort and hroad with a black tip. The large dark eyes have horizontal lids, and are always more or less weeping. The heavily feathered eara are set low on the head, hang flat to the cheek, and reach nearly to the ground when the dog is walking. The body is compact, the back short and broad, the chest wide, the legs stout and strong.
silky cont, which should be wavy, not curling The feet, the backs of the legs, and the tail are all feathered. For show requirementa the tail is docked to 4 in

The King Charles proper is glossy black with some rich tan on the legs and below the root of the tail, also on the cheeks and over the eyes. The tricolour is white with patches of black, the inside of the ears tan, and the usual spots of that colour on the cheeks and brows. The Blenheim also is white with patches of cliestnut or ruby red, and cheeks and ears red, and from nose to above the forchend a long patch of white with a clear spot of red in the upper part See Dog

KING POST. This is the centre or principal upright post in a king post roof truss, of which examples are found in many forms of domestic architecture. The roof truss comprises the horizontal member called a tie heam, which reaches from one side of the huilding to the other and rests upon the walls The principal rafters are framed into thistie beam, and

them in wood smoke. Most commonly the word kipper is applied to hervings.

The kippers niay be cooked in the oven, or broiled in front of the firc. It improves them if they are plunged for a minute in boiling water before cooking them. If no double gridiron is at hand they may bo tonsted or bung in a Dutch oven. Before broiling, trim the fish, and after they are cooked rub them with butter. Another way is to put them in a casserole with a little butter or good dripping, cover them tightly and cook in a hot oven 10 to 15 min . In this way no smell of cooking escapes into the house. The same method may be used for kippered mackerel, but they will take longer. See Fish ; Herring.

KIRMAN RUG. Persian rugs of the Kirnian type can be obtained in carpet sizes. Their soft and harmonious tones, in hlue, green, fawn, rose and old gold, and their naturalistic designs of bouquets and vases,

## Kitchens and Their Arrangement

## Suggestions for Suitable Furniture, Fittings and Equipment

An article on the Kitchen, which is the domestic workshop, suggests reference to its fittings, e.g. Cooker; Cuphoard; Dresser; Range : Refrigerator-Sink; to the practice of conking, on which there are hundreds of articles in the work; and to the entries on Eletricity; Gas, See also Chair; Cottage; Door: Flat; House; Labour Saving Larcer; Sculicry; Tile

Compactness is a great advantage in any kitchen and the disposition of cupboards, sink, range, electric or gas cooker should be thought out with a view to minimizing the number of steps taken in the various duties to be performed. A small kitchen saves much walking about, but it is more difficult to work in, as constant tidying up is necessary, if muddle is to be avoided. Even in the largest kitchen compactness can be achieved by careful consideration of the disposition of furniture and fittings, placing the working equipment close toget her and reserving extra space for comfortable chairs and a table for meals. Adequate ventilation is most neces sary. A grating high in the wall or over the outer door is desirable, as this permits the escape of the hot, stale air that rises when cooking is in progress.

A north light is best, and the larder should be on the north side, so that this is the proper location for the kitchen. The relative positions of the sink, kitchen cabinet or dresser, and stove should be such as to minimize the number of journeys between them. The range or cooker should he well placed with, if possible, a cross light. A convenient cupboard may be on the left and a kitchen cabinet, or fitted dresser, on the right. The sink should be under a window, or at least well lighted, and easily accessible from the work table. If possible there slould be an electric light or gas fitting above the sink. In a house where the kitchen adjoins the dining room a service hatch saves labour and a lift is a great convenience for service from a basement kitchen to a dining room on the lloor above.

It is most important that a kitchen should be bright, light, and as airy as possible; that it should have as many simple labour saving devices as are compatible with its size and the required amount of cookery to be done: and that the home worker who spends a good deal of time in the kitchen should have a comfortable corner in it, if no other sitting room is available. An attractive kitchen is no more expensive to decorate at the outset than a drab one.

Where there is a scullery it is often better to concentrate all the rough work there and let everything that is to do with food and the preparation of food, except vegetables, be done in the kitchen. For this renson many people find it better to have a small white porcelain sink in the kitchen as well as the larger one in the scullery. If all cookery equipment is in the kitchen the labour and steps involved in going in and out
show up excentionally well with 18 th century period furnishings. They should be examined for their cotton warps, their line, closely woven and slightly lustrous woollen naps, and the rich reds and blues of their threc or more bordel'stripes.

The design usually includes a large central medallion, sonnetimes scalloped. Among the devices used are the tree of life, the eightpetalled lotus, birds, gazelles, and other animals. The old patterns are reproduced at Tabriz and elscwhere. The carpets known as Turkey Kirmans are coarser, being fabrics of less merit. See Persian Carpet ; Rug.

KIRSCH SAUCE. This is made by mixing together and then bniling t pint of water and 2 teaspoonfuls of arrowroot. When they have boiled for two or three minutes, sweeten thein to tnste, and add ahout a gill of kirsch. If liked, cornflour may be substituted for the arrowroot.
of the scullery for water and also for many of the utensils required can be avoided. The perfect sink to wash up in is about a foot deep, fixed at a convenient height, which does not necessitate stonping, with draining bnards on cither side. Large sinks are sometimes divided for washing and rinsing with swivel taps or a double set of hot and cold. A plate rack over the draining board and, if possible, a tiled splash hack to the sink arc obvious advantages.

Where several servants are kept a pantry between kitchen and dining roon containing glass and china cupboards, service hatch and a sink is a great convenience. A separate washhouse is a useful feature where much laundry is done at home. Kitchen quarters must be adequate for the size of the family to be cooked and cateied for, also the number of servants kept must be a consideration. A scullery and pantry mean simply extra labour and cleaning for one maid, but it is almost impossible to do without them and be com. fortable if both a kitchenmaid and scullery
maid are kept, or if a large household has to he cooked for and the work entails a great deal of washing up and preparation of food. A gond sized kitchen is often a practical necessity in the case of the houscwife with young children. She wishes to have them under her eye, but not under her feet while she is working. Some of the newer houses are provided with an alcove for meals in the kitchen which is a great asset and can be utilized as a playroom for the children during the morning's work. Where a maid is kept such on alcove forms a pleasant sitting room recess.

Walls and Ceiling. The decoration of the kitchen has advanced of late years in practical and yet attractive fashion. Washable papers, good enamel paint, tiles and their substitutes are well employed in a room where hygienio cleanliness is the firet cousideration. There is no need for too much white in a kitchen. If on the northern or sunless side of house, or flat, in spite of the glow from cooker or range, an all white kitchen will look cheerless. On the other hand, there is something suitable a hout a cool scheme, such as blue or green with black and white. Glossy effects are excellent in a kitchen. A dado of white tiles with white enamelled walls and ceiling is refreshingly clean if the rest of the woodwork is painted blue, a black and white linoleum being chosen for the lloor, and black and white check gingham curtains for the window. The printwork can be picked out with black and the architrave of the door can also be black to give character to the room if a large onc The saucepan stand and various containers could be enamelled blue, a gaily coloured pattern chosen for the dinner service on the dresser, while rush mats would add further brightness to a cheerful scheme.

There is an excellent and inexpensive substitute for wall tiles. This is an cnamelled zinc product of British manufacture and may be used for wall tiling or for lining a cooking recess and for a sink surrourd. These tilings need not be necessarily in white, but are obtainable in attractive tints. Another form of imitation tiling which enables the housewifc to produce a charming effect at a small cost is obtainable in sheets which are applied to the walls in the same way as an ordinary paper. This tiling substitute can also he washed and wears excellently. It is infinitely more pleasing


Kitchen. Fig. 5. A well arranged small kitchen with tiled walls. recessed gas cooker, convenient shelves for saucepans above it, and ample cupboard accommodation

Iluninhrey ،f Vera Joel


Kitcuen. Fig. 6. Showing a kitchen cabinet in oak fited with Lour bin, ertending porcelain table, cupboards and drawera, conveniently placed near the larder
than the old-fashioned varnished papery which are still obtainable in tiled patterns.
Ancther suitable wall decoration is a washable paper which has a mat surface and is waterproof. Stains can be removed from such u paper by means of a damp cluth. It is made in a variety of colours and patterns. l'here is a preparation for rendering any wallpaper washable, which can he used by a decorator without alfecting the appearance of the wall covering. Ceilings are best treated with enamel, but, failing this, one of the flat wall paints will be found more durable than ordinary whitewash.

Furnishing and Floorings. Where a kitchen is well lighted and also used for meals, built-in furniture catn be stained oak brown. W'indsor eliaira and the table can also be of oak, but a porcelain enamelled top may be fitted to the table if it is to be used for culinary prepara. tions. Such tops are obtainable in white or in colours. Very practical kitchens are equipped with these tops, made to measure for the table surfaces of dressers, draining boards, shelves, window sills, wall slabs cupboand tables and Iarder shelves. The surface is especially prepared to withatand hot plates, dishes or cookery utensils. No scrubhing is required for cleansing, but merely a rub with a damp cloth.

Where space saving is important a meat safe and table combined is a good idea. In some thats the larder is merely a shallow cupboard with shelves and not well ventilated. The provision of a meat safe table, with steel cnamelled top and having a cuphoard below which is zinc lined, with a ventilation regu lator is therefore an excellent solution for storage of hot fond, which must never be put into a refrigerator. The latter piece of kjtchent furniture has become more usual of late years. Models are obtainable which can beroun by gas or electricity and some by paraffin oil, making it possible for people in the country to liave refrigeration in their kitchens where neither gas nor electric power is a vailable. The more costly pieces of kitchen furniture are obtainahle by paying a small suni down and then by monthly inatalments.

The all important natter of the range or cooking stove is discussed in detail under the various headings, Cooker, Range and Stove. The use of fuel or power is frequently dictated by local conditions and where electric power is cheap it has certain advantages on the score of oleanliness though in a large country kitchen the range provides a cosy centre to the home. Norlern coal ranges are excel lently equipped and there is also a cooking stove which burns small coke or anthracite This is an efficient stove and needs only to be filled once and riddled twice in twenty-four hours. It also provides about ien gallons of hot water for washing up.

Kitchen Cabinets. Kitchen cabinets have increased in number and practical advant ages The one illustrated in Fig. 6 takes the place of a store cupboard and has an extending porcelain table, which is ideal for pastry making and requires no scrubbing. The position of the cabinet in this case has been determined by the larder, which is seen on the right, and within easy reach of culinary operations Additional side units, as seen in Fig. 7, make a kitchen cabinet quite complete with ample accommordation for all cleaning requisites on one side and cookery utensils on the other. Cubinets may have vegetable racks, metallined bread drawers, egg racks, tlour bins, and baize-lined cutlery containers. One model has an automatically sealing bread and cake bin and also a detached steel enamelled tup table with extra chopping board. This table can be folded away inside the oupboard when not required. Such cabinets may be in oak or finished in enamel to natch the woodwork of the kitchen. In any cesc, the inside is linished with glossy white enamel.
Where there is good cupbosid and larder accominiodation the kitchen cabinet is often
dispensed with. The dresser may be made more practioal by having the upjer shelves fitted with glass doors so that the dinner service need not be exposed to the dust of the kitchen. Cupboards underneath the dresser ary also is space-saving iden and provide shelf room for kitchen orockery and tools. For storage purposes, if will space permits, a long shallow oupboard is better than a narrow deep one. In the former it is possible to see at a glance what is on the shelves, whereas in the Intter type of cupboard articles get puslied to the back out of sight. A washing up machine is very useful, but almost indispensable within reach of the sink is the plate rack, with compartmients of various sizes, made to hold cupe and saucers as well as p!ates and dishes. Another essential article is a clock. Waslable porcelain kitchen scalcs are more hygienic than the old-fashioned ty pe.

A good method of disposing of rubbish is a vital point of kitchen equipment, especia'ly in a flat. A sanitary receiver which is always covered is almost a necessity even where the private dustbin is lucnted just outside, as constant going to this causes delay and is tiresome in bad weather One with a detachable interior pail and an outer case of white enamel to which the lid is attached is a con venient refuse receiver. The lid opens by means of a foot pedal. A vegetiable rack and a tripod saucepin rack are inexpensive items which should be provided. Pans should never be stored in a cupboard, but kept where a current of air reaches them.

In many modern houses jointleas composition llooring is laid in a plastic state which has a surface that is easily cleaned. Tiled, brick or stone Hoors are all attractive and oleanly, but they are cold to the feet, and rush or other suitable mats should be provided. Rubber floorings and inlaid tiled linoleums of a good quality are suitable for boarded rooms. Plain lark colours are not a goad choice for these last ns they show marks and footsteps. Curtains can be of any washable material, but glazed chintz, gingham or coloured linen always look well. There is also a liking for rubberized material and for American oloth for casement curtains. Unless the kitchen is of the old-fashioned picturesque country type, or is used as part living-roon, when the real domestic workshop is the scullery, a certain severity is best in furnishing accessories


Kitchen. Fig. 7. Another type of cabinet in oak, with side units. The left-hand portion has shelves for cookery utensils, that on the right is made for vacuum cleaner, brooms and brusbes Courlesy of Triumpli Cabinel Horlis. Le.l.

Only practical curtains should hang at the windows unless the kitchen is overlooked, When starched mualin glass curtains may he provided, preferably with rods top and bottom to keep them trutly in place Checked American cloth is n good material for table covers and terry cloth for chair cushions

Illustrated Suggestions. Our first photograph is of a kitchen in a small country house fitted with modern.labour saving convenience and yet retaining a cosy look with its oak coloured woodwork, tiled flooring and chintz curtains. The porcelain sink possesses a doulile draining board Electric power being available, there is an electric cooker and kettle. In the tiled recess beside the cooker is a boiler for the hot water services and small radiator system. A little sitting room for the maid opens out of the kitchen. The dresser is fitted with cuphoards below, has sliding glazed doors above and a shelf specially fitted to take the row of gilded containers for dry ingredients. There is ample other cupboard accommodation on the wall not shown in the illustration.
Completely equipped with electric laboursaving devices the kitchen depicted in Fig. 2 is admirably designed to make the most of a small space. It possesses a British made refrigerator, an electric cooker, boiling plate, water heater, washer and iron. The conveniently deep sink is well lighted; the plate rack is on the wall at right angles (not seen in the photograph), and the vitreous porcelain kitchen table is just discernible on the left. Green enamel surmounts the dado of glistening whitc tiles on the walls. A kitchen cabinet opposite the window with cuphoards to contain china, glass, silver and drawers for cutlery and a fitted cupboard for brooms complete a compact and thoroughly efficient furnishing scheme.

## An Elricient Town House Kitchen

A larger kitchen of a town house is shown in Fig. 3. The range has been removed to make room in the now tiled recess for two hoilers. One of these is for the domestic supply of hot water and the other for central heating. The enamelled gas cooker is provided with a ventilating canopy. There is a seven-tiered saucepan stand and the porcelain sink is under the window. Beyond, not visible in the picture, is a teak wood draining board and a plate rack. The kitchen table top is half of marhle, which provides an ideal surface for pastry making. The enclosed dresser is opposite the window and there is a white enamelled clock and an enclosed electric light ceiling fitting.

A most efficient domestic workshop is shown in Fig. 4. Here the equipment is suitable for a Hat or house where gas is laid on. The double sink with swivel taps adınits of washing and rinsing at the same time. The high dado is composed of tiles on the wall by the elevated gas cooker (note the hoorl under which is the special ventilation grating and fue taken through the wall to the chimney) and the sink, while blue-green enamel is used for the dado on the other walls surmounted by pale primrose yellow for upper walls and ceiling. There are nuslin glass curtains and gingham practical ones. The meat safe table between the windows is zinc lined and has a vitreous jorcelain top impervious to heat. There is a gas radiator to warm the kitchen when the cooker is not in usc, and the central table is of the modern dual purpose type with fitted drawers for cooking implements and cutlery and also possessing an extra deal leaf, which renders it suitable for pastry making on the porcelain surface or for chopping on the wooden one.

An attractively designed small kitchen is shown in Fig. 5, which is suitably furnished for a flat. The cooker is recessed, the pot shelves are conveniently arranged, the taps are porcelain finished and there is excellent cupboard nccommodation. The tiled walls could be less expensively treated by one of the
imitation tilings mentioned earlier in this article. The flooring is a jaspé linoleum In light grey this tones well with pale blue tiling, dark grey enamelled woodwork and aluminium saucepans.

Culinary Requisites. Besides decoration, and the more insportant furniture, there are a number of service aids and cooking utensils to be thought of when equipping even a small kitchen. Aluminium has taken the place of other metals to a great extent, but an iron frying pan is a convenience, as iron will stand a grenter amount of heat than other metals, and boiling fat reaches a very high tempera. ture. Fireproof china and glass are also used extensively in cooking, and these wares have the advantage that they can be brought to the table, thus obvinting the necessity for extra dish washing

The articles required for equipping the kitchen must vary with indivi-
dual needs. It is a wise rule, however, to dual needs. It is a wise rule, however, to
have a few things and renew these as occasion demands, and to have the simplest equipment possible.

For a small family the following equipment is suggested as a minimum : A set of pans, one of each size ; $\Omega$ small and a large frying-pan; a preserving-pan, if preserves are to be made at home; a medium-sized fish-kettle, which can also be used for boiling hams and large puciclings; a couple of kettles, an earthenware casserole, some oven glass ware and one or two small fireproof dishes. A set of basins and jugs for milk, two or three pudding dishes, a jelly mould, wooden spoons for mixing, a soup strainer, colander, mincing machine, grater, pastry board and rolling pin, with varioussized cake tins and a Yorkshire pudding tin

Cutlery and Containers. Knives, spoons and forks for kitchen use and special culinary purposes should be included in the equipment.
A stainless steel saw edged tomato slicing and

## Kitchen Gardens and Allotments

## Details and Plans of Two Serviceable Plots

Associated with this subiect are the articles on the vegetables nnd fruits grown in a garden of this kind, e.g. Apple; Beans; Cabbage; Potato. Sec also Digging. Fruit; Insecticide; Manure

The successful management of vegetables depends chiefly on thorough cultivation of the land, a correct rotation of crops, and the choice of kinds and varieties whieh will maintain an unbroken supply of produce. Those who cultivate vegetables to perfection for exhibition purposes trench the land from 2 to 3 ft dcep, but that is costly and laborious work and unnecessary to ensure vegetahles for an average household.

Copping a vegetable garden is $n$ most important operation. The principle of rotation is simplicity itself, leing inerely a system which prevents the growing of crops belonging to the same natural order repeatedly year after year in the same ground. The potato, however, is an exception to the rule, becauso good crops of potatues may be raised from the same plot ycar in, year out. always provided there is a change of seed tubers every second season. An easy way to ensure proper rutation is to divide the gmund into four portions. Planting will be as follows:
plot 1.
Wirst year.-Peas, beans, celery, leeks
Second year.-Carrot, paranip. beetroot
Third year.-Cabbage, caulillower, kale, Lrnccoli. Brussels sprouts, onlon, lettuce, turnips
Fourth vear.- Potatoes
Fourth year.-Potatoes


Kitchen. Fig. 8. Kitchen containers in alazed earthenware obtninlifting knife, a fruit and regetable slicing knife, an apple parer, a meat chopper, tin opener, grape fruit cutter and corer, kitchen scissors. a juice extractor and a variety of pastry and vegetable cuttery are a useful collection. There are many other devices which can be acquired as neerl and occasion arise, such as fruit slicing, bread cutting and potato mashing and peeling machines, but these are only essential in the larger household.

Glass containers for dry ingredients are excellent for use in a store cupbonrd, as their contents are quickly seen, though they should also be clearly labelled. Enamelled or gilded containors look well, when bought to match, in a row on a shelf or on the chimney piece. The newest and most attractive, however, for the small or less severe type of kitchen are tho ones illustrated in Fig. 8. In creamy white highly glazed earthenware, decorated with quaint designs and delightfully shaped, these are obtainable for dry ingredients and for condiments.

Firat year.- Parmiip: Parrot 2.
Firgt year--Parnilip carrot luetront
Second vear.-Cablange, cantllower, kalo. Brussels prouts
Third year.-Potatoes
Fourth year.-Bcans, peas eclery, leeks Pliot 3
First year.-Cabbaige canlitlower, kale druasels sprouts
second year.-Potrtome
Thiril ycar.--Pcas, brans, celery, lecka Fourth yeir.-Carrot, beetroot parsnip Piot
Firgt year.-Potatcke
Second year.-Pcesk, heans, celerg. lec
Third vear.-Carrot. heetroot, paranip prouts, kale, turnip. onions, lettuce

It will be noticed that in the diagrams accompanying this article departure has been made from the above by suggesting a thrcecourse cmpping system. This scheme will be found equally satisfactory, and gives opportunity for devoting one of the four centre heds to the cultivation of small fruits. If the four-course system is preferred, however, ample space will be found in the marginal or outside borders for growing the small fruits shown in the plan.

Planting of vegetsbles is another matter which should receive much care. Endeavour
to plant in showery weather, always use the crops always min off the end of the an root o. garden line to guide sowing or planting in scedings, as this wist, $\notin$ or.-Sow in Feb. to April, 1 in. deep in straight lines, and do not cramp distances Irills 1 ft . apart
between rows or plants. Much good seed is Canlitiower, $t$ oz. - Sow April. 1 in . deen in drills,

and transplant carcfuls 0 rows $\simeq$ ft. npart at Interinis of 3 wew o maintain of 3 weeks 0 ॥ 0 on anccession hinly in finc ainllow oil Juring March, and oll firm. Use thlnParanip kalads
Parsnip, 02 .-Sow ands of 8 in during vals of 8 in. during strongest plant
Peas, then pt.-Sow rom Jan. to July 2 in. deen in rows of if ft. more between the rows than the heiglit of the aricty
Radish, 1 07. - $80 \ldots$ broadenst. or in drille, rom Feb, to Oct. Sow sufficlent only at one time for amall gat hering. nad rely unon frequent owings, otherwise they get woody and run to
waste vaste
Shallots. 1 lb - Plant In fine and flrm soil in early March, 8 in. apart, rows 12 ill . apart Spinarh, 02.-Sow rom harch onwards, in in apart at intervals of a fortulght to maintuiu ur ply iply
furnip, f 07.-Sow mony, ing Feb. to drille 15 fn. anart

The two diagrams definc the possibilitiesof kitchen gardens measuring respectively $148 \times$ 9 (ift., and $132 \times 8: 3 \mathrm{ft}$., cither of which may he modified ns required. The root principle of each is the four central divisions to accommodate the rotative system of cropping.
wasted lyy thick sowing, and it s far better to sow thinly and save unnecessary thinning out. Seedlings, whether sown in drills or seed-beds, should have a first thinning when they have formed their third leaf, thus giving up their room to nllow greater development of the remaining plants. Never leave scedlings in a hod to mass together, but transplant carly and secure better crops.

It is not possible in this article to include sowing quantities and planting distances for all vegetables, but the following instructions for popular kinds will he found useful. In all cascs the estimate is given for a 25 ft . row.
Artichokc (Jerusalem), 3! lbplant gpring or alltumn, in drills 5 in. deen and $1 \frac{1}{2} \mathrm{ft}$. apart, with . between rows
Bect, $\frac{1}{1}$ 07. Sow 1 in . deep in arly May, 1 ft. between rows
Broad jean, pt.-Sow during Broccoli, cabbage, Brussela sprouts. Broccoli, cabbage, Briasela sprouts, kale, and all winter greens, of oze hundreds of plants. Plant not less than 2 ft . apart all round. Four crops of cabbage may be produced, sowing times being August, March, April, and May. When transplanting green

 Kitchen Garden. How to lay out a garden which measures 132 by 83 ft . Three plots are devoted to vegetables, kitchen garden measuring 148 by 98 ft., showing a similar rotation ol crops and fruit
crops as rhubarb and herbs, it affords plenty of room for seedlings of various kinds.

By the middle of August the following crops hare prohably been cleared off the ground : early potatoes, peas, broad beans, spring cabbages, early turnips, early salads, spinach (not spinach beet), and shallots. Early varieties of pen are best for small plots The places of the early crops have been taken by winter greens, autumn caulillowors, lecks, late turnips and vegetable marrows. There may be a piece of neatly raked ground sown with spring cahbages. autumn onions, and lettuces.

Now let us look at our table for the second half of the season.

| Crops at mid-August |  |  |
| :--- | :--- | :---: |

On a $20-r o d$ plot everything is easy as far as allotting space is concerned. There can be 10 rods of potatoes, with a change of ground every year. Practically everything suggested for the 10 -rod plot can be carricd out, but on a larger acale.

KITCHENMAID: Her Duties. A kitchenmaid is, for all practical purposes, an assistant to the cook, and her duties are mainly confined to the kitohen and the preparation of meals. In large establishments two or more kitchenmaids are kept.
Her duties vary with the size of the household, but she is generally expected to cook the regetables and such foods as do not need a high degree of akill, and to prepare the materials which the cook needs. Much of the washing. up usually falls to the lot of the kitchen: maid. In some establishments the cooking for the other servants is done by her. Many girls who aspire to become cooks gain their early experience in this way, and a kitchenmaid who has served under the cook of a famous establishment will find the training there valuable if she seeks a post of that kind for herself

Kitchenmaids can be obtained, like other servants, by advertising in the newspapers, or by visiting a registry office. They should be insured against accidents that may happen to them in the course of their work, and also under the National Health Insurance scheme. See Cook; Insurance; Servant.

KITCREN RANGE. This contains an enclosed fireplace, with one or more ovens at the side, and a flat top, wherein are a number of holes, with removable covers; this structure enables the fire to be ferl and cooking utensils to be placed thereon. There is a great variety of ranges, and they are made to suit all types of houses, from the largest to the smallest. Some firms make a speciality of ranges suited for the tiny kitchens found in flats and amall dwellings generally. See Cooker; Range; Stove.

KITCHEN TABLE. Fig. $l$ is probably the simplest method of construction for a kitchen table, since it involves no mortise and tenon joints. Dimensions are given in Fige. 2 and 3. The legs are cut from 2 in . deal squares to the height of the table, less the thickness of
the top At the top end of each leg on two strengthened with corner blocks rubbed in at adjacent sides mark with a square the width the top. These blocks should be planed to of the rails, and with a gauge set to half width so as to line up with the inner surface the thickness of the rails, i.e. $\frac{1}{2}$ in., mark the of the leg and act as guides. The drawer may ends of the legs, thus indicating the width be dovetailed or rebated. The top is fixed and depth of the shoulders to be cut to take the rails.

The two surplus portions of the legs may be cut away with a tenon saw, as is shown in Fig. 4, and the !egs then tapered from below the shoulder $\ddagger$ in. on each side. The rails should then be prepared from 1 in . stuff, cutting them off square at each end. Note that the side rails reach only as far as the recessed portion of the leg (Fig. 4), while the end rails are sufficiently long to line up and cover the end grain of the side rails. The undersides of all rails are bevelled off as shown, and holes to take the screws bored, those in the end rails being farther away from the end so that all the screws will go into the leg. The whole is screwed together, fixing the side rails on first (Fig. 4), and corner blocks glued in for additional strength. The top, of course, will have to be jointed up to obtain the width. One-inch stuff should be used, and this should be fastened down to the framework by pocket screwing, as shown in Fig. 5.
Another Type of Table. The table in Fig. 6 has a better appearance and is fitted with a drawer, though this may be omitted. The necessary dimensions are indicated in Figs. 7 and 8. The lege are cut off, and the top ends marked out for the mortises. If a drawer is not required, all four legs will be marked alike, otherwise the drawer end will be fitted with two rails, as in Fig. 3, the lower one being tenoned in and the top dovetailed. These two rails should be about $\frac{1}{2}$ in. wider than the legs, and are cut round the latter as shown.
When all the joints have been carefully cut, the whole is glued together, taking the two sides first, and allowing them to set before glueing the remainder. When dry, runners are fixed, Fig. 10, being nailed, glued, and further as before with screws fastened from underneath. See Drawer; Table

KITE : How to Make. The best-known simple kite is the pegtop pattern, shown in Fig. 1. It is of fairly small sizc and covered with tissue paper gummed to the frame; such a kite, a foot long, can be flown on stout thread as a line. The frame consists of a relatively stiff wooden backbone, and a thin, llexible piece of split cane bent to a semicircle by a string arranged like a bowstring. The centre of the bow is lashed to the top of the back bone, and strings are run from the horns of the bow to the bottom of the backibone; these strings, however, are not tootight, as the strain is to be taken on the bowstring.

After the frame is covered, a piece of atring double the length of the kite has its two ends tied to the backhone, one near eachend This is the hridle, and the kite line is tied to it so that the upper arm of the bridle is shorter than the lower. The rig of the kite is completed by a tail, to which convention consigns the form of a string two or three times the length of the kite, tied to the bottom of the back bone and having screws of paper tied to it at intervals; a strip of fabric, however; answers the purpose equally well, being nore durable and less trouble to fix.

Home made pegtop kites sometimes have a rigid wooden member instead of the bowatring. This is a mistake, as it tends to prevent the horns of the bow from bending backwards under the air pressure, as they must do to give the dihedral angle effect needful for stability.

The adjustments that have to be made consiat in varying the amount of tail carried and the point of the bridle at which the line is


Kitchen Table. Fig. 1. Simplest form of kitchen table. Figs. 2 and 3. Side and end elevationg, giving, measurements. Fig. 4. Detail ol joints. Fig. 5. Method of fastening table top to framework. Fig. . 6. Another type of table, fitted with a drawer. Figs. 7 and 8 . Side and end elevations. Fir. 9. Detail of drawer ftting. Fig. 10. Runners and corner blocks in drawer aperture
adjustments are made suit. able to the speed at which the wind is travelling

The pegtop pattern is in convenient in large sizes, as it cannot well be taken to pieces for travelling. A modified form of it is therefore used in which the bowstring is replaced by a straight and particularly flexible stick and the bow omitted, the frame thus consisting of two wooden members arranged in the form of a cross, with a surrounding edge of string tied in succession to the four ends of the sticks. If this frame is covered with a light cotton fabric it can easily be arranged so that the sticks may be removed and the whole rolled up for trans port. The same adjustments as in the case of the pegtop kite are needed in order to secure for it a satisfactory stability.

Ań Eddy Kite. A more ambitious form of portable kite is the Eddy type. In this the frame consists of two sticks of equal length


E F, can be made from any very light material such as cambric or madapolam. Cut two pieces each 6 ft .3 in . long and 13 in . wide. Turn a hem on each side, and sew it twice to give the greatest strength. Take care not to cookle the material; the flatter the bands the better they will be. When hemmed, the bands should measure exactly 12 in . in width. Now overlap the ends and sew them together very strongly, thus making two endless bands. Lay them flat on the table and then Hatten them out, creasing the folds. Have one fold at the joint of the ends. Next fold over again, thus dividing the piece into four and again press at the folds. These 4 crcases will show just where to fix the 4 longerons, one being tacked on with 5 brass tacks to each corner or crease; and on the inside of the band.

Notch the ends of the diagonal struts, and glue a bit of tape around them near the ends, to prevent splitting. The length of these struts arranged in the form of cross, the two should be such that when they are in place being lashed together at their meeting point, they will be slightly bowed, and thus keep the which is one-fifth of the !ength of the backbone bands taut. Tie the struts together at the from the top end; a surround string is fitted centre with thin string, and to prevent them as usual. The dihedral angle effect in the slipping from their position glue or nail some Eddy kite is obtained by bending the ends of the transverse stick backwards and holding them in this position by a bowstring, which, of course, lies clear at the back of the kite. The cotton covering is made rather wider than the frame, so that it is rather baggy, and bellies out like a sail when the kite is flying. When properly adjusted these kites do not require a tail at all; the adjustments consist in varying the point of attachment of line to bridle, and in regulating the tension in the bowstring at the back of the kite.

Box Kite. Named from its rectangular form, the box kite is an excellent fyer, and can easily be made. The sizes given have proved successful, but can be modified to suit individual requirements. Constructional and other details are made clear from Fig. 3.

The longerons or corner pieces, A B, are made from $\frac{8}{8} \mathrm{in}$. square stripwood, obtainable at most model shops, or may be cut from a piece of pine in. thick, and planed up true. These pieces should measure 42 in . long. The diagonal struts, C, are approximately 26 in . long and made from similar material, but these

tile blocks of wood to the longerons. By leaving the struts loose the kite is easily dismantled for transport purposes.

A bridle of stout string is securely tied to one of the longerons, 6 in . from either end. The kite line is attached to the bridle with a reef knot and bowline knot to permit of its being adjusted on the bridle, the best positions being found by experiment. In general, the lighter the wind the shorter the front line of the bridle. In a very strong wind it might be advisable to attach the kite line directly to the longeron, just behind the front band.

KLONDIIRE. This is a card game for one or more persons. It is played with the ordinary full pack of $5 \underline{2}$ cards. The cards are shuffled and cut in the ordinary way, and the first card is turned face upwards on the table. To the right of this card, but face downward, are placed in a row six cards. Immediately below the left-hand card of this row of unexposed cards is placed another card, face upward, and five more cards to the right of it, below the top row and face downward. So the next row has one faced card and four face downward, and so on until there are seven faced cards and twenty-eight cards in all on the table in the form of a right-angle,

Any aces which have been exposed are taken from the lay-out and placed elsewhere on the table to form the foundations on which to build. Upon themare placed cards in sequence, two. three, fourking. When any card of the lay-out is uncovered by playing away the bottom of the row, the next card in that vertical row is turned face upward. Cards in the lay-out are built in descending sequence, king, queen, jack, etc., to
the two, and alternate red and black suits. The remainder of the pack not put down in the lay out is dealt out one at a time, and any card exposed may be used either on the lay-out or on one of the foundations. Spaces in the lay. out can only be filied with kings. If there be more than one card at the bottom of a row showing, all must be moved together or none.

A player pays fifty-two counters for his pack and receives five counters for every card he succeeds in getting on the foundations, running through the pack once only.
ENAPSACE. This is a form of bag used by soldiers, soouts, and travellers on a walking tour, to hold the necessary articles of food and clothing. It is carried on the back, supported by shoulder straps, the usual type being equipped with a long, loop-like strap, attached to the top of sides, to pass under the armpits and over the shoulders round the back of the neck.

Enapweed. The common name of the perennial Centaurea. See Comflower; Sweet Sultan.

ERNEE. This joint is formed by the junction of the lower end of the thigh-bone, the femur, with the upper end of the large legbone, the tibia. The patella, or kneecap. glides over the front of the joint. The bones are held together by a number of ligaments

The knee is much exposed to injury, and this may be followed by synovitis with an accumulation of fluid in the joint, on which the kneecap is felt to ride or float. This requires rest and perhaps painting with iodine to promote absorption. The knee should also be tirmly bandaged with a flannel or a woven elastic bandage. Very often it happens that when one gets up and about the swelling recurs, but with the daily application of the bandage this gradually diminishes and disappears.

Not uncommonly one of the cartilages is displaced, in football or similar accidents. The knee is locked in a bent position and is very painful. When put right it may easily recur, and a protective cap should be worn. See Dislocation ; Housemaid's Knee; Knock Knee.

ENEJLING PAD. Pads or mats used to kneel upon while floors are being scrubbed serve to protect the knees from cold, damp, and soreness. They are especially necessary on tiled floors, and should be thick enough to prevent the cold from penetrating through. Several thicknesses of folt or some similar material make a good pad, but the rubber kneeling mats obtainable in kitchen equipment departments of stores are the best for indoor and outduor use, being dampproof.

ENIFE : For the Table. It is claimed for some of the newer types of stainleas steel table knives that they never require re-sharpening. These have serrated edges and include dessert and bread knives.

Stainless steel knives which are not thus guaranteed need a special form of sharpener. The best is one which has two grooved revolv. ing rollers. The edge of the knife is placed between these two rollers and drawn backward sharply. Stainleas steel will become soratched somewhat easily. To clean blades of the stainless variety they should only be dipped in water and wiped. The placing of handles of knives in hot or cold water should be avoided, as this usually causes early discoloration.

Hardened steel knives which are not stain. less are to be had in various qualities. The cheap varieties are fitted with what is known as singleshear stoel blades, but the higher priced and more durable qualities are fitted with doubleshear steel blades, which are cross-rolled.

Handles for Kinives. The best handles for knives in everyday use are those which very closel y imitate ivory. There are many materials which give quite an excellent reproduction of ivory, but as long as cutlery is purchased from some well-known firm that specializes in Sheffield-made cutlery there need be very little


Knite Box. Fig. 1. Example with marquetry of satinwood, mahogany and sycamore. Fig. 2 Urn-shaped bor in painted satin wood. Both of 18th cent. English

Victoria \& Albert Aluseum
xpansion or owing to the varying temperatures
A simple test can be applied to assure one self of the quality of a metal-handled knife. The end of the liandle of the knife should be held lightly bet ween the finger and the thumb, and the point of the knife should be sharply tapped on some hard surface, such as china or glass. If the blade is hard soldered to the handle the metial will ring almost like a silver or gold coin when it is tested. If a knife is fitted with an inferior tang, and the metal blade is filled with a composition, there is a dull sound when the above test is applied.

Metal handles for knives are made in Georgian styles : also many continental styles of knives hise come into vogue. The difference between those and the usual English patterns is that the continental styles of knives are usually fitted with shaped hlades.

Cleaning the Knives. Knives which are not of stainless steel can be cleaned with a damp rag dipped in powdered batlibrick or by means of a knife hoard or cleaner.
The latter is prefershle; but a specially prepared powder should be used with the board. It is well not to wash knives in hot water, as if the blicdes are heated the metal tanga expand and the handles may split. Many persons try to avoid this by immersing the hludes only.

Ivory and bone liandles should never be washed with soap or in lasewarm water, as this causes discoloration. It is better to wipe them with a soft eloth that has been moistened with peroxide of hydrogen, and afterwards place them in the sun, which will whiten the ivory or bone.

Repairs to Knives. The handle of a carving or table knife may possibly become slack, and when it does it should be immediately eeen to. If the blade can be removed from the handle, it will be evidence either that the tang
fear regarding the discoloration of handles, as all the best firms use a reproduotion of ivory which will neither discolour nor split ; wherens with real ivory handles, unless of the finest grain and quality, there is always a risk that theivory will crack owing to the
is broken, which can be seen by inspection, or that the holding pins have sheared or hrolien. If the latter is the casc. carefully punch out from the handle the remaining portions of the pins, and do likewise from the tang, and test to see that it is atraight and true. Next prepare some cement comprosed of melted resin, pour this into the hole in the handle, and having pre viously warmed the tang, insert it in place and hold it in position until the resin has set. Then drill out the resin from the pin holes and inake them all secure with new pins of brass or Germitn-silver wire. They only need very slight riveting in order to make them secure Xylonite-landled carving knives and forks frequently have serrated tangs, which are difficult, if not impossible, to remove. Other types have through tangs, which ure often riveted on to a washer or cap at the end of the handle. This has to be removed before the knife can be repiired. A slight slackness can he taken up by further riveting the end cap. If the knife or fork is of rustless steel it will need especially careful handling, as this matcrial is much harder and more prone to break while being repaired Drilling is inore laborious, and requires plenty of lubricant on the drill to keep it cool and cutting freely. Otherwise similar nethods can be applied. This second style of case is illustrated in lig. 2. It is constructed of satinwood and heautifully painted

## Knitted and Stuffed Toys

Instructions for Making Nursery Favourites
Other articles in our work which deal with the construction of playthings for small children are
Dolls and their Homes; Noah's Ark: Toys. For related information consult also Crochet and the subsequent entry under the heading Knitting

To knit delightful, inexpensive and cuddle some toys which really appeal to babies and very young children and are also most sale. able articles on the nursery stall at a bazaar requires no special skill in arts and crifts and only a simple knowledge of knitting, which can be quickly acquired by studying the article on that subject which follows this one. The success of a stuffed toy depends largely on the way it is stuffed. Kiapok is used for these, and 1 lb . bags cost from 1 s . fid to 2 s . It is astonishing how much stufting is required in order to make a toy really hard wearing and nicely shaped.

The five toys illustrated and described oan be made up in other colours and the sizes varied. We have to thank the Best Way Serics for kind permission to reprint some of their excellent ideas here. The abbreviations used are K., knit ; tog., together; st., stitches; inc., increase : p., purl; lps., loops: rplt., repeat.

Wilfrid the Rabbit. The first toy is that well established favourite 11 ilfrid. He costs about 3 s . bid to make and requires $2 \frac{1}{2} \mathrm{oz}$. of pale blue and | oz of white teazle wool ; one pair of knitting needles (steel) size 11, 2 black shoe buttons Kapok for stuffing.

The work begins at the base wf the hody. 1st row. With the bluc wool cast on 14 st k. 30 rows. 31 Rl oo:0. Inc in flrst st. (15). 32 nl roov: lnc. in last st. (16). 1 ppt. these 2 rows 6 times ( 28 ). 45th row: K. 30 rows $75 \%$ rons: K. 10 st., place these on a kafety-pin. Cast olf 6 st. for armhole, k. renninink 12 st. $76 \mathrm{~h} / \mathrm{hrovo} \mathrm{K} .13$ rows on these 12 st. 89 th row. Inc. in frst st (13) 90 h pow : K . Rpt. these 2 rows once (14) and put thicse on a pin. 93ird rowo: Pich up the 10 st. from the safety-pin, join wool to Where the ast. were cast nif ho rolls. 100th these 2 rows once (12). 11uth row: $\mathbf{K}$. Pick un thic

KNIFE BOX. In the 18 th century kini:e cases were made in two distinct styles. Fig. I shows the type with a sloping hinged lid and a moulded front, the interion being divided int, compartments raised one abore the other for the knive., etc Many of these are matle of satinwood and some of mahogany the wool being often veneered on oak others wers inlaid or edged with sycamore and boxwood During the classical period Adam, Hepple white and Sheraton also designed manv of the rarer and more elaborate knife urns

Knife hoxes were frequently seen on the ideboards in the 18th century They stowil on the perdestals that lianked many of these pieces designed by Slieraton and other makers See Carving: Cutlery; Draw Knife; Ivory Paper Knife; Pocket Knife; Pruning Knife Sidebond: Steel: Table Layin\%.

KNIFE REST. Rests for supporting the carving knife and fork on the table are made in pairs in silver and electro plate, and also in glass. Each consists of a bar raised nbove the table by two supports. The supports take various forms, some being plain and others ornmmental. Thry may repiceent an animal or some orther kind of figure See Carvers: Si'ver

## Table l.aying.

KNIGHT'S TOUR. This is a useful pastime for an invalid or a child. All that is needed is a chessboard and 64 counters. The object of the game is to place all the counters on the board, the positions being those that a knight would take up at chess The player ca:n leemin on any square, and his aim is th place the counters on the hoard so that the whole of the © 4 squares are filled up. See Chess

Kniphotia. This is a hardy perennia!, known also as red hot poker, torch lily, and Hame flower. See Red Hot Poker.

14 st from the pin and $k$. them (28), 111 th row K. 112th rov: : K. 2 tog. k. 8 st., k. 2 tog., k. to ond
 at beginning, middle and end of nectle (2i). Rpt this row onec (2t). 12thl row : Ine. in Hrat at. (25) 125th rove: K (2t). 12 tht row: ine. in these
 at eurh cnd of necdle ( 206 ) $145 / 11$ rono. K. lipt these $\geq$ rows 3 times ( 20 ). 152nd runn: K. ${ }^{2}$ tof at beginning, nidic, and end ors ( 14 )
 . another in thic same manne
Froul of Boly,-18t row With whilte wool cast







Knitted Toga. Fig. 2. Black Sambo and Jumbo. These litte fgure are in simple knitting and stuffed with kapok
thicse 2 rows is tlmes (8). Cast off. K. another In the anme manner.
Inside of Leg.-1sf roo: With white wool cast on 8 at., k. 0 rows. Tth row: Inc. at each end of needle (i0) sth rooc: K. 23 rows. 31 at row: Inc. In first st. (1s). 32nd noin: Rpt. these 2 rows 6 tlmes
(17). (17). tith row : Inc. in first st. (18). thith row : Cast
olf 5 wt., $k$. to cud of row (13). Ilpt. these 2 rows olf 5 nt ., k . to end of row (13). Rpt. these 2 rows
3 times. Fusten off wool. l. another in the wnme 3 times.
inanner.
Ears.-lat row: With bluc wool cast on 7 nt $K$. rows. Wh row: Inc. in flrst and last st. (0).
 (12). 501/ row K . Rpt. there 2 rows once (11). Cist off. K. nnother car in lilue wool and 2 in white wool.
Arms.-1st ruio: With blue wool cart on 12 st . kieth rmo: K 5 row 35 h row: K. 2 rows. 37th rovo: Inc. in first 8 st ( 21 ) 38 hh rovo: Ctist olf $88 \mathrm{st} ., \mathrm{k}$. to end of ruw (13) $39 t h$ row : K. 12 rows. Sist row: K. 2 tou. ut esch end of needle (11). 52 nd roso: $K$. Kpt. these 2 rown once (9). Cast off. $K$. another ln thic sarue manner
Tail-Lst roec: With blue wool cast on 7 gt . k . \& ruivs. 5th rowo: Inc. at cach end of needic ( 9 ). 6 h row: K. Rpt. these 2 rows twice (13). 11 th row K .12 rows. 23 rd roio: K . 2 tog. In niddle of row (12). 241 h rove: K. Ryt. these 2 rows 3 times ( 1 ). Cast off. K. a similnr picce in white wool.

To make up the rabbit, with a wire brush brush up each piece of knitting. Sew up the two picces of the body, beginning at the throat over the face, herd, and along the back, lcav. ing about 3 inclies open for stuffing. Sew in the white front of body, beginning at the throat, and along the sides. Sew up the line leg and white inside, sew into the body. Sew up the aring and sew into armiholes. Turn the work. Stuff well with kapok, making the animal look ahapely. Sew up the opening Sew one blue and white ear together, and sew on in position. Sew the two pieces of tail together, and sew on to animal. Sew in the black shoe buttons for eyes. Mark the nose and mouth with fine pink wool. For whiskers use white bristles from a brush. Smooth the rabbit down with the wire brush.

Black Sambo. Seen on the left of Fig. 2 is a fascinating doll known as Black Sambo. He costs about 28 . to make, and requircs 1 oz . each of white, brown, red, and royalblue wool (4-ply); one pair of knitting needles (size 11): a little black wool for the shoes kapok.

The rork begins at the hend. 1at row: With brown werol crat on $128 t, k$. 2nd romo: Increauc in firat and lust at. (1t). 3rd rorc: P. Ilpt. these 2 rown twice (18). $88 / 4$ rowo: K. and p . for 10 rows 1 seh row: K. 2 st. tog nt cach end of needic (16) 18 ih row : 1. R位. these 2 rows unce (1t). 2end roin. Join on red woul for collar, $k$. Inc. in firat nad lagt st (16). Z3rd row: K. Kpt. these 2 rows twice (20) 28h rovo: Join white woml. Cast on " st., $k$ ( ( $\because 2$ ) Rpt this row once ( 24 ). 3 cet row: $K$ rows GOth row: Juin blue wool for trousers, $k$ st., place the retbaining 12 on a cotion for other les.

ightly and sew up and draw up To make up the doll, sew up the work, leaving an opening at one side for the stuffing with kapok. Sew up the opening, seam up the arms, stuff and sew on to doll. To make the nose, make a stitch about $\frac{1}{2}$ inch in the middle of face, and draw up tightly. Mark the eyes with white wool, and work the pupils with fine, black wool, and the mouth with red wool. Work the buttons down the front with red wool. Scw on the cap.
Jumbo. For the elephant Jumbo, which costs only 1s. (id., 2 oz . of grey 4-ply wool are required, with a little red wool for the saddle.cloth and yellow Sylko No. 5 ; one pair of steel knitting needles, size 11 ; one steel crochet hook size 2! : two black shoe buttons.
Int ronc: Cast on 15 st., k. 2 rows. 3rd row: Inc. 1 in first st., k. to cnd. Wh row : Cast oll 20 st, $k$. to end. 5 th row : Ine. 1 in first st., $k$. to end. Gth rovo: K. Rpt these 2 rows five tiincs. 17 th rowo: K. 3 rows. $24 t h$ rove: Cast olf 19 st., k. to end 21 s8 rovo: K. 으 rows. 11 ne rove: lnc. 1 In ilrat at., $k$ to end. t2nd roio: Cust un 19 st, $k$. to end. 4 3rd rowe. Inc. 1 in first st., $k$ to end. ath row. $K$. Kpt. theac ulf 25 at $k$ to cnd. 50 ih rove. K. knittlng last 2 ant toge 60v, roin. K. Kut. these if rown once 63nd roun: K. 2 rows. bisth rouc: K. 2 wg at licginning of row. Inc. 1 in last at. Geith ruw: K. Kpt. these 2 ruws twice. 71 st row: $K$. 2 togg, $k$. to end. $72 n d$ rono: Cant on 12 st., k. to end. Fi3rd roso: K. 2 tog. twice at beginning, $k$. to end. $7 \$ 1 /$ row: $K$. lipt. these 2 rows once. 77th rowe: $K .2$ tog. ut beginnink, tirce IImics. Cast off. Knit nnother picce in czactly the anine manner.
Undertindy. - Cust on 2 st. 1 at rovo: K. 2 rows 3 Ind revo: Inc. roio: Cast on 23 gt. for forelega, k. tu end of row. Wh row 1t rows 2lat row. Cast off 10 It rows. 21at rowi. Cast oft 10 St., kie to K 20 rove 2 nd rowo. Cast on 19 st $k$. to end of row. 13 nd 19 st., k. No en fond row. flth rovo: K. 14 rows इ̄eh rove. Cast off 20 st k. to end of row 5pth row: Sume as 58th row. ellh row: K. 2 tog. nt cach end of necdle. 61at roto: K. Kpt. these 2 rows once. Cast off

Soles.-Cnst on 3 st 1 st row K. Ind rovo: Inc. 1 ut cuch culd these 2 rows once. $\mathbf{2}$. $\mathbf{K}$ row $\mathbf{R}$. 2 rows 8 h rous: K. 2 tog. at carh end of ncerlle. 9ih roio: K 11 pt . thesce 2 rows once. Cust olf K. three more in exactly the same manner.
Ears-18t rowo: K. Cast on 8 at. 9nd rouc: Inc. 1 ut each end of needle 3 rd rowo: K. Rpt. these 2 rown twlce. 81h rono: K. 8 rowr. 1 thth row: K. 2 tog. at each end of needle. 17 th rovo:


Fig. 3. Teddy Bear, knitted In lawn teazle wool. Fig. 4. Koko the Monkcy, made in brown and fawn wool, with a scarlet cap
times ( 10 ). Cast off. $\mathfrak{K}$. another picce in the same manner
 3 rd row: Inc. in first and last st. (5). 4h row: 22 rows. $418 \ell$ row: K. 2 tog at each end of needle (9). 42nd row K. 5 rows. Rpt. these 0 rows twice
 k. $1, k .2$ tog. (3). 72 nd miv: $\mathbf{K}$. Cast off. Liny. $18 t$ rou Cast on 22 st., k. 8 rows. gth rovo K. 2 tog. twice at each end of ncedle (18). 10 h row K. Rpt. these 2 rowg once (14). 13 h rovo: K. 2 row 15 lh mio: Inc. at beginning, middle, and end o

 5 st., place theas on:a safety-pin. Cast off 3 st., k. to end of row (27). 48 Ch rovo: K., knitting last 2 st. to 26). $4 i / 1$ rown: K. 3 rows. buth row: K. $\varrho$ tog. a each end of needle (2t). 5lat row: K. Rpt. these nows 5 times (14). find rore: K. 2 top. at ench end of needle (12). Rpt. this row once (10). Cast off. Now pick up the 5 st. froml safety-pin, k. 2 rows, $k$. 2 tog k. 1, k. 2 tog. (3). K. Cast off. K. another piece in he same manne.
Arms.-1st row: Cast oll 15 st... k. 2 rows. 3 m wow : at becinning, midulle. and end of row (18) the row: K. 7 rows. 111 how K 2 tor at each nd of nerdle (16). 12 th rovo: K. 3 rows. 15 h row nc. in flrst and last gt. (18). 10 th row K. 3 row Rpt. these 4 rows twice (22). 27 th rono: Inc. In first and last st. (24). 288 h row: K . Rpt. these 2 rows twire (28). 33rd row: K. 2 rows 35th row: $\mathbf{K}$
 end 0 row (2n). 30th row. $K$.. knitting (18) $441 /$ row : K. 3 rows. Rpt. hese t5ih Kiv. K R. row: K 2 tog at each end of neadle ( 10 ) Rpt this row once (s) Cost of Now pick up the 5 at from the
 (3). K. Cast off. K another piece similariy.

Ears.-l ld rome: Cast on 0 st., k. 1 row. 2nd rono Inc. in first and last st. (8). 3rd row: K. Rnt. these rows twice (12). 8 h row: K 10 rows. 1 Reh row K. 2 tor. in mididle of row (11). Rpt. this row 3 times (8). Cast off. K. another in the same manner

To make up the bear, brush up each knitted piece well with a wire brush. Sew the two pieces of body together, beginning at the base of the front. Scw along the neck to the nose Sew in the headpiece, placing where the 3 st. were cast on to the nose, and sew along the top of head to neck. Sew along the back, leaving about 2 inches open for stuffing. Sew up the arms and sew into armholes. Sew up the legs and sew into openings. Turn the work, and stuff well with kapok, pressing the stuffing well into the legs and arms with a knitting necrle to make them firm. Sew up the opening that was left for stuffing. Sew on the ears. Sew in the two shoe buttons for eyes. Mark the nose and mouth with fine black wool, also mark the feet and paws. Smooth the bear down with the wire brush. Tie the ribbon round his neck.

Koko the Monkey. For this toy, which costs about half a crown, loz. of pale fawn 4.ply wool; 3 oz. 4-ply brown wool; to oz --ply red wool; one pair of steel knitting needles size 11 , and 2 black shoe buttons are required.
The work begins at the base of hody. Int row With hroirn wool caot on 6 st., K .10 rows. 11 th row
 1upt. theat 2 rows tirice (13). Put these 13 st. on arfety-pin. Now $k$. another picce from 1st row to the e8th row. Pick up the 13 gt from the safety-pin, and $k$. then. You ahould have 20 at on your needle. This makes the openings for the legs to be putin. 25th row: K. 26th row: Inc. in firit st. (27). 272h
 pin for the chest. Cast onf 4 st. for armmole, ant h the renaining st. (1:2), 57th row: K. 13 rows. 70 h
 13 st. on a pin. 72 nd now. Pick up from the safctypin the 12 st . that were left for the chest. Joinlng wool to where the 4 st. Were cast off, $k$. 13 rows. 85th row: K. Ince in last st. (13). Pick up the 13 st. from the pin and k. them (26). 86f/h row $K$. 8ith rolo : $K$. 2 tng. at brgilning, midilif, nnd elld of row (23). $\mathbf{K} 2$ pows 3 nil once (20). 9181 rore. K. 2 rows. $83 n$ ( 01 ) $9 t h$ nc. in frat and middle st b list 2 st tog (22)
 $K$. Row. K. 2 tog., $x$. 5 end o (16). 107t, rown: K 2 rows. 109 h rono: Inc. in frat st. (17). 110 hh row K . Rot. there 2 rows tivice (19). 11 Sih mow: Inc in flrst st., k . Inst 2 st tog. (19). $116 \% \mathrm{~h}$ row : K Rpt. hows 2 rows tivice. $121 s 1$ roio: K knitting 2 tog. in middle and end of needle ( $1 i$ ). K22nd rove K. 123 rd rove: K. 2 tog. at beginning, middle, and
and of needle (14). Rpt. this row twice (8). Cast otf $K$. another picce in the same manner.

1en.-The work begins at the foot. 1at row: Cast on 30 st, $k .0$ rows. 7th row: K. 2 tog. at rach enid of necile (3t). Si/h rovo: K. t th rove: Cast oll 10 at k. to cnd (24). Rpt this row ance (14). I11/ row Inc. in firat st., $k$. 2 tor. in mlddle of row. Inc. in last st. (15). 12th row: K. Hit. these 2 rows 11 Litne (20). 35th row: K. 2 rows. 37th row: K. 2 tos. at beginning of row. Ine twice in middle of row, $k$ lant 2 st. tog. (26). $38 / 1$ row: K. Rpt. these 2 rows 4 times (20). tith row: K. 2 tog. at beginning. Inc twice in middle of row, k. last 2 st. tog. (26). 48 h rov: K. Inc. twice in iniddle of row (28). lipt these 2 ron's 3 timm (3t). G5eh row: Inc. in first st (35). 58 h/h roor: K. 5 st., put these on a safety-pin. Cast ofl 8 st., $k$. thic remaining st. (22). Jith rms Inc. in frat st., $k$. last 2 st. tox. (22). SWh ronc: $K$ kpt . there 2 tolvs once (22). $018 t$ row : K, $\mathbf{k}$. Inat 2 st. tog (21). 62nd row: K. 3 rows. lipt. theac 4 rows nnec (20). 001 h rovo: K. 2 tog. at ench end of nerdle (18). Rpt. this row 0 times (6). Cast oll. Now pick ul the $\delta$ st. from the pin, joining wool to where 8 日t ivere cast $K$. 2 ro. K. Cast off. K. another in the same manne

Arms - $18 t$ row: Cast on 4 st. with brown rool, $k$ 2nd row: Inc. in frat and last st (G). 3rd rono. K Rpt. these 2 rows 0 tmes (18). 16 h row: $K$. 28 rows.
 heginning, nuidille, and end of row (15) âth rote p Rpt these 2 rown twice (9) Cast of $k$ anothe $n$ the same manne
Ears.-1st row: With brown wool cast on 9 st., $k$ 2nd row: Inc. in fret and loat st. (11). 3ril row K. + rows. Tlh rove: K. 2 tog. at cach end of needle (9). 8 h row: K. Knt. these 2 rows once ( 7 ). Cast off. K. another in the same manner.

Trid.- $18 t$ row: With brown wool cast on 4 st .
 rows. 26 h rovo: K. 2 tog at cacli entl of needle (12) 27th row: K. 14 rows. Rpt. these 15 rows twic (8) 55th row: K. 2 tog. at ench cmil of needle (0) 50 h row: K. B rows Cast off
Soles for Feet-18t rono: With fawn wool cast on $4 \mathrm{st} . \mathrm{k}$. These are warked in storking-stitch. 2 nd row: H . 3 red row : Inc. In first and last ast. (0)
the row : $\mathrm{P}^{\prime}$. Rpt. these 2 rows once (8). ih row
K. Keh row: P. Rpt. these 2 rows $\downarrow$ times. 19 h row K. 2 tog. at each end of necdle (0). 201h row: 1 same inanner. Fam-1st ro
This la vorked in tocking-stith cast on 0 st., $\mathbf{k}$ 3 red row: Ince in first, middle, and end st. ( $)$ ). 4el
 K. 10 f row: P. Rpt thime 2 rows twice (24) 21 trow: K. 2 tog. at beginning, middle, and end o icalle (21). 22nd row: P. Rut. thesc 2 rows 3 tImes (12). $291 /$ rove: K. 2 tog. 6 titnce (0). 30th row: I Cast ott.
Cap.-1at rolo: With red wool cast on 00 st., in 28 rows. $20 t h$ row: K. 2 tog. to end of row ( 30 ). rit rno: K. 3. rows. 33ril rotw: K. 2 tog., 5 st . 4 . (20). $301 /$ rove: K. 3 (h) rovo: K. ${ }^{2}$ tog., k. 3 st Rpt. thls to end of row ( 17 ). $38 / \mathrm{h}$ rove: K. $30 / \mathrm{h}$ row K. 2 tog. to end of row, k. 1 st. (9). 40th row: K lireak off a length of wool and thread throngh al e st., and draw ur.
To make up the monkey, sew up the borly to the throat. Sew over top of, heal, and along the back, leaving about 2 inches open for stuffing. Sew in the fawn face, placing where stitches were cast on to the neck. Sew along the sides. Sew up the arms and sew into nrmholes. Sew up the legs and sew in the fawn soles. Sew legs into the openings. Turn the work. Stuff well with kapok, pushing the kapok well into the head and limbs with a knitting needle. Sew up the opening that was left for stuffing. Sew on the ears. Sew in the shoe buttons for eyes, mark the nose and eyebrows with fine black wool. Mark the mouth with red wool. Sew up the tail. Stuff lightly with kapok, and sew on to animal. Mark the hands with black wool. Sew up the red cap, drawing all the stitches together Make a tassel of a few strands of black wonl Stitch the cap on to the monkey's head.

## KNitting: Stitches and Patterns

How to Obtain Both Simple and Fancy Effects
This general outine of the principles of knitting suggests, reference to the entricson Glove;
Knitting consists of loops or stitches of the right hand, and allow it to pass over the formed by means of two needles when working a flat picce, or four or more needles when working in a mound. Through connecting the stitches in one continuous piece an elastic fabric can be produced. In its earliest stage knitting $u$ as practically limited to making stockings in a fint piece on two needles, which were afterwards scwn up; from this, knitting stockings in a round was evolved, avoiding the back seam, and fastening off at the toe

The first process is casting on the stitches Hold the short end of the wool in the left hand, take the main lencth in the right hand and pass the latter over the short end, so that it forms a loop. Bend the main length of wool under this loop, keeping the latter in position with the thumb and forefinger of the left hand, and pass it up through the loop so that it forms a complete stitch, as in Fig. 1. Pass this loop on a knitting needle and draw up the wool closely until the loop just fits the needle. Huld this needle in the left liand, and take the working needle in the right hand. Twist the length of wool round the third finger first finger of that hand as the work proceeds. The tightness or looseness of the rool and the manner in which it is held over the third finger determine the tension of the knitting, and it is only by an even tension that good work can be produced. In working, the stitches should be kept near the points of the need!es
One stitch is now on the needle. To make further stitches, put the right-hand needle from left to right through the loop on the left hand needle, pass the wool round the point of the right needle, bring it through the single loop, lig. 2, and draw it out until it is long enough to pass it over the point of the left-hand needle, when another atitch will be produced. Continue this uperation until enough stitches are on the ncedle.

Plain and Purl Stitches. To work the first row, now put the needle in the stitch from left to right, and pass the wool round the right-hand needle as described for casting on Draw the loop through, and with the right hand needle pass the first stitch off the left necdle, as the new stitch now rembins on the


Knitting. Fig. 1. How to make the first stitch out of a loop in casting on. Fig. 2. Making the second stitch with the needles. This also shows how the right-band Angers rerulate the tension of the wool during work


Knltting. Fir. 3. Plain knitting, producing garter stitch, in prorress. Fig. 4. Purl stitch, Arst stage, with working thread in front of needle. Fig. 6. Porl stitch, second stare. wool round needle. Fig. 6. Casting off
right needle. Repeat this action to the end of the row, and if these rows are continued little ridges will be seen on the work, two rows making one ridge. Fig. 3 shows this stitch, known as garter stitch, in progress. To make a neat edge on a piece of knitting, work the first row through the back of the loops.
The next form of knitting is known as purling. This is used to produce the reverse side of the stitch, so that if stocking web is wanted and the work is being done on two needles, the hack row must be purled. Put the righthand needle through the stitch from right to left (Fig. 4). and keep the working thread to the front of the needle Pass the thread over and round the right-hand needle and back to the front ayain; then let the right hand needle pass through the loop of the stitch, while the latter stips olf the left-hand needle. Fig. 5 shows the sccond action, with the wool round the needle

Casting Off. The chief method of casting off the stitches is shown in Fig. 6. Knit two stitches as usual, then put the point of the left-hand needle, from left to right, through the first stitch knitted, and lift it over the second stitch and the point of the right-hand needlo. Knit the next stitch on the left needle and pass the first one over the second. Repeat this until there is only one stitch left ; then cut the wool and pass it through the remaining stitch, draw it up sccurely, and fasten in the end with a darning needle.
If a loose casting off is wanted, knit two stitches together by inserting the needle from right to left through the two stitches together instead of one only ; then knit them in the ordinary way, when one stitch will result on the right-hand needle. Now pass this stitch back again to the left-hand needle and knit it together with the next stitch, and again pass the resulting stitch back to the left-hand needle, and continue to the end of the row, when a loose edge will be the result This particular edge bears a reseniblance to $n$ cast-on cdge as near as possible.

Increasing and Decreasing. The next step to learn is how to increase and decrease stitches for the purpose of forming a picce of knitting into a different shape, such as the leg of a stocking that has to be narrowed towards the ankle. Therc are two methods of decreasing At the beginning of a row the decreasc is genorally formed so that it turns
 towards the centre of the row. thus: slip one stitch by simply passing it off the leff. hand needle on to the right, without passing the thread round it. Knit the next stitch, When there will be two stitches on the right-hand needle, and lift the slipped stitch over the knitted one with the point of the left-hand needle. This is usually re-

or similar garment this does not make a neat scam when the two edges are sewn together. Fig. 7 shows a piece of plain knitting decreased at both enils of the row
To increase, a stitch can be knitted into twice to make one extra. Knit in the usual way through the front of a stitch, then knit again through the back of the same loop befors passing it off the left-hand needle, and two stitches will result Another method is to lift up the loop immediately under the first stitch on the left-hand needle and knit it ; or knit one and purl one in the same stitch.

A made stitch is not really an increase, as this term should be used in fancy patterns only, to produce a hole and usually a stiteh is decreased directly after it to restore the balance of the stitches. To work n made stitch before a knitted stitch, simply bring the wool to the front of the needle so that it passes over the latter when knitting the next stitch, and a straight loop results on the right-hand needle. When working the next row this made loop is knitted like an ordinary stitch, and a complete new stitch results. To make two stitches in this way the thread is passed mund the needle twice, then when working the next row a stitch must he knitted and purled in the made loop, otherwise one of the made stitches will be lost. liig. 8 shows an openwork design that is based on inade stitches with plain stocking web rows between.

When knitting in a round for such articles as stockings or children's gaiters without side seams, the stitches must be divided equally on three or more needles, and a fourth one taken for the working needle. At the end of the round the wool must be drawn up very closely so that a gap does not occur between the needles, and when beginning a new neerlle put the latter in the first stitch of the next needle behind the needle that has just been worked, otherwise a little gap will appear at the beginning of every fresh ncedle, and this would produce a ladder right down a stocking. A flexible circular wire with points at both ends is often usell for knitting jerseys and other tubular garments.

Ribled knitting is used for the tops o stockings, hems and necks of jerseys, for slceve edges, and for any position where contraction is required, as the ribs cause the knitting to fit closely. In the case of stocking that are ribbed all the way down, the welt. usually about 3 in . decp, is worked in a different rib from the rest of the stocking. generally a single rib of knit one and purl one alter nately Double rib is two knitted and two purled stitches worked alternately, and a variety of rib designs can be formed, including many broad ribs such as knit 5 and purl 2 alternately. Fig. 9 shows specimens of single and double rib in knitting.

Joining Wool. In the course of a large piece of work, joining new wool or thread is sure to be done. When the first ball is getting near the end, stop when there is about 8 in . left, take the new ball and lay the two ends to gether, knit one stitch with the two ends, then knit the following stitches with the new and the old ball alternately. In knitting stockings
lerred to as the slip, knit. and draw-over method.

If a decrease is wanted at the other end of the same ncelle, two stitches should be knitted together as described above, and these are usually the sccond and third stitches from the end, so that there will be one stitch to knit at the end after the decrease If possible, a void decreasing right at the end of a row, as it makes an uneven erlge, and in the case of a jumper


Knitting. Fir. 7. Piece of plain knitting decreased at both ends. Fir. 8. Pattern resulting from made stitches with plain rows between. Fig. 9. Specimens of aingle and double ribbing, for tops of stockings
or any round piece of work this join will only be visible on the inside of the work, 80 on a flat piece of work on two needles the join should be done on the right side of the work so that the nlternate threads are passing on the wrong side.

Another method of joining is by twisting the new thread over the first as each stitch proceeds. Put the needle in the stitch of knitting, then, holding the end of the new ball down with the fingers on the left hand, pass the short end under then over the new wool, so that the latter is encirclel with the old end, then use the new wool to knit the stitch. Twist the old wool over the new ball for about 12 stitches and leave the short end of wool to be sewn down afterwards. The only place in which a knot is allowed is at the end of a row when a fancy pattern is being worked, and which would be spoiled with an ordinary joining. If the knot is tied right up to the edge of the knitting it can be hidden when joining up the side scams. A knot is never allowed in stocking knitting.

To make a chain edge on a piece of flal knitting, the lirst stitch must be slipped purlwise, and the last stitch should be knitted through the back of a loop instead of through the front in the ordinary way. This edge is used on the flap of a stocking heel, each chain being picked up afterwards when turning the heel to represent one stitch. It is also employed on the armholes of jumpers, and the sleeve stitches are picked up in the same way.

Double knitting is done on two needles, and is worked so that when the flat piece is completerl it has two distinct halves that can be pulled apart like a bag, but they are caught all round the edges. It is a useful pattern for scarves where extra warmth is required, as stitches can be cast on for any width and the picce continued for any length. Two stitches are usually knitted single at the berinning and end of each row, so an even number of stitches should be cast on to begin with.
Knit one plain row, then proceed thus : Knit two stitches, bring the wool to the front of the necdle, slip a stitch as if for purling, pass the wool back again, and knit the next stitch. Repeat these two stitches alternately to the end of the row, except the last two stitches, which are knitted plain to match the beginning. Continue this ruw for any length required, and it will be noticed that in the second row the slipped stitch is knitted, and vicc versa, which thus causes the two distinct sides of the bag.

Fancy Deslgns. Brioche knitting is a fancy rib, and for this the number of stitches cast on must be divisible by three. To work it, bring the wool to the front of the needle and slip one stitch purlwise: knit together the next two stitches, and repeat this alternate movement to the end of the row. Every row is worked in the same inanner, and in suc. coeding rows the two stitches that cross each other are always knitted together.
Two-colour knitting is chiefly plain knitting using two colours of thread in the same row to form a design. Sometimes six colours or more are used in one design, but two are usually confined to one row, as the different colours have to be carried along the row during the work. The first movement is shown in Fig. 10. The second wool which is not in use is held over the first finger of the left hand as for crochet, and in the first step it is passed over right-hand needle, before the working wool is passed over that needle to knit the
stitch. T'his catches the spare wool in with the stitch. The second stitch is knitted in the ordinary way, but holding the spare wool on the left finger away from the stitch. The wool not in use passes through every alternate stitch, and is only slightly visible at the back.

When working coloured stripes in ribbing, say, at the hem of a jersey. one plain row should be worked with the new wool on the right side of the work each time the colour of the wool is changed. This plain row will sink in the ribbing and give the work a neater appearance where change of colour is effected.
Graftling. Two pieces of knitting can be joined together so that the join is quite invisible and quite flat. It is usually employed for finishing off the toes of socks and stockings.

In the case of
a stocking toe the stitches would be equally divided on two needles, one being placedbehind the other. The


Knitting in two colours. Fig. 10. Firgt position, with second wool pacsed over right-hand needle belore working wool. Pig. 11. Second position, showing
thread should be cut off, leaving about 18 in . hanging for a stocking toe, or longer, according to the number of stitches to be grafted together. Pass the thread into a darning needle and, beginning on the front row-that is the row nearest to the worker-put the needle in the first stitch as if for knitting, pass the stitoh off the needle and draw up the thread, but not too tightly. Put the needle in the second stitch as if about to purl, draw the thread through while this stitch is on the needle, and do not slip it off.

Go to the back needle and reverse the action Put the needle in the first stitch as if about to purl, draw the thread through and alip this stitch off the necdle; put the needle in the second stitch as if about to knit, and draw the thread through, but do not slip the stitch off the needle. Repeat until all are taken off. The thread must not be drawn tightly.

The method of grafting above described can be memorized thus: knit and slip off, purl and keep on ; purl and slip off, knit and keep on. This includes the two needles.

Knitting Needles. Knitting needles are sometimes referred to as pins or wires. They are divided into two classes, steel needles, which are made in the finer sizes, and bone needles for the coarser sizes. The latter in. cluded aluminium, celluloid, ebonite, and amongst patent materials are silver and brass tubing coated with nickel silver.

Needles are numbered 1 to 10 on the bell gauge (q.v.), which is the standard knitting needle measure.

Steel knitting ncedles are sold in paper packets in sets of four, and bone in pairs of two and sets of four, some with knobs on for flat pieces of work, and the sets with points at both ends for knitting round or tubular garments. Thicker needles can be bought in
a variety of colours, so it is well to use dark needles for light thread and vice versa.

When buying bone needles they should bo carcfully inspected to see that there are not any flaws, as the tiniest chip will split silk and wool. When a flaw does occur it can be smoothed away with fine glasspaper. This also applies to the point of the neerle, which should not be too sharp.

Wooden needles can be treated with glasspaper and given a perfectly smooth finish. Celluloid needles are always smooth, but should not be used for very heavy work as they bend easily. Aluminium needles soil light wool, and should be used only for dart materials ; those made from brass tubing cuated with nickel silver are light in use, and do not soil the work.

Knitting shields can be bought cheaply for protecting the points of the needles when not in use. They are made in pairs attached by elastic. In shape the shield resembles a thimble, into which the needles fit.

Knitting Wool. All wools have a certain ply, whether it be 2, 3, or 4 ply, and so on, the word ply meaning the number of threads which compose the thickness of the wool in each case; but a 4 -ply fingering produces a garment about half the size of a 4 -ply thick wool; using exactly the same number of stitches and following also the same directions. There are numerous fancy wools on the market but the following are the main standard kinds.

Fingering, which is the kind in most general use, is divided into Scotch, super-fingering, and the cheap varieties. All these are employed for stockings, children's dresses and coats, jumpers and underwear. The term Scotch fingering has nothing to do with the plase in which it is made. The name should only be used when applied to such wools as are put up in skeins of certain definite yardage, so that the same length of wool is given quite apart from its weight.
Coming under the name of fingering, how. ever, there are many 4-ply threads to which the name of Scotch fingering should not be applied, as they are shorter in the skeins, or contain fewer threads than 60 to 1 oz ., the weight in which a skein of 4 -ply fingering is made up Cheap fingerings are harsh and do not give the same warmth or comfort in wear.

Vest wool is about the thickness of Scotch fingering of the same ply, 2, 3, or 4 ply. but it has a softer finish, being specially made for underwear. Unshrinkable vest wool is a common terin, but a real unshrinkable wool is not possible to produce without injuring the fabric, as some of the most valuable properties of the wonl would be extracted.

Soft knitting is sold in packets and is so labelled. Wheeling or Allos yarn is a dis tinctive yarn of 3 -ply thicknoss, usually sold in 2 oz . skeins, 8 of which form a head of 1 lb . When of good quality it is suitable for heavy socks and stockings, as it is rnuch thicker than 4 -ply fingering, although one ply less. Children's dresses and coats are made with this wool.

Double knitting is a 4-ply wool about twice as thick as 4 -ply fingering, and similar in weight and thickness to a good wheeling, although of much better quality and appearance, as well as softer to the touch.

Zephyr wool is equivalent to the old Berlin wools, and is sold in the same thicknesses, namely, single Berlin 4-ply, and double Berlin 8-ply ; it is particularly soft and full in the thread, and is more suitable for indour articles, as its smoothness and softness do not allow for the friction of hard wear.
Shetland wool is the name of a very fine 2 -ply wool, finer than 2-ply fingering, and receives its naine from the Shetland Isles, where very fine shawls, underwear, and jumpers are made. Andalusian is the standard name for a soft 4 -ply wool twisted in a similar manner to soft knitting, but finer
in size owing to the twist. Sold in 1 oz packets, it is chiefly used for children's garments and for socks.

Enocker. See Door.
ENOCE KNEE. In the common deformity known as knock-knee the legs diverge from one another below the knees so that the latter tend to knock against each other in walking. The affection may begin in early childhood, being then almost always due to rickets; or it may come on between the ages of 12 and 18 years. Weak boys or girls who carry heavy weights are very liable to suffer. Pushing a heavy wheelbarrow, for example, may cause the detormity. A child showing signs of knock-knee should not be permitted to crawl or walk. It should lie down as much as possible in the open air and sunshine, and be properly fed.
In many cases these measures alone will remove the deformity, but it is generally desirable to apply pressure. This can be done by putting a soft pad between the knees, so as to separate the lower ends of the thighbones, and bandaging the ankles together.

The legs must be massaged daily, and manipulated in a way the dootor will direct. The boot heel should be made higher on the inner than on the outer side, and, when walking, the feet should be turned in a little.
In the oases which develop later in life, a metal splint from the heel of the boot to the outer prominence of the hip may be used But the deformity, if pronounced, can be removed by a surgical operation. See Knee.
KNOP. This term is used for the knobs found at the handle end of old spoons and sometimes for those on the covers of drinking and other vessels. A familiar example is the apostle spoon, while the acorn is often found figured as a knop. Knops are also the rounded protuberances found in the stems of wine glasses. See Glass Ware; Spoon.

ENOT: In Timber. A knot is a hard part of the wood occasioned by the growth of a small branch, which, by growing out at an angle to the normal grain of the tree, causes one set of fibres to cross the other, thus forming a hard spot, very difficult for the amateur to deal with.

When the worker purchases ordinary prepared timber which has already been
machine planed, it will be found preferable to use it in that condition if the material is at all knotty, rather than attempt to plane it up. It is not always possible to do this, as the machined surfaces are not all smooth enough for the purpose for which the timber is required. In such a case, one course to adopt is, when planing, to set the plane iron very fine, so that it makes a very fine shaving, and to press it firmly upon the surface of the work, especially when planing over the knots.

It inay be as well, when a good surface is required, to cut the knot away bodily. In some cases, such as when the wood is thin, it will be found that the knot can be driven down through the wood with the aid of a small punch and hammer. If this is the case, the hole can then be enlarged with a twist drill, and plugged with a circular piece of wood which should be glued and driven in tightly. When the knots are running more or less with the surface of the timber, a recess should be chiselled out with the edges slightly underout, and a now piece of wood cut and fitted into it with the grain running in the same direction as the rest of the timber. These pieces should be properly glued in and allowed to set hard. The timber can then be easily prepared.

Whenever possible, knots should be avoided by selecting timber that is not prone to this trouble, such as American whitewood, Californian redwood, beech, and similar timber, which can be obtained in sufficiently large pieces to avoid the presence of a knot altogether.

Knots In Paintwork. In paintwork, the presence of knots is very objeotionable, as they contain a kind of resinous material which may ruin the paint if not specially treated. For this purpose various compositions are prepared, known as knotting. This should be brushed over the surfaces of the knots, prior to the application of the paint, and when the knots are very numerous, two coats or more of knotting will be better than one. The surface may then be prepared in the usual way. See Wood.
ENOT : How to Tie. Knots may be divided into the simple ones that are tied every day by ordinary persons, and the more elaborate ones that are used for various purposes by sailors and others who need something
much stronger in the course of their work.

The illustrations on this page show how the knots in common use, and also some of the more elaborate ones, are tied. Some of these, e.g. the timber hitch, are only used for certain special purposes, but others are useful in everyday life, and the more difficult among them can usually be tied after a little praoticgo.

Fig. 1 shows a common loop by which most knots are oommenoed, with its parts lettered for reference. The upper part $A$ to $B$ is called the standing part of the rope, $B$ to $C$ the loop or bight, and $C$ to $D$ the end. When the end is drawn through the loop, the simplest of all knots, a half hitch, is formed.

A figure-of-eight knot, Fig. 2, is made by forming a loop, placing the end behind the atanding part and finally over and through the loop and pulling taut. This knot is useful for making a stop on a rope to prevent the end fraying or slipping through a block. A reefknot, Fig. 3, is the simplest and best of all knots for tying together two ropes of equal size. A single sheet bend, Fig. 4, is a good method of joining two ropes of unequal sizes, and if the ropes are wet, or likely to be so, the knot can be made atill more seeure by again passing the end of the thin rope round the loop on the other, as shown by the dotted lines.
A hawser bend, Fig. 5, should be used when two thick ropes or cables require to be joined. A half hitch is formed on one rope and the end tightly lashed with strong cord to the standing part. The end of the second rope is passed through the loop on the first and secured in the same way. Two half hitchea, Fig. 6, are made on a rope to fasten it to some object. to finish a lashing or form a noose. This is a good knot for general use.

A round turn and two half hitches, Fig. 7, are employed for tying a rope on which there will be a great atrain so that the hitches shall not jam. For fastening ropes to posts, raising heavy beams, weights, etc., it will be found of great service. Two turns of the rope are taken round the post or beam, and then two half hitches are formed on the standing part and drawn taut. If there is an excessive or jerking strain increase the hitches or lash the end down.

The fisherman's bend, Fig. 8, which should be distinguished from the fisherman's knot, will be found useful in making fast where there is a give-and-take motion, or a varying atrain on the rope, as in drawing water from a well with a bucket, tethering cattle, attaching anchors, stays, etc. A bowline, Fig. 9, is made on a mpe to form a loop or noose which will not slip. It is used when a permanent loop is required at the end of a rope, or to attach tn other ropes. A running bowline or slipknot can be formed by drawing the standing part of the rope into the loop.
The Timber Hitch. A timber hitch, Fig. 10, is chiefly used for holding timber, etc., where the weight will keep the hitoh tight. The knot consists simply of a half hitch made with a rather long end, which is twisted baok again round the loop. In cases where there is to be a continuous strain or the timber requires to be kept pointing steadily in one direction, a half hitch should be added as at $H$. A clove hitch, Fig. 11, makes a good knot for commencing and finishing the lashing together of poles, beams, etc. As it will not slip, it can be attached to another rope or pole and still leave the end free for further use.

A lever hitch, Fig., 12, is a simple way of fastening a rope to a lever worked by a windlass
or to pilcs. stakes, tree-stumps, etc. which are to be drawn out of the ground by horses or power. It is very handy for fixing the rounds of a rope-ladder The draw hitch shown in Fig. 13 is of great service in securing a rope to a post, ring or other rope, in such a way that it can he instantly released The diagrams 1, 2, and 3 show its formation This knot will resist a give-and-take motion and can be released by jerking the end.

A sheepshank, Fig. 14, is used to shorten a rope. To make it, take up the length desired and fold it as in A Then with parts I and 2 form a half hitch round each loop as in B Wooden toggles can be inserted for further security, is at ' $\Gamma$, or the loops can be lashed to the standing parts of the rope as at L . A simple clinch, Fig 15 . is a small loop or ring formed on the rope and held together by tightly lashing with strong cord. For attaching a block, lantern, cte., it will be found very handy.

A catspaw, Fig. 16, makes a temporary loop for hooking on a block or supporting another rope. It is formed by first making two loops as at $A$ and then twisting them up as in $B$; bring the two eyes together and insert the hook of the blook or pass the rope to be suspended through them To make a double houk hitch Fig. 17, take the loop of the rope or sling and place it over the upper part of the hook crossing it behind, then place the under rope over the hook and cross the upper part over it, and draw both taut. This hitch will hold a weight more securely than any other form of hook knot. See Clove Hitch.

KNOTWEED. This is the popular name of polygonum, a large group of hardy plants some of which are very decurative. See Polygonum

KNUCKLEBONES. This game, also called chuckstones, five stones, dibs, jackstones, and hucklebones, is played with five or six small objects, the aim being to throw them in various ways. The objects, originally the knuoklebones of a shecp, are usually of metal ; but amall stones or pieces of wood will serve slmost equally well.

Of the several games, one consists in throwing up one of the pieces, and, while it is in the air, picking up one or more of the others from the table, continuing until all have been picked up. For this six stones are usually employed. the one thrown being called the jack. Another game is to throw up one piece and catch it on the back of the hand, following with two pieces, then with three, and so on until, if possible, the five are thrown and caught together. Special names are given to some of these throws, such as peas in the pot and horses in the stable.
Knuckle Joint. See Rule Joint.
KOCHIA. This half hardy annual, from 18 to 24 in high, of graceful bushlike growth,


Kochia, or Summer Cypress, valued for its graceful pale green foliage
is valued for its light green leaves, which turn reddish purple in autumn. It is known as the summer oypress and is often used in 8 ummer bedding, where it contrasts finely with flower ing planta The seedlings are raised in a heated glasshouse in February or March, are potted singly
in small pots, and are planted out of doors in May or early June Pron. Kö ci-a.

KODAK. This name is applied to cameras and other photographic products made and sold by the Eastman Kodak Company. It is generally understond to refer to roll-film cameras. See Camera Developer: Film. Photography: Plate

KODOL: A Developer. This photo graphic developer, which is made by the Eastinan Kodak Co., is a single solution of the paramidophenol type clean working, nonstaining and without liability to fog It is equally suitable for plates, films, bromide papers and gaslight papers. In ordinary dish development by the visual method, I dram of Kodol is used for every 3 oz . of water.

Development should be full, since there is a tendency for a certain amount of density to he lost in the fixing bath. Where the negative is known to he over-exposed, increase the strength of the developer taking 1 dram of Kodol for 2 oz water, with the addition of 2 or 3 drops of potassium bromide

If it is certain that the plate is under exposed usc a weaker solution I dram of developer to 5 oz. water.

Tables for development by the time and temperature methods have been prepared by the Kodak Co. from whom the preparations may be ohtained

For developing bromide papers the follow ing proportions are required:


Development will be complete at nornal temperatures in 2 min ., if exposure is correct. If exposure is insufficient it is useless to attempt to obtain detail by prolonging development. For gaslight papers Kodol is used in the following strengths


With vigorous gaslight papers development should be complete in 30 sec .; with the soft variety it will take perhaps 40 sec. See Developer; Developing ; Film ; Photography.

KOHI RABI. This somewhat coarse vegetable proves uscful as a substitute for turnips during hot dry weather when it is difficult to provide the latter. It is raised from seed sown out of doors in April or May in rows 18 in . npart, the seedlings heing thinned out to about 12 in. from each other. The greenish white variety is to be preferred to the purple one.
KOLINSKI. This is a yellowish brown and orange-red fur obtained from the Asiatic mink. Cheap in price, it is usually dyed to represent sable, for which it makes a satisfactory sub. stitute. It is used extensively for trimmings and wraps, and among furriers is known as red sable. The hairs from kolinski tails are widely used for making into artista' sable brushes

KOUMISS. This is the name given to fermented mare's milk, a pleasant acid drink, very digestible and slightly alcoholic. A kind of koumiss can also be made with cow's milk according to the following recipe :

$$
\begin{aligned}
& \text { Fresh cow's milk } \\
& \text { Water } \\
& \text { Fresh buttermilk (thnit obtained from } \\
& \text { churning whole milk) } \\
& 2 \text { quarts } \\
& \text { L.oaf augar }
\end{aligned}
$$

The above should be mixed in a gallon jar Afterwards cover the vessel with a cloth, and put it in a warm place for 30 to 36 hours, shaking the vessel every four hours; it is then
ready for usc. Some of this artificial koumiss can he used instead of huttermilk to make a fresh quantity.

Koumiss is a nourishing drink when an irritable stomach will retain no other lood. It is useful in fever, albuminuria, disorders of the stomach and intestine, and whenerer ordinary milk cannot be well digested. It is slightly laxative and diuretic.
KROMESKIE. This term is used to describe a dialı made from a mixture of fish or meat enclosed in rashers of bacon, coated with batter and then fried.

KRONA PEPPER. Though not so strong as cayenne, this is also a red pepper. It is made from a capsicum pod known as the Hungarian paprika and is sometimes also know's as paprika pepper. See l'epper.

KUMMEL. The Russian and German liqueur which bears the German name of the herb cumin is made with swectened spirit Havoured with cumin and caraway seeds Its distinctive Havour is nainly due to the caraway seerls 'The Russian variety of Kummel was formerly made at Riga, but is now manufactured in Norway and Sweden

ABEL: Its Uses. Adhesive or gummed labels and tie-on labels or tags are the two kinds most cominonly used in the houschold. They can be obtained from any stationer, and are often sold in packets containing a dozen or more of each

Tags are made of manilla or other atrong, durable paper, cut roughly to 5 in . by $2 \frac{1}{2} \mathrm{in}$. and other sizes, with an eyelet through which string is passed. They are used for parcels of all kinds sent by rail or post, and for labelling luggage, being generally tied to the handles of


Kohl Rabl, a usetul summer substitute for turnip travelling cases, trunks, and bags. Dis. tinctive labels are an advantage when sorting out luggage at a rail way station. Large oval tags in a variety of bright colours are ohtainable which can casily be recognized. It is a good plan to choose a particular colour and always keep to it for lug. gage la bels.

Adhesive labels are employed for similar purposes, and are often more convenient, but are more liable to get torn or rubbed off in transit than the tag.

Labela should be addressed in a bold, clear handwriting, so that they can be easily and quickly read by anyone who may have to handle the luggage or parcels. Very often only the town to which the travcller is bound appears on the label, and this no doubt suffices in most cases; but it is safer to give the full address in casc of accident. Amongst other varieties is the label used for distinguishing the keys of different rooms, which are madc of bone and attached to the key by split rings of metal.

Gardening Labels. Garden labels used to indicate the names of each plant are of rolled zinc or plain wood. The former may be purchased with raised letters on a black ground Garden labels may also be obtained from some
automatic machines, which punch out any desired combination of names or letters upon strips of aluminium.

Wooden labels may be made at home from strips of wood about 1 in . wide. The surface of the wood should be well rubbed with a piece of chalk to fill the interstices, and the writing should be done with an indelible pencil. Always start writing the name of the plant at the top of the label. Wooden labels which it is desired to render as permanent as possible should be given a coat of copal varnish.

Labels for trees are usually made of tin, painted and tacked on. They should be placed at a height of about 5 ft . from the ground, on a level with the eye.

A special kind of label consists of a small, flat glass tube which is closed at one end, where there is a ring by which it is attached to the plant. The varnish or ever name of the plant is written clearly on a piece of oiled paper, and this is dipped into the tube, being held in position by a smal rubber cap which fits tightly over the open end.


Label for Plants, consiating of flat glase tube, containing a piece of oiled papar with the written name, attached by a ring to the plant or tree

Photographic Labels. The of all such aids, employing the various attachbottles containing photo- ments to search dirt out of every corner and graphic chemicals should from hitherto seldom cleaned pelmet or always be labelled to avoid valance. Long-handled scrubbers and floor mistakes. either in ordinary mops, short-handled mop dusters, a great photographic operations or variety of brushes with labour-saving curves by confusion with domestic bottles. It is useless to attempt to gum a piece of paper on the side of a bottle containing chemicals, since it will quickly become stained and illegible.

One method is to glue the label, and when dry cover the face of the label with thin glue, finished off with a coat of copal varnish. It will then be impervious to moisture and to the action of any chemicals. Another method is to rub down the front of the bottle with emery-powder until a ground-glass surface is obtained. On this any name can be written or printed in Indian ink or waterproof ink, covered afterwards with a coat of transparent shellac

The amateur photographer should make it an inviolable rule to label every bottle, tin or other receptacle that contains chemicals

## LABOUR SAVING IN THE HOME

## Ideas of Value to the Busy Housewife

This article, of necessity general in its scope, is supplemented by the entries on the various domestic fiments and appliances mentloned therin, e.g. Service Hatch; Vacuum Clesner, See also Dining Room; Housekeeping; Kitchen; Laundry; Spring Cleaning

Modern buildings are naturally better fitted for labour saving than older houses designed when economy of work would hardly even have been considered a domestic virtue. Smaller houses built on the square are planned with as few steps as possible. Jointless flooring for kitchens, parquetry, linoleum or rubber floorings for other rooms, skirtings with rounded corners so that dust does not collect where it is difficult to remove, shelfless chimney pieces, casement windows that can be cleaned from inside, ample cupboard accommodation in the kitchen and bedrooms and on the landings, gas or electric fires or radiators throughout the house, electric lighting with convenient power plugs for various electric-run devices, fittings such as taps and door handles of chromium plate, porcelain or other material which does not require cleaning, lavatory basins in bedrooms with hot and cold running water: these are all important labour-saving points, many of which architects now incorporate in the home.

Where there is no electric power or gas available, coke, anthracite and oil are all brought into the labour-saving scheme of things with new inventions. Slow combustion lires and the modern grates are aids where coal is used and so also is access to a coal store from the kitchen instead of having to go outside for fuel, especially in bad weather.

Making meal service more efficient can save many footsteps. The trolley wagon is a useful help, and the service hatch and lift are excellent where situation of rooms and circum. stances allow. Labour-saving furniture for the kitchen includes specially fitted cabinets, cupboards, sinks, and porcelain metal table surfaces. Modern bathrooms are easy to keep clean. Baths are made with enclosed sides, so that there is no space underneath for dust to collect and the waste pipes and traps of lavatory basins can be well raised from the floor in order that the space underneath may be easily accessible for mop or duster.

Cleaning Equipment. The selection of labour-saving cleaning implements and gadgets is almost bewildering. To be of real utility such devices should be simple in construction, easy to clean, and not liable to get ont of order. The cost of any apparatus should be considered along with the amount of service required, e.g. a good electric iron is worth purchasing. as


Labour Saving. Fig. 1. Electric foor polisher and adjustable heads for particular purposes save much stooping and uncomfortable body angles while working.
A floor polisher such as the one illustrated in Fig. 1 is an excellent electric aid. Owing to the carefully designed brush action no brush marks are left on the surface of the floor. The brushes for polishing and rubbing up are quickly interchangeable and special buffers obviate all possibility of damage to furniture or walls. Quick drying of polish and a highly. glazed surface are secured by passing warm air through the motor direct to the floor surface. It can be used on parquet and linoleum.

An electric dish washer is a great convenience for a large family, but is not worth the trouble of cleaning for the washing up of a few plates and dishes. Many housewives have found a clothes washing machine a good investment. Hire purchase system over twelve or eighteen months makes it possible to own one without capital expenditure. A washing machine and a good electric iron form a laundry in miniature, and where much family washing is done at home justify their expense and are a great saving of time and labour. For the small kitchen a combined cookery table and ironing board is obtainable. The latter is stowed away out of sight when not in use. A clothes airer with an adjustable frame and wooden laths which can be fitted to the kitchen ceiling and lowered to any position is also a useful time-saver. The frame projects only 7 inches from the ceiling when pulled up. The efficient disposal of rubbish can be easily effected by a gas incinerator where there is no range. There are also good designs in garbage pails with imner containers which can be lifted out to empty One make has an inner pail that is perforated so that moisture drains away from rubbish, and in this way makes the latter sufficiently dry for burning
The Preparing of Food. In addition to the implements and machines for cleaning, there are those to do with the preparation of food. A refrigerator lessens labour in the summer by enabling the housewife to turn out very easily prepared and dainty cold dishes or iced sweets for the table. These refrigerators operated by gas, electricity or paraffin are extremely simple to use, and not only render food more wholesome, but save the housewife the labour of constantly bringing in fresh supplies of foods that quickly deteriorate in the ordinary larder.

A bread slicing machine (Fig. 2) which will also cut bacon and possesses a stainless steel blade is a useful device for the larger household. It is also of great practical help in sand wich making. The fruit or tomato cutter shown in Fig. 3 is inexpensive and ingenious. It is worth possessing, together with a cucumber slicer in the salad season. A potato peeling machine is another exceedingly useful aid for the housewife who has to prepare large family meals.

Labour saving low-pressure cookers and steamers are many. The cooker shown in Fig 4 requires no water and a whole nieal can be cooked at once in separate utensils placed in the one aluminium container. Obviously a saving not only of labour but also of fuel is effected by employing this simple device. Sow-pressure cookers simplify the preparation of meals, and entire dinners can be cooked thus on one gas ring. In such cookers the flavours and vitamins of the food are preserved. A household machine that may be useful in the larger home is one which reverses
the ordinary process and turns butter and labour spent in cleaning metal is out of all milk back to cream. The operation is quite simple and enables the housewife to procure rich cream in a few minutes at about one.fifth of dairy cost.

The smaller labour saving devices include mincing machines and vegetable strainers. The latter provide excellent substitutes for colandersand save work, heat and time. The strainer illustrated in Fig. 5 fits into the saucepan and can be easily lifted out when the vegetables are cooked.

Work is simpli. fied by using the best cleansing materials avail. able. Excellent polishes, sonps and powders are on the market and many recipes of good cleaning agents are given in our work, from which wide range it should he interesting to test and select the most suitable for the particular work on hand.

Where funds permit it is a good plan to replace all housebold equipment as it weara out with the best and most modern labour saving kind on the market. These are not all simple and easy to work at sight, and it is advisable for the housewife to find out exactly how to use even the smallest appliance, or the result may be the reverse of Inhour aaving.

Easier Ways. If all the beat electrical the kinife board. Aluminium and enamel appliances were installed. the work of running kitchen ware are easier to clean than the olda house would be ininimized very consider- fashioned imn and copper, which require scourably. But it is a fact that these idenl condi- ing. Aluminium ware is quickly cleaned with tions exist for a very few only, and that many a wet cloth dipped in an abrasive powder. housewives have to make shift with houses Ornamental collections of brass in sittingthat are badly planned and often poorly roms should be lacquered. Labour is also equippel. Housekeeping, however. is essen- saved when patent clips are used for stair tially a business, and as such must be carried carpets instend of metal rods.
on in a methodical way with as many of the Table mats instead of cloths are a saving labour-saving devices mentioned as are when laundry is done at home. For the practicab'e to the particular household, and service wagon, or for dressing talbles in weekplenty of ingenuity to make up for lack of end cottage or bungalow, tray cloths and expensive equipment where instalment of this runners in bright-coloured American cloth is out of the question. In many homes the ornamented with simple designs in raffia save


Fig. 4. Aluminium cooker waich requires no water. A complete meal can be cooked at the same time in separate utensils in one container Courtesy of Slainex Kizelien Elutpmone Co
labour, as they merely require wiping over with, a clean damp duster. A rubber apron hanging inside a kitchen cuphoard. that is quickly put on saves changing an ufternoon dress to wash up the tea or dinner things.

Labour saving is also intelligently achieved by mothod in catering and in keeping the contents of the store cupboard adequate for both ordinary and sudden needs. Last, but not least, much less energy is required to do things the right way than the wrong, and if the correct postures are adopted while working. When doing any sedentary work such as mending house linen or darning it is most important to


Labour Saving. Fig. 5. Vegetable strainer lor use inside a saucepan
sit well back in the chair so that the spine is properly supported.

When pastry making, ironing or doing other standing jobs, it is important not to stoop continuously over the work, but to take an opportunity to brace the shoulders. While stooping, stand a little anay so that the stoop comes from the waist and not from the shoulders. When using a long handled broom, mop or vacuum cleaner, use the body muscles as well as the arms, swaying from the waist with each movement Not only is the work better done if you put your back into it, but it is also far less tiring and thus labour saving.

LABURNUM. A very beautiful summerHowering tree, the laburnum is suitable for cultivation in town or country gardens. Trees may be planted at any time from November fo March inclusive, given favourable weather and soil.

The laburnum tree is most effective where the Howers are shown up against a dark background. The lustrian pine, the copper-leaved beech, and the purple nut are instances of trees and shrubs which show the laburnum to advantage. Although there are few species or wild types of laburnuin (the Scotch, Laburnum alpinum, and the common, Laburnum vul. gare, are the chief ones) there are many varie. ties of hybrids, and soine of them have inuch finer flower bunches than others: the hest are Vossii, Parksia and Watcreri. One named Alschingeri, which blooms later than the others, is also 10 be recommended. Laburnuin Adami is a re, markable tree, obtained by grafting the purple broom
 (Cytiaus pur (Cytisus purthe beautiful nowering tree pureus) on the common laburnum: it bears both vellow and purple flowers. Laburnuma flourish in ordinary soil and are increased by seeds, the named varieties by grafting.

Uses of the Wood. This wood is dark brown in colour, with a greenish shade towards the heart, and has a broad yellow sapwood. Being very hard, close in the grain, and capable of a good polish, it is used in turnery work and in inlaying. Much of the furniture before and during Queen Anne's reign was beautifully inlaid with laburnum. See Inlaying: Wond

## Lace and Lace Making

## Beautiful Examples and Practical Directions

In the first fart of this article the different types of lac: are classiffed and seg eestions given for the carc and repair of valuable pieces. The second part deals with simple directions for lace making See also ine entries on Crochet; Embroidery; Filet: Hairpln Work. Insertion Linen Kichelicu Work

A lace may consist of two distinct parts traced on parchmentstitchel to $n$ linen backing the net ground on to which the design is The linesof thedesignaresewnon to the follndaworked, as in Alençon (Fig. 1), or of the tion in a slicloton puttern. which is buttonholed pattern only without a ground, but connected by threads, as in guipure (Fig. 2). It may be classitied under three headings : neddle-point ; lsobbin; and inachine made.

Wherc only a single-threaded needle is used in the making, the lace is known as needle. point; when a number of threads are wound on to bobbins, so that the twistings and plaitings of the threads form the pattern, the lace is called bobbin. The term point alone should


Lace. Fir. 1. Part ol a border ol Alencon lace. an exnmple of 17 th cent. French needle-point
not he taken to mean ncedle-made, as it is userl to express either lace of the finest qualities and also for modern hand-worked laces in which lace braids are used and formed into designs by means of connecting huttonholed hars, and other lace stitches. Bolibin lace is sometimes termed pillow, but this leads to confusion, as needlo-point laces are also sometimes worked on pillows.

Needle-point Laces. Italy may claim the int roduction of needle point laces, and certainly their finest workmanship. Venice points inspired the French lacea of Argentan and Alençon, which resemble each other, a heavy outlining cond to the pattern being a feature of bot $h$, but tho Argentan is considered the finer work. Only the Alençon is made to day. chiefly at Burano, in Italy. The Inth century Alençon, which is often on sale in old lace shops, has spots or tiny sprigs posdered over the net ground : a
foral pattern floral pattern in running festoons and a conventiona hordering pattern. In the morlem lace these powderings are occasionnlly used with real llower pat. terns. Itisan exquisitelace for flounce, fan or scarf, and wears well.

Theearlier hea vy Venice needle-points have no net ground. The ground. ine

Fig. 2. Guipure. Specimen of $17 t$ h cent. punto in aria, a type seen in many of Vandyk's pictures
tion in a slicloton puttern. which is buttonholed elaborate lace stitches. When this is complete the lace is cut awny from both foundations In rose or raised Venice point the outlines are heavily padilel by threads and then worked over As the demand for lighter laces grew, the needle-point guipures were evolved (this lace is frequently also made with boblins). and then the point on net ground which inspired the French laces of Alençon and Arventan, and also the 13 russels point de gaze (Fig. 3), an exquisitely fragile needle-lace showing the powdered ground in the 19th century dosigus. Venetian lace wns also copied in Russin and callerl point de Moscow. while in the varieties of cut work and drawn thread laces the Russians frequently intioduced oriental colourings.

Needle-points chiefly made to-day are Alençon, Burano puint, Brussela point de ga\%c, ruse point de Venisc, and Greek point. A great quantity is still heautifully worked in the old designs and stitches in Italy, some in Belginm and Ireland, but not much elscwhere. Limerick laces are of three types : a heautiful cut-work: a run lace, in which a running design is needleworked on the net, as illustrated in Fig. 4: and tambour, in which n chain-stitch is employed. The last-named was hand-made on a tambourine-shapel holder which held the net Hat while being stitched. but is so easily copied by machinery that it is

hardly ever now made by hand. The Venice points are largely reproduced in fine Irish crochet.
Carrickmacross lace is of two kinds. One. an example of which is shown in Fig. 5, has a delicatc design which is applique on net, the other is a cutwork guipure made by tracing the pattern. outlining it with stitches on tine lawn, and cutting out after working in bars to hold the pattern to). get her. Needle-point is sometimes used in conjunction with hobbin lace, as in some designs of the

Honiton sprigs, and neerlle-point filling stitches have been used with machine-made braid mounted on machine-made net.

Bobbln Laces. In bobbin laces the pattern is drawn or traced on to prechment and is then pricked with pins on to the cushion, the pins being placed to guide the threads. On the upper part of the pattern the ends of the hobbin threads are fastened, and as the threads arc unwound the boblins are thrown and twisted with regulated movements to plait the threads round the pins and form the ground and pattern of the lace with a varicty of combinations. Most of the English laces arc worked with bobbins.

Copies of Lille, Valencienner, Maltese laces, guipures and torchons are produced in Bedfordshire, Buckinghanshire and Northampton


Fig. 5. Carrickmacross. Characteristic design with pattern appliqué upon net
shire, while a good (leal of Honiton hobhin lace is atill made in Devonshire, chielly in the form of sprays or sprigs to be mounted on machinemade net grounds. The hest type is a guipure with a corded outline consisting of a number of motifa joined by hars of twisted thread. An example is shown in Fig. 6. A kind of Ifoniton lace is known as Devonia, the rpeciality of which is the raising of flower petals or insect wings so that they stand away from the net ground. The holbinin laces of other countries are well copied by convent workers in Lreland.

A great deal of bohbin luce is made in Belgium. including torchons, Cluny. wireground Valenciennes. and the beautiful Malines or Mechlin laces. The first two named are in simple patterns and a somewhat conrre thread is used Valenciennes made fiom fine linen


Lace. Fig. 3 (above). Specimen of polnt de gaze, an exquisite needle-lace with powdered ground and raised cord outline to the pattern. Fig. 4 (below), Limerick lace of the type in which a running design is needleworked on the net Courleall of llayivards (Bond Street), Lld.
thread is a Hat luce without any raised design. The machine-made varicties are quickly detected by the even mesh of the ground Fig. 7 shows the slight variations in the handmade net Mechlin lace is sometimes confused with Valenciennes, but a magnifying glars reveals the mesh of the ground net to be made by plaiting and not merely by twisted threads A bright corred thread outlines the floral motifs and accents the designs of this lace In the bolbin-made Brussela lace relief is also given to the flowers and leaf veinings by a raised plaited outline Bruges duchesse point resembles the lloniton guipure. Other duch. esse lace is on net in fine designs such as the example shown in Fig. 9.

In France, a hlack silk and linen thread lace is made at Chantilly. The net work of the ground is oval in these laces and the pattern is outlined with a thicker thread. Most of them are now machine-made In Normandy Valenciennes laces are made, and hlack silk hobbin guipures at Le P'uy. In Spain silk lace is made for mantillas in black and white. Maltese lace is innde by hand in Malta in hoth silk and thread, and the hest patterns have portions of the design in high relief.

Machine-made Lace. Almost every description of lace is now made by machinery, and some is so well turned out that it is difficult at first sight to tell it from hand-made. The weakness is often in the edge-especinlly where indented-which is liable to ravel in washing. Machine lace never possesses the finish or rich, soft heauty of the hand-made, and its threads have a squeezed look. In net laces the mesh of the ground has a harl even appearance. instead of the soft, slightly irregular charm of hand work In needlepoint imitations the buttonhole-stitch, which


Fig. 6. Honiton. In tnis beautifiul erample the
design of flowers and butterfies is connected, not by a net foundation, but by bars of twisted thread
forms a large portion of the work, is not well reproduced, while the plait of bobbin lace can only he satisfactorily imitated at a high cost. Conrse laces are produced for furnishing purposes and curtain laces on bobbinet.
The Care of Lace. Old lace should be kept in a dry, warm atmosphere, and if laid away for a time should be taken out of the drawer or box and aired at frequent intervals, as it is liable, especially black lace, to a species of mould. Sometimes lace is handed on which has been cut or torn; unless the art of lace making be understood, it is worth taking the piece to an expert to he joined or mended.

In the case of laces with torn hand-inade net gmunds, which are often worn into holes

long hefore the heavier patterns show any signs of venr. the net should he repaired by necdle or hobbin, according to the original workman. ship, as a machine-made net hacking would destroy a good deal of the value of the lace.
Hand-made lace should not be dry-cleaned. as the process is injurious to the delicate fabric. It should be firnily pinned to a linen-coverel hoard with it sufficient number of pins to keep the lace flat, and dabbed gently till quite damp with a sponge. Then, pure Castile soap should he dissolved until it forms a good lather in warm water : the lace is dabherl with this till clean, the soap aponged off with clean water, and as much moisture as possible removod from the lace with a dry sponge. It must not he imned, but left to dry on the board. If properly pinned it will not be pulled out of shape.

Very thick lace that cannot he sufficiently cleansed by dablhing may he placed in a saucepan in soapy lather which has heen allowed to cool, and then brought to boiling point The lace should he rinsed in clean water, and pinned out flat to dry Black lace should be pinned in the same masuer, but dabhed with vinegar and left to dry. Should a deeper old tint be desired for "hite lace after it has been cleansed it may le laid in cold tea.

The rewing on of lace is an important part of its care. The cotton or silk used should match the lace and not the material. For lingerie laces, where a firm and yet delicate method of attachment is desirahle, a close satin-stitch is often used, and is suitable for a straight or rounded edge. The lace should first be tucked to the material, and then run with small stitches along the base This is practically n aecond tacking. which keeps the line of the lace straight for the closely covering satin-stitch. Without the precaution of this close running, the lace usually has a crooked appearance. After the completion of the satin-stitching, the raw erge of the material behindshould he cut a way close to the stitches.
For straight edges only, a hemstitched veining may be used.
Sufficient threads having been drawn for the veining. and the lower edge worked in the ordinary hemstitch way, the lace must be tacked to the upper edge of the veining. Between each ordinary hemstitch which connects a group of threads. one or two seam stitches should be put into the edge of the lace. The work is completed hy cutting the raw edge at


Lace. Fig. 8. Duchesse lace. Strip of delicate real lace, showing a cbarac-
teristic and beautiful floral pattern
threads passing through both linen and parchment. This forms a skeleton outline of the pattern and is closely covered by button hole-stitshes in thread. Connecting meshes, links, or bars, are made to hold the pattern together with buttonhole stitches. A sharp knife is inserted between the parchment and the linen, and the original stitches, which were passed between the parchment and the linen, are cut. The loose threads are picked off and the lace is complete.

In making the laces known as point lace, lace braids are first tacked carefully on to the pattern, following the design exactly. Patterns are obtainable ready drawn upon the linen. These point lace patterns are all drawn with double parallel lines, between which the braid is tacked on with small running stitches. When the brail turns a curve it must be whipped on both edges and lightly drawn up to follow the form of the pattern exactly. Having tacked down the braid, the connecting bars must be cast. Secure the thread with a small button-hole-stitch, pass to the opposite braid, and then return with a twisted thread to the place where the original small but-tonhole-stitch was placed.

Other spaces formed by the braid may be flled with various needle-point-stitches. There are about forty of these, and it is not within the scope of this article to give details of

that the bobbins themselves hang down over the cushion towards the worker and rest above the lace that is being made

Whatever form of pillow is chosen it must be firmly and evenly stuffed. It is first covered with canvas and then with green linen or sateen. Finally, a piece of white calicu larger than the design, is pinned securely over the pillow and the pattern is pinned to this. The pins are driven right into the pillow to secure the calico cover and the design in such a way that only the heads are visible. Most workers hem covers for their pillows of navy blue linen about 2 ft . square, washing the linen three or four times to be quite sure that all the free dye has been taken out.
In the centre a small circle is marked measuring about $1 \frac{1}{2} \mathrm{in}$. in diameter, and the circle is outlined all round by a running of thread. This is then buttonholed around, and finally the small circle of linen is cut out from the centre. Through this small hole the lace is worked so that the rest of the pillow and the lacework is kept covered and clean.

Ready-made pillows are not very expensive, but the beginner can make her own quite


Pig. 11

Leoc. Figt. 11 and 18. Bhowing aroasingl of the threade to make the hall-atito'」 them, or for employ-
ing them in the making of modern reticella, easily. A piece of green linen or sateen Venetian, and renaissance laces. The simp- measuring 18 in. by 20 in. is folded over, and lest braid lace is Bruges. This is made by tacking Bruges lace braids of varying widths into the selected design to form the pattern and whipping them into position. The spaces between the braids are then carefully filled. Sometimes a picot bar braid is used, or, if preferred, the connecting bar threads can be plainly buttonholed with equally good effect Having practised the handling of the braids and making the bars for this lace, it is worth while for the interested worker to purchase a book on needle-made laces.

Making a Pillow. The pattern in bobbin lace is made by twisting and plaiting the threads of linen, cotton, or silk. The design is selected first, and is drawn on paper or parchment to form the patterns. It is then pricked with holes by a pattern pricker. This pricked pattern is fastened to a pillow, and serves as a guide in the disposal of the pins used later to guide the threads.

Some workers use a circular-shaped pad attached to a board, which can be rested on a table and moved about easily. Other lace workers use a well-padded pillow, flattened at both ends so that it can be held between the knees. Whilst the lace is being made it is securely pinned down to the pillow, which is covered with a stout but soft piece of cotton for the lace to rest upon during the process of making. The threads from which the bobbins hang are fastened at the top of the pattern, so
its longer sides are joined by machine. This is turned inside out, and a half-inch hem is made at each end and a tape is run through each hem. One end is drawn up and tied securely. A circular piece of cardboard with a 6 in . diameter is placed at the end over the drawn-up portion. The pillow is filled up with sawdust or hair, and then a second circular piece of cardboard, exactly the same size as the first piecc, is placed over it before the open end is drawn up.


Lace. Fig. 13. Mesh of Buokinghamshiro lace onlarged to show details

Marking the Design. The design is drawn in ink on some strong, smooth blue paper. If the beginner finds it easier. she can have the design pricked on the paper, and even have a dot for every position where a pin must be placed later in manipulating the threads. The pins used by lace makers are smoother and more slender than ordinary pins: but the beginner can use large ordinary pins at first, and will need 4 or 6 dozen. Lace pins must be kept clean and free from rust, and a plentiful supply facilitates the work. Some workers dip the heads of the pins into melted wax, so that a little globule forms a bead at the head of each pin, and prevents it from slipping through the lace. It is a good plan to have a small pin-cushion with a tab, and to pin it securaly to the lace pillow in a position where it can conveniently be reached by the right hand when working.

Pricker, bobbins, and bobbin-winder have next to be considered. A pricker can be bought at any art needlework shop. A homemade pricker can be made hy taking the wooden portion of an ordinary penholder, melting a drop of sealing-wax, and placing it on the end, and then embedding an ordinary strong but tine sewing needle in the wax while it is still warm and soft. The wax is gently pressed round the eye-end of the needle, and when it cools and sets it hools it firmly in place.

Bobbins of many shapes are available in wood or bone. The number needed depends upon the nature of the design A beginner would only need about 2 dozen, but elaborate designs may require well over 1,000 bobbins. Each bobbin is like a little spool with a more or less elaborate handle. If the bobbins have any roughness or unevenness on their surfaces, it is advisable to rub them over gently with fine sandpaper, as the threads used in lacemaking are so fine and so easily broken. When the bobbins get dirty, they can be worked in a warm, soapy lather, but they must not be used to hold thread again until thoroughly dry.
A bobbin winder is not necessary for a beginner, but it saves time, especially if it has a skein-holder attached. It is very easy to soil the thread, so all handling must be avoided, and it is a good plan to wear white cotton gloves when winding the bobbins. Many workers wear aleo a white apron and over-sleeves to proteot the lace.

Making Bobbin Lace. Amongst the genera rules for making bobbin lace, it is important to work in a good light, preferably with the light falling from the left. Directly the eyes feel tired, the work should cease for the time being. It is not necessary to look too closely at the bobbins, but the threads should be watched, as mistakes are then quickly noticed and put right. The bobbins must be kept closely wound and are picked up lightly by the finger-tips, care being taken not to get them accidentally knocked out of place. Both hands must be used.

British-made linen thread is the best forlacemaking purposes, but mercerized cotton, silk, tinsel, and plain crochet threads are also employed. If the thread becomes entangled, it must not be handled, but the pricker must be used to free the threads. Any thread not in use should be rulled up in blue paper to preserve its colour, and put in an airtight tin until it is wanted.

If a thread breaks it must be dealt with sarefully, and a knot must never be left visihle in the lace itself. If the warp thread breaks some distance from the actual plaiting, it may be possible to knot the broken ends and finish the particular section of the lace before the knot is reached. If the break occurs in a traveller thread, it may be hrought to the erlge and there exchanged by a twist with a stationary bobbin. In this way the knot will not appear in the lace. If the broken end is very short. wind the broken end extending from the boblin round pin and tie it. Stick the pin into the pillow near the other broken end of thread. Replace the bobbin and go on werving. Then cut of the broken end close
The pattern in bobbin lace is often outlined with stronger thread than that used for the mesh. The variations in the twisting and plaiting of the mesh con. stitute an essential difference in the various kinds
of lace.
The bobbins should all be wound the same way, i.e. away from the person winding if she is right-handed. When the hody of the bobbin is moderately full, cut the thread, wind it twice round the neck, pull the end under the thread when it runs from hody to neck, and pull taut (Fig. 10). When all the bobbins are wound and hung on to pins ready to start the pattern, it is advisable to practise lengthening and shortening the threads. To lengthen, hold the bobbin horizontally and revolve it between finger and thumb until it is the length required To shorten, hold the bobbin in the left hand, insert the right forefinger under the thread which runs from body to neck, and pull upward whila the left hand revolves the bobbin until it is short enough.
If the thread gets loose from the neck and the bobbin hegins to unwind after the work is started, it is only necessary to wind the hobbin to the length required and finish by winding the thread twice round the neck of the bobbin and pulling taut. There are three elemental stitches nsed in all hobbin lace. They are known as half stitch, donble stitch, and cloth stitch. To make any stitch 4 bobbins are re quired, and to learn the stitches it is a gond plan to knot the threade of 4 bobbins together, fix the knot to a pincushion, and practise the stitches a few times before starting a pattern. Except for outlining with a gimp thread, bobbins are used in pairs.

To make a half stitch, place the two pairs of bobbins to be used in the centre of the pillow hanging from a pin and number them from the left. Cross 2 over 3, cross 4 over 3, cross 2 over 1 . The first step should be done singly and the second and third steps simultaneously. using the right hand to lift 4 over 3 and the left hand to lift 2 over 1. Figs 11 and 12 show the working 1)ouble stitch is half stitch done twice without interruption, while cloth stitch consists of crossing 2 over 3, 4 over 3, 2 over 1, and


Lace. Fig. 16. Strip of narrow Bucks lace with shell edge, made by arrangement ot pins snown in Fig. 15 above
to the pattern. The following stitch is used for it. Make a half stitch and twist once each of the pairs with which the hall stitol/ has been made. If a pin is put in, it should not be closed in. Make a Bucks stitch with thic 4th and 5th pairs, and with the 5th and 6th pairs; put a pin in hole 13 between the 5 th and 6 th pairs. Make a Bucks stitch with the 6th and 7th pairs; put a pin in hole 14. Make a Bucks stitch with the 7 th and 8 th pairs: put a pin in hole 15. Pass the gimp through the $8 t h$ pair and twist the 8th pair twice. Proceed in the same way with line B as far as putting a pin in hole 14, then pass the gimp through the 7th pair and twist the 7 th pair twice, In line C (Fig. 15) proceed as before as far as putting a pin in hole 13, then pass the gimp through the fith pair and finally twist the 6ith pair twice.
LACEWING FLY. One of the fow insects which may be called a friend by the gardener is the lacewing lly, whose larvac devour the


Lacewing or Golden-eyed Fly. One of the few insects which are heipful to the gardener.
eggs of the fly
aplides. The adult insects have slender, pale-groen bodies, about $1 \frac{1}{2} \mathrm{in}$. long.
They deposit their eggs upon hair-like filaments on leaves and shoots. About a week after tiny larvae hatch out, and these im. mediately begin to devour the aphides, slaughtering great numbers in a very short time. The larvae measure about $\frac{3}{1}$ in., and may be identified by their dirty white bodies, spotted with brown or orange. The parent fly, by reason of its prominent golden eyes, is sometimes called the golden-eyed fly. See Insect.
LACHENALIA. This showy spring. flowering greenhouse plant is popularly called the Cape Cowslip. The narrow tubeshaped Howers are chietly of yellow, orange, or orange-red colouring. Lachenalias look well in hanging baskets, or may be grown in pots. The bulbs should be potted in AugustSeptember in a compost of loam, with some decayed manure and sand added. After having been


Lachenalia or Cape Cowslip, a handsome spring-lowering bulb tor the greenhouse liept in a cold frame for six or seven weeks they will be well rooted, and should then be placed in the greenhouse. A temperature of 50 to 55 degrees will be found to be suitable. When the leaves begin to turn yellow in spring, watering should be discontinued gradually, and finally, as the leaves fall, the soil must be kept dry until August, when the bulbs may be taken out and re-potted. The chief kinds of lachenalias
are Nelsoni, pendula and tricolor, but many named varieties of improved colouring are now obtainable. Pron. Lac-e-nā li-a.

LACKEY MOTH. Much damage is done to fruit trees by the lackey moth. Its caterpillars feed on the foliage of many kinds of trees and shrubs, including the apple, cherry, plum, and pear among fruita, and the oak, hawthorn, willow, alder, clm, and rose among trees and shrubs.
In Leaflet 69, issued by the Ministry of Agriculture and Fisheries, the following measures are suggested for ridding trees of this caterpillar pest : Spraying is effective if carried out carly enough, and also at any time if there are not many cater pillars on the tree. When, however, the whole tree is enveloped in webbing it is impossible to get enough poison on to the leaves to do any goorl. The best time to spray is within three weeks after the dropping of the petals from the Howers. Lead arsenate ( 1 lb . paste to 20 gal . water) is the best insecticide to use, and the wash should be applied through a fine nozzle, giving a light dressing to every leaf on the fruit trec. In gardens with only a few trees affected the pest can be destroyed by hand. See Fruit ; Insecticide; Spraying ; Syringe.

LACQUER : How to Apply. The purpose of lacquering is to protect the surface of the object from the action of the air, and so prevent it from tarnishing. Door knobs, handles, fenders, and other articles can be lacquered, thus obviating the need for constant polishing. They should last at least six months without requiring any further attention.

The materials required are several bottles of lacquer of different colours; good quality soft camel-hair brushes, one or two clean glass bottles with cork stoppers, for the storage of the brushes, a quantity of clean saiwdust, preferably boxwood, and some means of heating the objects to be lacquered. The operation must be carried out in a warm room absolutely free from draughts, as they cause the lacquer to bloom, that is, to dry with a milky, bluish appearance.
Suppose, for example, it is intended to lacquer a polished brass or copper object such as a door knocker. The primary stages of polishing are dealt with in the article on polishing (q.v.), or the surface may be finished with a natt effect by dipping in dilute nitric, sulphuric, or hydrochloric acid. The utmost care must be taken when using these chemicals, as all of them are poisonous. Some clean tissue paper will be found useful for handling the lacquered article. The next stage is to clean the article thoroughly. This may be done by boiling it in clean water, allowing the water to drain off, and then drying it by burying it in a tin of hot sawdust which has previously been heated by baking it in the oven. After the object has been left in the sawdust for a few minutes it can be removed and brushed over with a clean, dry brush to remove any traces of sawdust. On no account must the article be touched with the bare hands after it has been cleansed, but should always be handied by grasping it with a piece of tissue prper, or some other material free from grease.
The lacquer, which is composed of shellac, a colouring material, and methylated spirit, or some similar solvent, is best obtained ready made from the makers, or from any high-class colour shop. One type, known as hot lacquer, has to be worked hot ; others are known as cold lacquer, which is brushed on like ordinary varnish, and generally sold under proprietary names. The cold lacquers are very simple and easy to use, and very handy for lacquering bath taps and fixtures which have to stand hard wear. For all ordinary purposes the hot lacquer should be employed.


Lackey Moth, an insect pest which attacks truit trees. Left and above, caterpillar ; below, right, moth B" permission of the Ministrin of All rieuture and

All types of lacquers can be obtained in a variety of colours, but, generally speaking. the colourless or crystal lacquer is quite invisible when applied to metal A pale gold scarcely jermits the yellow shade to be noticed. Daep gold imparts a notable increase in the deptl, of the colour, while the coloured lacquers. green, blue, or red, colour the metal more or less. They are all n pplied in the same way.

Hot lacquering is performed by first warm. ing the object, e.g. over a flame from a gas burner, or similar henting medium, taking care to keep the object more to the side of the flame so that it does not get soiled from the products of combustion. The exact temperature can only be determined by experience, but a few tests on various articles will show the effects obtained by variation in temperature. Roughly speaking, if the work is too cold, the lacquer dries up lustreless with a dead appearance. If too hot, the lacquer sizzles when applied to the work, and dries off with a strcaky, gramular effect.

The happy medium is that temperature at which the lacquer can be brushed on com. fortably, and will dry quickly with a very bright, lustrous surface. Usually this result is accomplished by using a large brush, dipping it into a clean glass container with some of the lacquer in it. A sufficient quantity, but not an excess, should be held by the brush, as the lacquer evaporates very quickly. Wipe some of the lacquer fron the brush on the edge of the glass vessel, but leave the hrush so charged that the lacquer will flow frecly from it, but without any tendency to drip of the brush.

Apply one corat only, on every part of the work, and never hrush the same part twice. In the case of a long, slender object, rotate it with the left hand while brushing on the lacquer with the right. In other cases, a long, firm, sweeping application of the biush is employed. Then bring the work fairly near the heating stove, and turn and twist it about for a few minutes until it is hard and dry. If any quantity of lacquering is to be done, it will he hest to make up a lacquering oven from an old biscuit tin. Fit a door to the tin, and fit up a pair of wire hooks, or a little tray, on which to rest the lacquered objects. The oven should be placed upon the heating stove and warmed up

Should the work be spoilt for any reason, the best remedy is to clean off the lacquer with methylated spirit, repolish and relacquer.

## LaCQUER WORK FOR THE AMATEUR Antique and Modern Forms of this Artistic Handicraft

Those interested in similar occupations should turn to the articles Gesso Work; Lampshade; Leather Work: Papier-Maché; Repoussi Work; Stencilling, etc. See further Bureau : Correr Cupbnard: Grandfather Clock: Sereen; and other picces of furniture on which lacquer is sometmes used; also Chinese Style; Chippendale Siyle; Queen Anne Style

Lacquer work was introduced into England in the latter half of the 17th century, and Chinese lacquered panels were imported and made up into pieces. In Queen Anne's reign English lacquer work became fashionable and was later popularized by Chippendale. The cabinet in Fig. 1 shows an exquisite example of 17 th century workmanship.

Much of the English lacquer was done on papicr-mâché trays. The tray illustrated in Fig. 2 is a gond specimen of modern lacquer copied from an old piece of English lacquer. The following directions are given for this work. Rub the tray or wood carefully with fine sandpaper, and coat it over with filling. which is paste made of whitening mixed witli water to the consistency of thin cream. Add a little plaster of Paris, and a little glue, powdered, if possible If ordinary glue is used it must be carefully mixed in when warm, and unless the filling is used at once, the mixture must be kept warm. Avoid using thick filling, as this makes an unevon surface. When dry, rub it down again with anndpaper.

A filling can be purchased together with a set of Chinese lacquer colours and other requisites in an outfit. They are subject to the Petrolcum Act and cannot be sent through the post. Spirit Incquers require careful handling as they are inflammable. and cellulose lacquers, though yielding a fine finish, possess a pungent odour to which the worker requires to accustom himself.
When the work is fillcd and rubbed down, a design has to be chosen. Designs may be bought from some firm which specializes in this kind of work. Most oriental designs are built up from several motifs, and can be adapted from illustrations or other Chinese piecos. A willow pattern plate or dish makes a good design for adapting to a small piecc of work.

The difference between English lacquer and the Chinesc is that the design is usually more cnowded in the English. Small horders of flowers, scrolls, etc., tend to alter the character. The scroll shown on the tray is typical of English lacquer.
The next step is to colour the background For this, dull black lacquer should be em. ployed. Put on one coat with a flat squirrel hair brush and allow it to dry. Then apply a second cont. If it is at all rough, sandpaper it carefully hefore applying the second coat. Two coats of black are usually sufficient, but should the groundwork look poor, apply a third coat. Draw, or trace from a copy, the


Fir. 2. Ovai papier-maché trag. a specimen of Fodern lacquer conied from an old English piece
main objects of the design on a piece of tracing paper the size of the article, then turn it over and rub the back with whitening. Lay this onrefully on the article and goover the design with a pencil, which will apply a clear white
tracing to the black surface The raising paste is next applied Makeall surfaces where it is intended to apply raising paste rough by scratching with a penknife. A paste can be used as directed for the filling, except that it must be much stiffer, or gesso powder may be employed. Clinose a hog's hair brush with ong hair for this, and apply it by working round the inside of the outline, twisting the brish towarls the worker. As it spreads a


Fig. 3. Small lacquer table. a rood modern example in the Cbinese style
little, keep inside the outline. Very little rais ing is used in English lacquer. For the tray the only part raiscd was the roof, the rockis at the back, the bridge and the figures very slightly. Allow the raising paste to become quite dry, but do not put it near a fire or it will crack. When dry, rub it carefully with sandpaper if at all uneven or mugh

Next gild the raised portions and all main parts of the desigu, onsitting any fine detail. For this gilding lirst use the special medium obtainable. Paint it over, and when almost dry dust it over with rather beavy bright gold powder, uaing a chamois leather. Allow it to dry for at least a day. Then wash with soap and water, and dry it carefully, using n soft cloth. If the fine detail cannot be put in freehand, trace, then paint it in with chrome yellow to which a little medium has been added. Dust it over with gold. When it is dry wash it, and put in any forcground. touch it up where necessary and shade it n little with black lining ink and water colour. When diy give it two coata of brown varnish, rubbing down hetween each coat with poudre de silice. After the recond cost of varnish is thoroughly dry, give it a good ruls with chamois leather. In English lacquer the floral borders aro uften painted in oolours.

Prepare the wood very carefully when lacquering an old piece of furniture. Wash it well with strong sode water, then rub it down or have it scraped, to remove any roughners. Apply the lacquer very evenly. Quick drying spirit lacquers are not easy to use. A modern outfit mold contains a special solvent for thinning these, as the best reaulta are obtainable by using two or three thin coats rather than one thick one. Amateurs should always try black first, as it is much enaier to remorly any mistakes, and usually works more evenly. Pale coloured lacquers are the most difficult for them to use as they
need careful bandling, and cannot be touched up to any extent.

After the surface is ready, transfer the design as explained, tien study it well and decide which portions are to be raised. Unless it is a large piece of work, such as a cabinet, do not raise it too much as it looks clumsy. The small table and finger plates shown in Figs 3 and 4 respec. tively had the rocks, temple, and roofs of the houses raised; the lampstand in Fig 5 had only the foreground and a bircl.

When dry sandpaper it well and dust it carefully before commencing to work in the fore ground. For this the apecial medium is required. Paint over all the foreground, and when tacky dust it over with coloured bronzes using gold, red, green, and a little silver. These can be shaded in with the chamois leather. When dry dust off any superfluous powder, and gild all the main objects in the same way. Use fine dull gold for this and the mixing is done in a saucer convenient When dry wash and dryit. When filling in the to work from while painting the article, as detail use a very fine sable brush, and make shown in Fig 8. the strokes as fine as possible. Only do a little piece at a time and dust it over with gold. The medium dries quickly and will not hold the powder if allowed to become too dry.
When the detail is finished and dry, wash it well and dry it carefully The line work must be done next. Mix the special ink with ivory.
black water. colour, and put in the fine lines. Should the gold lines be too thick, this can bere. medied by painting a black line at the side. The work may be shaded by using a little burnt aienna and here and there a touch of red Poster colours may be used. The advantage of using these is that mistakes can be wiped off with a wet rag and the parts in question put in again. Should the work be too bright when finished, dip a damp rag in a litile poudre de silice and rub it over the surface. working with the grain of the wood. A final coat of clear varnisb may be applied over the "hole work where pale ground coloura are used. Otherwise brown varnish is used as described for finishing the tray (Fig. 2).

For a silk lampshade, such as that illustrated in Fig. 5, no raising paste must be used, as the effect must be obtained by shading. The shade is painted after it has been made up. If the work is to be transparent, use oil colours and stencilling medium. Broad work is the most effective, and the use of gold should be asoided as much as possible. A vellum lamp


Lacquer Work Fig 5. Chinese lacquer lamp stand with silk lampshade
shade to suit this style of lamp may be coloured with waterproof inks.

Modern Forms of the Work There are other kinds of lacquer work of interest to the amateur. Lacquering on leather will he described under Leather Work, and lacquer used in conjunc. tion with raised and modelled gesso and barbola paste has been dealt with in the article on Gesso Work Modern methods of decorating over lacquer grounds include Worcester painting, so called from the designs chosen, which resemble those on Worcester China, and Marbling Examples of the first are shown in Fig. 6, while the candle. stick in Fig. 7 has been decorated by means of the second. Stencilling is also employed, being carried out in liquid oil colours over the ground. work of Incquer. When it is desired to mix lacquer colours for the groundwork this cannot be done from the bottles,

Worcester painting is particularly suitable for the decoration of dressing.table sets, oigarettc-boxes, and for pieces of pottery. Artistic work is achiovel with this type of decoration when applied to a pottery vasc suitable for a lamp and using the same designs for the vellum shade. On Worcester and Chelsen china tea services, etc., designs are often set in shaped panels, and birds, small flower sprays and Chinese motifs can be copied. Maroon, canary-yellow and apple. green are all correct colours for the finished groundwork, and show up the panels most eflectively. The first atage is to coat the article over with the filler, as already decribed, sandpapered to a smooth surface


Lacquer Work. Fiz. 8. Cigarette bor and powder bowls showing Worcester Cbina effect with stlppled coloured background and white lacquer

Then a coat of white brush-lacquer colour is painted evenly over the surface, using a squirral hair brush. This must be allowed to dry and a second cont applied. The work must now he left for some hours, preferably overnight, to allow the lacquer to harden before proceeding further. The inside of a hox or other article should be lacquered without the conting of filler. The supface must first be sandpapered.
The next stage is to wipe the article over with a damp cloth and then to cover it


Fig. 7. Candlestick decorated by marbling process in water colour or lacquer
with the desired shade, yellow for instance, using chrome lemon poster colour, and to stipple this over quite firmly afterwards with a dry equirrel hair brush. The method of holding the brush is shown in Fig 8.

The coat of stippled poster colour must be allowed in dry before the third and most interesting stage of the work is begun. This is illustrated in Fig. 9, which shows the methorl of wiping out the panels for the Worecster de. signs It is better to use temblates for this rather than trust to the unaided hand.

Templates may be cut out of niled manilla paper, or purchased in packets of a duzen assorted shapes for a few pence, and their usage will enaure the clean sliape of the oircle, oval or triangle. Through the template the small panel apaces are wiped out with a slightly wetted rag (see Fig 9), removing the yellow poster colour and lea ving the originally painted white lacoser: groundworkshowing. should remain.
After the panels have been thus prepared tracing paper and a carbon For this work, however, cmbroidery transfers can be used of amall floral patterns. Poster colours are used to tint these, and their simple delicate nature is shown in the three attractive pieces in Fig. 6 The powder bowl on the left has an apple green stippled ground. The interior, handle and rim are of the white lacquer Crescent-shaped templates were used through which to wipe out the panels on the lid The design of wild roses is painted in pinks and greens and the panels are outlined witt. gold Cold may also be used for the interior of a box or bowl. It must be used over the lacquered

The rim and base of the article should be green and rellow, treated in the same way. This must be done other shades being cleanly, and not a trace of the yellow colour obtained by mixture eses, as, for exainple. the designs are drawn and painted. More in the ship designs elaborste designs can be traced by means of shown, the colours are
ground work. When completed and quite dry the whole article is varnished with clcar white varnish.
Marbling is even a simpler method of decorating a lacquer foundation. This consists in wiping off the poster colour with a damp cloth in a zigzag fashion to imitate graining or the many varied markings of marble. The candleatick which is samon in Fig. 7 has been decorated in malachite green over a cream Incqucr groundwork: White or cream lacquer lends itself as admirable for


Fir. 8 (above). Method of bolding dry brush int stippling background. Fig. 9 (below). Dse of a template when wiping out the panels in Worcester China designs Courlesy of Winsor \& Neuton. Led foundations for this work, as for Worcester painting, but other lac- paper. To prevent the lines being rubbed off quer colours can be used, and except black are they are scratehed over with a steel knitting suitable for marbling. Blue poster colour can needle. Excellent results can be obtaincd by the not be used over red lacquer asithas a tendency amateur worker skilled in repousse work, who to blacken. Designs can be introduced into is able to prepare his own designs in slight relief this marbled work by means of wiping a panel on pewter, brass or copper, and subsequently apace clean through a template to show the plain lacquer groundwork Very simple landscape or llower designs of the type used in modern marquetry work look well introduced into articles with slightly marbled surfaces.

Lacquer Work on Metal. Examples of a kind of lacquer work which appeals to many people are shown in Fig 10. For this work four lacquer colours are prepared, red, blue, needle. Excer killed in repoused work who to colour them by means of these lacquers.
Bronze powders can be utilized in this work and Japan black lacquer. Camel hair brushes are employed for broader effects and line sable for details. Yellow varnish is used to coat the whole piece when finished and thus render it untarnishable
In conclusion it may be noted that brushes used for lacquer colours should be washed out
 na to enhance n already modelled in the metal. In others, as in the brass cigarette box, which is being painted in Fig. 11, the design for the most part is traced on to the metal Having clcaned the box with methylated spirit, the eelected design is transferred by means of a carbon
in methylated spirit immediately after they are linished with each time After use with oil colvurs for stencilling, if this is employed, hrushes arecleansed with turpentine, and poster colours are washed off with water.

Bottles must be kejut corked when not in use. Best results are obtainable il the work is allowed to dry thoroughly between cach process. A coat of varnish should always be given to the linished article. Varnish should be applied evenly with a suft brush and the work sct aside to dry where no dust is likely to settle on it. Lacquer colours always require an absolutcly smooth surface. Where raising paste is used the opposite rule obtains The particular portion of surface to be raised has to be roughencd to make the paste adhere firmly to the work
LACRYMA CHRISTI. A famous Italian wine from the vineyards situated on the slopos of Vesuvius is Lacryma Christi. It is a very attractive wine when drunk on its native soil, but comparatively little is imported into Great Britain An exceedingly luscious wine of refreshing llavour, it is ordinarily of a rich red colour, although white and sparkling varieties arc produced. The white variety is noted for its piquant flavour
LACTIC ACID. By the action of the lactic acid bacillus on milk sugar lactic acid is obtained as a colourless, syrupy, sour lignid It is one of the waste products of muscular contraction and has much to do with inducing muscular fatigue

Lactic acid is found in the stomach in the earlier stages of digestion, when it is produced by the action of bacteria on the carbohylrate foods. Metchniloof thought that the presence


Lacguer Work. Fig. 10. Examples of coloured lacquer work on metal. Fig. 11. Brass cirarette box in process of decoration ; the design bas been trangterred and the coloured lacquer is being applied by means of a camel bair paint brusb
of lactic aced bacilli in large numbers in the intestine prevente the growth of other bacteria and thereby prevents auto-intoxication, or wisoning from the substances manufactured by such bacteria in the buwel. For the purposes of his treatment a large number of preparations containing lactic acid bacilli are sold for the artificial souring of milk, and milk soured in this way can be had from reliable dairies
Calciutn lactute, duse 10 to 30 grains, is ued to increase the lime content of the blood, in restruining bleeding, in urticaria, chilblains, and for other purpuses. The syrup of calciunn lactophosphate, dose $\frac{1}{2}$ to 1 dram , is a good tunic
LACTOMETER. The specific gravily of milk may he measured by an instrument known as a lactometer, which is Hoated in the milk. and the figure marked on the stens of the instrument corresponding to the upper surface of the milk is then read off and represents the specific gravity. In good milk this should be 1.028 to 1034.

The greater the amount of cream the lower the specific gravity : but the increase in the figure which results from skimming off a purtion of the cream can be lowered by the sddition of water By itself, therefore, the lactumeter is a fallaciuus guide to the quality of inilk, and other tests are therefore necessary Sec Milk
LADDER: How to Use. Extending ladders. in two or mure sectiuns, aro very convenient in the home, being light in weight and oufficiently
 rigid for most household work. These are placed against the wall and extonded by pulling upou a rope or by pushing up the extending portion. Iron fittings, varying in type with the different makes, are provided to huld the two parts lirmly incontact
and prevent


Ladder. Fig. 1. Correct rositions when raising a ladder. Fin. 2. Method of lowering a ladder so that one man acts as a constepbalance to the weight borne by the man who holds it up


Ladder. Fir. 3. Useful type ol ladder giving access drawn un, and is concealed by the trap doar be Courlesn of Loft Ludders. Led.. Bromlen
the upper part of the ladder from sliding down until released.

When a ladder longer than 10 or 12 rungs is to be raised or lowered, it calls for two or more persons' assistance. To raise the ladder it should be placed on the ground, with the bottom a few feet out from the wall, in the pusition it will occupy when the ladder is raised. One person places one foot on the bottom rung, grasps the third or lourth rung above it and commences to pull, while the other person lifts the opposite end as high as possible.

The ladder is held with the arms extended above the head, by grasping the rungs and advancing hand over hand, there by gradually raising the ladder higher and higher. The other person stands on the bottom rung and holils on to the fourth or fifth rung, leaning hackwred as far as lie can, as shown in Fig. 1. This procedure is continued until the ladder is in a perpendicular position, when both persons should stand on the ground. grasping the sides of the ladder, and very cautiously allow it to fall over in the required position on the wall of the house, or wherever it is being placed. For a very long ladder three or four persons may be needed to elevate it.

As a precaution, the amateur may attach a rope to the ladder, leading it through an upper window and stationing somcone at the end of the rope to haul on it when the uthers are lifting the ladder, and to ho!d un tight when the others pause. Having raised the ladder, it should be securely lashed to some part of the building, to prevent it from swaying or rocking. The angle a ladder makes to the house is important, and it is belter to have it more upright

Hith otherwise: the more vertical a ladder is the less strain is on it, and the less it will sway while anyone is working upon it.

Lowering a Ladder. 'l'o lower the ladiler, llie sequence ol operations is to a large c.atent teversed. The lashings are removed, and if it is proposed to use the check rope from the upper window, this should be uttaclied before the lashings are cast off. The persun at the "pper winduw with the check roje should constantly watch, or be advised of the action of those below, so that all concerned inay work ith unison. The petson on the clicek rope should take the weight chiefly when the persons lowering the ludder are moving the hands from one rung to another.

The usual procedure is tirst fur one to stand on the bottom rung on the inside of the ladder with his back to the wall of the house, while the otlier stands with arms elevated, reaching up and holding on to the highest available rung. The one behind the Indder pushes, while the one in front pulle, until the ladder is vertical; the one behind then stands on the lowest rung, and holds on to the third or fourth rung, and gradually leans hackward, while the other person allows the ladder to incline over his head, walking backward, with arms erect, and grasping the ladder rung by rung until it has been lowered to such a height that it is possible fur him to cume from beneath it and hold it with one arm, as shown in Fig 2 . After this the ladder may be gently lowered.
During the whole of this time the person at the back must keep his weight as far behind the Indder as pussible, the object being to act as a counter-halance to the weight of the ladder; by this arrangement it talies on more or less the form of an L-shaped lever. The stronger person should always be the onc beneath the ladder, while the heavier individual should generally hold on to the back.
The amateur should, in all cases of cloubt, attach a strong rope to the top of the ladder so that it can be contralled. The rope could he twisted round a crowbar or stout iron or wooden bar, which might rest aoross the window-opening, as by carrying the rope in this way it relieves the slack end of much of the pressure, although it makies it more difficult to pull up the ladder. When placing the ladder, care inust be taken that the top docs not damage the eaves or gutter, or any pait of the loouse. This is prevented by tying old sacking round the ends of the ladder, but mostly by care in raising it

Fig. 3 shows a useful type of ladder for giving access to a loft. When unt of use it rises up and is concealed by the trap door. See Attic: Loft; Step Ladder; Trestle.

LADDER FERN, The genus Nephro lepis, known as the lailder fern, includes useful ornamental ferns. The most popular in exaltata, which may be grown in greenhouse or room window if potted in a compost of peat, loam, leaf-mould, and sand. As a bnsket plant the ladder fern is exce!lent. See Fern.


Ladder Fern. Ornamental pot or basket plant

LADLE. A lad!e is a large sponn used for serving soup, sauce, and other liquids. Ladles are made of silver, electro-plate, and various
 alloys. Others are of china and earthonware, generally being made to match the
spring. They are propagated by sowing spores in pans of moist peaty and sandy soil in a cool greenhouso See Fern.

LADY GRASS. Ribbon grass and gardener's garters are other popular names for Phalaris arundinacea variggata, an ornamental grass, 2 ft. high, with green and white leaves. It flourishes in ordinary soil and is increased by division in autumn An annual, to which the name Pinalaris canariensis is given, supplies the birrlseed which is in demand by those who lieep enge-birds
Hy permission of the Director. Victorla a
dinner service and lit the sauce boats. Examplas of silver ladles are found dating from the beginning of the 18 th century. These inclurle ladles used for tilling glasses from the punch bowl, many of which had handles of whalebone or a dark wood. Some were ornamented by fitting a coin in a hole cut in the hottom of the bowl; but collectors should beware of spurious examples. See Cutlery; Sauce Boat; Spoon

Lad's Love. This is a name of the plant also known as artemisia, old man, and southernwood. See Southernwood

LADYBIRD. There are about 30 specics of the scarlet and black sputted beetle known as the ladybird. and all are of assistance to the gardener in destroying


Ladybird green $\mathrm{fl}_{\mathrm{y}}$. The larvae are known as garden crocodiles. The most common species is the scven-spotted ladybird.

The larvac live for a bout three weeks, hatching out from buff-coloured eggs laid underneath leaves, efterwards turning to pupae, and in ansther three wepks emerging as mature heetles. The crocodiles are each able to destroy hundieds of aphides in a short time.

LADY DAY. This is the name given to March 25, the reason being that it is the feast of the Annunciation of the Virgin Mary. It is a quarter day in England and Ireland, but not in Scotland.
LADY FERN. The name is applied to a very beautiful hardy ferm belonging to the genus Athyrium The actual lady fern is A filix-foemina; there are numerous fine- varieties. They thrive in ordinary soil to which leaf-mould has been added, and they like shade. Free watering is necessary in dry weather. The dead fronds should not be cut off until


Lady Fern. Delicate fronds of this beautiful hardy
fern, very suitable for indoor decoration

LADY'S FINGER: The Biscuit. To make these rich biscuits, take 4 eggs, \& lb castor sugar, and $\ddagger \mathrm{lb}$. flour, also 1 extra yoll: of egg. Work the yolks of the eggs, alter separating from the whitc, with the sugar until of a creamy appearance, and add the flour and any essence desired

Whip the whites of the eggs to a stiff froth and fold lightly into the mixture. Fold a shect of kitchen paper to make in it three divisions, lay it open on the board, and pipe the biscuits evenly in rows between the dividing lines. They should be 3 in . long by $\frac{1}{t}$ in wide. Cover them with sugar, lay the paper on a thick baking sheet, and bake in a muderate oven to a light fawn coluur.
To remove the biscuits from the paper, lay the whole sheet on a board or cloth wetted with hot water: the warm moisture will enable the paper to be peeled off without breaking the biscuits

LADY'S FINGER : The Plant. This is the popular namc for anthyllis, a rock-garden trailing plant which bears pea-shaped flowers in early suminer. It necds well-drained soil and a sunny place and is increased by sceds sown in late summer, or by division in autumn or spring. The best is Anthyllis montana, which has greyish leaves and rose-pink flowers. Another name for the plant is kidney vetch.

LADY'S MAID. The duties of a lady's maid vary, but she must be n good necd!ewoman, able to keep her mistress's cluthes in repair, to renovate or alter any garment, and to make from patterns or copy garments when required

In addition she will be expected to know something about hair-dressing, manicure, and face massage. Her employer's wardrobe is entirely in her charge, and she is responsible for its care and for the setting out of the toilette to be worn. She assists her mistress to dress, and may also be expected to do some of the finer washing, such as lace, gloves or evening handkerchiefs.

In many cases the lady's maid is a kind of travelling companion, whose business it is to look after the luggage, get the ticketa, and save her mistress from all the routine work of a journey, either by sea or land. Packing and unpacking are included in her work, whether sho accompanies her mistress or not. A competent lady's maid oan cominand high wages. See Packing; Servant.

LADY'S MANTLE. The name is given to a genus of hardy herbaceous perennials, Alchemilla, of which a few species only are grown. Alpina is a British native with silky hairs and leaves which are silvery on the under surface. It is about 9 in high, and suitable for the rockery.

LADY'S SLIPPER. The popular name of the Cypripedium group of orchids is lady's slipper Some of them are hardy; others need
grcenhouse treatment. The name ts derived from the shape of the lip or lobe of the blossom, which resembles that of tho toe of a lady's slipper. See Orchid.

LADY'S SMOCK. The name of Carda mine pratensis (cuckoo flower), a familiar wild plant with pale lilac-coloured flowers in spring. The double varicty is a pretty plant

LAELIA. One of the most popular forms of hot-house orchids is the laelia. The pseudobulbs must be placed in pots, pans, or hanging baskets in a mixture of peat, sphagnmm moss, charcoal, and sand. They should be watered frecly during the summer inonths, given plenty of sunshine and air. and kept at a temperature of about $70^{\circ}$. In winter the thermometer may be allowed to drop to $(3)^{\circ}$
There are many species and hybrids, with flowers that range in colour from white through pink and lilac to purple, and new sorts are produced every year by orchid growers. Propagation is effected by division of the pseudo-bulbs at potting time, or when new growth is dereloping. Sec Orchid
LAGENARIA. A hardy annual climbing plant, with bottle-shaped fruit, lagenaria (bottle gourd) is an excellent climber for covering fences, trcllises, etc, and belongs to the same family as the gourd ( $q$ v.) It is best raised from seeds sown in April in a hented greenhouse and planted out in carly June
LAGER BEER. Of a pale amber colour, bright and sparkling, full and pleasant in Havour and entirely free from acidity, lage, beer is not so strong as English beer, and contains a smaller quantity of alcohol. In brewing it, not only fewer hops but from 20 to 40 per cent less malt is used than in most English beers

Most of the Austrian beers have a mild and soft flavour, and it is rarely that any of then are as bitter as English pale ales. Pilsener beer, brewed at Pilsen, in Czecho-Slovakia, is exceedingly pale in colour as well as remarkably light. It is coven weaker than Vienna beer, but it has a sharp, almost medicinal, bitter llavour due to Saaz hops. See Beer.

LATD WORK: In Embroidery. Laid work is used chicfly in Chinese embroidery, for filling backgrounds and large spaces in designs, or when copying 17th century Italian work in which gold and silver thread are couched down with tiny stitches. A thread is laid. either following the outline of the design or in straight rows across it, or in some filling pattern when the background is to be decorate with laid work, or following the lines of the ground material.

Laid work is emploved for designs when the embroidery is wanted in high relief, and where the working medium cannot be drawn through the ground material in the ordinary way, as in the case of cords. chenillc, and


Lady's slipper. Flowers and leaves ol a lavourite greenhouse orchid (Cypripedium)
heavy silver or gold threads When em broidering with metal thireads this work has the advantage of using less of these expensive materials, ns they are not taken through to the wrong side of the fabric but only caught down on the surface.
Designs are frequently first padded all over by means of stitchery in coarse, soft crochet cotton Floral designs may have leaves and llowers stiffened or still further raised by means of cardboand shapes. The Iatter can be prepared by transferring the required portions of pattern on to a sheet of cardboard and cutting out the shapes with a sharp knife. Sometimes such cardboard shapes are pasted on to the fabrio to be embroidered : in other work they are stitohed over with the raised padding cotton to give a more raised effect. The metal thread is wound double on to a spindle; this facilitates the even laving of the thread. For raised designs in which the effect of satin-stitch is desired the double metal thread is taken backwards and forwards across the padded leaf, or other figurc, and secured on the opposite side with a tiny


Laid Work. Fir. 1. Simple couching stitch used in this form of laid work
back-stitch Laid work is employed for designs embroidered on leather, suède and felt, and also in conjunction with appliqué.
Couching Stitches. Several forms of laid work are accomplished by means of different ways of placing the laid threads, and variations in the couching stitch used. In its simplest form couching stitch is shown in Fig. 1, holding down the double thread. Such a stitch has been used for the gold laid wark on the embroidered cushion shown

Fig. 2. To keep the metal threads in position a little couching stitch has been worked across them at intervals of $\frac{1}{d} \mathrm{in}$. 'This design has not been raised by padding, but is laid down directly on to the black satin. In the central leaf ornaments the beauty of the design is made by the variations


L,aid Work. Fig. 2. Black satin cushion embroidered in gold thread couched down with small stitches in black silk
in laying of the goldthread with the veined coucls. ing in black silk going in acontrary direction.

In Fig 1 the couching stitch is shown in black, and is left rather loose so that the position of it can be plainly seen but in the actual work it is drawn duwn closely. so that it is almost in visible. It is quite permissible to work

To work, the laid thread can be caught down at the beginning to keep the end in position, then bring the working thread to the right side of material, after fasten ing it on the wrong side, just above the laid thread, which is on the outline of the design, draw the thread through, and put the needle hack under the laid thread in a perpendicular line. Now bring the point of needle through but set wide apart.
this stitch obliquely acruss the laid thread when working an ordinary outline, but when working couched filling, and over very round laid threads, as in the gold embroidery on the cushion illustrated, the stitch should he quite straight and uniform. In couched filling the stitches come exactly inidway between two stitches of the lirst round. ground material again about $\frac{1}{A}$ in. to the left, or large spaces such as bold fruit designs and just above the laid thrend, and draw through, conventional flowers.
when a perpendicular stitch will be seen across the laid thread. The illustration shows the needle in working position, and it will be seen that it is like is hemming-stitoh,

Scaled couching is formed with loops couched down in the centre, and arranged so that the loops of succersive rows begin in the centre of a loop of the previous row and linish in the centre of the next loop of the previous row, so making the forma. tion of scales.
In veined couching, when the first threads are laid in the form of leaf out. lines, these are often only caught down with a tiny stitoh on either side, but the veins are laid in a reverse direction to the foundation threads, and each vein is couched down as it is leid


Fig. 3. Showing laid threads couched down with oriental filling
with the stitch used in oriental filling and thus holds the first laid threads in place

Oriental Filling. This filling is an importunt stitch in laid work. Used for a back ground, it is illustrated in Fig. 3. It is shown, worked in silk, following the lines of the soft canvas groundwork, and it is worked here more open to illustrate the stitch better. The work can be done over the fingers, or in a frame for large pieces To work, proceed as follows: After joining the silk on the wrong side bring the needle up through the material to the right side at the lower edge of the design and pass it down again exactly opposite on the upper edge of the design. Bring the neeedle up again a little to the left of this lail thread, about $\{$ in. down. Insert the ncedle exactly opposite to the right of this laid thread and bring it out to the left again about $\ddagger$ in. down, as shown.

When it is drawn through, a little stitch will be formed across the laid thread. The needle is again inscrted to the right of where it last came out, and brought out again ou the left about $\frac{1}{}$ in down. Repeat the procese to the bottom of the thread, after which another thread is laid close up to the previous one, and so on in succcssion until the background is covercd closely so that no material is visible.

Diamond and Diaper Stitch. Other fillings are of threads laid with diaper stitoh, and also with diamond stitch. They are both used as embroideries for covering backgrounds


Laid Work. Fig. 4. Showing how the small stitch is made at the crossing of laid threads in diamond stitch. Fig. 5. Diaper stitch. showing position of needle at the second balf of the stitch

In the form of laid work utilizing diamond stitch the foundation threads are first laid in a sloping direction from left to right, the second lot of threads crossing these in the opposite direction. This is best worked in an embroidery frame to make sure that the threads are taut without being drawn too tightly.

The second process is the making of the little stitch at each crossing of the threadr. and this sets the diamond pattern. Fig. 4 shows this stitch in progress. The needle comes through material to the left of the crossing, and is put down again in a straight line to the right of it. With one movement it can be brought up again to the left of the next crossing. When the needle is drawn througli a little stitch is formed whioh holds down the two threads of the foundation.

In diaper stitch the foundation threads are also laid obliquely, first in one direction, then across the reverse way. The points of the crossings are then couched down with diaper stitch, whioh resembles cross stitch, but is mide and placed differently.

The first half of the stitch is worked acrona the junction of the two threads, letting it extend at each side of the main threads, so that it is a distinctive stitch in itself and not a little couching stitch only. The lirst half of the stitch runs parallel with the warp threads of the material, then the work is turned and the second half of the stitch
worked in the same way and parallel with the weft threads. Fig. 5 shows the second nortion of the stitch in operation Se: Embroidery.

LAKELAND TERRIER. In size the specimens of this breed are similar to the fox terrier, but in colour are fawny brown. The coat should be of a wiry texture and close.


Lakeland Terrier. Specimen of this tamay-brown wire-haired terrier., bred for fox bunting Ihoto. Thos. Fall
as these dogs are used for going to ground to bolt fox or badger. They are active and game, therefore must have sound and level leeth, strong jaws, and small eyes. The best weight is a bout 10 lb . See Dog.
LAMARCKIA. A hardy, low-growing annual ornamental grass, lamarckia has silky golden folinge, and when dried is useful for the purposes of indoor decoration Seed may be sown out of doors in springtime. The grass should be cut and dried during August.

LAMB: In Cooking. The flesh of the lamb is both delicate and digestible, and is of a lighter tinge than mutton when cooked. It takes longer to cook than beef or mutton, for, Whether it is roasted or boiled, every portion of the joint should be thoroughly done and frequently basted. When roasting lamb it is necessary to lower the temperature of the oven after the first 10 or 15 min . to prevent the flesh being scorched or hardened. Allow 20 min to each pound and 20 min . over. Roust lamb is served with clear gravy and nint sauce. New potatoes and green peas, when in season, are the usual vegetables. English house lamb can be obtained by the end of November or the beginning of December. Grass Inmb is fit for the table by April, and lasts all summer and enrly autumn.

When purchasing, one of the chief points to observe is that the lamb is fresh. To judge the fore-quarter, see that the vein of the neck is eitlier ruddy or bluish in colour : if it has n green or yellowish tinge it is not good. The quality of the hind-quarter can be determined by the feel of the knuckle and the state of the kidney; this latter must he small and perfectly sweet and the knuckle should be quite stiff: the Hesh should be firm to the touch. In foreign lamb, the best quality of Canterbury (New Zealand) meat is excellent if well cooked, but the joints should adways be of a clean appearance and the fleah a good colour.

Lamb is cut up first into hind and fore quarters, and these are again divided into legs, shoulders, loins, necks, and breasts. The pluck, known ns lamb's fry, is served as a brenkfast or supper dish, while the liver, heart, brains, sweetbrends, ears, tail and feet can be used in the preparation of side dishes.
Lamb Blanquette. This is an entréc composed of seallops of cold roast lamb heated
in a rich white sauce with the addition of mushrooms. Cut some thick scallops of ment from a cold roast leg of lamb, keeping each one as much as possible the same size and giving them a neat rounded appearance. The quantity required is about 1 lb .
For the sauce, melt in a stewpan $1 \frac{1}{2}$ oz: butter, and mix with it 1 oz flour. Cook theso together without browning, and then moisten with pint clear while stuck Add 6 oz . mushrooms which have been prepared and cut into strips, and a pinch of grated nutmeg. Stir over the fire for a few minutes, then add the ment and heat it in the sauce.
Bent together the yolks of 2 eggs with 2 ta bleapoonfuls of cream, remove the hlanquette from the fire, add the liaison and cook all gently 3 or 4 min . to take the rawness from the eggs and cream. Take care that the sauce does not boil after the mixture is added. Season with salt and cayenne pepper, and squeeze in a little lemon juice. Serve with cronttons of fried bread.

Chops and Cutlets. Before they are conked, lamb chops should be well trimmed and all skin and supertluous fat removed. They must be grilled or boiled, and served with a pat of maitre d'hôtel butter on each one. Sometimes the maitre d'hôtel hutter is omitted and plain butter is spread over, with a seasoning of pepper and sa!t and a good sprinkling of chopped parsley. Lamb chops are usually small, and it is well to provide sufficient for a second helping.

Lamb cutlets should always be cut and trimmed as described for mutton cutlets, and with all cutlets a good shape should be of the


Lamb Cutlet. Dish of cutlets fried in egg and bread-
first importance. They are good simply broiled and served with fried potato straws. After hroiling they need brushing over well with butter and plentifully seasoning. They nay also be egged, crumbed and friod, and served with a marnish of peas, or one cutlet as $n$ casscrole dish. For this fry the cutlets for n few minutes in butter, then remove them and cool the butter. When cool mix it with the
yolks of 2 well-beaten eggs and add seasoning. yolks of 2 well-benten eggs and add seasoning. into white breadcrumbs and laid in a casserole. Pour a little good geravy over them, add seasoning, 4 tomatoes cut in halves, and the juice of half $a$ lemon. Stew gently for $\frac{1}{2}$ an hour. Serve on a bed of pens and strain the gravy round.

Slices from the centre of a leg of lamb can be made into an excellent dish of cutlets if stewed with good stock to which has been added a bouquet garni and a little spice tied up in muslin. Stew the cutlets 20 min ., then take them up, skim the fat off the surface of the gravy and remove the bouquet and the spice.


Lambeth Ware. Lambeth Delft mug; with the arms of the Leathersellers Company, and ingcribed Bee Merry
and Wise, 1880

Thicken the gravy with butter and Hour made into a roux. and add 8 forcemeat balls, $\$ \mathrm{lb}$. mushrooms, prepared and fried in hutter, a pinch of ground mace and the yolks of 2 egga beaten with 4 tablespoonfuls of cream.
Stir the mixture of eggs and cream into the gravy and cook, but do not let it boil Hent up the outlets in the sauce, and serve them with some neatly cut beetroot. One ounce each of butter and flour would be sufficient to thioken I pint or more of gravy.

Lamb Pie. To make lamb pie, procure a neck of lainb, remove the chinc bone, and saw of the breast part, so that the bones of the cutlets remaining will measure only about 3 in. Separate those neatly and pare off any superthous fat. Put the spine bones and trimmings into a stewpan with an onion stuck with 2 cloves, a grated carrot and turnip, a few peppercorns, and salt. Cover with cold water and boil at least 1 hour to make stock. Place the prepared cutlets in a ment pie-dish, nrranging them in circular form round the side, aeason them, and fill the centre with peeled, uncooked, and rather small new potatoes or old ones pared and shaped in balls. Pour over these and the meat sufficient stock to three parts fill the dish. Cover with a rich crust as for meat pies, and bake $1 \frac{1}{2}$ hours When the pie is baked add more stock. and serve hot or cold
Lamb's Head. To make a tasty dish o lamb's head, remove the brnins, blanch and boil them, then chop them and make them ints) a forcement, adding the same ingredients as for veal stuffing. Soak, binnch, and boil the head with the tongue and the liver, if procur able. Cook gently for an hour, remove the bones, and lay the flesh neatly on a well greased Yorkshire pudding-tin. Skin the tongue and cut it into dice with half the liver: mix these with the forcemeat. Cover the Hesh of the heal with the mixture, and grate over a little lemon rind. Bake in a good oven for 20 min ., and baste it well with dripping.

With the liquor in which the head was boiled make a rich gravy, thickening it with butter and Hour and flavouring well. Dish the head with the stuffing covering it, strain the gravy round, and garnish with fried bacon and the remainder of the liver cut in thin slices. The bacon and liver can be cooked by the side of the head in the baking-tin. See Carving: Cutlet; Hot Pot; Mutton: Pastry.

LAMBETH WARE. A sharp distinction should be drawn between the two great classes of decorated pottery for which Lambeth is famed. For about $n$ hundred yeara after the middle of the 17 th century several factories in that vicinity produced glazed faience of the style introduced at Delft, in Holland. This Lambeth delft was painted in blue and other colours and comprised tiles, wine-bottles, oval dishes, candlesticks, and mugs.

Pieces much prized hy collectors consist of sets of six plates, each bearing a line of a daggerel verse describing a Merry Man. As this ware seldom has a factory mark, it is often difficult to distinguish from contemporary delft made nt Bristol or Liverpool, and even f́rom Dutch ware itself. A rosy tinge, showing up the dark clay body through the thin tin-enamel, sometimes helps to distinguish it.

Lambeth faience is n name given at the Doulton works to a form of art pottery consisting of $a$ coloured hody painted in decorative designs and fired under the glaze. See Delft: Doulton; Faience.

LAMBREQUIN. This word is now used tor a drapery, usually of embroidered linen or some rioh material, found on bed testers of the time of William and Mary and of Anne. The carved wood is closely oovered with the fabric, which is fastened on and elaborated by festoons of drapery and hanging tassels In some beds made to-day for period rooms this type of drapery falla from a wooden corona. The name Inmbrequin is also used for the Viotorian arrangement of festooned drapery on mantelpieces and over doors. See Tester.
LAAMBSEDN. Skins of young or pre maturely born lambs are tanned with the Heece on and treated as furs, which are used in the Near East to make caps, coats, and cloaks, and are also employed by western furriers Imitations are made in mohair yarn plush in cream culour for babies' woar as well as in dyod shades with ourls of different pattern, length and lusire. The fabrius oan
be washed like woollens, and the light colours cen be re-dyed to darker shades by the use of wool dyes. See Fur.
LAMB'S HETHUCE. Tho leaves of lamb's lettuce or corn salad, a quick-growing salad plant, are valuable in winter and spring. Seed is sown in late summer in drills 0 in. apart, the seedlings being thinnod to 5 or 6 in. from each other The fresh, young leaves are the best to eal.

LAMENESS. Many oauses may produce lameness, inoluding oorns, bunions, deformities of the feet or other parts of the lower limbs whether present at birth or aoquired subse quently through injury or otherwise, and diseases of the joints or of the nerves or muscles The symptoms should be investigated at once in any oase and treatment will vary with the cause. See Club Foot ; Foot : Hip Disease ; Infantile Paralysis.

## Lamps: Oil Gas and Electric

## Latest Ideas in Practical and Decorative Lighting

This contribution deals with the various forms of portable lamp, and also with gas and electric amps which are fexibly connected to the malna and may be moved from place to place. Other lghting articles Include Acerylene; Alr Gas: Burner; Electricity; Gas; Lighting: Oil. See also Bent Iron Work; Lacquer Work: Standard Lamp

The three main kinds of lamp used in domestio lighting are oil. gas, and oleotria. When oil lamps are used it is generally beosuse neither gas nor eleotrioity is available though some people profer them, especially for reading purposes, beoause of their soft light. Formerly vegotable or animal oils, suoh is colza and sperm. were burnt in them, but these havo now been superseded by mineral oil.
In an ordinary oil lamp the wicke by which the oil is suoked up from the reservoir and supplied to the llame are either flat or oircular: in duplex lamps two flat wicks are placod side by side. Whether flat or oiroular, the wick should be of a size to fit the burner exactly and long enough to allow of about 2 in . being coiled up on the bottom of the reservoir. When so much of it has been burnt away that its lower end only touches the bottom, the wick should be dis. carded and replaced by a new one. It should be kept trimmed as evenly as possible For this purpose it is tumed down until it is nearly level with the top of the burner, and then the oharred portion is gently rubbed away with a rag. This operation should be repeated every time the lamp has been usod. Cutting the wiok is rarely necessary.

In lighting a lamp, turn the wiok down low and wait a little time before turning it up again after putting the glass chimney in place, lest the glass be cracked by the heat. If the wiok is turned up too high the flame will smoke and not burn olear. The funotion of the chimney is to create a draught and supply the flame with sufficient air for proper combustion. By fixing a talc or glass shield, of whioh various
patterns are sold, on the top of the ohimney the current of hot air rising from the thame may be deflected and spread, and blackening of the ceiling a hove the lamp reduoed.
Some lamps are provided with a lever, whioh when pressed extinguishes the flame. In the ordinary type, when it is desired to extinguish tho light, the Hame should be turned down low and either allowed to go nut by itself or put out by blowing sharply across the top of the ohimney, not down it. Some times there is an arrangement whioh automatically extinguishes the flame should it be overturned or tited far from the vertioal.

Kerosene lamps should be kept sorupulously alean. The oil reservoir ahould be of metal not glass, beosuse if the lamp is knooked over, the glass breatos, and there is serinus risk of firo. The reservoir should be kept fairly full the lamp not being burat oontinuously for so long a time that the oil is exhausted. The older type has been superseded to a great extent by lamps in whioh an incandescen: mantle :s used.

Incandescent OII Lamps. There are several types on the market some in which a wick conveys the oil to the special burner, and others in which the oil is vaporised under pressure before mixing with air at the burner In the latter type a pump is incorporated in the reservoir, or an attachment is provided to which a small nir pump (e.g. a cyole inflator)


Lamp. Fis. 2. Preasure oil lams with rase in coloured elased pottery. Pis 8 Aaddin table lamp, in which a wiok convejs the oil to the special burner rlley Lamp Co.: and Aladdin Industries, Led
can be oonneoted when starting the lamp Figs I and 2 illustrate pressure lamps and Figs. 3 and 4 the other type. The pressure lamp: shown hrild enough oil for about 10 burning hours, and the makers state that a gallon of paraffin oil will give a light of 300 o.p. for 04 burning hours. The intensity of the light is governed by the air pressure at which the lamp is worked. The average candle puwer of the lamps shown in Figs. 3 and 4 is given as 80, and a gallon of oil laets about 70 hours.

Gas Lamps. When gas is spoken of in con nexion with the lighting of houses, the coal gas or town's gas supplied from public gasworks is usually understood To a limited extont: however. in plaoes where a publio supply is not available, other kinds of gas are employed suoh as acetylene and air gas. The former can be utilized in portable lamps for indoor use and a useful type of acotylene table lamp is shown in Fig. 6. Another type, whioh might be used in a shed or outdoor workshop. is illustrated in Fig. 0.
Those who rely entirely on coal gas for lighting are not debarred from using table lamps, since it is possible to obtain useful and decurative gas lamps which take their supply from n.gas plug point on the skirting, through a floxible metallic tube (Fig. 7) Their use calls for a certain amount of care in the disposal of the Hexible connexion, so that it is out of the way, and does not pull on the lamp. and the latter must bo placed so that its heat cannot cause danger to fabrics or woodwork.

Electric Lamps. In addition to the many kinds of electric flash lamp or torch, dosigned only for intermittent lighting, there are


Fig. A. Aladdin brackot lamp, shom. ing the incandesoent mantle, whieb produces a pare white ligat baitery oper. atcd hand lamps which will give continuous light for a few hours These are relatively expensive to work, since the dry bat tery ithust be oftcn replaced, so that electric hand lampa arehence a dapted rather for use in any emergency that arises.

Eleotric table lamps for flexible connexion to the mains are made in all styles, from $n$ desk lamp to the more ornate and decorativo types with suitable lampshades. The Sunray lamp shown in Fig. 8 gives out warnith as well as light.

Plug Points. When connecting or disconnocting a lamp at the plug point make sure that the switoh at the lamp and the plug are turned off. In a safety type of switch-plug (described in the article on l:lectric Light Fittings the switch is interlocked so that the plug cannot be withdrawn until the switch has first been turned off.

Vases for Lamps. Glass, metal or pottery vases, provided they are narrow at the neck, can be converted into table lamps by means of a cork, a piece of wire an electric bulb holder.
a plug. and a few yaids of flex. The cork is shajed to fit the neck of the vase and the piece of stout galvanized or copper wire can be cut to the required length by means of pliers or wiro cutters Failing these tile a notch in the wire and bend it till it parts at the notch. The ends can be sharpened by neans of a tile so that they will penctrate the cork after the wire has been hent in the middle to form the circular support for the bulb holder shown in Fig. 9, which remains in position by means of its lower ring, when this is screwed up tightly from below the wire circle. The electric bulb is then placed in the holder. The holder, flex and the plug, to fit the existing plug point in the room, can be obtained from any electrician.

The effect is particularly good when these vase table lamps are anitably shaded, and many helpful suggestions will be fuund in the article on Lampshades. It is often possible to repeat the design or part of the design on a pottery or china vase by tracing it on to a parchment shade and colouring it. Lovely lamps can be made from cut crystal vases of rounded shapes or even from those of plain glass when these are lilled with water dyed to a colour which is repeated in the design of the shade

LAMPREY. Similar to the cel in general appearance, the limprey is in scason during March, April and May. Lampreys are usually stewed in the same way as eels, or they can be made inton pic See Eel Fish

## Lampshades: Their Materials and Making

## An Arcictic and Proftable Occupation for Leisure Hours

Among the various articles in our work containing other helpful ideas In connexion wilth this decorative art are those on Appliqué: Candle Shade: Embroidery: Lacqucr Wor's Stencilling: Woodwork. Sce also Electric Light: Lamp. Siandard Lamp

In most liomes Inmpshadey arc an cssential decorative fenture. IV lien chosen with due regard to their surroundings they can grently aid the appearance of a roon by day, and are still more important by night, as they can be cleverly employed to make subtle clinnges in the quality of lighting effects Even where wall or coiling fittings are of metal and glass, parchment or silk shades are probably required for table lampa and standards. Artistic shades for ceiling fittings can also be made in simple pagoda and inverted whapes by the home worker, while many wall brackets are furnished with pendant lampshades or shiclds for candle lamps.
There is economical and artistic pleasure in producing for a trifling cost something that looks exactly right in the roum, and as if eapuecially designod at an cxpensive shop To achieve such a result considerntion must naturally be given to the particular lamp or fitting and also to the matcrial, colouring and atyle which will harmonize best with the particular surroundings. When redecorating a room, table lamps or floor standarils which have hecome shabby can be brought into the new scheme of things by restaining and


Iacp. Fig. 5. Acetylene table lamp. Fig. 6. Acetylene lampuseial for a shed or outdoor workshop. Fig. 7. Gaj lamp sopplied from a gas plur point through flexible metallic tubing. Pir. 8. Sunray electric lamp which gives ont warmth as well as light. Fig. B. Electric table lamp contrived from a narrow-necked vase
polishing, or into colour relation by being painted with cellulose, enainel or inequer brush paint Various idens fur the decorntion of lamps and shades to match are given in the articles on Lacquer Work and Lamp

Materials Obtalnable. The way of the Inmip shade creator is now cased by the great variety of practical materiala available for her assistance Ready-made imitation vellum or parchment paper shades arc vcry chcap in the smaller sizes and are also obtainnble ill n variety of larger sizes suitable for lloor standards. Packets of cut-out lamp shaclos in assorted shapes may he hought, or, for those who prefer to cut out their own slicets of imitation vellum and coloured parchment papers are sold. Special lampshade paper is also made for pleated shades and therc arc coloured strip horders. Wire frames are obtainable to suit all sizes and shapies in standand, pendant and gimbal fittings

For making-up purposes, galons by the yard in black and gold, to be sewn or cemontal on the edges of shades, and leather thongings or coloured silk braids for lacing then, are provided Glass ornamental drops for corners of pagoda shaped shades and brightly coloureal tassels of wooden beads in various sizes, silk cords and plain or shaded fringes are all obtainable as decorative furnishing touches.

There are also certain fancy mnterials cut into shapes and perforated for lacing with thonging. These materials have marbled, mother-of-penrl, or opalescent finishcs. A large assortment of lampshades with designs already transferred and only needing to be coloured are obtainable in many sizes. Separate transfers for designs adapted to various styles of decoration, mandarin and other inka and also lampshade colours, for painting on parchment or, with the correct medium, on silk, brushes for use with these, clear varnish and cement can all be either purchased or ondered in a good art department, or from firms which specialize in materials for this decorative work.
In practice it is often found that better quality Chinn or Jap silks are prefernble tn those sold for the purpose of Lampshade making. The latter are too thin to form a satisfactory basis for painting, or for trimming with rows of fringe Linen is nlso used nud is particularly suitable for shields to shade electric candlí lamps.

Pleated Paper Shades. Simple to make nnd yet most decorative are shades of pleaterl paper. They are popular for modern table lamps, either on a plain pottery vase shape. or for the wooden type illustrated in Fig. 1. A chnrming effect is obtained by employing two colours, one for the lamp, the borders, cord and tassels of the shadc. and the other for the pleated paper, which accent colours in the room. The part of the shade through which the light actually shines should be one of the beconing tints ranging from cream to npricot, or from pale pink to dcep rose. The exception is green for a reading lainp. On the mahogany lamp stand in Fig. I, the effect of peach-coloured paper, chestnut hordery and silk cord finished with brown and gold hearl tassels is dignified and uncommon.

Any gond quality of firmly textured nind yet finely grained paper will hc suitable for pleating A amall-patternel wall paper which answers this description can be used, but most makes are too brittle for successful pleating. The beat paper is of the same description as $n$ cream-laid or boud notepnper. The easiest bordering is one of the specially made stijps


Lampsnade. Fig. 1. Pleated shade lor mahogang table lamp. It is of peach-coloured paper bordered with chestnut brown ribbon a passe-par the pencil.
tout, but $a^{8}$ thin silk rib bon can be sewn on, as used for the shade in Fig. I, with a fine needle and sewing silk to match
When cut. ting the paper for a pleated shade, first measure the frame. Two and a half times the circumference of the base will be the length ol paper re quired for pleating, and two inches extra should be allowed for the depth. To get the required length. scveral widths of paper may have to be joined. They should Lo decorated and pleated first.

For this style of lampshade, either a plain border may be used for top and bottom, as in Fig 1, or a good effect is gained by applying two strip borderings in a broad and narrow width, the lower one about 2 in . from the base of the shado: or stripes may be painted in mandarin inks either side of a pasted gold border Cut-out motifs can be applied but these are not really so successful for this style of shade as the plainer borderings.

To pleat the paper, baving allowed any paste used to apply decoration ample time to dry, fold in sections of about $1 \frac{1}{1}$ in wide, pressing each fold down firmly with the thumbnail. The folds must be in concertina fashion and afterwards are folded again backwards and forwards to make them each f in widc. The pleats can, of course, be larger or smaller, according to the size of the shade. Pleating can be practised on a spare picce of paper to be sure that the size of the folds will give the effect desired.

The next process is to punch a row of small holes through which the cord or narrow tinsel ribbon is passed, about 2 in . below the top border of the shade. In some of these shades a lower row of holes is punched for a second cord and tassels. This ensures that the pleats will be held in place, and two rows look well when no other decoration is used The holes must be out an cqual distance from the edge of each pleat Before threading them, the lengths of pleated paper must be pasted together and the shade joined. Then the cord or ribbon is threaded through and the shade adjusted on the frame before drawing up, tying and finishing off with ornamental tassels or glass pendants.
Parchment and Vellum Paper Shades. The number of other varieties possible in paper shades makes selection quite difficult. Natural coloured vellum paper is attractive when decorated with a border or a painted design. For those who like to do as much of the work themselves as possible, white parchment paper or imitation vellum shades can be made from sheets of prepared paper.

In order that the shade shuuld set properly it is essential that it should be cut out as shown in Fig. 2, so that the paper used for the shade is a segment of a true circle. Whatever the size required, it should be carefully measured out for depth and cut in this way, with the help of a pair of compasses formed of a pencil, a short piecc of string, and a drawing-pin, to which one end of the atring
pasted on, or is attached while the other end is fastened to
pin tho paper at ita lour corners down to a flat-topped table, or a drawing-board, and mark out the segment for the shade with the compasses. If an elaborate design is to bo painted, it is ensier to decorate before cutting out Ordinary water colours may be employed, or lainpshade colours, or inks. The use of special lampshade colours facilitates putting in a smooth background if it is desired to colour the shade all over. Trace or draw in the chosen design. Work the background to $a$ finish before putting in the culours of the design. A little mediun is mixed with the lampshadc colour selected and a flat squirrel hair brush is used to wash in the backgmund. A swab of soft white rag is necessary to smooth the culour over the shade, wiping it off with a light, circular movement.
The use of the medinm and rubbing with the rag produces a good surface on which to finish the work. When the background is quite dry the design can be painted in. After this work has been completed the shinde can be cut out with sharp scissors and stuck together with strong lampshade cement. Weight


Fig. 2. Disgramshowing method of cutting one strip of paper or parchment used for shade. Fig. 3. Wire Irame for pendant lampshade, gi in. across base
the join until quite set, afterwards connccting up the design with additional touches of coluur. The latter operation is very essential so that the join does not show.

On a ready coloured paper effective designs can be outlined in black waterproof ink, and metallic bronze powders can be employed with the correct medium Map varnish can he painted over the shade when dry, leaving

Lampshade. Fir. 4. Empire shade for floor standard; it bas a reometrlcal design coloured in waterproof inks. Fir. 5. Varnished shade with oriental design in water colours. Fig. 6. Imitation parchment shade bound with leather thonging and decorated with coats ol arms orappropriate stencils can be
obtained. In the case of an oriental vase lamp the design on the base should be copied by tracing or adapted by frechand drawing on to the shade.

Whendesir. ing to copy the same de-
sign for a nuinher of work an unprofessional look. ncedle and silk by hand.

a border of dull gold paint halt an inch wide top and bottom, which makes a good finishi. This method of decoration is especially suit able for n lacquered standard lamp or for small shades in a room with lacquered furniture. Designs for Chincsc scencs can bo adapted from those employed for lacquer work,


Fig. 7. Inverted shade of vellum
paper for a ceiling fiting shades to be made of natural coloured vellum paper, the original tracing or drawing can be outlined in heavy black waterproof ink, and this-pattern can betraced under the vellum paper, which being oiled is semi-transparent and skows the design clearly through. This method, while facilitating the drawing for the amateur, does away with pencilled lines on the surface of the vellum paper, which gives the

Once the shades are coloured, and tho edges joined, making up is simple. For a pendant to be used on a bracket the shade is placed over a wire support as shown in Fig. 3 For a table lamp a gimbal litting is uned Turn the joined shade on its head, paste the wire of the top of the frame, and the lower ring in the нame way. Allow time to set, and then lightly stitch the wire rings to the frame. Take a pair of very sharl scissors and cut off any edges of the shade which come beyond the wircs, and then bind the wired edges with a fancy galon sewn on with a fine

The empire shade for a Hoor standard lainp. which is illustrated in Fig. 4, is loound with black and the geometrical design is worlied out in wine, yellow, green and black colourngs. This intereating design would suit a moderu wooden standard. Such ull-over de. signs lend themselves to painting with waterproof inks, as these are traneparent, leaving the natural vellum for a few of the lighter portions of the pattern To dilute these inks distilled water should be used, or rainwater, or water that has been boiled and allowed to cool. Do not use cold water from a tap. Sable or camel hair brushes are best for painting with in this nedium, the former for tine work The other empireshade shown in Fig. 5 has a delightful orientally inspired
landscape de sign. Moist tube water colours are best used for this type of work as they give a softer effect than any other kind of painting, while waterproof inks are best where brilliancy of tone is re quired, as in a hard, conven tional design This shade has been varnished with clear map varnish on con pletion.

An nttractive touch is given to a lampshade with a booder design if the vellum is treated with la
The colour should The oralour should be shaded from deep rose on to coarse needle and passed through the or orange at the top to a pale tint, as this shadc and round the divisional wircs Such a forms a delightful background on which the shade would look particularly well in a study design at the base of the shade stands out well. Applied designs may be used for these shades Very simple, but effective, is a border of frieze banding, cut out and applied to a tinted parchment shade, which is afterwards varnished. Clintz or cretonne floral sprays can be cut out and pasted on in the same way, but such decoration is apt to look spotty unless kept to borders leaving the light to shine through the softly-tinted parchment. Silhouettes are purchnsable in black and gold or can easily be cut out from black, silver or gold paper to make a good decoration In the same way coloured scraps may be used for nursery shades to form nmusing borders Charming colour effect is obtained by staining the electric bulb amber or orange with transparent glass painting colours.
Many-Sided Shades. Lampshades with many sides are cut to fit special frames. Fig. 6 shows a vellum shade decorated with coats of arms and laced with leather thonging. Having selected the frame, pieces of vellum paper are cut exactly to fit the sections, holes are punclied abuut $\frac{1}{2} \mathrm{in}$. from the edge of each


Fig. 11. Sbade in a special taucy material suitable for a cut placs lamp Courtexn of Welbb "Corbelt


Lampshade. Fig. 8. Quickly decorated shade; the parchment panels are bought ready lor colouring. Fig. 8 . Shaped panels with a marbled effect laced torether with leather thonging. Fir. 10. Shade with painted Jacobean design laced with fancy rold braid
eparate panel, and the thonging is threar shadc and round the divisional wircs Such a or library, and designs can becopied from book. plates. Fig 7 shows the same method of thonging utilized for an invertel shade. The decoration in this case is a geometrical design on the base carried out in cobalt blue, orange and black inks. The inside of the shade is painted orango.

Very quickly decorated arc parchment hades cut out in panels, perforated for thonging and traced for painting uith waterpronf inlis, as illustrated in Fig. 8. The correct placing and size of perforations is clearly scen here as a guide to those who wish to punch the panels for themselves. With the ready prepared panels the frame to fit must be purchased at the same time.

Other materials made up with thonging are obtainable in these shaped panela. The marbled cffect scen in the lampshade in Fig. 9 looks well on a pottery lamp, and also on a wonden standard, lacquered in the way described as marbling in the article on Lacquer Work. The inother-of-pearl and jade imitations are also particularly decorative in these fanoy lainpahade materials, and require little or no further ornament than the thonging, except in the case of a handsome shade like the one in Fig 10, which is of Pancy vellum with a watered surfacc. the pancla being laced tw the frame with a narrow gold braid instead of leather thonging The design, which is painted in inks to resemble Jacobean embroidery, is particularly effective.

The cut glass lamp in Fig. 11 has a beautifully accordant shade in a fancy material which resembles ground glass. The hackground is softly-tinted for a sunset sky, leaving a border of grey-green water at the base from which the reeds spring. The birds are painted in blue and brown, and the shade is thonged with silvered lenther.

Many-sided and dome-shaped shades can also be made up by sewing the varicus panels or sections to the divisional wires of the frame, and covering the ;oins with a fancy


Fig. 12. Painting a shade after the sectlons bave been stitched together to fit the canbric-bound frame
braid or gimp This mothod is a:so used for making up silk or linen shaides The frame must first be covered with nainsook or similar cotton materinal cut on the cross in strips I in witle All downward lines of the fiame are covered lirst. In Fig 12 n frame ready prepared is seen, and also $n$ shade stitched on to it cut to fit the various sections When the painting has been completed, the stitched joins wil! be covered with a light gold gimp.
The vel!um or ailk is tirst cut out a little arger than the divisional section of the frame. Taking one piece at a time, cut it nently to fit the ourved top of the frame Sow th:s piece on with blanket stitch, holding the thread with the left hand whice each stitch is being taken, to prevent ang knotting. Hating stitched round the ton curve. adjust the acctions of material neatly against the frame and cut round the base so that it exactly lits, and sew this also to the cotton binding Make these stitches about $\frac{1}{2}$ in. apart. Having trimmed the sides to the shape of the wire, leave this panel until the next one has been attached top and bottom, and then stitch the two panels together on to the frame These must not overlay, but just meet on the frame. Continue in this way until all the aections of the frame are covered, and then if a design is to be painted this may be done before stitching the braid or gimp on to hide all joins and to edge the shade. Cover the downward seams first and then the top and back. Panels may bave the designs traced on them before stitching to the frame, but in case of tearing a section during the process of sewing together it is better to do the actual painting after stitching has been done.
Some prefer also to sew on the gimp first, but there is little likelibood of tearing the paper while doing this if reasonable care is taken

In Fig. 13, prints of birds have been used to make the decorations of central panels for a set of shades bound with ribbon, which would look most attractive in a man's room.
Silk and Linen Shades. When making a silk shade in the manner just described, the binding on the frame nust be very tightly wound round the wire, so that it is impossible for it to turn or slip when the silk is sewn on. The silk should be cut to fit with the lines of the grain going horizontally. The panel section nust be pinned to the cambric bound frame, stretching the silk so that there are no wrinkles. Sew the two sides down with fine tight stitches and keep the matcrial very taut. Then sew top and buttom with rather less tension or the silk will sag in the middle of the panel Trim closely when the sewing is done and then begin the next panel. When the frame is covered bind it with gimp, taking care to sell this through to the cambric


Lampshade. Fig. 13. Group of shades with coloar prints of blrãs used as decorative panels
covering the frame. When. a coloured material is used for the covering the binding on the frame should match in colour.
Silk lampshacles may be trimmed with rows of silk fringe either arranged as a border or almost covering the entire shade. A drawing. room standard lamp may have a shade on which narrow frinyes, tintel in gradations from deep rose to pale pink, are sewn in zigzag lines round the top and likewise again at the base of the shade.

When covered correctly so that there is not a single wrinkle to spoil the surface silk shadea aro easily decorated with Inmpshade colours, using the special medium for painting on silk. Inks can be also used in flat washes and the shading and details of the design finished of with tube water colours. The dome-shaped shade in Fig. 14 has a charming conventionalized design on a mottled backgmund. The panels, top and base are ribbon hound. Such a shade would look well on a table standard in a drawing room.
Shields for electric candle lamps or wall brackets are made on small semicincular wire frames, which are first bound in the manner described, so that no part of the frame is visible, except the wire for fastening it to the electric light socket. Such shields can be of vellum, ailk or linen. The last-named is particularly attractire with a bordering design in brightly coloured wools. A medium conrse linen should be used. Tho stitches must be very nent on the wrong side, or they will not look well when the light shines through the shade. The embmidered linen is well pressed, interlined with thin buckram and lined with pink or orange silk. The edges may be left untinished and neatened after the work has been stretched and fitted to the frame. The shade must not sag in any way. Having pinned it on to the frame as described in the making of a silk shade, the edges are trimmed and oversewn with ornamental blanket atitch or turned in and sewn down with invisible stitches.

LANCASHIRE CHEESE. The toasting properties of Lancashire cheese form onc of its most popular attractions. This good quality is thought by some makers to be due to the fact that it is moulded when in a colder and more pasty condition than are other cheeses.


Lampabade. Fig. 14. Shade made of silk stretched on a wire irame and hand palnted

The great difference in the method of making Lancashire and other varietics of cheese is that it is made from curds of different ages, usually of three different days. Thus the acidity is developed more slowly than with other hard. pressed checse, and the mixing of curds at differont stages of acidity causes the loose, friable curd in the resulting cheese.

Lancashire cheese is usually made in two shapes, one of which is large and rather Hat, and the other like a small Stilton. The former usually weighs from 44 to 50 lb . and has a diameter of from 13 to 15 in . The smaller size usually weighs about 12 lb. has a diameter of about 7 in ., and is about 9 in. high. See Cheese; Welsh Rarebit.

LANCERS: The Dance. The lancers, n set or square dance, is an adaptation of thic quadrilles, and of English origin. For it at least four couples are needed, though occasionally six dance. Each couple faces inwards, the first (nearest the band) opposite the second, the third on the right of the first and opposite the fourth couple. Tho women stand on the right of their partners. There are five figures in the lancers, and the correct way of dancing these is at walking pace; but usually people onc-step, or fox-trot, or waltz. The first four figures open with an introduction of 16 bars of music, during which there is no dancing.
First Figure.
The first voman and second man advance to the centre, turn, and return to thicir places. The first and second couple advance and exchange places, the firat leading through the second couple. They then return to their places, the second couple in this case pasaing through the irst. This occupies eight bars. Set to corners and turn. Here all the partners separate and the men turn with the nearest women to the left. The movement is then repeated from the beginning three times, the second woman and first man leading off, then the third woman and fourth man, then the fourth woman and third man.

Second Figure. The first couple advance and valse round the centre for 16 hars and return to their places. The side couples divide and join hands with the first and second couples to form tiwo lines, top and bottom. The lines advance and retire. All turn their partners in their places. The figure is repeated with the second couple leading off, then the third couple, and then the fourth. In the case of the side couples the lines are formed at the sides, the first and second couples separating. Third Figure. The four women advance to the centre and wait. The men advance and join hands in a circle behind the women, while the latter curtsey and pass under their raised arms. The women place their hands on the men's wrists and alf dance round in a circle, finishing in their places- 16 bars. The four men then advance to the centre, turn back to
back, and bow to partners, who curtsey. The four men give their left hands across, put their right arms round their partners, and all cliassé round, finishing in their places. Thi women repeat their lead, and the men follow.

Fourth Figure. The first and second couples valse or one-step up and down the centre for 8 bars. They stop and are joined by the third and fourth couples respectively. In two groups of four they give the right hand across, woman to woman, man to man, then the left hand - 8 bars. They cross hands and swing round to the left- 8 bars; or half-way left and balf-way right. This is repeated, the first and second couples finishing with a different side couple. Third and fourth times side couples lead.

Fifth Figure. In this figure there is no in troduction except a prolonged chord when all face partners, present right bands and bow. All then lead off with the grand chain, which occupies 16 bars. Women walle round in a circle to the left, men to right, giving first one hand and then the other, going in and out until own partner is met half-way round, pause and bow, continue the circle until meeting own partner in own place. The first couple or top then lead off with a waltz or one-step down the centre and return to places- 8 barsfinishing in own place but facing outward Side couples fall in behind-third couple, fourth and then second, or bottom couples.

All chassé, cross over, women passing in front, men behind They return to the other side in the rame way, women following the leading woman, and men the rame- 8 bars. The leading woman turns off to the right, men to the left. lcaders up the centre, others fol. lowing- 8 bars. All fall back, form lines and advance and retirc, turn partners- 8 bars. Grand chain is formed again, after which the other couples in turn lead round. The grand chain occurs between each lead round. The figure finishes with grand chain or a general chassé round. See Dancing.

LAND: How to Buy. When purchasing an estate or a piece of land there are several matters that require careful attention. There must be a writing, signed by the other party, to evidence the contract; i.e. the purchaser requircs a writing signed by the vendor before he can sue him; and the vendor requires one signed by the purchaser. The writing need not be formal: it may be contained in a letter. The signature may be by initials, or even a printed bill-heading.
On an open contract, i.e. one not containing any express stipulations to the contrary, the vendor muat be prepared to show a good titlo for 30 years back in himself or his predecessors. He must also show a title unencumbered by restrictions. The vendor must next submit to the purchaser an abatract, or epitome of the deeds and documents of title, for investigation, and allow the originals to be inspected. If, on looking at the abstract or the deeds, the purchaser finds that the vendor has only a defective title, he can refuse to carry out the contract and clain damages. For this reason contracts are generally drawn up by solicitors, in which the purchaser bars himself in advance from taking certain technical objections; and binds himself not to claim damages if the contract goes off. The conveyance must be by deed. In all these matters a solicitor should be employed

The purchaser of land should always be careful to see if there are any easements or public right over it-such things as rights of way. If he is buying a farm, but without the minerals underneath, lie ought to be cautious how far he gives the mineral owner the right to let the surface down. A man who buys a farm must remember that if it is in the occupation of a tenant he will, if the tenant leaves, have to settle for tenant-right ; but if the owner is in possession there is no tenant-right.

Therefore a farmer or market-gardener who sells a farm which he both owns and occupies must make a special bargain with the purchaser if the latter is to pay for unexpired manurial values, standing crops, and the like.

The purchaser of land who intends to build a factory, workshop, or other business premises there will be wisc to examine the title to sec that it contains no restrictive covenants by a former owner which would prevent him from carrying on the business he wishes 10 start. Unless mineruls are expressly reserved by the reller, the sale of a piece of land carries with it everything underneath. As our ancestors used to say, the owner of land owns down to the centre of the earth and

## Landings: Decoration and Arrangement

## How to Solve a Difficult Furnishing Problem

## This article connects those on Hall and Staircase. to which the reader is referied, and also to such headings as Carpct; Linoleum: Wallpaper

It is probahly due to the difficulty of making landings and passages attractive that so little attention is given to their furnishing, except to hang pictures and ornaments that are considcred out of date and unsuitable for the living-rooms. This is quite disastrous from the decorative point of view, which requires hall, staircase and landings to form harmonious parts of an important section of the house which must be properly related to the whole.

Landings in terrace houses often present particular difficulty in furnishing and decors tion, owing to the narrow floor space and comparatively high walls. If added to these drawbacks darkness has a!so to be contended with, well placed lighting fittings, a large mirror which will reflect any natural light from windows, and a pale colour chosen for wallpaper, or painted panelling of hall, staircase and landing will help. In sume casos it is impossible to have any pieces of furniture on a landing except one piece that will fit into an angle. Corner cupboards arc most useful in this connevion Very long mirrors are better raised from the ground, and a chest, narrow table or some low stand with plants placed in front of them. In this way they give the same sense of space, but no one is likely to try to walk through them.

Treatment of Walls. High walls require careful treatment to make them interesting. In selecting the decoration for the hal!, which may be quite well lighted by a good staircase window, such as the one shown in.the first illustration, thought must be given to the landings above, which may be merely dark passages. In this instance the temptation to choose a heavy patterned tapestry paper or brown panelling effect which would not be suitable throughout has been resisted. Light artificial silk for curtains, plain tinted paper. deep cream paintwork and ceiling, the polisned surfaces of tloorboards, stair rails and chest, patterns confined to the oriental design of the stair carpet and the well placed pictures: all give $\boldsymbol{r}$ feeling of light and space. The landing appears furnished, though actually there is only room for the grandfather clock in the stair angle and the oak chest.

The halls illustrated in pages 574-575 may be studied for suitable ideas of wall decoration The applied landscape motif shown with a light marbled paper is especially suitable for repetition on narrow passage landings. When panelling, either real or simulated, is used for the hall it is possible to reduce it to a dado height for the staircase and landings. It is a good plan to fix a rail similar to a chair rail and to cover the lower part of the wall with the panelling. The upper part of the wall above the chair rail should remain light in colour. This is a suitable method of decoration where there is much traffic on staircase and landings. Where lincrusta panelling is used,
up to the aky. If land is hounded by a river or stream, in the absence of evidence to the of the bank, each taking to the middle of the bed of the stream. It should be borne in mind that in law a river or a pond is simply so much land covered with water. See Building: Contract: House.

LANDAU. This is a four-wheeled carriage. It has a divided top, so that the whole can be either open or closed. The word landaulette is sometimes used for a small landau, hut these carriages are not often scen to day. The diminutive landaulet, or landaulette, was sometimes used of a small landau or coupé See Carriage; Driving; Horse.
heavy this kind of stain is not so servicoable, as it quickly wears

Care is necessary, when dealing with landing flonrs that are polished, to see that no lonse mats are placed near the top of the stairs This difficulty can be overcome by sewing special press-stud fasteners to each corner of the mat; these clip into fasteners that are screwed into the floor. The landing lloors of old cottages are often very worn and irregular. Fibre matting and dyed string carpeting are both suitable coverings in such cases.

For upper landings in a sunal! house a piece of oak, which furnishes a passage without overcmivding it, consists of four drawers on a raised stand, surmounted by a large but shallow cuphoard. Where space is limited, a corner of the landing may be fitted with a hanging wardrobe. Houses not providel with hot linen cuphoards will need some gool store for linen, and where there is sufficient room the upper landing is a most convenient place for either a large chest of drawers or a cupboarl, in which to keep linen, provided it is placed against a ilry inside wall.

Larger Landings. Roomy entresul landings give more opportunity for the effective placing


Landing. Fir. 1. Small landing, rendered individual by the curved stair-head, polished oak chest, and grandiather clock set in an angle of the stairs. Fig. 2. Wider landing into which extra light penetrates thrgogh the glass-panelled doors of the sitting rooms which open of it

Fig. 2, Humplirey \& Vera Joel
of a few pieces of furniture, more particularly if thore is a good wide window across the recess. A window seat upholstered with cushions covered in cretonne. printed linen, or artificial silk, and matching the curtain fabric, gives a restful appearance, while a book table is both useful and attractive. Such a space may often be converted into $n$ small extra lounge if a radiator is placed behind a grill under the window seat for winter use. Either side of the recess hookoases inay be fitterl, stepperl in modern fashion, with the addition of
one or two amall easy cliairs, a brightly coloured rug, which tones with the curtains and staircarpet such a landing can look most inviting from the entrance hall

For a squarer type of firat floor landing the second illustration shows the possibility of achieving brightness and a spacious fecling by means of glass panelled doors through which the sitting rooms on either side are visible. The glossy light-refecting texturcs chosen for the upholstery of the cleverly designed divan. for the foor coverings and painted walls, together with the well placed anglel glass lighting fixtures, decorate and furnish this landing space without any crowding or superfluous ornament.

Country house landings are usually easier of treatment. They are either definitely light and spacious or intended to be somewhat cramped, full of the nooks and corners made by the inequalitics of floor boards, odd steps, and cross passages. In the latter case, as much light should be admitted as possible from the casement windows, and heavy curtains or jutting out of pieces of furniture should be avoirled. Niches are nearly always effective on landings and provide a safe place for a Hower base, well coloured piece of pottery, or lamps. Any niche or recess lined with mirror glass in oblong sections will reflect the light decoratively.

LANDLORD. Neither the landlord nor the tenant (except in the case noted below) is bound to repair a house unless he has contracted to do so. A tenant is liable for waste, that is, for damage done by him or his family to the house.

If a landlord has agreed to repair, he cannot be sucd on his agrecment unlcss the tenant has given him notice of the want of repair, and he has failed within a reasonable time to put it right. But a tenant is liable without notice from the landlord, because he is on the spot and can see when repair is necded

Rent Restriction. A landlord can always suc for his rent, and can distrain at common law, but under the Rent Restriction Act he must first get leave from the county court. The same act limits the rent which a landlord may charge for houses within the Act to the standard rent, that is, the rent at which the premises were let on August 3, 1914, or the first let thereafter, plus certain increases up to a maximum of 40 per cent. of the standard rent. Notices of these increases must be given

The Housing tct, 1925, imposes on the landlord of working-class property a liability for repairs, and he cannot rid himself of this liability by making any special arrangement with his tenant. The act applies to houses in London let at $£ 40$ a year or under, and houses elsewhere let at $£ 26$ or under. There is an implied condition that such houses are in all respects reasonably fit for human habitation when let. There is also an implied condition that the landlord shall keep them so fit during the tenancy.

If the house is let for a term of three years or more on the terms that the leasec will put it in repair, these conditions do not apply, unless the lease is determinable, at the option of either party, before threc years.

In the casc of such houses as above, the local authority, if satisfied that repairs are needed to make a house fit for human habitation, may serve a notice on the landlord requiring him within a certain time specified in the notice to execute all necessary works. The time named must be a reasonable one, and not less than 21 days. The landlord has an appeal to the Ministry of Health. If he fails to do the work required, the local authority may do it and ane the landlord for the expense incurred. The name and address of the local medical officer of health and of the landlord must be written in the rent book or given in writing to the tenant of a house that comes within the Act.

When premises are dangerous or injurious to health, the local authority may make a closing order, and if the tenant has to remove, the landlord is liable for his removal expenses See House; Lease; Rent.
LANDRAIL. A plunip delicate small bird, the landrail, commonly called the comerake, is in season from August 12 to the middle of September. It is usually roasted. When
trussing, draw the head under the wing and skewer the thighs close to the sides. The hird should be plucked, drawn, and wiped inside with a cloth dipped in hot water, and before trussing lay inside a good lump of butter with a little clopped shallot and parsley. The time varies for rossting from 15 to 20 min , but the bird must be well basted Serve with rich brown gravy, on fried crumbs.

## Landscape Photography <br> A Fascinating Branch of a Popular Hobby

In addition 10 a general article on Photography our work has articles on various kinds of photography, e.g. Colour Photogra hy, and on the choice and use of photogriphic apparatus, e.g.
Fur satisfactory landscape photography it satisfactory alternative, particularly if the is almost essential to have a camera which has photograph is to lie taken with the camera a focusaing sereen or a direct vision fincer and one that can be set upon a tripod for time exposuros. The camera that posseases only the amall so-called brilliant view-finder is almust useless, for the picture which can be seen in it is not only mislexdingly bright, but it is far too small, and rarely shows accurately what will be found on the plate. The hest help) in composing a phutographic picture is given by a focussing screen with a hood

Composing a picture photographically means nothing more than selecting the best view point. To do this it is necessary not only to see how it looks to the eyes, but what the camera sces-which is a very different thing. The eye will miss objects in the foreground which, on the focussing screen, will be found to be too prominent, or to he out of focus lecanse they are tou near the camera. An insignificant bush, or even tall, waving grass may cover part of the plate with an out-offocus blur. With a brilliant view-finder they wou!d not be noticell, and the photograph would be spoilt. If the camera has no focussing screen, a direct vision finder, through which is seen the actual portion of the view which will appear on the plate. provides a fairly

ald at the level of the eye
The size of the camera is largely a matter of convenience. Such good lenses can be obtained with the modern small camera that satisfactory enlargements can be made from $3 \frac{1}{2}$ in. by $2 \frac{1}{2}$ in negatives up to 12 in. by 10 in . Ā good tripod is essential in order that lengthy exposures may be given when occasion requires. A light aluminium one is best if much tramping about the country is to be done. It should be fitted with a ball and socket head so that the position of the camera itself may be adjusted without having to move the tripod legs with every chanye of position.
The amateur will find it best to use ortho. chromatic plates or films if he does not use panchromatic, which are generally preferred. Whichever he uses he should have one or two light filters to resider the different tones If he uses panchromatic plates or films, light filters are essential. The advantages of panchromatic plates or films are explained under the heading Panchromatic.

Only flat, white, toncless skies can be obtained with ordinary plates or films. Even if brilliantly lighted clouds are not present the tone value of the aky will he better represented on orthochromatic or panchromatic plates. No sky is completely toneless, whatever the weather conditions, and a photograph which represents it as a blank white space is false and inartistic.

For photugraphic purposesall landscapes should be viewerl as series of different tones. The beginner is very apt to he taken with the beauty of the colour in the view hefore him, forgetting that the camera can only record the colours by monochrome tones of varying depths.

Some Useful Hints. The following hints will he of use to the amateur in landscape. hut he should remem ber that the best reaults are only to be olitained by practice, by cultivating an eyc for the composition or making of a picture. by severc criticism of his own photographs, and by the study of the work of others.
A common failing is a lack of sharpness of detail in the foregrour:d of a photograph. The
eye insists that objects near at hand should be sharp and clear to bre convincing or satisfy ing Fuzziness or woolliness of fore ground objects betrays enrelessness in the photographing, or failure to observe that some objects are too near the camera and out of focus. This does not mean that every object from the fore ground to the farthest distance should neces. sarily be sharp and hard. An all-over sharpness destroys the ntmosphere of the pic ture and brings its distant parts forward in an unpleasing fashion Do not thore fore atop duwn the lens two much in an effort to get sharpness.

Do not attempt to get too much on the plate at once Con Hicting interesta particularly should be a voided, as scen, for example, in the photograph reproduced on page 431. A primary rule in composition of any kind is to concentrate the interest. Everything in the view chosen should therefore be in harmuny with, or subordinate to, some main feature. The view point should be shifted until the best possible composition is obtained.

The eye should the led on from the forcground through more or less clear iniddle distance to the more distant part of the scene, which should be comparatively soft. The best method is often that knuwn ns differential focussing, which, with molerately good lenses, gives very pleasing results. This means that while the foreginund is moderately sharp, the focussing is so arranged that the more distant parts are progressively, though perhaps alightiy, out of focus Thus the planes of a picture can be separated and a feeling of distance gained.

The aninteur should not be nisled by the grandeur of a great open space or of towering hills. Thoir small size in the resulting photograph is inevitably disappointing unless something is contained within the photograph to suggest distance or height.

The foreground of a landscape photograph should always have something to concentrate the interent and lead the eye onward. An example of this is seen in Fig. 1, where the cart tracks and sun on the beeches are the principal points of interest in the foreground. This is also a case of differential focussing. Had the trees in the farthest distance been as clear as those in the foreground all sense of depth in the wood would have been lost. Another method frequently adopted in huilding up a landscape photograph is to get the foreground intereat and to make the distance recede by using trees as a frame. An example is seen in Fig. 3. This framing effect is the secret of much of the charm which photographs of scenes thmugh archways often possens.

Finally, the amateur landscape photographer will be well arlvised to attempt no photographs unless the sun is shining. Grey weather inevitably gives grey and flat photographs : the best times are perhaps early morning and Inte afternoon, when the shadows are long and the light contrasts are great. At these times a suggestion of mist softens distances.

LANGSHAN. This is one of the best all. round breeds of fowl, noted for comhining goud laying with excellent tahle qualities. Though


Fir. 2. Open landscape view from a hill-top in which the eye is led from the foreground by the chalk road. Distance is kiven by differential focussing. The three subjects reproduced are from panchromatic plates
principally bred in black, there are white and blue varieties, the plumage of the first-named being of a heautiful metallic green alieen.

It is conspicuous by its stately carriage, and the legs are slightly feathered, the feather line running down the outside of the legs to the toes. The hens are quiet and docile, making reliable sitters. and they lay a good-aized dark brown egg. The hardiness of the breed adlapta it to all climates, pos
also does excellently in contincment. See Fowl; Poultry.

LANOLIN. Lano. lin or hydrous woolfat, which is obtained from sheep's wool, is a commonly used basis for ointments. As it is readily absorbed through the unbroken skin, drugs to be absorbed through the skin, especially mercury, are frequently incorporated with it. Lanolin is softer than ordinary woolfat, and as it penetrates into the skin it is a favourite basis for wrinkleremoving creama, skin foods, etc.
LANTANA. A shrubby plant, with verbena-like flowers of various colours, lan. tana is suitable for the greenhouse and for planting out of doors for the summer months. In autumn the plants must be lifted, potted and kept in a heated greenhouse. A conipost of loam. leaf-mould and sand is suitable. Propagation is by cuttings in August ; if repotied in spring they will be ready for use in summer flower beds early in June. The tops must be cut off to in duce the development

Fir. 3. Tree used as a frame for a view from a billside. giving botb foreground effect and throwing distance into proper perspective

of side shoots. If the plants are kept for several years they should be pruned and repotted in spring.
LANTERN. A lantern is a transparent case enclosing a lamp or source of light, and it is found in numberless designs and types. The Chinese lantern, made with decorated paper and provided with a candle or nightlight, lends itself also to illumination by electric lamps. The hall lantern lighting fitting, examples of which are seen in pages 415 and 520, is commonly made with inserted panels of glass, suitable for gas or electric light, as well as oil lainps or candles.

The bull's-eye lantern has a small lens that throws a concentrated beam of light to a considerable distance. These are usually made with a device to cut off the light by turning the top. which turns an inner piece shaped like a tube and pierced with a hole for the passage of the light: thus when the tube is turned the light is obstructed.

Various types of folding lantern are anitable for campers and for holiday purposes, as they can be packed into small compass: they are available for oil or for candle illumination. Magic lanterns are optical projectors

The first attention required with lanterns is to keep them clean. This applies to all types, but more particularly to those in which paraftin oil is the illuminant. Paraffin has a natural tendency to croep and cover everything with a film of oil. and unless this is removed with $a$ dry cloth the lamp will smell in an objectionable manner, and the light will also suffer. The wicks should be kept well trimmed by amoothing them with a piece of Hat wood wiped over the top of the wick when it is just above the level of the wick tube. To get the beat illuminating resulta, the glasnes must be kept in a perfectly clean condition

LANTERN SLIDE. A lantern slide is a photograph on glass intended for showing on an enlarged acale on a screen by means of an optical or magic lantern. The standard English size of a slide is $3 \ddagger$ by 3$\} \mathrm{in}$. Plates of this size are sold coated with lantern or transparency emulsion. They may be obtained of either gaslight or bromide emulsion.

Lantern slides are made from photographic negatives. If the negative is a small one, or if only a portion of a large negative is to be utilized for the lantern slide, the latter is made by contact. The negative is placed in an ordinary printing frame, a sensitive lantern plate laid film to film with it, and, after the two have been pressed firmly into contact by apringing in the back of the frame, the negative is exposed to the light of an electric bulb or incandescent gas for a time ranging from a second or so to several minutes, according to the density of the negative and speed of the lantern plate.

If the whole subject of a larger negative is to be included in the lantern slide, the reduction process is used, the large negative being photographed on to a lantern plate, using any convenient camera. A usual plan is to fix the negative in a frame attached to one end of $a$ board; at the other end the camera is secured by means of a screw passing through a slot in the board, so that the position can be adjusted for focussing. The plate is then developed, fixed, washed, and dried
Formulae for the solutions are given in the instructions for every commercial lantern plate. To complete a lantern alide, a black paper mask is attached to it so as to cut off some of the margins, and give an exact shape to the picture. Two white paper disks, about $\frac{1}{} \mathrm{in}$. diancter, are stuck on the part of this mask above the picture. They are required as a guide to the lanternist when showing the slides. A clean cover glasa is bound to the lantern slide with a gummed strip of paper. See Gaslight Paper: Optical Lantern; Photography.

LAPAGERIA. This is a Chilean evergreen climbing plant with slender stems and bearing large rose-red or white drooping tubular Howers in spring and early summer. It likes cool conditions and thrives in a greenhouse facing north or east. A winter temperature of 40-45 degrees is high enough. In mild districts it can be grown out of doors on a partially shady wall. If trained on wires beneath the greenhouse roof it is very beautiful when in bloom.
LAPDOG. Among the small pet doga fav oured eapecially by women and often termed lapdogs is the King Charles spaniel (q.v.), the pug, the toy black and tan terrier and the Yorkshire terrier. The first-named is the black and tan variety of the old English toy spaniel, the others being the tri-colour, ruby, and Blenheinn, which has rich chestnut red markings on a white ground.

In later times the Pomeranian came into fashion, at first too big to justify the appellation lapdog, as well as the Brussels grifion which is quite small. The little Japanese at one time looked like becoming very popular, but was nusted by the Pekingese. Attempts have been made to acclimatize the papillon, or buttertly dog of the Belgians, so called from the characteristic shape of his ears. See Dog.
LAPEL. The lapel is that part of the breast of a coat or overcuat that is turned back.

The exact size and ahape of the lapel, both on men's and women's coats, varies with the fashion, but their corrcet set is one of the marks of good tailoring.
LAPIS LAZULI. This is a mineral which has a very beautiful azure or ultramarine blue colour. Sometimes the stone is Hecked with white spota and bands. It takes a good polish, and is used for ornaments and for chains of beads In jewelry it is best suited for daytime wear, as it appears almost black by artificial light.
LAPPED JOINT. In the simple form of joint known as lapped joints, one part overlaps the other, and the tivo are glued or nailed together. The lapped joint has been developed in manv directions, as, for example, the


Lapped Joint. Showing how to set the two parte ol the tramework square and true before bammering in the naila
lapping dovetail, in which the overlapping portion is dovetailed to the other portion. A lapped halving joint is one in which the one piece overlaps the other, and half of the substance of each is cut away so that their surfaces are Hush
Assuming that an ordinary lapped joint is to be made at right angles, the angle may be attained by the use of a square, as shown in the illustration The upper piece of wood is set in place by the edgc of the square, which is applied to it as a guide. The first nail is then driven and the accuracy again tested with the aquare, and if all is in order the jointing is completed by driving the remuining nails.

Screws are put in on the same system, but in this case the gimlet is used to make the hole for the acrew. and the work tested as before. In cither case the parts can be adjusted by tapping them with a hammer or inallet th set them square after the first fixing has been made. as the two parts of the joint wil then huld together by the friction between their faces.

When a square-cornered frame is to be made, as for a packing case, it is preferable to make the joint between two ends first, thus making two L-shaped parts, and then to join up these two, rather than to attempt to join up all the corners and then to expect them to come square. If the former inethod is followed it is known that the two opposite corners are syuare, and it is then an easy matter to adjust the remaining two corners. See Amateur Carpentry; Dovetail Joint; Juint, etc.
LAPPET, The name denotes the process by which the goods are woven on the lappet loom, fitted with a special attachment. Lappeta are cotton muslin with white or colnured dots. sprigs, or other simple designs formed by one continuous thread, and lonking as though they had been embroidered on the cloth. They are considerably chesper than muslins embroidered by a separate machine. Lonse ends of thread are left at the end of each pattern. They are used chiefly for summer wear and are suitable for windluw curtains.

LARCE. The common larch (Larix europea) is a hardy non-evergreen tree which is ornamental in spring, when the young growth contrasts with the brown trunks and red cones:
it reaches a height of 70 feet or more It is good as a plantation lree, apart from the value of its clean, straight stems. In damp sites and on stiff soil it is particularly liable to the attacks of a fungus.

A closely related tree is the golden larch (Pseudnlarix kaempferi), so called because of the antumn leaf colouring.
Uses of the Wood. The heart-wood of the European larch varies from a yellowish white to a reddish brown, and is usually atraight grained. Its lightness and durability have brought it into use for alecpers, pit propa, scafold poles and ladders, wnile in carpentry it has the merit of being compara. tively free from large loose knots. Its straight stems are welcome to the flower gardener for pergolas and arches or rustic hridges. Old pieces of larch with the base charred, creosoted or otherwise treated with a preservative, last many years. See Arch; Wond.
LARD. To be genuine, !ard should be clear nnd colourless, but firm to the touch. It is ubtained by melting in a pan over boiling water the inner fat lining of the pig, and also the fat surrounding the kidncys. As it melts it should be poured off, leaving the sediment. It is used for making cakes and nastry, either alone or mixed with butter. For all kinds of light frying, lard can be employed with advantage
It is frequently adulterated by the aclmixture of the fat of other portions of the :ig, also with veal and mutton fat. Laid should be kept ill a conl piace in a covered dish. S'ee. Dripping: Frying.

LARDER. In country and the larger types of town houses larders are often allotted a good floor apace In some of the modern houses they are replaced by a ventilated food store, which is practically a big, well arranged cupboard, augmented by a refrigerator. In very small flats perishable food is kept in a meat safe, and storage room is often merely supplemented by a kitchen cabinct and vegetable rack. Wherever possible, a baby refrigerator should also be installed.

When the larder is separated from the kitchen it should be placed conveniently near. A northern aspect is always desirablc, as it is essentially a cool room. If the larder has two windows, one may have glazed glass panes and the other be covered with a tine galuze wire or perforated zinc to exclude flies and dust, and allow free access of freah air. If there is only one window, it should be kept open with a piece of white muslin fastened over it, which can be secured with drawing pins. The window sills may be lined with tiles or have fitted porcelain enamel covers. The ceiling should be whitewashed, and the Huor of concrete, red tiles, or Hags. The walls should be tiled, or, failing this, they can be cither distempered of painted with sanitary paint or plainly whitewashed. If there is not sufficient ventilation by means of windows, it is a good plan to have a few perforated bricks let into the wall, and the panels of the door replaced by sheets of perforated zinc or wire gauze.

Suitable Equipment. The larder must be well equipped with shelves. Many modern larders have shelves of slate, marble or stone. Fixtures should include strong iron hooks fixed from the ceiling or hanging from iron rods running from wall to wall. Small hooks should also be fixed to the shelves.

In a good sized larder there may be accommodation for vegetables, which may take the form of either special wooden rack shelves or a wire rack hanging from the wall. Some wire covers of different sizes for covering cold meat are nccessary, and a few hanging meat safes consisting of muslin stretched over wooden hoops will be useful, also plates, disher and basins and a large carthenware
vessel for milk. A piece of muslin weighted by beads at the corners should be provided for covering the milk. Butter should be kept in a butter cooler, or in a bowl of salted water.
In a small house or flat where there is no special larder, and a cupboard has to do duty. it is best to set aside certain shelves for fresh foods and to cover such shelves with American cloth, or, better still, with slabs of slate. Meat must be placed in a special small safe. The table safe described in the article on Kitchen is the most suitable for a larder substitute.

Perfect cleanliness is essential in the larder, and the floors and shelves should be wiped daily with a damp cloth When thoroughly cleaning, all food should be taken out and the woodwork or floor scrubbed with hot, soapy water to which some disinfectant has been added. See Kitchen; Refrigerator; Store Room, etc.
LARDING. The process of larding consists of running strips of fat bacon through meat by means of a larding needle. Diy portions of meat, such as the breast of poultry, beef fillet, liver, etc., are those most usually larded. A special kind of bacon can be bought for the purpose, but if preferred the fat of ordinary bacon may be used. The strips, which are usually about 2 in . long, should be threaded through the needle and the latter put in rather deeply across the grain of the meat. A small stitch only should be made and an equal length of fat left at each end. About in in. should be left between each stitch.
The Larding Needle. This is a length of hollow, graduated steel. The thin end is pointed and the thick end is slit into four for the purpose of holding the strips of larding bacon called lardoons. These needles vary both in size and length and are from about 5 in . to 9 in . long.
LARDIZABALA. An evergreen climbing shrub, Lardizabala biternata is familiar chiefly to dwellers in the south and west of England as it is not hardy in cold districts. It should be planted in spring or autumn in well drained loam, peat and sand. Its purple Howers are borne in early winter, and it may be propagated by shoots struck under glass in autumn. It is chiefly suitable for the greenhouse.
LARESPUR. This is the name popularly used for the annual delphiniums, of which there are some beautiful varietics. The pink larkspur is particularly attractive. Seeds are sown out of doors in April when the plants are to bloom in summer. See lelphinium.

LARVA. The term larva is applied to an insect emerging from its egg-stage in the form of a caterpillar, which may devour the foliage, stems, or roots of plants. Although most of the damage to crops results from the activities of larvae, the prudent gardener will not fail to wage war against the adult insects, be they beetles, moths, or butterflies, because it is during this stage that they deposit their eggs upon growing crops. See Insect; Insecticide.

## LARYNGITIS

 Inflammation of the larynx is caused mainly by cold or excessive use of the voice, the chief symptoms being

Latch. Fig. 1. Mochaniam of the secret latoh. Fig. 2. Gate latoh with part of woodwork cut away to show structure of latch. Fig. 8. Gothic lateb for an ontrance door. Fig. 4. Thumb lateh combined with door-handle
and hinged, and on this the bont is tashioned. The leather inner sole is placed upon the bottom of the last, and the boot upper, all ready and sewn together, is tacked to the inner sole, thus fashioning the upper to the shape of the last and forming the base for the middle and for the outer sole.

Lasts are made in all sizes, with as many as eight different fittings or sub-sizes to each size. Regular customers of a bootmaker frequently prefer to have their own last, in order to ensure a perfect fit. The foot is measured with a tape or a pedometer, which gives such exact measurements to the lastmaker that he can produce a perfectly anatomical model of the customer's font in wood. Plaster casts are often used for a crippled or otherwise abnormal foot. See Boots.

LASTING. Exceptionally firm, strony an ll heavy cloths resembling linings are known as lastings. They are generally black, but can be made in other colours. House boots and slippers are sometimes made with lasting, instead of leather, uppers. Hard, smonth and unstretching, lasting is useful for the binding of account books.

LASTREA. The shield, male, and buckler ferns belong to Lastrea (nephrodiuni). Most of them need greenhouse culture, but a few are hardy. The indoor species need a penty soi! and a shaded corner of the greenhouse. Hardy kinds are best when grown in a shady corner in soil to which leaf-inould has been added. The common inale fern, of which there are many beautiful varicties, is Lastrea (nephrodiun) filix-mas. I'ropagation is by spores sown under glass

LATAKIA. ( )ne of the most costly items in the totacen blender's store is the dark, almost black, aromatic leaf which is grown in the neighbourhood of Iatakia in N. Syria. It imparts a distinctive Havour to the more expensive mixtures sold in Grent Britain, and also makes for cool smoking, but it is not liked by all smokers, and consequently retailers generally supply mixtures without latakia as well as with it. It is treated by fumigation before it is ready for the market. See Tobacco. Pron. Lat-a-kec-a.

Latania. This is a grcenhouse palm with bright green, fan-shaped leaves. It needs the same treatment as kentia (q.v.).

LATCH. The latch is a device to keep a door winclóis; or other movable part closed. and does not as a rule reøuire a special key. as in the casc of a lock. Simple latehes are made in the form of a pivoted bar that drops into a slot, other forms being actuated by a handle or a spring. Some varicties combine the functions of a latch and a bolt ; several types of spring lock are known as latches, such as the night latch, which is closed by shutting the door, but can only be opened from tho outside by a latch-key.

The Norfolk Latch. One of the best known types for the home is the Norfolk latch. This comprises a handle, and a plate that is screwed to the door: above the handle is a thumb latch which when depressed raises the other end of the lever of which it forms a part, and this in turn raises the catch which is screwed to the other side of the door, and drops into a striker or notched plate attached to the door frame. Variations are the Suffolk and the Canadian latches, both of which are in substance the same as the Norfolk, though the C'anadian has a somewhat shorter catch.

A Secret Latch. The secret latch is a pattern that is useful on cabinets and other furniture, shop fittings and the like. It is a simple spring latch, and is relcased by pressing on a circular

plate let in Hush with the surface, so sa to be inconspicuous. Fig. 1 is an example of this type of latch

Other Types. The gate Intoh which is illustrated in Fig. 2 is made in ceast iron, and screus to the surface of the gate. The striker is made as indicated to fix to the edge of $n$ frame, or with a flat plate to fix to the face of the gate post. Patterns are also made to build into brickwork. and for stone or concrete gate posts.
A pattern of latch that has developed from the same style is illustrated in Fig. 3, which shows a typical Gothic gate latoh. It is made of malleable imn. finished in Berlin black, and varieties have ring and other shaped handles There is a square hole in the boss or hub to which $\Omega$ short shaft is fitted. This shaft passes through the door and connects with the boss of the handle on the other side.

The thumb latch seen in Fig. 4 is of the Norfolk type; it is used with the Gothic gate latch, and takes the place of the drop or ring handle and cross shaft. The how latch shown in Fig. 5, still used in old houses is a link between the earlier varieties and the modern type of night latch. It has a pivoted lever actuated by a handle, which is shoun separately, and the latch is pressed down by a spring. The handles are fixed to a square shaft that passes through a hole in the end of the lever; when the handle is turned the lever is raised and the door released. There is also a holt which can only be actuated from the inside of the room. When shot, it slides hehind the round-headed knob that projects froin the striking plate. The lever drops behind the top of the same knob, which thus does duty as a frastening for both lever and bolt.
The rim Intch, shown in Fig. 6, is a development of the bow latch, but is enclosed in a case; it has a spring-pressed latch which can be drawn back by the handle and is controlled by a separate bolt and a slider. The night latch is made in many forms; for example, the pin tumbler type, Fig. 7, and the mortise night latch, which tits into a recess or mortise cut into the edge of a door. A handle is fitted on either side of the door, and these are attached to a squared shaft by means of a setscrew or a fixing pin; thus, when the handle is turned the latch is drawn back. In some varieties there is only one handle, on the inside of the door. and a key is needed to shoot back the latch from the outside; in others the outside handle is not attached to the shaft, but directly to the door. See Door: Gate ; Lock.

LATH: In Building. The principal use of the lath, which is n thin, narrow slat of wood or other material, is to construct a lath and plaster partition in a building Laths are
raquired for the repair of ceilings, and are useful in the home for such purposes as making packing crates and chicken coops, and also for trellis-work Laths are usually 1 in . wide, and are made in lengths up to 4 ft .6 in The sizes are: lath $\frac{3}{16}$ in thiok, lath and a half $\frac{1}{}$ in thick, and strong or double lath $\frac{8}{16} \mathrm{in}$. thick.
In making a lath and plaster partition a firanowork of timber is provided to which the laths are nailed. The frames should be so positioned that there is a support for the laths at a distance of not more than 12 to 14 in apart, when they are at right angles to the studding or framework. The laths should
always break joint; that is, the ends should
 not all come over each other. This may be done by fixing, say, 8 or 10 laths, with their joints on the middle stud, the neat set should come on another stud, as in the illustration. If this were not done the vibration would he !ikely to cause the plaster to crack along the joint, since all the lathing would then bend along the same


Lath. Showink how the lutns are nailed to
the wooden studs or uprights in the construction of a lath and plaster partition
sary to fix lathing to a wide piece of wood, as, for example, to a boarded part of the work, the lathe inust not be nailed directly to it, but to a set of underlying laths or hattens at right angles to the face laths This is done to provide mom for the plaster at the back of the laths, as the plaster has to be pressed through the gaps between the lathing to form the key that prevents the plaster breaking away.

Netal lathing is used for the same purposes in the form of a shect of perforated or expanded metal, the interstices providing the key for the


Latch. Fig. 5. Mechanism of the bow latch. Fig. 6. Rim latch which is enclosed in a case. Fig. 7. Constituent parts of pin tumbler type of night latch planter. This lathing is fireproof, and valuable for many building purposes.

Lath Nail. This is a wire nail witha fairly large, round, Hat head, used principally for nailing laths to studding, in the early stages of making a lath and plaster partition or other structure. Common sizes are line. The laths are fixed about $\frac{1}{}$ in to $\frac{3}{b}$ in 1 in and $1 \frac{1}{4}$ in. in length and No. 16 gauge apart, and the best nails to use are ordinary in thickness. Sce Building; Ceiling; Eaves; 1 in . French or lath nails. When it is neces- Furring; Nail; Plaster; Ruof.

## LATHES FOR AMATEUR WORK

## Describing the Different Types and their Uses

This article is complementary to those on Metal Turning and Wood Turning. Sec also Amateur
Carpcnery, Centre: Chuck; Drilling: Mandrel : Milling, etc.
A lathe is an indispensable tool to the and extending from the floor to the bed itself. amateur oraftsman, as by its aid all manner Means of driving or rotating the mandrel of circular objects can be produced within have to be provided. This usually takes the the capacity of the tool. Fssentially, the form of a hervy fly-wheel with steps or gronves lathe consist.: of five parts. The head stock comprises a spindle, called a mandrel, which turns in hearings formed in the hody of the head stock. The spindle is provided with a Hat or V-shaped pulley, generally with several steps oi different dianmeter. The end of the mandrel is screwed for the attachment of various devices for holding the work.
The head stock is fixed at the left-hand end to a har known as the bed. A movable part, called the tail stock, is usually provided with a spindle, which can be pushed in and out of the tail stock body by means of a lever or hand wheel and screw. The tool rest is also movably attached to the bed, and is used as a support for hand tools. More advanced types of lathe have a mechanical tool-handling device, known as a slide rest. The next feature is a stand or support of some kind, and may take the form of short feet projecting from the hed and raising it about 6 in . above the surface of the table or bench to which they are screwed; or preferably strong legs well braced together
turned upon its rim, varying in diameter, and corresponding with the proportions of the steps on the mandrel pulley. In the case of a hench lathe, that is, one which is screwed to the top of the work bench, the Hy-wheel is mounted upon a light stand complete with a treadle, forming a foot motor. On other types the Hy-wheel is mounted on a spindle attached to the left-linnd standard. A Hat or round belt transmits the motion from the fly-wheel to the mandrel. Motion is imparted to the lly.wheel by pressing upon the treadle with the foot, working ulways with a regular, steady motion, so that the lathe revolves at a uniform rate.
Types of Lathes. These range from simple wood-tuming machines to elaborate screwcutting lathes, which have a set of gear-wheels and a long threaded steel shaft known as a lead screw. This is connected to the slide rest, which is frec to slide along the bed, and has an independent part known as a top slide, which also has a little lead screw of its own
and propels the tool holder. The tool is has a bed of hollow, clamped into the tool post on the top of the circular form, enclosing tonl holder, and it is possible to traverse the the lead screw. The tool along the length of the bed, an operation height of centres is 4 in . known as sliding. By turning the top slide lead screw, the tool is traversed acrose the hed. Twisting the top slide at an angle to the bed causes the work to be turned to a taper, and is known as angular turning. Turning at right angles or across the bed is known as surfacing.
Screw cutting is effected by connecting the lead screw to the mandrel by a train of spur gears, and arranging their ratio so that the lead screw makes a certain predetermined number of turns per minute, while the mandrel makes another number of turns. Consequently, if the tool is mounted in the tool post and hrought into cut, so that when the point of the tool touches the work it will remove shavinga, a long, continuous groove or screw thread is formed upon the work held between the centres of the lathe.

Modern amnteur lathes. of which three are illustrated, include a variety of mechanical devices. In all lathe work, whether turning wood or metal, the work has to be held in one of two ways. It may be bolted or otherwise attached to a disk of motal screwed on to the mandrel nose, and called a face plate, or in some other form of chuck, in which case the turning operation is generally known as chuck or face-plate work. The other method, especially applicable to the case of relatively long spindles or rods, is to mount them het ween centres. This means that onc end of the rod is supported by a point centre placed in the end of the mandrel, the opposite end of the work heing supported by a similar centre in the tail stock spindle. The ends of the rod have to he drilled and countersunk to form a hearing for the ends of the point centres. The next step is to fix a clamp called a carrier to one end of the bar, and to screw on to the mandiel nose a small, flat plate with a peg projecting from it and called a driver plate. The peg engages with the hack of the carrier, and when the mandrel is rotated thereby rotates the work. The tuol is either a hand tool, or a slide rest tool mechanically held in the slide rest.

Generally speaking, all wood turning, as far as the amiateur worker is concerned, can be carried out with hand turning tools. Metal turning is usually effected by the use of the slide rest, although a great deal of work can he done with the ordinary hand tools.

Figs. 1 and 2 show a Drummond lathe with 34 in . centres. The leading fentures are indicated in the diagram, Fig. 1, which shows the lathe arranged as a hench machine. A lathe of another type, especially adapited for the model maker. is shown in Fig. 3. This

Fig. 4 showa the Verschoyle mandrel, an inexpensive portable Inthe for light wood or metal turning. It clamps on to the edge of table or bench occupying little space, and when dismountel can be paoked into small comprss. It swings 6 in. aloove the bod and takes 12 in hetween centres. By adding an extra length of bed and another bracket the turning length may be increased by 20 in.

## Essential Points.



1ig. 4. Verschoyle mandrel for lipht wood or metal turning Courlest of George Adams

Points that should be looked for in any and the centre of the tail stock should always lathe include the following. The mandrel be in the same line, no matter into what should he made of highest class steel, and position the tail stock is moved. For wond rotate easily hut without the least trace turning, the fly-wheel should be large in of shake in adjustable bearings. The nov- diameter and the mandrel pulley small, as high ing parts should operate smoothly, casily, speed is essential. For metal turning, the flyand without shake. The centre of the niandrel wheel should be smaller and the mandrel


Lathe. Fig. 1. Drummond back-geared lathe, with the principal parts explained


Lathe. Fig. 2. Drummond $3 \frac{1}{2}$-inci treadle lathe. the principal parts of which are indicated In Fig. 1 . Fir. 3. Drummond 4 -inch model maker's lathe

Courtesy of Drummond Bras.. Lid.
pulley larger. There should be a difference in the stepping ratios, that is, one large diameter step on the tly.wheel and a small diameter on the mandrel pulley for wood turning. The intermediate position should he provided, and in addition a small step on the fly-wheel, in conjunction with as large a diameter on the mandrel pulley as possible, for turning cast iron. Metal-turning lathes, intended for turning cast iron, are preferahly fitted with a mechanical apeed-reducing arrangement known as a back gear (see Fig. 1). The treadle should be so arranged that if the foot is accidentally placed heneath it the connecting rod will automatically he thrown off the crank pin, otherwise the foot may be severely injured.

The lathe as a whole should be stiff, rigid, and atrong, so that when in use it does not vibrate or shake ahout, as this is fatal to good work. Chucks, tools, and accessories can be added to it from time to time as occasion demands. The hearings must be kept free from dirt and frequently oiled.

LATHER. Soap and hot water atirred together form a thick froth or lather. It is used in laundering certain fragile materials
which would suffer if rubbed with soap, the garments being squeezed in the froth until they are clean. A lather is also necessary for shaving, special soaps being prepared for the purpose. A quick method of producing a lather for washing is to shread some soap into a bowl, pour boiling water over it and stir with a stick. This will be found satisfactory for most purposes. See. Water Siftener; Laundry; Shampoo; Shaving.

LATTICE. A lattice is an openwork structure of wood, metal, or other material, formed by crussing or interlacing strips of material Such a structure is often used to cover a window, to form a screen, or to protect a doorway. In lattice work all that is necessary is to cut strips of material to requisite lengths and, if working in metal, to drill them at regular intervals for the rivets. When wood
is used it will suffice to nail the strips together. To ensure uniformity, the strips may be guided in position by means of a simple space jig, made from a batten having notches cut in its edge at regular distances corresponding to the desired spacing.
In use, one set of strips is laid on the bench or other support, and spaced by placing the notched batten upon them, so that a strip is beld in each notch. The first of the next series, which run in the opposite direction, is laid up against the batten, and nailed to the first set of strips. The batten is then removed and turned at right angles, and one of the notches placed over the strip just nailed on. The other strips are put into position into the notches and similarly nailed and fixed. The batten is then removed towards the end of the strip and the joints nailed together.

## LAUNDRY WORK AT HOME

## Suggestions for Lightening a Domestic Task

This article will be helpful to the housewife who wishes to economize by doing the laundry work at home. See further the entries on Clothes Line.; Clothes Peg; Copper: Dolly ; Mangle; Soap : Starch, and those on the materials washed, e.g. Cretonne ; Lace; Linen; Silk. See also

The laundry work tor a large family can only be satistactorily done with space and equipment and a place set apart for its performance. The floot should be of concrete, tiles or brick, with a fall to one corner where there is a drain or outlet, so that the floor can be washed down at ang time. There should be good light and ventilation, together with sufficient space for the various appliances. It is sometimes pussible to arrange a small laundry in the acullery by converting the kitchen into a combined kitchen and scullery, fitting a new sink and connecting the waste-pipe to the nearest trapped gully. Due regard must be paid to the by-laws of the local authorities. Scrupulous cleanliness is essential in any laundry and the walls should be finished with tiles or washable paint.
The first requirements for this task are an ample supply of hot water and a convenient means for boiling. These requirements can be met in most cases by a portable copper, which is placed in a corner, and the smokepipe taken to the nearest flue, or carried out through the roof or walls. The hot water can be drawn off from a tap fixed in the lower part of the copper, while the cold supply is provided by a separate pipe terminating in a tap over the top of the copper. Many varieties of copper are available for heating with solid fuel or gas: it is best to choose one with a galvanized case and tinned copper pan.
A strong bench should be fixed along one side of the laundry for the washing-tubs, if hand-washing is to be undertaken. If a washing machine is used, less space will be required. There is a large variety of these appliances both electrically and gas driven and also non. gas. The task of washing is lightened by these machines. Compact machines can be purchased from about three to ten pounds by means of which rubbing the clothes by hand is eliminated, the hot soapy water being forced through the fabric automatically. Afterwards the garments are re. moved for rinsing.
A mangle or wrin. ger is also an asset, and small compact mangles can be used oven when laundry work has to be done


Laundry. Arrangement of a lanndry, for which a
basement room or an outbuidding conld be used
in the kitchen. One variety of mangle fits on to the kitchen table. A wringer is obtainable which is fitted with a table top. Another useful type is combined with a washing machine. Four castors enable this machine to be easily moved about. It has rubber rollers, and pressure is secured for wringing or mangling by screws which operate through powerful double springs.
l'robably the chief difficulty for the housewife is the drying of the clothes after they have been washed, especially in bad weather. The most economical plan is to fix cords, or smooth wooden slats, across the ceiling and as near to it as possible, supporting the ends of the slats by ropes which run over pulleys fized to the walls. By means of the pulleys the slats can be raised or lowered without diffi. culty. With such an arrangement, if a small amount of ventilation is provided near the top, a heating stove can be lighted overnight and the laundry closed, the clothes being generally dry by the morning without further trouble. Ready-made ceiling drier fixtures are obtainable

Another plan is to make a cupboard-like structure, preferably with asbestos cerrent sheets, and hang the wet clothes in it. Hotair pipes should be led around the interior of this cupboard, and may be heated by means of a small oil stove, gas ring, or other con. venient means, much on the lines of the heated linen cupboard. The apparatus may follow the general principle of construction adopted for greenhouse heating, and hotwater pipes can be used instead of hot air.
Other SImpler Appllances. For laundry on a big scale wicker baskets are required for storage of the clothes. Where sufficient space is availablea good solid table should be provided, and if possible should be of such a size that one or more of the laundry baskets can be stored beneath it. The irons, soap, scrubbing brushes, etc., should behoused in a cupboard. The use of electric or gas irons not only saves the cost of a heating stove, but keeps down the temperature. Besides the more important
urnshing equipment the home laundry requires one or two galvanized tubs, an ironing table or board, sleeve buard (essential when ironing sleeves), enamelled basins for washing smaller articles and for starch, a wooden spoon, clothes line, clothes rack or horse and clothes pegs. A wooden dolly and tub may be useful where there is no washing machine. A small washer is obtainable which has a strap that fits over the hand and a surface that squeezes out the dirt without damaging the material. but thus saving the knuckles. The indoor clothes line illustrated is a convenience to the housewife who only has a small kitchen in which to do the washing. The required length of line is drawn out of the container and fastened temporarily by the ring on to a hook on wall or dresser. By a device the bandle fixes the line tautly. An attachment with arms is pricurable for the clotbes horse.

Practlcal Suggestlons. Unnecessary stooping must be avoided by taking care that washing and rinsing tubs are not placed either too high or too low. Washing machine, rinsing tubs, mangle or wringer should be placed near lugether to avoid unnecessary steps to and fro.
Select one day a week or fortnight for laundry work and avoid doing any other unnecessary housework on that day. Either a Monday or Tuesday is the best day to choose, as when the weather is bad for drying it leaves several days in which the drying, ironing, and airing can be completed before the week-end.

Mendall clothes before they are washed; this prevents rents and holes from becoming further torn during the washing process.

Make soap solution and starch the previous day, if possible. Ecru starchis obtainable which tints and starches curtains, otc., at the same time. Keep in stock hard soap, borax, and washing powder. Soda turns white materials yellow.

Soak any badly soiled clothes overnight in cold water. Remove any stains that may be on the clothes. Prepare the copper and light the fire early. While the water is getting hot, sort the clothes in the following heaps: white and coloured woollens; silks ; fine things and table linen, handkerchiefs, bed linen, and upstair towels ; coarse things ; coloured articles

If the entire wash is to be done on one day, the silks and woollens should be washed first, so that they may be dried quickly, followed by the coloured things. F.ntirely fresh water must be used for the white wash, or the clothes will not be a good colour.

Softening the Water. The softening of the water is a problem which must be solved by every laundress before dirt can be removed from the clothes. Where a water-softening apparatus is not installed, some housewives prefer to use borax, others rely on one of the prepared soap powclers.

Whichever method of softening is selected, it must be remembered that no cleansing can take place whilst the water is hard and soap curd is visible. All the soap that is rubberl on to the clothes or added to the water, as


Laundry. Indoor clothes line : the handie can be fred so that any
length of line is made tant
dissolved soap or jelly, combines with the dissolved minerals in the water and forms soap curd. More soap must be added until there are no minerals left with which it can combine: the surplus soap forms a lather. A lather is merely a sign that free soap is present in the water. When washing new garments that contain dressing soap curl may appear in water which previously was very soapy Should this occur additional soap must be added to the water.
Alwrys wash the cleanest things first. Any new clothes and handkerchiefs should lee rublied out separately in a little soapy water. This economizes washing waters, as they do not get dirty so readily Where no washing aids are available, prepare two baths of soapy water. Rub the garment all over in the first bath: when clean, wring out, turn garments and pillowcases on to the wrong side, and wash again in the second hath of clean water. Any very soiled parts, such as collars, cuffs, and neckbands need special hard rubbing. Wring the things from the second water and rub on a little hard soap before rinsing.
When washing woollens, fine work or coloured articles. soap llakes arc usually the hest cleansing agent. Coloured things can be kept without fading if the snapy lather is allowed to cool hefore use The garments should be washed quickly, never wrung out if of fine - materials, but wrappel separately in clean cloths and the water gently squeezed out by a kneading procesa

## How to Wash Delicate Fabrics

Small lace handkerchiefs, gerrgette collars and cuffs, can be putinto a preserving jar with a screw top, filled with a warm, sonpy lather and ahaken vigorously. When clean they may le rinsed in the same way. This method obviates any damage by rulibing the delicate fabrics. Chiffon or net can be washed in a clean muslin bag by placing it in warm, soapy lather and gently squeering out the dirt. Afterwards the articles are rinsed in the bag by placing it in clean, warm water. Rinsc again, in fresh water, until no soapy moisture comes from the bag when it is kneaded.

Onily handkerchiefs, kitchen cloths and the heavier white cotton and linen articles should he hoiled to keep them a good colour Under. clothing or table linen should not be boiled in the same water as soiled kitchen cloths or towels, etc. Arrange for two boilings. The water in the copper should contain plenty of soap, and it should not be hoiling when the clothes are first put in. but should be allowed to reach hoiling point moderately slowly. Boil for 20-30 minutes
The next process is the rinsing and blueing. Take the clothes from the hoiler, and rinse them thonoughly in plenty of clean, warm

water to remove the soap. If a large wash. is in progress it is better to rinse first in warm water, then in cold. Prepare a bath of blue water, and blue one or two things only at a time, as if garments are left in the blue water the colour settles in streaks and is diflicult to remove. The same thing reaults if the blue water is inade and left to settle before used.

After blueing, wring and hang those things out to dry that do not need alarching. Whilat these arc drying, starch table linen, collars. aprons, etc. Things that do not actually require alarching, such as pillow-slips, sheets, and lace-trimmed mats, etc., may yet lie improved in appearance by passing through atarch water, which gives them just a alight firmness Exactly which things should lie starched depends on individual taste.

Damping and folding are the final stages Take in the clothes when nearly dry. Thoso things requiring careful ironing will need further damping with cold water, but woven underwear, towels, etc.. can be folded ready for ironing. These will naturally require a a little damping if they have been allowed to get bone dry. Roll up all fancy things tightly and leave for several hours before ironing. preferably overnight. The labour of imning is minimized if large thinge that can he folded fat are mangled after dainp. ing: this removes a large proportion of the creases in the garments. The clothes are then ready for ironing.

LAUREL. The laurel is grouped by botanists as a scction of the group or genus Prunus which includea the almond, apricot, plun and cherty. The commin laurel (Prunus laurocerasus) is a vigorous shrub with large evergrcen leaves, often used to form a hedge: it. impoverishes the surround. ing soil and is not suitable for small gardens. Old over. grown hedges may be cul hard back in April. Cuttingi form roots if inserted in sandy soil in a frame in August. The Portugal laurel (Prunus lusitanica) and its myrlle-lcaved variety are handsome evergreens. The best time to transplant Inurels is in May or September, and it is advisable to put in small specimens, because they become established more quickly than large ones.

Lavender.-carple heads of th
sweet-scented garden plant

survire the winter in heavy soil. but is raised from sceds sown under glass in spring

LAVATORY. A lavatory is a place for wasbing. The word is sometimes used in the lome, but more usually cloakroom is the term employed for it.

The Lavatory Brush. II. though chemical salts and acids are availahle for dealing witls the closet pan when it becomes discoloured or furred, the use of the lavatory brush will keep the pan in sanitary condition. The two standard designs are a long, round handle with a done-shaped brush at the end, and a flat brush similar to a long-handled bath brush. If preferred a Hat brush is obtainable with a half-round dome end. Stiff bass, hassine, fibre, or cocon-fibic are the materials used, a serviceable quality being a mixture of bassine and libre known as union. See Basill: Brush; Water Closet

LAVENDER: The Plant. Thu sweet-scented garden lavender is $\Omega$ half-shrubby plant, with greyish leaves and purple Howers. Its thick. ragged. barked stem, 2 ft . high, branches alove into a broad LAURUS. Laurus nobilis, the sweet bay, bushy head. The flowers are produced in a favourite evergreen shrub with fragrant long, ercct spikes. It makes an admirable leaves, is not very hardy. It is usually grown hedge. For the purposes of perfume manufac. in large pots or tubs, and if placed out of doors ture it is grown by the acre in Ensex and for the summer must be brought under cover before winter and kept safe from frost. In mild districts it may be planted out of doors. l'ropagation is by cuttings in sandy soil in a frame in August.

LAURUSTINUS. This haidy evergreen shrub (Viburnum tinus) grows 5 to 6 ft . high and bears pink buds which npen to white Howers in autumn, winter and early spring It flourishes in ordinary soil.

LAVATERA. The rose mallow (Lavatera trimestris) is one of the most beautiful hardy annuals. There are several improved varieties, e.g. loveliness, which has large, rose-pink Howers on plants 2 to 3 ft. high. Sceds are sown out of doors in spring for summer flowers. The tree mallow (Lavitera olbia) is of vigomus shrubby growth, forming a bush 4 to 5 ft . high and bearing carmine rose Howers for many summer weeks. It may not

Kent, and to a lesser extent in Surrey.
As a garden plant lavender thrives best on warm light soils, and may be planted either in spring or autumn. The plants ahould be about 18 in. apart every way. Lavender is propagated by cuttings inserted outdoors or in a frame in September. The proper time for gathering lavender for distilling or crying is when the flowers are fully expanded and fresh. The munatead lavender blonms very freely and blossoms earlier tian the common kind.

Domestic Uses. Lavender sloould be ent when it is in full bloom and spread out to dry on a newspaper, either in the sun, on the rack of the kitchen range, or in a hot linen cuphoard When quite dry it may be masie up into bags, sachets, or whatever form of scent. container is required.

Lavender bags may be inade from organdie or butter muslin. This is cut to the size
required, and the sides run up in the ordinary way. A bunch of lavender is inserted, heads downward, and the opening made fast with cotton firmly stitched, or tied with narrow mauve ribbon. The stalks are then cut neatly until only a few inches remain This method has the advantage of retaining the perfume longer than if the stalks were removed.

Lavender Vinegar. A refreshing toilet proparation with inild astringent property ie made by mixing 6 parts of rosewater, 1 part of spirits of lavender, and 2 parts of Orleans vinegar. It can also be prepared from freshlygathered lavender Hower tops Thesc are

## The Lawn: Its Maring \& Maintaining

How to Get the Best Results with this Desirabie Garden Feature
The amateur gardener who is intereated in this subject should consult aiso the aricies Garden
Grass ; Soil and others of that kind, while. when the lawn is made, those on Croquet Lawn Tennis will be found useful. See also Drainage; Edglng ; Sp rit Level

The lawn is an expanse of turf in the garden, level on top, and sinking it further until generally adjacent to the dwelling-house. If exact level between the two is secured, carryit is to look well and wear well, the laying-out ing on in the same manner the whole length and maintenance are matters requiring careful of the line, when a true centre lovel will result. attention, especially in regard to soil and Cross levol must drainage. Heavy soil in which clay pre- next be ascertained, ponderates will speedily stagnate if water does not drain off easily, therefore road grit and leaf-mould should be added while digging proceeds. Light sandy soil requires manure. so that moisture may be conserved and parch. ing prevented during a season of drought.
Large lawns which become sodden should be drained by pipes, laid in the way shown in the diagram. The pipes should be laid about 12 in . deep and slope gradually to a sump or outlet. Where branch pipes meet the main drain they noed packing above the junction with slats, tiles, or stones. Open ends of drains must not be near the roots of trees or strong-growing oreepers, as these eventually choke the inlets.
Levelling. Levelling a site is not such a difficult task as it appears to be. The implements necessary, with the exception of a true spirit lovel, are a number of wooden pegs ; a straight-edge board, 6 ft or more in length ; and a strong garden-line. First ascertain the centre level by stretching the line from top to bottom of the plot. Then drive one of the wonden pegs into the highest end of the site to just above the surface of the soil, following this with another peg down the line at a distance something leas than the length of the traight-edge. Do not drive it far in at firat. but gauge the relative depth by placing the straight-edge on the two pegs, with the spirit


Lawn: draining and lovolling. The arrowe show alope to ontiall. $1.8 i m p l e$ levelling : A, straigat-edre board : $B$, sorewod-on apirt level; $C$, levolling pega : 1. Another method of pipe drainare: A, inlote. S. Pipe drainaging for large tipaces plantain. Turves are usually obtainable in lengths of 3 ft by 1 ft. , and it is easy to estimate the number required, allowing for spoilage.
If a lawn is not immediately required, seedsowing has much to recommond it. Any seed. however, will not suit overy kind of soil ; a mixture that is excellent for dry, light land may fail on moist loam. Consequently it is advisable to order the seed from one of the reliable seeds. men who specialize in grass mixtures, mentioning the particular class of soil for which it is required. Provided there has been thorough preparation of the plot, and a suitable mixture of grasses obtained, excellent lawns may be secured economically from seed, 2 lb . being sufficient for about 30 sq . yd.

The best time for sowing is April or working on the rame principle across the garden, and securing the level from those pegs already in the ground. The whole procedure is made clear in the accom. panying diagram.
Grassing. The two best methods of grassing a plot are by laying turves or by sowing seed, the former possessing the advantage of forming a sward almost at once. It is essential, however. that turf should be of good heart, and free from such weeds as daisy, crowfoot andelion and
dried, placed in a stopped bottle and steeped for a week in Orleans vinegar. Every day the bottle must be shaken, and at the end of the weck the liquid is drained off and filtered through white blotting paper or through a filter paper bought frum a chemist.

Lavender Water. This toilet preparation is easily prepared at home Into a quart. bottle are put 1 uz essential oil of lavender, 1 drop musk and $1 \frac{1}{1}$ pints spirit of wine. These three ingredients are well mixed together by shaking. The mixture is loft to settle, shaken again in a fow days, then poured into perfume bottles with airtight stoppers. See Scent.


Lawn. 1. Right (a) and wrong (b) tari-laying. 2. Implements: $a$, hand turt beaters ; $b$, turAng iron; $c$, edging tool. 8. Ideal tarf and its mocsaremente. 4. How to liny pipes. 5. Trench drain in seetion. 8. How to cover plpe junctione 4. How to iny pipes. 6. Trench drain in seetion. 6. How to cover pipe fanctions
with slats. 7. With turt. 8. Path drain. 8. Beat type of drain

August-September. The soil must be dug over, levelled and made "fine" on the surface. Choose a calm day for sowing, acattering the soed with a swinging motion, first down the plot and then across.

Strands of black cotton should be tied on sticks a fow feet apart. as well as with rag flutterers and rattles of tin and glass, to scare away the birls. Cutting should nut be attempted until growth has reached a height of 5 in ., and then only light topping with a scythe until the roots are strong enough to stand cutting with a mowing-machine.

The most suitable time for laying turves is between autumn and spring. laying them ovenly down so that they join lightly tugether. Fit them in pusition so that open seanss will not uccur, and dump them firmly with a wooden beater as pictured in the diagram. This useful implement can be made at home. To keep the lawn at its best, watering must be done freely in dry weather and always in the evening. When a lawn is established and growing vigorously, the mower without its collecting-box may be run lightly over the grass, leaving the slight trimmings as they fall
to act as a muloh, and as a protection during hot days. As a rule mowing should be performed when the grass is dry.

Lawn Sand. A preparation of sand and chemicals, known as lawn sand, acts as a destroyer of certain lawn weeds, and as a fertilizer to stimulate the growth of lawn grass itself. Lawn sand may be purchased prepared, but may be made, if desired, by thoroughly mixing $\frac{\mathrm{lb}}{\mathrm{b}}$. of finely pulverized sulphate of iron, $1 \frac{16}{} \mathrm{lb}$. of sulphate of ammonia and 15 lb . of ordinary sand. It should be applied at the rate of 2 oz . per sq. yd. The grass may be discoloured but will recover.

LAWN: The Material. The materials known as lawns are predominantly made in cotton. Sheer lawns are plain white linens with no lint on the surface, bleached in the cloth and made with fine or very fine yarns, in this way resembling handkerchiefs. Whito Lawn is the traditional material for bishops' sleeves. Boiled linen lawns are not so free from fibre on the face of the fabrios. Linen lawn costs considerably more than ootton, wears better and does not soil so quickly. It feels cooler, and is preferred upon that ground for summer underwear.

Cotton lawn is a superior calico about the same fineness as good longcloth. A good quality of raw cotton is taken to make lawn cloths. Cotton lawn is almost always worn white, and it makes up well into underwear and summer frocks.

## Lawn Mowers and Their Care

Machines Suitable for Large and Small Gardens
The various implements needed by the Gardener are dealt with in this work, among them being Dibber; Fork; GerJen Roller: Spade. See further Gurdening; Gear

Lawn nowing machines act on the scissors principle, by means of a fixed knife ncross which blades, set at an angle, revolve ns the machine is propelled. The moving blades are fixed together so as to form a cylindrical cutter, which is caused to revolve on its axis by gearing connecting it to the wheels on which the machine mins. The knife is fixed to the frame of the machine, and the lieight of the knife above the ground is determined by an adjustment which has the effect of tilting the machine hodily. A gear case is fitted on most types of machine to prevent the teeth of the spur wheels from hecoming clogged with grass cuttings, and a detachable box is fixed in front of the machine to catch the cut grass ns it flies off the cutter blades

Back Drum Mowers. There are two main types of lawn mower, one working on the back drum principle, and the other by means of side wheels. The former has a drum of large diameter, extending the full wilth of the machine, which drives the rotating cutters by toothed wheel gearing, though a chain dive is used in some designs Tho cutters and the knife across which they pass are disposed forward of the drum, and a roller is placed in front of all; twin handles are generally fitted. The axle of the cutter is carried in journal bearings at the ends, and these are capahle of being raised or lowered by means of screws.
The position of the cutters must be ad justed with thesc screws, so that as they revolve they just scrape the knife or hottom blade equally all along; if the outters are slightly too high they will only tear the grass instead of cutting it cleanly, and if too low they will hammer on the knife and blunt both theinsolves and it. Should the axle be at all slack in its bearings, the half bearings must be taken out and filed carefully on their small Hat abutting faces till the slack is just eliminated.
The double spur wheel, which is driven by the drum and Irives the cutters, is mounted with its axle in a slot and has a nut to lock it in position. After the cutters have been adjusted into correct relation with the knife. this nut should be slacked ofl and tha axle of the inter mediate spur wheel moved in its slot and secured by tightening the nut when it is so placed that it is in mesh with the pinion on the cutter shaft

Gear whecls inust not be en gaged so decply that the tops of the teeth of one wheel reach down to the hottoms of the gaps in the other. The hearings of the drum are designed so that they can be moved a little and re-secured ; this adjustment is provided to enable the depth of meshing of the main spur wheel and the intermediate pair to be corrected, but this is seldom necessary. The brackets carry: ing the roller are arranged to slide up and down in the frame of the machine. This is the means provided for regulating the length to which the grass is cut: the effect of raising the
 for sma!l lawns. The former has the roller placed behind the cutters, which is an advan-

Lawn Mower. Fig. 1. Side wheel mower Lawn Mower. Fig. 1. Side wheel mower signed on the bact drum principle Courtext of thunsomes sinus \& Jclleries. It
pattern, owing to the arrangement of its priate machinery. A lesa expensive proces: design, is considerably cheaper than the is to sharpen the cutting parts at home with back drum machine and is commonly used emery powder without removing them The tage for cutting long grass, machine is turned upside down so that it rests with the handles on the ground and the knife on top. the knife blade being on a slope with its cutting edge lowest. The cutters are adjusted up to scrape the linife, but not sc hard as to prevent the mechanism being turned by the palms of the hands pressing on the drum. The cutting edge of the knife is then smeared with a thin paste of fine emerv powder moistened with a mixture of oil and paraflin, and the drum is turned by hand to grind the blales
The grinding paste on the kinife must be frequently added to, as it soon gets dull and loses its abrasive power ; this can easily be done by putting the new supply on the inclined face of the knife, when it will llow down to the edge. When the grinding process has procecded so far that the drum becomes casy to turn, the blades should he ratised up a trille so thiat the action may continue. The sharpening must go on till all the blades rub equally throughout their length on tho knife: the sound, as the mechanism is turned very slowly, will be found to be a sufficient guide

Some machines are arranged so that a handle can be screwed on to the first spur wheel, and this makes the operation less laborious, but it is not essential. Emery powder of suitable grade is on sale as kinife polish. Care is needed that a finger does not cet caught among the rotating blades. The above refera particularly to the hack drum type; side wheel machines are sharpened in an exacily similar manner, except that when turaed over the machine must rest on the cross-bar of the handle and on a block placed under the front frame cross-bar, so as to leave the side wheels of the ground and free to revolve.

Useful Hints. Mowing machines require
types has its special advantages. The side wheel
rollers is to tilt the front of the machine down and bring the linife nearer to the ground, so that the grass is cut shorter than if the rollers werc lowered.

Side Wheel Mowers. The other type of mower is operated by side wheels provided with internal gear tecth meshing with pinions on the cutter shaft ; no adjustment of depth of meshing is provided, as none is required. In this class of machine the roller is behind, and its height is adjusted to regulate the length of grass cut as in the back drum design The adjustment of the blades to scrape the knife, however. is reversed, the knife heing the movable member in this case. The knife is mounted so that it can be rocked by slacking one piair of screws and tightening another pair, the edge being thus hrought closer to or farther from the cylinder blades

Each of the two main
Lawn Mower. Fig. 3. Motor mower with 4d h.p. four stroke petrol engine. By de-clutching cutting cylinder the machine may be used as a rolle Courles"l of Dennis Bros . Ltd., Gulldford
 one wheel that is on the turf. Both patterns are perfectly capable of doing their work and lasting, with fair treatment, for many years
Sharpening the Knives. Mowing machines are designed to he sharqened by temoving the knife and blades and grinding each on appro-
 overhanging the edge of the lawn. When cutting at the edge with the side wheel type, on the other hand, a strong twist has to be maintained by the hands so as to prevent tilting sideways, and force the machine to run firmly on the roller and the
 -
$\qquad$


ground is then very moist after the winter, under which conditions the wheels give a lot of trouble by skidding and consequently cutting up the ground.
The back drum machine, though the more costly and henvier, is free from the skidding trouble. and has the advantage thet it will work without any tronble with part of the cutter blades of the blades and knife should be wiped the cutter blades clean after use. The bearings require oiling
vccasionally. If the mower runs heavy, the correctly; if this fails, sharpening must be meshing of the gears probably needs adjusting. If the blades sometimes fail to revolve when the machine is wheeled forward, the ratchet action must be taken out, scraped clean and oiled.

In the case of back drum machines the ratchet gear, usually fitted in duplicate, is located inside the drum; in the side wheel type the ratchets will be found inside the pinions on the cutter shaft, and can be got at by taking off the side wheels. If the grass is not cut cleanly, or if the blades clog, the cutters must be readjusted to scrape the knife

When the machine is put away at the end of the mowing season the bearings and gear teeth should be given a good oiling, and the blades and knife must be wiped clean and dry and well greased; neglect of these precautions will cause rusting serious enough to involve heavy grinding to get the blades sharp in the spring. Stones on a lawn are apt to blunt the blades, or even chip them ; the only safeguard is to keep a sharp look-out, especially where the grass is alongside a path

## Lawn Tennis on Grass and Hard Courts

## Eints on Playing this Popalar Outdoor Game <br> r Gam

## This work contain 3 articies on the outdoor games that are played in and about the home, such Inciuding Badminton ; Bowls; Croquet. See also Lawn

There are two forms of lawn tennis, singles it and doubles. In singles two players are pitted against each other : in doublos four take part, two against two. It is also possible for one person to play two others. The game is as suitable for women as it is for men, and mixed doubles, as they are called, are very popular.
The pame is played on a court, usually of grass, ou't "often of eregrel, asphalt, sand, cement or some other hard substance. The former kind is the most popular, but the latter, which is coming more and more into favour, has the advantage that it can be used in winter and almost at once after a spell of wet weather ; in such conditions grass courts are unsuitable for play. In general the game is faster when played on a hard court.
Balls, Racquets and Net. ' The implements required are a net to divide the court, a racquet for each player and a number of balls. Each player provides his own racquet, choosing one that suits him or her. The main considerations in making this choice are weight, balance, the size and feel of the handle, and the thickness and tautness of the gut. As regards weight, a man's racquet will weigh about 14 or 15 oz . For most men a light one, say 14 oz ., will be quite heavy enough, but others will prefer a heavier one. Women should not use a racquet weighing more than $13 \frac{1}{2} \mathrm{oz}$., while one of 13 oz is probably heavy enough for the majority. The rules of the game place no restrictions upon the size and weight of the racquet.
To test the balance of the racquet the following method is suggested. Place the racquet on the first finger just about where the screw passes through its neck. The racquet will then either sink at the handle or the head end, or will renasin halanced. One that will remain balanced is the most suitable for an ordinary player.
If, however, a player wishes to concentrate on driving from the back of the court, a racquet that sinks at the head should be chosen. If, on the other hand, a player wishes to devote hinself to volleying. one that sinks at the handle is advised. As regards the handle, a fairly thin one is usually preferred. For a woman this should not exceed $4 \frac{i}{i n}$. when measured below the leather, and it need be no more than $4 \frac{5}{8}$ in. For a maan it must be somewhat thicker. The handle shoulld be fairly rough; if


Lawn Teania. Diarram of the conrt marked for boum siagies end doables. Por the farmer itu width is only 27 th, the sibe boundaries belar tho inneer of the two línes nhowa
it gets smooth and slippery it is a good plan Some players like a rubber covering for the handle, and in some cases this certainly prevents slipping. Persons with moist hands should, however, avoid these grips. Other grips which they may use are made of adhesive surgical wrapping. If a grip is used it should on no account be more than 6 in . long.
Gut for racquets is either thick, medium, or thin, the medium being best. It is important that a racquet should be tightly strung. This can be tested by flicking the nails across it, when a good one will give forth a musical sound. In addition to these points the buyer of a racquet should take it firmly in the hands and see how it feels in the grip when swung.
If it is not absolutely comfortable and easy, it should not be bought, however good a racquet it may be. A racquet should be kept in a press when not in use.
After the Great War a new kind of racquet was introduced, aluminium wire taking the place of gut. For a time this was popular, but after a trial many players abandoned it and reverted to those made of gut.
The balls are of rubber, covered with flannel or cloth. The rules of the game order that a tennis ball shall not be less than $2 \frac{1}{2}$ in., nor more than 2 f in . in diameter, and shall weigh between 2 and 2t oz. The court, whether hard or grass, shail be a rectangle 78 ft . long. For the singles game it shall be 27 ft . wide, and for the doubles game 36.
These measurements are shown by white lines marked on the grass or gravel. It is customary to mark out a court for the double game, and if a single is played to regard the $4 \frac{1}{2} \mathrm{ft}$., which is marked on either side, as outside the area of play.
By the rules, the court must be divided across the middle by a net suspended from a cord, the ends of which shall be attached to, or pass over, the tops of two posts, 3 ft . high, that shall stand 3 it. outside the court on either side. The height of the net shall be 3 ft . at the centre, where it shall be held down taut by a strap not more than 2 in . wide. There shall be a band covering the cord and the top of the net, not less than 2 in . nor more than $2 \frac{1}{4}$ in. in depth on each side.

How to Play the Game. The aim of a tennis player is to drive or place the ball over the net into the opponent's court, in such a way that the opponent, or
opponente, cannot return it, or, if they can, they return it wildly, and therefore send it out of play. Each game is opened by a service, the player serving, each throughont a game, in turn. Serving consists in landing the ball in what is known as the service court, behind which one of the server's opponents stands ready to take it. The server himself stands just behind the back line. If he fails to land it correctly at the first attempt he is allowed a second ; but if he fails in this service also, his opponent scores a point.
As soon as a correct service has been delivered the ball is in play and any player can hit it. A hit is correct if the ball is either volleyed or taken on the first bounce, provided that it lands across the net and within the court. The players return it from one to another as often as they can, this being known as a rally. When one side fails to return it correctly, the other side scores a point. The score is called at the end of each point, that of the serving side being put first. Thus $40-15$ means that the serving side has scored 40 and the opponents 15 , while $15-40$ means the reverse. If the two sides are equal, the score is called with the word all added.

Method of Scoring. The score is reckoned thus: 15, 30, 40, and game. A game can, therefore, be ended after four rallies, or even by four strokes. If, however, both sides reach 40-deuce, as it is called-one side must win two points in succession before a game is secured. This is done by a system of advantages, or vantages.

The score that immediately follows deuce is either vantage-in or vantage-out, the former if the server wins it, the latter if his opponent does so. If the side that won the vantage wins the next point, the game is theirs ; but if the other side wins, the score reverts to deuce and play goes on. As, therefore, a game can theoretically go on for ever, and as in actual fact games do last for a considerable time, the players in friendly games sometimes agree to deoide a game by the issue of a single point.

A set, which is the unit generally played in lawn tennis, consists of six games. Here, again there is an arrangement similar to that for the advantages in a game. If the combatants reech five all, a set must continue until one side is two games in front of ite opponenta. Thus a set may go to 6 all, 7 all, 8 all, and only end when 10 or perhaps more games have been played, with a score of $10-8$ or 11-9. Players usually toss as to which side of the court they shall play. The one who wins, chooses, and the other side takes the first serve. It is customary to change from one side to the other at the end of each odd game, i.c. 1, 3, 5, etc. This applies to both singles and doubles.
Such is the game in brief outline, but fuller particulars can be obtained by reference to the laws drawn up by the Lawn Tennis Association and accepted by lawn tennis players everywhere.
Advice on the Game. To be proficient in the game a lawn tennis player needs the quickness of eye, hand and foot that is essential to success in most ball games, a knowledge of the various strokes and constant practice. Primary rules are that he should keep his eye fixed on the ball, and by correct footwork should make the best use of the weight of the body. He should remember that the amount of pace imparted to a stroko depends upon the speed of the racquet when it meets the ball.

One authority lays it down that every stroke in lawn tennis can be divided into three separate and distinct actions, which should, however, in practice be blended harmoniously into one movement. The first is the swing hack of the racquet ; the second is its swing forward and its hitting of the ball; and the third is the end of the swing after the ball has been hit. the follow-through, as it is called.

The thind, far from being unnecessary, contruls the balance of the player's body. To some extent the play of men differs from that of women, but this distinction does not affect the main principles of the game.

The lawn tennis player must finst of all learn how to serve. The service most finvoured to day largely as the result of the example of American and Australian players, is the high overarm one, delivered at a very rapid pace and usually made additionally difficult to take by the spin that is put on the ball. The first service is usually delivered at the utmost possible speed; the second, if such is necessary only a little less fnst

This high overarm service is used by most men players and by the best women players. Figs 3, 4, and 5 show a grent player in the act of delivering it, which he does by hitting the ball with the racquet at the full stretch of his arm, thus getting the greatest possible power on to it, and then letting his racquet follow the hall right through the stroke until it comes to rest near the right leg. The ball should be thrown up over the right ear and struck the second it comes within reach of the centre of the racquet.
When beginning the serve, the weight of the body will be on the right foot, but when the ball is hit, it should be transferred to the left. To impart the necessary spin, he draws his racquet across the ball at the moment of impact. This scrvice can usually be acquired by men of ordinary agility and strength, provided they practise. They should not hesitate to throw the ball up to a good height when serving; many serves are quite spoiled because this is not done, and therefore the ball cannot be hit with the racquet at the player's utmost reach and power.

To receive a service of this kind the player should atand well behind the back line, dizgonally to the server. He should watch carefully for the break of the ball, and, if it has this quality, should mect it sn that it breaks towards his hitting arm, not across his body. It should be hit hard, preferably with a little top spin, as this will kill the spin the ball already possesses. The return strokes generally used are the drive acruss the court and the one down the side line. If these strokes are made with the forehand drive and a spin is put on the ball they are very difficult to return.
The Chiei Strokes. It is fairly generally agreed that there are five strokes, apart from the service, that are of major importance, the others being varintions of one

which cannot then be hit as strongly or as necurately

Equally impurtant is the correct use of the weight of the body. This sloould remain, as far as possible, on the right foot until the stroke is half completed, when the player should begin to transfer it to the Icftone. It should be entirely on the loft or front foot as the stroke is finished and the player swings the racquet round for the follow through The right or back foot should never be lifted from
line with the forearm than at right angles to it. The head of the racquet, as a general rule, should be parallel with the ground. It is well for the player to separate the forefinger from the other fingers, as he will get a firmer and more comfortable grip. The thumb should lie across the handle, not tightly round it.
There are several varieties of the forehand drive, the names, such as the chop drive, the cut drive, and others, given to then suggesting slight variations in the way the ball is hit. One that is most practised is the horizontal drive. In this the ball is hit either with the racquet at right angles to the ground, i.e. without spin or cut, or hit with a racquet that moves upwards a little and turns overafterthe ball hasbeen hit, thus giving what is


Lawn Tennis. Overarm service. Fig. 3. Beginning the serve, racquet being shown at its lowest point. Fig. 4. Raising racquet and tightening arip. Fig. 5. Position of racquet after ball has been bit, showing full cxtent of Beginning the stroke the player seginning the stroke, the plag
being aideways to the ball called top spin to the ball.
To make this drive sucscssfully it is the ground before the ball has been hit. It necessary to have the body in a correct is understood that these instructions refer position. The player should stand sideways to to persons who hold the racquet with the right the net with the left foot in front of the right, hand; for left-handed players the position of the feet being parallel to the base line and the feet must he reversed. about 15 or 18 in. apart, according to hia height. The reason for this position is that without it the player cannot swing his racquet freely, cannot use his weight properly, and cannot keep his eyes so easily on the ball.
The drive should be made with the arm straight or almost so and the ball taken as high as possible consistent with the horizontal position of the racquet and when it is at a point about the middle of the player's body. In this way racquet and arm, moving together in one long, straight sweep, put the greatest possible power into the stroke, the analogy being that of a straight stick, by which a harder blow can be struck than with a crooked onc. forwards parallel with the ground, and the bali' A common fault is to should be hit as far away as possible from the get too near the hall, hody, provided that there is no loss of balance

The ideal place to h:t it is at a point a little below the line of the waist, that is, lower than that taken for the forehand stroke.
When he begins this stroke tho player should have his weight upon the back foot. from which it should be transferred to the front one as the racquet comes forward and makes the hit, and it should be wholly upon the front foot as the drive is completerl will be of assistance to the follow through if he lifts his left foot from the gmund as soon as the stroke is made. Tho wrist should be quite rigid when the ball is struck.
In playing this stroke good players make use of the left shoulder. By means of this the body is turned as the stroke is made, and the rotary movement thus given helps the swing and power of the drive. If a player is unable to play this atroke with a horizontal incquet at right anyles to the ground, or wants a variation from it, he can play it with the racquet slanted back somewhat. This will then pass under the ball, and so give back spin to it , thus causing it to hang a little after pitching.

## The Smash Stroke

The smash stroke is played with very much the same action as the scrve, and players who are good at the latter are usually good at the former. As this strake depends for its success very largely on power, the harder the ball is hit the better. In some cascs a ball hit in this way can hardly fail to score.
To play the smash well a player must get into the correct position, and with the arm stretchal to its fullest extent must bring the racquet down with its utmost force just as the ball is on the middle of it. The stroke must not be hurried, and the weight should be transferred from the back to the front as it is finished If the right position has been taken up, this movement enables the full weiglit of the body to be put into the hit. If this cannot be done the player has probably misjudged his pusition.
In addition to this, the usual form of the sunash stroke, there is a backhand smash that can sometimes be used to good purpose. To make it the racquet should be held with the backhand grip, with the thumb along tho handle to give control. It should be made with the forearm, the ball being taken above the left side of the head and hit with a sweeping action round it. As with the ordinary back. liand stroke, the player should lave his body sideways to the net and his feet parallel to it and apart. The wrist should be rigid as racquet and ball meet.

Volleying. Volleying, which means hitting the ball before it has touched the ground, is one of the most effective of lawn tennis strokes It should only he attempterl when the player is quite near the net and in position to dash the ball down at great speed. In this stroke the wrist plays the dominating part, little or nothing depending upon the weight or swing of the borly and the sweep of the racquet. The wrist must be as firm as possible and the racquet held in a strong grip. If this is not done the racquet will turn in the hand and the stroke will consequently be a failure. The volley derives its power from the pushing action of forearm and wrist and its speed from the pace of tho ball when it meets the racquet. Accuracy of aim is secured by keeping the head of the racquet supported above the wrist.
To make a volley it is not necessary for the player to put himself into a position sideways to the net, as he should do for a drive, although this position is recommended by some authorities, who assert that a harder return is thus secured. Most players volley facing the net with the feet more or less parallel to the side lines. One reason for this is that there is less time to prepare for the volley than for the drive.

There are scveral forms of the volley. A forehand volley is made with the racquet held in the forelinnd position. The ball should be hit about the height of the shoulder, and the head of the racquet kept a little above the horizontal, with the wrist pressed down. A variety of this stroke is necessary when tho ball drops below the height of the net. The danger of driving it into the net can be avoided by stocoping down and keoping the head of the racquet up, so that the ball is hit slightly upwards and clears the not.

Volleys, like other strokes, must be placell if they are to score. This is done by turning the wrist one way or the other. For instance, if a player is near the net in the centre of the court, and he wishes to volley to the left of his opponent, who is alnost facing him. he must turn his wrist out, i.c. away from the body, and slant his racquet in that same direction. The ball will then be volleyed to the right, which is the opponent's left.
The volley is sometirnes made with a back. hand stroke. For this the grip should be shortened and the thumb placed down the back of the handle. The player should take up a position sideways to the net, and shuuld stoop down so that the head of the racquet is about the height of the waist. As for all other volley shots, the racquet must be held tightly and the feet planted firmly on the ground. It is not necessary, however, to swing the racquet for this stroke.

## Use of the Stop Volley

Very useful on certain occasions is the stroke known as the stop volley. If properly delivered it makes the ball drop just over the net, and, is, therefore, often played when an opponent is at the back of the court. It can be made in two ways. One is to hold the racquet loosely at the moment of hitting the ball, and the other and better way is to slant it, thus giving the ball the necessary spin.
The same purpose, i.e. placing the ball just over the net when the opponent is well away from it, is fulfilled by the drop shot. To play it the ball must be hit crossways, the racquet being almost parallel with the ground. It hits the bal! underneath from right to left in order to put on it the spin which will prevent it from louncing far when it drops wer the net. This stroke is mallo with the wrist and arm. The player does not put any of his weight into it, neither does he swing the racquet for it nor follow it through. as he does with most other lawn tennis strokes.
The stroke known as tho half.volley is worthy of attention, although it should only be played in an emergency. It is something between a volley and a ground shot, and is useful when the ball comes in such a way that the player can neither volley it nor drive it. It should bo played with the racquet quite firmly held and in as horizontal a position as possible, the ball being hit as soon as can be after pitching. It differs from volley shots inasmuch as the racquet should be swung to the ball and should follow it through as far as possible.
The Lob. The last of the five main strokes is the lob. In this the player lifts the ball over the head of an opponent so that it pitches just inside the base lines, or at least in the back part of the court. It is a very easy stroko to play, though it cannot be played with the necessary accuracy without a good deal of practice.
In order to play a lob properly the player must be in a sicleways position. just as for the forehand drive. The racquet should be slanted back and be swung from undernenth in a firm grip. Care must be taken to lift the ball high over the opponent's head otherwise it will be smashed back. The lob can also be delivered with a backhand stroke, and it can be inade
with spin on the ball. Its prime easential, however, is accuracy, as inaccuracy cannot in this case be compensated for by pace, as it can with the drive.

These and other lawn tennis strokes are played in the same way for singles as for doubles. In singles the player's task is quite simple; ho must himself return every stroke to tne utinost of his power, but in doubles the two players must have an understanding on the subject; otherwise confusion and luss of points will be the result.

Tactics for Doubles. In men's doubles the tactics of the best players are as follows. The server, having delivered his service, dashes up to the net, where his partner is already stationed. Each in his own half of the court, they will then be in a position to smash or volley a large proportion of the returns. They must be prepared to run back if a lob is threatencd, each watching his own side of the court : but otherwise the nearer the net the better is quite a goorl rule. Players in this position shuuld always be moving. or appearing to move, towards the centre of the court, in order to cut off an opponent's return and also to keep him in a state of uncertainty.

When it is the turn of a player to receive a service, he and his partner should both be on or behind the base line, the best playels having abandoned the idea of having the one not receiving the service at the no!. W'hen a return justifies it they should go forward together, kceping in line and the same distance from each other, so that they will cover as much of the court as possible. One authority suggests that the striker-out should occasionally send a drive straight at his opponent at the net, as a stroke of this kind, if delivered about waist-high, is usually very difficult to return, cither forehand or backhand.

In mixed doubles different tactics are desirable. The accepted formation is for the man, when not serving, to be at the net and his partner on or near the base line, the best position for most women players being a little outside the line and not far from the corner of the court. In this position the woman player can make two effective shots, the drive across the court and the drive down the side line. When the man is serving, he dashes up to the net as soon as he has delivered his service.

In most cases this formation is doubtless the best, but there are exceptions. For instance, if the lady is a goorl volleyer it may be advisable for her to play the same game ns a man would do; but if she is not., her partner, being at the net, should hit on the volley everything that comes within his reach.
Handicapping. In lawn tennis tournaments, and sometimes in friëndly games. players are handicapped. This is carried out by giving strokes to the weaker players, and making the stronger ones owe strokes. For instance, a player may receive 15 points, or 30 or 40 . This means that he has one, two or three strokes in hand when the game begins. If, on the other haml, a player owes 15,30 , or 40 points it means that he must win one, two. or three strokes before he can begin to count, 15. 30, and so forth. Thus, if a player owing 30 plays one who receives 15 , the latter only requires threc strokes to win, unless deuce is reached; the former requires six.

The nore usual way, however, of handicapping is to give or receive strokes represented by sixths of $1 \mathbf{5}$. These odds are re. coived in each group of six games of a set : in the first place in the carliest possible even games. That is to say a player who receives onc-sixth of 15 receives a stroke in the second game of each group of six: a player who receives two-sixths receives a strokic in each of the second and fourth games, and a player who receives three-sixths roceives a stroke in the second, fourth and sixth games.

IAE : Of Smoked Salmon. A special preparation of smoked salmon, lax may be served as hors d'oeuvres, being cut into thin slices, covered with dressing and garnished with parsley or chopped pickle. Lax is also served as a savoury on small buttered biscuits. It should be freed from the oil in which it is preserved, moistened with salad oil and lemon juice and then seasoned with pepper. It should be allowed to stand for some little time so that the oil etc., may soak in. Parsley may be used as a garnish. See Hors d'Oeuvres; Salmon.

## LAEATIVE.

 The mildest cath. artic or opening medicines are known as laxatives or aperients. The principal laxatives are cascarb sag. rada, sulphur, euonymin, manna, magnesia (magnesium oxide), castor oil, olive oil, and liquid paraffin. Many fruits have a laxative effect, particularly stewed prunea, figs andLAXTONBFRRY fruit raised by cross-breeding between the raspberry and the loganberry; it needs the same treatment as the latter. As the flowers are partly self-sterile the laxtonberry should be planted near other berried fruits.
LAYERING. This is a method of increasing stock of carnations, roses, and other shrubs and plants. The idea is to prevent the return of the sap from the extremities of the leaves and branches to the ronts by means of a cut in the stem. The sap bleeds, the wound hardens, throws out roots, and eventually the branch becomes a separate plant.
To take a layer, a suitable low-lying branch or shoot must be chosen, and all the leaves stripped off below a selected joint. The joint is sliced half-way through with a sharp knife, at a very acute angle. Thc partially sovered branch is bent upward and pegged firmly down into the ground in a patch of very sandy soil.

Pegs, in the shape of inverted V's, are pressed down, with one leg on either side of the layer, in order to keep it in position. Hair-


Layia Yellow blooms of the

LJAD: Its Uses. Lead, which is one of the heaviest and softest of metals, has many uses in the home. In the form of pipes it is extensively used in sanitary systems, for waste pipes, and occasionally for hot and cold water services. In sheets, lead is used in the construction of gutters and for covering flat


Layaring Methods. 1. Lajeriag stolons of 8t. Bernard's Lily. 2. Maltiple Lajering of Lapagaria!: $a$, soil: $b$, Abre: $c$, gtaging. 3. 8trawberries lajerod into (a) planged pot and (b) boz. 4. Stom-lajeriag: $a$, pebble in tongue $b$ halved flower pot. S. Carnation out and pergod (a). 6. Carnation cut loganberry shoots : a, stones. 9. Clematis layered : a, slit stom behind joint
mof surfaces, the lining of sinks, and in numer by the weather, and does not rust or corrode under the action of water.

Lead can be soldered, or joints formed by burning, this process consisting in melting the lead at the joints so that it fuses or burns together. Lead is often used for decorative
purposes in the form of garden ornaments, rain-water heads and pipes, and in some forms of ornamental statues, generally those used as a centre ornament for a fountain

In the home lead is used for keeping carpets in place at the edges. or for weighting the bottom of a table-lamp stand or other structure It has the advantage of occupying less space for its weight than any other convenient metal.
Polsoning by Lead. The presence of lead in water or food may lead to poisoning, but it is most commonly found amongst persons whose work involves the use of lead. such as, for example, plumbers, painters, and potters. The symptoms are sickness, acute pains and diarrhoea. While awaiting the doctor induce vomiting by tickling the Dack of the throat or by an emetic. If it is at hand a dessertspoonful of Epsom ssits should then be given, followed by milk and white of egga. A hot poultice on the abdomen will help to relieve the pain.

In chronic lead poisoning the first symptoms may not appear for months, the most prominent being colic, with agonizing pains in the region of the navel. There is a blue line along the gums at the junction of the teeth. also anaemia and muscular weakness. Thorough medical treatment is required. Ser: Casting: Flashing: Gutter: Plumbing : Sink.

LEAD ARSENATE. This is a poisonous and dangerous compound, which may be purchased in paste form in jars for mixing with water in the proportion of $\frac{1}{2} \mathrm{lb}$. of paste to 10 gallons of water. It consists of a combination of acetate of lead and arsenate of soda, and special precautions must be taken in its use. the maker's instructions being strictly followed.
The wash is valuable for clearing fruit trees from the larvas of such pests as the codlin, vapourer, winter, lackey, and currant moths, gooseberry slugworm and sawtly, and also caterpillars and biting beetles. See Fruit: Lackey Moth : Spraying, etc.

## Lead Art Craft for Home Decoration

## How to Make Incepensive Leaded Windows and Mirror Frames

Thls article deals with the various forma of ornamentation possible by means of prepared lead strips.

Many people like the appearance of leaded lights for their homes, but are deterred from installing them owing to their cost. By the use of prepared lead, obtainable in coils, a special cement. brush and sponge, the amateur can for a trifling sum convert a plain window into one with leaded panes.
This lead is manufactured in thin strip form and in various widths. It is extremely pliable, easy to use, and is coiled to facilitate handling and for convenient packing. A particular feature of the lead is that it adheres to tiled surfaces, metal, wood, or glass. It can be used for framing pictures or mirrors, and is one of the easiest materials for applying with cement as a moulding. It can be paintod with cellulose quick-drying paint when employed to outline tiled surfaces in a bathroom or kitchen.
Designs for decorating glass screens, glazed doors for wall cupboards, bookcases or overmantels, can all be carried out by the amateur, while the lead can also be employed for name plates on front doors and gates. The cement to be used with the coils of lead is specially prepared to withstand all weathers. Various outfits are obtainable for this craft. including one which contains glass colour stains for use on windows, etc., in ruby, amber, blue, and green.

Simple Leaded Windows. A small window on the staircase or landing may be selected on which to experiment. It will be found that after applying this form of decoration the
window is quite easy to clean. The strips do not work up, however much they are rubbed. if the special cement is used for fixing them on to the single panes of the ordinary vindow.

The first task will be to measure off the correct length of lead. Hold an end of the lead in one hand at the top of the window and allow the coil to unwind and fall perpendicularly (Fig. 1). Then nick the lead at the desired point with the thumb nail and, taking it from the window, snip it off at that mark.
Measure off and cut all the lengths for one window before proceeding any farther; then take the brush and the tin of liquid cement and paint each strip of lead on one side only with a thin but even coating of cement (Fig. 2). Treat two or three strips of lead in this way before attempting to affix any to the window, as the cement must bo on the lead for fifteen minutes before applying. This will ensure that the cement has partially dried and is slightly "tacky," and therefore more adhesive. Pencil-mark the window frame to ensure the strips being laid on straight. Now take the strip of lead which was ccmented first and lay it against the glass in the position required.

Having made sure that it is exactly straight, press it firmly and evenly with the ball of the thumb (Fig. 3), and with a linen rag damped with petrol or turpentine gently sponge away any cement which has boen pressed out from under the lead on to the glass. It has been found better to start


Lead Art Craft. Fir. 1. Measuring lentth ol lead required. Fig. 2. Coating joint. Fig. 5. How to bend strip lead. Fip 6. Smoothing inner buckled edse
the desircd curve, doing a little piece at a time (Fig. $\mathbf{j}$ ). The lead is now neatly curved on the outer edge, but the inner edige is buckled. Pro. ceed, therefore, as follows: Lay the curved strip on a flat surface. Hold lirmly in position with fingor and thumb of one hand and gently press the buckled surface witl the ball of the finger (Fig. 6). Practically all tho buckling will then disappear, and by gentle rubbing with the linger, which should be protected by the corner of a linen rag, a completely llat appearance will be ensured

For making a number of curvos of the saine size it is easior to work with a template. This is a thin piece of cardhoard which is cut to the exact curve required. Tack this template on to a smooth pioce of wood. Next tack the metal strip to be curved just above the top of the teinplate; then gradually ease the load round the elge of the template with the lingers by means of a gentle pulling and pressing movement.

Glazed bookcases can bo treated in the same way as windows. Books appear attractive bchind leaded panes, and so do china and glass. Recessed oupboards on landings or in halls often look well if the upper with the horizontal strips, but leaving the top portion is gla\%ed and decorated in this way. and hottom horizontals until last. They will Fig. Is shows a simple design for a bookcase serve to frame the others and keep them in or cuphoarl. Coloured glass effects may be position. Many people leave the spare cement introducod by means of the specially prepared on the edges of the lead, preferring thic stains. but requires discrect usage. appearance of age which the resulting irregnlarity affords. The strips may he applied to both sides of the window, as the cement stands all weathers.
similarly, opinion is divided upon the question of overlapping. Some prefer to overlap the strips of lead, for this method is easier and quite attractive. Others prefer to cut each rection flush with the next, giving a soldered-joint effect (Fig. 4). Nistakes are easily rectitied. If a strip of lend is applied incorrectly turn up the edge with the point of a knife and the whole strip can then be pulled off quite easily. After experiment. ing with a aquared pane effect, diamond panes (Fig. 7) will he found equally easy to simulate.
To imitate the Gothic or Norman arch, as seen in Fig. 8. or to insert panels of heraldic designs, etc., the amateur must learn how to hend the lead. Hold the strip mo that the side which is to become the outer. rdge of the curve is "ppermost, and gently pull the lead round to


Fix. 7. Diamond pane effect. Fir. 8. Imitation of Gothic arch. Fig. 9. Design for bookcase or cuphoard


The prossibilities of lead strips for framing pictures and mirtors are well worth noting. By this means a permanent frame js procured with little more trouble than the temporary one made with phsse-partout paper. A groove in the particular form of strip sold for framing purposes allows the lead to ho bent on to the lack of the picture
or mirror inount. r mirror mount. lining.

Figs. 10, 11 show this simple process, while in Fig. 12 may he seen the artistic effect of a perfectly plain mirror framed in lead.

Designs may be heavily drawn in pencil and placed under glass to be outlined in lead for ornamenting panels for screens or other articles. A special form of very narrow lend strip is sold for the purpose of outlining such designs.

House Name Plate. One of the most effectivo uses to which lead strips can he put is to make the lettering and framing for house name plates. Under a rectangular piece of glass of the sizo required for the plate, the name, having heen written or printed in ono of the various types of lettering suitable for this purpose, is placed and the letters are double outlined


Lead Art Craft. Firs. 10 and 11. Two stares in the use of grooved lead strips lor Iraming purposes
with the narrowest width of lead strip obtain. able. The lead must he alowly ensed along, the forms of the letters showing through the glass, and one end must be steadied with the left hand so that the forms alieady made will not be pulled out of shape. The worker must not proceed tou fost if the letters run on, or the first letters of the name will not have il chanco to ndhere properly.
Metallio paint may be applied on the back of the glass, so that the letters appear golden in the centre and outlined with lead. Another piece of glass of the saine size and sha pe as the lirst picce is then laid over the leaderl letters, so that they are protected on either side by glass. To provido for safe suspension of the plate two thin pieces of hrass are each cyeleted at onc end and slit at the other, su) that tho slit euls can be bent up, one to the front and the other to the back, to form resting places for the two pieces of glass. Having placed these on the upturned euds of hoth pieces of brass, hind logether with strips of the passe-partout width of the lead, thus binding in the brass with the bottom of the plate and leaving the two eyeleted ends projecting at the top, where this is in turn bound with the passe-partont. In order to a void the danger of moisture con. densing between the two pieces of glase, the under edge of the passe. partout fram. ing should be pierced in several places to provide ventilation. The lead strips are oltainablo in "illthe of from $\frac{1}{}$ in. to in. St randed for finc out.


Fir. 12. Good effect of a plain mirror framed in lead

## Leaded Lights for the Home

## An Old-World Attraction for the Modern Home

Other articles that deal with the decoration of the home arc Enamel: Paint; Panelling; Parquet.
Sec also such entries as Casement; Class; Stainced Glass; Window and those on the matcrials and processes. c.g Cement; Soldering

The old form of decoration known as leaded light work consists in the use of pieces of glass to form a pattern, in which they are held together by calms, or strips of lead. These are soldered together at the joints, and the whole fixed in a framework. Leaded lights form a pleasing fenture of some styles of decoration particularly in houses furnished on the Tudor or Jacobean models. In many cases it is possible for the amateur to take out existing casement windows and replace them with leaded light panels. or add lead panela to the framework.
The nmateur worker is recommended to study the article on Glass nad Glazing The tools required for making leaded lights are one or two good glass-cutters, cither a diamond or one of the newer types of wheel cutter. On a rippled or variegated surface it is $p$ mhable that better result will be obtnined from the use of the whecl, but in large sheets the diamond is less likely to cause a breakage, as it requires less pressure to effect the cut. A board upon which to out the glass, a T-square and set square, and straight edge are required, as Well as one or two linives for cutting the lead, a pair of pliers, and soldering iron
One or two special implements are noeded, including the lathykins, made from a piece of hardwood or bone a hout 7 in . long, and shaped as shown in Fig. 2, which shows a group of the tools required. The point is used for opening up the llanges of the lead hefore inserting the glass, while the prepared flat end is used for pressing them down agnin when the glass is in position. Machine-drawn lead calmad can be ohtained ready for use from various firms specializing in this material The smaller sizes are generally solid lead, while the larger are often reinforced with a steel core.
The types of glass in common use are the ordinary sheet glass, such as is used in windows, and which may be ohtained in various colours, and obscured glass, which is made in different grains or surfaces. One of the cheapest kinds that can be used for tints is rolled cathedral glass; it is made in a variety of colours, is non-transparent, and is very useful where some obscurity is required, as for the panela in a screen or a hall lantern

A number of glasses are graded under the heading antique, and include pot, flashed. streaky, Venetian, and opal. In the jot metal glass the colouring medium is introduced in the process of manufacture, and consequently the glass is coloured right thmugh. Flashed glass is only coloured on the surface. Streaky glass exhibits a variety of atreaks of different colour. Venetian has a strongly marked pattern, and is n very brilliant glass; opal hlass has anl opaque white surface.

Preparing the Design. When preparing a design it is necessary to bear in mind the nature of the material and the restrictions it imposes. For example, it is impracticable to introduce very thin lines, except those which are formed by the lead, as obviously there is a limit to the breadth of the glass in the sense that it is extremely difficult to cut a very narmo strip The desired effect should be olitained therefore fmm breadth of treatment rather than detail. This only applies to selfcolour glass, for when stained glass forms part of the composition the design may he treated in a more decarative and detailed manner For example. the body of a window made with
plain glass of various colours could linve a central panel introduced in stained glass which may have some particular fenture, such as a heraldic shicld or emblem. The hest models of such windows should be studied, as it is easy, when dealing with stained glass, to introduce a garish or cheap effect into a window by the use of poor design and colouring.

Taking as an exainple the light for a window composed of pieces of clear glass, the first procedure is to make full size drawings showing the exact arrangement of the separate pieces The lines upon the drawing should represent the heart or centre of the lead (see Fig. 1) The size to which the glass is cut must then be smaller hy the thickness of the heart (i.e half the thickness for each side). Sometimes the drawing shows also the thickness of the calm itself.
When it is necessary to cut up a number of



Leaded Liphts. Fig. 1. Diagrams shoming three varieties ol lead calms employed in this decorative work
squares or lozenges of the same size, the glass is first cut into strips of the desired width, a nd then cut across to form the squares, etc. Test the first strip) by placing it between odd pieces of calm and observing that the centre of calm registers with the centre line on the full-size drawing.

When the glass has heen prepared and the requisite quantity of lead is at hand, the framing is placed flat upon a level table or board, and lathe are nailed down on two sides of it in register with the line of the rebate of the window frame, as shown in Fig. 3. The outside lead is then arranged so that half of it will protrude from the rebate and show inside the sight lines

Inserting the Glass. Before using the lead it should be slightly stretched to straighten it The lead is la il upon the bench and the gronves slightly opened with the lathykin on both sides. The requisite number of pieces of lead are cut to the length and breadth of the light and laid on one side ready to hand Sufticient pieces of glass are then inserted into the

lead and built up in the vertical direction of the light. The glass is inserted into the grooves in the lead and tapped tightly in position with the handle of the lead knife. As each piece of glass is inserted, it is temporarily fixed by driving n nail lightly a little way into the hench with the side of the nail against


Leaded Lights. Fig. 2. Above. cutting board. T-square and soldering iron ; below, other speciai tools required
the edge of the glass. Short pieces of lead murt be inserted between each piece of glass and cut to such a length that their ends will butt against the vertical strips, as in Fig. 4.

When the first set of glasses has been inserted a long strip of lead the requisite length for the vertical strip is slipped over the edge of the glasses. To do this will necessitate lifting each glass separately from the hench, for which purpose the hent knife is required. This is pushed under the glass and raises it just enough to allow the Hange of the vertical lead to he held hetween the glass and the hench. The temporary nails are removed while the lend is inserterl, but fixed behind the lead to present it alipping off again. Each nail and separate piece of glass is treated in the same way until the whole length is complete. The light is continued until all the glasses are in position The remaining two outer leads are placed in position and temporarily secured by nails to the bench. The whole is then pressed tightly against the laths, and afterwards secured by two additional laths.
Before driving the nails into the bench to secure these laths test all the dimensions. Should the panel be oversize this may be corrected by tapping the edge of the Inth and driving the picces of glass more closely to gether. Corner angles should be tested with a set-square, and when all is in order the second set of Inths may be fixed and the joints carefully soldered.
Soldering the Joints. The soldering tool must he tinned before using The surfaces to be soldered are rubhed over with a composition candle and the solder flowed on to the joint Neat joints are best obtained when the soldering imn is at the right lient. The face of the iron should be placed only on the joints and held firmly until the solder runs into place. as shown in Fig 5.

When all the jointa are soldered the panel aliould be turned over very carcfully. Two of the laths can he removed and the panel drawn forward on the surface of the table until it projecta sufficiently to allow the hands to be inserted beneath it. It should le grasped between both hands and the projecting portion laid on a strip of wood, while thant part of the light resting on the hench is raised with the left hand until the panel is vertical, as in Fig. 6, when it should he turned round and rested against boards which are slanting backwards. The bench is then oleared and the panel lifted by means of boards, laid in a vertical position, tilted over and pushed on to the table. The second side is then soldered us hiefore.

For cementing, a small quantity of white lead may he used. Another cement is composed of whiting, plaster of l'aris, boiled oil and turpentine, coloured with lamp-black, and with the addition of red lead and patent driers.
The object of cementing is to fill up the grovies and crevices between the glass and the lead so that the panel becomes one solid structure. A good way of doing this is to apply the cement with an ordinary paint brusil which has been much worn and has got strong in the bristles, and to brush the cement well in under the finnges of the lead, as indicated in Fig. 7

The corners should reccive extra careful attention: proper cementing is evi. lenced by the cement working right thmugh from the top to the underxide of the worl: Lift the light from the bench occasionally and see if the cement

has worked through. Surplus cement should be wiped off with cotton wasteor clean rag, the light turned over and the cement brushed in on the other side. The whole sur-
face of both sides should then he wiped over to remove surplus cement, and the surfaces dusted with whiting. The panel should he set against a sloping board to harden, and allowed to stand for 12 to 24 hours, when it may be cleaned by dusting it over with clean, dry sawdust and the use of n acrubbing brush. Any cement adhering in the corners should be cleaned out with a pointed piece of hardwood. The panel is then set aside to dry and harden for several days.

Fixing the Panels. Leaded light panels are fitted in different ways according to the nature of the frame. A simple method is to fix the panel into a rebate in a wooden frame secured with little battens of wood screwed or bradiled. In the case of large panels, strengthening bars of iron or copper have to be fitted, soldering a little hook of copper wire to the leads and twisting it round the iron bars. On outside work the rebate should be loaded with putty or cement prior to inserting the panel. If the light is to be fitted into a window with a stone mullion or framework having a rebate, the holes for the supporting hars will have to be chipped out with a mason's chisel and the light bedded in mastic cement, which may be composed of lime, sand, and a little litharge.

Repairing Lights. Repairs to leaded lights are effected by a process known as stopping in, and presuming only one or two small pieces of glass are broken, these are removed by levering up the flange of the lead with the aid of a lead or putty knife, until the pieces can be removed easily. The new piece is cut to shape, inserted in place, and the lead pressed down smooth again. If this necessitates cutting the soldered juints at the corners, they will have to be resoldered. If several pieces of glass are broken, the best plan is to cut away the whole of the damaged part and replace it with now lead and new glass, soldering and cementing as if the whole were new work.

LEADSALTS. When applied to ulcers or broken skin surfaces lead salts act as an astringent and help to arrest bleeding. They are oommon ingredients in douches and lotions, and are sometimes of value for itching. Preparations comnonly employed are strong solution of subacetate of lcad (Goulard's extract) : dilute solution of subacetate of lead (Goulard's water). the most convenient liquid preparation for external use : glycerin of subacetate of lead: ointment of subacetate of lead; lead or diachylon plaster.

LEAF. Leaves perform important funo. tions in the life of a plant, but cannot be called absolutely es. sential organs, branches some. times performing similar offices, as in the case of cacti and other plants. Nevertheless, if leaves are denuded from plants, the plantswill quickly die or else have their vitality greatly


Leaded Lights. Fig. 3. First stage In the work. Fig. 4. Tbree pieces of glass in place, the calms held by ping. Fig. 5. Soldering the joints. Fig. A. Turning panel over to solder other side. Fig. ${ }^{7}$.
Brushing cement into joints with an old paint brush
injured. The function of a lenf appears to be a combination of lungs and digestive apparatus, which enable a plant to absorb air and nourish. ment from the atmosphere. In the case of evergreen plants these functions are performed for years, but in deciduous trees and plants leaves cease to funotion after a short period, and the withered lenves fall.

Transpiration with plants varies according to temperature and growth, and this explains why they do not require so much water in cold weather or during the period that blossoms ripen into seed. Frec transpiration is essential to the health of plants, and consequently it is important to keep the leaves clean so that they can function properly.

Directions for drying the leaves of herbs for culinary purposes is explained in the artiole on herb.

Leaf-Mould. Leaf mould is one of the constituents of nearly all potting composts, and in conjunction with loam and sand it forms an ideal rooting material for plants. It also helpa to lighten the soil.

The decayed leaves of oak. elm, and beech make excellent leaf-mould. especially oak leaves. Evergreen leaves, such as those of the holly and laurel, are not good for the purpose All leaves of the right sort should be preserved by the gardener rather than burnt. Decnyed leaves arc the origin of the bulk of the humus which is found in the soil. Thev should be swept into a heap. or heaps, in corners as sheltered from the wind as possible. As a precautionary measure it is well to cover them with a thin layer of coarse soil, in order to prevent them from being blown. See Begonia: Compost; Loam. Mould; Potting.
LEAK: How to Stop. A leak is recognized by the escape of the contents through failure of some part of the container. In the hoine, a leak is most common when water pipes burst owing to the action of the frost, and, if neglected, mny result in the Hooding of the premises.
The pipe should be blocked at some point above the fracture, so that the water cannot How through the pipe and the leak is stopped Repairs are effected according to the nature of the material of which the pipe is made. In the case of $n$ lead pipe, this is done by making $n$ plumber's wiped joint, and in the case of an iron pipe, by fixing a new section in plece of that which is danaged.
When rain finds its way through a roof or guttering, the leal usually is cansed by a broken or misplaced tile or slate, a small hole through the gutter, or through the roof covering if of some material such as bituminous sheeting. The remedies arc to replace the dimaged tiles or slates with new ones and close up the fracture in the sheeting. There are several patent compositions which are often effective in curing a leaky roof.

The remedy for a leaking water tap is generally to fit a new washer in place of the old one. Directions for this will be found in this work in the article Tap (q.v.) See líost; Water Supply.
Lean-to Building. This is a simple form of erection which leans against another building. See Greenhouse : Shed.

LEASE. A lease is a grant of property either at will or for a period determinable on notice, or for a fixed period by a person who has a greater interest in the property. The person who grants the lease is called the lessor. and the other who receives it the lessee. That which is left to the lessor after he has granterl the lease is called the reversion. The lessor need not be the freeholder. He may be himself a lessee froin another lessor, and in such a case the lease which he granta to his own lessee is called a sub-lease, and he is usually spoken of as a sub-lessor, and his lessee as a sub-lessee. A lense is usually given in consideration either of a sum of money paid down or an nnnual rent in money, or both, but it is not necessary that there should be any monetary consideration.

A lease for three years or over must be by deed under seal, but if anyone has an agreement for a lease in writing, and goes into possession of the house or other property on the strength of it, he will be considered a lessee, and cannot be turned out so long as he is prepared to execute a lease if required, and to obscrve the terins of the lease which was to have been made. The ordinary lease taken by a householder is for a fixed term, varying from 3 to 21 years. Sometimes it contains an option to terminate the lease nt certain fixed periods by giving a certain notice, or to renew the leasc on notice. The person taking advantage of the option should be carcful to give the notice atriotly in accordance with the terms agreed upon

Rates and Taxes. In leases of houses and other buildings, especially in towns, the landlord very often insists upon certain covenants and conditions being inserted in the
lease. The most common of these are that the tenant shall pay all rates and taxes, except landlord's property tax, which the tenant cannot agree to pay: a covenant to repsir the premises; a covenant to pay the rent, and very often covenants not to use the building for certain purposes. A covenant to pay rates and taxes is simple enough, but sometimes it is put in the form that the tenant shall pay not only rates and taxes, but "al! impositions whatsoever," and this sometimes reaults in a tenant being obliged to pry unexpected burdens whioh may be placed upon the property by the local authority.
Restriction of Use. It is quite common for leases to contain covenants restricting the use of the premises. Thus, when a landlord oorns a roiv of shops, he sometinies desires to keep the shopkeepers from cut-throat competition : so he decides to let one shop to a butcher, another to a baker, a third to a tailor, and so on, and he inserts a clause in the lease that the butcher shall use his shop as a butcher's shop and for no other purposes without his consent.
Another form which this covenant may often take is that the tenant shall not use the premises for businceses which the landlord considers to be ohjectionable, or which might be a nuisance to the neighbourbood: e.g. it is common to find a stipulation that the premises shall not be used for a fried fish shop, or ins a soap boiler's, or as a public-house This is, of course, partly to preserve the value of the property and partly to protect the neighlourhood against nuixances. A third form is to be found in the case of houses on a residential estate.
In some neigh bourhoods the residents object to lodging houses and boarding houses and schools and the like occupations which can be carried on in a private house. To protect himself against depreciation the owner of the estate inserts in his leases a clause to the effect that the house shall not be used as anything but a private residence. The courts interprot this clause very strictly; and have even held that a person who established a home for girls out of work, to whom she made no charge at all, way carrying on a trade or business within the meaning of such a covenant.
At common law every lessee is ontitled to assign his lease or to underlet the premises or any part thereof to suit his own convenience. The tenant sometimes agrees not to assign or underlet without oansent.
An express covenant is always put in a lease that the tenant shall pay the rent, and this is done to make the tenant take or send the rent to the landlord. If there is no express covenant by the tenant to pay the rent the landlord cannot distrain upon the premises or sue for the rent unless and until he has made a legal demand for it. A legal demand must be made after the rent has become due, and upon the premises themselves between the hours of sunrise and sunset.

Breaches of the Covenant. Where a tenant is guilty of a continuing breach of some covenant which is not innmediately remediable by the payment of a sum of money, the court will injunct him fmm continuing to do it. In the case of a breach of a covenant to repair, the landlord can always get ns damages the reasonable cost of doing the repairs But nearly every lease in these days contains what is called a condition of forfeiture and re-entry. whereby it is stipulated that if the tenant shali fail to pay the rent or to perform and observe the oovenants contained in the lease, then the lease shall be forfeited and the landlord shall have the right to enter upon the premises and take possession of them again.

Before taking the step of trying to eject the tenant the lessor must, however, give the lessee notice of the breach of covenant complained of, requiring him to remedy the breach, to pay compensation for it, also to pay the costs of the
landlord's solicitor and surveyor in connexion with the matter. After the notice is given, the lessee must be allowed a reasonable time irithin which to comply with it, and if he does not do so the lessor may then take action.

It should be observed that the forfeiture of the lease does not exonerate the lessee from paying damages. Even after the lessec has failed to oomply with the notice and the landlord has brought his action in the court, if the lessee comes forward and expresses his willingnces to comply with the covenants and pay reasonable compensation, the court will not allow his lease to be forfeited, but will suspend the action to give him time to do what he ought to have done at first. The lessee will also have to pay all the costs of the lessor.

An esception to the rule about giving notice is when the tenant has failed to pay his rent. In this case the lessor can bring his action for forfeiture without giving any previous notice or requiring the lessee to remedy the breaches of which complaint was made.
If a lessee of premises continues in occupation of them after his lease has expired he is said to hold over. The tenant who holds over and pays to his lessor rent on a yearly basis becomes a yearly tenant upon the same terms as the lease, and his tenancy will be only determinable by six months' notice on either side, which notice must expirc at the end of a current year of the tenanoy.
The Rent Restriotion Acts, so long as they continue in operation, entitle a tenant under a
lease to hold over after the expiration of his lease, but if be pays rent to the landlord no presumption arises that the landlond has accepted him as a yearly tenant. He is what is oalled a statutory tenant. The landlord can raise his rent to the amount which the statute allows by giving a month's notice of bis intention See Agrcements: Building House
LEASEHOLD. This is the name given in England, Wales and Ireland to land that is let on a long lease for huilding purposes, not sold as is freehold. It is usually leased for 99 or 999 years for an annual payment known as the ground rent. At the end of that time the land, and also any buildings that have been erected thercon, revert to the successor of the one who granted the lease Such buildings must be handerl over in good condition lt should be noted that leasehold property is regarded us personal, not as real estate.

LEASH: For Dogs. Some form of leash is desirable for dogs when they are taken out for a walk. The various leather leads that can be purchased are undoubtedly the most satisfactory, and they can be had, either round or Hat, suitable for almost any breed. See that the swivel at the end has a strong spring; otherwise it will continually be coming off the collar. The leather may be preserved by rubbing occasionally with Mar's or castor oil. For very powerful animals a chain may be preferred, but it is much heavier and less comfortable for the hands. See Dog.

## Leather \& Ornamental Leather Work

## The Necessary Tools and Simple Methods Described

The following article contains many useful hints on materials and accessories required for this decorative craft. together with practical directions for modelling and colouring lcather.

Sce also the entries on Boot: Glove: Lacquer Work
When choosing leather for an important leather made from hide splita and known as piece of worlk such as a fire screen, large bag velvet splits. Plain skivers are cheap and or blotter, it is advisable to purchase a quarter useful lining leathers. These are the upper skin of medium growth. Older skins are grain of split sheepskins. The under or flesh coarser and young ones cut to waste Merchants charge more in proportion for supply. ing panels of frawless pieces, and if there is a surplus of material after cutting out the required amount for the work in hand, the extra pieces can be made up into sinaller articles. Skins are usually sold by the square foot.

English calf skin is the best leather for plain or modelling purposes. It can be prepared so that embossed work retains its sliape without padding. Kip calf, or East India kip, is a less expensive leather with a coarser grain, but is also good for modelling work. Cowhide is a useful leather for large pieces of work such as a screen or a shopping bag. It models, stains and wears excellently. As the skins are very large these leathers are obtainable at the lower rate in eighths as well as in quarters and ha|ves. A clieaper underhide is obtainable in narrower widths. Russian leather has a beautiful surface for bookbinding work. Morocco is made from the finest selected and hand-dressed goat skins. Pigskin is light, but very tough and durable. The reptile skins, crocodile, alligator, lizard and snake, make ornamental but expensive leathers.

Lining and Imitation Leathers. Persians are hard wearing and made from foreign sheepskins. They are obtainable in browns and several other colours. Velvet persians are a fancy form of this leather with a suede finiah. Persians are used extensively for tining firstclass work. Degrained persians are a superior form of suède, finished leather used for golf conts and other dress wear. Velvet sheepskin is similar in appearance to velvet persian, but coarser, and is used for making bags and blotters, etc., required with a suede finish. Less expensive for smaller articles is a strong
split is called chamois, though only an imita tion of the skin of that almost extinct animal. Skivers should be strengthened by pasting to leather, linen or board. They are not suitable for pockets or gussets, as they tear easily. They are obtainable in plain coloura, in fancy shadings and in nappa finish White kid is used for glove making and linings, and lacing calf for thongs and gusseting for pocketa.

Imitation morocco is made from sheepskin with a grained instead of a velvet surface. Polished crocodile. in large or small grainings, and velvet crocodile are copied well in hide. These are strong and effective leathers for shopping bags, pochettes and undecorated blotters. Lizard grained sheepakin is also an excellent imitation of another reptile skin which can he most successfully made up into handbags.
Tools and Accessories. Simple outfits are best for the beginner. There are many excellent ones on the market which vary slightiy in their contents. A useful set of tools comprises : a transparent set square for correcting angles and cutting the various parts of the work to fit: being marked with inches and quarter inches it takes the place of a rule; sharp knife for cutting leather and turning edges (Fig. I, D) ; double edged ball tool for embossing, i.e. pushing up the design to raise it from the back: combination tracer-model. ling tool, used for tracing and modelling the finer parts of a design (B) ; pliers punch for punching holes in the leather before thonging (A); boxwood mallet for Hattening out corners and pressing the eiges of finished work (K). A large-eyed blunt noedle is required for use with leather thongs (G). A rug needle will do.

A Dresden tool is often used for hackgrounds and completing delicate detail. One
end is shaped like an inverted $V$ and the other forms a semicircle. Both these work. ing ends are thin and smoothly finished. A purse crense is a useful tool for finishing the orges of leather work. It is heuted over a gus jet and held vertically. The gmove in the creaser lits over the edge of the leather. To round corners it is important to move the article round to mect the creaser. A well finished smoothly indented crease is thus ensily made. A brass holing gange (Fig. I, F) is a detachable device for


Leatuer Woik. Fig. 1. A simple outft. A, six-hole punch pliers. B, combined modelling and tracing tool. C, paring scissors. D, cutting knife. E. stitch tool. $F$, hollng rauge for pliers. G, needle for thongling. H. nwl. J, press button punch and die set. K, boxwood mallet
holes accurntely at equal distance both from the edge of the article and from hole to hole.

A brass die outfit (J) for fixing press studs and eyelets to bags nod other articlea can also be ohtained, and press buttons can be hought in various sizes and colours. Each press button consists of four parts: two upper pieces, cap and cap cuelet; and two under pieces, spring and spring eyelet. Directions for the use of these outlits are sold with them, but if the amateur wishes it is possible to get press studs put in work by a leather merchant or adler. Jatting punches for ornamiental work are used for simple forms of decoration instead of morlelling the leather and are sold with a number of fittings.

Many other helpful accessories are obtain able. Metal corners can lo hought ready for lixing in wallets. Vip fasteners, hag mirrors, frames and locks for bags and metal elges and tabs. Made-up bag linings are also supplied with patterns showing the exact sizes of the outside colers required to fit the inners Inners for wallets, blotters, pochettes and other neticles can be fitted to tho panels embossed or decorated by the home worker. Frames are obtainable for tire-screens in onk, mahogany or walnut. Rublier linings are made for leather tobncco pouches. Thongs are prepared for use in various widths and lengths of persian and calf.

Aniline spirit dyes are chiefly used for colouring leather work. A special jolish is wold to give a brilliant finish; manilla board is used for stiffening purposes and pattern making, and a cement or Hour and water paste for fixing linings, etc. Bronze powders and silver and gold leaf are suitahle for decorating lcathers, and may be supplemented with transparent lacquer colours. Jesigis and patterns are obtainable in great variety for decoration and articles in lenther.

Modelling or Embossing. Hnving cut out piece of leather to the requined size, damp it with a clean sponge and water, place it on a drawing bonrrl and fix the selected design over it lyy means of drawing pins, beyond the edges of the leather to obriate marking this. Having traced over the whole design with the tracing tool, remove the paper and trace the design again firmly with the tracing tool on the lenther itself.

To raise into relief portions of the work from the back, if the panel is a large one, the leather is held in position by the left arm, the first finger and thumb of the left hand limiting the particular portion of the design boing raised. while the right hand underneath the panel pushesup theleather, between the left finger and thumb, with a ball modelling tool, working it to and fro. Care must he taken not to stretch the leather too much. High relief does not look well in leather except in rare instances, when it is usually filled with a padding of cotton wool pasted to the liack of the leather and covered over with paper, pasted on before affixing the lining. Merlium and low relief should require no filling out if a good quality of calf or hide is used for this work. All the raising work required is done from the back hefore any modelling is begun on the front of the leather.

Having completed the raising, lay the panel Hat on a piece of plate glass; or, if a soft surface is requireil. pin several shects of


Leather Work. Fir. 2. Useful book or shopping bag in hide decorated with a modelled conventional design
hotting paper on to the drawing honrd Then holding the modelling tool at an angle of about $45^{\circ}$, press the wholo design down into position along the traced lines. Use the tool in one direction only and with sweeping strokes, to produce a distinct groove, without creasing we hackground. The heavier the leather the more frequent will be the damping required to keep it soft. Having thus completed the raising and depressing of the principal portions of the relief, work is now clone with a Dresden tool on the detail nnd hackground Using the same long. swepping strokea, the whole design is thrown up by this menns into varying shades of relief. |in really good leather craft. designs are not overworked, but accomplished with a minimum of witrokes nnd curves. Jatting punches are often used for lackgrounds to give them variety of texture The whole of the ground must be covered and the punch is held upright, the sane force being given to each blow of the boxwood mallet on to the punch. Where very low relief is ic. quired the background is merely pressed down without raising the design from the brack.

Staining. In all decorated leather work it is essential that the surface should he absolutely clean bofore using any stain. When the design is completed the whole piece of leather should be damped over with a clean sponge moistened in witer, and then oxalic acid solntion is applied with a pad of cotton rool. When this is dsy, colouring may lie proceerled with. An antique effect in obtained ly apply ing a coat of bichromate of potash to the leather after it has been cleaned. Choose spirit stains of the requirerl colours and mix them with methylated spirit to the tint suit. able for the particular work. In some cases the entire surface of the leather is stained one colour, in others several shades are used to bring out the designs. The leather must first be dainped before applying stains.

After the article has been colonred (exclud ing the design if that is to be multi-coloured) and the stain allowed to dry, begin to paint in the design with a camel-hair brush, working quickly to avoid hard lines, as these atains dry rapidly. Several contings of n stain may be required for dark colours. For large surfaces stains are applied with Hat wash brushes or with parls of cotton wool. Shading and tinting reguire practice. Several colours may he merged into one another by painting them on with small, rather dry brushes If the effect is cruile when linished, a softer one can be produced by a quick wash of very thin background colour over the whole design. Stain. ing may he used to colour designs without embossing, and embossing without staining. as forms of decoration in leathes work. The natural colour of calf is beantiful in some modelled work. Suall pieces of leather may be utilized to make artificini tlowers. Once modelling and colouring bave lseen graspell these call he effectively copied from real or imitation llowers. Skivers and suede are mostly used for this work, and Hower centres nud other accessories can be bought for it. (See Artiticial lilowers.)
Thonging. Lacing leather by ineans of narrow thougs threadal through a rug needle is a simple method for fastening, and is also used for ornamental edging as seen in Fig. 7. If thonging is to present a work manlike appearance it is essential that the spacing between tho holes is accurately gangerl.

Using a lacing of $\frac{1}{N}$ in wide, the holes should be $\frac{3}{18}$ in from each other and from the edge of the article By means of the holing gauge device already mentioned, marking and measuring are rendered superfluous

In use it has been found that shorter lengthe of thonging are the most practical. Dragging more than 30 in . of lacing through a large number of holes merely to avoid joining is not only waste of time and energy, hut also is apt to spoil the look of the work and to tivist the thong To start, fix the end of the thong between the lining and the leather with paste, and sew as if overstitching. To join thonging. pass the old and new piecc through the sane hole at the actual join, the old one from the back and the new one from the front, and paste about $\frac{7}{3}$ in of each under the lining. cutting of the superlluous tength of the old piece. Another method is to shave off each end and paste them together, hut this is not so durable.

Hide Book Bag. A most useful bag for books or for holding oddments when travelling is illustrated in Fig. 2. It can he made from two pieces of cowhide each 14 in by 11 in .; two pieces of brown persian or of skiver for lining of the same size; two pieces of persian calf 14 in by $1 \frac{1}{2} \mathrm{in}$; one piece of hide for the gusset 36 in . by 3 in . (the gusset is without joins); one piece of lining for saine; four pieces of hide for handles, $11 \mathrm{in}$.by 3 in ; brown stain, pastc and thongs.

A conventional design is traced on the upper portion of the bag. Any good oblong formation which comes to within about 2 in of either side and $1 \frac{1}{2}$ in. from the top will be suitable. The background of the design is pressed down, but the latter is not raised from the back for this piece of work: it is lightly modelled with a modelling tool from the front. Both sides of the bag are stnined dark brown.

When cutting the $36-\mathrm{in}$. strip of persian for lining the gusset, allow 1 in . for turning at either end to neaten and strengthen. Turn
down firmly and then paste the lining to the


Leather Work. Fig. 3. Fire screen of painted leathe:, mounted on a 3 -ply wooden backing and tramed in oak
gusset Paste the lining to the back and front pieces of the hag Lay two pieces of leather together for each handle, and thong them all round on loth sides. lix the handles on to the back and front pieces of the bag temporarily with paste, and paste over them the two strips of persian calf, $1_{2} \mathrm{in}$. wide, to neaten and strengthen the top of the bas. Thong along the top of the bag through lenther and lining and through the handle pieces and strips, to fix them firmly to the bag. Trim the sides of the bag pieces quite evenly and see that they are of exactly the same size.

Now thong the sides and the gusset strip together, working from the top corner all round the front pieces, and then do the back piece in the same way. Stain the thonged edges brown to match the rest of the bag.

Fire Screen. The panel for the fire screen illustrated in Fig. 3 relies on colouring and not on modelling for its decoration are obtainable which would be suitable for such a screen. Having traced the design in he manner already descrihed and gone over it lightly with the modelling tool, the spirit stains are applied, using dark brown for the gull's wings and tail, tipping them with black or with white to bring out the feather markings. The top of the hody and head are also white, the eye is black, and the beak and legs scarlet. The curves of the sea are in white and gradations of hlues and greens, while the lish are in browns and white. The sky is left the natural fawn colour of the leather.
The leather panel when painted is covered with a thin layer of paste und affixed to a 3-ply wooden backing. This is allowed to dry thoroughly before framing. It is kept in position by hammering gimp pins through the beading to the sides of the screen. The panel is pulished with a special leather polish to give it a glossy surface. Sicreen panels are also sometimes thonged to frames which are furnished with screw eyes.

Embossed and Coloured Blotter. To make the blotter illustrated in Fig. 4, cut out the panel in calf skin or hide, $22 \frac{1}{2}$ in. by 14 in ., this heing the size when opened out. Chnose a bold, conventional design, and after damping the whole surface that is to take the design; trace this ns directerl


Fig. 4. Front cover of a blotter in calf skin or hide, embossed in a bold The inner fltings are shown in the next page
in the gencral instructions for leather work: tracing. Now proceed to carry out the instructions given for modelling leather and for punching the background; then to stain the emhossing in different colours, proceed as directed for staining.

When the design has been completed and the skin is ready to he made up. cut out a piece of skiver $f$ in. smaller than the calf-skin and place this over the inner sidc. The skiver can be obtained to match the bacliground colour of the blotter. A better article results from using a plain persian lining. The finished cover can be sent to a leather merchant to have an inner fitted to it if desired.

Fold the calf-skin over the skiver and paste down securely. Cut out two triangular pieces, 2 in . by $2 \frac{1}{2} \mathrm{in}$, and paste these across each of the right-hand corners. Now cut out a piece of skiver 10 in . by 16 in . and fold over one edgc of the wider aide $\frac{1}{4} \mathrm{in}$., pasting securely. Cut out nnother piece 14 in . by 7 in . These pieces make the inside flaps. Turn the edge of the smaller piece to make a $t$ in. hem and partc down. Now place the smialler llap over the langer, bringing ilie hottom edges together, and machine them together through the centre, thus making two pockets. Machine the sides of the smaller pocket on to the larger. Place the bottom edges to the edgc of the blotter and the sides of the larger flap to the sides of the hlotter. The extra inch on each side of the larger flap must be folded in, gusset-wise, and flattened down.

Now open the blotter out flat and machine all the way round, joining the edges of the skiver to the outer akin and joining the two Ilap prockets on also. Care should be taken that all the parts are exactly in position before being machined, as the work will probably be apoiled if the machine stitching has to be undone. A in strip of calf, stained to match the lining, cut the length of the blotter must


Leather Work. Fig. 5. Interior of bloter of embossed leather, the front cover of which is shown to the previous pare
heen thonged, after the model. ling has been completed, with silver in the central motive and at the bottom, also on the outer edge. The back ground has been gilded with gold bronze powder Tu make the cover, the calf to be de corated is cut out in one piece to fit the book, allowing ? in over for the edges to project. For a telephone book cover the panel ol calf required would be $20!\frac{1}{2}$ in. hy 12 in , and the skiver for lining would be cut 21 in by $12 \frac{1}{2} \mathrm{in}$. to allow for turnings when paster
be sewn recurely at the top and bottom edges at the exact centre, inside the blotter This forms strap for the blotting paper to be slipped through This strap should be glued in position before the machining is begun, as it can then be machined in with the lining and pockets. These are shown in l'ig. 5 .
The blotting paper sheets should be cut $\{$ in. smalier than the blotter and slipped under the narrow strap the whole width of the blotter. Turn all the blotting paper sheets over on to the right side and slip the corners into the triangular pockets The whole blotter can be finished off by wax polishing. To do this, put a small quantity of pulish on a piece of flannel and rub it carefully into the whole surface using a circular motion. Continue this until an even polish has been applied. Leave for a short time and then rub over with a soft flannel
Decoratlon with Silver and Gold. When the methods of modelling and staining have been successfully practised there are several forms of decoration which give beautiful and antique finishes to leatherwork Lanellé is a form little known in England It derives its name from the silver thongs used in the decorating. These are often interlaced to form a kind of mesh Lanellé is used in conjunction with modelling. To carry out this work, thin strips of silver are cut $\frac{1}{8}$ in. wide. The leather is placed on a board and boles punched with a single thonging punch at the points where it is desired to thread the silver.

Thesilver is threaded from back to front, and is tapped with a tiny hammer so that it shall lie flat. It is threaded through the next hole from front to back, and so on, until the design is completed. The silver is out off and pressed flat When the silver thonging is finished it must be tapped at the onds and at the back with the hammer to ensure that it will lie flat. Most of this class of work is thonged inund the edges when tinished, but the example shown in lig. 6 is finished with a crease made by the purse creaser already described
The design for the loose cover for an A.B.C. or telephone hook illus. trated in Fig. 6 has


Fig. 6. Design for a telephone or zeference book cover in gilver thonged or lanelle work inside the cuver. For an A. B.C cover the calf would measure $12 \frac{1}{2}$ in ly $8 \frac{1}{2} \mathrm{in}$, and the akiver for lining 13 in by 9 in . When making up, eyelet holes are punched into the back of the cover top and bottom for a thong, or cord, to be passed through which holds the book in place

A fascinating form of lenther work is Vene tian lacquer on leather This may be worked with gold or silver leaf, but it is simpler to employ bronze powders. These are ohtninable in small tins the upper part of which holds the silver or gold powder, and the lower contains the special medium for using with it. The diary or address book cover in Fig 7 has a raised and modelled design which has been ornamented in this method Fint brushuork is also possible, and very beautiful effects are carried out on leather with a flat design painted in bronze powders and transparent lacquer colours
The modelling of a raised design is first completed with the exception of punchingif it is deaired to work up the background in this manner-which is done after the gold has been applicd. Mix a little gold powder to the consistency of cream with the medium in a small container or tinting saucer. Pass this mixture evenly over the surface of the leather, using a flat-topped Japanese stencil hrush. Work in circles to avoid streaks. Cover over all the leather, and if necessary give it a second coat after allowing 16 minutes for the first to dry. No sizing is required. Now leave the work for half an hour to dry, then coat over the parts to be left plain gold-in the case of the cover illustrated the back and the horderwith a thin coat of apirit varniah. Then on the central unvarnished portion of the fimnt wherc the design has been raised the colouring is applied with transparent lacquers. Yellow is a pplied first for the hackground, and then blue is put quickly over it to make it a green colour, while the raised design is worked up with yellow first and then red for shading, so that it has an orange effect
When the paint ing is completed the diary cover is ready for mounting, and the thonging must be painted with
gold powder. When the making up is linished the thongs are painted over again with gold. To make such a cover the worker will need 1 piece of calf $8 \frac{\mathrm{~d}}{} \mathrm{in}$. by th in., l piece of per sian for lining 9 in by 7 in., 2 pieces of calf. finished persian 3 in . by $6 \frac{1}{2}$ in The two last pieces are used to make the pockets into


Fig 7. Diary or address book cover in Venetian lacquer on leather which the diary covers are slipped to keep the book in place Stick the lining to the finished calf panel, turn ing in the edges of the former to match Turn in the edges of the neatly pared pieces of persian calf for the pockets and stick them lown with paste. Lay these pieces to the elges of the cover and thong all round.
LEATHER CLOTH. This cloth, as its name implies, is a substitute for leather, and is used mainly for upholstering. Manufactured by a patent process, it is obtainable in almost every colour with a variety of grains, morocco, antique leather, and pig and buffalo skins being among the leathers simulated. The cloth is dampproof and fadeless, and requires na sjecial cleaning. Dust or stains inay he removed with a damp cloth without destroying its lustro. Leather cloth may also be used for panelling walls See Panelling: Upholstery.
LEATHERJACKET. The larva of the daddy long legs or crane fly is popularly termed a leatherjacket. The grubs of this fly are about I in. long, two or three times as thick as the wireworm, brownish-grey or black, and exceedingly tough. They have hard black heads and jaws. They are very difficult to reach undergmund. Watering with a very strong solution of nitrate of sorls has bern found harmful to them Special preparsions are sold by seedsmen for the destruction of leatherjackets See Crane Fly Insecticide
Leaven. In its household application leaven is ured as a synonym for yeast (q.v.).
LECLANCHE CELL. This is a primary cell used for converting chemical into electrioal energy. It is largely employed in electric bell work. A single fluid cell, it consists of an outer glass vessel containing the electrolyte or chemical fluid, which is a saturated solution of sal-amınoniac.
Standing in the solution is a porous pot, made of a kind of earthenware, and filled with a mixture of hlack oxide of manganese, or manganese dioxide, in the form of a coarsc powder. In the centre of the pot and surrounded on all sides by the oxide of manganesc is a plate of carhon. The top of the pomus pot is closed with a layer of pitch, or similar material. The carbon plate comes up ahove this pitch, and has attached to it a brass terminal for connecting to the conductor, or wiring system

In the space hetween the outer vessel and the porous pot is placed a zino rod, usually circular in section, and terminating ut its unper end either with a terminal or with a short length of insulated copper wire soldered to it (see illus. page 70.) This class of cell has an electromotive force of it volts, and is suitable for supplying an intermittent current. It can be left on open circuit for a long time without
deteriorating, and has the property of recuperating when not used for a time.
The chemical action results in the zinc rod being consumed, and at the same time the anl. ammoniac is used up. For each oz. of zino consumed 2 oz of sal-ammonine will he used up, so that whenever the zinc rod has to he replaced the electrolyte should he renewed After about four zinc rods have heen eaten away it will he necessary to replace the porous pot and its contents
Leclanché cells should be recharged by thoroughly oleaning all the parts, putting in fresh zinc and refilling with fresh asl-ammoniac solution. The solution is made by putting into clean, preferably distilled, water as much sal-ammoniar as can he dissolved, but no more. The proportions are ahout 3 oz . of salaminoniac to 1 pint of water

Too much of the sal-aminoniac must not be used, or a deposit will form around the bottom of the cell and impede its action. Local chemical action may be set up, resulting in the rapid deterioration of the zinc. Since the deterioration takes place more at the top of the zinc than at the bottom, there is littla difficulty in finding out whether the cell is too heavily oharged with sal -ammoniac. Leclanché cells are used for batteries, several cells being connected in series to increase their voltage, or in parallel to increase their amperage In the former case, the wire from the zinc rod of onc cell is connected with the carbon on the next. In the latter, all the zincs are oon nected together and all the carbons together See Battery: Bell; Sal-ammoniac.

LEECH. Though now rarely employed, the leech was formerly much used for removing hlood to relieve local congestion, e.g. in certain eye disesses, etc As a rule. they drop off when surfeited: hut when they remain too long, the application of a little salt will make them quit their hold Bleeding from the bites is usually easily arrested by pressure Care should he taken not to apply a leech over a vein, too close to an eye, or not in any case to persons prone to bleeding.

LEEDS WARE. As the Leeds pottery was active for 120 years after its estublishinent about 1760, there is no scarcity of examples of this heantiful ware. The principal body was a


Leed, wate, urt will duracage amall figure dating from about 1780
fine creamware with $a$ rich arsenic glaze, in clined to $a$ grecnish tinge.

Manyof thebest pieces,except in the hlue. printed ware are unmark. ed. Among themarks used are Leeds Pot. tery, sometimes cross. wise; Hartley, Greens \& Co., for the best period; L.P.; and after 1863, R.B. \& S. The pieces to look for are those decorated with quiet enamel colours, together with the large class of per. forated or basket ware.

LEEK. This is a valuable hardy winter vegetable; the edible part is provided by the hlanched stems for ordinary purposes seeda are sown out of doors in March or April in shallow drills on a seed bed. If the seedlings are not overcrowded they may remain undisturhed until July, when they are planted finally. Deeply dug and manured soil is necessary Holes 8 in deep should be made with a dib ber one seedling being placed at the bottom of each hole, and the mots covered with $\pi$ sprinkling of soil. As the plants develop they will become blanched, and more aoil may be moulded up to produce a grenter length of blanched stem. The holes ought to be 8 to 8 in. apart and the rows 15 th 18 in . from each other

To obtain the finest leeky with a good length of blanched stem, the seedlings should be raised under glass in February and planted in early summer in trenches dug on rich ground. As the plants progress the trenches are filled in with soil to blanch the stems. Another method is to plant the seed. lings on the ground level and to blanch the stems by means of stiff paper bands. Two excellent varietics of leak are the Mussel. burgh and the Lyon.

How to Cook. The leok is used either as a vegetuble, as a garnish or as a Havouring for soups etc.

To stew lecks. trim and wash them, out them in half lengthwise, and then leape thein to sonk for about half-hour in a bowl of cold water to which a little vinegar has been added They should then be drained. cut up again if necessary and put into a pan containing enough wtock or salted water to cover them. Stew them slowly with the lid on the pan for ahout half-hour, or until they are tender. then season, and before serving add a sinall lump of butter White sauce is often served with leeks, or they are excellent if, when cooked, they are covered with a good cheese


Legs for Furniture: stock patterns which the home worker can procure. 1 , cabriole cabinet. 2, cabinet. 3, 4, dining table. 5, kitchen table. 8, table. T, tapered. 8, cabriole stool. 8, Jacobean table. 10, 11, swinger and leg tor gate-lér table. 12, dining table. 13. sidehoard
stock patterns in sets from timber merchants, and their use saves the home worker a lot of trouble. We illustrate a group of designs photographed from the stock of Messrs. Handicrafte, litd.. London, N.W.5. It will be noted that tapered, turned, twist, and cabriole legs are included, and in the case of those for gnte-leg tables the necessary swingers for the gates are available en suite. See Cabriole Leg: Chair: Furniture ; Stretcher: Table: Turning: Woodcarving.

LEGACY. A legacy is a gift of personal property by will. A gift of real property is called a deviso. Legacies are of three kinds: specific, demonstrative, and general.
A specifio legacy is a legacy of a specifio thing, e.g " my gold wateh" or "my $£ 200$ london County Council Stock." A demonstrative legacy is a legacy, not of a specifio thing, but where the testator points out or demonstrates the fund or property out of which the legacy is to be made, e.g. "I give to my son John $£ 1,000$ out of my Great Western Railway Stock."

A general legacy is the legacy of a sum of money in general terms without indicating any particular fund or source from which it is paid. l.g. "I give to my daughter Mary the sum uf $£ 500$." The advantage of a specific legacy is that if the testator's property is not sufficient both to pay his debts and to pay the legacies, the executor must resort to specifio legacies last or, as it is sometimes said, specific legacies do not abatc.

Demonstrative legacies share in the advan. tages of specific legacies in that they do not abate, but if the fund pointed out for payment of a demonstrative legacy is not in existence when the testator dies, the legacy is payable out of the general funds of the estate. A specific legacy, on the other hand, goes altogether if the thing bequeathed is not in existence when the testator dies.
Two Examples. For example, "I give to my son John my gold watch." If I sell my gold watch before I die, John gets nothing in lieu thereof. J3ut if I say "I give to my son John $£ 500$ out of my money standing to my credit in Barclays Bank," and when 1 dic I have no money in Barclays Bank, John gets his money out of the general fund if there is any ; in other words, it is just as if I said "I leave to my son John $£ 500$ " On the other hand, if I do lcave money in Barclays Bank when I die, iny executors must pay niy debts out of other funds before resorting to tho Barclays Bank money.

To give a complete example, a testator bequeathed $£ 1,000$ to John, $£ 1,000$ to Mary, $£ 1,000$ out of his money at Barclays Bank to Susan, and his gold watch to Isaac. The watch is worth $£ 100$. The debts and funeral cxpenses amount to $£ 2,500$ and the testator's total assets arc only $£ 4,000$, including the above legacies. The debts must be paid, so the exceutor, who has $£ 1,000$ besides the legacy money, requires another $£ 1,500$ to satisfy the debts and expenses, and this he will take out of the general legacics left to John and Mary, viz. : $£ 750$ from cach. He will not wuch cither the demonstrative legacy left to Susan, or the watch left to Isaac.

The Legacy Duty This is a tax paid in Great Britain and many other countries by persons who inherit money either under a will or on intestacy.

In Great Britain the duty varies according to the relationship of the legatee to the dc. ceased. Husband or wife and relatives in lirect line, i.e. parents, children, and grandchildren, pay I per cent. ; brothers, sisters, nephews, and nieces pay $\dot{5}$ per cent. ; while other relatives and strangers in blool pay 10 per cent. Relatires of the husband or wife of the deceased are regarded as strangers in blood. Legacy duty is not payable by a widow or child under 21 who inherits a sum
of $£ 2,000$ or less, or by a husband or any relative in the direct line who inherits $£ 1,000$ or less. Moreover if the whole estate does not excced $£ 15,000$ in value, legaoy duties are not oharged on money inherited by a husband or wife or by relatives in the direct line what. ever the amount they receive.

It is the executor's duty to pay the legacy duty out of each legacy before handing over anything to the legatecs. If the legacy is payable " free of legacy duty," the executor must pay the legacy duty out of the general funds of the estate, and not out of the legacy itself. See Estate Duty: Executor: Probate: Will.

LEGAL TENDER. This phrase is used in English law for the coinage which a oreditor is bound to accept when payment of a debt is offered to him. A creditor is not bound to accept a oheque unless that method of payment has been customary between the parties, or a large sum of money in shillings or other silver ooins: he can legally refuse to take it, and the debt will rensin unpaid until the debtor returns with the money in legal tender.

Legal tender consists of Bank of England notes and gold to any annount. Silver ooins are legal tender up to 40 s . and bronze coins up to 18., provided they are those issued by the royal mint. Bank of Eingland notes, it should be said, are not legal tender in payments made by the Bank itself. In Canada, Australia, and other parts of the British Empire the same principle prevails. Gold is legal tender to any amount and other coins up to a certain figure. In C'anada the gold coins of the U.S.A. are legal tender.

LEGGINGS. Leggings, usually of leather or canvas, are sometimes worn in bad weather and by those who work in the open air, by sportsmen, chauffeurs, and others. Leather leggings are usually either black or tan in colour, and are fastened either with buttons or with straps, the former being the more general. Canvas leggings are usually light in colour, drab being a common shade for them.

Leggings are sold in sizes, the lengths usually stocked for men being $11 \frac{1}{2}, 12,12 \frac{1}{2}$, and 13 in. Their calf measurements vary also. If leggings are ordered by post it is well to give the measurement round the centre of the calf, and to state whether this is bare or over tho breeches. Leggings and boots in one piece are known as Wellingtons. Leather leggings should be cared for in very much the same way as bonts. Canvas leggings can also be kept clean by brushing. See Buots; Gaiters.

LEGRORN: The Straw. Leghorn is a finc, soft straw used chiefly for children's summer hats in its natural colour. It wears almost indefinitely and requires very simple trimming. See Hat ; Straw.

LEGHORN: The Fowl. This breed undoubtedly stands first as an egg producer. It lays a large, white-shclled egg, is a nonsitter, and possesses no merit as a table bird. From an economic point of view it is cheaper to keep than most breeds, as it consumes a smaller quantity of hand. fed food in comparison with its output of eggs.

Apart wom this, it is one of the most attractive denizens of the poultry vard, its plumage, be it white, black, brown, or cuckoo, contrasting vivill!. with its yellow shank and bright red comb and Wattles. See Fowl: Poultry.

LEMON. The Plant. The lemon is a greenhouse evergreen shrub which will flower and mature its fruits in a glasshouse having a
minimum temperature of $50^{\circ}$. The plants should be placed in pots in a mixture of loam, enriched with manure, crushed bones, and charcoal. They should bo watered freely all the summer. The temperature during these months should range from $60^{\circ}$ to $65^{\circ}$, but may be dropped 10 points during the autumn and winter.
The Howers, which are white, appear in early summer, and are followed by the fruit. Lemons which are formed in one season, however, will not ripen until the following year Lemons belong to the Citrus family, which inoludes the orange, lime, and citron.

LEMON: In Cookery. A squeeze of lemon juice is an improvenient to fried fish, to a dish of mince, or meat rissoles. It is preferred to vinegar by many for salad dressings. The juice is used to whiten various dishes as well as for Havouring, e.g. for ices or when mixed with icing, for cakes. It is also useful for softening the fibres of tough substances. thus making them more easily digested. Lemon is often substituted for milk or cream in tea. It is cut into thin slices, one being put into each cup of weak tea, sugar to taste being added. This is known as Russian tea. The juice of a lemon in a tumbler filled up with soda water and swectened to taste is known as lemon squash.

Frum the rind, lemon essence, candied peel, and oil of lemons are prepared. The lastnamed is used both in cookery and scent making. The white pith below the rind is avoided in cooking, as it is very bitter. The rind should be pared very thinly or grated. In making custards and creams Havoured with lemon, the thinly pared rind should be added to the milk or creain preparation and brought to the boil. The rind is removed when the preparation is taken from the pan. In making lemon cakes or puddings the rind is usually grated. Slices of lemon cut across diagonally are used for garnishing cutlets, fried or boiled fish, veal, pancakes, and several madeup dishes.
To preserve lemuns, smear them all over with the white or yolk of an egg and place them on a shelf to dry, or keep them in a jar of water, renewing the water daily. Another method is to put them under clean dry salt in a box, which inust be kept in a cool, dry place. Lemon peel may be preserved if grated, put into bottles and covered with salt.
Many afternoon tea cakes, pueldings and sweets are flavoured with lemon. This Havouring is also a favourite one for an icing (q.v.) for cakes and sponge sandwiches with various fillings. The recipe for making lemon water ice will be found in page 615.

Lemon Bun. To make lemon buns, allow $\frac{1}{2} \mathrm{lb}$. flour to 3 oz . butter or margarine, 2 oz . castor sugar, 2 eggs, a teasporonful of grated lemon rind, and a teaspoonful of baking. powder. Add the baking-powder and lemon rind to the Hour, stirring them in lightly. Beat the butter and sugar to a smooth cream, gradually whisk into them 2 beaten eggs, and


Lemon Bung, an acoeptable addition to the afternoon tea-table


Lemon Squeezer which screws on the edge of the table. The bandle rotates the centre piece and the juice drains into $n$ basin
into $n$ greasel pio•dish and hake for ahout an hour. or put into a greased pudding hasin and steam for about two hours. Serve with a plain sweet nauce or $n$ sauce llavoured with lemon if the pudding is steamed. If baked, sprinkle it with castor sugar.

A different kind of lemon pudding is made in the following way. Line a pio-dish with puif paste. Mix if oz. bread or cake crumhs with 4 oz . castor sugar and a table. spoonful of grated lemon rind. Add 4 oz . butter or margarine and simmer all together for ahout 10 min . Put the mixture aside until it cools. Add the juice of 2 lemons and the heaten yolks of 2 eggs. Whisk the egg
then fold in the llour, etc. If the egga are amall and the mixture seems too stiff, ald a little milk to obtain the right consistency of a smooth batter. Grease some patty-tins and drop the mixture in, thout twothirds filling the tins. Bake them in a hot oven for about ton minutes. If liked, the huns can be covered with lemon icing when cold
Lemon Cake. Lemon cake is made in the following way. Take $\mathbf{6} \mathbf{~ o z}$. Hour, $\mathbf{4} \mathbf{~ o z}$. butter or margarine, 3 oz. castor sugar, I teaspononful baking-powder, and $!$ lemon. Beat the butter and sugar to $n$ creain. Grate the lemon rind on to the butter and sugar, and stir in. Beat up the eggs very lightly. Add $n$ little of the beaten egg to the hutter and sugar, then a little of the llour, and whisk lightly with n fork. Continue heating in the eggs and flour alternately, and at the last add the juice of the lemon and then the baking-powder, which must be lightly atirred in but not beaten. Pour the mixture at once into a greasel cake-tin and bake in a moderate oven for about one hour. Let the cake cool on a wire cake stand, and then ice it with lemon icing.

A lemon anndwich cake is made liy preparing 2 thin rounds or squares of sponge, ns described under jann sandwich (q.v.), and spreading them, while hot, with lemon cheese

Lemon Cheese. This is made by beating well together in front of the tire 3 oz . freah butter and ${ }_{4}^{3} \mathrm{lb}$. White sugar. When this is soft and melted, add the grated rind and strained juice of 2 lemons, and 4 or 5 new-laid eggs, well benten, and mix them thoroughly Stir the cheese over a slow fire until it is thick and crenmy, but do not let it boil, then put it into small jars and tie down when cold. Keep it in 2 conl, dry place until needed. It is used ns a preserve for sandwich filling or for ojen tarts and cheese cakes (q. q .)
Lemon Cordial. For this boil I lh. sugar and 1 pt . Wrter together for 15 min . and leave to cool. 'Then mix 1 oz. citid acid with $\frac{1}{2}$ dr. essence of lemon and add these to the syrup. which must be hottled for nae. To n tumbler of hot or cold water add 1 or 2 tablespoonfuls.

## Lemon Drops. See Acid Drops.

Lemon Pudding. An economical pudding that can be haked or steamed is made from $\frac{f}{6} \mathrm{lb}$. Hour, 6 oz . suet, 2 oz . breadcrumbs, 8 oz . castor sugar, 2 teasponfuls baking. powder, 2 lemons, water to mix. Chop the suet and mix it with the breaderumbs, tlour and baking-powder. Add the juice of the lemons to a cupful of water for mixing. Nix the sugar with the grated rind of the lemons and add these to the dry ingredients. Nix sill to a loose, moist consistency. Put
whites and add these at the last. Vour this mix.
ture into the prepared pie-diah and bake for about 40 min . It ahould be served with crean and sugar or, as an alternative, a sweet sauce.


Lemon Sjueazer in coloured pottery suitable for making lemonade at table. The top bas holes through whlch the juice runs into the cup

A verv dainty lemon puading is made by boiling the thinly pared rind of 2 lemons in $1 \frac{1}{2}$ pints milk until the peel is soft. Pound the peel with 4 o7. butter and pour the milk over $\frac{1}{4}$ lb. Savoy biscuits. Stir the butter into the mixture and add $f \mathrm{lb}$. castor sugar, the juice of 1 lemon and the yolks of 3 eaga well whiskerl. Pour the misture into a buttered pie-dish and bake for abrut 40 min . Whisk the whites of the eggs to a stiff froth and pile rough!y over the top of the pudding. sifting castor sligar over the fioth. Turn the oven to a slower heat and leave the pudding in for alout 10 min ., or until the froth is crisp and pale fawn in colour.

Lemon Sponge. This is made from I pint of water, 2 oz castor sugar, 1 oz . yelatine, 2 lemons and 3 egga. Pare the lemon rind very thinly, and mix it with the sugar and the strainel juice of the lemons. Dissolve the gelatine in the water over gentle heat. W'hen dissulved, strain the gelatine into another saucepan and add to it the sugar, grated lemon rind and lemon juice. Simmer or about 10 min., then place on one side to get quite cuol. Separate tho whiles of the ogys and whisk
them up very stiffly with $n$ pinch of salt. Alde these to the gelatine, etc., and whisk al together lightly. Pile in rough herps on a dish or set in a mould rinsed out in cold water Turn out when firm. The sponge should be kept in a cool place until required. If the sponge is serverl in a dish it should he garnished with erystallized cherrics or violets and pieces of angelica.

A lemon cream sponge is made thus. Add to a pint of cream the grated rind of a lemon and a little castor sugar and sot it on the stove to heat slowly, but nat to lnoil. Dissolve rathes more than $\frac{1}{2}$ oz of gelatine in a little milk, atir it into the Havoured cream and set it aside to cool. Then add the juice of $1 f$ or 2 lemons, and the benten white of an egg. and whisk the whole until it is stiff.
Lemon Squeezer. This is designed for the purpose of expressing the juice of lemons without the admixture of pips or pulp. The simplest squcezer is of glass, formed like a pyramid with a channel round the base and a spout on one side. The half of the lemon should be pressed, cut side down, on the point of the pyramid, and as the pressure takes place the juice flows down the sides into the channcl These are obtainable in aluminium and glass. An improved kind has n glass cup beneath the squeezer, the hase of which is perforated so that the expressed juice is collected in the cup. and several lemons can be squeezed in motation and the juice is strained at the same time A juice extractor which clamps on to the side of a table is the most convenient form of нqucezer und atrainer combined
LEMONADE. When making lemonade allow two gnod-sized lemons to a pint of water The juice should he squeezed into a jug with a lemon squcezer, and about \& lh. of loaf sugar added. Pour on a pint of boiling water and stir until the sugar is dissolved. A little thinly pared lemon rind may be added, to be removed before tho lemonade is served.

When the lemonade has cooled it should be strained and then more sugar can be added. if desired, and more water if it should be too strong. It should ho put aside to get quite cold hefore being served. A stronger solution can be made by using double the quantity of lemons and sugar. The lemonade can then he diluted with water as required. For an effer vescing drink 1 teasponitul of bicarhonate of sodn should be added to a tumblerful of the heverago and stirred quickly in. Sce Gilass.

LEMON GRASS. This is the common name of a hothouse grass, Andropogon schocmanthus. The leaves give off fragrance when pressed with the fingers. It thrives in a compost of loam, lpaf-mould and wand: and is jropagated by division of the tufts.


Lemon Squeezer which is useful yhen only a few drops of the juice are required. A perforated alumininm tube is first pushed throurb the lemon, and with is perforated tobe is again ingerted, the juree straining perforated tabe is akain inserted, the juce straining ps at a time Cuarleis e! Blaines liuulpment Co

LEMON-SCENTED VERBMNA. This favourite small shrub (Lippia citriodora) is valued for its fragrant leaves. It is not very hardy and needs the shelter of a greenhouse in most lucalities in winter. In mild districts it may be planted at the foot of a sunny wall where it will reach a height of 3 or 4 feet. It is propagated by cuttings in summer. Moderate pruning is necessary in spring.

LEMON SOLE. This is a kind of plaice sounewhat resembling a Dover sole and oocasionally called the sand sole. The flesh is not so plump, neither is it as firm as the true sole.
It is better not to attempt to broil or grill this fish, and it is not well adapted for being fried whole, but if skinned both sides and filleted it oan then be egged and crumbed and fried in boiling fat.
Fillets of lemon sole are also very good conked with a stuffing and baked in a deep fireproof dish in the oven. The dish should be greased with butter, and the fillets, after being filled with stuffing, should be laid in it, seasoned and covered over with a buttered paper. About 15 min . will oook them and they will look white and creamy. Serve with a well-favoured sauce poured over them.

Stuffing the Fish. The stuffing may consist of a plain veal forcemeat or it may be made with 0 mushrooms, chopped fine, 2 oz. butter or margarine beaten to a cream, 1 oz . fine breadcrumbs, a pinch of nutmeg, a teaspoonful of grated lemon rind, seasoning of pepper and salt, and 1 large egg to bind it. Heat this mixture until the egg is set, then cool it and lay a portion of it on one half of the fillet, fold the other half over and proceed in the same manner until all the fillets are stuffed.

Lemon sole tillets, stuffed or unstuffed, may also be baked with tomatoes, to which should be added 2 chopped shallots. They must be laid in a deep dish with 1 oz . butter, and with the tomatoes round them. Baste them while cooking with the liquor which runs from them, and keep them well covered with thick greased paper. When cooked, coat the fillets with fried crumbs and sprinkle over them grated cheese. Return to the oven for 2 or 3 min . to brown the cheese. Serve very hot. See Sole.

## LEMON THYME. This is an attractive

 variety of the common thyme (Thymus serphyllum) named citriodorus. It has fragrant leaves and purplish pink flowers in early summer, but grows only 5 or 6 in. high. Propagation is by cuttings in summer: if set in sandy soil and oovered with a handlight they will soon form roots. The golden-leaved (aureus) and silver-leaved (argenteus) varieties colour well if they are planted in full sunshine in poor sandy soil.

Lemon Thyme, a fragrant garden plant

## Lenses and How to Choose Them

## An Important Consideration in Amateur Photography

A reference to the article on Camera la suggested by this contribution, which is another step in making our work an Encyclopedia of Photography. The reader is referred also tó Developing; Enlarging: F/Number: Focus: Photography: Stop, and other articles dealing with the sublect

The amateur photographer thinks when he and accordingly needs knowledge for handing sees a photograph which is sharp in detail all it to the best advantage. With his fixed-focus over and bright in appearance that it must lens in a box-form camera all objects from have been taken with a rery good and, therefore, expensive lens. This is quite a mistaken idea, for cheap lenses, used within their limitations, can give a picture whioh is sharp in every detail. The outstanding difference between a cheap and an expensive lens is its speed, that is, the length of exposure it requires. This factur is expressed in a figure representing the a perture of the lens, or its $\mathrm{f} / \mathrm{number}$. Thus a lens working at $f / 8$ requires twice the length of exposure of a lens working at $\mathrm{f} / 5.6$ to give the same properly exposed negative.

Cheap cameras necessarily mean cheap lenses with comparatively small apertures $\$ / 8$ or $\{/ 11$. which can only be used for snapshots or so-called instantaneous photographs in the bright light of a summer day. All good types of cameras are supplied with various lenses,
 Lons. Fis. 1 (left). Diagram of admplo achromatio IV. Fig. 8 (right). Rapid rectillinear for gym
according to the desire of the purchaser, so that the price of a particular camera may vary with the lens with which it is fitted. The idea that special lenses are required for different kinds of photographic work may be dismissed entirely, with the partial exception of portraiture ; any good modern lens will meet all the requirements of the amateur photographer.
There are three main typos of lenses used in photographic work. The simple colourcorrected or achromatic meniscus lens, the rapid rectilinear lens, and the varieties of anastigmatic lenses. The simple achromatic meniscus lens type is seen in section in Fig. 1, in which two meniscus lenses, one of ground glass and one of flint glass, are cemented together. This type gives good definition if it is stopped down to about $1 / 16$ or $\$ / 11$. The whole of the lens cannot be used, because definition is lost tuwards the edges. The rapid rectilinear, sometimes called symmetrical, shown in diagram Fig. 2, is a great improvement and gives good delinition without disturtion at $f / 8$, though its definition at this aperture is not equal to that of an anastiginatic lens of equal aperture.

The chief points about an anastigmatic, one type of which is seen in diagram. matic form in Fig 3, are that with stopped down definition is perfect over the a case a wide-angle short-focus lens must be whole of the plate which they are designed to cover, and also that they are much faster than meniscus or K.R lenses.

Having obtained a good lens, the amateur nay be disappointed to find at first that he does not get as good results, from the point of view of definition, as he did with his cheap. probably fixed-focus lens. The reason is that the modern lens is an instrument of precision,
without being focus a narrow-angle long-focus lens. In such 2 or 3 ft . away up to the farthest possible distance, called infinity. were automatically in focus, and no question of focussing arose. With the anastigmatic lens, on the other hand. the greater the aperture and the focal length the shallower is the field of focus.

From one point of view this may be regarded as a disadvantage attaching to the speed of a lens, but in practice it will be found that at least with a moderately large aperture, say $\mathfrak{f} / 6$ or $\{/ 5.6$, more artistic and pleasing results will be obtained. So long as objects in the foreground of a picture are not blurred or fuzzy, those in the distance may be softened by being slightly out of focus.

It is largely a question of understanding the capacities and limitations of a particular lens in use and practice in its accurate focussing ; the wider the aperture and the shallower the field of focus the greater the necessity for care in focussing.

Two other questions which arise in the choice and use of a lens are its focal length and its angle of vision. In the average lens short focus means a wide angle giving a large field of vision on the plate, while a long focus means a narrow-angle lens giving a smaller field of vision on the plate with detail on a larger scale. A lens of short focal length and wide angle throws a larger amount of the object on to the plate than one of long focus; that is, it covers a wider field and reproduces it in smaller detail. On the other hand, a lens of long focus and narrow angle, covers a smaller part of the field, does not focus the object until it is farther away from the plate than the short focus lens, and accordingly gives the detail on the plate on a larger scale.

Not only has this the advantage of getting objects in comparatively large scale. although the camera is at some distance frum the object being photographed, but it has the very valuable property of giving much truer perspective than the wide-angle lens. The familiar case of the amateur portrait in which the hands are larger than the rest of the sitter's body is an exposition of the disadvantages of the wide-angle lens. Again, the wide angle lens sees more than the human eyes at one glance, and consequently the photograph given by it seems to lack actuality. Examples of this are seen on page 431, where the upper illustration is a wide. angle short-focus picturo and the lower a narrow. angle long-focus picture.
On the other hand, it will sometimes happen that a building or other object is to be photographed in a street or confined quarters street or conhned quarters
where it is impossible to get far enough away to used. In earlier days photographers carricd a complete selection of lenses of different anyles and types to meet such circumstances. With the modern lens, however, this is overcome, either by adding temporarily an extra lens to shorten the focus, or, more satisfac torily, by making the lens convertible.

This means that the lens is so designed that either of the two principal components seen
in Fig. 3 may bo used as a separate lens. Thus the complete lens may have a foca length of $5 \frac{1}{2}$ in for a quarter-plate camera If the back portion alone is used the focal length will be, say, 8 in ., while if the front portion alone is used the focal length may be 11 in. We have thus three lenses in one. each of which is a guod anastigmut. Of courso when a portion of the lens is used the effective aperture is considerably reduced, so that, if the complete lens works at $/ / 6$ the back and front components will probably be equal to $\mathrm{f} / 11$ and $\mathrm{f} / 16$ when used separately

To use a convertible lens in this way it is essential that the oninera should have at least double extension, that is to say, that the front must be capable of being racked out twice the distance required when the complete short-focus lens is used.

If a convertible lens cannot be acquired a sound rule in choosing a lens for general photographic work is to select one whose focal length equals the diagonal of the plate it is to be used with: for instanco, for a $\&$ plate camera the lens should be $5 \underline{d} \mathrm{in}$. focal length.

For the hest results in portrait work specially largo lenses are designed with considerable fucal length, so that the camera may be a good distance away from the sitter The aperture in some cases is ns large as f $1.5, \mathrm{f} / 2$ or $\mathrm{f} / 3$, with n focal length of 16 or 17 in . for a whole plate camers.

Camera lensos should be kept free from dirt and damp, and when not in use they should always he covered up. Under no circumstances should they be cleaned with anything but a camel-hair brush, special lens paper, or a piece of old, well-washed, soft linen. Lenses are easily scratched, and while a scratch will not be visible in a photograph, yet several scratches will reduce the amount of light which passes through the lens, and in bad cases will impair the definition. Of course no polishing substance of any kind whatever should be used. In the special kind of glass used in making modern anastigmatic lenses small bubbles will sometimes be observed these are unavoidable in the manufacture of the glasy and havo no effect on the brilliancy or definition of the lens.

The Lens Hood. In the modern folding hand camera it is rarely possible to provido any whade or hood of considerable size for the lens, owing to the lack of space. The result is that on bright days a certain amount of light from the sky enters the lens beyond that which comes from the ohject or scene being photographed. This light tends to be scattered over the negative and reduces the brilliancy of the picture, the negative being, in fact, more or less fogged.

Much more brilliant photographs will be obtained by the use of a sky shale or hood for the lens. The simplest form is a pieco of thin card about $2 \frac{1}{2}$ in. long by it in. wide, conted with a dead black varnish. It is held in place on the top of the Lens Hood, consist lens by means of an elastio ing of clipand hinged band. A black card is not sufficient, ns its slightly shiny surface reflects back the light

Another form consists of a stiff wire frame fixed to the lens mount at an angle and arranged to fold down when the camera is folded up. Over the frame is draped a small piece of black cloth. A third form consists of a clip which fits the lens llange with a metal shade hinged as shown in the diagram. It should be treated with dead blark.

When a shade is fitted it is essential to test it to see that no direct light is cut off from
the lens. Thiscan be efferted by focussing on a near object and examining thr image on the focussing screen See that there are no dark shadows at the bottom of the focussing screen. If no locussing screen is fitted to the camera, a test exposure should be made

LENTEN ROSE. There are some beautiful tlowers anong the varieties of Lenten rose (Helleborus orientalis), a hardy herbaceous perennial, 12 to 18 inches high whioh blooms in spring. The plants like partial shade and losmy soil with which decayed manure has been mixed A few of the finest varieties are Isolde, rose: Qucen of the North, blush-white; and Rohert Froebel, reddish crimson. It is unwise to disturb the plants unnecessarily, but propagation may be effected by lifting and dividing the clumps when the flowers are over.
LENTIL. The lentil is hardy annual bean, the seeds of which may be sown in sunny borders in April in rows nbout 1 ft. or 18 in npart. They should be put in about 2 in. deep and the same distance apart. The Howers appear in June and July. After flowering the tiny seed pods about 1 in. in length by 3 in. wide. are formed Each of these contains two seeds. The plants should be left in the ground until they are yellow. They should then be pulled up, thomughly dried in the sun, and the pods stripped ofl and stored in a dry place.

How to Cook. Largely used in vegetarian cookery because they posseas all the strengthening qualities of ment, lentils sometimes tako the place of a sccond vegetable, and are also made into soup or used us the foundation of side dishes. Lentils should not, however, be served as a vegetable in the case of a heavy meat dinner, but rather when the meat course is scanty.
The Egyptian red lentil is used most commonly; it requires soaking overnight, and must bo thoroughly washed and picked over in the morning, all pieces of black being removed. If to be rerved as a vegetable, boil it in plenty of salted water with an onion peeled and cut in strips. Add a little dripping or some other fat and boil for if hours. It is better to cook lentila n little too long than not enough. When done, drain the water away and add another 2 oz . of dripping. Season well and mix in the fat thoroughly by stirring over the fire. Serve with chopped parsley sprinkled over
Lentils may alao be served with bacon, and in this way inake a good supper dish. To prepare this, cook the lentils according to the directions given in the previous recipe, and, just before they are ready to be drained and dishod, fry 3 oz. atreaky bacon and out it into dice. Dish the lentils und bacon together, and serve with them $\frac{1}{2}$ pint of any good brown sauce and a few sippets of tonst or fried bread
Lentll Soup. One pint of red lentils, soaked overnight, nre required to make lentil soup. Prepare it by melting 2 oz. butter in a sauce pan, adding the lentils, a sliced onion, 2 sticks of celery cut into small lengths and a bunch of herbs, stirring the whole over the fire for 5 min . Pour in 2 quarts of stock and boil the soup until the lentila are soft; then take out the herbs and rub the soup through a fine sieve. Reboil it, scason it carefully, and then and


Leopard's Bane. Long-stemmed of doronicum

1 gill of cooked peas and 2 oz cooked ham cut into dice, if liked Serve the soup in a hot tureen, shaking in some powdered mint. This quantity is sufficient for about 8 persons. See Soup. Vegetarian Cookery

Lent Lily. This is the popular name of the wild dafiodil(q.v.)(narcissus psendo-narcissus)

LEOPARD MOTH. Also known as the wood leopard moth. this is a long-bodied insect bearing white wings with black spots Its larvie penetrate the interior of the branches and trunks of applo, pear and pluni trees, besides several other ornamental trees.

The presence of Inrvie in trees may bc detected by holes, but owing to the extensive turnings and galleries bored it is difficult to get at the pests. The only remedies are to push n hot wire in the hurrow with the hope of killing the caterpillar, or to squirt carbolio acid or paraffin emulsion into the holes Where the injury is confined to a single branch this should at once be removed, if the nbove remediey fail.

## LEOPARD'S BANE.

 This is the common name of doronicum, a liardy herbaceous plant 12 to 24 in. high. It beara large, yellow. dnisy-like flowers in spring and will Hourish on a shady border. It thrives in ordin ary soil and is easily increased by division in September. The finest of all is Doronicum plantagineum excelsum (Harpur Crewe), with long-stemmed blooms which are most useful for cuttingLEPTOSIPHON. This pretty, hardy annual, 3 to 8 in . bigh, is useful as a llower border edging or in the rock garden. A mixed packet of sceds will yield thowers in rose, yellow and ot her colours. Seods are sown out of doors in April where the plants will bloom in summer.

LESCHENAULTIA. This family of Australian evergreen greenhouse shrubs is in bloom from June till September. They thrive best in peat and sand in a sunny glasshousc, and like plenty of ventilation in tine weather.

LESPEDEZA. This is a Japanese shrub, 4-5 ft. high, which has attractive pinnate leaves and heara purplish pea-shaped flowers


Lespedeza. Leaves and clusters of pea-like purple flowers of this bardy shrub for a sunny border
in carly autumn. It is suitable only for planting in mild districts. The branches ehould be hard pruned in spring. Propagation is by sowing seeds or by division of the rootstock in spring.
LETTER: How to Write. There are a number of formal matters which those who wish to write a good letter should know. The writer should see, first of all, that his own correct address and also the correct date are stated at the top of the letter. If there has been a change in the address, whether temporary or permanent, and the existing paper is atill used, the new address should replace the old one ; if it is a temporary one it would be well to add the date at which it will cease
Methods of Address. The method of addres. sing the person written to varies according to the degree of intimacy. For persons of rank there are recognized forms of address, but relatives and intimate friends will discard these. For letters on business matters the usual olpening is Dear Sir if to an individual, or Gentlemen or Dear Sirs if to a firm. As regards others, there ean be no hard and fast rule, as so last rule, as so
much depends
won the personal yyon the personal however, not to take a familiar tone with persons who are only acquaintances or with those, not intimate friends, who are of high social position. The phrase, My dear, suggests an intimacy not present in the ceremoninl Dear.
The subscription to a letter also takes many forms. P'ersons use yours truly and yours faithfully indifferently; yours affectionately implies a close personal relationship. while yours respectfully and yours obediently suggest a request or a formal letter to a superior. Yours sincerely or yours very sincerely is the subscription most commonly used to acquaintances or friends.
If a letter is an answer to one received, the correct date of the latter should always be given when replying to it. If to-day or to-morrow is mentioned, the day of the week should be added; othcrwise a person may be in doubt whether it refers to the day on which the letter was written or the one on which it was received. If a day is mentioned it is well to add the date again in order to avoid a possible confusion. It is a good plan to read a letter over carefully after it has been written : this will prevent mistakes due to hasty writing. such as, for example, the omission of the important little word not.
Formal and Ceremonlal Letters. Convention or etiquette decrees that letters shall be written to friends, and in some cases to acquaintances. on certain special occasions. Letters of condolence are written to the relativesgenerally to the nearest-of a dead person. Letters of congratulation are written to persons who have received some honour or appointment; to persons whose engagement is announced. and on other occasions of rejoicing, such as the celebration of a silver wedding or a birthday It is also customary to write a letter of thanks to one's hostess after a stay in her house.
When writing to a stranger, perhaps one who has asked for the character of a maid, sonle persons write in the thind person. This kind of letter has the advantage that it need not contain expressions of friendship, which seem incongrunus in the case of a stranger, nor be signed. Care should be taken, however, that the third person is maintained throughout the letter. See Ink; Notepaper.

The Letter Case. This is a case for holding $\mathrm{E}, \mathrm{F}, \mathrm{K}, \mathrm{P}, \mathrm{U}, \mathrm{V}, \mathrm{X}, \mathrm{Y}$, and Z arc slightly
envelopes, writing paper, blotting papcr, pens, narrower : $\mathrm{B}, \mathrm{L}$, and S are much narrower. envelopes, writing paper, blotting papcr, pens. and all the necessaries for writing letters. The covers are usually of leather, or one of its imitations, and can be fastened by a Hap, made safe by a lock or snap, or both. See Ieather.
LETTERING. There are so many uses for lettering in the home that a knowledge of the various styles will be useful. Good letters must be readable, simple, and distinct. They must be proportionate and pleasing in form. and suited to the purpose for which they are employed.
The Roman alphabet is the basis of all lettering. The simplest form is the line letter illustrated at Fig. 1; the proportions are the same as in Roman, but it is drawn with fine strukes of the pen or pencil. A development of this style is the block letter shown at Fig. 2 : this may be done with a wide pen-nib or outlined and filled in with ink or colour. Decorative letters suitable for various purposes are

Fig. 2
$A D \longrightarrow$
Fig. 4

the (iothio and the Old English, shown at Figs. 3 and 4. For letters over $\frac{1}{2}$ in. high, a reed or canc pen is most suitable, but smaller work can be done with a quill or one of the steel pen-nibs sold for the purjose.

Preliminary practice will soon enable the writer to form the simple strokes. He slould commence with glazed paper, and with a pencil rule faint guiding lines. The paper should be supported on a board as about an angle of $45^{\circ}$, and the ink should be applied to the pen by a brush rather. than the pen dipped into it. The pen should be held lightly and horizontally to the paper, with the nib always in contact with the paper. Thick strokes aro vertical, thin strokes are horizontal.
The correct spacing of half-uncials, as the small letters are called, is important ; as a general rule two
curved letters should be close together and two straight strokes spaced well apart. The space between words should be exactly equal to the height of the letter.
In inassed writing the usual distance spart of the writing linos is three times the height of the letter o, and the up and down strokes of the small letters are, with the exception of $t$, twice the height of the
o. The uncials, or



Lettering. Fig. 5. 8 mall lettern, some capitals and pano-
tation marks of a simple but decorative form of lettering
Lettering. Fig. 5. Small letters, some capitals and pano-
taation marks of a simple but decorative form of lettering and $M$ and W wider. The same proportion applics to line letters, but block letters have. as a general rule. more or less the same width as they have height.

Dealing with the suitability of letters for various purposes, the line letter should be used for marking ink on household linen and clothes, but if the name is stitched the block letter is more effective. Small notices, menu cards. and programmes look well if uncials and halfuncials are used. The use of margins should be considered in spacing out lettering in this connexion.

Proparing Labels. Labels used for boxes, bottles, canisters, and other purposes should be in block lettering. A special pen is made to enable a thick line of ink to be drawn on labels and parcels, but a grod substitute will be found in a camel-hair brush with the pointed end cut off or one of the flat bristle brushes used in oil painting. Large notices may be done in the same way, but it is advisable to use thick ink or water-colour paint. Trunlis and other travelling cases should be painted in block lettering with Brunswick black or paint mixed with varnish. Roman letters are suitable, but look better when painted on attaché cases, and lend themselves to brushwork better than any other form.
Cutling Stenclls. For cutting stencils it is customary to use block letters with properly situated ties to hold the metal together. Incised letters in wood and stone are usually executed in Roman type; it is not a difficult matter to cut capitals in hardwood with a veining tool. The letters should be drawn in pencil or ink direct, or they may be traced on with carbon paper and then cut as far as possible against the grain. It is essential that the veiner employed in making the $V$ cut is kept perfectly sharp in order to leave clean edges ; the correct depth and width should be tooled in one cut, not worked out bit by bit. See Drawing ; Stencilling.
LETTER PLATE. A metal framework with a hinged flap is used for closing an aperbe coupled thats, or capital letters, shonld not metal fittings of the door. Usually the flap is o, the spacing may o, the spacing may be wider apart. To the flap working smoothly the bearings should mence with letters about if in. high and gradu- tension of the spring increased by unfastening ally reduce to about $\frac{10}{} \mathrm{in} .$, and always work one end, giving it another turn, and thell to ruled lines. Indian ink should be used in refixing it. See Door. preference to any other.

The Roman capital is distinguishable from the line and block letters by the endings of the strokes, known as serifs; the thin stroke should, ss a rule, be $t$ the wirlth of the thick stroke, and the latter about $\frac{1}{\text { \& }}$ of the height. It is equally as effective drawn in outline as filled in. The letters $A, C, D, G, H, N, O, Q$, $K$, and $T$ are about the same width as height.
orming words, and hung on two pivot bearings, and it is shut

LETTERS : Games With. Collections uf letters with which a variety of games are played can be bought or made at home. Bristol boarl, or any thin cardboard with a smooth surface, may be used. Squares are cut to any size required, the most usual being about $f$ in. square, but the actual size is immaterial if all the letters are uniform. They should be Roman capitals, done Bristol board, or any thin cardboard with a
livered, and is known as a letter plate. A usual variety is made of cast iron and painted with Rerlin black, or coloured. Better qualities aro made in polished and lacquered brass either plain or ornamental.

The letter plate should be chosen with regard to the appearance of the front door or to the entrance of the house, and the design should har. monize with the monize with the
Usually the flap) is hung on two pivot bearings, and To shut be oiled occasionally, and if necessary the
either in ordinary black ink or in Indian ink, and though the number required for each letter varies with the size of the set, the following mny be taken as a uscful proportion for a small set. There should be at least 25 of each rowel, and prefernbly 30 for $A$ and $E$; most of the consonants need 20 , but $Q$ and $Z$ can he cut down to 5 , and $X$ and $Y$ to 10 . $D N, P$, $R$ and $S$ may very well have 25 . A set made round about these figures should keep four plavers amused for $n$ considerable time

The games played with these letters arc very numerous. Word making and word taking may be mentioned first. Rules and directions are sold with every hox of letters purchased. Another game is for each plaver to draw a given number of letters, say 30. and with those to make as many words as possible in a fixed time. The letters must be well shaken up before drawing.
The players may be given letters forming one polysyllahio word, such as incomprehensible, and be told to form as many other words as possible using only those letters. It is usun to stipulate that no word must contain less than three letters. Another variant is to have the letters piled up in a henp in the middle of the table. while the players turn them over at their will, making as many words as possible in a given time. The rule mentioned ahuve holds good in this game also, and plural and singular are not allowed as separate words.

Another form of letter game is the adjective letter, in whioh a letter is written with all the adjectives omitted. Only the writer knows its contents, but the players arc then asked to suggest adjectives in turn, each of which is filled in by the writer in the order chosen As the adjectives arc chosen haphazard by a number of players, the result, when the letter is road aloud at the end, is always amusing by its incongruity. If possible the letter should be written mefore the guests arrive.
LETTUCE. This favourite anlad plant is grown chiefly for summer supplies in the average garden, but it can be ohtaincd in spring, summer and autumn by making successional sowings out of doors and under glass. Lettuce must be grown on rich soil and during dry weather needs watering very freely. There are two types, the tall upright cos, and the flattish cabbage lettuce, and numerous varieties of cach type. The cabbage lettuces are grown largely for late and early supplies and the cos lettuces for summer: the latter are more difficult to grow really well than the cabbage lettuces and should not be attempted on poor soil.
The first sowing out of doors should be made in March or early April as soon as weather and soil conditions allow of the seed being sown. The drills should be 12 in . apart. It is most necessary to thin out the seedlings hefore they become crowded; if necessary some of them may be trans. planted to form fresh rows which will be ready later.
Successional solf. ings are marle in Jlay and June to mect requirenients. As leituces are only pala. table when fresh it is


Letfuce. How to krow them successiully. 1. Correct soil preparation : a, fine soil: $b$, soil: $c$, manure ; $d$, vegetable refuse. 2. When thinning, $a$, snows correct distance apart : b. too crowded 3. Result of Rood toinning 4. Growing cos lettuces : $a$, neglected plant : $b$, plant with leaves tied round to blanch the beart. 5. Caich crops on celery ridges. 6. Forcing under
cloches on botbeds. 7. How to grow fer soring supplies: $u$, fine soll: $b$, soil preferable to sow a short row every fortnight and boil it for 5 min . cool it, part it in the
than to make several large sowings. Lettuce centre nad fill with a good forcencat. Tie it is often grown as a cstch crop between rows together again and braise it gently on a bed of of pens on in parts of the kitchen garden wherc room can be found among other crops.

Seeds sown out of doors in July will pro vide lettuces in autumn, and for winter and spring supplies seeds are sown in August and September, the plants being lifted and set in a hed of soil in a frame in the autumn Sonse of them may be planted on a wirm sheltered border in March if protection can be given in cold wenther. A further sowing in a heated glasshouse in early spring will provide scedlings for planting out in March.

A few of the best cabbage lettuces aro Herculcs, Wonclerful, Continuity, Commodore Nutt, Standwell and Ideal. Favourite cos lettuces are Superb White, Exhibition Cos and Jumbo. Varicties most suitable for sowing in August and Septemher are (of cos lettuce) Black Seeded Bath, Winter White, Hick's Hardy White, and Brown Cos. Of cabbago lettuces for autumn sowing Hammersmith and All the Year Round are fovourites.

Pests of the Plant. One of the ohief peats to guard against is the lettuce fly, n brownish. hlack insect with black wings, which lays its eggs in the blossoms and interytices of the lettuce in eurly summer. The effective remedy is to uproot infested plants and burn them. The lettucc root aphis cannot be dis. covered until the plant hegins to fade and droop. Usunlly a lot of coltony looking insects will he found to he olustered ahout the roots. The bidd plants should be at once destroyed, and the lettuco patch treated to u dressing of lime The other chief pest is caterpillars.
The cabbage lettuce is in season earlier than the cos, and is more delicate in texture and llavour. It is, therefore, more suitible for salads; for other purpuses of cookery the cos lettuce is the kind preferred.

Preparing for the Table. Lettuce is valued by cooks as a foundation for salads. It must he thoroughly cleansed before use, and all leaves carefully looked over, in case insects should be lurking in them. When preparing a salad lay the lettuce in water to freshen, then sprinkle it with salt and leave it for an hour or two ; wash it in two or three waters, shake well, and lay it on a hair sieve or a piece of clean cloth to drain.
Lettuce may be malle into a stew. Tie together a large cos lettuce after preparing it.

together again and braise it gently on a bed of vegetables with good stock for 20 min . Dish the lettuce. strain the gravy, reduce it by hoiling, skim and pour over the ettuce. The stuffing may be omitted, but the gravy must then be thickened and flnvoured with Worcester sauce and lemon juice See Salad

LEUCOJUM. This is the name of a group of spring and early summer Howering bulbs. The heat known are the spring snowthase (vernum), 6-7 in., which bears white. green-tipped Howers in April, and the summer snowflake (aes. tivumi). 18 in., Which has white Howers in May. The bulbs should be planted in autumin and left undisturbed; they


Leucojum. Drooping whit adreen fowers of the thrive in ordinary welldrained soil. An in croased stucle can be raised by means of offsets taken off the bulhs when the lenves have died down or in autumn.

LEUCORRHOEA. A discharge from the vagina commonly called whites is termed in medicine leucorrlicea. It occurs most frequently in women who have hurne children, but is also found in children and unmarried women.

Infection by microbes is the most common cause amongst ohildren, aggravated often by want of cleanliness Threadworms sometimes produce a discharge both in very young and older girls. The parts should be washed four or five times a day with warm water and an antiseptic lotion npplied, suoh as a weak solution of permanganate of potash.

Leucorrhoea may occur in voung women who work in close, hadly ventilated rooms or stand u great doal. It is very common in ansemin and chronic oonstipation. Married woinen often make the mistake of not consulting their doctor early enough. The cause may ho inflammation following childbirth. Ittention must bo directed to the general health, and the doctor may order an astringent or antiseptic douche. The patient should take no alcohol, and tea only in moderation. Sulticient rest is often of importance.

LEVER: In the Home. In the domestic sense n lever mny be considered as a rod or bar which can be inserted under or behind an object in such a manner that it is possible to prize it along, or to force it from its position. In most cases the word lever is employed in order to indicate some rodlike part of a machine which is provided in order to ohtain a mechanical advantage.

Supposing that the fulcrum, or that part about which the lever turns, is so placed that one part of the lever is four times as long as the other. Four times the pressure exerted at the long end is imparted by the short end, but the long end will travel four times the distance of the short end. When a bent lever has one arm which is jointed to another portion of the mechanism by means of a pin somewhere near a right-angle corner, it is known as a hell-crink nad will then transmit motion from one point t" another at right angles to it. See Handspitic

LEWISIA. This describes a group of rockery plants having fleshy lenves and summer flowers of various colours. They need rather special treatment and should be planted in full sunshine in well drained soil of peat. loam and sand. They must be protected from wet in winter by glass fixed a few inches


Lewlsia in bloom, with rosette-like cluster of leaves
ahove them on wires Howellii, rose pink, and Tweedyi, salmon rose, are two of the best varieties of the plant.

LEYCESTERIA. This is an attractivo hardy flowering shruh, also called the pheasant berry. It thrives in ordinary soil, grows 3-4 ft. high and in summer bears red bracts and cream coloured flowers, which are followed by black fruits. It is not recommended for planting in oold districts. Propagation of the leycesteria is by cuttings in autumn. Pruning takes the form of thinning out weak or crowded branches in spring

LHASA TERRIER. Some specimens of this small, rough-haired dog, found in Bhutan and other hill countrios adjacent to Tibet, have been imported into England. They have engaging manners which make them pleasing pets. The body is covered with a profusion of soft. shaggy hair, and the plumed tail is carried over the back, as with the Pekingese. The legs should be straight and short, and the colour white and black, silver, grey, or coffeecoloured. See Dog.

LIBEL. Libel is both a civil wrong, giving rise to an action for damages by the person libelled, and a criminal offence. Seditious libel and hlasphemous libel are criminal only. The one consists of publishing words onlculated to bring abuut discontent against the king's government or the king; and the other of writing againat religion in an irreverent and indecent manner.

LIBERTIA. In gardens only three species of the hardy evergreen perennial libertia are generally found. L. formosa, with its slender, grass-like leaves, height about 18 in., bears some resemblance to the iris. It retains ita frealiness throughout the winter if grown in a sheltered, sunny place, and in light, sandy loam, peat and loam, or other friable soil The white flowers appear in May. Grandiflora and ixioides are taller plants and fower rather later; both are white They reach a height of from 2 to 3 ft . The plants may be separated into pieces and replanted in spring, or seeds can be sown in the autumn in a frame.

LIBOCEDRUS. Name given to certain evergreen conifers. The most generally useful is Libocedrus decurrens, a magnificent tree of narrow, upright, columnar growth which will reach a height of 40 to 50 ft . in time. It likes deep, moist. loamy soil and minkes a splendid lawn tree.

LIBRARY: Bow to Furnish. There is no room more conventional in its furniahing than the library. Its model comes down from the 18th century as preserved in many country and town houses. Decorative schemes are aimple and dignified. The books in themselves form amplo variations in oolour. In a small
roons the shelves may reach to the ceiling, but of interior decoration which has been revived in a more apacious library panelled walls are in prasent day libraries.
in keeping with the period of the original model and look particularly well in natural coloured wood, wax polished The same wood is used for the bookoases and parquet for the floor.

It is important in a library to prevent the accumulation of dust : for this reason there should be either rugs on the floor or the carpet must not come to the edge of the room. The surround should allow a space of nt least $1!f t$. from the bookcases.
The conventional deak or bureau is a necessity, hut it is ureful to have in addition a substantial table placed in a good light on which work can be apread out This table is all the more useful if it is provided with drawers. Large makes of book tablea are also appropriate, since they are oomposed of several tiers divided into sections which hold journals, magazines and reference works, besides books in use taken from the wall shelves

Any bureau or writing table must be placed so that the light falls from the left-hand side. A good reading lamp is essential: several should be provided if the ronm is to be used by more than one person habitually Convenient wall lighting fixtures, and, for a large mom, a central ceiling fitting are alao advis. able. Velvet in a rich yet quiet shade is partioularly suitable for the ourtains and upholstery of a library, with a comfortable leather armohair or two. Heating arrangements must also bo well thought out in order to maintain a pleasantly equable temperature, which is important not only for the occupants of the room, but niso for the preservation of the books. A tapestry panel, one or two bronzes or good pieces of pottery, a handsome writing desk set, are suitable in a library, but anything superfluous or inerely pretty seems out of place.

Care of Books. Built-in bookshelves are usually open. Sectional bookcasos sometimes line one wall, for such volumes as are better kept behind glass. If the shelves reach to the ceiling library steps will be necessary. Dummy backs of books on simulated shelves are sometimes used to cover the doors of the cupboards or of the room so that the line of the bookshelves may bo unbroken. This is an old form

Books require careful handling, especially under modern conditions, when bindings are less mbust than formerly. A feather brush thoroughly used once a week will keep them ressonably clean, if pamphlets and other unbound books are placed in folders properly la belled, a supply of which can easily be made at home. Once a month a methodically arranged oleaning is necessary. A vacuum cleaner is best for the purpose, but if this is not available the hooks must be taken out and the books and shelves thoroughly dusted. At spring and autumn cleaning a real overhauling must be undertaken, when books which are no longer useful can be weeded out, and those which are in need of rebinding can receive attention. See Bookcase: Burean; Writing Table

LICE : How to Remove. There are three forms of lice, the head louse, the body louse, and the crab louse. They lay many egga per week, and these nits mature in about ten days. Applications which destroy the lice may have no effect on the eggs There is itching, anmetimes intense, of the paris affected, which may be the scat of eczema Treatmient of infestation with head lice is dealt with in the article Hair (q.v.).

Body lice live in the folds and oreases of the olothing A warm bath, followed by rubbing in sulphur ointment for several days. will cleanse the body of any egga that may adhere. The underclothing and bed linen should be boiled. The outhr clothes are to be imned on the inside with a hot iron.

Crab lice most commonly infest the hair in the pubic region, but sometimes they attack the armpits and cheat, and may reach cven to the beard and eycbrows. For this variety rub into the hair and the neighbouring parts equal parts of white precipitate ointment and vaseline. Or use the following application :
Betr-naphthol
1 dram
Cologne water
1
0
0
or
or
Nake into a lotion. Sop on to the affected parts twice daily. See Disinfection

LICENCE. In Great Britain the owners of carriages, motor cars, motor cycles, doga and guns, and the employers of menservants,


Library. Corner of room modelled on the conventional form of the $18 t \mathrm{t}$ century, wita recessed bookshelves and walls in panelled wood stripped and way polished. The girandole lighting fiztures, graceful
settee and oriental rug enhance the perloc decoration
llumphrey \& Vera doel
arc taxed on them, the tax taking the form of a yearly payment for a licence. Licences are usually taken out at a post office, and fines are inflicted if the articles in question are owned or used without a licence, which must be shown to the police if required.

In England, one of the wars of getting married is by licence.

A licence must also be obtained before a wircless receiving set can bc used. This costs 10s. a year. In addition to the receiving set, at the home of the licensee, it allows the use of a portable set. Sec Carriage; Chauffeur: Dog; Gun: Marriage: Motor Car; Wireless.

LICEEN : A Skin Disease. Lichen is the name applied to a group of skin discases characterized by the formation of papules There is itching, which may be severe. The cause is considered to he a generally run-down and exhausted state of the nervous system. If the general henith is helow par a course of Easton's syrup, or some other tonic, sometimes does good. Arsenic is often prescribed

For the itching a 1 in $\mathbf{4 0}$ solution of carbolio acid in water may be sopped on the spots. As a local application to the papules, the following prescription may lie made intoan ointment and applied locally twice a day

## Carbolic acld <br> lichloride of mercury <br> Zinc oxide ointment

10 gr
2
1
LIFE INSURANCE. Persons can insure their lives for almost any sum of money from L:5 upivards. This is done through insurance companies or friendly socicties that transact business of this kind. The premiums, usually paid half-yearly. vary according to the age and condition of the person insured Full information on this point can be obtained from any insurance office.

In addition to the policies that provide for tho payment of a sum of money at death. all offices issue policies payable at a certain age, sny 60 or 65 . A certain measure of relief from income tax is allowed on money paid as premiums on life insurance policies. See Annuity; Friendly Society ; Income Tra: Insurance.

## Lift. See Service Lift.

LIGATURE. Ligaturea are cords of silk, catgut. or somo other material used for tying arteries cut accidentally or in the course of all operation, to stop, hleeding. See Bandage : Bleeding.

LIGHT : In Therapeutics. Light, which is $\Omega$ form of electrical energy, travela from its source in straight lines The lines of transmission only maintain their direction, horrever, so long as the waves are passing through the same medium, say air. When they strike another medium tho direction is changed, and the line is then said to be refracted If a beam of sunlight is made to pass through a glass prism, n har consisting of a succession of colours is produced, the order of the colours nlways bcing the same, namely, red, arange, rellow, green, blue, indigo, and violet
This bar is called the solar spectrum, end represents the disintegration of visible light into its constituent parts, or colours, this disintegration taking, place because these different rays of which white light is composed have different wave-lengtha the longer having greater difficulty in passing through the prism, and therefore being more refracted. The longest waves are at the red end of the spectrum, and they become progressively shorter townrds the violet end

Beyond each end of the spectrum ravs are jussing. although they are not visible, simply because the eye is adjusted for the range of the ordinary spectrum only. Beyond the red end they have a longer wave-length than red rays, and are the invisible heat rays
whilst beyond the violet end they have a shorter wave-length than those of the latter rays. They are called the ultra.violet or invisible actinic rays, and are the most powerful as regards chemical action
The ultra-violet rays have iniportant functions in the processes of life, and their effect on human health is far-renching. Those coming to us from the sun, however, are largely prevented from passing through the atmosphere by dust and moisture, and the supply is therefore very restricted in towns. Moreover, they are absorbed by ordinary window glass, so that they are not available in a room so protected. Arc lamps of various kinds are used to produce ultia-violet raya artificially, so that this method of therapy is readily available. The light from such lamps is sometimes described as artificial sunlight

Exposure to ultra-violet rays will kill micro-organisms, and this explains the longknown disinfecting properties of sunlight. It also largely explains the success of ultraviolet rays in the treatment of slin disorders. The rays are absorbed by the blnod, increasing its content of calcium, phosphorus and iron, and increasing its germicidal power.

Exposure to ultra-violet rays also increases the vitamin activity of foods. In consequence of this the rays nfford a powerful meana of preventing and curing rickets. They have, in addition, a general tonic effect on the whole body and a tranquillising effect in atates of irritability. Applications of the rays have cured sciatica and lumbago, headaches and neuralgia, and have been beneficial in a large nuinber of nther disorders.
Treatment by natural sunlight, or heliotherapy, is carried out at Alton and Hayling Island in connexion with the Treloar Homes, and elsewhere in Great Britnin, and at Leysin in Switzerland and other places aliroad. The value of light in the treatment of surgical tuherculosis was well established nt some of those places a long time before its other posaibilitios were grasped. As ult ra-violet rays form such a porrerfui weapon, however, their indiscriminate use, or, particularly when they are artificially produced, their overdosage, is capable of doing harm. Even moderate doses are eapable of causing quiescent tuherculosis of the ling to llare up into activity, and of doing other harm, so that this form of therapy is unsafc except under medical supervision.
LIGHT FILTER。 All ohjects whioh contain colour will be more accurately rendered in n photograph by the use of a light filter, which is known also as a colour filter, colour sereen or orthomatic screen. A light filter is a piece of gelatine. dyed yellow, placed in front of the lens of a camera to filter out inore or less of the blue light to which the ordinaryplate is unduly sensitive.

Thig undue sensitiveness is very niarlied in
outdnor photographs which include a portion of the sky. Although the sky miny he full of clouds nothing of them will he scen in the print inade from an ordinaly plate which is anything like sufticiently exposed. The hluc rays in the light coming from the sky have so much more effect on the plate than the mived rays coming from the objects in the Inndscapo that the aky portion of the plate is seriously over-exposed and without detnil. This is the causc of the harsh and unreal white skies scen in many photographs. A pale yellow filter overcones this defect by absorbing a part of the hlue from the white light passing through the lens.

A light filter has other adrantages Used in conjunction with orthochromntic or panchromatic plates, it permits the production of photngraphs in which colours are represented by differing tones in a scale of accuracy rising with the depth of colour of the filter used and the colour sensitiveness of the plate. For instance, an ordinary plate without a filter will represent a bright vellow as an almost black tone in print. The eye sees a ycllow tulip as a bright colour and therefore a light tone, hut the unaided plate is so much more sensitive to blue than yellow that the yellow of the tulip has little effect and is dark in the print. Again, the green varies in different trees, and when rendered into monochrome or one colour, in a photograph they should appear ns differing tones: this cannot be effected without $\Omega$ colour-sensitive plate, aided by a light filter.
An example of the difference in result ohtnined by the use of a mediun light filter is scen in the two illustrations. Fig, 1 was made on an ordinary plate without a filter; Fig. 2 was made on a panchromatio plate with a K if filter. It will be noticed how incorrectly the red and hlue look as represented in Fig. I; also the darkness of the yellows


Light Filter. Fig. 1. Photograph of a shelf of hooks made on an ordinary
plate, without a light Alter. Fig. 2. Same books taken with a alter on a panchromatic plate. The diference in res-لनts is obvious

LIGHTING: In the Home. Building by-laws lay down minimum requirements as to the area of the windows in every ronms which is generally taken as 10 per cent of the floor area in sq. ft .; hut this rule is only a guide, and the allowance should be exceeded when. ever possible.

The regulations tend to develop a tall window, which may be satisfactory on north, east, or west, but is not mo good ля a long, low window on a southern wall, as in the summer time, when the sun is high, the long window restricta the amount of sunshine that can enter the room, as the wall above the window casta a shadow into the room ; but in winter, when the sun is not so high in the sky, the rays of light pass more directly into the room The result is that full advantage is obtained of the winter sunshine, while the intense light of the midday sun in the summer is moderated without detriment to the occupants.

In planning a house, windows should be placed so that early morning sunshine can have access to all working rooms. When it is not possible to place the windows in this way it is often feasible to provide a reflector or to whiten an adjacent wall, and so gain the advantages of increased lighting. Another aspect of natural lighting is the effect of colour, eapecially that cast by the window hanginge. This is noticeable on the north side of the house even more than on the south, as the north light is always cold and cheerless. The use of brightly coloured curtains will correct this, as is easily proved by hanging flame-coloured curtains in place of white ones. Colours such as blue and grey on the south windows have a cooling effect, softening the glare of the sun.

Artiflcial Light. Artifícial illuminants are numerous, the simplest being the candle, which still hns its uses. Modern develop. ments of oil as an illuminant have produced highly efficient lampe with an incandescent mantle. Various types are used in the home, from the ornamental floor standari or table lamp to the small hand-lamp.

Coal gas has many advantages, not the least being that one installation is available for lighting and heating. The wide choice of artistic fittings, the use of inverted incandcscent burners, together with the by-pass system of control of the burners from a distance are factors which have greatly contributed to the value of gas as an illuminant. Gas lamps can be made movable by the aid of flexible metallic tubes, just as clectric lamps can by the aid of wires. The article on Gas should bo referred to for further information.

The great advantages of electricity as an illuminant are anfety and convenience; there arc no exposed flames, and the light is obtained or turned out with a simple switch. Moneover, electric lighting permits of decorative schemes which would not be practicable with an illumin ant having an exposed flame Useful information on this suoject is given in the srticle Electric Light Fittings (q.v.)

Other kinds of artificial lighting are provided by acetylene gas and nir gas, but as a rule these are only used where persons are unsble to get gas or electric light. Acetylene is sometimes used as an illuminant in farmhouses and detached country residences, as it can be produced by a small plant. It has, lowever, certain disadvantages. The producing apparatus must be housed in a building nutside the house that is to be lighted, and great eare must be taken that naked lights are not brought into this room Smoking, too, is dangerous there.

Air gas or peírol gas is another illuminant often seen in country dist ricts. It can easily be made by means of a small apparatus, and for it incandescent mantles are suitable. It is, however, dangerous if the proportion of petrol in it is hetween 2 and 5 per cent. On the other hand it is claimed that it vitiates the


Lightning Arrester. Device osed as a safety precantion, with booded insulator and enclosed rap
which breaks down at a comparativaly low voltage
atmosphere of a room lcas than any other artificial light except electricity

Theory of Illumination. Scientifio experiment has shown that the human eye cannot sustain a brilliancy greater than about $\delta$ candle. power per sq. in. of lighting surface, equal to the old-fashioned single-wick oil-lamp. The modern gas-burner and electric lamp have an intensity very many times greater, the high efficiency types of the latter reaching 3,000 candle-power and over per sq. in. For this reason the employment of proper shades and difiusing globes tuecomes a matter of the greateat importance.
Three ways of dealing with the problem are in general use. They are known as the direct, that is, when the lamps are protected by shades; the semi-indirect, where they are protected by translucent bowls through which the light is filtered and diffused; and the indirect. where the lights are concealed behind cornices, mouldings and ornamental screens.

With all theae systems the bulk of the light in the room is reflected from the walls and the ceiling. It is therefore very important that the light sources be placed in proper positions to give the most advantageous results. It may be assumed that indirect lighting takes twice the amount, and semi-indirect half as much again, as direct lighting, to produce equivalent lighting effect.

But the diffusion will not be similar, as the direct light is more concentrated, the indirect most diffused, and the semi-indircct the most pleasant for all-mund lighting, apart from the beauty of the fittings that are available on this system. Thercfore when a strong light is neederl in any particular part of a room the direct system is best, but for all genera' purposer the semi-indirect is preferable.

The colour of the wallpaper has an important bearing on the matter, as a dull or dark-colouren paper will take twice as much light for effi cient illumination as will he necessary when the walla are papered with a light reflecting colour See Acetylene; Air Gas; Electricity; Gas.

LIGHTNING: Injuries From. Injuriea due to lightning may be alight and temporary. or may consist of severe wounds and permanent damnge to the brain and other organs.
When insensihility results, it may last only for about 5 or 10 minutes, or may endure for an hour or two. In this condition the pupils of the cyes are dilated, the victim hreathea very slowly, and the pulse can scamely be felt. Except in immediately fatal cases the patient usually recovers in a short time.
A doctor should be sent for, and in the meantime rub the limbs and pile conats on the natient, if necessary, to keep him warm. If he is unconscious, put amelling-salts to the nose, and as soon as he can swallow a stimulant should be given, cither a little spirit, a teasponful of aal volatile in water, or hot coffice. When the patient gets to bed hot-water bottles should be put to the feet, and if there is collapse the foot of the bed should be raised. In case of almost imperceptible breathing artificial respiration (q.v.) should be practised

Lightning Arrester. This is a device used in conjunction with the aerial of a wireless apparatus. It is intended to protect the building from the effects of lightning, which might be attracted by the aerial and directed into the building.
The device generally comprises a small gap betwcen two conductors, which are joined to acrial and earth respectively. In the event of an atmospheric or lightning diacharge, the current goes to earth by way of the gap, in preference to the path of greater imperlance through the aerial circuit of the receiver.

Common types of arreater employed in liroadonst reception consist of a hooded insulator and an enclosed gap which breaks down at a comparatively low voltage. A bracket is provided by menns of which the device can be fixed to the window frame or wall outaide the housc. One terminal of the arrester is connected to the aerial lead-in, and the other terminal is joined to eartl. An arrester may be employed in conjunction with, or instead of, an earth switch.
Lightning Conductor. The functions of a lightning conductor are first to cause rapid leakage of electricity between a thundercloud


Lilsc. Fine head of blossom of the double white Madam Lemoine. See article page 723
and the carth, so that the charyo contained Central America. It in the cloud is reduced to such an extent is used in furniture as to be harmless; and secondly, if the making. In the 17th leakage action has only been partially success- century it was emful, to provide a safe path to earth for the ployed for marquetry lightning flash, so that it does little damage, if any, and that only to the lightning oonductor and not to the house it protects.

A charge of electricity leaks readily off a sharp point, and therefore the first requirement is met by providing three or four such points mund the top of the anain vertical lightning rad whose lower end is efficiently carthed The second requirement is met nine times out of ten by the same vertical rod, but practically certain protection is afforded if tho building is enclosed in an earthed metallic network This result is readily achieved by electrically connecting all such external metal work as rain-piper, gutters, metal roof-shecting or lining, metal casement frames, etc., to the main conductor. These onnnexions are known as subsidiary conductors.

The need for protecting a house is perhaps less if the adjacent housc is protected, but is certainly greater if the house is higher than its neighbours or stands a lone.

LIGBTS. The lungs of animals used for food are known as lights, and were formerly included in the fry, but are now only employed as food for cats and dogs. They should be well washerl, soaked, if nossible, boiled for ahout $\frac{3}{}$ hour, and then cut in pieces. See Cat.
LIGNUM VITAE. The hard, henvywond known as lignum vitas comea from $S$. and and was much used later for inlaid furniture by Sheraton and others. See Woorl.
Ligustrum. This is the botanical name for privet (q. v.).
LILAC. The hotanioal name of lilac is syringa, a word commonly and wrongly used to denote the mock arange or phil. adelphus. This hardy flowering shrub (Syringa vulgaris) is represented by numerous single and double varieties of various colours. It thrives in ordinary well-tilled soil, but is liable to


Lilies grown in the garden. 1. Good dormant bulb. 2. Same. starting rrowth 3. Planting lilies in gronps, bulbs resting on gand. 4. Another method ol be diapplointing if not dianting ; $a$, bulb festing on sand; $b$, covered with bine soil : $c$, manure pruned correctly. When the flowers are pulled up. It is bencficial to topdresa the soil over, old woak branches should be cut out to prevent overcrowding, and some disburlding or the removal of superfluous young shoots is necessary. Suckers, shoots which grow through the soil from the stock on which


Lily. Examples of liliea suitable for the rarden and the greenhouse. Pig. T. Tiker liy, orange-gcarle
Fig. 2. Japanese lily. Fig. 3. Speciosum rubram, white with crimson spola. Fig. 4. Madonna hily with manure in early sunimer. The best method of propagation is by lavering in summor. The common lilac attains i height of about 20ft. and has smooth, heart-shaped, oppositc leares.

Some of the best single varietics are Maric Legraye, white; Charles $X$ ruse purple: Souvenir de L. Spath, reddiah crimson Good double ones are M. Buchner, lilac; Charles Joly. reddish ; Mme. Lemoine, white. The Perainn lilac (persica) is an attractive shrub, $3-4 \mathrm{ft}$. high. bearing fragrant lilac-coloured blooms very freely.

For foreing, the lilacs should be potted up in autumn in the usual potting mixture and kept out of doors until they are neerled. They should then be taken indoors and kept in a temperature of from $50^{\circ}$ to $55^{\circ}$, and syringed daily. Increase the temperature when the buda burst. Prune back Howering shoots after hlooming, and place the plants out of doors They will be of no more use for forcing but may very well be used in the open. Fine grained in character, the wond of the common lilac is employed in inlaying and turning. Sec Flowers; Pruning; also illus. p. 722.

LIIY. The true lilies (lilium) are de lightful flowering bulbs, some of which must be regarded as indispensable in every garden. While a few need special conditions to ensure success, most of them are hardy and casily managed if given correct cultivation. The most popular of all is the Madonna lily (Lilium candidum), which bears white. fragrant flowers on stems 3-4 ft . high in June. The bulbs should be planted in August-September, 3 in. deep, in ordinary well-cultivated soil As this lily is liable to the attacks of a troubleanme disease the bulbs should be shaken in $n$ bag of sulphur before being planted, and it is wise to mix sulphur frecly with the soil.

Other showy hardy lilies to plant in late summer or early nutumn are croceum (orange lily), 3 ft., orange red, July; clegans, 12 to 30 in., yellow, red, June and July; Hansoni, 3 ft., yellow, June; Henryi, $5-\mathbf{d}$ ft., apricot, August-September; Martagon, 2-3 ft., reddish purple, June July ; pardalinum (Panther lily), $5-7$ ft., yellow and red, July ; pyrenaicum, 2-3 ft., greenish-yellow, May-June ; tcstaceum, 4-5 ft., light yellow, June-July; tigrinum (tiger lily), orange red, $3-5$ ft., AugustSeptember; umbellatum, 2-3 ft., orange red, July.

Bulbs of Lilium nuratum, white flushed with yellow, and speciosum, rose and white, arrive in Grant Britain in the Nelr Year, and are planted in February and March. There are


Lily : pot culturc. 1. Components of a rood compost. 2. Planting non-stemrooting bulb : $a$. compost ; $b$, sand $; c$, rough soil : $d$, crocks. 3. Planting stem-rooting bulb; $a$, compost: $b$. sand: c, rourh soil: r, crocks. 5. Bulb ofisets 6. Same planted to make growth: $a$, compost; b, rougb 5. Bult ofrets. 6. Same planted to make rrowth: a, compost; removed to facilitate dying down. 8. Pot emptied of old soil. 7. Seed-pods remoil and bulberesdy for repotting
several fine varieties of these lilies; nuratum rubro-vittatum and speciosum melpomene are richly coloured.

All the lilies mentioned above (with the exception of auratum whioh often detcriorates


Lily of the Valley. Beautiful clump of this fragrant flower, grown in a pot
after the first year) will flourish out of doors if planted in deeply dug soil with which leafmould and sand have been mixed freely. In heavy land the bulbs should be set on sand. It is neccssary to set the bulbs at the correct depth, and this varies according to whether the lily beiongs to the stem-ronting class or not The following produce roots at the base of the stem as well as below the bulbs, and should be covered with 4-5 in of soil: nuratum, croceum, elegans, Hansoni, Henryi, regale, speciosum, tigrinum. The others named need a covering of only about 3 in . of soil.
Of numerous other lilies which are available for cultivation in gardens the most remarkable is Lilium giganteum, which, when establisherl. thows up a giant, leafy stem 8 to 10 ft . high and bears large. fragrant white Howers It likes purtial slade and moist, leafy soil.
remaining space is filled with fibre, which will be replaced with soil when the bulbs legin to grow. They should be placed in a frame from which frost is excluded. In summer the lilies may be grown out of doors or in the greenhouse. Lilies can be raised from sceds, but the seedlings of most of them grow slowly Lilium regale will blonn in two vears from seed sowing. Sce African Lily: Arum Lily Belladonna Lily : Guernsey Lily, etc.

LILY OF THE VALLEY. This favourite spring-Howering hardy plant flourishes in whady places in soil with which leaf-mould and decaved manure have been mixed frecly It is not a true lily, its botanical name is Convallarin majalis. The roots of lily of the vallev, which are known technically as crowns, should be planted in October, 3 or 4 in epart, the tops just below the surface of the ground. Anamnual top-dressing of leaf-inould in October should be given. In the course of years the plants will become overcrowded and fail to bloom freely; they should then be lifted and replented finest varicty is Fontin's, which has unusuallylarge hlooms, in one named rosea the flowers are tinged with pink.

There are many methods of forcing to provide early blooms under glass. One of the simplest is to put a bundle of crowns into damp moss and put them on hot-water pipes. Another is to place as many crowns as will go comfortably into a 6 in. pot in a compost of sandy loam and leaf-mould, and introduce into bottom heat. Good crowns will produce Howers in two to three weeks if plenty of tepid water is used.

Crowns alone need not he used in the culture of lily of the

The bulbs dic after Howering, but arc perpetuated by offsets.

The favourite lilies for cultivation in pots are auratum and speciosum and their varieties, tig. rinum and longiforum (white trum pet lily). The bulbs should be obtained in autumin, winter and early spring as they are available, and set singly in well drained pots 6 to 8 in. wide, using a compost of two thirds loam, one third peat or leaf mould (or both), with a free addition of sand. The bulbs must be set low down in the pots to leave room for top dressing with fresh soil later on: they nre partly covered with soil and the
valley under glass. Imported clumps may be potted in autumn, kejut in a frame for a few weeks and then put in the greenhouse. They will bloom in spring. Large Howered varieties are now available. Excellent lilies ó the valley for all purposes are available at any time of the year, by obtaining what are known as retarded crowns, and forcing them on. See Flowers.
LILY POOL : How to Make. Even in small gardens which possess no such facilities as running water, the cultivation of the water lily is not difficult, if a satisfactory pool can be provided Tubs, barrels, tanks, or old cisterns will serve the purpose if placed in an open, aunny aspect, with periodioal changing of water All that is required is a drain-off jlug and bottom foundation of brickbats, as illustrated in p. 725. A more permanent structure may be made in the form of a round, oval, or square pool with a good foundation of cement. April and early May are the hest months for constructing a pool, as the hardiest water lilies are then ripe for planting.

The two sectional diagrams 4 and 5 give the details for a pool of moderate size. Nate rials and implements required consist of cement and shingle, straight-edge, spirit level, spade, and a bricklayer's trowel. The bases of constructional work are excapation and lining of concrete, faced with cement mortar, trowel-finished and smoothed ; and a draining pipe with wooden plug as shown.
Draining the Pool. The conorete basin or poul should have a thickness of about 8 in its water depth may be something under 3 ft. On sloping ground it is quite practicable to associate two or more pools with pipes connected to the basin possessing an outlet pipe of sufficient size to permit quick drainage. This is important, as the plants will suffer if time is lost between emptying and refilling. A more ambitious design is shown in lig. if, which contains a centre pool with Hag-stone margin, rose beds, and grass Such pouls generally draw their water from a standpipe or tiap, and thercfore $\Omega$ convenient and suitahle spot must be selected for their construction.
After construction of the pool, when its components a ppear to be well set, fill it with water $t_{1}$ be the desired level, take careful register of depth, ind leave it for a week or 10 days If no rain has fallen, incasure the depth again, and if there should he any appreciable dmp from the original depth, drain of


Lily of the Valley. 1. Bunch of crowns as sold for forcing. 2. Goud crown ( 7. Overcrowded outdoor colony. 8. Same, replanted and covered with ifbre 9. How to plant on moist soils ; $a$, manure ; $l$, raised bed


Lily Pool. Charming example of a lily pool with a brick edge and paved surfound llumplirev and Vera Joel
the pool and give the whole another facing of cement mortar The cause of the leakage may be a crack or fissure, and in that case the necessary filling may be done and the pool tested as before It is essential that any leakage should be stopped immediately.
The Contents. It must be remembered that the plants are gross feeders, and an excellent compost for their needs is made of two parts mud from the bottom of a ditch or pond, two parta loam, one part coarse sand, and one part of rich manure free from straw. A layer of crocks should be placed on the cement floor, then a good layer of the above mixture, followed by mounds of the same compost for each plant with its apex 1 to 2 ft . below water level
The roots must not be planted too deeply, but simply covered sufficiently to allow the crown of the plant to peep through the soil. If preferred, the lilies may be planted in wicker baskets holding a few bushels of compost, and sinking each in any desired position. Suoh baskets sometimes rot away, but generally the plant roots form a network which holds the soil together. Planting operations are shown in the diagrams.

Amongst suitable varieties are the stronggrowing common white water lily, the yellow Ainerican species flava, the carmine-flowered sphaerocarpa, and the Asiatic dwarf species, pygmaca. See Water Lily.

Lima Bean. This is an alternative name for the butter bean (q.v.).

LIMB. The upper extremities or limbs are attached to the trunk by the shoulder blades and the collar bones, and the lower ones by the innominate bones. The shoulder blades are bound to the chest wall by muscles simply, and this allows of very froc movement, while the innominate bones take part in the formation of the pelvis, move little, if at all, and thus promote stability in standing and walking. Sec Bandage: Fracture.
LIME: The Tree. The lime tree or linden (Tilia vulgaris) is much favoured for town planting, and is met with in numerous suburban gardens. It bears yellow flowers in Jaly, with a rioh and rather cloying odour. The leafy, half-winged bracts which fall so abundantly with the accompaniment of moisture after the flowering are also a feature. The tree loses its freshness rather carly in autumn. Tilia petiolaris and dasyatyla are to be preferred to the common lime because the leaves do not fall so early.
The lime thrives best in substantial loan or friable olay, but it may be planted in most
thirds filling it with lump lime, covering it with water, and allowing it to remain for several weeks until it is a thick creamy mass It is then known as lime putty, and is userl in conjunotion with sand or other ingredients
Lime is purchased from builders' merchants and when ordering it is well to atate the purpose for which it is required For instance lime for mortar will be blue lias and lime for plaster-work pure or fat lime, these expressions referring to the setting properties. Rich limes are those whioh only contain about 6 per cent of insoluble impurities. and are used for plastering because of their readiness to slack, and their consequent non-liability to, blister as compared with hydraulic limes
The rapidity of setting of lime depends on the quantity of other substances it contains which render it independent of external agents for its setting properties The limes containing about 15 per cent of such aubstances are termed feebly hydraulio. Those containing about 25 per cent are moderately hydraulic, and those containing from 25 to 35 per cent are eminently hydraulic. The last


Lily Pool. Making a pool for water-lilies. 1. Small tab-pool. 2. Bow to plant in tubs. 3. Planting In wicker basket. 4. Good type of concrete pool in
section. 5. Section throuxh pool with rock sides and concrete base. 6. Plan for section. 5. Section throuxh pool with rock sides and concrete base. 6. Plan for
a pool garden $a$, lily pond $; b$, flagred rim $; c$, paths ; $d$, fagged edgings ; $e$, roses or ground lilies
soils and in most situations thist are not dis. tinotly bleak or dry. Propagation is by layers in autumn. See Limo Juice.
LINE : For Building. Line is a natural cement, and there are various qualities and grades, of which those used for building are the blue lias, and the groy or chalk. Lime requires dry storage. Quiok lime, before it can be used, is slaked with water.
Lime is best slaked by spreading it out upon a board, covering it with a small proportion of sand, and sprinkling the whole with water from time to time, turning the lime over until it is thoroughly slaked. It should be allowed to stand for at least a month before use. For plaster work lime should be slaked by providing a tub, or by digging a hole in the earth and lining it with boards, two-


Lime: for bailding. protect it from rain. The lump lime is Jaid upon boards set upon bricks, and a little trench is dur round it Ga den. Lime is plication to new gardens and to old gardens which have been heavily manured for a long time Heavy soils are rendered more workable by its aid, and it also sets free various plant foods. In addition, it acts as a soil insecticide. To light soils lime is best applied in the form of chalk. A stone
(14 lb) of lime per pole is a good avcrage quantity to use.
Chalk may be applied to the extent of double this amount. The dressing may be repeated every three or four years Gas lime, ie. burnt lime, is an excellent thing to apply in autumn to vacant land which is ןest ridden.
Lime Sulphur. This is a useful spraying mixture for apples and pears in spring and varly summer The Ministry of Agriculture (Ieaflet 131) describes its preparation and usc.
It nay be purchased ready made in large or amall drumis. so that it is only necessary to dilute it to the proper strength For spraying against apple and picar acab summer strength lime sulphur, namely 1 gallon of concentrated solution mixed with 29 gallons of water, should be used. The lime sulphur should be poured slowly into the water, stirred well, and used at once. Spraying machines with copper parts should not be used for line-sulphur spraying. It should be noted that 'rox's orange pippin and James Grieve are particularly sensitive, and for these varieties, and also for Wellington and Newton Wonder, half summer atrength is necessary, namely 1 gallon to 59 gallons of water. See Apple; Bordeaux Mixture; Garden : Manure: Prar; Spraying.
LIME : In Medicine. Salts of lime form a most important constituent of our food. I'hey are required to provide thic earthy matter, or calcium phosphate, which imparts hardness to the bones. Calcium salts are necessary for the coagulation of blood, and in other ways they perform an important part in the body chemistry. Some foods are poor in lime; for instance, fish, neat, fruits, and potatoes Others contain it in abundance, among then being milk, eggs, oatmeal, wholemeal bread, and some varieties of green vegetables
The calcium compounds arc of great use in medicine. Calcium chloride, 5 to 15 grains, and calcium lactate, 10 to 30 grains, are remedies against bleeding. These are also good remedies to take for chilblains, and in some cases of urticaria, or nettlerash. Calcium hypophosphite, 3 to 10 grains, calcium phosphate, 5 to 15 grains, and syrup of lactophosphate of lime, $\frac{1}{2}$ to 1 drani, are good seneraland nervetonics. The carbonate of calcium or chall: has the same action and uses.

Lime Water. Lime water acts as an antacid and a mild astringent, and is often aken in milk for dyspepsia and diarrhoea. The lime water is added in the proportion of 1 to 3 of milk. It is often added to a baby's milk mixture to make it more digestible. It enters into skin lotions for weeping eczemas, burns. and other conditions For a burn in which the skin is not broken it may be mixed with an equal guantity of olive oil or of linseed oil (Carron oil)

Poisoning by Lime. Chalk is a good nntilote in poisoning by acids. In any cnse of line poisoning give draughts of weat vinegar and water, or lemon juice and water. Follow these with warm milk, cream, olive or cod liver oil, or barley water. Apply hot poultices or fomentations to the abdomen for the pain. The plysician should be called in at once.

LIME JUICE. The fruit of the lime tree eommon in tropical countries closely resembles the lemon, but is smaller and more sour. The jaice has medicinal qualities of an antiscorbutic character. It has a cooling effect, and when added to water or soda water makes a rf freshing drink. Several preparations of lime juice aire on the narkiet. See Lemon.


LIME PUTTY. Also known as plasterer's putty, this is made by slaking clalk lime, allowing it to stand in a tub with water for some weeks. It ultimately hecomes of a thick, creamy consistency, and is then used for making plaster. See Conrse Stuff, Fine Stufl Gauged Stuff ; Lime. Plastering

LIME WASH. Lime washing, or lime whiting, is the process of treating exterior or interior surfaces with a mixture of pure lime and water, which is applied hot with a stiff brush of
substantial proportions. In substantial proportions. In preparing the the go gauge, be


Limit Gaur
of a disk of steel
is made up with powdered chalk. See Distemper: Whitening.
LIMIT GAUGE. This is a measuring device used as a standard of comparison. The term linit means that the permissiblecrror is limited, or in other words that a piece of work to be measured with it must be within a certain prodetermined degree of accuracy. The one shown in the illus. tration is seen gauging the diameter of a disk of steel. The gauge has two sets of jaws, one a little larger than the other, and known as lime wash, a sufficient quantity of quick- the jaws. and the other as the not-go gauge, lime should be put into a tub or old box that because the article must not go into it. Thus is reasonably water-tight, and the lime covered the actual size of the article must lay between with boiling water. After it has dissolved, the two, and its absolute dimensions are sufficient hot water is added to make an easily workable mixture, a quantity of which may be put into a bucliet and stirred as reguired.

Before applying the lime wash, the surface to be coated should be washed down with soda water, and in the case of outbuildings, such as poultry houses and the like, a little soft soap can be added to the washing water. The walls should be sprayed with a strong solution of disinfectant, such as carbolic acid, diluted with water in the proportion of 35 parts of water to I part of carbolic acid, and sprayed on by means of a garden syringe fitted with a line rose head.

As soon as the carbolic is dry, the whole surface is coated with lime wash. and, to assist it to harden and adhere to the woodwork, a little common salt and sulphate of zinc may be mixed with the slaked lime. The proportions are 2 lb . of salt, and a bout twice the quantity (i.e. 4 lb .) of zinc sulphate to a bushel of lime. The best brush to use is a well-worn whitewash brush. and the wash should be applie.| vigorously, so that it is driven well into the surface. If necessary, two or moie coats may be given, according to the nature of the work to be done
-1 fter walls or ceilings have been repentedly coated with lime wash, the surface will show a tendency to Hake and chip off, and in such cases the old lime wash should be thoroughly well washed and scraped off. Lime wash should not be confused with whiting, which


Limoges Ware. Two plates, typically patterned examples of this beautiful Franch hard-paste porcelain
Courtesu of J. Chomette \& Sons. Lid

LIMNANTHES. A pretty, low-growing hardy annual with vellow and white saucershaped How.
 ers. Limı. anthes Douglasii, $\mathbf{6}$ in., is the only one grown. Seeds are sownout. of-doors in April where the plants are to bloom in sumine ${ }^{\prime}$, or they may be sown enily in September for apring fowering. Self-sown

## seedlings are usually numerous.

LIMOGES: The Ware. The hard-paste porcelain which was produced at this ancient town in central France for about 70 years after 1780 was decorated on a highly glazed translucent body. An early mark is C.D. If com. bined with the Sevres mark it means that the hody was made at Liniogea, which had the ndvantage of its own china-clay beds, and was decorated at Sevres, whose own ware whs soft-paste. Biscuit figures and medallions were marked Limnges. The very large range of pigments introduced by Limoges chemists has been ndopted by other French potteries, and gives to these products their characteristic variety of colour.

Still another special development was the artistic treatment of the chromo transfer and the gold transfer, thereby inparting to decorated Limoges the effect of hand-painted wares. In the middle of the 19 th century American enter prise took the local inclustry in hand, and there is now a large output, by a score of factories, of modern limoges wiur. Among these the name of Pillivuyt survives from the early period.

That which bears the mark Haviland \& Cie is a strong ware, decorated in styles sometimes suggestive of Moorish art. There are also inexpensive dinner services and other useful pieces with floral and scenic designs.

## Linen for Household Purposes

## How to Stock and Arrange the Linen Cupboard

Other information of interest in connexion with this important fcature of home equipment will be found under Embroidery : Furnlture : Lace: Laundry : Mending: Starch: Table Laying. See also the cntries Rédspread: Rlanket: Cupboard: Tablecloth: Towel

Ohtained from the flax plant, linen is one of the most beautiful and useful of woven fabrics. Although the improvements in the manufacture of cotton goods have led to their employment for many household and dreas purposes in place of linens, the latter remain firmly in the housewife's favour on account of their superior qualities of texture and durability.
Time has little or no effect on linen, as ancient embroideries on this material prove, and it is not subject to ravages by moths. New methods of dyeing and the old ones of grass bleaching render coloured linens unfadeable and white ones fresh after their final laundering. Half-bleached linen is muoh in demand for embroidered lunclieon and dressing trible sets, afternoon teaclotha and cushions. This apparently natural écru shade should, however, be artistically achieved by dyeing which is guaranteed fadeless; when the shade is merely due to partial bleaching of the linen it is not permanent and washes out to a dirty cream.

The Nature of Linen, Flax stems are ahout ? ft. long; their middle parts furnish the best line, and the tops and roots become tow. The finer linens are made from the longer and hetter flax fibre, technically known as line. Thicker and coarser fabrics, such as crash and canvas, are made from tow. The long fibres are not nctually one and indivisible, hut are huilt up of shorter overlapping fibres if to 18 in in length, glued together by a natural com pound called pectose. In wear these shorter clements eventually come apart. Linen should not be hoilcd in soda, because washing soda weakens the pectose and disintegrates the filaments. It converts flax into Huff, and horax should be substituted as a water softener.

The strongest, hut not the smoothest, sew. ing thread is linen, and flax thread should be used for atitching carpets, boot buttons, and for any purpose in which exceptional atrength is demanded.

The expert eyc can discern easily the difference between linen and cotton materials; the feel is different, and whereas linen rips with a sharp sound and the edges of the tear look smooth, cotton tenrs with a dull noise and the edges curl. Linen does not ahsorh or retain moisture so readily as cotton. If a damp cloth is passed over a length of cotton material, the surface will look rough; but if the same is done to linen, the surface of the fabric will remain unaltered.

Linen is one of the hardeat textiles to dye because it is difficult to get the fast colour to penetrate far into the cloth. Successful methods are, however, absolutely guarantced, and in made up form or by the yard for embroidery or other purposes only qualities in coloured linens which are thus gharanteed to withatand both sun and washing should be purchased.

Table Linen. Although luncheon sets and dinncr set.s of mats and table centre are often liked because of the ense with whioh they are laundered at home and because of the decorative appearance which they give to the table when of coloured, entbroidered or lace trimmed linen, many housewives prefer an all over cloth for breakfast and for the formal dinner table. Coloured and checked linens are greatly liked for the breakfast table, and the latter kind are extremely chenp, effective and hard wearing, with a variety of borders in shades of blue, green, rose and yellow to tone with the breakfast service in use.

Fine linen damask has always a beautiful appearance on the dinner table. Double
damask is more expensive than the single kind, but its glossy surface is far richer and being more substantial washes and weara hetter. Coloured damasks ane also liked. especially for smaller tables. Used in harmony with glass, china and flowers or candles, rose, maize, green or écru cloths present a most inviting appearance at luncheon or dinner. Even more heautiful are tablecloths in ivory damank. Lace trimmed cloths are also used by their fortunate possessors for festive occasions Decorative examples in fine Irish linen trimmed with filet lace and insertions, or in coarser ivory linen with a peasant made lace, can give a handsomer effeot than any other form of table covering Nnpkins should match the tablecloths used, and any other linen in the room, such as a sidehoard runner, should also correspond in style.

Damask table linen in course of furnishing sometinies receives an injury which develops into a crack or cut and which does not appear until the artiole has been laundered once or
twice. As soon as such a crack develops it should be mended carefully, hut the better plan is only to buy linen from a firm which would replace such an unsatisfactory article All cloths sliould also be purchased fully shrunk, otherwise after washing they may run up in width to the extent of 2 in . in a yard.
Afternoon teacloths, tea napkins, bridge cloths, breakfast tray sets, cocktail sets and tray cloths are seen in almost endless variety and can be handmade in linen introducing decorations of coloured horders and appliqué embroidery, every kind of good washing lace made of linen thread, drawn thread work or crochet.

Bedroom and Kitchen Linen. Linen bed clothes-that is to say, sheets and pillow-slips, bolster covers and bedspreads-make for coolness and ease. Bad sleepers and invalids find the texture of linen welcome and soothing, but others prefer cotton, especially twilled cotton. Linen union and linen-finished materials are superior in appearance to the all-cotton ones.
Coloured sheets and pillow cascs are cxpensive in linen, but an excellent effect is given by faggoting a wide hem of coloured linen to plain white shcets and pillow cases in place of the ordinary hemstitched horder. The same method of decoration can he used for towels. Bolster cases are often dispensed with altogether, and a large pillow is substituted. To measure for pillow alips, run the tape measure along the pillow at the ends and sides, and allow an extra inch on hoth results for bulk. Hemstitched edges count as extrancous measurements.

Linen is the beat choice for face towela Fine linen huckahack with damask borders in white or colours are expensive, but wear well. Plainer towels can be trimmed at the ends with cross-stitched designs or with lace or cruchet. Einbroidered monograms and initials always give a distinctive touch to linen. Dressing. table seta look particularly well in colours with drawn thread work corners and hems, and large monograms embmidered in satin-stitch on each piece.
For round towels and kitchen cloths linen is undoubtedly the most economical purchase in the long run. It is also a far better fabric for dusters than ordinary cotton. Glass cloths should he of linen with a small percentage of cotton to soften the materinal.

Sales at reliable stores very often provide good opportunities for obtaining bargains in linens. Slightly shop-soiled articles are greatly
reduced, or cotton may be on the up-grade and linen down, thus enabling the store to purchase large quantities of goods at a low wholesalo price and retail them cheaply.

Printed linens for covers and curtains provide excellent wear and are usually of good design, though these linens as a rule do not show quite the brilliant colour patterns available in cotton
The Linen Cupboard. In house linen, as in other equipment for the home, space-saving ideas have limiterl the quantities considered necessary for the stocking of the linen-room or cuphosard. In smaller houses and llats there is usually a built-in cuphoard provided for linen, but, if not, a movable one should be installed. In some of the molern homes there is good accommodation for this purpose, and the hot-water pipes pass through the large cuphoard or room, which is also supplied with proper ventilation. Choose a spot near the landing radiator, kitchen range. or some other heating arrangement in the house to place a movable cupboard, if one has to be bought for the storage of linen.
Drawer accommodation should be provided for fancy tea cloths, mats, guest towels, and toilet covers which are not in constant use. Where a linen cupboard has only shelves, amaller articles can be kept in a series of cardboard boxes to ensure their freshness when required. Old shcets or discarded pillow cases make good linings for shelves, hut the more excellent way is to line the shelves with chintz or cretonne. Pieces of material are cut the exact width of the shelves but twice their depth, and these pieces are bound or neatly hemmed and attached to the wooden shelves with drawing pins in such a way that the surplus depth hangs over the edge of the shelf, ready to be turned back over the piles of linen when these are arranged in their allotted spaces

Various articles not of linen (abric are included in the term linen when it is used to denote the contents of the linen cupboard. Cotton sheets and pillow slips, bath towels, bedspreals of other materials, and hlankets are all counted as house linen. When arranging the atock it is well to keep articles that are not so frequently iequired on the less accessible shelves and reserve a separate place for each description of linen. With a large atock shelves may be labelled and their contents specified. Single sheets should he in a pile apart from double, cotton pillow and holater cases separated from linen ones, large hath towels from small, and the face towels in their sets. Articles newly returned from the laundry are naturally placed at the bottom of their respective piles.

When setting up housc in a small way, a useful list of linen is лs follows: For the bedroums, 2 toilct covers or dressing tahle sets for ench mom, 3 pairs of sheets for each hed, 3 pillow slips and 3 holster cases, or 6 pillow slips if bulaters aie not used, 1 mattress cover. 2 hedspreads, 3 blankets and I under blanket, and for each member of the household 4 face towels and 4 bath towels, with a dozen of the former and half a dozen of the latter in reserve. For the tahle, 3 afternoion tea cloths, 3 best dinner tahle cloths, 3 others or 3 sets of mats, 3 breakfast cloths, 3 kitchen table cloths, $1 \frac{1}{2}$ doz napkins, or sets to match various cloths, 6 tray cloths, 3 sideboard cloths, I set of dessert doilies. For the kitchen, 1 doz. each of dusters, glass cluths, tea cluths (not all to he given out at once, but in sets of 4), 6 polishing dusters, 3 oven cloths, 3 mller towels, 6 lavatory towels.

These figures will naturally require adjustment to individual household needs and the housewife's taste and discretion. With care and additions, as need arises, this amoint of linen should last for years In a large house-
hold the amount for each person may be lower either by fitting them in a hole pierced in the in proportion. Linen can be marked free of side stakes of the bottom as indicated, or by charge when ordered at any large store. A the method shown in Fig. 4. The corner book may be kept in the cupboard to chroniole purchases.
Good uses may be found for old linen. Face towels or pillow slips past ordinary service make excellent polishing pads for metal and furniture. Turkish towels when worn out may have the best pieces cut out to be made into lavatory or floor oloths. Old tablecloths are useful for laundry work, either for ironing cloths or for wrapping up damped linen. Ola sheets may be stored for spring cleaning or redecorating of rooms, when they are of value for protecting furniture from dust or paint.
LINEN BASFEST. The cane basket shown at Fig. 1 is not difficult to make. It should be about 24 in. high, 14 in. by 12 in . at the base and 2 in . wider at the top. Commence with a flat bottom with 12 stakes, as shown in Fig. 2, to a width of 12 in ., and carry to a height of 14 in . with single cane weaving. The stakes may be held in a block of wood in which holes have been made at suitable intervals. If the upright stakes for the sides are driven in the side as suggested in Fig. 3, the outside stakes of the bottom should be of stout willow ; but if the uprights are scallomed as in Fig. 4, all bottom stakes may be the same size. The upright stakes should be whole cane, No. 10 pulp cane will do, and should be at least 3 ft .6 in . long. The four corner sticks should be either stout whole cane, willow. or $\frac{1}{4}$. birch dowel. A No. 5 pulp cane should be used for weaving, but it will be advisable to use a fine whole cane for the commenoing as well as for the intermediate waleing.

The first stage in the weaving of the sides is shown in Fig. 3 ; 10 upright stakes are driven in, each alongside a bottom stake, and bent upright: 14 stakes are secured to the sides,
takes are 24 in. high.
Commence weaving the sides as shown in Fig. 5 by working three lengths of oane alternately. A commences behind No. 1, is carried in front of 2 and 3, and brought to the front from behind 4. B starts from behind 2, is carried in front of 3 and 4 , behind 5 and left in front of 6 . C goes from 3 , in front of 4 and 5 , behind 8 , and is left in front of 7. A is now picked up again, carried over the others in front of 5 and 6 , behind 7 , and left in front of 8. This is carried on until a corner is reached, when the method shown in Fig. 6 is followed, A representing the first length to be carried round the corner stick. Continue oompletely round the four sides and repeat for another two or three rounds.
Single rod weaving should now be done to a height of 2 or 3 in ., and another round of 3 rod weaving carried round. Follow this by about 10 in . of single weaving, then another 3 rod wale, as it is called, a further 5 in . of single weaving, another 3 rod wale, and finish with single weaving up to border height. Continual measurements should be made in order to obtain the necessary splay.
The lid should be made in a similar manner to the bottom, but carried to a height of 16 in. The outside stakes should in this case be stout and the ends finished off with lengths of similar stuff, bound to the outside weaving with pulp cane. Another method is to make a complete frame with stout whole cane and form the stakes by the acallom method shown in Fig. 7. This will take a little longer, but forms a much neater lid.
The handle is made by bending a length of whole oane to about 2 in . diameter, binding it with either round or split cane, and attaching it to the lid with the same material ; the lid is hinged by threading three or four rounds of cane under the two borders and seouring the ends in the weaving. A heavier foot may be worked by turning the basket upside doyn, driving short lengths of cane Fig. 6

Fig. 8


Fis. 7


Linen Backet. Fig. 1. Square cane basket with Lid. Fis. 2. Commencing on the bottom. Fig. 8. Upright atakes driven into sides, and weaving began. Fis. 4 . Another method, with scallomed aprighte Fig. 8. Showing how the moaving of the oanes is begun. Fis. 6. Weaving roand corner gtate. Fis. 7. Boallom method of torming chates ior lid
 Lneniold decoration within a moulded framewort.
This exsmple was found in 8omersot, on the oak panolling of a 15 th century farmhouse By Dermisalom of the Direction. Vletoria and Albert
alongside the stakes, running a row or two of a three rod wale, and then turning down the stakes to form an ordinary border.

A Round Basket. A round linen basket may be made by commencing from a suitable bottorn and staking it up as shown on page 65. The sides should be filled up with randing with a three rod wale at intervals. The lid is made like the bottom, a border being formed by inserting short lengths of cane by the side of each sposke and laying them down as a border. Owing to the difficulty of keeping the stakes upright, this basket should not be attempted by the inexperienced. See Basket Making; Cane; Osier.

LINENFOLD. This is a form of deooration sometimes found upon furniture and the panels of walls, dating from the 15th century. It resembles folded linen and is seen particularly upon pieces of furniture and wainsoots of the Tudor period. See Panelling; Tudor Style.

Ling. This is the popular name of the common moorland heather (Calluna vulgaris).

LING: The Fish. Ling may be prepared according to any of the recipes given for cooking cod, a fish it somewhat resembles in appearance. The tongue and sounds of the ling are usually sold separately in a pickled form. See Cod; Fish.

Liniment. See Embrocation.
LINE. There are a number of applications of the word link. As a unit of measurement it equals $7 \cdot 02$ in., 100 links making a chain in land surveying.

In the valve motion and other parts of many kinds of prime movers, such as steam and gas engines, a link is a connecting-rod joining two parts of the mechanism together, and particularly described by a prefix, such as a vibrating link or a shifting link, the former performing a function in the valve motion, and the latter being used to transmit motion from one part to another

LINNAEA. The linnaes, or twin flower. is a very pretty, trailing evergreen plant. The leaves are borne in pairs and the pink, bellshaped flowers are in pairs on the stalk. It does well in moist peat in a cool part of the rockery. Propagation is best effected by means of division in autumn or spring.

## Linoleum : Plain, Inlaid and Other Kinds

With Directions for Laying, Cleaning and Polishing

The reader is advised to consult further the entries on Bathroam: Kltehen: Landing: and other rooms where Linolcum is used. See also Corper; Floor; Furnishing: Labour Saving

Linoleum is particularly suitable for hath rooms, nurseries, and kitchens, as its surface is impervions to moisture, grease, and dirt. nnd it is easy to clenn and is durable. If well laid. it has no cracks or crevices to collect dust, and the cork in its composition makes it a warm and quiet floor covering. There are, however, a few conditions which make the use of linoleum ns a flonr covering unsuitable. It renders the floor practically air-tight, so that it is not recommended for damp ground floors.

Dampners, combined with the absence of air, causes linoleum to rot on the under surface, a condition which develops dry rot in the woodwork of the floor. Worn and uneven floors, either of hoards, tiles, or bricks, such as are often found in old houses, should not be covered with linoleum, ns the unevenness of the anfface canses cracks to appear, thus making it anything but cconomical. Concrete, pmoided it is dry and smooth, can be covered with linoleum succesefully, when fixed with special linoleum cement.

In renovating old cottages and country houses it is sometimes necessary to convert a seconll kitchen or washhouse into a bathroom Linoleum or cork carpet is a suitable and warm fionr covering, provided the floor is fairly level. If it is badly worn it should be floated with cement, then covered with felt paper, and the linoleum glued in position. An underlay is obtainable which prevents water from penetrating through to the floor and is particularly suitable for putting under linoleums in bathrooms and sculleries. By using the same linoleum through several moms on the anme floor it is possible to gain unity and a feeling of greater space. This is particularly to be recommended for small houses. The rooms on the second floor often open from a centre landing or passage, and the general appearance is improved if a uniform floor covering is laid. This arrangement is also more economical, ns the linoleum cuta to hetter advantage, and good use can be made of cuttings left over.

The width of linoleum varies, but that for covering romms is usually 72 in . wide, the price being quoted at so much per square yard. To ensure buying the correct quantity this must he taken into account. Thus, supposing it is required to cover the entire flour of a room 9 ft . $\times 15 \mathrm{ft}$. This is $3 \mathrm{yd} . \times 5 \mathrm{yd}$.; therefore 15 sq . $y \mathrm{~d}$. is necessary. This nmount is contained in a length $7 \frac{1}{2} \mathrm{yd}$. long and 72 in . wide, $7 \frac{1}{2} \mathrm{yd} . \times 2 \mathrm{yd}=15 \mathrm{sq} . \mathrm{yd}$.

If a surround only is required, the amount can be calculated by deducting the area covered by the carpet from the area of the whole floor. Linoleum for covering stairs and passages can be bought either bordered or plain; the width varies, and for these purposes it is bought by length.

Varieties of Linoleum. Plain linoleum is of one colour, the price and quality varying according to its thickness. The advantage of this kind is that it goes well with either plain or patterned carpets and rags and there is no pattern of which anyone can-tire. Dark plain linoleums have the disadvantage of showing every footmark; on the contrary light shades of buff, grey, brown, or green are good colours where traffic is heavy. Inlaid linoleum has a pattern incorporating two or more colours, which cannot wear off, as it goes right through to the canvas. It is more economical to buy inlaid linoleum, although the initial cost is greater, for any floor aubjected to hard wear. When huying, examine the cut edge to see if the pattern is really inlaid. Such linoleums are made in
good tiled losigns and to imitate parquet flooring or with a marbled effect.
Painted or printed linoleum is plain linoleum with a design printel or transferred on to the surface with paint It is considerably cheaper than inlaid
Whatever the nature of the floor, it should be well "ashed and perfectly dry before the fluorcloth is laid. Any old nails or brads must he removed. Loose hoards must he fixed, and any uneven edges planed off. Holes and eracks should he filled with putty or plastic woud Linoleum is brittle, and difficult to handle without cracking in cold weather, so if the flocorcloth is being laid in winter, it is hetter to leave it in a warm room for 48 hnurs before unmlling it.
A better result is ohtnined if a waterproof underlay or one of felt paper is first placed on the boands. This can be fixed in position by the use of a little paste or glue The cffect is the same as a carpet underlay: it acts as a cushion, deadening sound, and makes walking quieter and more pleasant.
How to Lay Linoleum. To do this success. fully careful measurement and attention to detail aro necessary A plain lino shows defecta and bad joins more than a patterned one, but when laying the latter extra care is needed to match the pattern successfully. Avoid unneccssary joins, and if possible arrange that there is no join at the doorway. Lay the linoleum so that as little waste as possible is incurred. A good arrangement is to eut it to run lengthwise in the opposite direction of the lloorboards. The edges at the seams should be butted tightly against each other with the pattern carcfully matched. Pmper tacks without heads should be used, and placed about $\frac{1}{0} \mathrm{in}$. from the edge and at a distance of 4 in . apart. When knocked in, the top of the tacks should be slightly sunk into the surface of the linoleum.

To cut fairly long lengths it is hetter to rule a pencil. line and place a long ruler, preferably one with n steel edge, on the line to guide the knife. It is not necessary to cut right down to the canvas, ns. provided the knife has made an incisian, it will readily break when folded back. A sharp penknife or pointed cook's knife can be employed, but. if liked, a proper linoleum knife that has a curved end miny he used. Where much fitting

laid underneath them, thus ensuring a neater finish.

A certain amount of expansion or treading out always occurs after linoleum has been laid a short time. therefore it is customary to lay it at first temporarily, using a few taches, but only where they are essential, and not along the sides of the mom rdjacent to the skirting. After the linoleum has been walked on for abnut two weeks it should be trimmed again where necessary and tinally nailed in position.
A treatment which is even more satisfactory and practically makes a jointleas flooring is to provide a small triangular moulding to match the moulding on the skirting board The lino can then he cut $t$ in. or $\frac{1}{2}$. short of the skirting board. The moulding is tacked to the latter, and this keeps the lino in position and hides ita edges. Laid thus the lino can expand without buckling. The moulding should not be tacked to the Hoorcloth, but fixed to the skirting board in such a way that when necessary the lino can be drawn from under it.
Cleaning and Polishing. If properly cared for, linoleum retains its appearance is easy to clean, and wears well. Wash it over with warm soapy water, but do not add washing anda or any stming cleansing powder of an alkaline nature. Alkalis act on the oil in the linoleum, removing a certain amount each time they are used in the same way as soda water removes varnish on wood

Scrubbing is only necessary on worn and neglected llonrs It is best to wash only about a yard at a time, rinse off the soapy water, and dry with a foorcloth. If suspy water is allowed to dry on dark Hoorcloth. white marks appear. The aurface should not be awamped with water. The result of this can often be noticed by the Hoorcloth rotting and chipping along the edges and joins. After washing, the surface can be renewed by rubbing in linseed oil, cedar oil, or wax polish. The first is suitable when a polish is not desired : it preserves the lino as well as wax, but does not give a gloss
The best treatment to get an excellent surface is to rub wax in thoroughly. To retain the polish, occasional applications of paste or liquid wax polishes are necessary. A mop or an electric floor polisher with a long liandle makes the polishing easy. Slippery Hoors are caused by extravagant use of floor polish, insufficient rubbing off, or by using the paste too thick. This should be thinned in cold weather with turpentine.

Painted linoleum wears better and retains the colour if it is conted with varnish or white ahellac. All dirt must firyt be removed and the Hoor thoroughly dried. Apply the varnish as cvenly as possible, and leave it for at least 12 hours before the floor is used or the second coat applied. It is better to apply two thin coata, as then the varnish will probably only require renewing once a year. Varnished lino can be kept in good condition by mopping with a slightly oily mop).

LINSEED. In the form of a puultice linseed is a favourite housshold remedy for applying warmth and moisture to a part for relieving pain, and as a counter-irritant in deep-lying inflammation. Linseed is also largely used in the manufacture of painta.
is being done the knife requires fre. quent sharpening so that clean cuta can be made. Special care is needed in fitting lino round pipes, radiaturs. doorvays, and wall projections. Whenever possible fixtures should be disconnected so that the floorcloth can be


Linoleum. Fig. 1. Method of cutting, using sharp penknlfe or cook's knite and steel-edred ruler. FiR. 2. Use of curved lino knife for titing linolenm round

Linseed Poultice. To make a linseed poultice, to 2 oz . of crushed linseed add $5 . \mathrm{oz}$. of boiling water, or larger quantities if need be. Stir continuously while the water is being added. The poultice should be prepared immediately beforc use and should he applied
as hot as the patient can stand it. A fiannel bag should be roughly stitched together to receive the poultice, and this will retain warmth much longer if it is overlapped all mund by a piece of niled silk or jacnnet.

LInseed Tea. Linseed tea is an oldfashioned remedy in certain kidney diseases and ooughs. Put 2 oz . of linseed, $\frac{1}{2} \mathrm{uz}$. of liquorice, and a quart of boiling water in a jug Cover, and let it stand near the fire for four hours. Strain through fine muslin. Do not crush the linsced.
LINSEED OII. There are many uses for linsecd oil in the home, particularly for polishing furniture. If an old piece of oak or other furniture does not respond to ordinary treatment, it should be washed with warm water and soap and well rubbed with linseed oil daily until the desired effect is obtained.

Mahogany is subject to a cloudiness known as bloom: this requires gentle rubbing with hot water and vinegar, and then with warm water to which linseed oil and turpentine have been added in the proportion of a cleasertspoonful of each to a pint of water. Linseed oil oan be ueed for at ained and varnished floors. It should be allowed to soak in and then be rubbed of thoroughly with a clean cloth.

When whiting is uscd for cleaning pewter it should be moistened with linseed oil and turpentine. Bronze ornaments may be wiped occasionally with a cloth moistened with linseed oil and polished with a dry cloth or chanınis leather. Leather coverings of chairs are improved by polishing with linseed oil and vinegar in proportion of two to one. Creaky boots may be stood in a vessel containing linseed oil. See Paint.

LINSEY. When cloths were woven at home from linen and wool, linsey-woolsey was a coarse union fabric with linen threads in one direction and woollen in the other. Linen has been superseded for that purpose by cotton. Rag merchants still call wool and cotton stuffs linscys; as rags they are inferior in value to all-wool, and are sorted out separately.

LINT. A soft linen fabric, smooth on one side and shredded on the other, lint is used for applying ointments. Iotions, and liniments, and otherwise in surgery. Lint impregnated with boric acid, salicylio acid, and other drugs can be obtained at the chemist's. These form a con venient dressing for wounds, etc., applied dry or moistened with boiled water. When used on a broken surface, the smooth side should be applied, as it is less likely to adhere than the other. See Bandage; Dressing.

LINTEL. In a house the lintel is a horizontal bean which supports that part of the wall built over a doorway or window. It may be constructed either of wood, metal, stone, or concrete. As to size, if a new lintel is to be used, as in the case of a new window opening, the size for a wooden lintel should be at least $4 \frac{\mathrm{in}}{\mathrm{i}}$. wide and 3 in . deep for a span not exceeding 3 ft .

Ferro-concrete lintels are made by building a boxing of rough wood around the opening and filling it. with concrete ; 2 or 3 iron bars are embedded into the concrete, and should be about $\frac{f}{8} \mathrm{in}$. in diameter. Another method is to prepare the concrete lintel at least a month before it is intended to use it, making it up in a wooden mould. See Concrete.

LION'S TAIL. This is the common name of a greenhouse shrub, Leonotis leonurus, which bears whorls of scarlet fowers in winter. It is increased by cuttings in spring, and thrives in ordinary potting compost of loam with a little leaf-nould and sand. The plants may te placed out of doors for the summer, but must be brought into a slightly heated greenhouse in autuinn.
LIP. The lips are subject to certain diserses and affections, among the most ordinary being chapped lips. One of the best
applications for this condition is an ointment made of lanoline 1 oz and boric acid 1 dram, or one may use ordinary boracic ointment or a mixture of four parts glycerin and one part Friar's balsam. Chnpped lips should on no account be allowed to remain untreated.
Herpes of the lips is common in severe colds, little vesicles forming, which dry up after a time. They should not be pricked. Bathe with some warm boric acid solution, $\frac{1}{2}$ teasponnful to a tumbler of water, and rub over with vaseline or cold cream. In eczema the lips are often scaly. Bathe with a lotion of one teasponnful of glycerin to 2 tablesponnfuls of rose water ; or a pply cold cream, to cach oz. of which is added 5 grains of salicylic acid.

Cancer of the lip is chiefly met with in men. It is often thought to be due to irritation from the short stem of a clay pipe. Because of the supreme importance of early operation, any ulcer on the lip should be brought to a surgeon's attention if it seems slow or dilatory in healing.
LIQUEUR. The general term liqueur is applied to mixed, perfumed. or flavoured spirits, or certain wines and unsweetened spirits of superior quality remarkable for their bouquet. Thus a liqueur brandy or liqueur whisky is a brandy or whisky of age and quality. Cognac is the chicf liqueur of connoisseurs.

Alcohol, sugar or syrup, and flavouring matter form the basis of most liqueure. Tho highest class are produced by distillation, aromatic substances being mixed with strong spirits and distilled. Others are made by the essence process, or addition of resential oils. A third method is by infusion, in which alcohol and sugar are added to fruit juices. The alcoholic strength varies from close upon 80 per cent on some kinds of absint he to 27 per cent in milder liqueurs.

Among the many kinds of liqueur are Benedictine, Chartreuse, Cointreau, Curaçao, Créme de Menthe, Kummel, mostly made in France. South Africa produces a liqueur called Van der Hum, which in taste and colour somewhat resembles Benedictine but has a distinctive flavour of its own.

Many liqueurs are distilled from cherries, the best known of these being cherry brandy, cherry whisky, Kirsch, Maraschino, and Noyau. Other liqueurs are made from apricots, peaches, sloes, black berries, and black currants. Mint is used in certain liqueurs which are fannous for their digestive qualities, as crême de menthe, alsi caraway seeds in Kummel and


Lithospermum. The lovely blue flowers of
L . prostratam in a 8useez rook garden
anisced in Anisette. See Brancly: Chartreusc : Kummel: Maraschino, etc.

Llqueur Glass. This is a small glass made to hold liqueur. Such glasses are made in various qualitics, from the finest cut or engraved glass to a plain and cheap variety, and in several styles. They are often sold in sets of six with decanters and tray to match, and some of thesc sets are copies of antique patterns. Liqueur glasses, however, are themselves modern, their predesessors being the cordial glasses of the 18 th century. See Glass.
IIQUIDAMBAR. The best specics of this group of hardy shrubs is styracifiua, which is grown chiefly for its brilliant antumn leaf colouring. In time it develops into a large tree. It thrives in ordinary soil and is propagated by seeds or lavers. In its native country, the United States of America, it is a valuable timber tree.
MQUID MEASURE. This measure, used for milk, beer, and other liquids, is as follows: 4 gills=1 pint: 2 pints $=1$ quart: 4 quarts $=$ 1 gallon. See Gallon.

LIQUORICE. The extract of liquorice ront is used in medicine as a demulcent and as a flavouring agent. It covers the taste of ammonium chloride, cascara, and other drugs. The compound liquorice powder which is used as a laxative contains senna and sulphur. About a teaspmonful of it should be taken in a little water in the evening.
The liquid extract is a common constituent of ccugh mixtures, and the dry extract of cough rozenges. Sticks of Spanish liquorice provide the drug in a handy form. Small pieces may be broken off and sucked for the relief of an irritable cough. Dyspepsia may also be relieved by it.
LIRIODENDRON. A hardy, tall-growing, flowering tree, often attaining a height of from 70 ft . to 80 ft ., Liriodendron tulipifera likes a sandy loam, and is an ideal specimen tree for a lawn. The lea ves are large, saddle-shaped, and bright green in colour, while the greenish yellow flowers are fragrant. The shape of these flowers gives the liriodendron its popular name of tulip tree. Propagation is by sowing seeds.

LISLE THREAD. The wearing power of lisle threadl is well recognized, and the tops and feet of silk stockings, being the parts which receive tho greater wear, are frequently made in lisle. The thread is a well-spun cotton, owing its wearing power in large measure to its tightness of $t$ wist.
LITHARGE. Litharge is made by heating lead; it. has a straw-yellow colour, and is used in the making of various lead compounds. It is found in flint glass used in the pottery in. dustries. and also in certain classes of accumulator plates. Chemically it is known as lead monoxide. See Paint.
LITHIUM. The salts of lithium have long been used to remove utic acid from the body in gout. This they accomplish by replacing sodium urate by the much more soluble lithium urate. Lithium salts also act as diuretics, that is, they increase the flow of the urine. The preparations mostly used are lithium carbonate, 2 to 5 gr ; lithium citrate, 5 to 10 gr . ; and effervescing lithium citrate, 60 to 120 gr . The waters of Maden-I3aden, Carlsbad, Kissingen, and other places contain lithia.
LITHOSPERMUM. These hardy trailing plants need peaty soil and a sunny place in the rock garden. The best is prostratum, Heavenly Blue, an evergreen which hears beautiful blue tlowers in spring and summer. It is increased by cuttings inserted in sandy soil in a frame in July and August.

LITRE: The litre is the unit of capacity in the decimal or metric system. It is equal to 22 gallon and, mughly speaking, $4 \frac{1}{2}$ litres
make 1 gallon. See Mctre.

LIVE AXLE: Of the Motor Car. The wheel hubs After undoingthenuts, $\mathrm{B}_{1}$, that lock rear or live axle of the motor car is the final step in the drive hetween the engine and the back wheels, and on it dcpends in a large measure the road speed and efficiency of the velicle. It constitutes a rigid structure carrying the wheels and braking mechanism, supporting the weight of the car, and serving as a suitable casing for part of the transmission.
There are various patterns of live-axle rasings. The banjo design (Fig. 1) is all in


Live Aale. Fig. 1. Horizontal banjo type arle casing fited with underneath worm drlve
one picce, and is provided with a large inspection cover which, when removed, exposes the whole of the axle drive, so that it can readily be got at for adjustment of removal. Other typics include the three-piece pattern, constructed with a central enlarged portion and two tubular axle sleeves bolted to it. The central part is furnished with an opening towards the rear closed with a light cover (Fig. 2).
There are three main types of live axle in use, namely, the semi-flonting, the three-quarter-lloating, and the full-Hoating. The chief difierence in deaign between the three types lies primarily with the metlind by which the wheels, or, rather, the liubs of the wlicels, are mounted on or connected to the axle or axle casing. With the aemi-floating type the live axles, apart from driving the car via the road whecls, have also to
sustain the full weight of the rear of the greater part lies under the ribs on the right vehicle. The bearings in which the axle shafts rotate also act as the bearings for the road wheels. In the three-quarter-foating axle, intermediate in type between the semiand full-Hoating axles, the road wheels have their own bearings, which run on the outside of the axle casing. The weight of the car is thus transmitted directly to the wheels. The axle shafts are supported at their outer ends by the hubs of the wheels, to which they are secured as solid; therefore, although the road wheels are stabilized by the axle shafts, a very large proportion of the bending stress in the axle shafts has been removed.

Fig. 3 is the full-floating axle, and with this the location of the road wheels is in no way dependent upon the axle sliafts, as the lubs, $B$, are mounted on ball (or roller) bearings locatcd on the axle sleeves. A brake drum, $C$, and a di trohable wheel, D, are secured to each hub, B. The axle shafts, being suitably connected to the hubs, act as the driving medium only, and are not subjected to the bending streares to which the two former types are prone. The ends of the axle shinfta that enter the differential cose nind engage the differential sun-wheels are splined, and are kept in place by a spring ling, $F$, engaging recesses in teoth, $E_{1}$, projecting from the ends of the
side of the body. Above it is the diaphragm, which separates the chest from the abdominal cnvity; under the liver are part of the stomach and large inteatine. Attached to the under-surface is the gall bladder, the storehouse of bile which is manufactured by the liver.
wheel hubs After undoing the nuts, $B_{1}$, that lock
the shafts to the road-wheel liubs, and removing the spring ring, the axles can be drawn out.

Driving and Lubrication. Methode of driving the live axles comprise the bevel and worm types. In example of the former is illustrated in Fig. 3, and of the latter in Fig. 4. The straight form of bevel gearing is not now used in cars, but has heen superseded by spiral bevel gearing, as in the cxample illustrated. $A$ form of double helical genring is found on some vehicles. In the worm drive shown at Fig. 4 the worm is mounted in ball bearings, end play being resisted by a double thrust bearing.

Worm gearing is silent in action, even when it becomes worn, but is more liable to damage in the event of lubrication failing. Should oil run short the gear nisy be entirely ruined during a run of a few miles under such conditions.

The lubrication of live axles nust be so carried out as to ensure a proper supply to the working parts, while preventing any leakage from the ends of the axle on to the brake drunis. The axle casing sliould be filled with oil up to the proper level, which is shown by an overllow plug or a filling orifice arranged at a suitable height. This point is well below the centre of the axle. The creeping of oil along the shafts is prevented by providing baffles, $A_{3}$, in the axle casing, A (Fig. 3), and although some oil works along and serves to lubrica te the roller bearings, leakage is stopped by the felt packed rings, $A_{2}$ (Fig. 3). See Motor Car.

LIVER: Nature and Diseases. The largest gland in the body is tlie liver, which weighs about 53 oz . in a full-grown man. The


Live Axle. Fig. 2. General view of the Eumber live axle casing, one of the three-piece patterns

The hepatic artery brings blood for nutriment of the liver; the portal vein brings blood collected from the stomach and intestines which contain all the absorbed food except the fat. The hepatic veins carry away the whole blood supply of the organ, and the bile ducts convey the bile into the intestine. The bile ducts are so arranged that while part of the


Live Arle. Fig. 4. Dnderneath worm drive wlth radial and thrust ball bearings keeplag the worm in correct position
bile passes directly into the intestine another part goes to be stored in the gall bladder.
The liver is composed of millions of minute cells, each of which is a factory for the production of bile, glycogen, sugar, and urea. Bile, which is a reddish-brown or dark green Huid, is an important factor in digeation; it aids the pancreatic juice, especially with digestion of fats, and stimulates the movements of the intestine. The liver receives sugar in the blood coming from the intestines and converts it into glycogen ; this is stored up in large quantities after meals and is then given out as sugar to the blood as required. Urea, the poisonous substance produced from the disintegration of protein food (meat, egga, fish, etc.), is made by the liver, as is almo uric acid. These pass into the blood and are excreted from the hody chiefly in the urine. A further useful function of the liver is the filtering from the blood of poisonous matters iniurious to health.
Diseases of the Liver. These many or many not be accompnnied by jaundice. Some diseases cause enlargement of the liver, ot hers diminish


Fig. 3. Sectlonal plan view of full-floating bevel-driven llve arle: arle shafts can be withdrawn without disturbing road wheels, which are mounted on tapered roller bearings on ends of arle casing. Arle shafts do not carry any of the load. See terit
of causes, including the following. Fatty infiltration, occurring in oberity and chronic alcoholism ; acute inflammation, or hepatitis, due to the poison of a fever, alcoliol, etc.; chronic congeation, which may accompany indigestion ; passive congestion, occurring in advanced heart or lung disease ; a bscess, which may be due to amoebic dysentery; and amyl. oid disease, the result of degenerative changes commonly caused by syphilis.
Diminution of the liver occurs in alcoholic cirrhosis, in poisoning by phosphorus and other substances, and in certain other diseases, including acute yellow atrophy.
The term liverish feeling is synonymous with biliousness and is dealt with under that heading.

Liver Pill. Pills which relieve biliousness and increase the activity of the liver are popularly deacribed as liver pills. A large number of drugs have this action, including podophyllin, rhubarb, aloes, calomel, colocynth, sulphate of soda and others. The following is an example of such a pill : Extract of podophyllum, gr. $\frac{1}{4}$; extract of hyooyamus, gr. 2; pill of aloes, gr. 2. One or two to be taken at bedtime. See Digestion; Indigestion; Jaundice.
LIVER : In Cookery. The liver of the oalf, sheep, pig, and bullock are all much used in cookery. Calfs liver is generally considered the most delicate in flavour; bullock's liver is sometimes rather coarse. Liver can be fried, stewed, or served up in a number of made dishes.
To fry liver with bacon, wash 1 lb . liver in tepid salted water, dry it, and cut it into slices the way of the grain, about 1 in . thick, removing any skinny or muscular pieces. Cut off the rind and the rough brown akin from $\frac{1}{2} \mathrm{lb}$. fat streaky bacon, afterwards cutting the latter into thin slices.
Heat a frying-pan, lay in some slices of the bacon and fry them gently until lightly browned on each side. Take them out of the pan and keep them hot. Mix 1 oz . flour on a plate with a good seasoning of salt and pepper : draw each piece of liver through the flour and at once lay it in the hot fat in the frying-pan, and fry it slowly until it is well browned on each side. Fry a few pieces at a time, as they must not be on the top of each other. They will probably take about 10 min . to cook through.
When thoroughly cooked, lift the liver out of the pan and put it with the bacon to keep it hot. Add 1 oz . bacon or beef dripping to that in the pan, stir in $\frac{1}{2} \mathrm{oz}$. Hour, and fry it until brown. Pour in $\frac{1}{\ddagger}$ pint stock and stir this gravy over the fire until it hoils, then season it carefully. Arrange the liver neatly in a hot dish, the slices overlapping each other; strain round the thick brown gravy, and garnish with the fried baccon.

Stowed liver makes a cliange from fricd liver, and is more digestible. Soak in salted water about an hour, dry, and cut 1 lb . liver into fairly thick slioes. Melt 2 oz . drippingeither beef or bacon-in a saucepan, and when it is hot stir in 1 oz . Hour and 2 tablespoonfuls finely chopped onion.
Fry these a rich brown, and atir in 1 pint good stock or water and a little meat extract. When the whole has boiled and thickened, put in the liver, a good-sized carrot, cut into cubes, a bunch of herbs, a couple of sticks of celery, chopped into small pieces, and a small tea. spoonful of salt. Cover the pan and let the liver simmer for about 1 to 11 hours. When tender arrange it neatly on a hot dish, strain over the seasoned gravy, and garnish the liver with fried becon or hain, and some of the cooked carrot.
Bullock's liver added to stewing steak, in the proportion of l lb . liver to 1 lb . beef, makes the stew richer and more palatable. This is especially so when inferior cuts of beef are used.

An easily prepared dish is a fricassée of liver and tripe. Cut some cold, cooked tripe and some liver, equal quantities of each. into strips. Fry the liver, after suaking in salted water, and put it on a dish in the oven to keep hut. Dip the slices of tripe into seasoned Hlour, fry them, and add them to the liver. Next fry some sliced onions, and with them make a border round the dish. Over the whole pour some thick brown gravy or brown sauce, and serve at once.
Liver Forcemeat. Liver forcemeat is used for stuffing game, pigeons, quails, and other birds. It is made with lb. calf's liver, 3 oz fat bacon. $\frac{1}{2}$ onion, 1 shallot, 1 oz. dripping or butter, 1 teaspoonful mixed herbs, a pinch each of cayenne and nutmeg, and pepper and salt to taste. The liver and bacon must be finely minced and browned in the fat in a frying-pan, the onion and shallot minced, the herbs and seasoning added and all stewed gently until tender. The mixture is then pounded in a mortar, rubbed through a wire sieve, and mixed to a paste with the volk of an egg.
Llver Sausage. Boil 1 lb. moderately lean pork, then mince it finely. Wash and dry 1 lb . sheep's or calf's liver, mince that also, and mix it with the pork. Add and mix in very thoroughly 2 small onions, chopped very finely, a level teaspoonful pepper, a dessertapoonful salt, a gond pinch of powdered nutmeg and cloves, and a level dessertspoonful powdered mixed herbs, including sage. Melt 4 oz . land and add that also.
This mixture is then put into large sausage skins, but should only fill them very loosely. Tie them at both ends, drop them into boiling water, and let them simmer for about 40 min . Drain them and hang them up until required.
Value in Therapeutics. Treatment of anaemia by feeding with about half a pound of liver, raw and cooked, each day has had favourable results. The raw liver is given in sandwiches, or a reliable extraot may be chosen.

## The Living-room and Its Furnishing

## How to Combine Beanty with Comfort

The reader may consule the entries on the various liems of Purniture mentioned, e.g. Chair:
The reader may consule the entries on the various trems of furniture mentioned, e.g. Chair:
Setree: Writing Tabie, and those on the other rooms of the house. See also Carpet. Colour;
Cottage: Decoration; Electriclty: Fireplace: Flat; Gas ; House; Panelling
As its name suggests, the living-room should be the type of sitting room which people really want to live in and not merely to use on formal occasions. In choosing decorations and furniture extreme fashions should be avoided, unless they embody some particularly apt style for the room in question; as for instance, period reproductions for an oldworld setting. The largest, sunniest, and most convenient room in the house should be selected for the room in which the family will spend much of their tinie indoors.

In general, rooms that face south or southwest are the best lighted and most cheerful. Those with windows on two sides have advan. tages, whilst north rooms with a beautiful expanse of country in front are preferable to a south room that looks on to brick walls. Extension on to a loggia or a veranda is an asset to a suburban or country living-room.

Walls and Floors. The treatment of walls allows plenty of choice. Pleasing colours in paint, distemper; or wallpapers of good deaign oost no more to buy or to apply than ugly, drab colours. Where economy has to

LVERPOOL WARE. Earthenware and ohinaware ot Liverpwol origin fall mostly within the later half of the $18 t h$ and the earlier half of the 19th century. Among the earlier pieces were punch-bowls with maritime scenes, usually in blue, often made to commemorate some famous voyage, and tavern mugs with doggerel rhymes.
There was a large output of salt-glaze and delft, sometimes recognizable by its bluish tinge, as well as ware printed by Sadler. the inventor of transfer- printing. Blue-dash chargers are large dishes bearing crude devices of scriptural and royal personages, for cottage use. The creamware, bone-porcelain, and other Staffordshire atyles which were copied at the Toxteth Park pottery for half a century after 1794 frequently bear the works name, Heroulaneum. See Delft Ware; Lainbeth Ware.

LIVERY. As understood to-day a livery is the distinctive dress worn by eertain classes of male servants. An example is the serviceable livery of the chauffeur. This consista of coat or overcoat and peaked cap, with breeches and leggings, the coas of Melton and other cloth being coloured grey, black, dark blue, or dark green. Liveries are usually provided by the employer. There is no tax on the wearing of a livery beyond the annual one of 15 a for a manservant. See Servant.

LIVERY CUPBOARD. This is a type of cupboard in use in England in the l5th, 18th and 17 th centuries. With the allied court cupboard, it was the forerunner of the dresser and the sideboard. The livery cupboard is usually smialler than the court cupboard, and was sometimes, therefore. placed on the top of the latter. It had an open front generally decorated with a series of turned pillars. These cupboards were often placed in bedrooms so as to hold food which oould serve for the long interval between the evening and the morning meal. See Cupboard.
be studied, the decoration should receive particular care, seeing that it will have to last for years.

In many small houses and bungalows the woodwork is not painted, but merely dyed or stained to imitate different woods. A woodpreserving stain, such as solignum, should be used, and linseed oil rubbed in to make the wood water-resisting. Panelling is a favourite method of wall treatment in some of the modern as well as period living-rooms, and is especially successful when carried out in natural woods wax polished, rather than in a heavy imitation of Jacobean style.

Distemper in all shades is obtainable and has advantages. It is cheap, and can be renewed quickly without skilled labour; but for a living-room, particularly where there are children in the family, it is not always satisfactory. Even light knocks remove the surface and show plaster underneath, while fingermarks are not easily removed, and greasemarks are even more persistent. Distemper is not suitable for old walls the surface of which is bad. The better way, where it can
be afforded, is to use painf or enamel. Painted week-end or summer holiday house of this walls need no attention other than washing type. Wide surrounds of parquet or other for many years. Graincd and marbled sur- easily cleaned flooring are necessary in a room faces are particularly suitable for this type of sitting toom, as they provide a slight, pleasing variation in colour without the tiing effect of a definite pattern. All the plainer wall surfaces possess the adrantige of allowing the housewife to change the appearance of her ioom rompletely, without mural redecoration, by having a second set of curtains and covers for the lurniture, or by using loose cretonne covers and light curtains in summer and showing the upholstery fabric of some durable type that will not ensily soil in the winter, with curtains in a rich and warm shade of velours or velvet

These effects ol graining and marbling can be obtained in wallpaper if the expense of painting is too great Pale tones and unbroken surfaces are. however. still better lor the small room with a poor window allowance. Such treatment seems to push the walls away. Patterns or heavy panelling, on the contrary, have the effect of pulling then in the same colour, or a lighter tone of the same colour, as the walls. The absence of a cornice in many motern rooms increases their apparent size. Flush doors also seem to enlarge wall space, while decornted or panelled doors give interest to higger rooms Wooden pelmets to the windows, either in onk or stained or painted wood, are another detail which is a particularly liappy iden in the modern living-room. It ensures a neat window line, nnd the trouble of making or changing curtains is greatly lessened if there is no valance or fabric pelmet to lie considered each time of such renewal
A living-room can be uninteresting if there is too little colour contrast and pattern; it can be cut up and made tiresome and diaturbing with wrong choice of these, or with too many pictures and ornaments. It is usually safe to build up from the darkest colour note on the floor to the lightest on the ceiling. Where there are old oak beams or a modern version of these, the plaster between them should be kept to a warm cream, and if the wall treatment is dark panelling a wide frieze of light colour is essential in the ordinary. sized room.

Carpets are the most suitable covering for living.room floors. It is usually desirable to strike the note of comfort which n carpet gives, but which is lacking with other floorings. Choice should be limited to hard-wearing carpets in colours that do not show every footmark or are casily damaged by mud. A toopronounced pattern on a carpet will often destroy the harmony of a whole room. Imita. tion Persian carpets in velvet pile, or modern ones with geometrical designs, are suitable. The hard-wearing qualities of hair-carpet and its low price make it a most useful floorcovering where expense is of the first importance, and it is an excellent brctiground in its natural colour for ıuga. In a bungalow or cottage living-roon, fibre or rush matting may be substituted, especially in the case of the

Where there are no beams or supports which particularly witable to the country typo of visibly mark the ceiling it is restful to have this living.room. Bar grates can he modernised

Heating and Lighting. An open fire is the forourito means of heating, and it is more economical, especially for rooms that are in use during the wholo day. Gas-firea, it is true, do awny with the filling of acuttles and cleaning of grates, but they do not convey the sense of comfort and companionship that belongs to $n$ coal or wood tire The brick fireplace scems
 Living-room. Fig. 1. Window end of living-room in a small house near
London. A novel form of diffused lighting is provided by the ceiling fitting London. A novel form of diflused lighting is provided by the ceiling fitting of tubular glass attached to the cross beam at small cost, with $n$ barless front which increases the width of the grate nnd brings the hot fucl further into the mom. When new stoves are being fitted, the question of a sitting room stove with a boiler at the back is worth consideration. Ecunomy of fuel combined with increased confort is thus obtained. Stoves for use with open or closed fires which burs any kind of fuel and can be kept alight day and night are sometimes a suitable choice.
The comfort of the family also depends largely on the efficient lighting of the living-
ruom The diffused type of lighting tixture is not sufficient in a room wherc work is done, unless scparate small lampeare provided. The actual method of lighting is controlled largely by what is available Eilectricity is brith convenient and clean. incandescent gas gives good light, but the mantles neerl care or fie quent renewal will be necessary In districts where neither of these means of lighting is nvailable, lamps burning a mixture of air and petroleum vapour and producing a 250 candle.power light are most usoful for living roons.

Furnishing Ideas. The furniture required naturally depends not only on the size and type of room, but also on the size and tastes of the family. Bookshelves may line the walls where thic latter arc literary One writing table would not be suflicient where several nembers wished to use it a good deal. The addlition of one or even two sinall bureaus sulve the problem, and when shut up eneroach little on the lloor space. Plenty of cuphoard room is an excellent feature in moat cases, so that unsightly-looking working or amusement outfits can he stowed nway with a minimum of fuss If a living-room has to be used also nз a dining room it is simplest to have one end devoted to this purpose.

Our illustrations provide some excellent ideas for the decoration and furnishing of delightful living rooms. Jig. 1 shows a morlern type of roons in a small house nenr London Eissentially simple and without superlluity of pattern or ornaments, comfort is ensured by the lieavy pile carpect. and by the chairs and settoc up)holstered in the same style of modern design The window admits of abundance of light, and there is a door, visible on the righte, which leads on to a loggia The curtains are of a transparent, lightly patterned fabric for sum. mer use, which gives a beautiful quality to the light from the window. The walls are painted, finished with a glossy surface, and the ceiling is the same culour except for the wooden heanis. The lloor is of wood blucks.
The fireplace, at the other end of the room. not scen in the photograph, is a heantiful example of modern brick, in keeping with the beamed ceiling, and is without fender or mantelpiece. Its decoration lics in the design of the brickwork on the surround and raised hearth. The writing-desk and bookcase by the timplace


Fir. 2. Old world living-room in a Sussex house. The simplicity of the wide hearth, massive beams and plaster walls is pleasantly contrasted by the comfortable armchairs and settees and enriched by the fine piece of tapestry
selected tor the low table in the window and for the floor standard scen in the picture

A contrast is provided in the second illustra. tion This living-room is in an old house in Sussex. The heavy cross beams are worn uneven, the walls and ceilings are roughly plastered. the casoment windows are diamond paned. Tho fireplace has a wide, tiled hearth and solid oak shelf on which are collected respoctively interesting specimens of hearth furniture and some beautiful old pieces of china, quite suitable for the room. Velvot is chosen for the upholstery and curtains, except for the cane-backed and cushioned settce on the right. which is covered with shot silk rep.

Pictures are not wanted on the low walls, and also they would detract from the tapestry above this settee, and there is little wail space left with the other window, door and accommodation for looks. Lighting fittings have boen woll thought out. There is a charining bracket fixture over the armchair on the right and the standard on the other side of the fireplace is equally harmonious in this room with its finged shade.

In Figs 3 and 4 two views of a morlern living. room are shown. For a comparatively small room in a town house or flat, the decoration and furniture are heautifully designed and chnsen The panelle! walls are finished in glossy enamel of a pale colour and the wide fricze and the ceiling are of the same colour, but finished with a mat surface. The fluted wooden pelmet fixture should be noted and also the beautiful window treatment of coloured net glass curtains and silk practical ones to tone with thi modern carpet. The loose covers have a geometrical pattern, and an interesting feature is the excellent accommoda. tion for books on shelves built into the space helow the windows. These shelves are divided by useful little cupboards. In Fig 4 the fire place is seen, with its attractive tiles, pillars and mantel treatment. The lighting fittings are particularly harmonious, with their plain shades and ehields. Eivery detail is charm ingly thought out and the placing of the pic tures should he noted, and of the ornaments on the windowshelf. The one richly decorated piece of furniture in the room is the paintel Czechoolovak eabinet on the left of the window


Living-room : thee views of a modern example. Fig. 3. A delightfully planned window treatment provides plenty of light and excellent shelf accommodation for books. Fig. 4. The tiled freplace piece and pictores. Fig. 5. The mirrored corner of the room, tiphly decorative in itsell, is cleverly designed to give light to the hall through the Rlass door of the living-roum
rig. 5 shows in detail the mirrored corner of this room, visible in the background of Fig. 4. This clever arrangement is not only an attractive decoration in itself, but it adds reflected light to the entranco hall through the glass panelled door of the livingmom. The low table in front of the mirme, the Empire watch clock and the reflecteil ornaments add to the charm of the view of the mon from the hall.

LOACH. The loach, sometimes called the stone-loach, is a fresh-water fish. It has a delicate tlavour. and is not unlike the gudgeon in shape. Loach is best stewed like carp (q.v.)
LOAM. This is a soil particularly valuable for garden purposes, and its texture may le divided into thrce olasses, heavy, medium, and light. In the former there is a good proportion of clay, with a smaller quantity evident in the medium kind; in light loam sand preponderates All loams are easily worked. and are made more fortile by liberal manuring. The heavy variety is greatly improved by an occasional liming.

For potting composts loans is invaluable, the best being the top 3 in. from old pasture land. This should be lifted and stacked with the grass downwards, sprinkling decayed manure bet ween each layer; it will he ready

ill 12 months. See Compost ; Cucumber; Gloxinia: Soil, etc.

LOAN. A loan may be either of a sum of money or of some article which is to be returned intect. The latter kind of loan is called a bailment in law; the borrower is called a bailee and the leniler n bailor of the ar ticle. The bailee is bound to take as much care of any article lent to him ns a careful inan would take of his own goods: if he does not dossiand the article is loat or damaged, the bailẻe is liable to repay the loss to his bnilor

A loan does not carry interest unless interest is agrced upon. If A agrees to lend B a sum of money and fails to lend it., $B$ cannot bring an action for breach of contract, because he has in the eyo of the law suffered no daniage. A moneylender must carry out all loan tranyactions in his registered name at his registered office and on a special form of contract, and not otherwise. The contract must show the date of the loan, the amount of the principal and the rate of interest per cent per annum, and must be signed by the borrower. A copy must be sent to the borrower within seven davs. If he transgresses this rule, the moneylender cannot recover his loan in court. Sce Building Society ; Debt; Mortgage.
LOASA. Most of the loasa group of halfhardy S. American plants are annuals. The seed should be sown indoors in February, and after once transplanting, the seedlings may be placed out of doors in June. The chief kinds are hispida, 12 inches, yellow, and lateritia, climbing, red. The last-named is known as the Chili nettle, because of its stinging hairs.

LOBELIA. The most popular forms of lobelia, which arc half-hardy garden plants are thoso used for edgings to beds and borders. They are often grown as annuals from seeds sown early in spring, in well-sifted mould, with a liberal mixture of fine sand, and kept in a temperature of from $65^{\circ}$ to $70^{\circ}$. The seedlings should be planted out in shallow boxes, 2 in apart, and hardened off in a cold frame.

Lobelias treated in this manner may be planted out early in June Old plants, if lifted and potted in autumn and kept in a heated glasshousc, will provide cuttings in early spring.
The herbacenus lobelias are handsome border plants, 2-3 feet high, which bloom in late summer. They are not very hardy. and in most districts must be lifted in October and stored under glass in boxes of light soil for the winter: they will provide cuttings in April, and may be planted out of doors in May. Fulgens and its variety Queen Victoria with bronze leaves and scarlet flowers are very showy. Of the latest novelties the scarletHowered Huntsman is splendid. Lobelia syphilitica has given rise to a race of plants with flowers of many colours-purple, rose, mauve, etc. : these need similar treatment to the varieties of Iobelia rulgens.

LOBSTER : How to Cook. It is hest as a rulc to buy lobsters alive, choosing those which are heavy in proportion to their size and rejecting any which have incrustations on their shells or are light and watery. The llesh of the hen lobster is inferior to that of the male, but the spawn is useful for colouring sauces, etc. The hen may be distinguished from the male lobster by its broad tail and fewer claws.
To kill a lobster, pierce the spinal cord with a skewer or a sharp knife at the joint between the body and tail shells. The fish is cooked in a pan of boiling salted water for 20 to 45 min ., according to size. If lobsters are hought ready cooked, their tails, should they be fresh, will opring back when straightened.

A good brand of tinned lobster can be used for made-up dishes or for salads when fresh lobster is unobtainable.

A boiled lobster may be dressed when cold by removing the two largest claws and cracking them, separating the head portion from the tail and splitting both down the middle. Take out the intestine, the stomach and the spongy looking gills and serve the lobster on a dish with the head in an upright poaition and the claws and tail placed round it. Salad may be used as a garnish, and oil and vinegar served separately.

To roast a lobster, cut it lengthwise through the middle, removing the intestines, etc., and place the pieces flesh side uppermost in a roasting tin in a hot oven. Cook the fish for about $\frac{1}{2}$ hour. Baste it with melted butter and season it. Garnish with slices of lemon and a ferv sprigs of parsley. Lobster that is to be broiled is prepared in the same wny, but is cooked over the fire. Tise pieces are basted as for roasting, and turned once. Melted butter sauce is served with it.
Scalloped lobster is prepared by cutting the flesh of a boiled lobster into small pieces, mixing it with melted butter sauce and turning the mixture into greased scallop shells. Sprinkle some fine breadcrumbs over them, and bake them in the oven until they are lightly browned.

To devil lobster, the flesh is first finely chopped. It is then placed in a saucepan over gentle heat with a little savoury white sauce, a dessertspoonful of mustard, and pepper and salt to taste. These should all be made piping hot, and the devilled lobster served piled on hot buttered toast.

The following recipes are of various appetizing savoury or luncheon dishes which can be
made up from cooked lobster. Such dishes arc also useful for buffet suppers, and when nicely garnished present a particularly attractive applearance.

Lobster Bouchée. Lobster bouchiées are made by cutting three slices of stale bread about $\stackrel{(i n, ~ t h i c k ~ a n d ~ t h e n ~ s t a m p i n g ~ t h e m ~ i n t o ~}{n}$

brush the cases and lids of bread with some beaten egg and coat them with breadcrumbs. Fry them a golden brown, and drain.
Fill each case with the lobster mixture. heaping it up slightly, put on the lid, and stick one or two pieces of lobster feeler in the top to give a decorative rffect. These bouchées may be served either hot or cold.

Lobster Butter. This is a savoury butter made either from lobster spawn or coral If the former is used, cook it in salted water until it assumes a bright red hue; then drain and dry it and pound it in a mortar with twice its quantity of butter Finally rub it through a hair sieve. When lobster coral is used the process is the same, except that the coral is merely washed and then dricd in $n$ cooloven.

Lobster Cream. Sniall lobster creams are made by pounding the fleah of half an avcragesized lobster with $\frac{3}{}$ gill sauce. rubbing the mixture through a sieve, and then adding 3 teaspoonful of anchovy essence, a little lemon juice and a small pinch of cayenne. Beat these ingredients together, adding $\frac{1}{2}$ gill whipped cream, and then turn the inisture into some rmall china cases. Whip another $\ddagger$ gill creani, put a little on the top of each, and then garnish with a little pounded coral of lobster rubbed through a sieve. The creams should be left to stand on ice before being served.

Lobster Cutlet. To prepare this dish, melt 1 oz butter in a saucopan, stir in 1 oz. Hour, and ald a gill of water. Stir the mixture till it leaves the sides of the pan, add a small tin of lobster, linely chopped, and seasoning. Mix well, and spread in a plate to cool; then turn it on to a floured buard. Shape it into cutlets, brush these over with beaten egg and cont them with breadcrumbs, and fry them. They should be served with salad if cold, or, if hot, with fried parsley and lemon. See Hors d'Oeuvres; Mayonnaise: Sulad.

## LOCKS: HOW TO FIT AND REPAIR

## With Simple Instructions for Cutting Keys

Thls contribution describes the mechanism of the chief types of lock and gives directions for fitting them to door, lid, or drawer. The process of cutting keys is clearly explained and fully illustrated. See further the articles Bolt; Lateh : Padlock; Safe

In the home a lock is usunlly a piece of sliding in the case. The key is inserted in mechanism by which doors, drawers, or lids the keyhole and touches the edge of a notch are secured so that they can only be opened which is cut in the bolt. As the key is turned with a key made to fit the lock. The three in the direction of the arrow it presses the main types are warded, lever and pin tumbler bolt outwards, as illustrated in Fig. 2. The locks, cach comprising the mechanism in a key must be long enough to reach nearly to case, a sliding bolt, and the key. In some the top of the slot, but not too long, or it will types the lock is operated from the outside only; in others from either side.

A drawback lock can be opened from the inside by aliding a knob; and with a letter bock, or combination lock, the locking is effected by moving two or more disks or their equivalent; the disks are marked with letters or numerals, and when the proper ones are opposite each other the lock can be opened, but in no other manner. The disks have a notch cut in the rim, and only when these notches are in line can the lock bolt be released, the large number of possible combinations rendering it difficult to open the lock unless the proper combinn!ion is known. This type of lock is available from the cheapest qualities to elaborate devices for a strong-room door or safe.

Warded Tumbler Locks. Figs. 1-7 illustrate the action of a warded tumbler lock. The bolt is shown in Fig. I as


Lock. Figs. 1-7. Diagrams showing the action of s warded tumbler lack. A qull explanation with a key to the
 Figs. 8-11. Action of the lever
Fig. 11A. Key for a lever lock not turn further, as it nust do to release the too much, and the lug will engage in the key on the other side of the keyholc line, as lower of the notches in the lever, consequently shown in Fig. 3. From this position the key the bolt could not be shot. Most good lever is turned until it can be pulled out of the locks have threc or more levers; the slots keyhole.

Two point are made at varying distances from the part nothing to prevent the bolt being pushed in all have to be lifterl simultaneously to such or out without the aid of a key, and any heights that all the slots arc in line hefore key that will pass the kcyhole will actuate the the lug can pass and the bolt be shot. For bolt, so long ns it can pass the top of the slot this reason the lever lock is one of the most in the holt. Wards are therefore introduced sccure of the ordinary domestic locks to prevent the key from turning unless it has Pin Tumbler Locks. The pin tumbler an aperture to allow it to pass the wards systen works on an altogether different

This is shown in Fig 4, where two pins, A 13, prevent the key from turning unless cut away as shown. In place of the pins a circular ward plate or ring is fitted, as at C, Fig. 4.
To prevent the holt from being moved
except by the key, another piece of apparatus shoots the is added. This is a tumbler, a flat plate of bolt when the netal hinged at one end to a peg, as shown at cylinder is A. Fig. 5, and pressed down by a light spring turned. The It is generally placed in front of the bolt, key turns the with its lower edge in line with that of the cylinder and bolt. A U-shaped slot is cut through the raises the tumbler, and a peg or lug, $B$, is fitted to the locking - pins. bolt, so that when the bolt is in, the lug rests These pins are in the inner end of the leg of the tumbler small pieces of slot. as at lig. 5.

When the steel rod that as hefure, and at the tumbler from its starting position to the ed in the two elevation, as in Fig. 6, thus bringing the slot parts of the in the tumbler in line with the lug on the bolt. mechanism, This allows the lug to pass, but when the key as shown in has been further turned the tumbler falls Fig. 12. and the bolt lug is then in the outer leg of tho One set of tumbler slut, as in Fig 7. The tumbler holds pins, of varytho lug, and so prevents the bolt from ing length, is being lorced back

Lever Locks. In lever locks the bolt is cylinder and secured diferently, and there is often $\Omega$ " fol another set in lower," which takes the bolt with it. In Fig. 8 the body, the the lever $A$ is shown "down" and the bolt latter pressed lug B is in the inner end of the slot in the lever. down towards The key has to raise the lever until the the cylinder central slot is in line with the lug, and no more, by the little
as in Figs 9, 10, finally allow. ing the lever to fall and enl. gage the lug, as in Fig 11. thus locking the holt So far the action: is similar to a tumbler, but there are differences. The key must raise the levers to the corrcct licight. and this is accomplished by shaping the top of the key accordingly, as at C, Fig. IlA: the prait of the key at $D$ throws the bolt over as before. Should the key be too long in the blank it will lift the lever principle. As can be seen from Fig. 12, it comprjses a body with a cylindrical hole, wherein turns a cylinder of metal, into which the key is inserted, the key slot being usually corrugated. Attached to the cylin. der is a connecting bar (not shown) which


Fig. 12. Pin tumbler lock, cyllider mechanism
coiled springs. The top edge of the key is notched to varying depths, and as it is inserted into the slot it raises the pins. A key suitably notched for the particular lock will raise each of the cylinder pins so that it is just level with the joint between cylinder and body. When the key is fully home all the pins are in line and level with the juint, consequently the key can be turned.

Fitting a Rim Lock. Door locks are made either right or left hand. When purchasing the lock should be held in the hand with the holt to that side which it will occupy when in place. Then see that the keyhole is the right way round, and that the lock can be fitted to the door. Many locks are made reversible to suit any door. Fig 13 shows the rim lock, a type which is easily fixed on the outside of a door. The first thing to be donc is to mark out the door and sink the flange of the lock plate into the cdge of the door by chiselling aivay the surplus wood. Having done this, hold the lock in position and carefully mark the position of the keyhole and the spindle hole with a bradaw on the face of the door. As nearly as possible the size of the hits for boring the holes for the keyhole and the spindle should he equal to the size of the keyhole in the lock plate and the diameter of the spindle. Thic lock is screwed on with round-headed screws, flat-headed screws being used for the cover plate.

The spindle knobs and escutcheon plate are placed in position, the last-named fixed with escutcheon pins. The box staple may be set


Lock. Fig. 13. Cover and interior viem of rim lock. Fig. 14. Mortise lock with cover removed, Fig. 15. Fitting morlise lock into door Fig. 16. Simple cupboard lock, screwed in place. Fig. 17. Drawer or cabinet lock, showing cover and screws employed
to $\mathbf{\theta z}$ it. Fig. 18. Cutting the recess for a drawer lock
in the door frame. or on a block. The lock is tested by shutting the door gently, when the bolt should shoot into the staple with a decided action and a perceptible click. There ought to be just sufficient room for the door to clear the front edge of the staple, and not too much space between the lock case and the staple when the door is shut, or the bolt may be forced open if the door is subjected to pressure

Mortise Lock. Fig. 14 shows a type of lock which is almost invisible when fitted, being mortised in the door It is widely used, although the deep mortise greatly weakens the door. locks of various shapes have been put on the market to obviate this defect; some circular in section, others conatructed with a narrow case, so that a fine mortise is reguired for their fitting. The door is first markel out and the centres of the spindle hole and keyhole marked and drilled. The mortise is Lock. Fir. 19. Showing method of fiting pin tumbler lock refully cut in the ordinary way, the lock llange being recessed into the edge of the door, as shown in Fig. 15, and the lock secured with countersunk sciews A striking platc fakes the place of the staple and is recessed into the edge of the frame. The holes for the lock bolts are drilled out and equared up with a chisel, and must be deep enough to allow the bolt to enter. When the plate is in line, and the bolts enter the holes properly, the plate is fixed in place with countersunk screws. The joiner uses a special long shanked chisel with a hookerl blade to cut the mortise in door (Fig. 20).

## Fitting Pin Tumbler

 Locks. Fitting this type of lock is similar to a rim lock, with the addition of a hole "hich has to be drilled through the door for the passage of the lock body, which is held! in place by two long screws passed through the door from the back, prior to fixing the lock case. A specially shaped washer plate is supplied to bear against the woodwork, which. by aid of the screws, clamps the lock body to the door (Fig. 19).Cabinct Locks. Iron cupboard locks seen in Fig. If are used for the doors of ment


Fir. 20. Special tools used in lock fltting. Above, lonk-shanked mortise chisel witn hooked blade; below, drawer lock cbisel


Lock. Stages in Key Cutting. Fig. 21. Filing the blank to correct thickness. Fig. 22. Testing with calipers, to ascertain size of blank. Fig. 23. Cutting the blank to actuate the various levers. Fir. 24 . How key ghould fit a simple lock. Fig. 25. Warded key cut to clear ward ring and shown lifting tumbler. Fig. 28. How internal slots are cut in a key tor a warded lack. Fig. 27. Pipe type of key, showing alteration to seme to rendar
keyhole should be carefully ascertained and cut out with a bit and a keyhole saw, or a tine chisel. The lock is then screwed into place The bolt hole in the top rail of the drawer is next made. Its correct position is ascertained liy placing a little blacklead on the top of the bolt, pushing the drawer into the proper position, and turning the key so as to force the holt on 10 the surface of the tup rail of the drawer. If this is done several times, the shape and position for the bolt hole is clearly shown. The bolt hole may then be chiselled out to the requisite depth

Box locks are litted in much the same way, but the top plate carrying the lugs with which

the bolts engage, has to be fitted to the lid. This operation is easily performed when the link plate has pegs or spikes formed on the upper side, as the lock is first litted, the link platc inserted in the lock, and the lid shut down hard on to the link. The pins hold the link, and when the lock is unholted the lid is raised with the link in position. The recess is then marked and cut, and the link plate sccured with screws.

Padlocks are in a class by themselves, as they require no fitting; they pass though a staple or any place that is to be locked, as, for example, the wheel of a bicycle to the front forks. Varieties are made with lever, tumbler, and pin tumbler mcchanisu, as well as simple letter mechanism. Ot hers have a spring-hack bolt that is self-locking. Where security is of importance it is a mistake to buy cheap padlocks. For an outside door a type with a short stout shackle should he chosen, as this is diflicult to force, and the thick shackle would take some time to sever with a saw. It should he locked through a stout staple over a hasp. If a chain has to he used, its linke should be thick cnough to offer at least as much resistance as the shackle or staples. For owtside use all fastenings should be as strong as possible.
When locks reg,uire to be repaired, the chief items are the replacement of hroken springs, renewal of damaged pins, and rehushing of spindle holes. Most ironmongers stock a selection of springs, and their replacement involves nothing more than slipping into a notch, or retixing with a screw or rivet, according to the nature of the construction. Worn hushings can be replaced with new. or the hole can be enlarged and hushed with a ring of brass
tubing soldered in place and the faces cleaned "p true with a file.

Locks should be oiled occasionally, since this assists the smoothness of action and prolongs their life. The old fashioned method of using a feather dipped in oil is useful for a siniple plate or stock lock, but the only way of oiling the modern types of rim and mortisc locks is to take them out and unscrew the backplate in order to lubricate the whole of the parts. Locks should always be properly oiled before fitting.

Key Cutting and Fitting. The first requirement in key cutting is to understand something of the lock the key is to actuate, and the way in which it works The description of the $t$ ypes of lock in the foregoing pages should be studied, and the lock itself examined.

As a first attempt, suppose a key is to be litted to an ordinary rim lock of the lever type; this may be dealt with on the following lines: First of all a blank must be procurcd fron the ironmonger : a blank is a solid uncut key, and should be obtained as nearly the correct size and shape as possible. See also that the shank of the key is long enough for the door to which it is to be fitted, so that the bow can turn on the outside. In the case of a lever lock the key has first to lift the levers, and then to throw back the follower, which takes back the bolt with it. Therefore the next step is to file the blank to such n size that it will enter the keyhole and set against the backplate or back part of the lock case. This is accomplished by grasping the key in a vice with the blank to the left and the shank gripped in the vice jaws.

The top of the blank is then filed down, keeping it perfectly level at the top until it will just enter the keyhole. Sec that the pin or the holes in the lock-case do not stop the key from entering, and that the blank is not too thick; in either of these cases the blank must be carefully filed to fit (Fig. 21). The use of a pair of calipers (Fig. 22) will be found a great assistance in the progress of the work, as they can be used to test the thickness of the blank and the height from the shank to the top of the hlank.
It will facilitate matters if the lock be removed from the door and be taken to pieces, as the action can then be seen and appreciated, as is clearly shown in Figs. 13, 14, 25, etc.

The key is first fitted to the follower as described, and then the master lever found by inspection; it can be detected, as it is the one with the slot nearest to the lower edge of the lever. The end of the blank has then to be filed down at the spot exactly opposite this lever until it will taise the lever the required amount: the other levers may be removed while this is in progress (Fig 23)

Each lever is treated in the same way, and the series of steps thus produced on the blank are touched up here and there until the whole of the levers lift properly and the follower throws back nicely. The action should be perfect in either direction, shooting the bolt in or out with equal facility. The width of the blank may be such that it will have to be filed back or made narrower to allow it to turn when the cover-plate is replaced ; hut this is an easy matter, the main thing is to remove a little metal at a time from the blank, when the result of so doing can be seen and appreciated.

The usual files for this work are the thin warding files sold in many sizes; some thick and some thin ones should be obtained. They

Fig. 4
are used in the manner shown in the illustrations, which also show progressive stages in the fitting of a key to a lock.

A warded key is cut on similar lines, but it mny be noted that the blank can often be obtained with n number of the wards already cut, thereby reducing the amount of time and labour in fitting the key to the lock. In this case the key has to he cut away until it can be turned in the lock, as it will then throw back the follower and shoot the bolt, so all that has to be done is to tile away the parts of the blank that obstruct the free turning of the key (Fig. 25).

A duplicate key can be cut by careful calipering and comparing with the original. When the lock is accessible a film of tallow or beeswax may be applied to the blank, so that when the key is pressed against the wards they will leave a mark on the hlank, and thus indicate the parts to be cut away. It is alwnys wisc to proceed alowly, and to try the key in the lock several times to note the progress of the work.
Keys for the pin tumbler type of lock are perhaps best entrusted to the locksmith, who has n special appliance for the purposo. The pattern key is clamped in the machine, and the blank is nutomatically cut to the same notching by a grinding wheel of the proper shape and section.

A device to render a key, and therefore a lock, more difficult to copy is to cut off a piece of the pipe or hole in the key of a pin type of key, and to fix the piece on the peg in the lock, securing it with a touch of sulder (Fig. 27). Similarly, a pin can be fitted to the lock-case in those types of lock in which the liey turns on a peg. It is necessary to cut back and drill out the keys to fit on to the peg, but it is then more difficult to place the key in the lock.

When several or a number of locks are ordered at the same time, it is possible to arrange for a master key to be cut which will unlock all or any of them, each having, of course, its own individual key. This method is commonly adopted in hotels, boarding. houses, etc. A skeleton key is one in which houses, etc. A akeleton key is one in which
the major portion of the blank has been cut


away to clear the wards, and is thus easily ahle to open the lock, as there is no metal in the blank to obstruct the turning of the key, the only requirement then being that the height of the blank be sufficient to throw over the follower. But akelcton keys are useless against a good type of lever lock, as all the levers have to be raised to different heights; the use of picks made of thin, stiff wire is resorted to by the locksnith when a key has been lost. Most good class locks are, however, made with safety devices that render them almost proof against picking.
LOCKER. There are many uses for lockers in the home, either as internal fittings or as receptacles for holding odds and ends They are often provided with falling flaps, but these are only suitable when they are not more than 4 ft. or so above the ground level. The lower shelves of those filling a recess can be divided off and fitted with tlaps with turn-buckles or locks; they provide good storing space, and may often save building a cupboard.

Fig. I shows an example of a simple locker with a falling tlap secured with a padlock and staple, the whole, excepting the llap and hingeing piece, being of $\}_{\text {, in. deal. First }}$ prepare the two ends to size and cut and rebate them at each end deep enough to takc the false top and the bottom. The two latter are then cut out, and in length should cqual the width of the job less the thickness of the projections formed by the rebates on theends, as is shown in Fig. 4.

Glue and nail the job together, and nail on a back, 3 -ply being the best stuff to use The hingeing piece is nailed on to the front, as in Figs 2 and 3, and must be of the same thickness as the llap. The latter may be of one piece, strengthened on the inside with battens, or for a better job may be clamped. It is hinged with ordinary brass or iron butts, and a hole cut at the bottom to allow the staple to pass through It is better to fix this first, so that the position at which to cut the hole will be automatically marked The top is fixed by nailing down from the top, or in another method may be screwed from the inside through the false top. Fig. 5 is another form, having a sloping top which acts as a lid. It is most suitable to be fixed to a wall, for which purpose it is necessary to fix two battens to the back to allow for clearance when the lid is raised (Fig. 7). The front, back, and sides are rebated together, as in Fig. 8, extra widtll being given to the front

to allow for its heing bevelled off at the top at the same angle as the sides. It is easier to bevel it after the job is put together. The bottom is either nailed or serewed on from underneatl.

LOCKET. This old-fashioned piece of jewelry is made to hold a miniature or small portrait, or a lock of hair or other memento. See Pendant.
LOCKJAW. The cause of lockjaw, also called tetanus, is a microbe, the bacillus of tetanus, which is introduced into the body through some wound or cut in the skin, and produces a virulent poison. It is found in garden soil, stable sweepings and dust.

The first symptoms may be headache or languor. the muscles of the neck hecome stiff, then those of the jaw, and the jaws become fixed or locked. The face becomes tixed and the corners of the mouth are drawn back in a curious smile. The spasms extend to the body and lega.

As regards prevention, any dirty wound should be thoroughly cleaned up by a doctor, and according to the nature of the contamination he may consider it necessary to give a prophylactic dose of antitetanic serum.
In any case where there is stifiness of the muscles in the neighbourhond of a wound, or of the jaws and neck, the doctor should be sent for, and in the meantime the patient should be given a warm bath and put to bed.

Rest and quietness are of the utnost im portance. The patient when in bed must not face the window Draw the curtains, put a thick carpet on the floor, oil the door-lock and hinges, and remove all creaky chairs. Avoid nny sudden noise, such as the banging of doors. Do not let the patient speak unless it is absolutely necessary. Cover artificial lights with a blue shade, and keep the light, natural or artificial, always dim. Observance of these nursing rules will sprare the pationt nuch ngony and further his recovery.

The diet must be nutritious and Huid. The food must be given slowly, and with the greatest gentleness, to avoid causing a convulsion. The ealy usc of antitetnnic serum is important.
LOCK NUT. A lock nut is an ordinary nut used to check, or lock another nut which is screwed on to the same bolt, and prevent its further progress For example, if a bolt is to be screwed a certain exact distance into a hole a nut is placed on it, and when the boit has reached the required position the nut is screwed up tight, thus locking the bolt in position. Sometimes two nuts are screwed on a bolt together, the lock nut holding the first in position

Lock nuts are secured, when necessary, by means of various patented methods in which some special arrangement is used to prevent the nut unscrewing except under the action of a spanner.

## Locomotive: Building a Scale Model

## How to Construct a Replica of the L.N.E.R. 2-6-0 Mogul Engine

This powerful Gauge 1 Locomotive is built from
Mer of standard parts, and its assembly articles on Engine: Railway. Other allied

Model engineers should consult also the artictes on Engine: Railway. Other allied entries are Boat; Electric Motor; Yacht
The building of scale morlel locomotives is on the crank pins and secured by small screws. a fascinating pastime, but is generally re. The cylinders (2) are next taken in hand, garded as a hobby requiring considerable skill and a fair amount of experience in metal work. The Mogul locomotive for gauge 1, however, which is illustrated herewith, should present little difliculty as it is built entirely from finished standard parts olitainable from Mcssry Bassett-Lowke, Ltd., of Northampton. The simplest tonls only are required, such as soldering iron, screwdriver and pliers, and a careful inspection of the accompanying photographic illustrations will assist the worker considerably, as all the parts referred to in the following instructions are numbered. Only one example of each pair of frames, set of wheels, axles, etc., is show'n in order to a void confusion. Erecting the Chassis. The main frames (1) are acrewed at the lad. ing end to a cross bearer (30), and the smokelox saddle (32) is fitted between theframes by means of the lugs and slots provided Plate (34) is next soldered. llange downwards. to the rear end of the frames, plate (25) being similarly eecured at the front end, the flange being uppermost. The finnt buffer beam (28) and rear beam (18) are then soldered in place, the central lug on the latter extending backwards to take the pin of the tender draw-bar (5)

Axlc boxes (4) are next insertel in the slots in main frames, together with their respective axles (8), and driving wheels (11, 12). Wheela are fitted with crank caps (14), those marked (13) being used for the central coupled pair (11). which are made flangeless to facilitate running on curves. The caps (13) carry the return cranks which actuate the valre gear. The wheels are tinally retained by means of horn stays (21), the coupling rods (17) teing slipped


It will be seen that the vibrating lever (16) is pivoted on a screw at the top end to a small bracket on the main frames. To the middle of this lever a screw attaches one and of the value rod (7), which is pivoted at ite other end to the piston valve itself. The radins rort (9) connects lower end of lever (16) with the return crank (13).

The reverse lever brachet ( 20 ) is noxt screwed in position on the rear foot plating, the reverse lever and rod (23) lecing pivoted to the bracket and steam valve reverse arm respectively The reverae lever not only changes the direction in which the locomotive is running, but also serves to shut off stenm and to control the speed.
The beading ( 27 and 29 ) is next soldered in place under the footplating, and plates (31) are screwed in position over the central axlehoves to protect them from the flame of the lamp. The pony truck (19) is assembled by pressing on the wheel (15) to axle (3), the latter heing pushed through the bearing bushes shown, the addition of a second wheel com pleting the unit
The flame guards (24) are providerl with lugs which fit into slots in the footplating, a twist on the underside making all secure
'To complete the chassis it is then only necersary to add the buffers (22), coupling hook (26), and the footplate steps (33)

The Boiler and Fittings. The boiler (50) is supplied as a complete unit conaisting of a rolled sheet brass barrel with flanged ends and a stout central stay.

At the cabend are situated a steam whistle and a blow off cock, whilst on top of the boiler are two dummy snfety valves to preserve the scale appearance of the model. The working safety valve (and filler combined) are housed in a renovable dome. At the smokebox end of the beiler is attached a large displacement !uliricator. connected to the steam pipc, as shown. Handrail knobs (soldered into the boiler shell) are provided, with nuts on the inside, together with the handrails, which are cut ready to length and only require soldering in position.

The other items shown in the photograph are the complete smokehox (49) with funnel and handrails, the cab (52). and the vaporising spirit lamp (51), a twin gas burner of really efficient design and performance. A spirit measure and filling funnel are shown at Nos 53 and 54 respectively.

The mounting of the boiler on the chassis is a comparatively simple matter, as the bariel fits at the rear end in a circular hole in the cab front, the sinokebox and resting on the saddle plate (32) previously referrel to

The cab is accordingly soldered in posit:on on the rear footplating, the plate (35) being fixed between the frames at the front of the cab with the square cut-out piece arranged to provide a hole to accomnoolate the reverse rod. The steam whistle and reverse lever project through slots in the cab roof. The boiler barrel is free to slide in the cab opening to allow for expansion when hot.

The steam pipe is soldered into the steam control valve, thus holding the hoiler to the


Locomotive. Scale model of a Mogul engine which can be built from a set of standard parts. Above.
left, view of the chasgis. The separate parts are illostrated on the nert pare
chasais at the smokebox end. The exhaust pipe (6) is attachod to the boiler front by means of a soldered clip the steam escaping from the funnel The smokehox is completed by the addition of handrails and screw holt. the whole unit being a pushon fit over the front of the boiler.

The vaporising lamp fits into a recess bet ween the fraines and is retained by an L-shaped wire catch soldered to the rear buffer beam
Lamp brackets are attached by means ol small nuts and bolts in holes ready drilled in the front lootplating, anil scale nodel lamps arc provided nas a lurther contribution to correct detail and realism

Constructing the Tender. The tender is ol the six-wheeled type, and representative parta which are needed for its construction are shown in the accompanying photograph. The footsteps, handrail, knobs, buffers and rear coupling hook are similar to those on the engine Building the tender from these tinplate parts constitutes quite a straightlorward soldering job.
rounded corner. The plate (39) is soldered to the front of the tender with the flanges inside The completed sides with end plates arc then soldered to the sole plate Finishing touches to the tender include the fitting of the coal slide (55), the footplate (37) and the coaming plates (38) The tender is finally washed out with hot soda water to remove all traces of Hux used in soldering, and is completed by the addition of the vent pipes (40), the manhole (45) and a set of lamp brackets. The completed locomotive is then tosted under steam and finally painted in the colours of the chosen prototype.

Oil the axles, crank pins, valve motion joints, and other moving parts with typewriter oil, and fill the lubricator with thick cylinder oil. Fill the boiler two-thirds full with clean hot water The lamp needs a little care in filling with methylated spirit, and the measure which is supplied by the manufacturers should be employed for the purpose Carefully wipe off any spirit which may be spilled, or allow it to evaporate. before lighting lamp.


LOCOMOTOR ATAXIA. Uncertain gait may be one of the first symptoms of loconint or ataxia, a chronic disease of the apinal cord, which is most common in males. It may be due to alcoholism, sexual excess, syphilis. or injury to the spinal column.
The patient gradually finds that he is very liable to lose his balance unless he watches his feet. Walling becornes more diflicult, and the reflexes are completely lost. Two sticks have to be used, and gradually the power of locomotion is lost entirely, together with control of the hadder In many cases of lacomutor ataxia the optic nerve is affected and total blindness may speedily ensue
The patient should place himself under a doctor's care at the earliest possible moment All fatigue of hody and mind and worries and anxieties must be avoided, and the patient must live a simple, regular life. The patient should use alcohol very moderately or not at all. The diet should be nutritious, but not rich and stimulating. Secure a daily movement of the howels; guard against chills and wear flannel next the skin. Take regular tepid baths.
The remedy which has met with most success is the system of exercises suggested by Frankiel. These are designed to re-cducate the patient in making the necessary movements, and they may be commenced even when he is bedridden.

Locust Tree. The locust trec is a hardy summer-leafing flowering tree, better known as the false acacia (q.v.).

LODGER. A lodger is a person who hires a room or rooms or part thereof in the house of another He is in some respecta like an ordinary tenant. If he does not pry his rent, his goods are liable to be distrained upon by his landlord. His landlord's landlord can, in the first place, distrain upon all goods which he linds in the house, including those of the lodger. But the lodger can recover his goods by giving a notice in writing to the person who niakes the distress containing a list of the goods claimed and a statement that they are the goods of the lodger, the terms upon which the lodger holds. i.e. weekly, monthly, etc., and at what rent. and also how much rent he owes, if any

The lodger must pay to his landlori's landlord any rent which is overdue by him. He is then entitled to have his goords redelivered to him, and if the distraining landlord refuses to deliver them, application should be made at the nearest police court. As against his landlord, the lodger is not entitled to any special protection for his goods. He must take care of them himself. But the landlord must not be guilty of negligence, e.g. taking in a servant without a character who turns out to be a convicted thief.

A lodger should always stipulste what notice is to be given to determine the contract, and in

First the frames (36) are fitted, as shown, with the die cast axle box units (4I). the reverse side being seen at (43). The spigots behind the spring shackles are pushed into the holes already drilled in the frames and riveted over. The hollow bearing spigots are then expanded into holes in the frames, using a tapered punch The axle boxes are fixed on the same side of the frame plate as the flange, the semicircular slot being at back of the tender, provided to clear the nuts which sccurc the rear buffers to the buffer bean (42)

The frames, with axle boxes fitted, are next soldered to the sole plate (56). The wheels (47) are supplied complete on axies (44) and are simply sprung into position between the frames. The back (42) and front (46) bulfer beans are soldered into position on the sole plate. Handrail knobs are then bolted to the side plates (48) and handrails soldered in place.
The end plate (57) is soldered inside the side: plates, leaving a good fillet of solder to form a


Locomotive. Separate parts used in the construction of the model locomotive illustrated In the previous pare. They are described in the text, where directiong for agsembling them are also given
the absence of any express agreement he is entitled to a reasonable notice As a rule, where rent is payable weekly a week's notice is sufficient, and where payable monthly a month's notice. The notice must expire at the end of a week or month of the tenancy.

A ludger who takes furnished ronms is in exactly the same position as one who takes unfurnished rooms, except that under the Rent Restriction Acts a lodger who takes unfurnished rooms is entitled to the protection of the Act, and cannot be turned out except by an order of the court, which order can only be made for the reasons specified in the Act $A$ tenant of furnished rooms is not entitled to any protection under this statute; but the Iodger. even in unfurnished rooms, who by his contraot is entitlcd to attendance is also out side the protection of the Rent Restriction Acts

Lodgers, botlı men and women, are entitled to vote at both parliamentary and munioipal elections, a residential qualification being sufficient. See Agreements; Landlord; Tenant.
LODGINGS. When lodgings or furnished rooms are required in a town which the prospective lodger dnes not know, an inquiry addressed to one of the local newspapers will prohiably be of assistance By sending a stamped addressed envelope anyone may learn from the chief clerk of the classified advertising section which of the districts a re ocoupied by the better type of landlady and boarding house. It is then a simple matter to advertise for rooms in onc or other of these neighbourhoods, or, preferably, to make inquiries on the spot. Muoh can generally be learned about the character of individual houses by inquiries at local shops or from a policeman.
There are various types of lodgings, in ciuding the bed-sitting room, with or without board, in a private house, or onc or more bedrooms and a sitting room where more privacy is secured, at a higher price. Lodgings may be taken in a house where the landlady supplies no meals and has little to do with her tenants. For a man this method may prove rather expensive if he has to buy all his meals outside For a woman it often solves the problem of economical living away from home, as such ronms are usually provided with a gas-ring or some kind of gas lixture on which meals can be prepared. A third method of many landladies is to let each of the rooms of a large house at a fixed rent with breakfast, the meal being either sent up on a tray or scrved in the dining room as in an ordinary boarding house.

A person living in rooms should a void making complaints, whether about food or service, except to the responsible person. Heavy luggago causes trouble to servants and often injury to walls. If a good deal of luggage is necessary, packing can be ao arranged that the heaviest trunk may be put in a hox. room or basement. Alteration of furnishing arrangements should not be made without the landlady's consent.
Furnished apartments are alan of interest to the holiday-maker. Prices vary considerably, according to the season of the year, the highest heing usually obtained during July and August. Some landladies make a weekly charge, which covers board and lodg. ing, but the majority do the cooking and attendance, leaving the visitors to buy their own food.
Furnished apartments can be obtained by lonking down the columns of the local paper or by application to the inquiry bureau which exists at nearly every British watering-place, usually under the direction of the town clerk or other municipal authority. Those requiring apartments, especially in the summer months when schools are closed, should book their ronms at least three months ahead.
The letting of apartments as a means of gaining a livelihood is often the only career
open to a widow with a family, or to an unmarried woman who has been left with a wellfurnished house without sufficient inconse to run it. A house must be run on sound business principles to pay. Three important aids to success are absoute cleanliness, good conking and pleasant manners. it well-aired, well dusted house, creates a gond impression without elaborate furniture or expensive decorations. In furnishing rooms a landlady should nim at clean walls, simplicity in the floor-coverings, with staincd wood or linoleum surrounds which do not harhour the dust, good lighting suitably placed for reading, a gas-ring and a gas heating fixture where central heating is not in use, cunvenient bathrooms, and perfect sanitary arrangements. See Holidays.
LOFT. In general a loft means an upper room, a room situated above another. To-day it is used mainly for the vacant space at the top of a house, that between tho joists and the rafters, and for a similar space above a stable or other outbuilding. The latter space, provided it is propierly Hoored, is ofton used for storing hay or corn, or other accessories of the stable. It is sometimes used for pigeons, and on this account the term pigeon loft has come into general use. A loft of this kind can also be converted into a useful workshop or gymnasium.
In the case of a loft in a house the only dif. ference between a $\ln f t$ and an attio is that the loft may be without a boarded floor, the only Hooring being that provicled by the joists Such lofts are therefore useless. A loft can. however, be made serviceable either as a store-room or a lumber-room, or even as a study or a den, by laying down a boarded Hoor over the joists, provided they are strong enough, and making certain other alterations.
The oeiling joists, while presumably adequate for their proper purpose, may not he strong enough to carry additional loads. In. deed, some care is needed when placing lumber in the loft, to dispose the heavy articles on that portion of the joists which gets support from walls, partitions, etc. Expert advice should be obtained on these points. The conversion of a loft, or any similar work, may come under local by-laws, and the houseloolder should satisfy hinself about this before com. mencing any alteration
The entry into a loft is gencrally through a trap door, or through one of the upper rooms in the house. A disappearing ladder is a useful fitment. Types are illustrated in the articles


Loganberry Culture. 1. How to prepare the soil. 2. Shoots cut down after planting. 3. Mulching, $a$, in summer. 4. Training, $a$, new shoots for next fruiting ; $b$, centre supports for fruiting canes : $c$, wires: $d$ canes tied to wires ; $e$, posts with ground basestarred. 5. Propagating single shoot held down by stone, with cut bebind bud. 6. Multiple proparation Sboots pegzed down at buds to form roots

Un Attic and Ladder. The Hoor over the ceiling joists is laid with tongued and grooved flonrboards at least 1 in in thickness, which are nailed to each joist with $2 \frac{1}{2}$ in oval brads, driven in with a light hammer so as to minimize the vibration, which otherwise might damage the plaster ceiling undcrneath. Great care must be taken not to treal upon the lath


Loganberry. Spray of leaves and large fruit that and plaster work: some of the Hoorboards may be laid down temporarily and used to stand upon, or use may be made of any strong rough boards. Light might be admitted by neans of a skylight, a window in an end wall, or a few slabs of glass substituted for roof slates. See Attic; Ladder.

LOGANBERRY. The general culture of the loganberry is similar to that of the raspberry. The fruit is large, decp red in colour, and of excellent Havour when thoroughly ripe. It is valuable for cooking and preserving. The plants should be about 12 ft . apart when planted to cover a trellis or against wires, and if there are two or more rows the distance between them may be about 7 ft .

Tho loganberry is easily propagated by bending the tips of the canes to the ground late in sum mer, pegging them in , and then leaving them to root. When they have rooted the cano is severed near the top, and is ready to be transferred to its fruiting quarters. The method of prun. ing the loganberry is by outting out the old stems when the fruits have been gathercd; the new shoots are tied to the supports.

How to Cook. The fruit of the logan berry plant is used in tho same way as other cane fruits in the making of janis and jellies, and also for pies, pastries, etc. It is sensonable in July. The general directions aro the same as for raspberries.

When making jam use ? b . sugar and


Loggia Fig. 1. Loggla of a stone-built Wiltstire bause : it is furnushed and used as a garden room

The loggia can, if desircd, be furnished and made to serve the purpose of $n$ lounge. or even of a living. room, at least in summer. In this case its supports should admit of the fixing of soreening material in times of rain and cold The best arrangement is one embodying sliding or removable sashes that can be brought into use as required A loggia oan also be arranged so as to serve as an extension to one of the living-ruoms Its furniture should in teacupful water to every 1 lb . fruit. If the any oasc be well able to stand a guod deal of fruit is very large and juioy, no water is exposure to the weather; otherwise there will required. Loganberries can be mixed with be a constant carrying of chairs and tables to red currants and stewed, or made into jam, pics, etc. in the same way as raspberries They are also excellent mixed with apples.
In bottling lognnberries, use water or syrup; $\frac{1}{2} \mathrm{lb}$. sugar to 6 quarts water makes a sufficiently rich syrup. The time required for boiling is $1 \frac{1}{2}$ hours and the temperature should be brought up to $160^{\circ}$ for about 5 minutes See Jelly; Laxtonberry; Pastry; Raspberry

LOGGIA. A loggia is a pleasing addition to a house and can be put to excellent uses It is somewhat after the nature of a veranda
 and fro. The furniture of an ordinary sitting room oannot, for instance, be kept continually in a loggin without gerious damage reaulting.

Three Examples. The illustrations herewith show three loggias in styles specially well adapted to various types and sizes of English houses. Fig. I shows a loggia bolong. ing to a Wiltshire house. which is built of local stone. It is furnished as a garden room and can be used as an upen-air extension of a living-room for hot weather.

Fig. 2 shows the loggin of a Sussex house. this being a part of England for which this feature is very suitable. It is not put to any special use, but fol ling ohsirs and tables would quickly convert it into a sun parlour if required. The charmingly designed window shown at the far end gives on to the rose garden. The oil jars and lighting fittings are partioularly decorative. Fig. 3 shows another shelterod loggia which opens from one of the living-rooms. It is furnished in a more solid fashion. The benches and chairs afford plenty of accommodation when meala are taken in the loggia, while the side tables and plants suggest an air of homeliness and comfort.

These loggias are each part and parcel of a house, having been included in its original design, but it is quite possible in houses of a certain type to add a loggia to the existing building. Many houses in the country have a corner that could be roofed in at little expense. It is desirable that such $a$ corner shall get a fair amount of sunshine and that the addition to the structure docs not interfere with the ndequate lighting of the adjacent
being part of the actual structure of the house, and is an added attraction to a seaside bungalow. It is desirable that the loggis should stand well above the level of the garden. as in this way a clear out look will be assured. Obviously it should be erected on the sunnicst side of the house, but should be rarefully sheltered frum extreme winds. so that it may be a cosy outdoor room. If it is to be used for ineals it should be conveniently placed with regard to the kitohen.


Logria. Fir. 2. Charming paved lorgia of a Sussex house. Fir. 3. Sheltered loggia furnished for summer use
1 and 3. Courtesy of Country Life: 2. Humphiren, loet
rooms of the house See Garden Furniture House: Veranda.
LOIN : Of Meat. This is a prime portion of meat, but not considered economical on account of the excess of fat. It is that por tion of the animal that lies on both sides of the spine between the false ribs and the hip bone. In mutton and lamb, also in veal, this portion is sold as a joint and called the loin In beef it becomes the ribs and sirluin. In pork it is known as the hind loin and fore loin while in bacon it is called the back See Bacon Beef; Mutton: Pork
LOMARIA. Must of the family of ferns known as lomaria require greenhouse treat ment. They have feather-shaped leaves thrive best in shady positions in the greell house, and require plenty of water f́rom spring, all through the summer, till nutumn. Propagation is by spores so wn in fine soil in the warm house at any time of the vear. Lomarin (Blechnum) spicant is a hardy fern of which there are many varictics.


Lomaria. Feather-shaped fronds of $n$ lepn which requires greenhouse treatment

LOMBARDY POPLAR. A hardy de. ciduous tree, Populus nigra pyramidalis, the Lombarily poplar thrives best in deen, moist soil, but will Hourish almost anywhere. I। serves as a boundary screen, or as a quick growing lofty hedge if kept well trimmed For small gardens it is not suitable, owing to the extent to which its roots rob the soil of moisture and nourishment. See Poplar
LONDON PRIDE. One of the commonest of all garden plants, London pride (Saxifraga umbrosa) is familiar as an edging to shady borders. It has rosettes of evergrecen leaves and in May bears graceful spraye of pinkis'. Howers. It flourishes in ordinary soil and pieces may be detached and replanted at any time of the year. See Border.
LONGCLOTRE. This form of oalioo get. its name from the fact that similar cotton cluth imported 200 years ago frum India was put up in long Jengths, not in short pieces It is plain woven and made square with threads just as fine and as many in one direc tion as in the other, so that it is equally strong in warp and weft. Woven 28 to 36 in wide. longcloth can be bought either bleached ur unbleached, and it is made in standard qualities that are denoted by trade marks.
LONG MEASURE. This is in constant use for measuring lengths of materials, ground, etc. It is as follovis

| 12 Inchics | $=1$ foot |
| ---: | :--- |
| 3 fect | $=1$ yard |
| 51 yarls | $=1$ rod, pole, or perch |
| 40 mids | $=1$ furions |
| 8 furlongs | $=1$ nille |
| 3 mlles | $=1$ lengue |

LONGPORT: The China. This Staffordshire ware was produced at this suburb of Burslent in the 18 th century. In 1793 the Longport works rere acquired by the Davenport family. See China; Davenport Ware.

LONG SIGHT. Long-sightedness, or try to beat the last player's card If unable to hypermetropin, is generally due to the eyehall being shorter than the normal length from finnt to back. Consequently the image is

follow suit he must trump, nnd if the trick has already heen trumped he must over-trump if he can. The winner of each trick leads for the next, and must lead a trump if lie has one.

The Pool. The pool is divided in the proportion of one-third for each triok. If one player has taken two tricks, for example, and nnother one, the first takes two-thirds of the pool and the second one-third. The remaining players are said to he looed and place in the pool an nmount, with the new dealer's contribution. which totals the original mmount of the pool, to form the new pool If only three players play and cach takes one trick, the other players are not loosed, but the new pool is provided by the dealer. This hand is then usually known as a must, the meaning of this expression being that each player must play, whatever his cards may he, and the miss is not dealt.

LOOFAF : For Washing. The lenf of the oofah plant is used for washing nnd other household purposes. Its mugh surface has a stimulating effect upon the skin Lonfahs can he purchased as plain pieccs of any aize re quired, or made up into washing gloves or straps. In the latter casce they are bound with atrong tape or webbing to prevent them from tearing where they have been out to shape.

Inner soles made of Inofah for shoes are excelicnt wear both for summer and winter. In summer they keep the feet cool: in winter they keep them warm

Picces of Inolah may be put in kettics to prevent them from beconing furred. Such pieces can be bought from any ironmonger, and will last without attention for a long time When they become impregnated with chalk they should be taken out and suaked.
Looking Glass. See Mirror.

## Looms: For Home Weaving

## Constructional Details of a Workable Pedal Loom

Thls contribution describes a handy type of table loom, and tells the woodworker how to make a portable loom of a larger type. The home waver will find the craft clearly explained in the article on Weaving. See also Rur; Tapestry
Hand looms range from a board loom such clear. The uprights should he of well as that shown in Fig. 1, on which narrow seasoned hardwood, $2 f$ in. by $2 \ddagger \mathrm{in}$. They tapestry can be woven, to the table loom are connected by rails made of 1 in . beech shown in Figs 2 and 3, which permits of work dowcl rod, which run through and are up to 33 in wide, and the pedal operated loom (Fig. 4), on which a variety of fabrica up to 42 in . wide can be made.

Making a Pedal Loom. The loom illustrated in Fig. 4 differs from the conventional
focussed behind. instead of on the retina. Near objects cannot be seen distinctly; distant objects may, but this requires ancffort when thic long-sightedness is extreme. The cure is to wear convex glasses which will focus all rays entering the eye accurately on the retina See Lye: Spectacles

LOO: The Card Game. This is a game for any number of players, hut six to reven is the best number. It is played with the ordinary pack of 52 cards, which rank as in whist.

The dealer deals three cards one at a time to the players, and also an extre hand, known as miss. The next card on the top of the pack Finglish type in conis turned up for trumps, Each player in turn looks at his hand, and is asked by the dealer if he will play, or take miss, or pass.

If the player has a good hand he usually elects to play; if not, be oun either take the three cards in miss or pass. In the last case he signifies by doing so that he is not taking any further part in that round of the game. Every player in turn is offered the option of playing, taking miss, or passing. As soon as one player takes miss, those who follow have only the option of playing or passing. The player who takes iniss must play, no matter how bad the cards in miss may be. If only one player plays, he takes the pool. If all except the denler pass, the latter takes the pool. The pool is formed at the beginning by each player putting in a counter.

The eldest hand of those who have agreed to play leads. He must lead aocording to the following rules: If he has two trumps in his hand he is compelled to lead one. If he holds the ace of trumps he must lend it, or if the ace happens to be the turn-up and he holds the king he must lead the latter. If only two players are playing, the leader, if holding two or more trumps, must play the highest. Each player must follow suit if possible, and must
struction (see Weaving) and might at first inspection be thought somewhat slight for its purpose. Developed frome a simple Greek prutotype, it has been used constantly in a weaving atudio over a period of years, the design being modified as and when improvements were found desirable The frames are held together by dowels and pegs, so that the whole structure is readily erected or taken down.
Back, front and side elevations are given in Figs. 5, 6 and 7. In conjunction with Fig. 4, they make the method of construction quite


Loom. Fig. 1. Simple board loom, arranged for weaving narrow tapesirg. Figs. 2 and 3. Alston table loom, a compact portable appliance which takes warps up to 33 in . wide

rails which hold the reed The cap, or upper rail, is free to move up in the slot in the swords, mo that the reed can be inserted or removed The lower bar is fixed by pegs to the swords, and the cap also has holes for pegs, so that it can be secured when the reed has been inserted. The reed measures about 5 in in depth, and is held by the grooves in cap and lower rail. The slots in swords and the tenons on cap and lower rail must be accurately cut, and the peg holes in the upper part of swords should be evenly spaced, so that the batten hangs level from the roller. The rack teeth, too, must be acourately cut and spaced or the sleigh will not hang squarely acrose the loom. The whole of this part of the loom needs especial care, and the materials must be good seasoned stuff free from shake or twist. Fig. 8 is an end view of the sleigh, showing slots and the tenons of rails.
The hamess is shown dia grammatically at Figs. 11 and 12, and is represented as the simplest form, with two heddles. The laths should be made of oak, 1 in by in. section. The short upper laths are slung by a connecting them together permits the loom loop passed mund the supporting moller and to be dismounted and packed into small through $n$ hole in the centre of lath. The compass. If portability is not desired the endless cords connecting short laths to heddle end rails might vell be made of rectangular laths are about 40 in. long before making the section stuff inortised and tenoned to posts knots. The connexions to pedals are clearly in the conventional way.

The Rollers. The breast roller (Fig. 10) is turned from 2$\}$ in stuff, and one end is left square for a distance of 4 in Two holes for a turning stick are bored through at right angles, and the stick may be a piece of 1 in . dowel. The cane roller or warp roller is similar, but the squared end is at the opposite side. Both ends of this roller might be left square if desired. Both front and back rollers are grooved to take the cane which secures the warp in place. The groove, $\frac{1}{2}$ in square, is indicated in the diagram of the cane roller Fig. 4 shows how the mollers are mounted on the brackets the breast roller with its square to the right and the back roller with its square to the left, both viewed from the firnt of the loom (seat board). The diameter of the rollers, especially the warp roller, may be increased witli advantage

Sleigh and Harness. The aleigh or batten ( Fi izs. 8 and 9 ) consists of four parts, the two sides or swords, by which it is hung from a whler supported on the rack, and two grooved


shown in Fig. 12, corresponding part* Leing lettered $A$ and $B$ respectively A single cond might be taken from centre of lower lath to pedal if desired For clearness, the heddle laths are represented with two leashes only on each pair. Slip knots in the connecting cords piermit of any desired adjustment for length The medal boaida ae 4 ! in wide hinged by loops to the bottom front rnil, as shown in Fig 4, and provided with a serics of holes at the other end, in one of which the cord to lower heddle lath is finstened

The heddle leashes can be procured ready made in lots of 100, tied in 25's. A reed will be needed, and a raddle The warping boart can be made by the home worker, and fill instructions will be found in the artiole on Weaving, where also are the necessary instructions for making the warp, entering and beaning the warp, and setting up the harness. The accessories necded, and supplies

of yarn or other materials cun be obtained from the Alston Weaving Studios, 39, Jnmes St., Landon, W. 1 . LOOP. A dress. maker's loop is used instead of an eyelet or metal eye. To work it lay two or three threads along the material for about $\frac{1}{4}$ in., or according to the length required for the size of the hook. The threads are laid by catching up a little of the material at each end of the space, then a back-stitch lasi thread is laid to secure them. Fill these


Loom: construction of a pedal type. Figs 5-7. Back, front and side elevations Figs. 8 and 8. Details ol sleigh, showing groods to take reed. Fig. 10. Breast roller and cane rollep. Fig. 11. Leashes on heddle laths. Fig. 12. Connexions from heddles to roller and pedals

Courtexy of Aluton Wearino Studios liaid threads with buttonhole stitches and fasten them off securely into the material at the end of the loop.

LOOP HOLE. The term loop hole is ap plied to a series of doors or openings set verti cally above each other on the floor levels of a warehouse, as a means of passing goods in and out. As a rule, a crane is fixed above the topmost loop hole. It is also used to describe a long, narrow opening in a wall, which may be glazed or otherwise.

LOOSESTRIFE. The purple loosestrife (Lythrum snlicaria) is a familiar British plant often seen by the waterside. Lythrum virgatum Rose Queen is a valuable hardy garden plant ; it grows 3 ft. high, thrives in ordinary
soil, and bears ruse coloured flowers in summer Propagation is effected by dividing the clumps in autumn

LORDS AND LADIES. This is a common name for Arum inaculatum, a familiar wild plant also known as cuckoo-pint, wake robin, and Italian arum.

LORGNETTE. A lorgnette is an eyeglass or pair of eyeglasses made to be held in the hand instead of being fixed on the nose. Tortoiscshell is frequently used for the fittings of long-handled lorgnettes, and gold for the more old-fushioned types, with springs for folding, or hinged between the glasses. These lorgnettes can be fitted with convex glasses for rearling and with concave ones for distant work See Eyeglass; Spectacles.

LOST PROPERTY. The law relating to articles lost and found is, roughly speaking, that a person who finds an article can keep it against all the world except the true owner; but if the true owner turns up he can either clain the article or its full value. An honest man who finds anything will endeavour to discover the owner: but in law he is not entitled to any reward, nor even to the expense to which he has heen put.

No one is entitled to anything found on someone else's ground, not even if that ground is a railuay station or a railway carriage. Articles lost in such places belong to the owners of the ground as against everybody except the true owners. In London and a number of other large towns there are local latws making it ohligatory on the conductors of omnibuses and drivers of uther public vehicles to take any articles they may find to a police station, and at Scotland Yard there is a special department to deal with property lost within the London area. Individuals who find lost articles often take them to a police station, while those who have lost valuables may offer a reward for their return, publicity to this being given by the police. Anyone who keeps for himself any article he finds, believing that the owner could be found, is guilty of theft.

Railway companies have lost property offices where application should be nade by persons who have lost anything while travelling, or left it in a railway carringe. The lost property will be returned to the applicants on payment of a fee.

LOTION. A liquid preparation of a drug for external application is known as a lotion. It is made to dry quickly by adding alcohol, and slowly by the addition of a little glycerin. lotions are classificd as antiseptic, antipruritic, astringent, soothing, and atimulating.
To apply an antiseptic or other lotion, soak a piece of lint in it and lay the lint on the part with the smooth part downward. Over this place n picce of oiled silk or other waterproof material, which must project about $\frac{t}{\text { in. all }}$ round the lint. Cover with a laver of cotton wool and bandage Antiseptic lotions are also used to cleanse ulcers and wounds, $n$ piece of lint or sponge being dipped in and then squeczed over the wound.

An evaporating lotion is used for conling some parts of the body. It may be very grateful in lieadache, especially brow ache, in sprains and strains, and in scute infainmation of the skin from whatever cause. Alcohol or weak acetic acid or vinegar in water is generally employed for the purpose.

LOTTERY. A lottery is a distribution of prizes by lot or chance. If there is in the scheme such an element of skill ns removes the matter from being an affair of chance entirely it cerases to be a lottery. A sweepstake where the names of the winners were drawn by pure chance, is a lottery, and the courta have held that a competition in which the names of the winners in a race were to lic correctly given in a coupon is a lottery and therefore illegal.

As it is an offence to hold a lottery at all, it is also an offence to advertise a lottery, or print or otherwise be concerned in the publication of the proposals for a lottery. Any. hody who publicly or privately keeps any oflice or place wherein a lottery is carried on, or knowingly permits a lottery to be carried on in his house or any room or place occupied by him, is liable to a penalty for each offence to $£ 500$, to be recovered at the suit of the Attorney-General, and he is also liable to be dealt with on summons as a romue and vagabond (penalty $£ 25$ or threc monthas hard labour). It is also an offence to sell any ticket or share in any foreign lottery, or to print or publish any notice relating to it.
The Lottery Act applies just as much to lotteries which are organized for the purpose of charity, or to raffles at bazaars, as it does to any other form of lottery A real skill competition is permitted, but a mere alfair of chance is forbidden. Nor does it make any difference whether or not the prize is to be given out of the money contributed by those who take tickets, or is given by some person who has no interest in the affair.
A Legal Lottery. By the Art Union Act. 1846, a genuine association for the purchase of paintings, drawings, and other works of art, which are to be afterwards allotted and distributed by chancc or otherwise amongat nimbers, subscribers, or contifutors as prizes, is legal although it is a lottery. See fiamhling.

LOTTO. This gaune is played with oblong boards or cards and counters. The cards are divided into $2 \overline{7}$ spaces, ! in a rosv. Four in each row are blank and the other live are marked with numbers, which may be any figure up to 90 . The 90 counters are wooden or ivory pieces, marked from 1 to 90.
The players take one or more cards each, and the banker shalies the counters one by one from a bag. As each falls he calls nut the number, and the players who have that number on their cards mark it, usually by covering it with a counter. This continues until one player has covered all the numbered squarcs in one row on his card.
LOUD SPEAKER. This is an apparatus which converts the electrical energy in the output circuit of a wireless receiver into sound vibrations. It is designed to handle relatively large inputs, so that the volume of sound may be comparable with that of the original. Loud speakers may be divided into two main types, the cone and moving-coil.

Cone Loud Speakers. These are sometimes called the moving-iron type, and comprise armature or reed magnetically balanced between the pole pieces of a permanent mingnet system. The reed is connected to a metal rod, which projects through the apex of a cone of stiff paper, or other material, where
it is held fast by means of a small serew or nut. The cone is mounted at its periphery on a ring (or number of atrips) of some material such as thin rubber, kid glove leather, etc., which is also attached to a supporting framework sometimes forming the baffle. The cone is thus frec to move in a horizontal plane in sympathy with any movements of the arma. ture or reed. The electrical impulses in the out put circuit of the receiver pass through the windings of the "speech" coils and produce varying movements of the armature, which are transmitted by way of the metal rod to the conc.
Cone loud spenkers aresensitive, and givegood results. although careful design is necessary if ohjectionable resonances are to be avoided. The diameter of the cone has a marked effect uloun the reproduction. Too large a diameter may cause bass resonance and hoominess with a poor high note response, while too small a diameter may give a high pitched effect, and lack of bass. A large haffle improves the low notes. It is essential that the metal rod should be sccured tightly to the apex of the cone, ollierwise unpleasant "ditliers" may necur when the loud speaker is in operation. Some cone units have a nieans of adjusting the position of the armature in relation to the niagnet poles, and the adjusting knob or screw should he carefully rotated to give maximum sensitivity
Moving-Coil Loud Speakers. Coil-driven cones are capable of giving reproduction of the highest quality, but are more expensive than the reed types A small circular former, "jon which is wound a number of turns of fine copper wire, is attaclied to the apex of a cone, and is accurately centred between the pole pieces of a powerful electro- or permanentmagnet system. The cone is attacherl to a supporting framework, as in the type described above. The electrical impulses in the output circuit of the receiver pass through the coil winding and produce movements of the coil and attached cone.

Moving-coil loud speakers are obtainable in three types, viz. permanent magnet, battery operated, and mains operated. The permn-nent-magnet models require no external source of supply, whereas the battery- and mainsoperated types derive the energising current for the magnet from a 4- or 6-volt accumulator or from the mains respeotively. Tho moving coil may be wound to have either a low or high resistance, low-resistance coils being employed in conjunction with a step-down transformer. A baffle is cssential for goud low note response. See Filter; Wireless.

LOUIS STYLE: In Furniture. This ceneral term is applied to the four styles of furniture and decoration which were produced in France during the reigns of four of the Ionis, namely-XIII, XIV, XV, and XVI.


Loud Speaker. Fig. 1. Cone type of apparatus, with large conical diaphragm.

Louis XIII. The style Louis XIII, or Louls Treize, was a reaction from that of the previous reign with its superabundance of carving and painting and rich ornament created and revived by the Renaissance. Louis XIII chairs were small and rectan. gular in contour, with slight frames of wonds covered by well-padded velvets, tnpestries and embroideries, fastened by
round-headed brass nails. The arms of the clairs, however, were rarely panded: the legs were joined by stretchers. Large armoires or wardrobes, chests of drawers and knec-hole desks were embellished with inlays of coloured woods, ivory and bone, depicting llowers and birds. The walls were panelled and adorned with ntirrors. This particular style corresponded in period to the early Iacobean in England, hut was far less severe.

Louis XIV. The Louis Quatorze ( Iouis XIV) style is a heavy classical one. The furniture was overlaid with carving, rich inlays and heary carved metal mountings after the designs of Buhl. Some magnificent pieces were made in this style. The chairs had tall backs, square or $V$-shaped; the cabinets were large, glazed and often bowed. The sofas were ample


Louis Style. Fig. 1. Clock of the Louis XIV deriod.in a babl and ormolu case. Fig. 2. Commots
Louis Style. Fig. 1. Clock of the Louis XIV period, in a babland ormolu case. Fig. 2. Commots
with overlaid marguetry of mahogang. and beavily monnted with chased ormaln ; period Lonis $X V$ Fig. $\mathrm{J}^{2}$ Louia XVI chair of carved and gilded wood apholatered in tapestry Bu permission of the Dircctor. Victoria d Albert Museum, S Kensington
ia size, and for them rich brocades and tapes- prototype of many pienes in anites designed for trics of baroque designs were used. Fig. I drawing rooms and labelled Louis Style. shows a clock of this period with its Horid design, classical pilasters, baluster rail and Buhl case with ormolı mounting. Louis XIV wtyle grently influenced English, furnishing and decoration during the reigns of Charles 11 and lames 11. The period concluded approximately with Queen Anne style in England.

Louis XV. Louis Quinze (XV) is the rococo atyle. The wood was heavily carved, or covered with composition moulded into enrichments of rocke, shells, waterfalls and scroll work: among the latter doves, cupids, and lieads and busts of women, terminating in foliage were prominent. Much of the furniture is gilded or painted in delicate tints.
Other pieces were veneered with marquetry and decorated with heavily chased ormolu mountings as seen in the commode in Fig. 2. The chairs and couches have swecping curved bacis upholatered with tapestries, having Howers, figures, or animals worked thereon, or in Howered brocades. The woodwork is gilded. Corner cabinets and little round tables were also produced in this period. These are enriched by inlays of birds, figures and landscapes carried out in tinted and stained ivoods. Louis XV style was often too exaggerated and florid for real beanty. It corresponded in period with the mid-Georgian in Eingland, but lacked the fine designs of the best English furniture and decoration of the time.
Louis XVI. In the style Louis Seize (XVI) a ppear rectangular panela having simple mouldings and fluted columne, with quill and liusk fillings. Dainty ribbons and bows in urmolu and marquetry aurround riohly painted

The marquetry of the period was executed with extrnordinary amoothness and finish, and the mounts of gilded bronze, which were

the leading characteristics of most of the worl: of the 18th century, were finished with a ininute delicacy of touch The famous 18 th century English cabinet makers were not greatly influenced by the Iouis styles, although Chippendale furniture certainly frequently shows Louis XV ornamentations. Sec Buhl Chipliendale: Jacobean; Trpestry.
LOUNGE: How to Furnish. Unleas the term is an affectation, to style a sitting room a lounge means that it is furnished with special regard to comfort and relaxation. It is essential that the colour acheme should be restful withnut being depressing and that the room should have a cosy, homely atmosphero about it, as it often takes the place of a mmok-ing-room and combines a card-room with inl informal sitting room for general family use In country or large detached houses the lounge is usually either an extension of the hall, or a spacious and pleasant room with access to the garden. The former type is discussed in the article on Hall. the litter is well represented in our first illustration

With its southern ontlook over the garden and cheery French windows this lounge is furnished in the most reposeful fashion with a number of large armchairs and a coinfortable settce. The velvet chosen for the upliolstery gives a particularly rich appearance and is an ideal fabric for a lounge. This appearanoe is enhanced by the pile carpet with ite unobtrusive border and all over trellis pattern. There is nothing definitely binding to any particular period, either antique or modern, in the room The wide planning of the brick fireplace is in pericet keeping with the rest of the decoration, and the dark note of the woodwork is repeaterl on the ceiling with excellent effect. On either side of the fireplace is a delightful little swindow with a view on to the tennis lawn. Tho lighting is from wall brackets and table lampa
In suoh a sunny room a restful and beantiful colour scheme would be evolved by chorosing soft mignonette greens for the twotoned carpet, the deeper ahade of green for the velvet upholstery, the lighter whade for the wallpaper. Above the mahogany picture rail the frieze and ceiling would be washed with primrose yellow in a clear pale shade The warmth of the briok and the woodwork of the fireplace contrast happily with theas colours, and the printed linen for the ourtains would repeat the mellow tones of the brick in


Lounge. Fig. 1. Corner of room showing result of harmonious planning. The restifalnesj of the longe is enhanced by the velvet uphointery and the freplace nith its little window on either alde Humphrell \& Vera Joet


Loange. Fig. 2. Modern lounge in which severity of Une is delightfully contrasted with richness of furnishing fabrics and the comfort of the divan and settea Humphreu \& Vera Joel
its conventional Horal pattern with touches ol yellow and brown on a green ground.

In the second illustration a different type of lounge is shown, but here agsin the keynote is one of restful ease. Though the divan and settce are severe of outline, in keeping with the simplicity of the style of the roum, they are luxurinusly comfortable. There are no piotures, no frieze or cornice, and no break in colour or glossy texture of surface between the wall and ceiling. These detaila increas the height end apparent size of the mom and emphasize the uncommon design of the windows whioh add great interest to the scheme.

The upholstery in this case has been carried out in a modern heavily ribbed fabric and the curtains are of dull-surfreed silk. The carpet is a velvet pile in modern design. The built-in bookcase, the table and the two lloor standards are finished with cellulose lacquer. With so much glossy paintwork it is ensential that the furnish ing fabrics and carpet whould be mat and soft of texture. The colour scheme for such a severely simple lounge should he striking, and a beautiful effeot would be gained by using a pale French blue for the walls and ceiling, dark grey for the woodwork of the skirting, a rchitraves of doors and windows, r lighter tone of the same grey for the upholstery fabric and the fireplace surround, and three shades of grey for the carpet. The curtains would blend with the scheme by being of shot blue and silver grey silk, but the whole room would be brightened without any disturbing effect in such a reposeful setting, by choosing lacquer red for the colour of the standard lamps, bookcase. table and leather floor cushion. The pleated Inimpshades would be of parchment colour tied with red and silver cords. See Colour Decoration; Hall; Living.Roum.
Louse. See Lice.
LOUVRE. This is a form of ventilator, which may be made in wood, metal, glass, or other material, and consists of a framework across which a number of parallel slats are fixed, so that they incline downwards, the bottom of one slightly below the top of the next.


Love Bird. Specimena of Australian Budgerigar, Dopularly known as Love Birds

The louvre provides a convenient means of ventilation where it is not desired to leave a simple aperture, or to go to the expense of a sash or casenient window.

Louvres are found as ventilators fixed to the top of a roof, and in other exposed positions, as their structure is of a durable character, and calculated to withstand the attacks of the weather. A small louvre panel fixed in a door is a con. venient method of obtaining ventila. tion while exoluding any possibility of vision. Sometimes the word louvre is applied to a form of lantern, placed on the roofs of outbuildings for ventilation purposes. See House; Shutter.

Love Apple. This is an old name for the tomato (q.v.).
LOVE BIRD. This phrase is used, with. out any very exact meaning, for some of the small parrots. They are usually kopt in pairs, although the idea of mutual affection conveyed by the name is without foundation, the birds perching together merely for the sake of warmth. Solitary love birds do not pine ; if the death of one is followed by that of the other it only indicates 1.hat both were unwell together. The hardiest of the love birds is the rosy faced one. These will often breed in captivity, provided they are placed in a roomy aviary. In general, however, love birds are very delicate. The budgerigar is one of the most propular of the love birds. The breeding season is from April to July. See Budgerigar: Parrot.
LOVE IN A MIST This favourite blueHowered hardy annual ( nigella) flourishes in ordinary soil; the charm of the Howers is enhanced by the finely divided leaves which surround them. The best variety is called Miss Jokyll; it han Howers of deeper blue than the typical kind, Nigella damsacena. Seeds are sown out of doors in April where the plants are to bloom in summer, or in early September for spring flowering.

LOVE LIES BLEEDING. This showv. hardy annual (Amarantus caudatus) hears crimson Howers in long drooping racemes Seedlings, usually raiserl under glass in March, are planted out in .lune, but seeds may be sown out of doory in late April and May.

LOVING CUP. The loving cup is a large drinking vessel, usually made of silver, with two handles and somotimes threc, which is filled with wine and circulated at public banquets, each guest drinking and passing it on to his right-hand neighbour.
Certain formalities in the use of the loving cup were formerly more strictly observed than they are today. Each guest as the cup reaches him rises and bows to his right-hasid
neighbour whose duty it is to remove the cover and hold it while the other drinks. When there is no cover it is customary for both the right and left-hand neighbours to atand up. This is a survival of Tudor times. The cup was formerly filled with wine, ale or mead, with a piece of tonsted bread floating on the top; but it now generally contains spiced wine. This cuatom of (lrinking from onc cup) was obsersed at the Jewish paschal supper


Loving Cup. Example of a two-handled loving cup in silver, dating from 1710-11; helght, 7 inches Victoria A Albert Museum

LOWBERRY. This valuable berried fruit is obtained by cross-breeding between the loganberry and the blackberry; the large fruits have a blackberry-like liavour. Ihe cultivation is similar to that of the loganherry (q.v.).

LOWESTOFT CHINA. The porcelain produced at Lowestoft during the later half of the 18th century was of the same type as Bow and Worcester. As there was no factory mark, specimens of it used to be attributed to these works, especially as the Worcester crescent was sometimes copied at Lowestoft. Because of its rarity there are a number of counterfeits of this warc.

The factory turned out bowls and useful services, with blue and red decorations, sometimes with panelled borders containing local scenes. The ware is inclined to be heavy. opaque and vellowish. with a dull and


Love in a Mist. Blooms of the rich blae variaty named after Miss Jakyll


Lowestoft China. Teanot and cupand saucer of the porcelain formerly produced at Lowestoft. It is decorated with a Chinese design of fowers and birds
speckled glaze. Ribbed and Huted cups, decorated with detached or linked sprigs of llowers, besides embossed tenpots, and picces inscribed "a trille from Lowestolt," may be looked for.

An unsolved mystery is the use of the term Lowestaft china for arınorial ware, made and painted by Chinese nrtiste at Canton during the 18 th century, and never imported into or manipulated at Lowestoft. See China

LOW FREQUENCY. This term is ap plied to alternating currents having frequencies up to about 10,000 cycles per second There is actually no definite dividing line between high and low frequency currents, but in wireless the term low frequency is normally applied to those frequencies within the limits of audibility. See Amplifier: High Frequency
LOW TENSION (L.T.). This name is given to the voltage which is applied to the filament or heater of a wireless receiving valve in contrast to the high tension voltage which is applied to the anode. In a battery operated wireless receiver, the low tension battery may take the form of a 2.4 or $\mathbf{6}$ volt accumulator. according to the type of valves used. In the case of an "all mains" recciver, the heat current is derived from a suitable low-tension winding on the mains transformer. See Accumulator: Eliminator: High Tension.
LUBRICATION : In the Bome. There are many materials that possess properties which render them peculiarly adapted for certain forms of lubrication. Of these, a mineral oil forms the base of nearly all lubricating oils, the practical value of which depends almost entirely upon the proportion of the constituents and the method of manufac1.ure. Broadly speaking, oil suitable for a cypewriter, sewing machine, or clock is thin, alnost as Huid as water, and very pale in colour. Only the very best typewriter oil should be purchased for lubricating the typewriter, and similarly the sewing machine should be oiled with good sewing-machine oil.
For clock work only the very tinest specially prepared oils should te used. In ordinary household use for such purposes as oiling the beriings of a lawn mower, mangle, or other similar appliance, employed for comparatively light work and during short periods, any good quality light machine oil will. give satisfac. tory results.
Lubricants for Bearing Surfaces. Among lubricnnts used for bcaring surfaces are grajhite, sonpstone, and a variety of others which are used dry. Of these, powdered graphite gives excellent results on cast iron surfaces. Solid lubricants, when mixed with animal fats, grense, vascline, or the like, are converted into semi-solid grease, which may be used for bearings and is cxcellent for small carts
and the like. For some purposes vascine is A good lubricant, especially for slow-moving shafts and bearing surfaces lubricants for high speed bearing surfaces, such as those in a small electric motor, require a thin oil generally an animal oil

Objects made of woud and provided with bearing surfaces, such as the slides or bearers supporting a drawer, may need lubricating This is best accomplished by the use of dry graphite, but in practice it can seldlom be used as it tends to soil anything which comes in contact with it. Alternatively, French chalk, fuller's earth. or powdered tale can be employed for the purpose

The lubricating of geir wheels is difficu!t when they are not enclosed in a greaseprouf gear-case. If they do not revolve at a high speed they can be treated either with griphite in the form of a paste or with a heavy gear oil
ahout the thickness of stiff treacle. ()n small geare vascline will often give goud results.

In using lubricants for any machine in the home it is best to wash out the beatring surfaces occasionally with paratlin, wipo the exterior clean. and oil the bearings with Iresh oil. Run the machine for a minute or two to make sure the paraltin is entirely disposed of and that every part is properly oiled Again wipe all the exterior dry and apply a few drops of new oil, which will keep the bearings in good condition and add th the life of the machine. When the bearings are to be ailed the oil holes should be cleaned out before applying the lubricant, otherwise grit and dirt are washed down into the bearing and set up a grinding action which tends to destroy it. Lubricating vils should be kept in closed contuiners and stored in an equable tempera. ture See Bicycle: Oil

## LUBRICATION FOR MOTOR VEHICLES

How to Keep Car and Cycle in Good Running Order
This article deals with a subject of importance to the motorist. who will find other useful informs. tion in the articles Motor Car: Motor Cyele and Motoring. See also Gear: Live Axle, etc.

In all modern motor car engines the lubricating oil is circulated by a pump iutomatically operated by the engine. This pump which is usually little more than two gear wheels enclosed in a case, draws the oil from the crankicase sump, or a tank. and delivers it under pressure to the insin bearings

The methods employed for ensuring adequate lubrication vary in prinoiple and detail, but roughly they may bs divided into three classes as follows
(1) Circulating Splash (sometimes called pump-and-trough). In this system the pump delivers the greater part of the oil through suitable pipes or passages to a series of troughs arranged in the crankicase below the path of the connecting rod big-end bearings. Attached to the lowest pirt of the latter is a small dipper which picks up the oil in the trough and throws it so that, as this is being repented several hundred times a minute, the moving parts of the engine are working in an oil mist. Sume of the oil falls into troughs attached to each main shaft bearing, to the camshaft bearings, and to others feceding the valve tappets. Again, a quantity of the oil falls into holes on the big-end bearings and into troughs at the lower enils of the cylinder bores and pistons, which carry the film of oil up the cylinder walls, while the lubricant which has been splaslice into the pistons serves to lubricate the small-ends of the connecting rods.
(2) Splash and Pressure. This is n system nlso employing troughs under the bigend bearings, but leads from the pump are also taken to the main crankshaft bearings and sometimes to the camshaft bearings as well, thus providing a supply of oil under pressure to these important points. The
eciprocating parts are lubricated in the same manner as described in the circulatingsplash system
(3) Full Pressure Lubrication The pump delivers oil under pressure to the main bearings, nud from the interior of these it pinsses into channels tored in the crankshalt, which communicate with similar channels in the crank pins. Thus the big-ends are lubrieated from within. Similar channels take oil under pressure up ducts in the connecting rols to the sinall-end bearings. Surplus oil from these bearings is thrown off on to the cams, cylinders pistona, etc.
Oil Consumption. The quantity of oil con. sumed in a motor vehicle depends largely upon the size and general efficicncy of the engine, but an average of 1,000 miles to the gallon is regariled as a satisfactory consump. tion in a modern engine. Even if the oil. !evel indicatur in the sump indicates that there is a grod supply after a considerable inileage has been covered, it is desirable to drain the crankease and refill with fresh oil, as oil which has been used over and over again for long perinds loses its viscosity. Moreover, it necones contaminated with particles of carbon nnd with other impurities.

Special oils are now sold which have a high lash point and are known as upper oylinder lubricants. These oils are used alditionally to the main supplies and are usually mixed with the petrol. and so impart to the fuel a lubricating quality which serves to keep the valve stems well lubricated. Scparate containers for this upper cylinder oil are fitted on some cars.

Gear Box and Back Axle. Lubrication of the gear box and back axle (which contains the differential gear) consists mainly of making


Lubrication for motor cars. Fig. 1. Lubrication of the chassis: Tecalemit central asgtem. Arrangement of pumpand
pipes, the latter shown in thick black lines. A, fexible tube from frame to axle. pipes, the latter shown in thick black lines. A, fexible tube from frame to axle. B, connexions to steering wheels
sure that these important parts have an adequate sup. ply of oil. The lubricant ahould never be alluwed to be too much below the level specified by the makers. The level should not fall appreciably in 1,500 miles run ning.

Most cars are equipped with level-plugs (which are removed when filling the gear box or the rear axle to indicate, by overflowing, when the correct level has been reached An excess of oil in a rear axle may cause the surplus to find its way on to the brake drums

also to return the surplus to the outside reservoir.

In two stroke engines it is usually the practice to mix the oil with the petrol, the mixture varying from 30 parts petrol to 1 of oil when the engine is new, to 16 to 1 when the bearings and piaton have been well run in. In this system no other provision is made for lubricating the engine. It is a simple, if crude, method of supplying oil to rapidly moving parta, but is quite satisfactory except that the carburet-
Fig. 8 ter is usually
quantity of luggage carried free of charge, the amount varying with the class of ticket. Anything exceeding this weight is paid for at a fixed rate per lb. Passengers 'are responsible for their own luggage to the extent of seeing that, having been correctly labelled it is put into the right train, but if the company's servants once take charge of a package, the company is liable for its safety.
On most British railways luggage may be sent in advance at a fixed rate per package on production of the passenger's ticket. The charge includea collection and delivery, and notice should be given at least one day before. Travellers by motor coach are allowed a certain amount of luggage, although this is usually confined to suit-cases and bags that can be carried in the hand.
Travelling Abroad. For continental travelling the systems vary. In some countries each passenger is allowed a certain weight of luggage free and pays on the surplus, while in others all luggage except that actually taken in the carriage must be paid for. Luggage can be registered from the station from which the boat-train leaves, and it requires no attention on the passenger's part until he reaches his destination, unless he has to submit to customs and so render the brakes useless. Car ful attention should be paid to woim drive back axles, especially to th se which have the worm on top of the wheel; any shortage of oil here will quickly render the drive inoperative.

Lubrication of the Chassis. Certain bearings on a car chassis require lubricating more frequently than others. The points needing periodical attention are the spring shackles and pins, the joints of the steering rods, the brake operating gear and the front axle steering pins. The modern method of lubricating these parts is through grease-ways supplied with grease by means of a pressure gun. The appropriate grease should be forced into the nipples on the bearings until some of the grease exudes from the end of the bearings.

In some cases there is a sepa. rate nipple which is filled for each bearing, in others several bearings are fed by a group system from single nipples, and in a few from a central point, this feeding all the bearings.

Front wheel hubs require infrequent replenishment, but once every six months they should be given a fresh supply of grease to prevent the balls or rollers on the bearings frum corroding. The steering box, too, should not be neglected, and anould be tith a mixture of oil and grease.
Motor Cycle Engines. Owing to the limited space available in a motor cycle the flywheels of the engine are usually enclosed in the crankcase, and there is seldom ronm for a sump in its base. In most four-stroke motor cycle engines a slow speed oil pump, driven off the timing gear, is used to supply oil in minute quantities frum a reservoir to the crankcase, where it is used on the splash system, or it is carried to the big-end bearing. Hence it is distributed on the cylinder walls, and, through a hole in the partition separating crankcase and valve gear casing, to the valve gearings and tappets.

A few motor cycle engines embody a sump, in line with the practice in car engines, the pump being used to circulate the oil from the sump, through the bearings, and back to the sump. In what is known as the dry-sump system a pump servea to supply oil under pressure to the various parts of the engine and


Lubrication of car engine. Fig. 2. Diagram of fully forced syatem. Crankghaft is sectioned to show oil pasagea Arrowi indicate the path of the oil. Pif. a (above). 8plagh aystem, in which dipper on oonnecting rod cap dips into oil trough. A, oil collector or resarvoir, with feed pipe to bearing. B, oil collector cat in one with bearing
covered with a film of oil. If the engine is examination on crossing the frontier between allowed to stand too long with the supply tap two countries. As a general rule, however, open, there is a possibility of the oil, heavier of course than the petrol, settling in the carburetter and so making starting difficult. Experience has shown that much trouble may be avoided if the supply tap is turned off a little while before the engine is stopped, in order that the float chamber of the carburetter is not left with a supply of the petroil mixture, as it is called.

## L U G G A GE .

 Every passenger by train in Great Britain is entitled to have a certain

Fig. 4. Lubrication of motor cycle ongine. Dry sump asatem as applied to a singlo cylinder j.A.P. ongine Courlesy of the Motor Cycle
topping place.
passenger may take a certain amount of luggage in the cabin, and the reat goes in the hold, the cost of transport being included in the pasarge money The requisite labels are sent by the shipping company. While few people consider it necessary to insure their luggage for an inland journey only, it is, however, a wise precaution to insure it fur foreign travel.

Some Legal Points. The legal duty of the passenger consists solely in delivering his luggage
to a company's servant with directions where he wishes it to go. The company must then label it and send it on and all the passenger has to do is to claim it at its destinstion
The luggage a passenger is entitled to carry free must be peraonal luggage, that is, auch things as are ordinarily taken by a traveller for use as a traveller. If articles of merchandise are delivered to the company as passenger's luggage and are lost, the company is under no liability. They are bound to accept personal luggage up to the proper weight if properly packed, and can refuse to accept a jackage not addressed; but if they accept a package which is not addressed they are responsible for it. It is beat to have luggage put in the guard's van ; for if a passenger takes luggage with him into the carriage, to some extent he relieves the company from responsibility for its safety.

A railway company may make special conditions as to liability for the carriage of luggage by cheap or excursion trains. They are not entitled to make any special conditions exempting themselves from liability when ordinary fares are paid. If a servant carries luggage for his master as his own personal luggage, the master has no claim for its loss ; and the scrvant cannot elaim, because he has suffered no damage

It should be noted that if the passenger has over £10 worth of articles, e.g. jewelry, ctc., in his luggage, and fails to declare them, and they are lost, the railway company is not bround to pay a penny, and the whole loss falls on the owner unless the luggage is insured. See Holidays: Packing: Trunk.
LUMBAGO: How to Treat. Pain in the loins, or lumbago, is commonly due to fibrositis, or inflammation of the sheets of fibrous tissue surrounding and covering the muscles of the back. The fibrous tissue sivells at various points and presses on nerves, giving rise to pain, which may be very sharp.

The exciting causes of an attack are cold. damp, exposure to draughts when perspiring, and muscular strain. Predisposed persons should harden themselves by a daily cold bath or sponging, and by not wearing too warm clothes. But in cold weather the small of the back should be protected.

A Turkish bath will often avert an attack. Rest in bed is advisable. Apply a large, hot linseed poultice, or wring a folded piece of Hannel out of hot water, sprinkle it with turpentine and put it to the back, renewing it as it cools. Dry heat can be applied by half filling a large indiarubber water-bag with hot water and placing it againat the part, or a piece of flannel may be applied and rubbed over with a hot Hat iron.

An attempt should be made to discover the swellings on the inflamed tissue, and these should be kneaded with the thumbs, very gently to begin with, but with inoreasing firmness as the patient is able to bear it.
The bowels must be kept regular by occasional doses of some saline aperient. At the commencement of an attack a powder containing 5 grains each of aspirin and phenacetin may be taken several times at 3 or 4 hour intervals. Friction with stimulating liniments, such as turpentine liniment, or with Chilli paste, is useful as the ncute atage passes.

LUMP. A swelling somewhere about the body is popularly referred to as a lump. In the neck it is usually an enlarged gland, the commonest cause being tuberculosis. A lump in the breasta may be due to inflammation, or to cystic or tumour formation.

Much harm results from voomen delaying too long to get medical advice about such a lump.
In the groin a lump is generally a hernia or rupture, but may be due to enlarged glands or other canses. See Gland.

LUMP SUGAR. Sugar moulded into a loaf or conical shape is broken into cubes and sold as lump sugar. Lump sugar is highly refined and is the purest augar which can be purchased. It is, therefore, most suitable for using either with tea or coffee and also for many delicate sweets, if pounded, sifted, and given the place of castor sugar. See Sugar.
LUNAR CAUSTIC. Nitrate of silver, commonly known as lunar caustic, is used to remove warts and cauterize wounds. In cases of poisoning give a tablespoonful of salt in a pint of water, or the whites of 2 or 3 eggs beaten up in a pint of water See Wart.
LUNATIC: The Legal Position. A lunatio is a person of unsound mind, and under English law such can be put under restraint in an asylum nfter certain formalities have been complied with. There are several forms of procedure in such cases The ordinary method is by n reception order or petition, this being the one usually adopted in the case of private patients where urgent action is not essential.

Four documents are required, these being the petition itsclf, a statement of particulars, and two medical certificates. The petition must be signed, if possible, by the husband, wife, or nearest relntive of the alleged lunatio If this is not done the reason for another person signing it must be given. The signer of the petition must, moreover, have seen the lunatic within 14 days of the rate of the petition. Attached to the petition is a statement of particulars. This inust contain the name, age, sex and occupation of the person with details of his or her present illness and any previous attacks of insanity there nany have been.

Most important are the two medical certificates, one of which should be signed by the usual medical attendant of the alleged lunatic. Each of the medical men must examine the patient, separately from the other, within seven days of the date of the petition.

The Medical Certificate. A medical certificate cannot be given by the petitioner himself, by the superintendent, proprietor or medical attendant of an asylum or home to which the alleged lunatic is to go. It cannot be given by any person interested in the payments on account of the lunatic or by the husband or wife, father or father-in-law, mother or mother-in-law, son or son-in-law, daughter or daughter-in-law, brother or brother-in-law, sister or sister-in-law, or by a partner or assistant of any of the foregoing.
One paragraph of the medical certificate requires two statements: "Facts indicating
insanity observed by mysclf at the time of examination," and "facts communicated to me by others." The statements made under the first heading are the most important part of the certificate, and unless these contain ovidence sufficient to convince an independent reader that the person to whom the certificatc refers is insane the certificate will not he regarded as sufficient. A medical man who signs a certificate of lunacy is not allowed to continue to attend the lunatic. He is not liable to civil or criminal proccedings for any statement made therein, unless it can be proved against him that he has not acted in good faith and with reasonable care.

When they are completed the petition and other documents must be taken hefore a judicial authority, who is either a county court judge, a stipendiary magistrate, or a justice of the peace, specially appointed for the purpose. This authority, if satisfied with the evidence set forth, may sign the reception oriler forthwith, or may appoint a day, not more than seven days after the presentation of the petition, for ita consideration, and may himself visit the lunatic.
Cases of Urgency. When it is urgently necessary, cither for his own safety or for that of others, that a person should be put under restraint at once, the method of procedure is by an urgency order. This may be signed by the hushand, wife, or other near relative of the alleged lunatic. If anyone else signs it the reason for so doing must be given. The person who signs must have seen the lunatic within two days of the date of the order. A person can only lie detained under an urgency order for seven days.
If it is desired to put him under permanent restraint a petition must be presented in the way already deacribed and he can be detained until this is settled. Slightly different forms of procedure are employed in the case of a lunatic who is wandering at large or is a pauper; of one not under proper care or control: or of one who is cruelly treated or neglected by those in charge.

Two commisaioners in lunacy can aign an order for the detention of a lunatic in a recognized mental home even if there is only ollo medical certificate.

When once certified as insane a lunatic must be placed in an asyluin or home that is under the supervision of the lunacy authorities, and if the relatives are dissatisfied with his or her treatment there an appeal can be made to the officials of the Board of Control, whose head quarters aze at (i6, Victoria St., London, S.IV See Insanity.

## LUNCHEON AND LUNCHEON PARTY

## Dainty Catering for Family and Guests

This is a companion article to those in our work on Dinner and Supper. Dining Roon and Table Laying may be further consulted by the housewife. See also the entries on Enbroidery; Glass; Mat; and the articles on Diet ; Food; Pienic: Salad; Sandwich

The family luncheon on Sunday, or everyday where there are children, is a more substantial affair than the light lunch usually served when dinner is the chief meal of the day. The tendency, however, is to simplify midday fare, and, espccially in the sumner, to get away from the heavy joints and puddings associated with the old-fashioned meal. Two or three times a week fish is served instesd of meat for the children, and plenty of stewed fruit or fresh fruit salads and light junkets or custards are aubstituted in hot weather for the suet puddings so valuable as heat producing food in the winter

Variety is essential for healthy enjoyment of meals, and menus can be easily thought out by the housewife before the beginning of each week. The huge Sunday joint which used to supply cold meat on Monday and two or three made up dishes for the next day or two, of little food value in comparison with the
trouble of their preparation, may save a slight effort of imagination, but it is far more profitable and interesting to evolve a series of appetizing and well halanced meals. Such forethought makes all the difference between drudgery and gratifying efficiency.

Children's Midday Meal. Particularly suitable for substantial luncheon dishes in the winter, accompanied by vegetables in season, are beefateak and kidney pudding or pie, Irish stew, casserole stews of oxtail, beef or mutton, freah minced steak, liver and hacon, sausages and mashed potatoes. Boiled cod or hake with egg and parsley sauce, grilled herrings, dried haddock with poached eggs, fish pie and haked whiting fillets, are all excellent sulistitutes for the meat course with or without a nourishing soup, according to the selection of swcet to follow. For instance, if a boiled jam roll or apple pudding is selected, the soup would not be required; but if stewed
fruit or merely an open jam tart is on the luncheon menu, then, on a cold winter's day, Scotch broth or brown vegetable soup will form an admirable prelude to the meal.

In summer egg dishes are light and nourishing for children, particularly in the form of poached eggs on a vegetable such as spinach or runner heans. Nany suggestions for wholesome fish and meat salads will be found in the article on that subject. These are more appetizing on a warm day than hot food. Luncheon in the garden is a pleasant meal to return to from achool, and the service of this is facilitated by a trol. ley wagon laden with one simple hot dish in a casserolc or a substantial cold one, and cold sweets. The inexpensive fruit sets of one big howl with its smaller companions are attractive and useful adjuncts for the summer pudding course out of doors. Iemonade, pineappleade and orangeade are excel lent and popular luncheon heverages.

For children who have to take their hunch to school neat little cases are olstainable either for sand iviches only, or if something more elaborate is required, fitted with cup and saucer in unbreakable ware, a thermos llask and a sandwich tin Some nourishing fillings for sandwiches are described in the article on Sandwich. Oatcake and cream checse, datcs, raisins, celery, tomatoes and apples are all useful varieties of food for the luncheon case. Hot soup in the thermos makes a pleasant change in winter. Cold malted milk or a fruitade, in a wicker-cased bottle, are liked in the summer. A portion of some kind of sandwich calie makes a nice sweet with $\pi$ custarl tart or all iced bun for $n$ change.

The Sunday family luncheon may have to he $n$ more Victorian meal in the larger households. Servants expect it if no one elae does. Even then, cold dishes can be added to the menu in hot weather, joints can he sufficient for the day, the evening supper requiring a certain amount of left-over cold meat. The housewife can also keep her eye open for bargains in poulty and game to substitute for the sirloin of lieef.

Many men if they are at home for lunch on a summer weekilay really prefer a calad, bread and cheese and heer to a made-up, entrée. They will often fancy a dish of hore d'veluvres with a variety of sliced sausnges In winter a good fish or meat curry is an excellent luncheon dish, while many people who prefer a light meal serve a vegetable or macaroni all gratin, or a variety of omelette as the main dish.

Entertaining to Luncheon.
. Many housewivelion friends to meal of dinner than to the more elaborate meal of dinner. Sometimes such a luncheon is given hefore an afternoon's hriilge, or a matinée, at others it is a pleasant way of seeing people who come from a distance. lisitors to luncheon on Nundity entail very
little extra work in the household where a substantial midday meal is usually prepared on that day. It is alnays a mistake to give too formal a character to a luncheon party, and this in itself renders service easy and makes it simple for the hostess to entertain guests in a friendly faahion who are much hetter off than herself. There need be little or no waiting at table.
However simple the fare the first requisite is that it should he good of its kind. the second


Luncbeon. Charming effect on a pulisned table lard with a dainty lace
Courtesy of Welb \& Corbell
that the table service ahould he dainty. Some women prefer the all over damiask cloth, others lace or embroidered mats. As indicated in our illustration, a lace centre and mats show off beautiful glass to perfection, and an antique shade of lace looks particularly well on a dark polished tahle. In this case the table is laid for service from dishes handed round by the maid or from a side table by the hostess. The lace mats are protected by thin cork ones timished in cellulose to match the shade of the table. The effect would he spoilt if another colour intervened.
One solid course is enough as a rule at luncheon, and three or at the most four courses in all. Grape fruit, a fruit cockitail, melon or soup, are $n$ suitalile choice for the first course. Fither of the first two would be served in glasses, the melon on a glass plate, and the soup in cups or small tivo-handled soup howls. Sometimes in hot weather the soup is served iced. One of the small indivilual salads mentioned in the article on Hors d'ocuvres also makes an excellent first course for a luncheon party. Smoked salmon, salmon or prawn mayomaise look appetizing on glass plates.

When fruit is the first course a fish or egg dish niny follow either hot or cold, as taste and season of the year may decide. Veal or lamb cutlets and peas, salmi of game, casserole of chicken, becf tournédos or jugged hare are dishes which obviate the task of carving for the hostess. Vol-au-vent and various patties are often liked. Salads form a most useful series of helpful suggestions for the various courses of this meal. An iced sweet, where this can be made at home, is nearly always apprecinted and petits fours may be served
with it. With regard to beverages, ideas vary. Some people offer red or white wine in the winter, with whisky and beer in reserve for men who prefer them. In summer it is often enough to serve either a cider or a white wine cup, iced lemonade or heer. Many people never take alcoholic drinks at all, others never in the middle of the day. Good coffee should always be provided after lunclieon, and also two or three kinds of cigarettes.

The Luncheon Set. Designs for luncheon sets annsisting of a tahle centre and mats vary greatly in materials, colours and shapes. Sometimes three small mats go to each individual place at the tahle: one for the glasses used, one for the bread plate and one for the plate on which the course is served Sometimes these three are combined in one oblong or oval inat large enough to hold both plates and glass. These larger shapes look particularly well in antique embroidered linen or in coloured linen decorated with applique motifs.

Designs for Irish crochet suitable for luncheon sets are olitainable in various books on crochet and through needlework pattern sarvices. For a cottage set, coloured linen. annvas or raflia cloth mats are charming They may have borders and lloral dosigns embroidered in wool or ratfia. Coloured American cloth hound with bias binding to match and decorated with applique cretome llowers is also a good fabric particularly for an informal luncheon on a garden table or in the loggia.

LUNG. The lungs are two organs conical in shape, and of a spongy and very elastic suhstance. which fill the greater prat of the chest cavity, and which contract or expand as the air is expired or inspired. The air passages in the lungs are termed bronchi. Each lung is surrounded by a double layer of scrous membrane forming the pleural cavity. The right lung is divided into three lobes and the left lung into two It is in the lungs that the blood changes its colour from the dark purpliah red of venous blood to the hright red colour or arterial blood.
Diseases of the Lungs. Acute congestion of the lungs accompanies pneumonia and other inllammatory diseases of the lungs or tubes Passive congestion is common in disease of the heart when the return of the blood from the lungs is obstructed

Bleeding from the lung occurs in pulmonary tuberculosis, pneumonia. infarction and other disorders. An abscess in the lung may occur in pneumonin, in pulmonary tuherculosis, or from einholism.

Bronchitis consists in inllammation of the lining of the bronchi. When one or more of the bronchi hecome enlarged, hronchiectasis is said to be present. Emphysema is the name given to the dilatation of the air cells in the lung. One or hoth lungs may be nfliected.
Collapse of the lung is $n$ condition in which parts of the lung contain no air and are useless for the purpose of respiration. An instance of this frequently occurs in broncho-pneumonin, especially in children, and may be signa!ized hy the child hecoming suddenly very short of breath, while the lips hecome blue. Slonuld this occur, while awaiting the doctor, who should be summoned at once. the child must he placed in a warm bath and quantities of cold water should he thrown on the chest at short intervals, in order to induce deep inspirations See Breathing; Bronchitis : Consumption; Emphysema: Empyema; Inhalation; Pleurisy; Pneumonia; Tuberculosis.

LUNGWORT. This is the common name of a hardy spring-flowering borage-like plant of low growth (pulmonaria), which llourishes in ordinßry soil. The spotted leaves are ornamental. Angustifolia, 12 in., blue;
arvernensis, 9 in., blue; rubra, 12 in., reddish, and saccharata, rose-pink, are some of the chief kinds. They are increased by division in early autumn
LUPIN. The perennial lupin is one of the lovelicst hardy garden flowers of May and June In recent years many new varieties


Lupin. Tall spikes of blossom of the handaome perennial lupin havebeen raised of charming and varied colour ing - yellow, fawn, apricot crimson, rose. pink, eto. Some of them have been given names, but a mixed packet of good seeds will yield varieties of equal value.
The lupin needs deeply dug and man ured soil to be seen at its best; there, in the course of a year or two, it will develop into a large clump and will bear
dozens of flower spikes. It thrives in partial shade or in a sunny place, and is planted in autumn or spring. After a few years the plants are liable to deteriorate, but fresh ones are easily raised by sowing seeds out of doors in May; the seedlings will bloom in the following and succeeding years. Lupins must not be lifted and divided. Two of the best named varieties are Sunshine, yellow, and Downer's Delight, rose and crimson.

The annual lupins are pretty plants, 2 ft . or so high, which bear flowers in blue, rose, and other colours. The showiest is atrococcineus, with red and white blooms. Seeds are sown out of doors in April, where the plants are to bloom in summer
LUPUS. The skin disease known as lupus, which is the Latin word for wolf, received its name from the eating away of the tissues which often occurs in lupus vulgaris, one of the two forms of tho disease. The other form is lupus erythemstosus, which most commonly appears on the bridge of the nose and the cheeks, in what is termed buttertly distribution, covering them with red spots and greyish or yellow shiny scales. Septic conditions of the mouth or poisoning from some other source appears to have much to do with the cause of this form of lupus. The tubercle bacillus is the cause of lupus vulgaris, which is a very chronic form of tuberculosis of the skin.

Treatment consists in destroying the diseased parts by the application of germkilling drugs or chemical caustics, removal by the knifc, light treatment such as lïnsen rays, X-rays, and radium. See Light; X-ray.

LURCHER. Generally a cross between a greyhound and a collie or some other sheepdog, the lurcher scems to unite the virtues of each, with an added spice of mischief. Some are so trained that to all appearances they have nothing to do with their masters if a gamekeeper or policeman happen to be met. A lurcher will hunt for game, catch hare or rabbit. and retrieve it without fuss to the hand of its ouner. See Dog

LUSTRE WARE. Pottery is said to be lustred when a part or the whole of its surface is coated with a metallic film, which imparts to it a refulgent sheen. The earlicst lustre was the
silver. 'The lustre decorntion introduced into Stafordshire in the 18th century is seen st its best in some Wedgwood ware, and was manufactured at Newcastle, Sunderland, Leeds. and Swansea. It was produced by means of solutions of metallic salts, principally platinum, which gives the so-called silver lustre, gold. which is the basis also of metallic pinks and purples, and copper. Sometimes the whole surface was coated in order to impart the appearance of plated ware, a style which went out of use when electro-plating was intro-


Lustre Ware. Two-bandled goblet. dating from abont $1850^{\circ}$ duced and electro-p ated ware became popular. of the same type
churchyards, but in domestic architccture they form an ornamental approach to a house. A lych gate which the home worker can easily construct is shown in Figs. 1 and 2 The necessary dimensions are indicated on the diagrams

The best wond is oak, but well seasoned deal may be used. Such a structure, if roofed with dark red sandfaced tiles and neatly finished, forms an attractive external feature of the home. Fig 3 shows a chequerboard lych gate used in conjunction with fencing (yed and electro-p ated ware became popular. of the same type. See Gate: Roof.
Bismuth was used in Paris for producing an iridescent film resembling mother-of-pearl, and pearly ware of similar appearance is well known to collcctors of Belleek and late Worcester. These modern English wares. as well ns the oheap continental productions of Belgium, Holland, and elsewhere, lack the true refulgence and gleam of the older lustre pottery. But apart from thesc there are available admirable reproductions of much excellence, both from modern Italisn studios, and also among English craftamen, whose work inay be collected
Lustre decoration tends, more or less, to wear off. It should be cleaned with great care, without the use of hot water. The silver lustre made a century ago is sometimes resilvered, when intended for occasional use
LYCASTE. This beautiful and easily managed winter and spring-Howering orchid can be grown in a greenhouse having a minimum winter temperature of 50 degrees. It should be potted in a mixture of loam, neat and sand and is propagated by division as soon as the flowering season is over. The favourite kind is Lycaste skinneri, which has blooms of deep blush or rose-red sliade: the white variety, alba, is beautiful. Nany others are in cultivation

LYCH GATE. A lyoh gate is a covered gateway to the entrance of a building. Ex amples are often found at the entrance to


LYCHNIS. This is the botanical name of a group of hardy sunimer-flowering plants which includes many of considerable garden value. The Jerusalem cross (Lychnis chalce. donica), 3 ft . high. with scarlet llowers, is a favourite border plant. Lychnis (agrostemma) coronaria, 2 ft. , which lias grey leaves and carmine flowers. is a splendid plant for the shady border. Haageana, 12-15 in. high, is very handsome; it needs well drainel, rather light soil; there are soveral varieties of this with tlowers in scarlet, rose and other colours Viscaria (fl. pl.), 12 in ., with rose-red flowers, is very showy. Alpina, $4 \mathrm{in} .$, reddish, and lagsacae, 4-6 in., rose, are suitable for the rock garden. The double white variety of Lychnis vespertina has fragrant Howers. Lychnis flos-cuculi is the wild ragged robin. Although the perennials may be increased by division in early autumn, the best way is t o raise them


Lycb Gate. Fig. 1. Lych gate with a tiled roof which can be easily built by the amateur worker. Fig. 2. Working diagramagiving dimensions. Fig. 3. Cbequerboard lych gate constracted in sections

Fig. 3. courtes, of T. \& C. Associuted Industries, Ltd.
from seeds sown in boxes of soil in a frame in May The annual oampion (ooeli-rosa). 15 in., which bears rose-purple flowers, is sown out of doors in spring for summer bloom.

LYCIUM. The box thorn is a quick. growing hardy shrub with alender branches, especially well suited to seaside gardens. Lycium chinense, the favourite kind, has small purple flowers followed by red fruits. Propas. gation is by outtings in autumn or by seeds sown in a frame in spring.
Lycopersicum. This is the botanical nume of the tomato (q.r.).

LYCOPODIUM. Lycopodium, or club moss, is the name of a group of hardy and greenhouse perennials of somewhat moss-like growth. The hardy kinds, e.g. clavatum and alpinum, need moist peaty soil in the bog garden or rock garden. The greenhouse kinds need peaty compost and moist shady conditions; densum is one of the best.
LYE. The cleansing substance, or bleacher, known as lye, is a solution obtained from ashes or from substances which contain alkali, and is used in the preparation and making of soap, and as a detergent. A useful lye can be made from two parts of salt and one of caustic soda. These are mixed dry, and then diluted with water, the solution being employed for scrubbing or scouring purposes As caustic soda has an injurious effect upon the skin, the hands should be kept free from contact with the solution. See Bleaching.

LYGODIUM. This is a climbing fern suitable for cultivation in a heated groenhouse in a compost of half loam and half peat with annd mixed in. The favourite kind is Lygodium scandens; it miny be trained to cover a pillar or wire trellis.
LYSOL. One of the cresol antiseptios derived from coal tar is lysol, which is used in the home as a disinfectant. A 2 per cent solution in water is commonly made. The strong solution is very poisonous. In cares of poisoning, while awaiting the doctor, white of egg or oil may be given, but wat water. See Antiseptic ; Cresol: Disinfectant.

MACARONI: How to Cook. Macaroni is made from wheat finely ground and made into astiff paste with water, which is squeezed out into long pipes through n hollow, cylindrical vessel During this process the macaroni is partially baked, and is afterwards allowed to dry over artificial heat or in the sun.
Macaroni is cooked by being plunged into boiling water, which must continue to boil quickly, and should be well salted. About half an hour is the time usually required for boiling. The pipes should keep their shape and be quite soft. The macsroni is then draincd and is ready for use.

For thickening soup, use 2 oz cooked macaroni to about a quart of stock. It should be added to the soupalmost at the last, brought to the boil, and boiled for about 5 min

Macaroni with tomatoes makes a nutritious dish. Boil 4 oz. macaroni and make a tomato purée by rubbing a tin of tomatoes through a sieve. Iet it boil up with a tablespoonful of butter melted with the same quantity of flour and seasoning. Add the macaroni and boil it up. The macaroni and tomato can be put in a greased pie-dish with breadcrumbs and lumps of butter on the top, and placed in the oven for about a quarter of an hour

Macaroni also combines well with fish. Have ready any boiled white fish and flake it, removing all bones and skin. Boil the macaroni, using about $\frac{\mathrm{lb}}{\mathrm{lb}}$ macaroni to 1 lb . fish. Grease a pie-dish and place in it first a layer of tish then a layer of macamonif continuing these layers until the diah is full. Seasoning should be sprinkled over each layer. Add a aprinkling of grated oheesc and
breadcrumbs on the top, and a few lumps of butter and bake it for about 20 min

Another appetizing dish consists of boiled macaroni and kidney. Split and skin threc sheep's kidneys, and fry them in 1 oz. smoking hot butter; then lift them out, and in the same fat lightly fry a tablespoonful of chopped


Lggodium. Foliage of a climbing fern which is effective for training up a pillar
onion. Stir in 1 oz. Hour, and when the mixture is deep brown add the water in which the macaroni was cooked. Stir the whole until it boils and forms a smooth sauce; then strain it into a saucepan and add the macaroni and the kidncys cut into quarters. Season and simmer for 10 min , then serve on a hot dish.

Macaroni cooked according to Italian methods may be prepared from $\frac{1}{2} \mathrm{lb}$. macaroni, 4 oz grated cheese, $\frac{1}{d}$ pint tomato pulp, 1 oz. butter, and seasoning to taste. Break the macaroni into 2 in . lengths, put these into a saucepan of rapidly boiling salted water and boil $30-45 \mathrm{~min}$. Strain off the water, and add to the macaroni the sieved fresh or tinned tomato pulp, and a little seasoning.

Cover the pan and atir its contents over a low fire until the macaroni has absorbed suffioient tomato pulp to render the mixture thick and oreamy. Add two-thirds of the cheese and butter and turn the mixture into a greased fireproof dish. Shake the remainder of the cheese over the top, and place here and there amall pieces of butter. Bake the whole until the top is lightly browned, and then serve it with bread and butter.

A good cold sweet in which macaroni is an important ingredient is made by placing in a deep glass bowl alternate layers of stewed fruit and juice and cooked macaroni cut into short lengths. About two breakfastcupfuls fruit and 4 oz . inacaroni will be required Let the last layer be of macaroni, and over this pour $\frac{1}{2}$ pint of custard. sweetened and thavoured to taste. Decorate with glacé cherries.

Macaroni Cheese. A popular way of cooking macaroni for a savoury dish is to make macaroni cheese, or macaroni au gratin. For a dish to serve 4 people, boil 4 oz macaroni till tender, and break it into small pieces after draining well. Melt 2 oz butter and stir in a tablespoonful of flour. Add a pint of milk and bring to the boil, stirring all the time. Add 4 oz. grated cheese and stir until it becomes soft. Season well, and stir in a teaspoonful of made mustard. Grease a pie-dish and place the macaroni in it. Pour the oheese mixture over it and sprinkle the top with breadorumbs, grated cheese, and two or threc lumps of butter Bake in a quick oven until brown, and serve very hot.

Macaroni Pudding. To make a baked macaroni pudding, boil until tender l oz macaroni in a pint of boiling milk. Then draw the saucepan to the side of the fire and add 2 well-beaten eggs, sugar to taste, and any desired flyvouring. Stir over gentle heat for a few minutes, then put the mixture in a greased dish and bake for about $\downarrow$ hour in a slow oven
MACAROON. The almond-flavoured biscuit known as a macaroon is madu by mixing $\frac{1}{2} \mathrm{lb}$. ground almonds with 1 oz rice Hour and 10 oz. castor augar, and adding the whisked whites of 5 egge and a few drops of Havouring Sprend the mixture evenly on wafer papers, using about one dessertapoonful for each macaroon. Blanch $\underset{1}{ } \mathrm{oz}$ of sweet Valencia almonds, split each into four, putting a piece in the centre of each macaroon after brushing the latter over with water. Bake the biscuits in a moderately hot oven for about 20 min .

Macaroon Jelly. A pint packet of red jelly, some macaroon biscuits and fruit are the chief ingredients required for this swect. Arrange 8 medium-sized biscuits in the bottom of a glass or silver dish with a few small pieces of tinned pineapple and a banana split into 6 Dissolve the jelly in a pint of hot water, pour this over and leave the whole to set. Whisk the white of an egg to a stiff froth, and mix it with a gill of whisked cream, adding a dessertapoonful of castor sugar. Shake this on top of the jelly and in the centre place glace cherries and a few pieres of pistachio nut.

Macaroon Tart. Line tartlet tins with short pastry. In the bottom of each tart put a teaspoonful of jam, cover it with the macaroon mixture, as given for making macaroon biscuits, and hrush over the top with cold water. Cut some small thin strips of pastry, place two across each tart, anil bake the latter in a hot oven for 15 or 20 min . See Pastry.


Macaroon Tarts, a popular pastry for Sunday supper
MACARTNEY ROSE. This vigorous, almost evergreen, rose (Rosa bracteata) was introduced from China by Lord Macartney. The Macartney rose bears large single white flowers and is suitable only for planting against a sunny wall.

MACASSAR OIL. A good hair-dressing of this type can be made as follows: Reduce 1 oz. alkanet root to a coarse powder, in an iron mortar, and pour upon it 1 pint pure olive oil. Warm the oil. stir it occasionally, and, after an hour, strain it through fine muslin. When the oil, now coloured red, is cold, add the perfume, which is made in the following way : lemon oil, 15 drops; cinnamon oil, 10 drops; clove oil, 10 drops; and geranium oil, 2 drops.

MACE. Similar in its propertics to nutmeg, mace is a highly aromatic condiment that is procured from the membrane surrounding the shell of the nutmeg. It is prepared by aeparating it from the nutmeg as soon as the latter is ripe, and is dried by the sun and pounded to powder. Mace is chiefly employed in the flavouring of наvouries. Sce Nutmeg.

MACEDOINE. This term denotes a mixture of vegetahles or fruit, usually cut into dice or small pieces. Macedoine of vegetables, which is sometimes used to garnish meat, can be bought or made at home from carrot and turnip cut into dice, fresh or bottled green peas, French beans cut into short lengths. All these must be cooked before being cut up, and then re-heated together in a little butter, and seasoned to taste. If a cold dish is being prepared, they may be mixed with mayonnaise instead of butter.

Macedoine of Iruit consists ol grapes, tinned pears, apricots, pineapple, etc., cut into amall pieces, and set between layers of jelly. See Jelly.

MACKEREL : How to Cook. This fish should never be eaten unless absolutely fresh; it is in scason from June to August. When fresh, the fish is a beautiful bright colour, the flesh is firm, the eyes clear, and the tail stiff and unbending. It can be cooked in a variety of ways, and the roe should be served with the fish or added to the sauce.

Baking is a favourite method of cooking. Use two good-sized mackerel and olean them, removing the heads and roe. Boil the roes in salted water, then chop them, mixing in a tablespoonful of chopped parsley, a sprinkling of thyme, and pepper and salt. Add half teacupful breadcrumbs and bind all together with a beaten egg. Split the mackerel and stuff with the preparation. Brush the fish with olive oil or melted butter, cover it with breadcrumbs and bake it until it is nicely browned. Serve with anchovy sance.

To broil mackerel, clean and wipe the fish and split it down the back Wipe a little olive oil over the fish, and smear the bars of the gridiron with suct. Rub over the back of the mackerel a little chopped parsley mixed with a nut of butter. Broil slowly over gentle heat for about 20 to 30 min Serve with fennel sauce.
To fry mackerel, prepare the fish as for broiling, sprinkle it with Hour and fry it in butter, over gentle hieat, until nicely browned on both sides. Serve with anchovy or bechamel sauce, or with parsley butter. It can be fried in fillets; these should be dipped in egg and hreadcrumbs befure being fried
Soused Mackerel. Prepare four mackerel by cleaning them and splitting them through the midille and removing the backbone. Cut each fillet into three or four pieces. Season with salt and place in a fireproof dish with 12 poppercorns, 2 bry leaves, 1 blade mace, 2 cloves, and 1 teaspoonful salt. Cover with equal quantities of vinegar and water. Cover the dish, bake slowly for $1 \frac{1}{2}$ hours and serve cold in the vinegar.

Preserving Mackerel. Mackerel can be preserved in districts where there is a glut of fresh fish in the following way: Clcan the fish thoroughly and either fry or boil it. Divide the fish, removing the heads, bones, and skin. Rub over the Hesh with the following mixture For each dozen fish use 3 tablespoonfuls salt, $1 \frac{1}{2}$ oz black pepper, 6 or 8 cloves, a sprinkling of mace and of nutmeg. Cover the whole surface of the fish with the seasoning, and pack the fish in layers in a stone jar. Cover all over with good vinegar, and, if it is wished to keep the fish for some time before being used, pour salad oil or melted suet over the top of the jar. Do not use a glazed jar, as vinegar acta on this in an injurious manner See Fish; Sauce.

MACKINTOSH. A mackintosh may be washed by first soaking it in cold water, spreading it on a inble, and then scrubbing it with houschold soap Rinse the mackintosh by dipping it in a tub of cold water, shake, but do not wring it, and let it dry on a coat-hanget either out of doors or near an open window.

Mackintosh aprons, provided with a shiny white rubberized surface, which can be easily kept clean with a damp cloth, are worn by mothers when bathing babies; and it is usual to make up the cot of a small child with a mackintosh sheet immediately under the blanket as a protection to the mattress. See Baby; Rubber.

MACRAME WORK. One of the oldest forms of lace-making is that known as macramé. Macramé twine, a varicty of linen thread, is specially made for this work, which is done on a cushion or board. Some workers use a shallow box, measuring about 20 in . long by 10 in . wide. In this must first be placed heavy leaden weights, then a bag made of unbleached calico, and covered with colnured sateen. The bag is stuffed tightly with bran, and fits firmly and tightly into the box, reaching a little above it. Macramé frames may be purchased, but the box makes a good substitute. It is also possible to use a smooth piece of hoard, about a yard long and $8-10 \mathrm{in}$. wide, and fit it at each end with small, strong screws to hold the thread.

A few glass-headed toilet pins are sometimes used to keep the thread in position, and a large crochet hook to pull the threads under each other. If fine twine is used, all foundation threads should be double. Fasten the first cord lengthways across the board or frame by tying it round the screws or pegs.

To put stitches on, fold together the two ends of a length of twino, pass them up and under the first foundation cord, bring the ends down over it and through the loop thus formed. Draw then down lightly, and fasten as many in this manner as are needed for the length of work: then put another foundation cord just below where the threads are fastened on to the first one. Knot them on to this by taking the first thread in the right hand, passing it over and under the second foundation cord, and through the loop formed. Draw it up tightly, and do this to all before commencing the pattern

The single-knotted bar, one of the simplest patterns, is worked thus. Having got the threads knotted on the foundation cords, hold the first thread in the left hand atraight clown, take the second thread in the right hand, and pass it over the first one, under and up through the loop thus made. Then hold the second thread in the right hand, and work the same stitch with the left hand (first thread). Repent this alternately for the length required, drawing each stitch up tightly as it is made.

Macramé twine in bright colours can also be knitted or crocheted into various articles, such as shopping bags or table mats. See Crochet.

MADAPOLAM. A plain cotton fabric generally sold in the bleached state, madapolam is heavier than cambric and finer than long-cloth, being made from line-spun and good cotton

MADEIRA : The Wine. It is said of madeita that it can never be drunk too old. It is a rich and generouso wine with nutty aromn, owing its excellence to the climate of the island of Madeira, as well as to the black and white grapes from which it is made. It contains from 16 to 20 per cent of alcoliol.

Madeira is served with soup, especially turtle soup, and with fish, and may be drunk instead of port as a dessert or after-dinner wine in hot weather. The hest sweet variety is Malvoisie. White Sercial is dry, and a richer sort is Bual Madeira. See Winc.

MADEIRA CAKE. Madeira cake is made from $\frac{1}{2} \mathrm{lb}$. butter, 10 oz . castor sugar, 1 lb . Hour, (i eggs, a fow drops of lemon essence, a thin slice of citron peel, and a pinch of salt. Cream tho butter and sugar ; then add the Hour and eggs alternately, beating thoroughly after each addition. Mix in the salt and lemon
essence, and beat well for a few minutes, afterwards pouring the mixture into a wellpapered and greased tin. Bake in a moderate oven for $1 \frac{1}{2}$ to 2 hours and, when half-oooked. place the peel on top.

MADEIRA VINE. An attractive half. hardy climbing plant, the Madeira vine beary fragrant llowers during autumn, and reaches a height of about 8 ft . It is most suitable for greenliouse culture, but will grow on a south wall outdoors during a warm summer. The plants are raised from tubers planted in a temperature of $55^{\circ}$ during February.

MADELINE CAKE. Small fancy cakes conted with jam and desiccated coconut are made thus: Sicve together $\& \mathrm{lb}$. Hour and $\frac{1}{2}$ teaspoonful baking powder, and beat $2 \frac{1}{2} \mathrm{Oz}$ margarine or butter to a oream with


Madaline Cakes, coated with jam and coconut, a popular cake with children
the weight of 2 eggs in sugar. To the latter mixture add 2 egga, beating each in separ. ntely for about 10 min . : then fold in the flour and add a little milk. Stir the misture lightly and put it into some greased tin moulds similar in shape to small Hower-pots Bake the cakes in a bot oven for about 12 or 15 min ., until they are lightly browned and spongy to the touch, and leave them to cool un a sieve. Heat about 4 tablespoonfula jam, thinning it down with a little water if necessary, and then rubbing it through a sieve. Brush it over the tops and sides of the cakes, and cont the sides with coconut. The top can be decorated with lialf a glacé cherry.

MADONNA LILY Onc of the uldest and loveliest of lilies (Lilium candidum), this has been cultivated in British gardens for more than 30() years Tho fragrant white llowers on stems 3-4 ft. high open in June. See illus. p. 723.

Madwort. This is another name for the perennial yellow alyssum (q.v.)

Magdyno. See Magneto.
MAGGOT. The larvae or naggots of various Hies do much damage to garden plants and crops, e.g. onion, chirysanthemum, carrot, pea. carnation, marguerite, and cineraria The best preventive treatment is to spray the plants with an evil-smelling insecticide such as paraffin emulaion for the puryose of keeping away the flies.

MAGIC HUNDRED. This puzzle oonsists in arranging the numbers from 1 to 100 in ten rows in such a fashion that the total of the numbers counted in any one of three ways, horizontally, vestically, or dingonally, shall be exactly ro 5 .
The principles upon which the solution is based are fairly easy to remember if the rows are numbered. The horizontal rows sliould he numbered 1 to 5 from both top and bottom. The rows numbered 1 contain the numbers between 1 and 10 and bitween 91 and 100 ; the rows numbered 2 contain the numbers between 11 and 20 and between 81 and 90 ; the rows numbered 3 contain those between 21 and 30 and between 71 and 80 ; the two
rows 4 contain those between 31 and 39 and hetween 60 and 70, except 61 , which is compensated for by the presence of 41 . The rows marked 5 contain the numbers between 42 and 59, and also 40 and 61 .

The vertical rows may he lettered $A, B$, (: D, E from each end. In this case it will lic seen that the unit figures in the $A^{\prime}$ 's are noughts and ones; in the B's they are twos and nines; in the C's they are threes and eights; in the D's they are fours and sevens, and in the F.'s they are lives and sixes. To solve the puzzle the figures should be arranged as shown, and when added up in any direction the result will be 505 .

|  | A | B | C | D | E | E | D | C | B | A |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 01 | 2 | 3 | 97 | 6 | 95 | 94 | 8 | 9 | 100 | 1 |
| 2 | 20 | 82 | 83 | 17 | 16 | 15 | 14 | 88 | 89 | 81 | 2 |
| 3 | 21 | 72 | 73 | if | 2.5 | 26 | 27 | 78 | 78 | 30 | 3 |
| 4 | 60 | 39 | 38 | 64 | 06 | 65 | 67 | 33 | 32 | +1 | 4 |
| 6 | 50 | 49 | 48 | 57 | 55 | 56 | 54 | 43 | 42 | 51 | 5 |
| 5 | 01 | 59 | 58 | 47 | 45 | 40 | 44 | 53 | [2 | 40 | 5 |
| 4 | 31 | 09 | 68 | 34 | 35 | 36 | 37 | 03 | 62 | 70 | 4 |
| 3 | 80 | 22 | 23 | 24 | 75 | 70 | 77 | 28 | 20 | 71 | 3 |
| 2 | 00 | 12 | 13 | 87 | 80 | 85 | 84 | 18 | 10 | 11 | 2 |
| 1 | 1 | 03 | 98 | 4 | 90 | 5 | 7 | 03 | 02 | 10 | 1 |

Two simpler puzzles of this class may be given. One is to arrange the numbers lo 9 in 3 rows so that the total of each row, added toget her in any one of the three possible ways, will he 15 . The solution is :


A further one is 10 arrange the numbers 1 to 36 in six rows so that the total of each possible row shall be 111 . The solution is :

| 8 | 30 | 27 | 10 | 25 | 11 |
| ---: | ---: | ---: | ---: | ---: | ---: |
| 35 | 6 | 33 | 34 | 1 | 2 |
| 17 | 13 | 22 | 21 | 24 | 14 |
| 20 | 10 | 16 | 15 | 18 | 23 |
| 5 | 31 | 4 | 3 | 36 | 32 |
| 20 | $1 \underline{3}$ | 9 | 28 | 7 | 29 |

MAGIC LANTERN. Isntern used tor throwing picture.s on a screen. There are both atandard and toy lanterns, but the principlea are the same in both. They are now better known as optical Innterns. See Iantern Slide; Optical Lantern.

MAGIC MUSIC. In this game one person leaves the room, whide the others hide a thimble or any other amall article. The absent player then returns, and his business is to find the article He is assisted by someone playing the piano. the music being very soft when he is far from the object and becoming louder and louder as he approaches it.

MAGNESIA. The oxide of magnesium, or magnesia, is used in trio forms, the light and the heavy, which are obtained respectively from the light and heavy carbonates of magnesium All these relieve acidity and act as laxatives, and may be administered in doses of 5 to 30 grains for repented administration and of 30 to 60 grains for a single

MAGNESIUM: In Medicine. The salts of magnesium are irequently used in medicine on account of their antacid and purgative qualities. Magnesium sulphate, or Epsom salt, is a reliable saline purgative. White mixture is a useful laxative. It consists of magnesium sulphate, 3 drams; mag. nesium carbonate, $1 \frac{1}{2}$ drams; and peppermint water, 6 oz The dose is $\frac{k}{2}$ to 2 oz .

MAGNESIUM : In Photography. Mag. nesium, in ribbon or powder form, burns with a strong actinic light, and is largely used for indoor and other photographs when daylight is not available. Magnesium powder when mixed with potassium chlorate or perchlorate, or other combustible chemicals, is known as llash powiler. It should not be miade by the anateur, as some formulae give mix tures dangerous to prepare See Flashlight.

## MAGNETOS FOR MOTOR VEHICLES

## Constructional Principles of These Essential Parts of the Car

This article will be found useful by the owner of a motor car or a motor cycle. He should turn to those headings, as well as to Gear; Internal Combustion Engine; Lubrication, etc.

A diagrammatic drawing of a common type large number of turns of thin insulated wire, of magneto is given in Fig. 1, and shows the wound over the primary winding, one end of complete wiring from the armature to the sparking pluge. The return or earth circuit vis the sparking plugs is shown in dotted line. The cycle of opration is as follows: A represents the permanent stationary magnets to which are attached pole pieces, B. that are fitted so as to bring the magnetic field as close as possible to the armature $D$, thus intensifying the field of force. Rotating between these pole pieces is the armature $D$, which is constructed of an iron core, composed of a large number of thin plates tightly compressed. This is done in order to avoid waste current being generated in the core itself. On this core are wound the primary and-secondary coils.

The first, the primary, consists of a few turns of fairly thick insulated wire, one end of which goes to the fixed platinum point of the contact breaker, $E$, and is tappied for the condenser, $F$, and the short circuit or earth switch, G. its other end being earthed. When the earth switch is closed, the current llows through the primary windings across the earth switch back to earth. Therefore, although the contact breaker, F, will still be operating, it will no longer be interrupting, via the platinum points, the llow of the primary circuit. so that no high-tension current will be generated in the secondary winding that goes to the sparking plugs.

The second of these coils, the secondary winding, is composed of a
the armature by means of a long screw The contact breaker carries the fixed platinum point. L, which is in contact with the end of the primary winding, and the movable platinum point, M, through the medium of which the earth or return circuit of the primary winding is closed This movable platinum pnint is operated by a bell-cranli lever, that liceps it in confact with the stationary platinum point. L. by means of a Hat steel spring At the end of the bell crank is inserted a hard fibre block that makes contact with the cums which are on the inside of the cover, $N$, that surmunds the contact braker The action of these cams against the tibe bluck of the bell-crank causes tho platinum points to separate, thereby breaking down the primary circuit and causing the secondary current to be induced Mounted on the back of the contact breaker is a small spring-fed carbon brush that makes contact with the body of the magneto and completes the carth of return circuit of the primary winding via the platinum points. Fig. 2 shows the construction of the contact braker
The armature cuts the field of force twice during one complete revolution. Therefore two high-tension currents will be induced, and for this reason two cams are provided on the contact cover cam ring, and are so arranged that the primary circuit is broken at the monent when the armature is approximately at right angles to the field of force, in which position the maximum intensity of induced current is produced in the secondary winding.

The functioning of the condenser is as fol lows: When the platinum points of the contact breaker separate, the collapse of the primary circuit has the unfortunate effect of inducing a follow on current in the primary winding. but by interposing the condenser in the circuit, as shown in lig 1, this current is arrested Instead of Howing on and leaping the platinum points it takes the easier path into the condenser, and charges up the opposite plates with static electricity, which when fully charged discharge in opposite directions. thereby damping out the follow on current in the primary circuit, and causing the cessential immiediate collapse of the field of force.

Other Systems. Another type of magneto is eniployed, in which the primary and secon dary windings are atationary, the permanent magnet with its pole pieces being the revolving part. A magneto of this kind is shown at Fig. 3.

In the inductor magnoto there arc rotating inductors of aoft imn, and fixed magnets and windings. The magnetic Hux through the core is reversed as the inductors revolve

The Distributor. In the case of magnetos to be employed for engines of 4 or more cylinders it is customary to include a high-tension distributor as part of the unit: this is usualiy mounted at the contact breaker end.


Magneto. Fig. 1. Diggrammatic lay-out of the wiring of the common type high-tension magneto for a

and driven by a gear whee that is a part of the arma ture As the armature gives two high-tension currents per revolution. there will be twice the number of teeth on the distributor gear wheel. For $n 4$-cylinder engine the armature makes two complete revolutions (t) fire the charge in all 4 cylinders, and as the 4 high tension tead go to the one completc revolution during the period. difficulty will be experienced when starting The distributer ueualls congists of a fibro ring into which 4 bronze segments are embedded. Rotating in the centre is the hightension brush driven by engaging a pinion on the gear wheel on the armature. Mounted at the back of the distributor is the spring-fed carbon brush that picks up the high-tension current from the slip-ring and presses it to the segments by way of the rotating carbon brush in the correct order of firing. In place of the brush, on some magnetos a small gap is provided at corresponding points.
With magnetos designed for use on single and twin-cylinder $V$-machines, the high. tension distributor, as described, is dispensed with, and the current taken direct from the slip-ring. The only difference is that for the twin-cylinder engine the slip-ring is formed with two insulated segments, so that the spark shall go to the correct cylinder in order of firing. In the case of the magneto intended for use on twin engines, the cylinders of which are set at an angle of about $50^{\circ}$, it may be noted that it is impossible for the spark to take place at the most efficient position of the
with the slip-ring while the
armature is rotated. If the
end of the carbon brush
is clogged with metal, or
burnt, it should be care-
fully rubbed down with a
piece of fine emery cloth
before being replaced. With
the contact breaker, the
platinum points should be
adjusted to separate by the
correct amount, which is
mm. or ols in ( ${ }^{\text {a }}$ in in.).
wide apart, considcrable
experienced when starting
hand
With a new magneto, the small fibre bushed-bearing, in which the steel pirot of the bellcrank lever works, may be come tight. It is usually only necossary to clean the pin with metal polish, but if that is insufficient finc emery cloth may be used with care. It is inadvisable to enlarge the bush. The pin should be slightly moistened with thin oil before reassembly. At the back of the contact breaker will be found the small carbon brush that carries the earth return of the primary circuit. This should be occasionally treated in the same way as described for the slip-ring carbon brush. All carbon brushes will at intervals require the same treatment.

The magneto is a very powerful electrical machine, its power increasing in proportion to the speed of the armature. Perfect cleanliness of all its parts is absolutely essential if it is to remain in good order for long periods. Care should be taken to see that the wiring is in good order and not slack at the terminals. This applies in particular to the switch terminal on the contact breaker cover. It is not an uncom mon occurrence for one of the fine strands of wire that go to form the complete cable to come adrift and make contact with the metal of the cover, thereby shorting the primary circuit. In all cases of a failure of the high-tension circuit, it is as well to examine very carefully the wiring. as well as the switch itself, before looking to the more com. plicated details of the system.

When replacing the contact breaker, see that the small key that locates this part with the armature is entered into the slot provided to receive it. Also, when oiling at the parts marked be careful not to overdo it, as oil may get on to the armature and damage the insulation.

The Magdyno. On motor cycles a machine is sometimes used which combines in one unit a magneto to energize the sparking plugs and a
dynamo to charge a smali accumulator for lighting. The current output is usually 6 volts, at 5 amps. Since, owing to limitations of space and weight, the accumulator is small in capacity, the dynamo is kept on charge when lights are in use. There is a single drive from the engine, the dynamo being geared up from the magneto spindle Fig. 4. shows a Lucas motor-cycle magdyno.

MAGNOLIA. The magnolia is a group of evergreen and leaf-losing shrubs or amall trees of great beauty. Most of them are suitable for general planting out of doors; others need the shelter of a wall. They thrive best in loamy soil with which peat or leaf-mould has been mixed. Small trees should be planted in carly autumn, as large ones are difficult to transplant successfully. They need no pruning except that which is necessary to keep the trees shapely and well balanced.

Magnolia stellata torms a bush 4 ft . or more high and bears small white flowers in March-April. Other kinds form trees 15 to 30 ft . high and bear large cup-shaped Howers. A few of the best are conspicua (the Yulan), white, April. obovata and soulangeana, reddish, April, and parviflora, white, May. All these lose their leaves in winter. Magnolia grandiflora is a vigorous evergreen with large

armature, l.e. when
it is at right angles to the field of force. The reason for thie is that $50^{\circ}$ cannot be equally divided into $360^{\circ}$.

Care of Parts. Magneto construction of the present day is so extremely specialized that it is seldom that any derangement occurs. There are two parts that should receive periodical atten. tion, namely, the slip-ring and the contact breaker. The slip-ring should be occasionally cleaned with a little petrol and a rag, placed over the end of a piece of wood, and held in contact


Magneto. Fig. 8 (above). M.L. magneto with rotating magnot and frod primary and scoondary rrindings. Fig. \& (below). Luose motor oyde magdyno, wita smal eab anoh functing up from the magneto spindle


Magnolia Large fragrant cream-white towers of maggolia (stollata), Which booms in Maroh-April
handsome leaves and in summer bears immense cream-white fragrant flowers; it must be planted against a sunny wall.

MAGPIE. Magpies are occasionally kept as pets. They need large cages and can be easily taught, so that they will go freely about the house, but they are very prone to theft. They can be fed on scraps from the table, bits of meat, raw or cooked, and ground oats. In the wild state magpies are of some assistance to the gardener, as they feed on worms, insects and snails. See Bird Cage.

MAGPIE MOTR. The caterpillars of this common moth, which is white with black and yellow spots, often do serious damage to gooseberry and currant bushes in carly summer. Many of the caterpillars, which are marked with black and yellow, can be dc. stroyed by shaking the bushes vigorously to cause the pests to fall to the ground and then scattering lime on them. Hand picking is also advised before the caterpillars become numerous.

Poisonous washes, e.g. arsenate of lead. will destroy them, but they must not be used
within 3 or 4 weeks of gathering the fruits, which must be thoroughly washed. Great benefit often follows the use ort caustic sods. 2 oz . per gallon of water, in winter when the bushes are leafless, for the small caterpillars hibernate in crevices on the gooseberry and currant trees.

MAR-JONGG. The Chinese game known as mah-jongg is played with dominoes made of ivory and bamboo. There are usually four players at a table, each one acting for himself, as there are no partners. The dominoes, which number 136, are arranged in 3 suits, and there are 4 sets of each. One consists of 3 honours, red, white, and green ; another represents the four winds, north, south, east, and west. The third is more ela borate. consisting of 3 sets of 9 dominocs each. which are named characters, circles, and bamboos

The object of each player is to obtain the highest scoring hand, which is called mahjongg. Siequences of 3 cards of the same suit, or 3 of a kind and a pair make up a good hand, and extra points are scored for various combinations which may fall to a player's lot, these adding fresh interest to the game.

MAAOGANY. Besides its rich brown red colour, and the figuring of its grain, mahogany has other qualities which make it a good furniture wool. It dees not shrink or warp much, has very few knots, and seldom becomes worm-eaten; its colour darkens and improves with age, and it is obtainable in wide picces. Glue gets a good hold on it, and a high degree of polish is easily produced on its surface.

Two kinds are in common use. The best and most expensive is known as Spanish, which comes from the W. Indies, chiefly Cuba, and has a richer colour and better figure than Honduras mahogany or baywood. The latter is plainer, straighter in grain, and is softer and lighter, but is good material, and in the best work is often used instcad of pine. The best Spanish mahogany is mostly used as veneer.

Mahogany is employed for the interior fittings of houses and public buildings as well as for furniture. Handrails for staircases are often made of it, and so are counter tops and other shop and office fittings ; also the woodwork of cameras and instrument cases, and interior fittings of vehicles.
The colour frequently is darkened by the use of stain. A solution of bichromate of potash and water will darken it, if a little Vandyke brown or liquid ammonia is added. Oil alone may be used, or red oil may bo made by soaking alkanet root in linseed oil. See Furniture; Grain; Wood.

MAIDENEAIR FERN. The common maidenhair fern (Adiantum cuneatum) is a favourite greenhouse plant and may be grown in a room window during the summer months. It needs a minimum winter temperature of 50 degrees. Two of the best varieties of the maidenhair are gracillimum and Pacottii. The finest of all maidenhair ferns is Adiantum farleyense, a vigorous plant with large and beautiful fronds: it must be grown in a hothouse. Two-thirds loam, one-third peat and leaf-mould, with sand added freely, provide a suitable compost. Moist shady conditions are necessary. Adiantum pedatum, 18-24 inches, is hardy, and capillus veneris, 6-8 inches, can be grown out of doors in mild districts; they like shade, and peat and sand should be added to the soil.

MAIDEN PINK. This pretty low-growing pink (Dianthus deltoides) flourishes in sandy soil in s sunny rockery. The flowers are of carmine-rose shade ; those of the variety graniticus are more richly ooloured. This


Magpie Moth. Garden pest which aagpie woth. Gardon pest which mond cherse-cake known as maid of honour is made thus: Curdle $1 \frac{1}{2} \mathrm{pt}$. fresh milk by adding rennet powier as for a junket. A pinch of salt helps to separate curd from whey. Strain the curdled milk through a piece of fine muslin, and drain the curds well before rubbing them, with $\& \mathrm{lb}$. fresh butter, through a sieve. When this is done add the yolks of 2 eggs, heaten lightly to a froth, and also about a desecrtaponnful of brandy.

Blanch and chop finely $\frac{1}{2}$ oz. sweet almonds and 3 or 4 bitter ones, and add them with a little sugar and a sprinkling of powdered cinnamon or nutmeg. Lastly add the juice and grated rind of half a lemon. Line some patty-pans with puff pastry, fill them with the mixture, and, if desired, sprinkle with a few currants before baking them in a good hot oven. See Cheese Cake; Pastry.

MAINSPRING. The driving spring in the mechanism of a timepiece is the mainspring, which performs the same function in any other spring-driven moter, such as that for a gramophone. It is generally in the form of a thin, flat steel grij), hardened and tempered to give it resiliency, and is coiled up by means of the winding arbor into a close, tight spiral. It exerts its power in uncoiling, thus imparting motion to the main wheel. The spring when purehased is coiled up, and is surrounded by a metal band, which prevents it uncoiling until it is removed. This should not be done until the inner end of the spring has been attached to the winding spindle and the outer end to the cage, or part to be driven. Should the retaining ring or pin be removed before the spring is under proper control, it will fly out and probably do damage. The coils of the spring should be thoroughly lubricated. See Clock; Gramophone; Watch.

MAINIENANCE: In Law. When a married woman is obliged to apply, apart from her husband, for parish relief, the authorities may summon the husband before the justices, and the magistrates may make an order upon him to pay such sum weekly or otherwise towards the cost of the relief of his wife as shall be deemed to be proper. They may order that this money be paid to the guardians or to the wife or any other person for the wife's benefit. This should be carcfully dis-


Maidenhair Forn. The delicate fronds of this beantiful fern are much ased for mixing with cut flowess for buttonholes and vases
tinguished from alimony or from the kind of order made under a separation order when the magistrates decide that a husband and wife need not live with each other.

In the divorce court, if a decree has been madc at the instance of the wife for dissolution of the marriage, the court has the power to make an order upon the busband for the permanent maintenance of his wife. This may take the form of an order that he shall hand over some of his property to trustees, who are to apply the income for the wife's maintenance during the remainder of her life, or it pay have the form of an order that he shall pay so much a year to the lady. The court has no power to order the husband to pay a lump sum.
The provision ordered is usually a sufficient maintenance according to the rank and means of the partics. This does not mean a bare maintenance. The rule usually followed is that the husband shall allow such a suin as will make up his wife's income to one-third of the joint incomes of the parties. Thus, if the husband has $£ 1,000$ a year and the wife $£ 200$, the joint income being $£ 1,200$, the wife would be entitled to $£ 400$, i.e. $£ 200$ from the husband in addition to her own $£ 200$.

Although this is the ordinary practice, it is not invariable. Where it is possible the court will order security to be given for the pryment so that the husband cannot subsequently put his money out of her reach and so deprive her of what is her due.
At one time the view was taken that such orders for maintenance should be conditional on the wife remaining single and chaste ; but nowadays the court will not make any such order except in special casce, so that the allowance will be continued although the wife marries again or leads an inmoral life. Somctimes under special circumstances, when the wife is the guilty party and is divorced by the husband, the court will, as a condition of granting the divorce, order the husband to make provision for his wife; and in such cases a clause will generally be ordered to be inserted that the moncy shall only be paid so long as she remains single and chaste. See Divorce; Husband; Separation Urder; Wife.

Maisonette. Literally a small house, this word is often used as a synonym for a flat. See Flat.

MATMRE D'BOTTEL. This name is given to a method of preparing sauces and other dishes by heating them up with parsley and butter flavoured with lemon juice and seasoning. Maitre d'hôtel saucc is a white sauce, made with stock instead of milk, containing chopped puraley and lemon juice. Vegetables re-hcated in butter and (lear soulp) or stock to cover, and then flavoured with chopped parsley and lemon juice, are given the name of maitre d'hôtel. Chives or finely chopped spring onions are often added as a garnish. Haricot or butter beans or a mixture of green peas and carrots cut into smallcubes arc excellent re-heated in this way.
MAIZE. This is un alternative name for the genus of fineleavel grasses known as Indian corn. It is made into meal, which can be cooked in various ways.

Maizo Meal. This meal is made from the ripe grains of maize or Indian corn, finely ground. It is useful for thicisening soups, in
the place of flour, and for making porridge, ceramics, comprises tho output of severia bread, calics, puddinge, etc As it docs not ennous italian fabriqucs, notably in Urum keep very well, it is advisable not to buy more than will be used at once. It will soon go bad if kept in a damp place.

Maize porridge is made by sprinkling the meal into boiling water or milk. flavoured with a little salt, and atirring it for about 10 min., until it thickens Then add a small picce of hutter and serve it hot with milk and sugar. jam or golden syrup.

Maize meal can he used for bread making. using half white llour and half maize meal Caraway seeds are usually adderl.

Buns are made from 4 oz . maize flour, 1 tablespoonful golden syrup, $\frac{1}{2}$ teaspoonful baking-powder, 1 oz dripping or margarine. Mix the dry ingredients and rub in the fat Make a hole in the centre of the flour and add the syrup. Mix it to a stiff paste with a little milk and put it into a greased tin Add a. few raisins or currants, if desired. and bake the buns in a hot oven

The ingredients for $\Omega$ pudding consist of $\ddagger$ oz inaize llour, 2 oz flonr, 2 oz . suct. 1 egg , | oz. sugar, 2 oz dates Mix the flours shred and chop the suet, stone and cut up the dates. Add these to the flours with the sugar and a pinch of salt. Beat the egg and mix this in Use a little mill: in addition, if neccssary, to make the inixture into a soft paste, and put it into a greased basin and steam it for $1 \frac{1}{2}$ hours

Two favourite American dishes made from maize meal are Johnny cake and jolly boys A verv good Johnny cake can be made from the following recipe: Mix together 1 teacupful maize meal and 1 teacupful Hour with 3 oz sugar and a teaspoonful baking powder, also a good pinch of sult. Beat an egg with 1 gill milk, melt 1 oz . butter and stir it to the egg, and milk. Pour the liquid on to the meal and heat as for hatter Turn it into a shallow tin and bake it from 30-40 min

To make jolly boys, first scald $\frac{1}{2}$ pint meal. Cream $\& 1 \mathrm{lb}$. hutter with 6 oz. castor sugar; add 3 well-beaten eggs, then $\frac{1}{2}$ pint milk which has been scalded and cooled. Cream 107. veast; mix the liquirl to it by degrees and then make up into a dough, cover it over, let it rise till light and make it up into balls as for doughnuts, hut rather smaller. Fry these in deep fat and roll thens in sugar while hot. See Bread: Doug'anut; Indian Corn

MAJOLICA: The Ware. Somecxcellent reprorluctions of the majolica faience of medieval Italy, as well as original designs conceived in the sanne spirit, have been made at the Minton works since the middlc of the least century, and similar wares were introduced by W'edgwood. They are produced by different methods, the former being made of dark clays with an opaque enamel, while the latter con-


Majolica Ware. Pharmacy vase with Dortrait Agures. Faenza c. 1540 British Museum
sist of white bodies with transparent colnured glazes.

There is a large output of reproduc. tions of the early ware in Italy, in. cluding round and oval dishes, trenchers and shallow bowls, drug. jarsand ewers.

Genuine oldinajolica, the noblest production of European
lamous Italinn fabriques, notably in Urbinn and its vioinity, which were at their greatest during the 15 th and 16 th centuries. The most characteristio ware was tin-enamelled on dark clays, covered with painted designs, and lustred with metallic shcens. Some of the finest into nccount are the size of the hall or thentre and the brilliance of the stage lighting. If the performance is to be given in a theatre with footlights, lengths, sidelights, battons, toplights, and limelight, all natural shadows are llattened out, and it is essential in order that the oxpression should carry for the features of the players to be emphasized.

For this type of make-up greasc-paints are the best meclium to employ. They can he purchased in numbered sticks, with other requisites for make-up, at any thentrical costumier's and most large chemists' stores. The face should first lie cleansed with cold

tips over the whole face, care heing taken to come below the jawhone on to the neck, or a mask of naint will result. Then the colour is applied for the cheeks and lips, eyelrows, eyc-shading and lines or shadows for older or character make. ups; after that the face is powdered, and lastly the lashes are touched up. The grease-paint should be removed with cold cream or vaseline at the end of the performance, and the fince rubbed clean, after which it may lie lightly powdered.
Methods for Women. A straight make-up for women is obtained by using No $1 \frac{1}{2}$ greasepaint, palest flesh. colour, as a foundation (for a brunette a little No. 5 yellow may be worked in with No. 2), carmine 1 , or decper shade 2, smoothly rubbed into the checks,
oxamples were wrought in the silver-lustre at Deruta and the rubv-lust re at Guhbio. This style of pottery decoration was derived from the lustred faience of Monrish Spain, which in its turn was based upon the great lustre ware of Syria and l'ersia In the Italian ware the designs were usual!y bihlical or historica! scenes.

## MAKE-UP FOR AMATEUR ACTORS

Methods and Procasses Explained and Illustrated
Those readers who are interested in amateur acting should consule also the articles on Stage and Theatricals. See also Fancy Dress and Tablcaux Vivants

Amateur actors, to be successful, require as shown in Fig 1, using only a little colour in knowledge of malie-up. Perhaps the dabs until the desired effect is reached. The most important matters that must he taken sliape of the lips should be improved with the
cream, which is wiped off, and then the founda. tion paint of the desired colour is applied nnd smoothly worked in with the finger- lip-stick, emphasizing the how of the upper lip if necessary, and the evehrows earefully pencilled with a brown or black liner. Shading the eyes effectively requires a litile practice. A dark bluc line may he applied along the Inshes, and this line should be carefully blurred to sharle the lid. With n little more dark blue paint on the tip of the third finger shade under the cychrow to the cyelid, bringing the colour just beyond the outer corner of the cye, and bending it imperceptibly with the founda. tion Care is necessary or a hollow-eyed ap. pearance results. A line drawn for ahout $\frac{1}{2}$ in. with hluc or black liner licyond the outer corner of the cyo gives width. The alge of the lower lid should also he delicately shaded by using the paint on the finger-tip.

A pink powder for fair or yellow powder for dark complexions should be applied thiclily. If the cheeks appear too pale, a touch of dry rouge can lie adiled after powdering. The evebrows should he gently brushed free of powder
 grease-paint. Fig. 2. Melting black grease for lashes. Fig. 3. Applying the eye wig black with a fine camel-hair brush. Fig. 4. When fully made-up make-up for powder period costume with patches
and then the lashes must be treated with carmine 2 for colour and $n$ light shade of black grease cosmetic. A small quantity is powder. The adjustment of a inan's wig melted over a candle in a metal spoon (Fig. 2) and with $n$ fine camel-hair brush the liquid black is applied to the lashes, as shown in Fig. 3. For neck, arms and hands a theatrical wet-white may he applied with a sponge, rubhed in smoothly with the hand and afterwards powdered with white powder.
The effect of fragile age may be got by use of $1 \frac{1}{2}$, with $5 \frac{1}{2}$ predominating for the foundation, a little rose-pink grease paint worked into the cheek-bones, pale colour on the lips, light blue liner blended with a touch of lake liner to obtain a delicate purple for the shadows. Any finint indications of natural lines must be followed, and $n$ high light must be putahoveand below a line with the $1 \frac{1}{2}$, also worked with the finger-tip. The checks should be shadowed with the blue and lake below the cheek-bone and also the hollow emphasized in the inner corner of the cye below the brow and under the eye, very little colour being used to a void a patched appearance. The lashes should not be inade up with grease cosmetic after powdering, but just brushed with water-black.

White or grey wigs for period costumes require a fair maticup such as the first one given, and the same applies to a blonde or red wig. Hair should be tightly smoothed, or plaited round the head if long and the wig drawn on from the back after the makeup is completed (Figs. 4, 5). For gipsy make-up, 5 with $n$ little 9 (red brown) worked into it for foundation and 9 with carmine 3 for the checks should be used. Bule, n red-brown powder, can be applied to neck and arms for darli or sunburnt cffect.
Methods for Men. For a youthful make up for men 5 and 3 (dark flesh pink) should be used for foundation, with a touch of carmine 2 for colour; a rather older elfect is gained by the use of $5 \frac{1}{2}$ and 3 with 9 for colour. The shading round the eyes should be blended with dark blue and lake liners and the eyebrows touched up with brown or black. The lashes should be made up with water-hlack and not grease cosmetic, unless a very romantic costume is to be worn. Lines and shadows should be added for charncter make-ups, Fig. 6. Whiskers, moustache and heards can be bought ready-made at a wig-maker's. They should be adjusted to the face with spirit gum (Figs. 7, 8), and a hard effect of join is removed if crape hair of the same colour be used. A little of this should be pulled out and held near warnith to take out the crimp, and then put on with spirit gum to hide the edges. For a gipay, Mexican, etc., make-up, $5 \frac{1}{2}, 6$ (greyish brown), 8 (brown) should be used, with a touch of 9 for colour, and bole for neek and hands.

Men for make up with period white wigs should use $2 \frac{1}{2}$ with a little 5 for foundation,


Make-up for Men. Fir. 6 Cbaracter make-up; putting in the faisblag touches to the wrinkles before 7owdering. Figs. 7 and 8. Moustache and beard fired to the face with spirit gum. Fig. 9. Wir adjusted
correctiy on forebead and pulled on from sides. Fig. 10 . Join of wig band being hidden bs grease-pant

MALACCA. The malacea cane plant is Calamus, which can be grown in the hothouse in loann and leaf-mould, and attains an average height of from 6 ft to 10 ft . Propagation is by seeds or suckers The stems are split for caning purposes, though in Great Britain they rarely mature sufficiently for the purpose except under special treatment.

Malacca Canes. Although not so popular as formerly. a malncca cane is preferred by many on account of its distinctive appearance, strength. and durability. The cane or rattan from which it is cut is inported in bundles from the E. Indies, only the best canes being selected to be seasoned, cut, and polished. As the stick has no handle, all that is required to finish it is the silver or gold mount, and with ordinary care it will last n lifetime.
When the mahogany colour of $n$ malacea becomes dull after continued use an occasional polish will restore the lustre. For this purpose there is prohably nothing better than pure linseed oil applied with a rag and thoroughly rubbed in. Spirit varnish is nlso used If tlie silver mount works loose or becomes detached. a coment or paste for resetting it can be obtained (rqul most oilshops, or one can be made at hoone by melting and inixing together 6 oz. resin, 4 oz . pitch, and $\frac{1}{2} \mathrm{lb}$. bottle wax Attention should also be paid to the ferrule. See Walking Stick.
MALACHITE. A rich green stone in appearance very like marble, malachite usually has peculiar lines of light and dark shades of green. The stone is found mostly in Siberian and Australian copper mines. In Near Enstern countrics it is frequently used for decorating furniture. It is inlaid into taliles or employed for ornaments.

It is also used for making into cigarette boxes, snuff boxes, etc.. with silver gilt and gold mounts Large blocks of the stone are sometimes found which command high prices when cut into vases or other ornaments Mala. chite green is an oniline dye used for siilk, wool, jute and leather.
MALAGA. Onc of the wines of Spain is malaga. It comes from the province of $\mathbb{F}$ Andalusia, and is shipped from the port of Malaga. It is a hlend of new nnd old liquor and is one of the best swect wines which Spain produces. See Wine

MALAISE. As uscd by doctors, this word refers to the condition of languor and feverishness common in severe colds. influenza. etc. It is one of the premonitory signs of nearly all serious illnesses

MALARIA: Its Treatment. The direct cause of malaria or malarial fever is the bite of the anopheles mosquito, by which minute animal parasites enter the red corpuscles of the blood.

There are three stnges in malarin, known as the cold, the hot and the sweating stage At the early stage diagnosis is often difficult and the condition is lisble to be confused with pyaemia, typhoid, and other diseases. During the cold stage the patient is put to bed and kept thoroughly warm. In the bot stage the body should be sponged with tepid or cold water, an icobag is applied to the head and warm drinks given. In the sweating stage the patient must be guarded against draughts and chills.

Quinine may be giren at any stage. It is best to liegin with a dose of 10 to 15 gr . and follow this with 5 gr thrice daily, but larger
doses ate sometinses required For children cuquinine, which is tasteless. can be given.

Swamps, marshy ground and stagnant pools favour the breeding of mosquitoes, and for the prevention of malaria such spots should be drained. The larvae may be destroyed by pouring paraffin oil on the water, using 1 pint to 200 sq ft . The larvae should be deatroyed in collections of water round a dwelling house and all tubs and water barrels should be emptied every weck. Open windows may be protected with morquito net or fine wire netting, and berls surrounded with mosquito curtnins. Rooms can be cleared of mosquitses by burning pyrethrum powder therein.

Some protection from bites is obtained by mubhing the skin with oil of peppermint, cucalyptus. lavender, rosemary, pennyroyal. or a lution composed of 1 oz . of magnesium sulphate in 10 oz of water. Quinine taken daily may be a powerful prophylaotic, the protective dose, in the case of adults, heing 5 tn 10 gr daily.

MALCOLMIA. This is the botanical name of Virginian stock, a hardy annual which hlooms in about six weeks from sced sowing See Virginian Stock.


Male Fern, effective in a shady border
MALE FERN. This is a vigorous native fern (Nephrodium (Lastrea) filix-mas). Of it many beautiful named varieties have been raised, for instance, cristata, furcans, grandiceps and crispa, all of which have fronds of most graceful appearance. They will grow in any sliady corner if planted in a prepared horder of ordinary soil with which lenf-mould and thoroughly decayed manure have been mixed They should he liept moist in dry wreather. Autumn is the best time in which to plant the fern.

MALINES FOWL. Good alike for table and egg production, the Malines fowl porsesses a long, deep, hrond body and a well-devcloped breast, and when the cockercls are fatted they carry $n$ wealth of white ment of very firic quality.

The Malines is bred in five colours: black, white, blue, cuckoo, and ermine The black is solid and deep in oolour, but does not carro quite so much green sheen as some ather black fowls. The white is pure snowy white. The blue is somewhat like the slaty blue of the Andalusian; it is somewhat rare, and by some is much admired. The cuckoo is the most gencrally bred colour, and looks the most business-like member of the family. Its ground colour is bluc-grey, the feathers being crossed by bars of a inetallic blue-black abade; when exposed to the sun the colour takes on a brown-grey appearance due to sunburn.

The chicks when newly hatched are giey on the top and creamy on the under parts. The most beautiful of all the Malines is the ermine, which is marked like light Sussex fowls, the body colour being a pure snowy white with black in the tnil, wings and
 Chioken Poultry.

Malines Fowl. Prize-winning white pullet of this useful breed
MALINGERING. A hypochondrincal person may helieve with too grent readiness that he is suffering from some serious disease, and a craving for sympathy may be responsible for hysterical manifestations; but these conditions are quite different from malingering, which means feigning disease to secure anne personal adrintage, whether the avoidance of duty, the securing of a holiday, or the receipt of money as compensation for wickness. In most enses the application of appropriate tests provides evidence of malingering whioh is sufficiently convincing, at any rate for a medical man.
MALLET : Some Varieties. A mallet is n small hammer inade of wood. such as is used for driving wooden pegs into the ground and similar purposes. The word is also used for the implement with which players strike the ball in croquet ( $q$ v.)
The carpenter's mallet should he slightly rounded on all facea, and not square or Hat, ns in the case of a joiner's mallet. The handle should be about 13 in . long, and reduced in size at the neck. The handle is generalls. grasped about two-thirds of its length from the head, and, roughly speaking, the angle of the striking faces should be such that if two hattens were placed on the two striking faces of the mallet they would cross at some position near the elbow.
The tinman's mallet has a boxwood head about $2 \frac{1}{2}$ in. in dianmeter and is used for

knocking tin-plate into any required shajec A raw hide mullet has a head made of pieces of hide, coiled round to a diameter of a bout 2 in. and shout 4 in in length Ahole is drilled in the raw hide, and $n$ wooden handle inserted and pegged into place. The ends of the hide may be fastened, and in some onses are strengthened by a pieoe of metal. The mallet is used for sheet inetal work. The carver's mallet is circular in section and some what conical in shape, as in Fig. It is finished in this winy so that the carving tools can readily be strucli a blow in any desired direction, and the striking face of the mallet will be at right angles to the centre line of the Lool. If this were not the case the directional control of the carving tool would be difficult

A metal-bound mallet comprises an iron head, into which two tapered blocks of wood or hide are fitted A bossing inallet has a pear-shaped head and plain handle. The stretching mallet is very similar in general appearance : both are plumber's thols used in the shaping of shect and tube lead. The mason's mallet is very similar to the carver's, but larger and heavier and a little sliorter in the handle. A large circular, cast-iron mullet. known as a stob inallet. is sometimes liandy for rough work.
The method of using a carpenter's mallet is illustrated in Fig. 2, showing how the tonl is held. The worker should strive to strike a fair and square blow. When driving two pieces of work together, givg the whole face of the mallet a share in the work, as if the blow is struck with only one corner of the head this is likely to be split, and the worls is liable. to be very badly hruised. See Amatcur Carpentry: Mortise

MALLOW. The name is applied indisoriminately to many planta and shrubs, for instance, Jew's mallow (kerria), rose mallow (lavatera), and marsh mallow (Malva) See Lavatera; Malope ; Malva; Marah Mallow.

MALMAISON CARNATION. This type of carnation, which bears unusually large and liandsome blooms in early summer is now very little grown. It has been ousted by the perpetual carnation, which has a much longer flower. ing period. Those who wish to grow malmaisuns prefer the new perpetual flowering type, which needs the same treatment as the perpetual carnation (q.v.) Some of the best varieties are Boadicea, deep rose. Hon. Ciarlotte Knollys, red: Jcssie Allwood. yellow ; and Mrs. C H Raphacl, red.

MALMSEY. 'rhis strong, sweet liqueur wine is called by the Italians " manna to the anouth and balsain to the brain," It is made from grapes grown on the islands of the Aegean and the Ievant. See Wine.
MALOPE. Of this flower the only kind grown in gardens is Malope trifida, a showy liandy annual, 2 ft . high, which bears large orimson flowers in summer. Sceds are sown out of donrs in April where the plants are to bloom; the scedlings must be well thinned out to give thein room for development : they ought to be 9 or 10 in . apart.

MALT. By moistening barley and allow. ing it to germinate malt is obtained. In this process a ferment (diastase) in the grain converts some of the starch into malt-sugar and dextrin. The grain is then dried in a kiln and the germinating process stopped.

Malt is used in brewing and distilling, and in medicine. Powdered malt is mixed with
wheaten Hour to form infant fords. On the addition of hot water, or hot milk and water, the diastrase acts on the starch in the flour and converts it into maltose.

In making certain kinds of bread malt is employed, extract of malt being added in the proportion of 1 oz . to $3 \frac{1}{2} \mathrm{lb}$. of wholemeal flour.

Malt Extract. Liquid extracts of malt are prepared by making an infusion of malted barley and evaporating it in a low temperature until a syrupy fluid is obtained. This contains a large amount of sugar, often more than half its own weight, and is a valuable and readily digestible food.

Ground malt or malt extract mixed with wheat flour makes malted bread, the starch of which is partly changed into sugar. Dried as well as liquid malt extracts are obtainable. Mixed with arrowroot, gruel, porridge, and any kind of starchy food, they pre-digest it to some extent. They are therefore valuable in convalescence, dyspepsia, neurasthenia, tuberculosis, and whenever the digestion needs help. It must not be forgotten that their digestive action is destroyed when added to food at a high temperature. Malt extract. either alone or combined with cod-liver oil, often has a valuable tonic effect in wasting discases. The dose of the liquid extract of malt is 1 to 4 drams.

MALTESE DOG. The snowy little Maltese dog is animated, intelligent, very affectionate and good-tempered, cleanly in habit, and an expert in engaging little tricks. Hia


Maltese Dog. A champion of thia pare white, silly. coated breed of pet dog
constitution is delicate, and great care is needed in guarding him from chills. His pure white coat requires constant washing, and the long. silky hairs of which it is composed quickly get matted unless the comb is used frequently Drying after washing must be thoroughly carried out.

Much care is needed in the matter of diet. an excess of animal food producing eruptions, a deficiency causing eczema. His head is much like that of the Skye terrier. The short legs are straight and well feathered, and the feet round with black pads. The longer the coat the better, and the only markings are slight patches of lemon tint. The weight varies from 4 lb . to 10 lb ., but the less it is the more valuable is the dog. See Dog: Skye Terrier.

MALVA. The botanical name of mallow, a hardy flowering plant represented in gardens by the marsh mallow (sylvestris) and the musk mallow (moschata). They will thrive in poor soil and are perhaps better suited to the wild garden than the flower border. The most valuable is the musk mallow, $2 \frac{1}{2} \mathrm{ft}$., which bears rose-coloured flowers in summer: the white variety, alba, is very attractive.

MAMMILLARIA. This is a cactus of quaint, even bizarre, appearance which is easily managed if provided with the conditions suited to the cultivation of these plants -namely a sunny, airy greenhouse and a well.


Mammillaria. 8 mall greenhouse cactas, showing the great namber of apines
drained compost of loam, sand and powdered brick. They need little water and a minimum temperature of about $45^{\circ}$ in winter. Several species are in cultivation; a few of the best are barbata, rose-coloured flowers, biculor, purple, and dasyacantha, red; all are but a few inches high. Missouriensis, yellow, is the hardiest and in mild districts is sometimes grown on a well-drained sunny rockery.
MANCEIESTER TERRIER. Owing to its great popularity in Lancashire, the black and $\tan$ terrier (q.v.) is often referred to as the Manchester terrier. See log.

MANDOLINE : How to Play. There is more than one variety of mandoline, but the Neapolitan is most in favour and is here described. The mandoline consists of three main parts : a deeply convex body, having on the upper side a flat belly or sound-board in which is a round sound-hole, below which is the bridge; the neck. having a flat fingerboard fitted with 17 frets; and the head, which is slightly bent back from the fingerboard and holds the 8 pegs for the strings. These are carried from the pegs across the nut, and over the bridge to the tail-piece at the lower end of the instrument. The strings, 8 in number, are tuned in pairs, thus :


This, it will be seen, is identical with the tuning of the violin. The strings are usually of stoel. the two lowest pairs (D) and G) being wound round with fine wire. The compass is completely chromatic from the low G to the A three octaves and a note higher, though the highest five notes are not very useful. The 17 frets are necessary for the full compass, as
the fretting proccerds by wemitones. The table below will make this clear

As the tuning is like that of the violin, so also is the fingering: that is on the 4th string both A Hat (G sharp) and A natural will be produced by pressing the string behind the respective frets with the first finger, and $B$ Hat (A sharp) and $B$ natural by similarly using the second finger. In order to get higher notes beyond the reach of the little finger, the hand must be shifted down the neck. If on the 4th string the $B$ were played with the first finger. the hand is then said to be in the second position: if it played C, then it is in third position, and so on. The strings are plucked with a plectrum of horn, tortoiseshell, or some other material held in the fingers of the right hand.

Before beginning to play, the strings must be tuned. The standard is the second pair, which must be made to agree either with an $A$ tuning fork or with the $A$ on the pianoforte. The latter course is necessary if the piano and the mandoline are to be played together. Having done this, tune the 1) strings from it. and then the $G$ strings from the D , finally tuning the E strings from the A It is preferable not to tune each string to the piano. as on that instrument fifths are made a shade flat but to tune perfect fifths as violinists do. This needs a keen ear and a knowledge of the desired result, so it is well to listen to a properly tuned violin and try to memorize the sound of the perfect fifth between each adjacent pair of strings. An easy way of testing the correctness is to press the A strings behind the fifth fret, which will give D an octave above the third string. A further test is to use the seventh fret on the 1) strings. If the tuning is right. the result should then be in exact unison with the A strings.

The instrument should be held with the left hand round the neck, the fingers turned over the finger-board. The perfurmer holds it against him, the right forearm keeping it in position, while the right hand, holding the plectrum, plucks the strings just over the plate which is found on the sound-board below the sound-hole. The right wrist must be perfectly free in its action. Both down and up strukes are employed, indicated when necessary by A and V respectively.
Initial practice will be devoted to finding the open strings, using only the down stroke at first, but subsequently alternating up and down. When certainty has been attained in this, proceed to the study of fingering, for which the joints of the fingers must be squared and the tips firmly pressed upon the strings behind the proper fret. Early exercises should involve no shifting of the hand, which should be practised only when easy passages in the first, or normal, position can be played with fair facility.
As with all plucked instruments, the tone of the inandoline is evanescent ; consequently, when the effect of sustained sound is wanted, it has to be suggested, rather than actually produced, by means of the tremolo, which

consists in keeping the strings in cunstant vibration by means of rapid alternate strokes. For this an absolutely lissom wrist is essential. from the frequency of its employment, the tremolo may be regarded as a characteristic of the mandoline, and therefore it must be carefully practised.

'The tuning of the Milanese mandoline, or mandurina, is shown above.

The fingering differs entirely from that of the Noapolitan mandoline, but if the principles underlying the above explanation of the deapolitan mandoline have been clearly comprehended, anyone with aptitude and inclustry will soon be able to play the Milanese variety of the instrument.

MANDRAKE. This is a perennial herb of the genus Mandragora, which Hourishes in shady corners in loamy soil. Thic root is often forked, with a supposed resemblance to human limbs that formerly led to various superstitious beliefs being associated with the mandrake Officinalis bears blue flowers in May ; autumn alis, purple, blooms in September.

The supposed resemblance of mandrake root to the human body has given rise to a perfectly groundless belief in its efficacy in furthering conception. The root has medicinal properties, however, and has been used as a narcotic and hypnotic. It contains an alkaloid mandragorine, which acts similarly to atropine ; and poisoning by the drug is like that due to belladonna, and should receive treat ment on similar lines.

MANDRISL. The steel spindle in the head stock of a lathe is a mandrel, and the name is also given to a bar of steel provided with conical holes at either end. These holes are provided to enable the bar to be mounted upon centres in the lathe or other device, so that when the bar is revolved it will tum perfectly truly about these centres.

The bar is used to support an object to be turned in the lathe, which must have a holc through it of such a size that it will fit tightly on to the mandrel. Work so held can be machined all over, and it can be removed and replaced in the machine many times without fear of its being out of truth.

The Verschoyle patent mandrel is an inexpensive lathe for light wood and meta! turning, spinning, etc. It clamps on to the cdge of a bench or table and is thus very handy. for the home worker who has not a permanent workshop. This particular mandrel is described and illustrated in this work in the article Lathe. See C'andlestick

MANETII. This is the name of a stock, or root plant, upon which roses, chiefly of continental origin, are budded or grafted It is not as successful or popular in Great Britain as is the briar rose, which it resembles. See Grafting; Rose.

MANGE: In Dogs. This dog disease is caused by a parasite so small as to be invisiblc to the naked cye, and is transferable from one animal to another. The mite that produces mange is propagated by eggs, consequently cleanliness is one of the best ways of combating it. Dirt certainly harbours mangc, although it dues not produce it, and if they are undis. turbed the mites hatch and multiply with great rapidity.
Thore are two kinds of mange, follicular and sarcoptio. Follicular mange is almost in curable, the reason being that the parasitc. by burrowing into the hair follicles and sebaceous glands, is almost inaccessible. Thic disease
begins with a small circular pustular eruption, from which the hair falls, and it probably spreads all over the body the skin becoming corrugated and of a bluish colour. Thero is little itching. To treat a dog suffering from this form of inange, bathe with balsam of Peru and alcohol in equal parta, or cecolin and alcohol in equal parts. Some persons employ a 2 p.c. solution of formalin.

Sarcoptic, commonly called red mange, spreads rapidly, the parasites being on the surface, and the irritation is considerable Small red spots are first seen, from which unpleasant matter is exuded. These somn spread into big patohes l'owdered sulphur
with 8 parts of vegetable oil is recommended. applied very liberally for a week or 10 days at intervals of 3 or 4 days. The dog's bedding should immediately be burnt and his slecping box should be disinfected thoroughly brfore it is used again. See Dog.
MANGEL WURETSL. This cont emp is an excellent food for pigs and other animals, one reason being the large amount of sugar it contains. Mangels should not be given to animals until they have been stored for some months This should be done as early in the autumn as possible, and mangcls will usually be found to kcep in good condition, if required until the following midsummer. See Pig.

## Mangles: Their Care \& Repair

## Advice on an Important Feature ot Laundry Work

Other entries dealing with this essential branch of domestic work include lroning: Laundry;
Starch : Soap; Wringer See also Gear
A mangle is a machine for pressing clothes without a tall frame, but instead has clamps and linen. Large articles of a plain or coarse type, such as bed sheets and towels, are generally subjected to this treatment, which is in many cases merely a preliminary to or a substitute for ironing. The art of mangling consists mainly in laying out the clothes smoothly and arranging them so that those of equal substance shall come together. This will ensure an even, regular surface and an equally good pressing for all. Most articles are folded two or three times, and come out better than when arranged in single folds. This is because the thicker the substance the tighter the pressure of the rollers. Care must be taken, however, to see that too thick a substance cloes not result, otherwise the rollers may be badly strained.
The ordinary mangle consists of two heavy rollers, usually of hardwood, and made to rcvolve by means of a cog-wheel attached to one end of the lower roller, which engages a cog attached to the spindle of a whecl turned by hand.

The rollers and cogs are fixed to an upright frame, and pressure is applied to the rollers by a tension screw which levers against the top of the frame.

A table mangle, suitable for use in small familics and where space is limited, is made


Mangle. Electrically driven mangle, the motor ot which will ran for aboat two hours on one anit of electricity
Courtesll of Whittatier Bros (Aeerington). Lid
to fix it to a table or bench. The rollors measure approximately 16 in . by $3 \frac{1}{2} \mathrm{in}$., those of the standard type 21 in by 6 in. to 27 in . by 6 in Another model is fitted with a turn-over table; the back board is made inuch larger and without ledges, so that when the machine is not required for laundrywork the board rests flat on the machine and forms a useful wooden table 31 in. by 20 in . Wherc these table mangles are not in use, and a large mangle is considered unnecessary, wringing machines are often used as substitutes. Thesc. howcrer, do not press the clothes in the same way as a mangle.
Electric Machines. Special electric washing machines with mangle and wringer combined can be obtained. Their initial cost is rather high, but they afford a great economy of space and time. In some of thesc machines a wringer alone is found. In such it is intended to serve the purpose of a mangle, has rollers of the finest rubber, is reversible, and can be swung to any desired position.
The illustration shows an electrically driven mangle of a good type. By pressure on a pedal the driving pulley on the motor shaft is brought into contact with the Hywheel of the mangle, and thus drives the rollers. The motor will run for about two hours on one unit of electricity.
Important Points. When selecting a inangle, the following points should be noted. The cog-wheels or chain should be protected with a metal case, so that children cannot get their fingers caught. At least two whitewood shelves should he provided, the grooves for the lower one being in a sloping position, so that it can act as a drip board. The tension screw ought to produce even pressure along the length of the rollers.

The bottom roller gets greater wear, and for this reason is often made of lignum vitac. On no account must both lower and upper rollers be made of this or any other very hard wood, or the strain on the clothes would be too great, resulting in small holes, and, in extreme cases, when wet clothes have been passed through the machine unevenly, in straight cuts in the fabrics. When renewing rollers carc must be taken that the top roller is made of softer wood than the lower one.

Both rubber and wooden rollers are damaged, but chiefly the former, by wringing very hot clothes, as great heat perishes rubber. To clean rubber, washing is rarely successful: a rag moistened with turpentine is necessary to remove any soap curd and dirt which collect on rubber rollers. When not in use, the tension screw should be loosened so that no strain remains on the rollers.. It is tightened up according to the thickness of the material being passed through the rollers.
The mangle should be oiled regularly with thin machine oil; thick oil collects dust and
clogs the working parts. From time to time the working parts should be freed from all grease and dust: paraffin is a quick. cleanser if applied on a soft cloth. The metal framework ought to be washed from time to time with warm soapy water, then rinsed in clean water When the paint commences to chip or wear, the frame should be well rubbed down with fine glasspaper, and two coats of enamel applied. The exposure of bare ironwork may result in ironmould on the clothes.

When not in use a mangle whould be covered with a dust sheet to protect it from dust and grease. It should not be stored out of doors without some protection, and if $n$ small wonden shed or lean-to is not available, an old tarpaulin will serve.

Repairing a Mangle. After being in use for some years a mangle shows signs of wear principally in the rollers and other wooden parts. Metal parts may be replaced without difficulty if the machine is one of standard make. Of the two rollers, the bottom one wears hollow before the other, and it will pay to have them truad up once or even twice. but there is a limit to the amount a roller can be reduced in diameter without fitting new star wheels to allow for the diflerence

Unless the rollers have a stout cap or ferrule on the ends there is a tendency for the wood to crack and split. Rollers that have been kept in a dry place and not used for some time are very liable to crack: unless such openings are filled up the mangle will not give satisfactory results Small cracks may be made good with a waterproof wood-filler, worked in with a tine blade a nd carefully smoothed on top When set the surface should be smoothed with glasspaper that has been wrapped over a flat piece of wood
Newly turned surfaces should he protected with a varnish made by dissolving 2 oz. of white shellac and $\boldsymbol{2} \boldsymbol{\sigma z}$. of henzoin in suflicient methylated spirit to form a paste, and then adding 1 oz of heeswax which has been dissolved in a small quantity of turpentine. This should he applied with a pad while the roller is revolved

The wheels, heing made of cast iron, do not cost much, and it is not worth while to have new teeth litted. If one of the cogs should get broken off, the wheel must he removel, coated with blacklead on one side so that a rubbing may he made on a piece of paper of the exact shape, including the centre hole. The maker or ironmonger will then be able to supply a new wheel from the shape provided.

In the event of the wooden handle breaking or splitting. it. may be renewed by filing round the end of the iron mod and removing the washer; the new handle should he slipped in place and the end of the iron riveted over with a hammer. The drip board as well as the table is liahle to wear, and if the surface is good, the strengthening liattens on the ends may be replaced with new pieces. In renewing the strips use beech or sycamore.

When renewing the paintwork, the handle, guard and "heels should be taken off and the ironwork scrubhed with soda and hot water to remove grease and dirt. The framework, spring bow, handle of pressure screw. guard, bearing, fly-wheel and collar, with bolt heads. etc., should be painted in colour ; the outside of wheels should he coated with Brunswick black and screws and cog surfaces ccated with blacklead. In re placing the wheels, the keys should he driven in with a hammer and cold chisel.

MANHOLE. In building and other con structive work any aperture of sullicient size to permit of the passage of a man is known as a manhole. The term is also applied to amaller apertures, as, for example, those fitted to a kitchen hoiler. The manholes used to cover the oplenings provided in the sanitary sustem for the cleaning out of the drains usually comprise a framework of rectangular or other shape that is built into the brickwork. The cover or lid is provided with a lip which fits into a slot or groove nound the top edge of the frame. This groove should be filled with cart grease and sand, or some other composition, to render it airtight. In small work the covers are usually kept in place by their own weight and are lifted by means of grips. Sce 1)rains.
MANICURE. This name is given to the trentment of the hands, especially the finger nails. The set of implements and cosmetics used for this purpose can be bought separately from chemists, or completo in cases, differing in price according to size and qualit.v. They include usually-nail polish, a polisher, a small hottle of liquid bleach, cuticle cream, orange sticks, cmory board, some cotton wool, a file, and a pair of manicure acissors which have frequently short curved hlades. See Hand; Nails.
MANNA ASH. The manna or Howering ash is Fraxinus ornus, a handsome small tree, which bears white blooms in early summer. The popular name of manna ash arises from the use of the exuded sap as manna. It is quite hardy and may be grown in London and other gardens.
MANSARD ROOF. This is a style of roof two sections inclined at diflerent angles, or having two separate slopes. It is often undertaken on the scure of economy, as the bulk of the roof sjace may be used for rooms, and what would have heen the outer walls are huilt with roofing material. Another adrantage is that it reduces the height required with the steeply-pitched roof. The proportion between the slope of the lower and upper portions is important; a good outline is generally obtained by making the loirer slope

MANSARD ROOF. This is a style of roof ing mav be utilized. (iN) and the upper one $30^{\circ}$.

The example illustrated comprises a king post, roof truss,
 of hoaril may be edged with fialf-round hall or Jacobean beading, and, instead of the under button or clip, a pair of brass mirros' plates for nailing to the wall may be screwed on as in Fig. 6.

A good decorative effect mav le obtained hy a dentil pattern, as in Fig. $\overline{7}$; the dentils should he square in the front view and a bout half the front dimension in thickness. 'Ihey whould he glued on a strip ahout double the height of the dentils. A further method of securing mantelhoards is shown in Fig. 8. An ordinary wall holdfast, as in l゙ig. 9, should he driven in the wall with the eve uppermost and a screw driven into the board
MANTELPIECE. For almost all practical purposes the mantelpiece and the chimney picce are identical. Strictly speaking, however, the mantelpiece is only a portion of the chimney piece, for the latter enibraces the whole protective structure around the fireplace from fluor to ceiling, while the mantelpiece is only its lower part. Mantelpieces are niade commonly of wood, marble or iron. Iron ones can be standardized and turned out in thousands. The wooden ones are often beautifully carved, and both kinds are sometimes inlaid. Stonc and faience are also used for mantelpieces.

The mantelpiece which is not in itsclf satisfactorilydecorative should be painted or stained with due regard to the general colour scheme of the room. The wooden variety calls for no
special trentment, beyond taking care to olean the work before beginning to paint, and stopping any little holes or cracks that may be visible avith havel stopping.
The marble mantelpiece is very difficult to colour in a setisfactory manner. One method is to roughen the surface with sandpaper and use Hat colours; another is to apply special transparent stains; but these are not very durable. Cast-iron mantel pieces are amenable to treatment if they are well sandpapered hefore applying the first undercoating, after which they may be painted in the same way as woodwork. See Chimney Piece: Fireplace; Gas: Grate.

MANTILLA. Spain's national headdress may be white or bluck. The material is silk blonde lace, and though a great deal of this is machine-made, the best examples of the mantilla are hobbin-made, showing the heary floral lesign with finer filling lace stitches on a delioate net ground.

A mantilla is partly shaped and folded, so that when placed on the shoulders the straight piece may be drawn up and draped
over the high standing comb at the back of the head, and the shaped Hounce forms a graceful cape. Mantillas are sometimes worn as evening wraps See Lace.

MANTLE. In one of its senses a mantle is a form of cloak. In a nother sense a mantle is a piece of network, conical in shape, covered with some highly refractory material, that becomes luminous under a flame and is therefore used to add to the illuminating power of gas See Gas Mantle.

MANTLING. All the cloths used for women's outer coats are inclulled under this description. The variety ranges from soft, smooth woollen velours, blanket cloth, and showy tweeds to moiré silks, matelassés and imitation furs Mantle cloths are wind-proof in very different degrees, and for winter wear it is desirable not to choose too open a texture.

In buying mantling, regard should be paid to thie back as well as the face, hoth an to its appearance and as to its suitability for an unlined garment. Thick, solid oloths are not easy to cut out, and require tailor's skill and heavy ironing to look well.

## Manures for the Garden

## Natural and Artificial Fertilizers and their Uses

Detalled Information on the manuring of various plants will be found under the separate headings, e.g. Asparagus; Celery; Cucumber: Endive; Horseradish, ctc. Sec also Fertilizer:

Fruit: Garden: Hotbed: Kitchen Garden, etc.
Food or stimulant for trees and plants early summer. In the casp of heavy soils, grown in the garden consists either of the ordure of animals, farmyand manure as it is called, or of chemical or artificial fertilizers The three chief plant foods are nitrogen, phosphates and potash. Natural or farm. yard manure contains all three. A fourth substance, lime, is required, not so much, however, as a food for plants as on account of ita chemical astion on the soil.

Natural Manures. Natural manures and road sweepings found in or near towns are of little value, as they are usually impregnated with petrol and oil, and are therefore injurious. Spent hops, leaves and decayed green refuse are valuable manure substitutes. Among the best artificial manures, although it is really a natural prorluct, is guano. Dried blood, bnne manure and bone meal are also useful for various purposes.

A good chemical manure for general application consists of superphosphate of lime, 5 parts, and sulphate of ammonia, 2 parts; the mixture should be applied at 2 oz . per sq. yd. or diluted in water, 1 oz. per gallon.

Sulphate of ammonia and nitrate of sode are the two chief nitrogenous manures : they promote leaf growth and ure used at the rate of $1-2 \mathrm{oz}$. per eq. yd. of ground. Superphosphate of lime, basic slag, and bonemeal are phosphatic manures which help in the building up of stems and the development of flowers and fruits Basic slag should be applied in sutumn, 4-6 oz. per sq. yd. of land, the others in spring at 2 oz. per sq. yd Potash is present naturally in most soils, particularly in clavey ground, but it may lee supplemented by the use of sulphate of potnsh, 1-2 oz. per sq. yard in spring and


Manure 1. Liquid manure: a. solid manure in boz of pan; $b$, wooden rest: $c$ lid; $d$, water. 2. Soot water, bar of soot suspended from stick. 3. Open ground tank ; $a$, sunk tank; $b$, brickbats; $c$, straw; $d$, mannee; from rooi. 5. Manure stack. 6. Same with ank pail to collect draining liquid
on account of the nitrugen it contains, but it also improves the working qualities of the soil. If possible, it should always be stood in a dry shed for some time before use. When used for manure lime and soot should never be mixed, or the lime will drive off the ammonia in the soot. Six civt. of good soot is equivalent to a cwt. of sulphate of ammonia. Poultry manure should be stored in alternate layers with an equal bulk of dry roil in a convenient receptacle, or in a heap in a dry shed until it is nceded. It may be turned twice or three times, and, after such trentment, should be applied to all crops at the rate of from 4 to $\mathbf{6} \mathbf{~ o z}$. per sq. yd
Liquid Manure. Liquid manure can be made in the following ways: Take a peck of poultry manure, or a peck of sheep droppinge, and place this in a 40.gallon cask. Fill this with water, and after atanding 24 hours it should be ready for use. This makes an excellent manure for application to fruit, Hower, and vegetable crops during the growing season, the rate being 2 gallons to the sq. yd.

Lime. Lime is most valuable on heavy clayey soils. It may be applied either in autumn or early spring, ono bushel per three rods of ground, but it should not be put on at the same time as farmyard manure. It is best to do the digging and manuring in the autumn or early winter, and to apply the lime in the dry, slaked form about the beginning of March. Lime should be hoed or raked into the tup 3 in . of soil; not he dug in or buried deeply.
In Leaflet 320, from which much of this information is taken. the Ministry of Agriculture makes the following suggestions about manuring the various individual crops.

Manuring Potatoes and Cabbages. In the case of potatoes where the crop is grown on the flat, sulphate of ammonia should be applied on the surface just before the first
 l lb. per rod. Whare potatoes are planted in drills the sulphate of ammonia may be applied in the drills at the time of planting. Superphosphate of lime should be applied at the rate of It oz. per sc, yd. ( 3 lb . per rod), and may be forked in lightly before planting on the flat, or applied in the drill at time of planting. Superphosphate and steamed bone flour may lie mixed in equal proportions and applied, when planting, at the same rate.

All the members of the cabbage family respond to applications of nitrogenous manures. Sulphate of ammonia should be applied at the rate of $\frac{1}{2}-\frac{3}{3} \mathrm{oz}$. per sq. yd. ( $1-1 \frac{1}{2} \mathrm{lb}$ per rod) before the first earthing up, or as soon as growth starts. Superphosphate, or superphosphate and steamed bone Hour in equal proportions, should be used at the rate of 1 oz per aq. yl ( 2 lb . per mod) at the time of planting, or before the firat earthing up. In inland distriots, where allotment crops on light and medium soils are liablo to suffer from drought, salt is very helpful. It should be applied at the rate of 1 oz . per sq. yd.

Manuring Other Crops. Crops belonging to the pea and bean family can usually provide themselves with sufficient nitrogen. A mixture of superphosphate and steamed bone flour in erpual proportions should he applied to the ground before or after sowing the sced, at the rate of 1 oz . to 4 yd . in length of drill. The manure should never be sown in the hottom of the drill in direct contact with the seed. Basic slag may replace the superphosphate and steamed bone flour, and be sown at the rate of $\frac{\mathrm{l}}{\mathrm{l}} \mathrm{b}$. to 4 yd of drill.

For onions, leeks and celery, sulphate of ammonia should be applied at the rate of 1 oz. per sq. ycl. (l lb. per rod), with superphosphate and steamed bone four, mixed in equal proportions, at the rate of 1 oz . per sq yd. On light soils, liable to dry out, salt may be given with advantage (l oz per sq. yd.).

These crops should all he manured in the early stages of their growth.
For carrots, parsnips and beet, sulphate of ammonia should bo applied at the rate of $\$$ oz. per sq. yd. after singling. Superphosphate and stenmed bone flour, mixed at the rate of 1 oz. per sq. $y d$. , should be applied before sowing the seed. On dry soils, 1 oz. of salt per sq. yd. may be applied before drilling. Lettuce, spinach, and radishes are greatly helper by applications of sulphate of ammonia, which should be applied at the rate of $\frac{1}{2} \mathrm{oz}$. per $\mathrm{ar} . \mathrm{yd}$. in the early stagen of growth. Where radishes do not bulb readily, superphosphate, at the rate of 1 oz . per sq. yd., should be applied to the soil before sowing.
MANZANELLA. Made from n highly prized species of grape, manzanella is a fine sherry with a fragrant floral bouquet and an aromatic flavour. It is said to take its name from its similarity to a wine produced at a place called Manzanella, which is situated some 25 miles from Seville. It is a good beverage wine and goes with most table dishes See Sherry; Wine.

MAPLE. This is the common name of a jarge group of hardy trees and shrubs known botanically as acer: they thrive in ordinary well drained loamy soil. Of the trees the most familiar- are the sycamore (Acer pscudoplatanus), Norway maple (platanoides), the common maple (campestre) and the variegated box eldor (Negundo variegatum): the last named is a most decorative small tree with green and white leaves.
There are many beautiful varieties of the Japanese maple-shrubs which like a somewhat sheltered position: the young leavos are charmingly tinted in spring, and in some the autumn colouring is attractive. A few of the most beautiful of the Japanesc maples are roseo-marginatum, septemlobum elegans, Osakazulii and atropurpureum, which are varietics of Acer palmatuin: aureum and láciniatum are varieties of acer japonicum. These shrubs are slow growing. Maple sugar is mado from the sap of the tree.
Uses of the Wood. The wood of the inaple is light in colour, ranging from white to yellowish brown and grey. It is heavy, hard, tough, and fine-grained, with a lustrous surface, especially when cut radially through the centre of the trunk. This sometimes has a wavy or mottled appearance showing alternate light and shade across the surface. A variety called bird's eye maple has a speckled curly grain, and is used chietly in the form of veneer.
Maple does not easily splinter, and is excellent for floorboards and other interior fittings. It takes stain well and is easily polished. It is used for furniture, plywood, fretwood, turnery, musical instruments, dairy woodwork, wood spoons and platters, and rollers. A bog maple, cut from peat, and pale blue in colour, is sometimes used for vencer and small articles. See Wood.

MARABOUT. The name is that of a bird, and the original marabout was a tuft or plume of soft or grey feathers from beneath the wings and tails of storks, herons, and adjutant birds, and used as a millinery trimming. The term has been extended to cover fluffy feather trimmings, ruffles, stoles, wraps, and valuable coats having no necessary connexion with marabout birds.
Prepared feathers are braided or corded logether with their soft fronds projecting to make exceedingly light trimmings weighing much less than fur and giving similar warmth. They do not wear nearly so well as fur, but often look very becoming for dressing gowns and jackets. Marabout loses substance in wene by detachment of the feathers from the central binding cords, and the articles should be handled lightly and with care. Washing
is often detrimental, but marabout articles may be dipped in a warm soapy lather and dried by being shaken in front of the fire ; they should not be crushed in storage

MARASCRINO. A fine, delicately fla voured varicty of cherry known ns marazques is the suurce from which maraschino is distilled. It is a sweetish liqueur with a subtle taste, and is often used to flavour fruit salads and in some coclitails. A maraschino cherry is often placed in the half of a prepared grape-fruit, and in a cocktail glass containing a sweet liqueur. These cherries are bottled in maraschino.

MARBLE. There are many kinds of marble, some of the best of the English varie ties being found in Dorset. Purbeck is a mottled grey, whioh takes a tino polish and is suitable for decorative work. A fine black marble, known as Mento, comes from Galway. Conhemara, a blue green, and Churchtown, a red marble, are also quarried in Ireland.

Beautiful examples from Derbyshire, Staffordshire, and Devonshire are notable for their delicate colourings, and are employed for carved table ornaments and chimney pieces. Some of the most handsome varieties come from Greece. Pure white, from Carrara, in ltaly, is used for sculpturo and for expensive carving and ornamental work.

Decorative Uses. The purposes for which the various kinds of marble are employed depend largely on their weather-resisting qualities. Red Ogwell, which is a particularly aoft type, will not retain its fine polish out of doors, and is consequently reserved for household use. It is mado into mantelpicces, fenders, and pedestals for marble or bronzo figures. Dove marble, another soft variety, is of a pale grey colour, and, because of its high polish, is specially adaptable for panelling and wainscoting. Like red Ogwell and other coloured marble, it never discolours.

Mottled marble, a variety of white Sicilian, is also used for janelling, because of its fine markings, the slabs being arranged so as to form diamonds and other patterns. Unlike the coloured marbles, this is a hard type, and can be used equally well out of doors in the form of flower vases for the garden or terrace steps. Veined white Sicilian marble varics from the mottled only in the markings, and is employed for very much the same purposes.
Among the choicest and rarest of the many articles executed in marble are pictures wrought by Italian oraftsmen, in almost every variety and colour of marble, including bright einerald green, the supply of which is extremely limited, and crimson, which is equally rare. As a rule, these pictures are portraits rather than landscapes or seasca pes and usually fetch high prices. They are generally framed in mahogany or oak.

Domestic Uses. As used in the home, marble takes the form of wash-basins, table tops, pantry shelves, mantelpieces, curbs, etc., its chicf advantages being that it is sanitary, cool to the touch, and easily kept clean. Due, moreover, to its natural composition. which contains lime, it has the further property of heing germ-destroying, and so is ospecially suitable for lavatories.

Its cooling properties are best revealed in the pantry, where, in the form of shelves and receptacles for butter, milk, etc., it is the most practical material In the hottest weather it remains at a comparatively low temperature, and diffuses its coolness to such foods as would otherwise ensily melt. For the same reason it is of essential value for storing meat. Slabs for the purpose are eold cheaply at most monumental works.

Plain marblc curbs may be put together at home, parts for which may be cheaply obtained. Three blocks of the required measurements should be bought, two being
of short lengths for the side3, and the other as long as the hearth itself. These blocks may be polished or unpo!ished. Outside the bousc marble is used for doorsteps and terrace ornaments.

Cleaning Marble. When discoloration occur a little crystallized oxalic acid should be dissolved in water, and the mixture app!ied. Meat or vegetable stains require other treatment; $\frac{1}{2} \mathrm{lb}$. each of stone potash and pipeclay should be mixed in water with a little oxalic acid added to form a paste. Cover the stain with this preparation, and let it remain on overnight. The application should be repeated until the stain vanishes. Mineral stains, caused by rusty nails, etc., rarely yield to treatment, but may be subjected to the above application. Unpolished surfaces should be rubbed vigorously with pumicestone and water. A polished or glossy surface can be produced by a mixture consisting of four parts of oxalic acid to one part of sulphate of learl. This should be applied with it wet flannel cloth, and a brilliancy that will last for years will then be obtained
When marhle has beel exposed to the air for any length of time without attention the stains formed may be removed by first applying potash water and rubbing it down thoroughly, afterwards washing clean with lirst clean water and then water with a few drops of hydrochloric acid in it, although care should be taken not to add too much hydrochloric acid.
Another method that is sometimes used is to apply cqual quantitics of soft soap and реarl ash with a soft rag washing it off after a few minutes with warm water, and finishing with a soft dry flannel. If there are no stains a good plan is first to rub olive oil on to the marble and then rub down thoroughly with a sof trag, or a solution of 2 oz . soda carbonate in a quart of water should be well scrubbed down the marble, finishing with a soft rag.

Marble table tops, the tops of washstands and other articlea when cracked or broken may be riveted as is described in the article on the repair of crockery. The rivet holes need only be drilled half way through from the back of the material. The rivets are fixed in the holes by filling them $w$ ith plaster of Paris mixed with water. The joint should not be coated with the plaster, but if desired. when the top is finished, and the marble top replaced, the crack, if at all visible, may be filled with plaster by working it in through the top and colouring with suitable pigments to match the existing work.
MARBLE CAKE. To make a marble cakc, prepare and bake a cake according to directions given for Russien e:ake; cut this up into pieces of all shapes and sizes, and atir them


Marble Cake, a fancy cake with iced top
into a little sieved apricot jam melted in a pan over the fire. Line a tin with greascproof paper, and pack in the cake mixture, hlending the colours prettily. Put a lid with weights on it over the cake and leave it for an bour or two. Then turn it out catefully, putting the most level side uppermost. Pour over it some white glacé icing and decurate the top with wavy lines of chocolate glace icing applied with a forcing bng und plain pipe. See Russian Cake.

Marbling. See Graining; Iacquer Work.

## MARCH

## What to do in the Garden

| Flowers | and lie runta |  |
| :---: | :---: | :---: |
| w hardy annuals | (1) | ush iruit trees |
| esoil is rcasonably dry | 8 | Sow melon |
| Plant the corms of | Finish plantiny rose | pols |
| adiolus. Cape H | trees and hamdy flowering |  |
| nd montbre | d sliruls | Vegetables |
| Prune rose trmes at t | Plant Lulhs of | leinove offrets |
| of the month | auratuma and other lilies | lolve nrtich |
| Sow ten-week |  | opagation |
| aters nnd other hali |  | Make a first sowing |
| rily nnmusls in th | inlsil proming | of carrot at the end of |
| cenhouse | anting frult trees | ce month |
| Plant border car | Graft sruit trees | Sow raulflower in $n$ |
| ns and hardy | Wecd strawberry | rinme or mi the open |
| cerous jerrmalals | bods and plant ont | Sow lecks and onions |
| Propare tho site | last nutumn's runner | Get in carly motaloes |
| W lawn | Disbud vines nnd jeach | Sow mustard, criss, |
| Sow secds | ces mrown under glass | and radishics at we |
| renniala in boxes of | Spray froit trecs with | tervals |
| il in $n$ frime | ne-sulphir | Sentter coal |
|  | Strew fresh | -ollng peas |
| hrymanth | on the surf | colling | chrykant hemums

## Food in Season

| Fish <br> Barbol: Lieam; brill |
| :---: |
| carp: coll ; dory ; cel ; |
| Hounder ; gurnet ; had- |
| dock; halibut; hicr- |
| ring; ling; mackerel; |
| Inullet; jerch; pike; |
| salmon; skate; sinclt; |
| sole : sprnts; tench; |
| trout; turbot ; whitcbait; whitlog |
| Shellfish |
| Crals; cray tali ; lols. |
| ster ; mussels; oysters; |
| jrawns; scallops: |
| shrimplis |
| Meat |
| Recf; holise lamb; |
| mutton; pork; veal; |
| venimen |


| Poultry \& Game |
| :---: |
| Capons; capercnil |
| e chickens ; |
| wis : reese ; guinea- |
| wil hares; landmils; |
| ortolans; partridges; |
| pheasants; plover: |
| prairio liens: ptarmi- |
| gan; pigenna: pullets; |
| quail ; rablits: rutis |
| nud recves: snlpo ; teal: |
| turkey; Uidgeon; wild |
| fowl; woorlcock |

> celeriace; celery; cher vil; chicory; cress cucumber: endive recns: horse-rudish ceks: lettuce: mush
rooms; onions: pir roolls: onions; parand a pold) ratocs (nex solsify: savoys. Scotc hule: reakale: sorrel spinach: tomntoes splinach:

## Fruit

## Vegetables <br> $\qquad$ gum; beetroot; broc coll; Brursela spinouts eablonge; cardoons; jears; penches; pinc

 earmots: culliflower: olls kinds of nuts
## Notes for the Month

## Marcu 1-S. Dnvld's Day <br> Marck 26 . Lidy Day Quarter Day

are empluyed in the manufacture. After being relined they are churned with milk; colouring mintter and salt are added, tho latter acting as a preser. vative

Anrgarine is a wholesoneand chenp article of foorl. should not be bought in large quantities. On nccount of the milk which it conlains it does not remain in good conlition indefinitely. and should be used as fresh as possible.

Although it is very suitable for some purjoses, such as for making cakes and sauces, mirga. rine is not so suitable as lard or dripping for frying, owing to the milli and salt which it contains. If occasion arises when margarinc only is available for frying, the difficulty may be overcoine to aoncextent by placing the fat in a sauccpan on top of the stove or in a hasin in the oven, and allowing it to remain for some time, stirring occasionally. The heat eraporates

MARCOBRUNNER. 'I'his famous brand of Germian hock of fragrant aroma and brilliant colour is the product of the vinepard of Marcubrumn, which stands amons the lijls some little distance from the Rhine. The output is amall, and a great deal of wine which is not grown there is sold under the name of Marcobrunner. See Hock.


Mare's Tail. Hardy rush-like waterside plant
MARE'S TAIL. This is the common name of a hardy perennial with rush-like stems A few linds are suitable for waterside planting, but others are weeds which thrive chiclly in boggy ground

## MARGARINE. The term margarine is

 applied to any substance that has the same appearance as butter and that is used as a substitutc for butter. Beef and mutton fat,lard, coconut, cotton seed, and pea nut oil
the water, and dry
sediment resulting from the inilli can be emnved by straining
Margarine can be used for making pastry in conjunction with lard, in the proprtion of half land and half margarine; but, it should be noted, it is not advisable to use margarine lone for making pastry.
The Law About Margarine. Any margar inc or any margarine cheese that is imported into Great lbritain inust bear conspicuuusly on the ticliet the words margarine, or margarine cheesc, as the casc may require. Margarine must not contain more than 16 per cent of water or more than 10 per cent of butter fats, nor must it containany preservative prohibited by the regulations.

Any breach of the above protisions renclers the aifender, whether he be manufacturer, im. porter, consignor, consignec, commission agent or otherwise, linble to a penalty of $£ \geq 0$ for the first offence, $£ 50$ for the second and $£ 100$ for any subsequent offence. Thie prackage, whether open or closed, must be printed, or durably marked, with the words margarine or margarine cheses on the tol, bottom and sides in printed capital letters not less than 3 in. square, and this brand or mark must be on the package itself nnd not simply on a label.
Fuither, when these rticlea arc expored for sale by retail, a label must be on every parce so exposed in such manner as to he clearly


Marguerite. Flowers of the single variety grown as a pot plant. Above, fine large bloom of the double white variety Mrs, Sarde

MARIGOLD. The common marigold is clavatus, yellow; lilacinus, lilac; anıenus, a showy dwarf plant with orangecoloured rosy purple, and venustus, of which there are flowers. New brilliantly colonmed varieties have heen raised; they should he grown in prefcrence to the old-fashioned kind Orange King and Radio are especially finc. Once

MARJORAM. The hardy aromatic herb eplants should he prit in rich soil in spring


Marigold. Left, large, lemon-coloured, globular flowers of the African marigold.
Right, orange blooms of the common marigold
introduced into the garden, it will sow itself. and come up the next year in profusion. It is a Calendula, while African and French marigolds belong to the genus Tagetes, producing brilliant Howers in great abundance.

African marigolds, with their large globular dunble llowers, are of leminn and orange they thrive in almost any fertile, friable soil, heing raised froin seed under glass in February Thev grow 2 to 3 ft . hish.

Both single and double coloured and striped sorts of French marigolds are availahle, I to 2 ft . high, alen miniature single kinds about 9 in. high Etoile d'Or, lagion of Honour. Meteor, Diadem, Silver King, and Star of Indin make gold edgings. See Fig Marigold; French Marigold; Marsh Marigold
MARINADE. This is the name given to a brine uszd for sousing or jlickling fish and micat. A game or meat marinade is made as follows In a large earthenware vessel put 2 onions and 2 carrots cut into thin slices, a small handful of salt. a bunch of herbs, including sprigs of thyme, basil and sage, a few hay leaves, jeppercorns, macs and cloves. Pour over thesc 1 pint vinegar and 2 pints cold water cover the vessel and keep) it in a conl place. The meat or game is soused in this marinale hefore it is cooked.

A marinade for lish can be made thus: A gill of salad or olive oil is mixed with the same quantity of white vinegar, a finely chopped onion, a bunch of herbs, and a little salt and cayenne. The fish is put in this mixture to souse, and is then broiled, or it can hic haked in the marinade in the oven. See Mackerel ; Pickle, etc

MARINE GLUE. A special typic of glue. used in ship and boat building for making watertight joints, is known as marine glue. It is gencrally composed of shellac, or caoutchouc mixed with turpentine or naphtha. It can be used under any circumstances where a sound waterproof glue is required. See Glue

MARIPOSA LILY. This is the common name of Calochortus, a group of rather tender flowering bulbs. They should be ginwn in a bod of well-drained sandy soil in a sumny, sheltered position, as at the foot of a wail. In winter it is wise to protert the bed with a frame "light" to keep, off excessive rains. The bulus should be planted 3 in . deep, in carly autumn. The flowers are of many charming colours. A few of the best are
majority of the smaller towns they are still important. See Early Closing.
MARKING. Marking personal and house. hold possessions with the name or initials of their owner is usually done by means of marking ink and a pell sold for the purpose. Some people use a stencil specially made to use with marking ink. When marked each article must be left until it is dry. Tablecloths, shects, and other items of house linen are often marked in this way with the names of their owner, and many persons so mark their pocket handkerchiefs and other possessions. Another method of marking articles of clothing is to write or print the name on a strip of cotton, or other anitable material, and then to sew this on to the garment.

Clothing and house linen can be marked in another way. This is by means of initials, which are worked on to the garment in silk or cotton thread, either in white or colour.
To mark suitcases and nther luggage the initials should first be outlined in a suitable size, and then the paint. white or black oil colour, as desired, can be laid between the lines with a bush Careful measurements are necessary in order to make the letters

uniform insize and similar also in style. See Initial

Marking Ink. For marking the name of the owner on clothing. a marking ink ought to be permanent in its elfect, and not liable to hecome faint and illegible after repeated washing of the linen. The hest ink for the purpose is onc having nitrate of silver for a basis : but if blcaching powder is used in washing fahrics inarked with this ink there is a tendency for the linen to rot into holes at the places where the marking was donc. Other bases used are coal tar and aniline

The manufacture of marking inks is somewhat complicated, but a simple form can he made by grinding Chinese ink with a little water to a thick, smonth liquid: this is dried by placing it in a warm place, and is then reduced to ponder. To the powder is added a mixture of coal tar 1 part, mineral naphtha 2 parts, until a thin crean is formed. The resulting ink marks are quite permanent.

MARKING GAUGE. Onc of the indispensa ble tuols of the woodworker, the niarking gauge is used for marking incised lines in the clirection of the grain parallel to the edge. lt is illustrated and described in the article Gauge (q.v)

MARL. Largely consisting of decomposed limestone with a amall percentage of clay, marl is nutural soil which pussesaes the property of hardening very rapidly. Ordinary niarl contains fom 15 to 2() per cent of carbonate of lime. Being comparatively immune from the attacks of insect jests, it is much in request for grass courts, and it is sometimes applied to the surfaces of other garden suils as a top-dressing. Mas is used with other ingredients in the preparation of cement, concrete, and other building materials. Marl giays is a pasture grass which is sometimes used in garilen mixtures to match existing turf. It belongs to the elover family. See Soil.

# Marmalade: Orange and Other Makes 

## Directions for Using the Ingredients to the Best Advantage

This article contains adviec on the hest fruit to c.aoose, as uell as simple and excellent recipes. Sce also Jam ; Jelly

Although marmalade is the name originally given to a preserve of Seville oranges, other fruit preserves are now included as mama. lades. Sweet oranges and lemons arc used in conjunction with Seville oranges: lemons and tangerines noke delicious preserves, and grape fruit, melons, pineapples, and quinces are also malc into marmalades

The making of marmalade is rather a tedious process, as much depends on the preparation of the fruit, and this must not be done carelessly if a good preserve is to lie made. All the rinds must be shredded finely, and all pips and pith removed. The cutting can be facilitated if a marmalade machinc is a vailable: these can be hought quite reasonably, or sometimes a machine can be hired for a shilling or tiln Some people prefer the jeel sliced coarsely, in short sections, after the manner of Oxford inarmalade, in which case it is necessary to cut it with a knife by hand.

Success in marmalade making depends on sound fruit, good sugar, and careful preparation and boiling. Experts say that the earliest shipments of Seville oranges make the tinest marmalade, Fehruary and March heing the best monthis Certainly they are most plentiful and at their cheapest then. A good quality of fruit should always be used, and it should not be under-ripe or over-ripe. Overripe fruit is not worth preserving, as it will not keep, and the marmalade is sure to ferment and turn mouldy in a very short time. Under-ripe fruit is lacking in juice, and contains a large proportion of hard pith and skin, which has to be discarded. Also the under-ripe oranges do not contain enough pectin, the jellifying quality in the fruit which is essential. No amount of boiling will make the preserve jelly if this quality is lacking.

The best preserving sugar is necessary for a good, well-flavoured marmalade, and in the
long run is most economical, as it reduces skimming to a minimum Sugar should not be added to the marmalade until the neel and pulpare tender: it is not the sugar that needs conking, or that causes the marmalade to jelly Its purpose is to sweeten only.
There are numernus recipes for orange marmalade all varying a little in accordance with the experience and tastes of the makers. The proportion of water varies in each recipe, but for general guidance it is safe to sny that weight for weight of fruit and water will make a solid marmalade, and for a thinner one the water may be increased to a pint and a half for every pound of fruit.

The propurtion of sugar varies greatly, though pound for pound is usually advised for all Seville oranges; the length of time for boiling varics according to the quality of the fruit.

Orange Marmalade. A good general recipe for orange marmalade is to allow a pound of sugar to each orange, a pint of water to each orange, and one lenion to every four oranges Thus, to 12 Seville oranges allow 12 lb . sugar. 12 pints water, and 3 lemons. Wipe the oranges and lemons well, quarter them and remove peel from each quarter, and take as much pith as possible frmm fruit and peel: Cut up the pulp roughly with a knife or put through the marmalade machinc Remove all the pips into a separate basin. Shred the skins finely. Put fruit and peel into an earthenware pan, cover with 11 pints water, and leave to soak for 24 hours or longer. Then put the pips with the remaining pint of water in a saucepan and simmer for an hour Strain the liquid into the prepared fruit

Put the soaked fruit and liquor into a prescrving pan, bring to the boil and simmer for an hour. The marmalade must never hoil rapidly, as this toughens the skins. Then add the sugar, stir well and simmer gently for another half hour, removing scum as it rises. Use a wooden spoon, as a metal one will taint the preserve.

Test the marmalale on a plate; if it jellies when cold it is finished, but longer boiling may be necessary. Too long boiling makes the marmalade dark and gummy, so do not leave it too long without testing.

When finished pour off into warmed, dry jars, leave until cold and cover securely, first with a piece of waxed paper on top of the preserve, and then with a thick gummed circle that comes well down the side of the jar to keep it airtight. Store in a cool, wellventilated place
Jelly Marmalade. To 12 Sevillc oranges allow 3 sweet oranges and 2 lemons. Peel the fruit very thinly. cutting none of the white


Marmalade Machine. Type requiring the fruit to be inserted from the Top. There is also an attachment at the side for cutting French or
part with it. Cut the peel into the thinnest possible strips and tie them in a muslin bag big enough to allow them to swell Remove all the white inner rind from the fruit. and cut up the fruit conrsely. making about three pieces out of each. Lenve the pips in Put the bag of orange peel strips and thic fruit into an earthenware pan, cover with 12 pinta of cold water, and let it stand overnight.

Next day boil all together rather quickly for three hours, then remove the muslin bag and empty the strips into a hasin. Strain the pulp twice, and add the strips to the strained liquor Weigh it, nnd add an equal weight of sugar. Clean out the preserving pan, and put in the syrup and boil until it sets-about 25 or 30 minutes Let it stand half an hour before pouring off into jars.

Lemon Marmalade. To every pound of fruit allow 3 pints of water. Slice the lemons very thinly, removing the pips. Let the fruit stand in the water for 24 hours, and let the pips soak in water to cover them. Then atrain off the water from the pips and add to the rest, and hoil the whole until the lemons are tender. Leave to get cool, or pour off into an earthen vessel and leave until next day. Then weigh the pulp again, and to every pound allow $1 \frac{1}{2} \mathrm{lb}$. preserving sugar. Boil again until the strips of lemon become trans parent and the pulp jellies.

Tangerine Marmalade. Tangerine marma lade is made by using 6 Seville oranges. 2 sweet, 6 tangerines, and 1 lemon. P'are the fruit finely, and divide it Put the pips to soak overnight in $\frac{1}{2}$ pint water. Shred the rinds finely and weigh them, allowing 2 pints water to each $\mid$ b. fruit Let the rinds soak in this water overnight. Boil up next day arlding the water in which the pips were soa ked, and continue boiling until the rinds are tender Iet the preparation stand for another day, then weigh the rinds and allow 1 lb preserv ing sugar to each lb . fruit. Boil up until it reaches the jelly stage. This should take about $\$$ hour.

Grape Fruit Marmalade. Wipe the fruit, remove rinds and alice thinly. Remove the white inner tissue, pith and sceds Cut the fruit in slices. Weigh the pulp, and allow pound for pound of sugar. Put pulp and rind in a preserving pan, juat cover with $w a t e r$ and boil till rinds are tender. If the marmalade seems too bitter, the water should be changed once When rind is soft, add the sugar, and simmer until the marmalade scts when tested on a plate

Melon Marmalade. Canteloupe, citron, or musk melons may be used for miarmalnde. Quarter the melons, hut do not peel them. Take out the seeds, weigh the fruit and allow a pound of sugar to every pound. Grate the melons on a suet grater, discarding the rinds. To every three pounds of pulp allow the grated rinds of two lemons and a teaspoonful of ground ginger. Put all (including sugar) into a preserving pan, and let it boil gently until it thickens and sets well. Stir steadily from time to time to make it amooth, and remove scum as it rises When it is done pour into pots and cover while hot.

Ginger and Marrow. An excellent but cheaper marinalade of the ame type as the one descrilied is made by allowing

I lb sugar to each lb. vegetable niarrow To 6 lb . marrow should be added $\mathbf{6} \mathrm{lb}$. sugar, i lemons, 6 oz. green ginger, 2 oz root ginger, and if teaspoonful cayenne. The marrow is pared, pips removed, and cut into square pieces of roughly 1 in. Peel lemons, slired the rinds, cut up the root ginger, and put the juice, slireds and marrow into a large pan with the ginger and sugar. Let them stand until the juice covers them. This takes about 24 hours. Boil until the marrow is quite Iransparent. No water is ndded

Pineapple Marmalade. Remove the peel and eyes from the pineapple: pass the fruit through the mincer, weigh and allow is lb sugar to every lb. fruit. Mix the sugar and fruit well and leave in a bowl overnight Next day put into a preserving pan and simmer gently for an hour or until it sets. The large quantity of juice in pineapple makea it unnecessary to add water. Pour the marmalade off into warm jars and tie down while hot

Quince Marmalade. Quince marmalarle is prepared by peeling and quartering the frnit, removing the cores, and then putting the latter, together with the peelings, into a pan con taining just enough cold water to cover them Boil them over a slow fire until their llavour las been well extracted. Thes strain the liquid through a fine sieve and let it cool. After weighing the quinces, put them into a pan, pour the strained liquid over them and then cook them until they are a pulp, pounding them with a spoon if necessary For every pound of fruit add $\mathcal{I} \mathrm{lb}$ preserving sugar, stirring carefully until the Intter has dissolved Boil up the marmalade and continue hoiling until it sets, when it may be potted.

MARMALADE PUDDING. To make a boiled marmalade pudding, chop finely 5 oz . suet and put it into a basin with 5 oz . fine hreadcrumbs, 2 oz flour, the grated rind of a lemon, 3 oz . brown augar, and a pinch of salt. Into a small basin put 5 o7. orange marmalade, a tablespoonful of golden syrup which has been warmerl, and 2 egga. Heat all well together, then add nearly 1 gill milk. Mix the dry ingredienta, make a well in the centre and work in the eggs and marmalade. It must then be turned into a well-greased pudding. hasin or mould and steamed for $2 \frac{1}{2}$ hours. It should he served with marmalade sauce.
MARMALADE SAUCE. Mix a small deasertspconful of arrowroot into a thin paste with cold $u$ ater, then add $\frac{1}{2}$ pint boiling water, stirring it into the arrowroot by degrees. Turn all into a saucepan, and boil for 2 or 3 min add the juice of $\frac{f}{2}$ a lemon, 1 dessertspoonfui white sugar, and 2 talilcspoonfuls marmalade. Simmer ior 2 min . before serving, but stir all the time.

MARMOT. A somewhat harsh fur marmot is usually of a greyish black colour in the ground, becoming lighter and more yellowial. red at the top. The hair is reddish, stiff, and often speckled with black. It is usially dyed to imitate the more costly mink, and in this torm is used for making wraps and coats.

MAROCAIN. A soft lustrous material of silk or mixturc of silk and wool, or of all wool, marocain can be obtained in various qualities This material, bcing heavicr than crêpe-deChine, drapes well for dresses, and is also used for light-weight wraps and conts. It is ohtainable in plain colours or patterned.

MARQUEE, A large tent or marquee is constructed with two upright poles with the canvas formed in a ridge between them. It is generally oval in shape, or rounded at the ends with straight sidos. A marquee is often erected on a lawn for refreshment service accommodation and for sheltering the guests at social functions or during sports. See Tent.

## Marquetry and its Processes <br> A Decorative Handicraft Explained and Illustrated

In addition to Inlaying and Veneer, our readers are referred to the entries on the various woods used, e.g. Ebony; Satinwood: and to the articles that can be decorated with marquetry, such as Cabinet; Grandfather Clock: Knifc Box: Screen. Sec also Buhl: Louis Style

Marquetry is a form of inlaying in which the effect is obtained by the use of vencers applied to a gmundwork. The inlavs and the background are cut at once, the process affording scope for many artistic and elaborate effects

In Italy niarquetry was used to decorate caskets during the 1 हैth century. Ivory and natural woods were emploved. The form known as intarsia was first executed there in the ligth century. Geometrical designs were used, but later floral and pictorin decoration was applied in this manner. By the end of the 17th century marquetry was lavishly emplaped on Continental furniture, and by the 18th the great English designers, with the exception of Chippendale, used it frecly to decorate cabinetg, bureaux and amnller pieces. The secretaire shown in the first illustration gives an idea of the delicate and beautiful design and workmanship of the hest French marquetry in the 18 th century

Modern English marquetry work in the form of panels chiefly used for decorating side boirds, cabinets. screens, and mirrors, shows fine design and craftsmanship. The floral panel of the fire screen illustrated is beautifully executed in woods of contrasting colours, and the panel whioh decorates the sectional mirror is suggestive of the charming work that can be carried out in a simpler design
Fig 1 illustrates the principle of marquetry work Two shects of peneer of different wood or colour are fastened together and a saw out


Marquetry. Secretaire in marquetry with inlay of flowers marble top, ormoln monnts. The upper part has a falling front enclosing two dramers, the lower is a cupboard. French ; period of Louis XV Bu Dermission of the Director, Victoria \& Alberl Museum, South Kensington
made through the two, as irr Fig. I A. They are then aeparaterl and the pieces interchanged, as in lig 1 B , thus ohtaining the required inlay. The remaining parts (Fig. I C) would form another inlay. though it is seldom possible to use then for the same joh, as the hackground usually has to match the wood of which the piece is made. In commercial work the cutting is done with a power or treadle sulw, but an ordinary fretsaw frame with a very fine blade will serve the purpose quite well
Fig. 2 shows the type of donkey used by the trade when the mar quetry is still cut by hand, and is quite a simple structure to make. The worker sits astride the form and places the work between the $t w o$ thicknesses of wood at the head. A firm grip is obtained by placing the foot on the treadle, which being connected to the outer thickness of wood by a mpe, draws it inward toward the other. The advantage of the donkey is that the work is easily removed or altered to another position. leaving both hands fiee. and is fixed at an easy height.

A similar type is shown in Fig. 3, and is fixed in an ordinnry bench vice, the two thick. nesses being gripped with a thumb-screw. The front and main thick ness should be of 1 in. stuff and the back $\frac{1}{2}$ in

The wide range of materiel for inlaying is not confined to wood Tortoiseshell, ivory brass, and other metala have all been userl, hesides stained wood. The direction of the grain in the inlay plays a great part. Where the inlay occupies a small space in a large panel, it is only necessary to put a small portion of veneer sufficient for the inlay in the required position, but in a panel such as is seen in Fig. 4, where the inlays are distributerl faitly evenly over the whole panel, the inlay and background venecrs should be of the same size. In this care two different woods are used for the inlays, so that three thicknesses of veneer will be used. If two panels are required six thickneases nre cut, two of each lind of wood. The cross-banded edge and the inlaid line would not be cut in the marquetry, but would be applied after it had been laid.

Either knife or saw cut veneers may be usell, though if only a few thicknesses are to be cut it is advisable to use saw-cut; being thicker, it is not so liable to split during the culting process. If knife-cut is used, even though only one panel is required, it is generally a better plan to cut an extra panel and so get extra thickness to cut. as the firmer the substance the easier the outting will be All the veneers for a single panel must be either knifc or saw cut, as it is impossible succerafully to lay marquetry cut from veneers of different thicknesses.
A Simplo Pattern. Fig. 5 is an example of marquetry using only two woods, oak and ebony, the right-hand side showing the
finished panel with oak background and the left vicc versa. As the design fnitly covers the whole background, both sheets of veneer will be of the same size. First prepare a carcful drawing of the design on paper, with the woods to be used marked (though where only one inlay is used this is bardly necessary) and make a tracing of it.

Prepare the two sheets of veneer and glue them together with thin glue, and with $n$ sheet of paper between, so that they can be separated later If two panels are to be cut, place the oak and ebony sheets alternately, and when they are cut and separated, interchange the adjacent alieets It is of vital importance that the thicknesses should be as close together as possible, otherwise they will be apt to split during cutting. When glueing they should be placed between two llat boards and cramped to. gether Paper should be put between the veneer and the boards, to prevent them from sticking une to the other
When dry, paste the tracing on one side, and, fastening the work in the vice, cut round the design carefully right on the line with a very linc frctsaw. It is necessary to hore holes in which to start thesaw, and these should be as finc as possible and in such n position as not to bc noticeable; this is usually where two curves meet The saw must be held quite square to the work, so that the parts will interchange perfectly, and should be procected with in such a way that the panel is not unduly weakened. Do not cut away thic centre poition first, яs


Marquetry. Above, fifa screen in mojern marquetry. the panel being in woods of contrasting colours Below, mirror with pictorial panel in marguetry Courlenl" of A. J Rowlell. Kenainglon
this would render the veneer liable to split, especially when afterwards cutting the outer shape across the grain at the top and bottom. When any part is cut completely out, like the small pieces in each corner and the centre, mark on it the part finm which it was cut and its position, so that it can he replaced afterwards.
Having cut the complete design, the nex step is to separate the thicknesses. This is done by easing the parts away with the thin blade of a knife, so that the paper splits. If any difficulty is found from the glue having been too thick it is advisable to weaken it by
placing the veneers between two sheets of yellow pine is also good This latter should damp blotting paper and laying a weight on be givell a coating of size after toothing to top The moisture will then percolate through fill in the grain, and left to dry, as otherwise the wood, when the pieces niay be separated when the marquetry is a pplied the pine would easily. The various portions of the adjacent soak up more than its fair share of the glue sheets are interchanged and the whole glued and leave the marquetry liahle to peel of. on to a sheet of paper, using thin glue. Apply the glue sparingly, or the veneers anay buckle. See that the various parts lie together fat: t may be necessary to put them under a the caul methorl is used. Figs. 7, 8, and ? weighted boand for this purpose, though glueing down on to the paper is usually sufficient. When dry the veneer may be glued on to the ground work
Using Two Inlays. Fig. 6 is a nother exnmple of mar quetry, embodying the use of two inlays (satinwood and a green stained wood) on a mahogany liack ground. In this case the inlays secupy a relatively small space in the panel, the flower and the base only being in satinwood and the stalk and leaves in green wood, so that it will he necessary only to cut pieces sufficiently large to cover the local inlays. The dotted lines show the position in which these are placed, the green piece being put on the mahogany hackground first and thic two pieces of watinwood on the green wood after. wards. The tracing is pasterl to the flat mahogany side, care being taken to see that the various parta of the design come opposite to theit correspouling veneers. The cutting is then proceeded with in the usual way
The lines forming the divisions to the petals in the flower are formed by saw cuts. As the whole of the llower is intended to he in satin. whod only, it is advisable not to let the division lines run guite down to the juncture with the atalk, so that the llower will remain in one picce, thus asving the unnecessary labour of putting them together again. The lines are shown running right through in the sketch, since it might he desired as all alternative to form the flower with petals of alternate satin and grcen wood, instead of all satin, in which casc the cutes will run right through.
The necessity for good workmanship in marquetry is seen when cutting small panels. The practised fretworker will lind little difliculty in cutting out the shapes, but the beginner should have some preliminary practice in making even saw cuts hefore attempting any claborate work. It is a good plan to glue odd pieces of thin fretwood of contrasting colours toget her with a sheet of paper loctwenn them. A suitable but simple design should be drawn on one piece, and thell cut out.
The use of colour in marquetry is a valuable help in working out suitable designs. White woods, especially sycamore, can be stained by aniline dyes to almost any required shade, and brightly stained woods contrasted with dark roorls will give some tine effects.
The groundivork must he of a suitable wood to hold the glue well, frec from knots, and able to stand well without shrinking or twisting It must he prepared perfectly true and Hat, and must be toothed. Hunduras mahogany is the ideal wood to use for a ground, though


Fig. 3
give an idea of the kind of appraratus which is wanted The canl is a piece of woorl slightly larger than the ground and about I in. thick, ind quite Hat; this is to lay on the veneer and press it equally all over. The crosspieves are slightly longer than the width of the givund, those for the hottom being square. The top pieces are straight on the top edge but are curved slightly on the underside ( Hig .7 ), so that when pressure is applied to the ends the glue will be forced fiom the centre outwitrd (rig. 8). The shaping is rather exaggeratel in the diagram, hut alout $\frac{i n}{}$. will be sullicient in a length of 2 it. The lower conspieces must be wider than the top ones, so that the preasure bends the top pieces straight. Two cramps or handscrews are required to each crosspiece

The ground being ready, marl: centre lines in the length and hreadth of loth the marquetry and the ground ; this will give the cxact position for it to he fixed. The lines should he marked on the paper-covered side of the marquetry. Glue both the giound and the marquetry; place the latter in position and drive in two tine reneer pins to fix it temporarily. The marquetry should be paper side upivaril, so that the glue gripe the wood. Now lay a sheet of paper over the whole.

Heat the caul thoroughly on one side, place it on the paper and apply the centre crosspiece, tightening each cramp a little at a time so that pressure is applied gradually from the centre outwarl. Fix on the other crosspieces and give all the cramps in extra screw, and leave it to set. The whole process of applying the caul should be gone thmugh as quickly as prossible, hcause if the glue once chilla it will he impossible to aqueeze it out, and a repetition of the process will be required

Cleaning Up. To clean up the work when set, n steel scraper is used, and care must be taken to work this so that it dnes not tear the grain up. eapecially where the grain of an inlay mins counter to that of the backgiound. The joh is tinished off with line glasspaper, and the two pins used temporarily to sccure the veneer should be removed before cleaning

## MARRIAGE IN ITS LEGAL ASPECT

## The Responsibilities of Husband and Wife Outlined

## For the cercmony of marriage our readers are referied to the articles W'edding and its subsidiary cntries, c.e. Bride; Trousscau. Sce also Divorce; Husband

Marriage was defined according to the law district This official is not allowed to perform of Engiand to mean the union for life of one man and one woman to the exclusion of all ot hers, or the union of two people who promised to go thmugh life alone with one another. Consequently English law does not recognize polygainous marriages. In order that a marringe may be legal the following requisites must be conplied with :

Husband and wife must be of marriage able age, ie. 16 years of age. They must bo of such a mental condition as enables loth of them to know and appreciate the fact of the marriage If it can he provel that one of the partics to a marriage ceremony was incapable of knowing or appreciating what he or she was doing the ceremony is null and void.

The parties must consent to the marriage, and this involves the proposition that each of them knows what the ceremony means Instances have occuried where both boys and girls have been entrapped into marriage, being told it was something else, particularly in out-of-the-way colonies and other countries wherc people can go hefore a magistrate or other person and by signing a paper are declared to be married. Anyone who was married in this way can obtain a declaration of nullity.

There must he no legal impediment. A table containing the list of marriages pmobibiter will be found in the prayer book. Since that list was compiled it has become lawful for a man to mariy his deceased wife's sister. and for a woman to marry her deceased husband's brother. The marriage must hic performed in a legal mode. According to the rites of the Church of England, thesc arc either by the special licence of the archlishop of Canter bury, by licence granted hy a bishop or his surrogate, after the publication of banns or after due notice in lieu of banns given to the superintendent registrar of the district

The archbishop of Canterhury's licences miny lic given entirely at his grace's discretion, and may anthorize the marriage in any place and at any hour. The bishops mny only authorize the marriage in a church or chape in which banns inight have been laufully publisherd, and the marriage must be between $8 \mathrm{a} . \mathrm{m}$. and $3 \mathrm{p} . \mathrm{m}$. Banns are to be published in the chureh, and the clergyman is entitled to seven days' notice in writing.

Publishing the Banns. Where the purtien live in different parishes the incumbent of one parish shall not solemnize the marriage with out a certificste from the incumlient of the other parish that the banns have heen called there also. The parties must be married within three months after the publication of the banns, which are to be pulilished in an andible manner during three succeeding morning services, or, if there is no morning service during the evening service, and it must le on a Sunday. Pcople who do not desire banns to be called may be married according to the rites of the Church of England after having given notice to the superintendent registrar, who pulilishes the notice in the proper inamner for at least three weeks. In all marriages in the Chureh of England the ceremony wust be perforined by a clerk in holy orders. It is doubtful whether a deacon can perform the ceremony, though it has once been decided that he may

Marriages inay be solemnized according to the rites of other religious Imdies in cortain registered buildings and by registered persons, or in the presence of the civil registrar. A marriage in a register office can take place before the superintendent registrar of the

The Marriage Licence. In England annl Wales marriage licences are of two kinds, those issued by the officials of the Church of England and Wales for marriage in a building belonging to that form of faith, and those issued by a registrar for marriage in a church or chapel belonging to Nonconformists and registcred for marriages, or for marriage in a district register office.
As regards the Church of England marriage, licences can be obtained in London by applica. tion at the faculty oftice, at the vicar-general's office, and at the bishop of London's registry, hy one of the parties about to he married. Eilsewhere they may be obtained at the oflices of the bishopsi registrars, but licences obtnined at a diocesan registry only enable the parties to be married in the diocesc in which they are issued. Those procured at the faculty ollice, 2:3, Kinightrider Street, Doctors' Commons, London, E.C, are available for Iondon and all England and Wales; those pmoured at the vicar-general's oflice, 1. The Sanctuary, Westminster, Iondon, S.IV.I, are available for London and all England and Wales, excent the province of Yurk
No instructions, either verbal or in writing, can lic reccived except from one of the parties. Iffidnvits are prepared from the personal instructions of one of the parties about to le married, and the licence is delirered to the party upon payment of fees amounting to 31 s. in addition to the cost of stamp, los. No previous notice is required, and the licence is available as soon as it is issued. The cost of licences in the country varies, according to the diocese, from $£ 115 \mathrm{~s}$. to $£ 212 \mathrm{~s}$. Gd
To secure a licence for a marriage in a Nonconformist piace of worship or a register olfice, notice must he given persunally to the superintendent registrar of births, deaths, and marriages, or the deputy of such oflicer. One notice only is necessary, whether the parties live in the same or in different registration districts. and either party may give the notice. If both live in the same district, one of them must have lived there for 15 days before notice can be given.

If the parties are living in different districts, and both have fulfilled the necemsary residential qualification, notice may be given in either district. If one only had fulfilled the qualification, the notice must le given in the district in which the residence has been fulfilled, and the other party must be resillent in England or II ales when the notice is given The notice contains particulars as to names, ages, residence, length of residence, and the building in which the marriage is to take place.

After the lapse of one weekday, not Christmas Day or Guod Friday, from the date of the entry of the notice, the superintendent registrar may, provided no impediment is shown, issue his certificate and licence for the marriage, which can then take place on any day within three months from the date of the entry of the notice. For a marriage hy licence of this kind the total fees are $£ 2$ 10s. (kl. For marriages in Scotland no licences are necessury, hanns or notice by a registrar being substituted. They can talic place in a private houso or in a hotel.
Consent of Parents. The conscut of parents is only necessary where one of the parties is under the age of 21 . If, however, a young person under ago makes a rumaway match and marries without the parenta' consent, and even in spite of the parents prohibition, the marriage is lawful. Any minister or registrar, however,
who marrics an infant alter having been prohibited to do so by the parents or guardians and also the infant himself is linble to sevore penalties.

Marriages with Foreigners. In the case of marriage with a man who is a foreigner an linglishwoman may find herself awkwardly situated unless she takes care to find out how far he is at liberty to marry her, and whether or not any consents are required according to the law of his domicile. For instance, the French law is very atrict, and even though a man may lie an adult it reguires that licfore he can be lawfully married he shall obtain the consent of his parents.
An Englishwoman who marties in this country a domiciled Frenchman who has not obtained the proper consents is recognized as married by the linglish courts, but in France her marriage is not valid. It is wise, therefore. for an Englishwoman who intends to marry a foreigner in England to make previous inquiries at the oflice of the consul for that country, so as to ascertain whether or not it is essential to prncure anybody's consent to the marriage

Under the Marriage With Foreigners Act. I! Mif, nrangements may be made with foreign states for the issuc by the proper ofticer of those states of a certificate that duc notices have been givell. The foreigner may be required to give notice to the persons by ol in whose presence the marriage is to he solem. nized of the fact that he is subject to the marriage law of the country He inust get his government's official to issue a certificate that the notice reyuired has heen given, and that no impediment exists or that proper consents have been given. Anyone who celebrates a marriage where such a certificate is repuired without that certificate having been given is liable to a penalty not exceeding floin, or to imprisonment not exceeding a year. This Inw docs not apply to marriages hetwcen two .Jews solemnized accorling to Jewish law

Valid and Invalid Unions. In England it is an offence punishable liy fine and imprison. ment to give wilfully a false name on leing married, but the marriage is not rendered void. A marriage is apparently void where it is celebrated according to the rites of the Church of England after publication of banns if false names are given and both partica know that the names that have been given are false.

An Anglican marriage is void unless it is celebrated by a person in holy orders. It is also void if not celebrated in a lawful place, i.e. a chureh or chapel of the Church of England, a registered place of worship of any other denominalion, a place authorized hy the archbishop ly a special licence, or a register office. As to marringes which take place abroad, the foreign law applies, save that the marriage must be of such a kind that it comes within the linglish detinition of marriage, e. it must not hie a polygamous union.

Sometimes foreigners living in England attempt to celebrate marriages in places of their own which are not registered for the purpose. Such alleged marriages are void according to English law except, it may be, where both parties are subjects of a foreign state and they go through the ceremony of marringe within the precincts of the cmbassy of that particular state.

A nother point to be noticed is that, although as to the form of a marriage celehrated a hinad the courts in England will recognize that form, they will not recognize the validity of a marringe between Einglish people who could not have married in Grent Britain. Thus, hefore the pussing of the Deceased Wife's Sister Act, the Einglish courts did not recog nize a martiage abroad between an English man and his deceased wife's sister.

Marriage at sea on a British ship is a marringe in Britain and can be celebrated by all
episcopally ordained clergyman or minister There is authority for saying that a marriage celebrated by the captain is not valid.

The law as to what constitutes a valid marriage between British subjects abroad is not altogother olear. A marriage cclebrated anywhere according to the law of that country in the presence of an Anglican, Roman Catholio, or Greek olergyman is valid ; but cases arise where no clergyman can be found, as, for example, in remote parts of India or Australia. It has been held in some cases that where the parties intending to go through a ceremony of marriage bound themselves by words reprcsenting the fact that they are taking each other in marriage, the marriage is lawful. On the other hand, it has been held that where two pcople went to the British consulate in Smyrna and were married without the presence of a clergyman it was void.
In the case of public vessels, commanding officers of a certain rank are authorized under Admiralty instruotions to act as marriage olficers. They can, it appears, lawfully perform the ceremony of marriage on such vessels while at foreign stations, but only if one party to the marriage is a British subject, and if the ship is not at a port or place where there are facilitics for martiage in the ordinary way.

The Mestica! Side. A medical man is rarely consulted by persons about to marry, and in the vast majority of cases there is no need for median advice ; but, on the other hand, there are many cases uhere marriage should be delayed, and more than a fow where it ought to be avoided altogether.

A very early marriage is usually undesirable, though there arc exceptions to this rule, because the development of the body does not always correspond with age. So far as the wife is concerned a late marriage has also its risks. From the age of 30 to 35 onward the pelvis (or bony cavity at the lower part of the body) grows more solid and rigid. When a child is born, the bone-encircled outlet through which it passes does not yield so readily as it does in a younger woman, and hence labour may be slow and painful. Apart from rickets or other disease, this is not the case in a woman who marries earlier in life, has her first ohild before she is 30 , and continues to bear children thereafter.
Probably the best time for a woman to marry is between the ages of 23 and 27 . But in most cases there is no reason why she should not marry a year or two earlier or three or four years later. A woman with very narrow hips would, therefore, do well to consult a doctor before marrying, or at any rate some time before the birth of her first child is due. Sometimes the pelvis is not alone small, but misshapen, perhaps as a consequence of rickets. This, again, is a case for medical advice. Whether such a woman should marry at all is a question that will depend on the nature of the deformity.
There are certain diseases which should prevent the marriage of prudent people. Thus, serious heart dilsease (either in a man or a woman), Bright's disease, consumption, epilepsy, or any mental affection, makes marriage very undesirable. It is often a difficult question to answer whether an apparently normal-minded person in whose family inwanity has appeared should marry. A good deal depends on the cause and type of the insanity; but medical advice should always be sought.

A woman should never marry a man who is a confirmed drunkard. Very many women make the great mistake of believing that they can reform such a man. If a man habitually drinks to excess before marriage, he will almost inevitably continue his bad habit after it. And not only will the wife suffer, but the children are very likely to turn to drink also, or ton suffer from some nervous disease.

As to the marringe of cousins, it may be said that in the children of such parents any peculiarity of constitution common to both father and mother is very likely to be intensified. Cousins may, therefore, marry with safety if both are healthy and if there is no such disease as opilepsy, insanity, pronounced hysteria, etc., in their families. The danger of cousin marriages is that both may have the same kind of constitution, and, if any family disease exists, both may combine to transmit a tendency to the devclopment of this diseaso in an intensified form to their children

It was said above that both very early and late marriages are inadvisable. The same applies to the marriage of a young woman to an elderly man, or vice versa. Precisely what disparity of age is allowablo it is impossible to say. Many young women can be happy with husbands considerably older than theinselves, while to others life will be a continuous round of discontent. As a general rule, it is best that the wife should not be muoh older than the husband, and that the husband should not be more than 10 -at the most 15-years older than the wife.

The Marriage Settlement. When people of means are about to marry, it is usual for them to set aside a certain amount of property to make provision both for themselves and for the offspring of the marriage. This specially applies to people with landed property which has been in a family for some time.

The form of such settlements is as follows : Two or more trustees are appointed, one by the intended wife and one by the intended husband. A deed is drawn up to which the intended husband and wife and the trustees are parties. The intended husband conveys to the trustees or transfers to them whatever property ho intends to put in settlement, and the intended wife does the like. The deed directs the trustees to hold this property, until the marriage has been celebratel, for the intended husband and wife respectively ; and, after the marriage, to pay the income as directerl.

A Typical Example. Where the major part of the property is settled by the husband, it is usual for the income of it to be paid to him during his life, and, after his death, should he die before the wife, to pay part of the income to the wife. As to the capital, the husband is generally given a power to appoint it amongst the ohildren of the marriage in such proportions as he thinks fit, and if he does not do so, then his wife may, if she survives him; and if neither of them does so, then the ohildren of the marriage are to take cqually. The wife's property is settled on her in the same way, herself for life, then her husband for life, and then the ohildren as appointed.
The above describes an ordinary settlement of stocks, shares, and other invcsted moneys. In the case of land, however, it is different. The family estate is settled to be held by the trustees in trust for the husband for life, with an allowance to the wife; and, after the husband's death, a certain income or jointure is to be paid to the wife, a certain sum is to be paid to younger sons and to daughters when they attain the age of 21 or marry, and the land is to be held by the trustees in trust for the eldest son of the marriage in tail. This deed is called a family settlement.
A genuine marriage settlement, i.e. one made beforc and in contemplation of marriage, is a contract and conveyance for valuable consideration, because marriage is the most valuable of all considerations. Consequently, it cannot be attacked as fraudulent, i.e. as, putting property out of the reach of creditors, unless tho marriage itself was part of a scheme to defeat creditors.

If the husband who has made the marriage set tlement should go bankrupt, his trustee in
bankruptcy can seize lor the creditors his life interest in tho scttled lands or funds, but he cannot seize the land itself or upset the settlement on the ground that when the busband made it he was heavily in debt To this rule there is an exception. If a man and a woman get married on purpose so that the man can make a settlement of his property on the woman so as to put it out of their creditors' reach, the settlement can be upset as a fraudu lent conveyance. But this can only happen if both the man and the woman werc parties to the fraud.
The person who is to receive the rents and profits of the land through the trustees for his life is called the tenant for life, and has very extensive powers of management of the estate. Put briefly, he has power to deal with the cstate almost as if he were the absolute owner of it. He can grant leases of the property, he can sell it, all except the principal manor house and any heirlooms, and even these he can sell by leavo of the Court; but any capital moneys rcceived must always be paid over to tho trustces, who will invest them and only pay the income derived from them to the tenant for life.

MARRIAGE: The Card Game. This card game is suitable for two players. It is played with the piquet pack of 32 cards, i.e. all from the seven upwards, and is won by a game of 66 points. The values of the cards are as follows. The acc counts 11 points, the ten 10 points, the king 4 points. the queen 3, and the knave 2; the other three have no scoring value. Trumps are played in this game.

As in piquet and similar games, scoring is from cards in hand and from cards played. The scores for cards in hand are, for a marriage, i.e. king and queen of an ordinary suit, 2 points; and for a love, i.c. ace and ten of an ordinary suit, 30 points. For marriage and love in the trump suit these scores are doubled, i.e. 40 points and 60 points. In the outplay the counting cards played and taken give the score. Sixteen points arc added for the last trick taken, and 20 points if the last six tricks have been won by one hand alone.

The players cut for deal and the lower cut deals. He gives 6 cards to ench player and turns up the 13 th card to show the trump) suit. The remaining cards form a stock fron which the players draw. The play begins by the nondealer leading. The dealer can then, if he so wishes, play a card of another suit, as he nced neither follow suit nor trump. These two cards form a trick, and the winner of this trick leads in the following one.

The winner of a trick can now declare any marriage or love he may hold; if it is good it is scored at once. Each love and marriage must always be shown before scoring for them, and one card of the proved love or marriage cannot be played at once. The winner of the trick next draws the top card from the stock and the loser draws the one below it. This occurs after every trick until the stock is exhausted, so that during the earlier part of the outplay each player has six cards in hand.

Marriages and loves aan be made whenever convenient, but only by the winner of the trick immediately preceding. A declaration cannot be made after the stock is closed, nor after the first card of the eleventh trick is played. That is to say, during the last six trioks no declarations are valid. With equal loves or marriages the non-dealer or elder hand scores on declaration ; the other player does not.

A player holding the seven of trumps may exchange it for the turned-up card when it is his turn to draw, and as long as the stock remains unclosed or unexhausted. When a seven or the last card from the stock is drawn, it cannot be exchanged. After draving either player may declare the stock closed, and after that no player can draw a card from it. The one who closes it must thus win the game in
the outplay by completing if points; if he Drain them and remove the skins. Boil up steamer, add salt to taste, and cook them ails to do so hig opponent
even if he has not reached (i6 points and has a score lower than than of the closer.

MARRON GLACE. This aweetmeat consists of chestnuts preserved in sugar. To make them, procure some large chestnuts and remove the shells. Boil the chestnuts, putting them into boiling water, for about 15 min . ender but do not break them. Put them to cool, and make a syrup of 1 lb . sugar to pint water and boil to the temperature. of $290^{\circ} \mathrm{F}$. Take up the chestnuts with a pair of sweetmeat tongs and plunge them in the syrup, one at a time. Place the chestnuts on

## MarRow in Garden and Kitchen

## Its Cultivation and Some Attractive Recipes

After describing the growing of the marrow, our article gocs on to deal with various ways of cooking it. Sec also the article on Marmalade. For further information see Frame; Greenhouse; Hotbcd; Kitchen Garden: Manure; Pumpkin

The vegetable marrow, although regarderl serve vegetable marrow plain: Prepare it as a vegetable in cookery, is a fruit, like the tomato and the cucumber. It is a half-hardy annual trailing plant, with edible fruit.
There are numerous varieties of the vegetable marrow Of those with large fruits Long Green and Long White are favourites. Moore's Cream. Peny byd, Rotherside Orange, and Table Dainty are excellent small marrows. The bush and custard marrows are less vigorous in growth than the trailing varieties.
How to Cultivate. To grow good early marrows, the seeds should be sown under glass early in April in pots of light soil, in a greenhouse in which a temsperature of $50^{\circ}$ to $55^{\circ}$ inay be safely maintained. As soon as the plants are large enough to handle, they should be slifted into 6 in. pots. l lefore heing planted out of doors in May they should be hardened off. Marrows may be grown on turf heaps, even on a heap of garden rubbish, or on the


Marrow. Well-grown specimen of a green marrow. Top, right, a round marrow
ground level in manured soil. Three or four successional plantings may be made at intervals of a fortnight until the end of June, or seeds can be sown out of doors in May.

As soon as the leading shoots reach length of 18 in. to $2 . f \mathrm{ft}$. they should be pinched out, and case should be taken that the runners are trained evenly over the ground.

Feitilization should be carried out when the first of the femate hlooms make their appearance. This is done by stripping male Howers of their petals and applying the pollen to the centre of the female flowers.

If the marrows are wanted for preserving, they should be cut before they are ripe, and hung up in a dry room by the bases of their stenis. Marrows should alwnys be cut before they are fully ripe, for they are then of superior Havour. The young shoots of marrow plants, when thinning is desirable, form an excellent substitute for spinach.

How to Cook. When prepared as a vege table for table the marrow should be cut in halves or quartered, pared, and the seeds and pulp removed; but if intended for a made dish it is sometimes boiled whole, and after it is cold it is pared and sliced, as it remains firmer when treated in this manner. To
put in boiling salted water to cover it, and boil from $20-25 \mathrm{~min}$. Serve on pieces of toast with melted butter sauce poured over or handed round in a sauce boat
Marrows can also be baked. Prepare a good-sized marrow and cut it in two lengthwise, remove the seeds and parboil it for about 10 min . It should now be stuffed with a good veal forccmeat, Houred, and the two halves fastened together round the stuffing
 with white tape. Bake in a moderate oven about 20 min., basting it with plenty of good dripping and letting the marrow brown at the last Just before it is done strew brown crumbs over the top and baste them well. Serve with a good thick brown gravy poured round the base. Minced meat or ham may be added to the forcemeat.

Marrow can be added to fruit in pies and puddings or mixed with various ingredients and made into sweet dishes. In addition, marrows also make excellent preserve.

Cold cooked or parboiled marrow can be fried in butter or bacon fat and makes a good breakfast dish scrved with bacon.

Marrow au Gratin. Marrow aut gratin is prepared by peeling a marrow, splitting it into four, then removing the seeds and washing it. Put it into a saucepan of boiling water to which a little salt and soda have been added, and boil it gently for about 15 min ., or until it is tender. Nix $1 \frac{1}{2}$ oz. flour to a smooth paste with $\frac{1}{2}$ gill cold water, and put $-\frac{1}{2}$ gills milk to heat in a pan with 18 oz. butter, and pepper and salt to taste. When the latter are hot, pour on the llour and water, bring the whole to the boil, and then simmer it for 6 min., kecping it well stirred in the meantinie. Add 1 oz. grated checse. pile the marrow on a slice of toast placed in a gratin dish and pour the sallce over it. Sprinkle another ounce of grated cheesc on top, then put the whole under the grill and brown it slightly.

## Steamed Marrow

 Steamed marrow is served on toast and covered with egg sauce. Put the prepared pieces in a

Marrow Culture. 1. How to prepare a mound. 2. Seed sown in pot. 3. Seedling potted-on and ready for planting out. 4. Fruiting and non-fruiting blooms $a$, male : $b_{1}$ female. ${ }^{2}$. Plant in position: $a_{1}$, shelter in glass, $c$, weirat d, ventilating block. Artifial feeding : worsted taken through stem with ends in water
sherry and Madeirn, and is pale amber in served with soup or fish in place of sherry. and as a dessert wine. Sce Wine.

MARSH MALLOW : The Plant. This hardy biennial plant (Malva sylvestris), which grows wild in Britain, renches a height of nbout 2 ft . and hears reddish flowers in summer. The roots are thick, long and tapering They hend easily, are whitish. yellow outside, white and tibrous inside and a bound in mucilaginous juice. They are some. times used medicinally. The lenves of the herh should be picked and dried in August. See Hollyhock; Malva.
MARSH MALLOW: The Sweet. To malen lhis, dissolve 2 or. gum arabic in a $\}$ pint water. thell strain it. P'ut it into a small saucepan and add 4 oz. loaf sugar ; stir till melted, then hoil until a firm ball is obtained fron the syrup. To test it drop a little into cold water, rub it between the fingets, and if it forms a ball it is ready.

Remove it from the fire, Havour it with orange flower water, and work in the stiflly beaten whites of 1 large or 2 small eggs Spread this mixture out in a layer on a thick bed of confectioner's starch, which can be purchased at any large store. Cover it over with another layer of starch and leave it till next day. It should then be ready to cut into squares. Well dust the picces with starch and pack them away in airtight boxes

MARSH MARIGOLD. This decorative, water-loving plant grows about 1 ft . high, and bears yellow flowers in spring. The marsh marigolds arc useful plants for the sides of lakes, streams, and pools. Water may be allowed to llow on the roots, or may simply permeate the surrounding soil. The best month in which to plant them is October. Caltha palustris, 12 in., is the common yellow marsh inarigold, of which there arc several


Marsb Marigold. Clump of the rolden water plant which will grow in a damp corner of the garden
varieties. The finest of all is Caltha polypetala, 18 in., with rich yellow blooms. Marsh marigolds have creeping root-stocks and are increased by division in spring. See Marigold.
MARTEN: The Fur. Of the various kinds of fur obtained from the marten tribe, haun marten and atone marten are the best known. The finest of the baum marten skins are obtained from Norway, and are dark brown in colour. The tails, which are sometimes made to resemble sable tails, wear well, but in texture they nre coarser than sable.

Stone marten wears and looks almost as well
as banm marten, hut the tails are not ao good, and the skins have to be arranged in a special manner to obviate the marks caused by joins.

Fisher fur is obtained from another species of marten and, like baum and stone marten, is employral for making stoles, wraps, muffs, etc See Fisher Fur: Fur; Sable.

MARVEL OF PERU. This is the common name of Mirabilis jalapa. This herbaceons prennial is hardy only in well-drained soil in

mild districts ; in cold places, or heasy soil. the roots should he lifted in antumn and stored in boxes of soil under glass for the winter. It forms a busli about 2 ft . high and bears flowers of different colours on the saine plant. If seeds are sowll in a heated greenhouse in spring the seedlings will bloom in the summer of the same year.

MARZIPAN : The Sweetmeat. Marzipan is made from almond paste, coloured, shaperl, and llavoured in a variety of ways. Marzipan potatoes are made hy forming the almond paste, slightly Havoured, if liked, with vanilla, into the sliape of very small new potatoes. Mark a few cyes on each, and roll them in a little powdered chocolate.
To make cherries, colour the pastc with cochineal and roll it in the hands into little balls. Very thin strips of angelica will make the stalks. With careful sliaping, half-open pods of peas can he made with almond paste coloured with spinach green: apricots, with ralfron-coloured paste. Pastes coloured with cochineal and with saffron ate joined to make an rpple.

To make fruit marzipan, add, when making the nlmond paste, a tablespoonful of thick pulped fruit or jam to every lh. of sugar. Colour and flavour it as desired. When the paste is cool, roll it out to a thickness of ahout $f$ in., and ice it very thinly with royal icing. Cut it into any small shapes hefore the icing has quite set, and decorate each swect with a tiny silver ball, scrap of angelica, or small piece of blanched nut.
Dried French plums or good prunes and good quality dates can be aplit in half and stulfed with coloured, Invoured marzipan. Attractive sweets are also made by moulding a ball of coloured marzipan, and pressing on to ench sille of it a blanched almond, or half a walnut that has heen toasted for a minute or two in a moderately hot oven See Almond Paste : Chocolate: Icing

MASCARON Also known as a macaroon, this is the name of a raised ornament found on Venctian
glass and glass made in that style. It is a little bloh of glass on which the impression of a mask or face is stamped while loot The term is sometimes used when the design is a lloral or ot her ornament.

In furniture the mascaron is the figure of a face, either of man or animal, used as a centre feature in clecoration It is found in pieces of the time of William and Mary, and frequently on those made in the Louin XIS style. See Venetian Glass.

MASCOT. Anything given or acquired as a huck-bringer may be included under this term, from a tiny charm to the biass effigy on the front of a car. Copies in various materials of certain animals, such as a black cat, n pig (in bog oak the luck is supposed to be attracted when a leg of the mascot is broken off), or a blue bird; in gold or silver, the swastika (a (areck cross with each arm continued at right angles, the name meaning fortunnte), the sign of the zodiac or special setting of the stone for the birth month, the numbers 7,9 and 13 , various clarms in New Zealand greenstone and ligyptian scarals, are all favourite mascots.

Mascots for motor cars are made in Llass, or in brass or nickel, according to the inctal work of the car for which they are destined. 'fhose in glass ate designed so that they can he illuminated from within by means of a bulb and an electric switch. These mascots arc usually fitted to the homnet, and frequently screwed on to the top of the petrol tank. the actual method of fixing them varving with the make of the car.
The jacinth and amethyst are considered particularly lucky gems, while a black opal is said to bring fortune to an aitist if hought or found personallp, but not if reccived. A gold-mounted hare's foot or monkey's paw, a four-leaved shamrock, white heather, or a coin with a hole in it, onay be treasured as a talisman. The horseshoe "hen nailed up as a mascot must be turned with ends upward or the luck runs out. Grotesque animals or dolls come and go as fashionable mascots.

MASDEVALLIA. This orchid is suitable for cultivation in a glasshouse having a minimum temperature of 55 degrees. The plants must be potted in a compost of peat, orchid libre and splagimm moss, with sand and ernshed charcoal added. The compost must he kept reasonably moist throughout the year. When repoting hecomes necessary it should be done in February. I few of the hest kinds are Veitchiana, vermilion; ignea, reddish; and covarensis, white. Thare are many hybrids raised by crosy-hreeding between these and other suecies.
MASK. Any covering disguisc for the face, or upper part of the face, ivith openings for the cyea and, if necessary, for the mouth, is called in mask. These have been used from the carliest times of the theatre on the stage
Silk or satin half masks are worn at a masked ball, while the men and animal faces sold for the $3 t / 1$ of November and at Christmas time are bought by children for disguise and for fairy plays. Beautiful or grotesgue masks are


Mascaron. Left, cup with blue and white stripes, and gill bosses of lions' heads Right, bowl with spiral threadg, gilt masks, and small bosses $\mathrm{H}_{4}$ permission of the Director. Dictoria \& Alluert Museum. S. Kensinglon
executed in a great variety of innterials for wall decoration by oriental and other artists. The mask used in fencing is of iron netting with a padded frame fitting over the head and round the face to protect it from foil thrusts. See Fancy Dress.

MASK FLOWER. These lialf-hardy per ennials (Alonsoa) bear small, snapdragon-like flow rs in the summer time. They may be grown in pots under glass or be planted out for the summer. Propagation is by cuttings in a frame in August. The rose-red Alonson Warscewiczii is one of the slowiest. Tho plants nust be kept in a slightly heated greenlouse in winter.

MASONRY. The whole art and craft of working in stonc, from the rough shaping of the block to the completion of the finished product, is known as masonry. The term is also used to describe those prits of a structure which are built in stone. Stone being expensive material to build with, only the facing stones are generally squared up and worked to a fair face. The interior of the wall is made up with rough material, and the inner face lined with the faced stone, or with brickwork.
Masonry differs from brickwork in that generally the stones vary greatly in dimensions, and call for greater skill on the part of the operatives to get $n$ perfect bund. Walls made of stonc have to be considerably thicker than those of a similar height in brickwork. Exceptions are when the walls are built with conrsed stones properly squared and pointed, in which case the wallis may be thinner than in brickwork.

MASSAGE. Method of curing varions nuscular, nervous, and vascular maladics by rubbing, stroking, bnending, and otherwise treating the muscles with the hand. The four principal actions in massage are termed pétrissage, effleurage, friction, and tapotenient. Petrissage or kneading is done by pressing the palm of the hand into the museles, and grasping, kneading, rolling, and snueczing them by the thumb and fingers Fimeurage, or stroking, should be done with the pralm of the hand, which at the end of a stroke should glide back to the starting point. Friction is a circular movement done with the finger tips ol palm of tho hand. Tapotement is done by: the hands swinging from the wrists, and this movement should lie light, sharp, s!ninge, and vely rapid.

Anotlier livision of the movements in mats sage is asscciated with the Sivede, Peter Henry Ling He divided them into three: active, passive, and resistive. Passive movementsare done ly the operator, active movements by the patient himself Resistive muvements are done while the patient resists, or by the patient while resistance is supplied by the operator. These movements increase circulation.
The National Hospital, Quicen's Squars, London, W.C., gives a recognized certiticate. Students from other hospitals and achools must satisfy the examiners of the Chartered Socicty of Massage and Medical Gymmastics at Tavistock House (North), Tavistock Square, London, W.C.I.

MASTER : His Duties. The relation of master and scrvant is entered into by agrecnient. This need not be in writing unless the agreement is to be for more than a year from the day on which it is made. In agreement of service which does not state how long the service is to continue is supposed in English Inw to he for a year, but subject in practically every case to tensonahle or customary notice

In very many occupations there has grown up a customary period of notice. Thus, a domestic servant is entitled to give or receive a month's notice. The cditor of a newspaper by custom is entitlect to six montlis' notice. But most cases depend not on custom, but on
what is reasonable And what is reasumable depends upon the kind of service and the kind of engageinent.
Length of Notice. It may be stated, as a general principle, that the higher the class of service the longer notice has to he given on either side, and this is hecause it is always more difficult for a man in a higher grade of employment to get a job than it is tor a man in a lower grade, and it is also more difficult for the employer to procure a new servant of a higher grade than of a lower grade. Thus, an office boy would be entitled to $n$ week; $\Omega$ managing clerk to nt least a month. But as iudges and juries may take different views of what is reasonable, it is always wise in a contract of service to stipulate for n particular length of notice.

It is the servant's duty to serve faithfully. This implics an obligation not to disclose his master's secrets A servant who does this inay be restrained by injunction from continuing to disclose such recrets, and is also liable for damages. It is also a servant's duty to obey orders, so long as those orders are not unrensonable. It is the master's duty to pay his servant's wages punctually and without deduction; though in a few cases, by special ngreement, a master will be allowed to deduct penalties in the nature of fines for spoiled work, etc. A servant must be punctual; he must also he diligent, that is to say, he must work his hest and not be guilty of slacliness. If a servant, in carrying out his master's ortlers, incurs any liability, the master is bound to indeninify the servant against such liability.

A master is liable to outsiders for any act done by his servant within the scope of the employinent. This is a very wide phirase. It does not mean that the servant must have heen acting in obedience to express orders: in fact, the master may be liable under this doctrine although the servant was acting contrary to orders Suppose, for example, a tradesman employs a motor lorry in his busincss. and he tells the driver that whenever he is Iriving down the High Strect he is not to exceed a suced of 8 iniles an hour hecause of the traftic. In disregard of thesc orders, the man drives at twice that speed and negligently damages another vehicle The employer is. neverthciess, liable.
Liability for Wrong-doing. A minster may even he liable for his servant's fraul. This was held in a case where the manager of a bank stated in answer to an inquiry that X Y was a person of good substance to whom credit night be allowed, although at the time he knew that X Y was in very low water and could not mect his obligations. The bank was held liable for the fraud, because the statement was minde by their servant acting within the scope of his employment.
In the same way, a servant who is cmploved to make contracts binds his master within the scope of his employment. For instance, if 1 has a shop and he employs a man to manage it, and to do those things which manayers generally do, and he makes a contract such as a manager in the ordinary way would be entitled to nalie, A must corry out that contract or pray damages if it is broken. although he expressly told his manager not to make contracts of that particular kind

But if the person with whom the manager was dealing had notice that the mannger was not entitled to make that particular kind of contract, then A will not be linhle. It is for this reason that some firms print upon their Ietter pajer and other business documents, slich as invoices, a warning that no orders are to he accepted on bchalf of the lirm unless countersigned by one of the directors, or something of that sort Others give warning that no verbal orders for goods nic recognized.

The servant who is guilty of a wrongful act may himself be liable as well as his innster.

And where the servant, acting on his mnster's behalf, makes a contract in his own name or without disclosing that he is a servant, the person with whom he contracts may, on discovering that he made the contract as a servant, sue the master, or may elect to sue the servant personally. If so, then the servant has a right to be indemnified by the master

A inaster is not liable for any criminal offence committed by his servant unless he expressly authorized it or was in some way a party to it, in which case he can be convicted, sometimes as a principal and sometimes as aidling and abctting or as being an accessory before or after the fact. If the driver of a horse, being i . servant, is guilty of cruelt y to the horse, he alone is liable; hut if the cruclty consists in driving a liorse which was unfit to be out on the road or unfit to be employed to pull a load of such n weight, the inaster will also be linble if the horse was sent out with $h$ is knowledge or approval.
There are some statutes which make a master liable for offences committed by his servant. e.g. under the Licensing Acts. There are others which make the master liable in the tirst place, but with liberty to him to prove that the servant was really responsible and acted against orders; as, for example, certain ndulteration of fond prosccutions.
The Right to Dismiss. A servant who is dismissed without due notice may bring an action. The only ansiver to such on retion is that the servant has been guilty of misconduct. Disohedience to proper orders is good ground; in the case of domestic service, immorality is a good ground; dishonesty is sufficient; so is impudent hehaviour; so is persistent and gross neglect and inattention to work which is likely to cause serious loss to the employer; so is systematic unpunctuality. A slight breach of contract will not entitle the master to dismiss a servant without notice. The misconduct must he something which amounts to a repudiation by the servant of the proper relationship between them: that is to say, something like a fundamental breach of contract. Unless the contract of service says so, a servant cannot be dismised merely for being ill; but if the illness is of such a protracted nature or of such a kind ns to render the servant permanently unfit or unfit for a long perind to carry out his duties, the master may dismiss him.

If a servant has becn guilty of an offence which entitles the master to dismiss him instantly, the master must either do so or forfeit his right. For example, if the servant is guilty of impudence to his master on Wednesday, and the master says nothing ahout it until Saturday, which is pay-lay, and then on prying the wages tells the servant to go without notice because of the impudence of Werlnesday, the master is wrong. He ought on the Wednesday to say, "You are dismissed now, but if you like to renain to complete your week I will allow you to do so."
It sometimes happens that a master dismisses a servant sunmarily without justification, and after he had dismissed him discovers that the servant has bcen guilty of something which would have justified dismissal. If the servant brings an action for wrongful dismissal the master is entitled to rely for his defence ulon the second ground, of which he was not hware when he dismissed the servant. Sce Character: Employers' Liability ; Insurance ; Wortimen's Compensation.
MASTICATION. Unless food is thoroughly masticated, unnccessarily hard work is thrown on the digestive organs, and sooner or later indigestion results. Each mouthful should be chewed until it is Huid and frec from lumps. Eating solid food dry ensures more thorough mastication. Stareliy foods, such as hread and potatocs, should be well chewed. These
nie partly digested by the saliva in the mouth, and the more thoroughly the anliva is mixed with them the more easily will their digestion he completed in the intestine. Particular care should be taken with fat, cheese, hard-boiled egge, nuts, and other aubstances.

Children should be taught to masticate their fond thoroughly. Old people whose teeth are decayed should get artificial teeth, 0 ', as an alternative, they should have all food cut up very finely with a mincing machine; otherwisc digestive troubles, headaches, etc., will result See Diet; Food; Indigestion; Teeth.

MASTIC CEMENT. Brick, burnt clay, or limestone powdered and mixed with litharge, oil, or some similar substance makc what is known as mastic cement. It is used in constructional work for such details as bedding an iron casement into masonry, or the laying of a floor on a concrete or similar foundation. In making this cement care must be taken thoroughly to pulverize or grind the materials. If good resulta are required on fine work, the crushed material should be thoroughly sifted through a fine sieve. See Cement.

MASTIFF. Almost the oldest of British breeds is the mastiff, which is a most faithful custodian of home or person, and so powerful


Mastiff. A prizewinner of this lormidable English
breed of bouse dog
that no one dares to risk a fall with him. When carefully trained, he is not savage, but he should not be chained Mastiffs of tiro colours are bred, brindle and fawn.

The body is massive, broad, and deep, with strong lega set wide apart, giving the dog a square appearance. He should be of great size and weight, yet aetive when properly proportioned. The legs, both front and back, should be straight, that is to say, the hind legs should be parallel, but the hocks fairly well bent back. Back and loins should be wide and muscular. The head is broad between the ears; the muzzle short and broad under the eyes, and nearly parallel in width to the end of the nose. The mastiff is somewhat expensive to keep, needing plenty of meat and ample room. See Dog; Kennel.
MASTINE. This is a mixture used for staining wood. It is inade to imitate mahogany, rosewood, light oak, weathered oak, fumed oak, and antique nak. Of the nature of an oil stain, it may, if required, be thinned with turpentine. It can be obtained in tina (1 lb., 2 lb. , or 7 lb .) through any colourman. See Stain; Turpentine.
MASTITIS. In. flammation of the breast. or mastitis, is nisually due to the entrance of a microbe through an abrasion of thic nipple. The nipples should be kep scrupulously clean with soap and water, and may then be daubed

mat. Oval-sbaped mat made of rusnes, suitable for kitcnen or baturoom
with the following: Compound tincture of lavender, $1 \frac{1}{2}$ oz.: glycerin, l dram. If the nipple becomes fissured or abraded it should be washed with boracic acid lotion after nursing and then anointed with a paste consisting of equal parts of bismuth carbonate and castor oil.
If the breast becomes painful, hot, and swollen, the child should he withdrawn. Hot fomentations are applicd, and the bicast and the arm on the afficted side should be supported.

MASTODYNIA. The painful neuralgia of the breast known as mastodynia sometimes gives rise to a lumpy condition which may be mistaken for commencing cancer. A timcly consultation with a doctor will save a lot of worry. Commonly it is an affection of preg. nancy or of the period of suckling when the breast is overtaxed

MAT : For the Floor. Hall door mats should he of good quality fibre or they quickly wear down in use. Another important point is that they should fit the doorway or the sunk space often prosided for then inside the front door. Fibre centre mints are obtainable with wool borders in various colours.

For use on landings and in the hall outside the doors of various rooms if mats are required they should either match the stair carpet or be of a plain colour that tones with it, or of skin.
Mats for the bathroom may be of non-slip rubber in a wide range of colours, of coarse towelling, or of cork. In terry cloth they are patterned in good designs and all colours. Cork mats wear better if framed narrowly in wood.

For country cottage or bungalow use rush mats, or those in dyed coco fibre are suitable.
Wool mats can very easily be made at home in the same way as rugs. The necessary implements and materials are a gauge, a patent crochet hook, a pair of acisanrs, a piece of canvas and the wools. Charts in colour, giving suitable patterns for these mats, can be bought, or a pattern can be evolved or copied by the worker. Directions for making are given in the article on Rugs.

Making Rush Mats. Rush mats, suitable for bedrooms, kitchens, informal or bungalow living-rooms, loggias and bathrooms, can easily be made at home. The necessary rushes are sold in bundles, and all that is required besides is a packing needle and some atring. Before they are used the rushes should be soaked in water for 8 or 10 hours. They can be dyed to any shade required. Most mats, however, can be made chiefly of natural coloured rushes, coloured ones being only used for forming a pattern in the centre and for making the border.
The rushes should be plaited in strands, each strand consisting of three or more rushes, according to their size and the thickness of the mat. A mat such as is here illustrated is made by stitching the plaits together round
and round until they form an oval. The plaits may cither be sewn flat or edgeways, whichever is preferred.
To work the centre of the mat, take three small plaits, ane green, one natural, and ne brown. Stitch them closely together to form a zigzag pattern and, when a sufficient length has been made, bind the edges with a plait of rush in order to give the oval effect. The rest of the mat, save the border is of plain rushes, with the plait sewn edgewnys To join the rushes, put the hutt end of the new rush to the thin end of the other one. nnd plait it in ahout 4 in . from the end of the last rush. Such mats will wear better if the ends are plaited in and made neat. Any discoloured portions should be cut off. When colour is introduced care should be taken to have an even number of rows A break in the middle of a row shonld be avoided
Useful Hints. To prevent mata from curling'up at the corners, as they are apt to do after a few weeks' wear, turn them occasionally and use then upside down. In the casc of plain rope or hemp mats this can be done without any obvious change of effect, for the two sides are usually alike; but if they are decorative mats with coloured patterns some other method must he adopted. Weighting the corners is usually effective, but if this is done with coloured mats an oddment of material which harmonizes with the predominant shade is necessary. Cut the material into four small squares, turn them in neatly all round, then fold them into triangles and sew them on to the four corners of the mat, first inserting a tailor's lead weight in each corner. Take stitches right through the mat with a long darning needle, and sew firmly so that the weight will not strain the stitches.

Where mats are placed on linolemm the floor immediately heneath them should not be polished, otherwise they will slip when stepped on and may cause accidents. On carpeted lloors, in particular, dust quickly accumulates underneath mats, and for this reason the latter should always be removed when the carpet is swept.
Coloured mats which have faded may be nestored to brightness by washing them with warm, salted water, or with water to which a little vinegar has been added. If made of Indian matting they may also be scrubbed, rinsed well, and left in the open air or in a draughty place to dry. Stains which will not yield to ordinary treatment should be rubhed with benzine or washed with a solution of water and ammonia. Information about tahle mats may be found in the entries on Duchesse Cover, Luncheon Set, Table Mat. Sce also Embrodiery; Raffia; Rug.

MATCHBOARD. One of the most useful materials for the woodworker consisls of narrow, thin boards planed smooth on one side, grooved oll one erlge and tongued on the other. When a number of them are fitted together they form a fairly so!id. firm structure, and the interlocking effect of the tongued joint makes it draughtproof.
There are several varieties of this matrh. board; the ordinary kind is known as tongued, grooved, and beaded, as there is an ornamental bead worked on one side next to the tongue, thus breaking up the surface and offering scope for decorative effect. A plain matching is made without this beading, and when available is uscful when a large, smooth surface of timber is required Another tspe is known as tongued, grooved, and V-jointed, as the edges are bevelled, and when the bonrds are put together they exhibit a V-shaped groove at each joint.

Sizes vary from $3 \frac{1}{4} \mathrm{in}$. to 6 in . wide, $4 \frac{1}{2} \mathrm{in}$. being common. Thickness ranges from ${ }_{k}^{3}$ in. to $\frac{7}{7}$ in., the sizes commonly used being the $\frac{1}{2}$ in and $\overrightarrow{3}$ in. These sizes are nominal and actually measure slightly less, so that when


Matchboard. Showing how to use an odd piece o.
matchboard to drive other lengths up tightly
reckoning by the square-that is, sufficient timber normally to cover an area of 100 sq . ft . -it will be found necessary to add about 10 per cent.
Matchhoard 18 applied by nailing it to the wall or to thin brttens fixed firmly to the walls and packed up where necessary, so that the faces of all these strips are in line. The strips should run at right angles to tha direction of the joints between the boards and should be spaced not more than 2 ft . npart for the $\$$ in matchboard.

When erecting matchboard care should be taken to get the first piece fixed inght and true, as all the others will he affected. The sccond piece is driven home into the groove, as shown in the illustration, by means of $a$ mallet and an odd bit of the matchboard this being inserted into the groove or over the tongue to prevent the edge being spoiled by hammer marks. The tongue and groove is rather tender and should not be strained, nor should the hoands be allowed to lie nbout, as the edges are easily broken. See Bonrd.

MATELOTTE. This is a dish of fresh. water fish stewed in a savoury manner and accompanied by a matelotte sauce. Occasionally birds are cooked in the same way The fish should be all of one kind, and must be stewed gently in wine or stock well flavoured with wine. also one or two cerrots and onions are added to the stew, as well as some spice

After the fish is cooked strain the liquor and add to it $\frac{1}{2}$ pint rich brown sauce and 6 mushrooms, prepared and cut in pieres Let all boil up together, and then simmer very gently about 20 min., removing the scum as it rises. Strain this snuce and add $10 \%$ butter heaten with $\pi$ few drops of anchovy essence and a grate of nutmeg. Mix it well over the fire and sprinkle in a pinch of sugar. Serve the sauce poured over the fish.

## MATERNITY BENEFIT. In Great

 Britain, under the National Health Insurance scheme. this is a benefit prid to insured persons on the birth of a child. The amount is 40 s , pail to the wife of an insured man or to an insured woman on her confinement This henefit is payable after 42 weeks have elapsed since the man or woman became insured, provided that 42 weekly contributions have been paid. An insured married woman whose husk and is also insured is entitled to a double maternity benefit. See InsuranceMATTING. Woven rope, hemp, coconut fibre, etc., are employed to make matting, which differs frmm the ordinary doormat only in that the latter is cut to a certain size, while the former may be bought by the yard Narrow lengths of it are sometimes used to cover the floor of a hall or passage, while it is also frequently laid down during furniture removals to protect a polisherd Hoor from scratches, etc. In certain illnesses where
absolute quiet is essential to the patient's re covery, matting is sometimes laid down on any tiled or uncovered thoors near his room so that the sound of walking may be deadened, and in severe cases it may even have to be used on the pavement outside the house.

MATTOCK. 'The mattock is a too similar to a pickaxe but having two hroad hlades set in different planes Generally the blades take the form of an axe-like edge on one end and a chisel edge on the other. They are made of cast steel, the handle heing inserted in a hole near the centire of the tool
The mattock is used to loosen earth, grub out roots, and the like, the earth being turned up with the chisel end of the tool; any roots, such as would be found in grobbing operations can be cut with the axe end. The chisel end curves alightly inward to facilitate turning up the earth, while the axe end is formed practically at right angles to the helve, as in this position the tool can be used more offectively for cutting through obstructions

MATTRESS. Mattresses are divided into two principal types, top mattresses or overlays and under mattresses or mattress sup. ports The first type are of two kinds stuffed


Mattress. Fir. 1. Overlay mattress with part cu. away to show construction of spring centre encased in luxurious stufting of hair Courtes" of lleal \& Son
overlays of hair, wool and hair, or wool only. and inner spring mattresses. Mattress supports are of four kinds, ordinary woven wire springs, spiral springs in a wooden frame, hox


Fig. 2. Overlay mattress with pocketed springs ensuring resilience and comfort. The layer of hair stuming is cased in an envelope of material before being sewn into the mattress
Courtes, of Vi-Spring Products, Led

## Ther

The older kind of wire spring mattress is difficult to keep clean. Every week it should be brushed with a stiff, dry nailbrush, and the


FiR. 3. Support matress on wood irame for use on an existing bedstead with overlay mattress Courtesu of Staples \& Co.. Led
woodwork wiped with a damp cloth. In bar is repeated, beginning with the right warm weather the cloth should be moistened fo with disinfectant. Once a year the wire mattress should be taken apart by having all its bolts and screws unfastened. It should then be taken out of doors and pure carbolic poured round the holes where the bolts have been. This should be followed by an application of boiling water over the carbolic. The wire springs and the woodwork should then be scrubbed with a stiff nail-brush dipped into carbolic and water. The mattress should be left outside for some bours to become thorough!y dry
A wire mattress that has become rusty can be restored thus: Paint it all over with aluminium paint, using a small, pointed brush that will get inside the mesh See Bedding: Bedstead: Box Mattress; Cot; Divan.
Maxillaria. The culture of maxillaria. a family of hothouse orchids, is the same as that for masdevallia ( $q \cdot v$ ). See Orchid
MASINA. A sequence dance in common time, the maxina is composed of five parts The partners stand side by side facing the line of dance, the man's shoulder just behind the girl's, her left hand in his left, her right hand passing above her shoulder to take his right.
In the tirst part both glide the left foot forward and count 1. Then the right foot forward and count 2, the left again, counting 3, and the right, counting 4. The partners chassé to the left, commencing with the left foot and counting 1 and 2 ; then to the right, starting with the right foot and counting 3 and 4. The next step is to glide the left foot forward and count 1 , then the right and count 2. Both pivot round on the right foot, the girl turning under the hands, cross the left foot over the right and count 3, then point the right foot in front and count 4. The last

| MAT |  |  |
| :---: | :---: | :---: |
| What to do in the Garden |  |  |
| Flowers <br> Harden off summer | Fruit <br> Spray frult trees with | Vegetables <br> Sow rumer and French |
| dding planta | the polsonnus arsenate of |  |
| Plant half-hardy an- | lead or ant Insecticide to | Sow the malu crop of |
| nuala raised under glasa Plant anapdragons and | kill caterpillara Pinch off the ends |  |
| bonder chrysanthemums | viue shonta leaving only | potatoes |
| Prepare sites for | two leaves sbove the | I'repare trenches for |
| dahlias and tle hardy | bunch of grapes ${ }^{\text {Disbud }}$ peach trees by |  |
| border planta | gradually removing most | Sow Inttuce at fort- |
| Thin out the scedllings | of the young shoots. | nighty intervala |
| of liardy annuala | Leave one shont at the | Sow the rosette cole- |
| Lift apring bulbs from | base and anothicr at the |  |
| flower bella and plant on | top of each old branch |  |
| a reserve border | Mulch the soil round | franic |
| double clalay. <br> miganthus, | newly-planted fruit treea with manure | Sow vegetable marrow |
| and replant the nicees | Lay atraw betwe | ut of doors |
| Sow secda of Chinese | atrawberry planta | Thin out superfluous |
| primula and cineraria under glass | Water frult trees on walls in dry westher | secdilinge of onlon, carrot and other vegetablea |
| Food in Season |  |  |
| Bnag. Fish | Poultry \& Game | horseradish; lceks : |
| Bnas ; breatn ; brill ${ }^{\text {a }}$ ( | Capmur ; chlckens ; | lettuce; muslimoms ; |
|  | ducks and duckilings | onlons ; pcas: nota- |
| ers: gurnct; hake: | fowla ; goallnga ; guinea | tocs; radislica ; rea- |
| ers: gurnct; hake: <br> halibut: herring; ling mackerel: mullet | fowla : harea: orto- | le : sorrel : aninach; |
| mackerel; mullet: plalce: salmon: akate: amelt: sole; trout : | hens: ${ }^{\text {detarmigan }}$ ( pral- | watercreas |
|  | leta ; quall: rabblta: |  |
| turbot: whitcbalt: | rutta and reeves | ruit |
|  | Vexetables | Applea; bananas: |
| Crabs; craytiah ; lnbater ; prawns ; alirimpa | Artichokea aspar | derriea; flag ; goore: |
|  | gus: beana ; be | berries ; grapes; ${ }^{\text {com- }}$ |
|  | doons: rarruita |  |
| Beet ; inmb; mut. | Hower: cliervil; creas ; | pineapple: rhibarb : |
| ton; veal ; venison | cucumber; cndive; | atrawherrica (hothothe) |
| Notes for the Month |  |  |
| May 1.-May Day. Stock Exchangea closed |  |  |
| May 6.-Annlversary of the accession of George $V$ |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

The second part is simpler. Placing the left heel to the floor, both partners turning to the left, count 1 , then hop on the right foot and count 2. This is repeated 8 times until a complete circle has been made.
The movements in the third part are as follows: Glide the left foot forward and count 1, then the right, and at the same time dip. bending the knee, and count 2. Bring the left foot forward with the heel to the ground in front of the right foot and count 3. Close the right foot up to the left and count " and" Move the left to the rear with the toe to the floor and count 4. Repeat the movement.
Right and left glides are a feature of the fourth part. Glide the left foot forward, count 1: the right, count 2 ; then the left, count 3 The man closes right to left while the girl pivots round to face him, counting 4. In the fifth part both hold as for the fox trot, (q.v.), and two-step or waltz for 4 bars.

MAXIXE. Like most of the dances intro. duced from South America, the maxixe is danced in such a way that it can be done in long pampas grass. Thus, the feet point straight, the knees are kept a little bent and the legs, wherever possible, are kicked forward, rasing tho feet a little at the back to free them from the grass. The steps. on the whole, are kept small, the movement being taken from the knees and not from the hips, as in other dances, keeping the upper parts of the legs comparatively still. The foot is kept almost flat, with a slight dmp on to each step occupying more than one beat.
The figures may be done in almost any position. The dance usually starts in the waltz position, after which the couple may pass into an open position in which they face the same way. The arms need not be altered, but the man may take the girl's left in his right hand and either stretch it st raight out or turn it at her back, as in his original position. See Waltz.

MAY: The Tree. This is the popular name of hawthorn (Crataegus oxy. cantha). There are varieties with white and red. single and double flowers. Under the name of whitethorn or quick it is largely used for hedge planting. See Haw. thorn: Hedge

MAY BUG. The may bug, also known as the cockchafer. is a rather hulky looking brown bcetle, about 1 in. long and $\frac{1}{2}$. wide, coated with delicate down, the hind body tapering to a point bevond the wing-covers 'Towards the end of May or early in June the bectle may damage the foliage of treea; but it is in the larval atage that it is most harmful. The female deposits her whitish eggs in a batch of nearly 100 , a little
below the surface of
the soil, and the grubs for more than three yeara feed on the roots of grasa and herbaceous planta.

The visita of rooks and starlings to the lawn should be encouraged, as they hunt systematically for the grubs. and their powerful bills enable them to reach their prey. Failing this natural remedy,


Meg Bug of cockchater infested ground should be dressed with a mixture of nitrate of soda and soot, in the proportion of $\frac{1}{2} \mathrm{cwt}$. of nitrate to 7 bushcls of soot for $\frac{1}{2}$ acre of ground. See Insecticide.

MAY FLOWER. This is a hardy and cvergreen creeping shrub (Epiguea repens), which grows well in sandy peat if planted in a shady position, and bears fragrant white Howers in May Planting may be done during spring or autumn; propagation is by division of roots in October.

MAYONNAISE. This name is given to a sauce or salad dressing. The ingredients are : I yolk of egg. I gill salad nil, I teaspoonful dry


Mayonnaise Miyer fitted with
fannel from which olive oll can be mired in drop by drop mustard, tablespounful cream, $\frac{1}{2}$ teaapnonful cas. tor sugar, 2 teaspoonfuls tarragon vine. gar, 2 tea. spoonfuls white vinegar. salt and pepper. Mix together the dry ingredients and the egg yolk Whisk in, drop by drop, the salad oil, then the vinegara Add the cream last, and very grad. ually. Beat all the time with a slow, regular motion, always working in une direction. At the end add a dessert. spoonful of boiling water. It is essential for the success of the mayonnaise that the oil be added drop by drop and each drop mixed in thoroughly.
Mayonnaise sauce is used as a dressing for salads, with lobster, crab, chicken, salmon, etc., which are then known as lobster, crab, chicken, or salmon mayonnaise respectively.

## Mayonnalse Mixer. This is the name given

 to a contrivance which assists in preparing mayonnaise dressing for salads, etc. The ingredients are placed in a bowl, and a small funnel, which is attached, filled with olive oil. The oil then can be mixed in drop by drop. The mixer is worked by means of a handle. See Salad ; Salmon.MAZUS. This hardy herbaceous perennial of creeping growth is suitable for planting in gritty soil in the rock garden. Mazus pumilio and reptans, with purplish mauve flowers, are the species in cultivation. Propagation is by division in spring
MEAD : How to Make. Mead is a drink made with honey, Havoured with hops. To make it, add to each gallon of water 4 lb : honey. Boil together for \& hour, and akim it
well. Measure the liquid and allow 1 oz. hops to each gallon, then boil it upagain for $\frac{1}{2}$ hour, turn it into a wooden vessel, and stand it till the next day. It must now be put into a cask, and to each 4 gallons of mead add $\frac{1}{2}$ bottle of brandy. Iet it ferment, and when it has finished close the cask tightly and leare it to stand. In about cight months it will ber ready to bottle.

MEADOW RUE. This is an attractive hardy herbaccous perennial with ornamental leaves and flowers of various colours in summer. They llourish in ordinary well-drained soil The chief kinds are aquilegifolium. 3 ft., purple : Delavayi, $2!$ ft., mauve ; dipterocarpum, 5 ft., lavender rose: and glaucum, 5 ft., grey leaves and vellow flowers. Adiantifolium $\mathbf{g}$ in., with fern-like leaves, is suitable for the rock garden Propagation is by division of the planta in early autumn or spring or by sowing seeds under glass in autumn or spring

NEADOW SAFFRON. Theso heautiful hard y bulbs bear crocus.like blooms in autumn The leaves, which are very largo, do not appear until apring They should be planted in grass or arnong low growing evergreen plants so that the flowers are not spoilt by soil splashed up in rainy weather. The bulbs ought to be set 3 in. deep in July-August; they thrive best in well-drained loamy soil


Meadow Saffron. Purple crocus-like
flowers of Colchicum autumnale Colchicum autumnale, the common meadow saffron, has purplish blooms : the finest is spociosum with large rose-purple Howers. Pro. pagation is by ofisets which may be taken off the bulbs whenthe leaves have died down. or by seeds which are sown as soon as they are ripe.
MEADOW SWEET. This is the popular name of a wild plant, Spiren ulmarin. It hears cream-white fragrant llowers in early summer. See Spiraen.

MEAL. Meal, in one sense, means grain ground to powder. There are thus various Kinds of menl, e.g. barley meal, maize meal, oatmeal, and wheatmeal, although sometimes the word meal is dropped when referring to them. See Barley; Diet; Flour; Food; Oatmeal; Wheat.
Mealies. This is another name for maize meal or Indian corn. See Maize.

MEALY BUG. One of the most troublesome of the pests that damage fruit and plants cultivated under glass is the mealy bug. Its body is covered with a substance like meal, and is furnished with n number of waxy thread-like filaments, those at the tail end bring the longest. The larvae are hatched from a constant succession of egga, and soon settle down to suck the sap.

An elfective remedy is thorough cleansing of leaves and shoots with an insecticide, using a small brush or a sponge. Isolated bugs are beat dealt with by means of a brush dipped in methylated spirit or paraffin oil. See Insecticide.

MEASLES : How to Treat. Measles is an acute contagious disease which mostly attacks children, but sometimes occurs in later life. One attack is usually preventive of others. It is very infectious and generally spreads in epidemics in spring or nutumn. The cause is

most probably a microbe which has not yet been identified.

Infection is conveyed in the breath and saliva, from the skin if touched, and probably also by clothing and toys. Ibout 10 days after infection the disease begins suddenly, resembling a severe cold with sneezing, running at the nose and eves, and temperature up to $102^{\circ}$ or $103^{\circ}$. Three or four days later red spots appear on the nech, face and body and tiny rose-pink spots may be seen inside the mouth. The rash begins to fade after two or three days; there follows a desquamation of fine scales and convaléscence is rapid.
The chief danger with measles is to the lungs and
 respiratory paseages ; bronchitis often leads
to broncho pneumonia. Catarrhal laryngitis may occur before the eruption; as it may be due to concurrent diphtheris, the doctor should be told if a child suffering from measles becomes croupy. Inflammation of the ear may also occur.

Measics is intensely infections before the eruption appears, and when there is reason to think a child has become infected he should be isolnted at once. A large, airy top room is best. It should have a fireplace and should be kept at a moderate uniform temperature of about $65^{\circ}$, and the air should be moistened by menns of a bronchitis kettle sending steam into the rom. Moist air is necessary to soothe the irritable mucous membrane of the bronchial tuhics. Screens should be placed round the bed. The healthy children should be kept as far as possible from the sickroom, or sent to another house. The diet is that for fever. The child ahould be sponged all over with warm water every day Bronchopneumonia is the most serious complication, and requires constant medical attention.
The patient should not lenve bed until the temperature has been normal for seven days. A week later he may go out of doors if the weather be fine, but in cold wenther not for two or three weeks. The diet must be nutritious and digestible during convaleacence. Cream is a valunble food at this time, and it
is advisable to give cod liver oil for 8 or 10 weeks, with iron if there is annemia; chemical fond would be a suitable form.
The safeguarding of young and delicate children from infection is of great importance. Greater care in recognizing early stnges of the disease in older children and prompt isolation will be helpful. The things to watch for are n rise of temperature in the evening and swelling of the lining of the lower cyelid. II spots have appeared in the mouth it is too late, infection has probably been transmitted.
MEASUREMENT. This means the act and result of mensuring. Correct measurcmenta are necessary in order to make the various articles described in this work, and for many of these diagrams with ineasurements are given. With most of the woodworking articles a cutting list is supplied giving dimensions of the various pieces of wood required.
To measure the height of anything there is a simple method which most persons can put into operation. Take, for example, a flagataff. A certain distance, say. 40 ft., must be marked in a straight line from this, and a stick of a certain convenient length placed in the ground at the spot. The next step is for the measurer to go still farther away from the tree, still in a straight line, until, with his head on the ground, which must bo level, lie can sec the top of the stick and the top of the llagstaff in the same atraight line.

This apot should then he noted and carefully measured. In the present case we will assume that it is $t f:$, making the line from the flag. statif $4(\mathrm{ft}$. in all. These lines should give tivo imaginary triangles, as ahown in the diagram. All that now remains is to work out a sum in simple proportion. As the line $C F$, is to the line $\mathrm{D} C$, so is the line 13 E to tho line A 13 . which is wanted. In the example here taken it can be assumed that the length of the atick above the ground is 4 ft . The actual sum is : As 6 is to 4 , so is 46 to the answer.

$$
\frac{4 \times 46}{6}=\frac{184}{6}=30_{3}^{2}
$$

Thus, the height of the flagstaff is $30_{3}^{\frac{2}{2}} \mathrm{ft}$.
In actual practice calculations will usually be less simple than the one given, but the principles are exactly the same. See Centre to Centre; Drawing, etc.
MEAT: Food Value. Short-fibred meat, such as the breast of chicken and game, is more digestible than long.fibred varietics. In eating the latter-becf, mutton and veal-it is well to cut them in thin pieces across the fibres. Beef is probably best when the animals are about four or five years old. They are then more nourishing, bulk for bulk, than the fleah of younger animals. Veal is less digestible than beef. The fatter the meat, the less water it contains; hence the more economical it is for people with whom it agrees. But it is also less digestible.
The amount of water in meat is very large ; 1 lb . of average heef contains lb . of water and only $\ddagger \mathrm{lb}$. of nutritive matter. The same ap lies to lean mutton, lamb, veal, venison, fowl, hare, and pigeon. Pork is $\frac{3}{3}$ water and goose ${ }^{3}$. But very fat becf or mutton may be only $\frac{1}{2}$ water. Bacon contains very little water, only a hout \& of its weight. The calorific, or heatgiving, value of meat is very high. Too much meat enten in summer is inclined to overhent the blood

Beef and mutton are more digestible when under-cooked, but lamb, veal, and pork are unpalatable and unwholesome unless well cooked. Roasted meat is less digestible than boiled. The roasting or baking of nient leads, however, to the development of appetizing substances "hich are included under the name of osinazone. These stimulate the flow of
gastric juice. The plan of stewing meat in an inner vessel within that in which the water is boiling has everything to recomenend it. Casserole cooking is perhaps the best and most economical metliod of cooking meat, as the meat is cooked in its own juices, which are served up with it. Thus nothing is lost. On account of the high temperature at which meat is cooked in frying it is less digestible than when cooked by other methods. All meat becomes morc tender by hanging for some time, but it is not desirable to let it hang ton long and allow putrefactive changes to develop. Freshly killed meat requires more time to cook than meat that has been well hung.

Hints on the choosing of meat are given under the headings for the various kindsbeef, mutton, veal, pork, etc.-in this work.
It is most essential that meat directly it comes from the butcher should be thoroughly examined and at once put a way in a cool, well. ventilated larder, also that in summertime careful observation should be made that no blow fly has had access to it.

Poisoning by Meat. The symptoms of meat poisoning come on about thrce or four hours after taking food, and are usually due to eating pork pies, sausages, or cold pork which has begun to putrefy, or which has been kept in a hadly ventilated and unclean larder. In rare instances it takes the form of hotulism.

It is gencrally well to give an emetic of a tahlespoonful of mustard in half a pint of warm whter if vomiting has not yet occurred. This should be followed by a full dose of Epsom salts, according to the patient's age For faintness or collapse brandy or other stimulant may be given, and hot-water bottles should he placed ahout the patient. For severe pains put a hot linseed poultice to the abdomen. A doctor should be sent for at once.

Meat Extract. Extracts of different meats may be bought in hottles of varying sizes, and are used ns stimulants or in the preparation of soups and gravies.
Meat Jelly. Jelly is extracted from the boncs, gristle, and sinews of meat. To produce a jelly of any strength the bones are chopped in pieces and must not have been previously conked. The boiling inust be gentle and continuous for from 8 to 12 hours, and the scum must be carefully removed.

Knuckle of veal or mutton, also the feet, make excellent jelly, and one which, having little flavour in itself, can be readily adapted cither for a s weet dish or a savoury jelly. Ox feet produce a very strong jelly, but not so delicate as calf's feet. Cow hicel is obtained usually from the tripe-dresser's, and has already been boiled; but a good jelly for mixing with milk or other ingredients is ohtained from it.

Although meat jellies have little actual food value in themselves, it is possible to mix with them meat which has been cooked, pounded, and passed through a sieve, and either introduce it in the form of amall shapes set in the jelly, or let it mingle with it and give a marbled appearance Pieces of chicken or other delicate meat can be set in meat jelly, and the moulds may be decorated with leaves of aspic jelly and butter put through a forcer.
Meat Pie. There are two kinds of meat pies, those which are baked in pic-dishes, where the meat is covered over the top with pastry, and raised pies, where the meat is cntirely enclosed in paste.
For the pie made in a piedish almost any kind of meat, poultry or game will serve, pork excepted. The pastry covering consists of puff, rough puff, or flaky paste, but it is made with a larger proportion of fat than is considered necessury for most fruit pies. Meat pies are baked from $1 \frac{1}{2}$ to $2 \frac{1}{2}$ hours, according to size, therefore the crust must be rich with
fat or it will become dry during the process of rooking.

The best meat to use for pies is that in which the fat is not superabundant, and all skin and gristle must be left out when cutting it up. In the case of poultry or game whole joints are Inid in the pie-dish, but when butcher's meat is used strips or slices are cut and no hone left.
'To enrich the gravy of poultry or ganie pies, a layer of steak pieces is laid at the hottom of the dish. Flavouringa used are in accordance with the character of the meat They mny consist of shallots, parsley, herhs, mushrooms, oysters, forcemeat balls or hard-boiled eggs Slices or dice of ham or bacon may be arlded with advantage.

The raised pic is made with hot-water crust This crust, being very short, must be kept only warm enough to mould, and is always better for lying covered up with a thick cloth for some hours before it is made up. For raised pies generally pork or veal is required. Instructions for making these will be found under the headings Pork and Veal See alsn Bacon; Botulism; Beef; Iiet; Food : Game; Laınb: Mutton; Pastry; etc

MEAT SAFE. Whether the housewife possesses a refrigerator or not the meat snfe is an important item of furniture in the kitchen This is particularly the case where larder accommodation is limited. No hot food should be placed in the refrigerator, so that a zinclined meat safe with ventilation regulator in which food may be put to cool is a great asset. In a small larder it is alsu often clesirable to kecp meat separate from other dishes and foods.
The newer models have table tops of white porcelain enamel, or in sorne cases of chromium plate. These have all the advantages of $n$ safe and table combined and are constructed on hygienic principles with washable galvanized interiors In some of these safes. sliding, galvanized steel-lined trays for smaller articles of perishable foods are provided. The tinish of the safe is in enamel to match the wood. work of the kitchen, or in oak, and it is mounted on pivot bearing castors, so that when in use as a table it can be easily moved to a convenient position for pastry making or other culinary preparation.

Meat safes form a part of some kitchen cabinets which are provided with a cupboard lined with galvanized stecl for this purpose and properly ventilated. Small enamelled tin meat safes with panels of perforated zinc or iron wire gauze in the door and sides are also useful in the small kitchen as they take up little space and can be lixed to the wall. See Kitchen: Larder.

## MECONOPSIS. This is a biennial and

 perennial herbaceous plant of great heauty. It comes chiefly from China and other far Eastern countrics, and some of them have flowers of most exquisite blue colour. ing. The Welsh poppy (Meconopsis cambrica) with orange or yellow flowers is an excel. lent plant for a shady wall or for shady crevices in the rock garden and often sows itself freely, hut the exotic kinds require rather apecial treatment. They need shade and well drainedthough deep moist soil of peat and loam.Aculeata, hlue ; integrifolia, yellow;


Meconopsis. Flower spike of the Himalayan poppy

Wallichii, hlue: and Baileyi, blue, have flowers of ex quisite beaut These are biennials, raised each year from sceds sown in boxes of fine soil in a framein May. If the secdlings are planted out in autumnthey should be protected from excessive rains in winter by pieces of glass raised a few inches a bove them. Meco nopsis regia, from Nepaul, which hears large prim-rose-coloured
flowers, is the latest novelty in this group
MEDICAGO. Of the large fanily of creeping plants bearing the name of medicago only one is worthy of cultivation in ordinary gardens. This is the Calvary clover (Medicago echinus), an annual raised from seeds sown under glass in April. Its yellow Howers are borne in summer, and are succceded by quaintly twisted legumes. It is generally grown as a pot plant in a sunny window in a mixture of loam. leaf-mould, and some old mortar
MEDICINE: How to Give. The follow ing are important rules to be obscrved care fully in administering all medicines

Read the label every time before pouring out, and again after pouring out, the medicine Never give medicine in the dark. Shake the bot tle, even if not so directed.

Use a graduated measure always; spoons and wineglasses vary. If ininims are ordered. measure them in a minim-glass ; drops of some liquids are twice as large as drops of others. Never guess at a dose.

When pouring out, keep the labelled side upwarl. When dropping a medicine, first wet the lip of the hottle with water Give medicines, especially cod liver oil, out of jerfectly clean smons, glasses, etc.

If ordered to take medicine before or after meals, takic it 20 to 30 min . before or after: unless otherwise directed. To dull the sense of taste when taking nauseous medicine, put a little ice or peppermint in the mouth, or chew a piece of orange-prel. Castor oil is most easily taken in coffee, orange juice, grape juice, or effervescing lemonade. U'npleasant powilers should be given in wafer papers, purchas able at the chemist's. A pill is most easily swallowed if the head be bent forward.

In giving medicine to a resisting child, first try firm persuasion, then bribery. If these fail, hold the nose and put the spoon far back into the mouth The child's arms can be held to the hody with a towel. (See Dosage).
Medicine Case A small medicine case holding some of the most useful of ordinary medi cincs is carried by many travellers. The one illustrated can easily be carried in the pocket. The case is of leather, and inside are
six small bottles containing medicines that are useful to ward off a cold, or in case of
sudden illness. The medicines usually carried in cases of this kind include quinine aspirin, and sal volatile. See First Aid

MEDLAR. This summer - leafing trec, Pyrus (mespilus) germanica, is valued for the sake of its white llowers in spring and for its curious fruits in autunin. though these are liked by few. Medlars nust be left on the tree as late as possible and then stored until they are "bletted" or have become slightly soft The tree thrives best in rather moist but well drained loamy soil and should be planted in autumn. It is propagated by grafting on stocks of pear quince or white thorn and makes an attractive lawn tree. The Dutch and Nottingham are the best varicties.
Uses in Cookery. When gathered, medlars should be atored in a cool place until the early stages of decay are manifest They are some.


Medlar, showine the curious shape of the brown fruit
times employed as dessert fruit, but are more often used for making jams and jellies.
Mediar cheese is inade by cooking some medlars until they are tender in a covered jar placed in a saucepan of water, then rubbing them through a tine sieve and adding $\frac{1}{2} \mathrm{Ib}$ lump sugar and a teasponiful of allapice to every lb . of pulp. When the sugar has dissolved boil the whole steadily until it sets firmly

Medlar Jam. Medlars must be quite ripe and enft before they are used for jam. Wipe them with a cloth and put them in a preserving pian, just covering them with water. Stir then frequently while they simmer beside the tire for $30-35 \mathrm{~min}$., or until they split. Pass the pulp thmugh a rather coarse sieve, but line enough to retain the seeds, and put it back in the pan with the grated rind and juice of a lemon and just under l lb. sugar to every lb. of fruit. The fruit should be weighed for this purpose before it is put into the preserving pian.

Boil the jam fast for $30-45 \mathrm{~min}$., stirring and akimiming constantly. When a little scts when dropped on a cold plate pour the jam into dry warmed jars and tie down at once.

Medlar Jelly. To make this preserve, put the ripe fruit in a stewpan and just cover it with water, adding to every 40 medlars the rind and juice of a lemon. When this has simmered for about 40 min ., and all the fruit
has broken, pour it into a jelly-bag and at rain out the juice without any pressure To every pint of juice add 1 lb sugar, and then boil it in the stewpan for about $1 \frac{1}{2}$ hours, until it sets when tested It will need frequent stirring and skimming Pour the jelly into dry warmed jars and tic them down inmediately See Jaın ; Jelly

MEDOC. No Bordeaux wine is entitled to the name Médoc except that made from grapes grown in the Médoc, a strip of land on the left bank of the Gironde Some of the famous wines of the Médoc are St. Julien, St. Estephe, Pauillac. St Iaurent Cantenac and Margaux See Bordeaux; Wine.

MELANCHOLIA. In the form of insanity known as melancholia there is extreme mental depression. the low state of the feelings being associated with mental pain or distress Delusions tend to develop. There is a grave risk of suicidal attempts in melancholia and in thi depressed states which border on it. Such cases, therefore, require most carcful supervision, and this usually means that tho patient ought to be in an asylum See Insanity; Lunatic.
MELIANTHUS. This is a half-hardy bushy plant, 4 ft. or so high, which has graceful decorative leaves and reddish-brown llowers. The two kinds grown are major and minor, the former being the more valuable. In a horder and at the foot of a sunny wall melianthus is hardy in mild districts, but in other places the roots should be protected in autumn Propagation is by cuttings in August, or by seeds sown in early spring under glass.

MELOCACTUS. The melocactus is a species of cactus known by various popular names, including melon cactus, pope's head, Turk's cap, and melon thistle. It has spiny, ribhed stems, topped by a sort of cylindrical cap, which gives the plant a curious appearance. Being a succulent greenhouse perennial, it requires a sunny position under glass, and a minimum winter temperature of about $45^{\circ}$. The plants need little water between nutumn and spring.

MELON. Unlike other popular fruits, the melon can be raised from seed, but it is not hardy, and with one or two exceptions the varieties require heated houses and a temperature of $65^{\circ}$ or $75^{\circ}$. The season is gencrally from May to October.

How to Grow. As melons love heat and moisture it is customary to grow them in pits, which are half-sunk structures with low walls, sometimes lean-to's, sometimes span-roofs, with brick-encased beds, not as a rule more than 2 ft . below the glass at the front.

When a plant is carrying several fruits, it is desirable to support them with netting.

For melons in hotbed frames less atmospheric moisture is desirable, because there is greater danger of stem canker. Syringing once a day suffices. Ventilation should be practised in fine weather. A piece of tile or slate should be placed under each fruit so as to keep it off the soil. Seeds should be sown singly


Melon cut apen and seeds remaved in order to show the depth of the flesh
in small pots of loasyy soil in spring, and when the secdlings are well rooted they should be planted in mounds of loamy (turfy) soil set about 3 ft . apart on a hotbed made up in a frame or glasshouse When the plants reach the trellis fixed beneath the roof of the Iatter their tops should be pinched off to cause them to form side shoots on which male and female llowers will be horne

An important detail of cultivation is to pollinate several blooms at the saine time by transferring the pollen from the male or staminate bloons to the female or pistillate blooms: if pollination is carried out on different days the early fruits will develop fully but the others will be small. As the ronts push through the mounds of soil fresh loam must be added. 'To prevent the trellis becoming overcrowded with leaves the ends of the shoots must be pinched off at two or threc leaves beyond the fruits.

Some of the hest varietics for the glasshouse are Superintive. Enstnor Castle Emerald, Gein, and King Gcorge. For cultivation in a frame Hero of Lockinge and Little Heath arc suitable varieties.

Table Uses. In addition to its uses as dessert. melon is also frequently served as hors d'oeuvres. For this purpose it should be very cold, and is best placed on ice for some little time before it is served, together with sugar. pepuer, and salt. Melon is also served as a cocktail made by peeling it when just ripe, removing the pips, and cutting the fruit into


Melon Culture. 1. How to sow seed. 2. Seedling ready for repotting. 3. Plant repotted. 4. Position on mounds in trames. 5 and $\theta$. Other methods of planting. 7. Male flower. 8. Female flower. 8. Male prepared for lertilizing. ing. 7. Male flower. 10. Pollination of female bloom
sundae or custarl glasses, partly fill then with the diced melon, and then add a aprinkling of castor sugar and a little kirsch and maraschino mixed. Only a few drops of liqueur must be used, otherwise the delicacy of the dish will be lost. Stand the glasses on ice before serving them on small plates.

Melon Pickle. To make melon pickle, pare off the outer rind of a melon hefore it is quite ripe, remove the seeds and pith, and cut into cubes Put them in an earthen vessel, cover with good vinegar, and let then remain for 10 days, then pour all into a saucepan and simmer gently until they are tender. Drain them, lay them on a hair sicve, and when
cold insert a clove in each. Place the cules once more in an earthen ressel, and pour over them a cold syrup made with sugar and water let it run off them a little, then put them into pickle-jars cover them with vinegar which has lieen boiled and allowed to go cold: cover the jars securely. This pickle is good with roast meats See Greenhouse

MELTON: The Cloth. An old-fashioned woollen cloth excellent for overcuatings, melton is impervious to wind pressure. Usually plain in colour, it can be recognized by its rather sharp touch. In course of finishing the cloth a nap is teased out of it, and this is cut short, leaving upright ends of wool tibie

## Mending: A Domestic Necessity

How to Cope with Wear and Tear in the Home

## Further information about this Imporant feature of rood housekeeping will he found under such headings as Darning: Lace: Linen: Patching, etc.

A well-equipped mending hasket is exsential for cconomy in the household. A good selection of nendles, cottons, silk threads and darning materiala should be stocked, with various widths of elast ic in black and white, tapee and bias bindings. Besides the usual cards of linen and pearl buttons an asset for the mender is a glass bottle with a wide neck into which odd buttons are dropped It can be seen at once whether buttons required are in atock. A large rafety-pin should be kept, and on this are strung loose hooks and cyes Reels of cotton can be strung on a cord or ribhon. A small magnet on a long length of tape is useful to pick up needles which are dropped on the lloor. Pieces of material left over after making garments or other articles should be tied up and kept in a muslin bag for mending pur joses
Nothing that requires mending ought to go to the laundry. If there is not time to mend the holes neatly, then the torn edges can be drawn together with coloured cotton temporarily. Before clean articles arc put awny they should be gone over, and any that require buttons. tapes, or other mending put on one side.
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floss, and an embioidery ring or hoop is a help in darning large articles. It is also possible to darn household linen and towels on the sewing machine. The foot of the machine should be removed, and the worn place slipped into an embroidery hoop and this placeri underneath the needle. The machine is worked so that lines of stitching are made backwards and forwards over the worn part. The hoop is then turned round and sewing continued in the other direction till the darn is completed.

Whien shicets become worn in the centre, they can be cut down the middle and the raw eiges hemined. The sides should be seamed together so that the little worn parta are in the middle and the worn portion is at the outside When this process has been carried out and the shect again becomes wom, the unworn parts can be made into slipa for under. neath the pillow cases, or into holster cases.

Mending. Fig. 1. How a darn can be made in damask by imitating the design : above, right, preliminary stage in darning a cross cut in damask. Fig. 2. Mending a hole in fine woven materlal by placing a piece of net beneath it and darning over it. Fig. 3. Reatoring atocking web by counterleiting the material ; this is known as rémaillage. Fig. A. Repairing a hola in a
kid glove with buttonhole stitch in silk of the same colour
can be male into table napkins or into centres for round table mats by cutting them to the desired size and neatly trimming the edgea with suitable crochet or lace. larger pieces niay be used as tray cloths or side. hoard runners and trimned in the same way. Towels that cannot be mended again make useful face clothe. dish cloths, or polishing cloths.

Patching and Darning. Daming a damask cloth or napkin requires patience if, instead of the usual lattice work, the design is copied. Fig. I illustratcs how a simple pattern can be copied The lengthwny threads are made in the same way ra those of an ordinary dnrn, but the cross threads are interlaced to forin a pattern The number of threads lifted or mised depends unon the web to be imitated. A croan cut on damask can be darned by commencing, as also shown in Fig. I, on the wrong side of the material and the needle and cotion prased alternately over and under the edges of the cut till they nieet 'These stitcher inust not be removed when this preliminary darning ia finished, but are darned across in the usual way on the lines of the threal of the damask, using a finer thread than that of the material and extending the darn well beyond the cut.

Men's underwear can be strengthened by asving portions of similar worn-out garments and making a double thickness on the new garment where it is most likely to get worn In patching garments it will be found a help if a thick pal of newspaper is placed under the part to be patched, is this aids in keeping the material in posilion.

In mending a worn place on fine underwear a piece of net should be placed on the wrong side under the worn place and the darn carried out over this foundation, as shown in Fig. 2. This inethod is useful when a blause of fine lace or geargette is to be mended. In mending a drawir-thread tea cloth a piece of net will also be found a help. The net should be tacked round the worn place on the wrong side and the broken threads sewn on to the net in position.

It will be possible to draw the threads, with the help of a needle threaded with strong cotton, up to the edges of the cloth, nnd if the work is not very worn it is possible to mend almost invisibly over the foundation of the net. A net patch also makes a good foundation for darning a cotton or silk stocking. 'I'he net should be tacked on the wrong side and cut away round the dan! when the lask is finished. For very fine silk stockings old veiling is excellent as a foundation material for a darn. To restore otooking wel, the material can be counterfcited by rémaillage, as shown in Fig. 3. Note setting of warp threada and the working of the weft with the needle. 'l'he stitch is hrought up through the loop and between two strands and passed under two strands, as shown in Fig. 3.
'l'o mend a tear in a I weed or woollen suit, strands of the wool should be unravelled from the seams on the wrong side. The garment sliould then be stretched over a pad of white
paper and tacked loosely into yosition, the wrong side being uppermost. If the tear is jagged or threc-cornered, it should be drawn into position with a coloured thread. Now darn the torn edges closely together with the strand of wool, and continue taking fresh lengths of wool as they are required until the darn is completed. This is called invisible mending.
'l'o mend a jagged tear, buttonhole round the torn edges with silk as nearly as possible the same colour as the material. On the wrong side draw the silk threads of the buttonholing together firmly, and press with a warin iron over a damp cloth.
Mending Gloves. Kid gloves that have become worn at the tips or at the bottom of the seams can be mended by buttonholing round the worn parts with silk twist of the same colour. Turn the glove inside out and cut away the kid that is worn. Doa row of buttonholing all round the edges, then a second row of buttonholing, slipping the neodle into the first row. Continue this, drawing up the hole until it is filled. Turn the glove right side out. When suede or chamois gloves wear into holes they are more successfully mended by patching. Old gloves should be kept for this purpose. The patch should be neatly sewn in with silk on the wrong side.
A jagged tear in a mackintosh can be repaired by placing the tear flat down on a table, wrong side out, and pressing the edges together under strips of sticking plaster. A rubber mackintosh can be patched if a suitable piece of patching material can be procured by using rubber solution that is, sold for mending bicycle punctures.
Carpet Mending. To mend a carpet, turn it on the wrong side and lay the torn pieces in position. Buttonhole each edge with carpet flax, then draw the two edges together by means of the double row of buttonholing. If there is a considerable worn area around the tear, the carpet should be slit down and a strip, taking in the worn part, cut away. The pattern should then be carefully matched, the carpet reversed, and the join carried out as directed above, by means of buttonholing. If a carpet is worn in the centre, it can have its period of usefulness considerably extended by cutting it down and placing sides to middle. To mend linoleum, first mark out in chalk the worn part. Cut it out with a sharp knife, then lay this pattern on the new piece that is to be used for mending, and cut it out. If the linoleum is patterned, care must be taken that the patch exactly corresponds in pattern to that which it is required to replace. Glue round the edges and underneath the new piece and fit this exactly into the space in the linoleum. Press it down into position and leave it to dry. Further information about mending articles in common household use will be found under the headings Boot Repairing; Chair ; Crockery ; Glass ; Soldering.

MENINGITIS. Intiammation of the meninges or membranes covering the brain and the spinal cord is known as meningitis, and there are several kinds.

Tubercular meningitis is most common in children between 2 and 7 years of age. It accompanies tuberculosis of other parts, and sometimes follows measles, whooping cough, or a fall. The most marked symptoms at first are intense headache, sickness, chills, and the child often utters a short, piercing cry. In all varieties of the disease treatment must be in the hands of the doctor.

## Menopause. See Change of Life.

MISNSTRUATION. The monthly flow of blood mized with other fluids which is known as menstruation or courses begins with girls at puberty, and only ceases with the change of life. Usually the age at which it commences is from 13 to 15. At first there may be irregu-
larity, but as a rule this is of no consequence The discharge continues for 3 to 5 days, and should recur every 28 days. If it is exces. sive or there is much pain a doctor should be consulted immediately.
When menstruation occurs a girl should be careful to guard against chills and should avoid fatigue or any games that involve violent exercise. She will also be advised to keep away from dances and theatres, or any placo where the air is likely to be hot and impure, and she must not touch alcohol By attention to these points the length and the amount of the discharge will probably be lessened on future oocasions. Baths, provided they are not cold, can be taken with impunity.
A great deal of ill-health in after-life reaults from neglect of proper precautions at the time when menstruation commences. Girls are seldom warned beforehand of what they are to expect, with the consequence that many suffer from serious nervous shock. This is particu larly the case when children are away from home in a boarding-school, and are too shy to speak of the occurrence. In these circumstances, and very often even in their homes, they may receive no special care.

It is therefore of the greatest imporlance that mothers should understand how this function affects the health of young girls, and
should see that proper precautions are taken.
Most healthy women are able to perform their domestic duties as usual during the period, but they should be careful to avoid any strain as, for instance, in running upstairs or moving furniture.

MIFNTHOL : Medical Uses. By cooling oil of peppermint a crystalline substance is obtained which is known as menthol or mint camphor. In medicine menthol is often used externally as a local anaesthetic, particularly in neuralgic conditions, because of the sensation of numbness and coolness it imparts when applied to the skin. For this purpose an alcoholic menthol solution may be applied by a brush, or the official plaster of menthol may be used, or the menthol in the solid form may be rubbed lightly on the skin.

The application of menthol may also be of great use in itching skin complaints. It is often used to relieve some forms of nassal obstruction, and in deafness due to catarrh of the Fustachian tubes. For this purpose a small quantity of an ointment consisting of 5 grains or more of menthol in 1 oz . of vaseline may be put into each nostril. This ointment should not be put into the nose of an infant.

MONU. The French phrase menu d'un repar means the particulars or details of a meal or entertainment. A menu, therefore, is the whole of the dishes served at a meal, and the menu card is the card that contains particulars of each dish.

Many of the dishes that find a place on a menu retain their French names, and a knowledge of French cookery terms is necessary in order to make a selection from among them. The main groups into which the foods fall are as follows :

## Demsert $=$ dcssert

Legume $=$ vegetable
Potake, Pure, or Consommé $=$ thick or clear soups Vlande $=$ meat

## Volallle $=$ poultry

Hors d'oeuvres is the name given to dishcs served in small quantities at the beginning of a meal as appetizers. Grape fruit and melons are often useni. Entrées are served after the fish.

French Names for Foods. The French and English names of the various foods are as follow :
Abricuts = apricots
Agneau = lainb Ananas = pineapple Anchois $=$ anchovy

Artichaut $=$ artichoke Asperges = asparagus Betterave $=$ bectroot

| Cabllaud $=$ cod | Maquereau = mackerel |
| :---: | :---: |
| Café = coffee | Merlan $=$ whiting |
| Canard = duck | Mouton $\sim$ mutton |
| Cerises - cherrles | Nolsettes $=$ hazel nuts |
| Choutleur = cauliflower | Noix $=$ nuts |
| Choux de Bruxclles - | Oeufs - eggs |
| Brusscla sprouts | Oie - koose |
| Crevettes $=$ prawns | Oignon - onion |
| Epinard - spinach | Paté - pic |
| Falsan = phcasant | Perdrix - partridge |
| Fole = liver | Petitspois - green peas |
| Fralses - strawberries | Plle - plaice |
| Framboises - raspberrics | Poircaux - lecks |
| Gateau = cakc | Poires $=$ pears |
| Glbicr - game | Pommes = apples |
| Gigot $=$ leg of mutton | l'omines de terre $=$ pota- |
| Glace = ice |  |
| Hareng $=$ herring | Poulct - chicken |
| Haricots blancs $m$ haricot | Prunes - plums |
| beans | Ralfort $=$ horse radish |
| Haricots verts - French beans | Ralsins $=$ grajes <br> Ris de veau $=0$ sweet bread |
| Homard e- lobster | Rognon - kidney |
| Huitre = oyster | Sauclsson-8ausage |
| Jambon = hant | (smoked) |
| Laitue - lettuce | Saumon $=$ salmon |
| Lapin $=$ mbilt | Truite = trout |
| Lard - bacon | Veau - veal |
| Lièvre $=$ linre | Venaison $=$ venison |

These foods are often accompanied by words or phrases indicating how they are cooked.
A la broche a roasted before a fire A la brunolse a garnished with spring vegetables A la crécy a prepared with carrots Au diable - devilled, or with hot seasoning Au gratin = cookel with breadcrumbs Au naturel = cookel very simply, or served uncooked Blanquette - cooked in a thick white rauce Chartreuse - a mould (of frult, jelly, or some savoury mixture)
Chaudfroid = coated wjth chaudfroid ssuce

## Conflt m preserved in sugar

Compôte $=$ stewed (of fruit)
En cocotte = served in a small carthenware dish En karl - served in curry sance
Fourré = coated with sugar, cream, etc.
Fricrasee - stewed with white sauce
Maitre d'hotel $=$ grilled
Roti = roasted
Sauté $=$ fried lightly
Soups are divided into consommé or clear, and purée or potage thick. Kggs are served à la coque, or boiled, or sur le plat, jrached. The roe of fishes is known as oeufs de poisson. Fried potatoes are pommes frites, and mashed potatoes purée de pommes de terre. Café au lait is coffee with milk, or white coffee : café noir is black coffee, or coffee without milk.

For a formal dinner the following courses are usual, hors l'oeuvres, soup, fish, entrée, roast, vegetables, sweet, and savoury." For an informal dinner the hors d'oeurres inay be omitted, as may soup or fish, sweet or savoury.

A Dinner Menu. In coinpiling a dinner menu certain rules should be observed For instance, the colourings of the various courses should contrast with each other and a variety of Havours be secured. The jrincipal ingredient of one dish should not appear in another ; for instance, if the soup is artichoke, artichokes should not be served as a vegetable. Two dishes of beef or mutton should not be served at the same meal; roast beef and fillets of beef, for example. Two fried dishes should not be served in succession, nor should two boiled ones Two sauces of the same colour should not follow each other, and the same garnish should not be used on two dishes.

Variety is also desirable when two dishes are offered in the same course. loor instance, if there are two soups, one should be clear and the other thick. If two fish dishes are offered, one should be plainly dressed, e.g. boiled halibut, and the other should be more elaborate, e.g. lobster cutlets Of two entrées one should be cold and the other hot ; one should be light aird the other somewhat heavier. Of two sweets one should be light and cold ; the other hot and more substantial. Of two savouries one should be hot and one cold.

Menu Cards. Menu cards, or cards which contain the detajls of the ment for a big public dinner, are usually printed, in some cases this being very elaborately done and the card artistically decorated. Menu cards
suitable for the home can be bought. just as postcards can. These are headed and left blank for the cook or someone else to fill in the date and the details of the various courses. Menu cards for dinner parties and other festive occasions are often specially prepared, a design being drawn by an artist. This will frequently contain something appropriate to the particular occasion. Such cards can be obtained from a firm of printers, or are provided by the caterers.

Small white marble or china tablets, with stands to match, are sometimes used as substitutes for ordinary menu cards, and on these the menu is written in pencil. Holders for menu cards can be obtained in oxidized


Menu card sapported in a holder consirting of a amall china animal fagure
metals, plated silver, or china, or in fancy designs suitable for a festive occasion such as a Christmas party. See Course; Dinner.

MERCERIZING. The result of the mercerizing process is to lend to good cotton some of the lustre of silk. Innumerable examples are found in mercerized poplin, linings, and sewing, knitting, and embroidery threads. Linen and even jute may be mercerized, but not wool.

Mercerized cotton absorbs dye much more readily than unmercerized, and should the re-dyeing of mercerized goods be attempted, care must be taken to see that the dye is thoroughly dissolved. Should any particles remain, they will lead to dark spots of colour upon the article. Drying after dyeing must be cautiously done at an even temperature, for if done before the fire with some portions exposed to more heat than others the colour will be irregular. A good plan in dyeing mercerized goods is to soak them first in water to which a little glycerin has been added.

It is only good cottons made from long fibred cotton, combed in course of manufacture, that show any adequate benefit from the treatment. One can thus be pretty sure that mercerized cotton is gond material. Properly done, the process of mercerizing strengthens the article, but when badly done, ruins it. See Cotton.
MERCURY : The Metal. This is one of the metallic chemical elements, and is also known as quicksilver. It is fluid at ordinary temperatures, but solidifies at $-39^{\circ} \mathrm{F}$. and
boils at $675^{\circ} \mathrm{F}$. It is a very heary metal, weighing almost $\frac{1}{2} \mathrm{lb}$. per cubic in. Pure mercury Hows freely as a liquid, has a silvery white colour and a metallic lustre.

Mercury dissolves many metals, forming with them the alloys, known as amalgams. It is used in the manufacture of fulminate, for the percussion caps of cartridgen, and is also employed in electrical appliances. It is the gauging element in thermometers, barometers, and other scientific instruments, being particularly susceptible to variations in temperature.

Another application is the mercury vapour lamp, giving a good light, but devoid of red light rays. See Barometer; Mirror: Pendulum; Thermometer.

MERCURY: The Drug. Employed in many different forms both externally and internally in a wide range of morbid states, mercury is one of the most valuable drugs in the pharmacopoeia, and externally is most commonly used on account of its strong antiseptic qualities. In any form the drug is always a nore or less dangerous one, which should never be used except under a doctor's supervision.
It should never be forgotten that most mercury preparations are highly poisonous, particularly those used for their antiseptic action. The acute form of mercury poisoning is usually caused by swallowing corrosive sublimate. An emetio of a tablespoonful of mustard in a glass of warm water should be given and the doctor be summoned at once.

Before and after the emetic, give the beatenup whites of four or five eggs, and then soothing drinks, such as milk, to each pint of which a wineglassful or two of olive oil is added. Put the patient to bed and keep him warm with hot-water bottles.

MFRINGUE. A meringue is a mixture of whipped whites of eggs and fine white sugar. Flavouring may or may not be added. In making successful meringues two rules must be observed: whip the whites of egg really stiff, and cultivate speed in the shaping of the mixture. The least scrap of moisture or egg yolk will prevent the whites from whipping up stiffly. If the egg whites are allowed to stand overnight they will whip up more quickly.
To make the mixture, whisk the whites of 6 eggs to a firm white snow, then sift in lightly 8 oz. castor sugar. The meringue is now ready to be shaped, and this may be done with a meringue forcer fitted into a stout jean bag or with two dessertspoons. Cover a $\cdot$-in. thick pastry board or a baking tin with white kitchen paper slightly oiled, with pure olive oil, and force or shape the meringue on to the paper. If shaped with the spoons, gather up enough mixture to fill the spoon, smooth it round the edge, scoop the meringue out with the second spoon and drop it on to the paper, turning it over. It will be an egg shape.

When all are shaped sift over some castor sugar and bake them in a cool oven to a very light fawn colour. The oven must be really cool, and the meringues will take 2 to 3 hours to bake. When cooked, remove each meringue carefully from the paper, press in the soft portion inside, or remove it, and return them to the oven, which must be very slack, until they are perfectly diy. They can then be stored in tins. Each egg-shaped piece is the half of a meringue, and must be filled with whipped and flavoured cream before being fitted to its fellow half.
This mixture is used for the decoration of many aweets. It may be made into a covering for fruits or may be forced in patterns on custards, trifles, etc. The meringue covering must always be dried in a cool oven, but the forced decorative pieces are dried on paper by themselves and fastened to the sweet with cream or fondant. Meringues are often filled with ice cream instead of whipped cream. It
is necessary to put the case on ice for a little while before filling it if this is donc.

Meringue Gâteau. This sweet is made by adding a pinch of salt to the whites of 3 or 4 eggs, whisking them to a stiff froth, and then


Meringue GAteau made with a centre of cherries
folding them into 6 dessertspoonfuls of castor sugar. Heat the syrup from a small tin of red cherries, and use it to soak a sponge-cake ring. When saturated, put the ring on a dish. coat it with the meringue mixture, and leave it in a warm oven for about 20 min . so that the meringue becomes crisp and of a pale biscuit tint.

Let it get cold, then fill the centre with the cherries, piling them up high. Decorate the top with some stalks of angelica, and serve the whole with some syrup made thus: Boil 2 oz . lump sugar and a gill of water for about 6 min. then skim it well, and when it is cold stir in $\frac{1}{2}$ gill sherry and colour it with cochineal. Whipped cream sweetened and Havoured may be served separately.

Meringue Jelly. Small meringue jellies, coloured with cochineal, make an attractive party sweet. To prepare them, dissolve a pint packet of strawberry jelly in hot water, and leave it until cold, but not set. Add a pinch of salt to the whites of 2 eggs , beat them to a stiff froth, and then beat them into the


Meringue Jelly. A party ameet for whioh trait jelly and beaten white of egs are used
cold jelly. Continue beating for about 10 min., add the colouring, and stir the whole 80 as to get an even effect Pour the jelly into small wot moulds, and when set turn them on to a glass or china dish.

MISRINO. This is the name of a Spanish breed of sheep bearing exceptionally fine, short, and wavy wool and is the original of a type now reared in many other countries; merino is thus a name for ultra-fine wool, superior to that of cross breeds, and the name of the material has been transferred to the goods that are made from it.
Merino or French merino dress stuff is a fine twill made from merino wool. At once warm and light, made usually $40-44 \mathrm{in}$. wide, and available in cream and light shades as well as in black, it is a serviceable, if old-fashioned, dress stuff. In knitted underwear merino has by long custom a different meaning, and implies a wool and cotton mixture, generally soft to the touch resembling that of pure merino wool. Merino underwear is usually cheaper than all wool, and is bought on that account and also because it shrinks less than all wool in washing.
Merino wool in any of its forms tends to shrink when washed. The tendency is seen in soft, fine baby flannels which should continually be stretched, first in one direction and then inthe other, while drying. Stockings made from merino wool contract and thicken because the material felts easily. Soap assists the felting, and for this reason all soap used in washing should be carefully rinsed out.

MERTENSLA. This borage-like herba- whiting has been placed. ceous perennial is suitable for the border or not for silverware rock garden. It thrives in ordinary welldrained soil and is increased by division in spring or by seeds. The oyster plant (maritima) and alpina are both of low growth and bear blue flowers in early summer. Taller kinds suitable for the border are the Virginian cowslip pulinonari oides) and sibirica: they are about 15 inches in height and bear blue flowers in May

METAL POLISH There are two hief varieties of metal polishes One is made up of rottenstone 2 oz., soft soap 1 oz., and trong solution
 Mertensia. Blace flowers of the speoies Eibirica, a plant suitable or a shady border oxalic acid sufficient to make the whole into a thick cream. The second is composed of fossil earth 2 oz ., oleic acid 2 oz ., oil of mirbane $\frac{1}{2}$ dram, mixed into a smooth paste.

A liquid polish is made as follows: Mix soft soap 2 oz., with solution of ammonia 5 oz . and separately mix kaolin 4 oz ., with petrol 9 o\%. Place the two liquids in a tin and shake them well together. A simple form of metal cleaning liquid is made by dissolving oxalic acid 1 oz. in hot water, 1 pint. This is rubbed on to the tarnished brass work with a cloth and cleaned off with a separate cloth upon which

METAL SPINNING lathe. To exemplify spinning in its simplest form, a piece


floung out Toor


These polishes are screw in the centre, the sheet metal has to be held up to the former by a revolving centre. Since a certain amount of thrust is necessary to retain it in place spinning lathes are fitted with ball-bearing back-centres (Fig. 3) to re. duce the end friction. When the work has half progressed, the back-centre thrust block is replaced by a follower to prevent the work already spun from altering in shape. The job must be annealed between operations if, through tooling, the metal gets too hard to flow properly. The tools used (Fig. 2) are long and stout enough to resist bending. The handles are held firmly under the armpit, the steel end being placed between two pins in the rest. The nose of the tool is held a little below the lathe centre at a point near the centre of the jub: the pressure is applied towards the larger diameter of the disk
of wood is held in the lathe and turned up to any desired profile, with curves and corners suitable to the thickness of the metal which is to be spun. This former. as it is called, appears in the photographs. A special tool rest. Fig 1, is then rigged up, which may be of the ordinary type but with a flat topped tee, having several holes in which the operator can place steel pegs to suit his own convenience. A disk of lead or soft aluminium sheet is screwed by a central screw to the former. By working the shank of the long-handled tool against the steel pegs in the tool rest, using the peg as a fulcrum, and bringing the tool up to the disk with a sweeping action, the revolving metal can be formed into shape. 'Ihe metal is greased before and during the spinning operation, soft soap or vaseline being conmmonly used.
Figs. 4-6 show the method of spinning an ornamental base for a vase or other article. As the object is not pierced with a
Fig. 1


Fig. 4


Tetal Spinning. Fir. 1. Tee feat for spiuning lathe. Fig. 2. Necessary tools for the work. Fig. 3. Ball. bearing tail stook spindle. Fig. 4. Stages in metal spinning: A, disk in position; B, disk being shaped;


Fis. 8. Method of holding tool for firat stage in spinning a bowl. Fig. 6. Disk span over to shape
with a sweeping movement, continuing the stroke repeatedly. On the roturn stroke a small pressure is maintained on the work.

To prevent the disk buckling, a back stick is employed. This accessory is a short piece of hardwood, like all accountant's deak ruler. It is used in the left hand and held hard up against the rotating sheet metal on the side opposite to that upon which the spinning tool is operating. Rough edges of work are skimmed with a cutting tool, as used in hand metal turning. Internal work needs hook tools. Roller tools are also employed. All tool points must be quite hand and highly polished, like metal bumishers. Each job requires its own former. When the diameters of the job will not allow a solid former to be used, i.e. in spinning an object like a narrow-necked jar or a bottle, where the former would be imprisoned inside, split formers must be used.
Taking a diameter of 4 in . as an average size of work in metal spinning, the speed in revolutions per minute is approximately as follows : soft sheet iron $\frac{1}{32}$ in. thick, 600 ; thicker sheets, 400 ; zinc, 1,200 ; copper, brass and aluminium, 800 to 1,0(0). The work requires so much skill that only the simplest jobs should be attempted at first, using the softer metals like copper and aluminium. For any but the smallest work a power lathe is desirable. See Chuck; Face Plate; Lathe ; Mandrel; Metal Work, etc.

## Metal Turning on Small Lathes

## The Tools and Their Use is Various Operations

This contribution deals briefly yet comprehensively with the main processes in metal turning. described and illustrated in the article Lathe. See also Meta Spinning: Mctal Work, ete.

The process of removing the surface of metal trated in Fig. 2. A second imp!ement, the in n lathe is known as metal turning. The side tool (Fig. 3, b), has a cutting edge on its oloject is attached to a rotating spindle, left-hand side; it may have a counterpart technically known as n mandrel, and a cutting made to the oppositc hand. The pointed or tool is applied to the revolving work so as to produce the required shape and size with a degree of accuracy hardly obtainable in any other way. The tool may be fell up by hand, or in a sliding screw-feed tool fixing, known as a slide rest. For hand turning in metal it is of the greatcst importance that the tools should be long, and have handles of adequate lengtlo and stiffness

To obtain the maximum power over the work, the heel of the tool should be supported by the rest, the adjustable bar near to the revolving work on which it is held during the operation, well under the cutting' clgo, as shown in Fig. 1. The tool should he gripped firmly and especially wherc iron or steel is being operated upon, the handle of the tool should receive a further support by resting in the hollow of the operator's shoulder. It will tend to lift resister this will work and the tool rest, very possibly spoiling the one and breaking the other.

The heavier jobs in metal turning are not usually set out to be accomplished by hand where a modern slide rest lathe is available. Hand turning of this character requires years of practice and great strength of wrist. When work must be done by hand the cutting must be obtained by rolling the tool on its hiel, so that the point enters the metal with the cutting edge at an angle to it.
lighter work on the softer metals, such as brass and aluminium alloys, can be operated


Fir 2. How to hold a metal turning tool when skimming up a projecting portion of the work
on with much less fatigue. The tool can be held as illustrated in Fig. 2. Skimming up a projecting rim with a hand tool, as here shown, is a quick and easy method of producing the desired result. There are many other similar operations, as, for example, the making of an odd-shaped knoh, or producing a curved, conical object like $n$ water-jet, which would prove troublesome to produce singly on $\pi$ slide-rest lathc, but can be made quickly and accurately with a hand tonl, using a shaped template in thin card or motal as a guide to form and si\%e.

Types of Tool. Among the most useful hand tools for a metal-turning lathe is the round nose tool shown in Fig 3, $a$. This cuts at the side to a certain extent, as well as in the front, hence its being used for the job illus.


Metal Turning. Fig. 1. Showing how a band tool cuts the metal
graver tool, shown at $c$ in Fig. 3, is another useful hand tool.

For brass work, the nose and side tools should have flat tops, as shown in Fig. 4. For turning iron and steel a top rake is necessary (Fig. 5), to obtain the best cutting effect. A pointed hand tool is extremely useful in producing a centre pop in a piece of work revolving in a chuck, preparatory to drilling it with the drill held against and fed up by the tailstock. In producing such a centre pop, the difficulty is getting rid of the pip which so readily forms in the centre of thic sinking. A sharp tool is therefore essential. Why this pip forms will be readily understood when it is remembered that the absolute centre is not moving at all, and that the metal around it is only moving with a slow-cutting speed. The thin spike or pip, being frail, is casily broken off.

Where the tailstock of the lathe can he brought up to the work, has a suitable chuck fitted to it, and is sufficiently stiff and accu. rate in alinement, a special device known as a centre-drill may be used. This is, howcver, a matter of appliances; the mechanic should be able to produce the centre by hand.

Use of Chucks. Work to be turned can be held in the chuck. The self-centring chuck is the most commonly used appliance for holding any kind of work which in itself is reasonably round The three jaws in this type of chuck all move together radially, either towards or from the centre, according to which way the operating key is rotated. The jaws are of two patterns, outside and inside, both sets heing supplied with the tool. The outside jaws are used to hold rings and disks for facing, boring, as in Fig. 6, or turning portions which are clear of the jaws. With the inside jaws, a hollow bush can be held by the internal bore, and the outside operated on alinost completely. The inside can only be machined for a part of the way. The pressure of the jaws of the chuck gripping the work inside tends to prevent deep boring.

The inside jaws are generally in place. because their function is also to hold small diameter rods, drills, and spindles on the outside. A self-centring chuck is only approx. imately accurate. For example, if a hollow bush is bored truly cylindrical on the inside, is then removed and replaced in the jaws of the chuck from this bore, and turned up outside, the outside and inside will not be concentricto a degree desirable in anything but rougher work. Independent chucks in which the four jaws are separately operated by screw keys are therefore used. The work can be tested and adjusted during the fixing up in


Metal Turning. Fig. 4. Diagram showing use of flat-topped tool for brass work. Fig. 5. Use of top rake for turning ron
sawn off. Where such an operation is impos sible it is usual to horc the job out accurately, and then to remove it from the lathe. A turned mandrel is made to fit the bore tightly, and the outside operations are accomplished with the work on this trie mandiel.

In feeding the tool, regularity of rotation of the hand wheel on the end of the screw should he observed. The knack of operating the feed handles with an even motion is soon obtained. Every lathe has its peculiarities. Where handles are fitted to the feed screws, the fingers and thumb alternate in propelling the screw. With a wheel, a slightly different manipulation is required, the im of the wheel being grasped by the hand. The tool sliould always be kept noving slowly but evenly; if it proceeds in jerks, the work will show rings.

All screw-cutting lathes can be arranged to obtain a self-acting traverse. The lasd screw which operates the sliding saddle should be connccted up with a train of cliange Wheels to give one of the liner rates of feed, i.e. 100 to 200 turns to the inch. With the self-acting feed, very fine finishes can be obinaned without effort

Screw Cutting. In screw cutting, the saddle of the lathe is traversed along the bed with a rate of feed which bears a predetermined proportion to the revolutions of the mandrel. The lead screw which guides the saddle tool holder is coupled by a train of gear wheels. Thesc gear wheels may be altered in intio as desired.

If the ratio of gears on the change-whecl quadrant is altcred, say, by coupling a 90 tooth change wheel on the mandiel with a 60 -wheel fixed on the end of the lead screw, that is in a proportion of one to three, then the lathe will produce three times 10 pitch, or a screw of 30 thieads to the inch. on the job rotat ing in the lathe. Change wheels for all the usual threads are supplied with screwcutting lathes. Odd sizes are sometimes obtainable.

Short threads can best be produced on a foot lathe by taking definite cuts along


32, 28, 2f. 19 threads per in., standard sizes for pipe work. The ohaser is a hand turning tool with a cutting edge in the form of a screw thread of the particular pitch it is desired to obtain. With the work revolving, not too quickly, the hand chaser is atruck in with a Interal sweep. Milling, drilling, and dividing, also the formation of scrolls, worms, and gear tecth, may be accomplished in the Inthe, by the addition of suitable fitments and accessory devices.
Cutting Speeds. The cutting speeds for various metals differ. The term cutting speed must, however, not be confused with the rate of feed. The latter is dependent on the size and power of the lathe being used. Cutting specds are the same for any lathe. Wrought iron and steel should be turned at from 200 to 300 in . per minute, tool steels at 2011 , cast iron at 190 to 200 , soft gunmetal at 500 ) to ( FO 0 , and brass at 800 in . The speed is found by multiplying the revolutions of the lathe mandrel by the circumference of the work. I piece of work in cast iron, 1 in . in diameter and approximately 3 s in. in circumference, should therefore run at from 60 to 65 revolutions per minute.

With the average foot Inthe it is difficult to get a high enough speed in turning small hrass work, and onc low enough for a large diameter cast-iron object, and therefore a certain degree of compromise in the matter of speeds has to be accepted. Cast iron, brass, and gunmetal are not lubricated in turning operations, but to obtain a good finish on wrought iron and steel requires the use of oil, or any saponaccous solution.
METAL WORK. This term includes a!l the mechanical processes for the fashioning of metal. l'ractically spealing, all metals are worked in onc of two ways: either the metal is cast, or it is rolled into sheets and bass, or drawn into tubes.
Casting is perhapa the first of the metal-working procesocs, as it utilizes the metal practically in the rawstate. Brielly, the process consists in making a pattern or mould of the shape of the
desired casting, and impressing it into damp sand, thus making a ho!e or cavity which is subseguently filled with metal. The casting is afterraids finished by machining in a lathe, or it many be milled.

Ordinary shect or bar metal has generally to tre cut to something spproximating to the desired length or size, and this is done hy sawing with a hack saw or cutting with cold chisels. Metal work that calls for many joints introduces soldering and brazing, hoth of these being nccomplished by melting anot her but aofter metal than that to be united, and working it into the joint between them. In some cases welding is necessary, particularly when dealing with ion and steel. Heavy pieces of metal that cannot conveniently be shaped in other ways are often functioned by forging. Sheet-metal work generally calls for a knowledge of rivets and riveting.

Hammers for metal work do not differ materially from those used by other trades, and may range from a lightiveight riveting hammer to a heavy sledge hammer for fashioning thick pieces of metal while hot, and for delivering heavy blows in general. Files are very necessary in all classes of metal work. The average size is generally between the ranges ( $;$ to 10 in in length, and varying from a smooth to a coarse cut.

Drills of all kinds are necessary for making holcs in metal, and are made in all sizes from something under $\frac{1}{16} \mathrm{in}$ upward in diameter. To rotate these drills, a hand-dri!ling machine is convenient up to about $\frac{3}{8} \mathrm{in}$. diameter. Above this size, however, a treadle apparatus or a powerful bench-drilling machine will be lound necessary.

A vice of some lind is essential in inetal working, and should be sufficiently robust for tho class of woik normally undertaken A small vice can only he suitable for smal work, but for heavier work a good substantial bench vice is necessary. Another useful metal wor!ing tool is the grinder, and com prises a variety of different types.

All manner of turning and shaping processes on metal can he carried out with the lathe. Numerous appliances and tools aie used in conjunction with it. Cold chisels form an important group of metal-working tools, and, while they are inexpensive, they are capable of much useful work in the chip. ping out and cutting of sheet and bar metal Smaller tools include punches, used for riveting and for maling indentations. See Face Plate the threaded por tion, stopping the lathe at the end, withdrawing the cut on the top slide rest, running the lathe backiward, and advancing the cut, proceeding through the same cycle of operations without relensing the lead screw. For longer threads, the lead screw is dechutched at the end of the cut, and the saddle and slide rest traversed back by hand. The proper re-engagement of the clutch or lead screw nut may reguire the challi marking of the work and the change wheels, to prevent a cross-threading cut being taken. Fig. 10 shows a screw thread that is being cut on the end of a pin supported bet ween the lathe centres.

Hand chasing, or screw thread chasing, bears the same relation to screw cutting as hand tool work does to that requiring the slide rest. Its successful use is largely a matter of skill. It is also more usually employed in dealing with brass work and for the finer threads, such as


Metal Turning Fig. 6. Internal boring, showing work teld in a three-jaw chuck. Fig. 7. Face plate work, showing a small piece of work clamped to plate. Fig. 8. Rod mounted and driven betwesn centres. Fig. 9. Roagbing down a mandrel, a swan-necked tool being used in the slide rest. Fig. 10. Screw cutting in a lathe

METER, A meter is an apparatus that records automatically the quantity of a gas or fllid passing through it. Such are used for measuring the amount of gas, electric light, and sometimes water, used in a house Some electric-light and gas meters are worked by the insertion of coins, a penny or a shilling providing a certain amount of light, which antomatically fails when the quantity is exhausted. See Electric Light; Gas; Water.

METHYLATED SPIRIT. Alcohol which has been rendered unfit for use as a beverage by a process of denaturizing is sold as methy. lated spirit and has many uses in the home. It must, however, always be most carefully handled owing to its highly inflammable nature Naphtha and petroleum or paraffin are the agents commonly employed for denaturizing, together with a trace of blue aniline dye. The sale of methylated spirit is regulated by law, and is forbidden hetween $10 \mathrm{p} . \mathrm{m}$. on Saturday and 8 am on Monday.

Methylated spirit is used for heating small stoves which contain an ahsorbent substance, such as asbestos fibre. In filling the stove only as much spirit should be added as can be ahsorbed and no more. It is dangerous to add a surplus of spirit, as when lighted the Hame may be carried on to the table and cause a fire

For glass cleaning there are few things to equal methylated spirit; it is invaluable for polishing wide surfaces of glass, such as wind screens, table tops, or the glass covers some times inserted in polished trays. It is equally efficacious for windows, but is too expensive for the ordinary householder to use in large quantities For small things the quantity needed is not excessive, and is well worth the outlay. A few drops on a soft cloth are generally sufficient. A little methylated spirit put in the water when rinsing white silk blouses gives gloss and firmness. Applied to brown boots the spirit removes stains and produces a fine polish. As it tends to dry up the leather, it should only be used occasionally.

For various medicinal and surgical purposes methylated spirit is of great use. If, for ex ample, it becomes necessary to sterilize bowls or other utensils quickly and there is no time to boil them, a little of the spirit may be poured in and lighted, and when it has burnt itself out the bowl will be ready for use. Lancets or similar small instruments may be stood in methylated apirit for half an hour and are then completely sterilized. For preventing bed sores or any other form of chafing methylated spirit should be rubbed on, and the area powdered. This applies also to tender feet, or to hands which hlister easily when doing unaccustomed work Finally, it makes an excellent lotion for sprnins or bruises, when added to water and npplied as a compress.
METOL: The Developer. Metol is a photographic developer which gives thin, deli cate negatives with full detail but little den sity. It is rapid in action, and is best used with a slow developer, such as hydroquinone. Metol is frequently used with pyro, the com hined developer being known as pyro-metol
The following is a formula for one-solution plain metol developer

## Metol

Sodlum suilphite (crystails)
Sodium carbonnte (cryatals)
Potassium bromide
For ordinary use take 1 oz . of the a bove solution and add 2 oz . of water. For portraits, add 1 oz . of water to each oz. of the stock solution.
In all developers containing metol the metol should be dissolved first, then the sulphite, followed by the other chemicals, using warm, but not hot water. The Watkins factor for metol is 30 .
With some persons metol has an unpleasant action on the skin; the skin cracks and the
fingers swell, resulting in broken mails and sores which may spread to other parts of the hands. In such cases the use of the metol developer should he a bandoned, though the risk of poisoning may be greatly, if not entirely, obviated by the use of rubber gloves The poisoning may he treated by soaking the hands in warm water and rubbing in zinc ointment, using bandages or gloves at night. The following ointment will cure the sores:

| Ichthyol | .. | .. | .. | . | .. | .. | 1 part |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Ianoltne | . | . | .. | .. | . | .. | 4 parts |
| Boric acid | . | .. | .. | . | . | . | 4 |

If a metol developer has to he used the hands should be washed frequently in clean water while at work, and afterwards washed thoroughly with warm water. See Developing; Pyro
METOL-HYDROQUINONE. An excel lent developer for general use is metol-hydroquinone, usunlly referred to as M.Q., and suitable alike for films, plates, bromide, and gaslight papers. It combines the advantages of both developers, giving the detail rendering of metol and the density and contrast of hydroquinone. If properly made up it is cleanworking and non-staining. The full quantity of sulphite given in the formulac that follow must be used. A good one-solution M.Q. developer is as follows:
Mctol
Sodium suiphite (crystals)
Hydroquinone
Sodium carbonate (crystals)
$\begin{array}{cc}20 \\ 1 & \mathrm{gr} \\ 02\end{array}$
Wium carbonate (crystals)


Dissolve these in the order named, using warm (not hot) water. For use take equal parts of the solution and water. It should only be made up when wanted, and used fresh. A two-solution which will keep is made up thus, using equal parts of $A$ and $B$

Soldtion A.
Metol
Sodium suilphite (cryatails)
Hy droquiuonc
Potassium bromide
Wuter to makc
Solution B.
Sodium carbonate (crystals)
Water to make
(crystals)
The Watking factor for M Q
14. MQ Q .Q. is a very suitable developer for all round use hy the amateur. As long as it is properly made up, used freah after preparation or dilution from stock solution, it is always to be relied upon.
Developers containing hydroquinone cease to act almost entinely when the temperature falls below $60^{\circ} \mathrm{F}$. If the $\mathrm{M} Q$. developer cannot be kept well ahove this temperature in winter it is desirable to increase the metol in the two-solution formula above to 30 gr . and reduce the hydroquinone to 15 gr . It is, of course, useless merely to warin the developer and its dish, as it will quickly talie on the temperature of the dark room. See Developer: Developing; Hydroquinone.

METRE. This common measure of length is the unit of the metric or decimal system. It is equal to $39 \cdot 37079 \mathrm{in}$., or something more than n yard. It is divided into decimetres (10), centimetres (100), nnd millimetres (1,000). The following table gives the equivalents of metres in yards :

| Metre | Yarda | Mctres | Yards | Mctres |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $1=$ | 1.093 |  | 8.748 | 60 | 65.616 |
| 2 | 2.187 | $9=$ | 9.842 | 70 | 78.552 |
| 3 | 3.280 | 10 | 10.936 | $80=$ | 87-488 |
| 4 | 4.374 | $20 \sim$ | 21.872 | 90 | 08424 |
| 5 | 5488 | 30 | 32-808 | 100 | 109-361 |
| 6 | 6-661 |  | 43.744 | 200 | $218 \cdot 722$ |
| $7=$ | 7.655 | 50 | 54.680 | 400 | $437 \cdot 44$ |

The Metric System. The metric or decimal system of weights and measures is a French invention, hut is used to some extent in Great Britain. It aims at uniformity and simplicity, features which are wanting in the system that has grown up in haphazard fashion in England. The alternative name, the decimal system, is
due to the fact that it works in tens, simplifying calculations.
The fundamental unit of the system is the metre, a measure of length, nnd from it the other units are derived. The gram, which is the unit of weight, equals the weight of one cubic centimetre of pure water at its maximum density. The unit of capacity, the litre, is equal to the volume occupied by 1,000 cubic centimetres of pure water of maximum density. From these the other weights and mensures are derived. The Greek words, kilo, becto, and deca mean $1,000,100$, and 10 , a kilogram being 1,000 grams and a decalitre, 10 litres. For small quantities the Latin words milli, centi and deci are used, a millimetre being rod part of a metre and a centigram $\frac{1}{10} \sigma$ part of a gram. The capital letters $\mathrm{K}, \mathrm{H}$, and D are used for the multiples, and small letters $\mathrm{m}, \mathrm{c}$, and d for the weights and measures that are less than a unit. Kg., therefore, represents kilogranı: Km, kilomotre; and Kl, kijolitre; mg. represents milligram; cl., centilitre ; and dm., decimetre. The word myria (M) is used to represent 10,000
In addition, there are special units for square or superficial measure. For instance, 100 square metres equal an are, and 100 ares equal one hectare. In the case of areas the multiples change by 100 , not by 10 at a time, and in the case of volume, or cubic measure, they change by 1,000 . Below are some of the metric weights and measures and their English equivalents

## 1 metre $=39.37079 \mathrm{in}$

kilometre $=0.62138$ miles, or 5 furlongs
sq. kilometre - $247 \cdot 17$ acres
gram $=15 \underline{1}$ grains
kilorram $=2 \cdot 2046 \mathrm{lb}$
1 litre $=1.75$ pints
METRONOME. A metronome is a device enabling a composer to indicate with precision the speed at which he wishes his music to be performed. It is hased on the principle of the pendulum, which differs, however, from that of a clock in being weighted at both ends, and in oscillating from the centre instead of from the top.

The weight upon the upper part of the rod is made to slide up or down so as to rest against certain figures engraved thereon. The figures begin at 40 or a little more at the top of the rod and progress down at intervals by two's to 60, after which they go on by threes to 72, then by fours to 120 , next by sixes to 144 (where some metronomes finish), and finally by eights to 208.
The position of these figures is calculated in proportion to the heaviness of the fixed weight on the lower part of the rod, so that on the movable weight heing placed against


Metronome. Device for indicating peed at which music should be performed any given figure, the pendulum will swing that number of times in a minute. Consequently, all the composer has to do is to indicate the value of the note which repre. sents the pulse or beat of his musio and then to give the necessary figure. In the great majority of casesthe crotchet, either plain or dotted. is the
unit of speed, though the minins and the quaver are occasionally used $P=60$ ) therefore means that the music is to move at the rate of 60 crotchets per minute.

There is more than onc kind of netronome. That known as the Maclzel is wound up like a clock, the mechanism being contained in a wooden casc of pyranidal shape, and when the rod is relensed it oscillates, ticling at each swing. Sometimes there is a bell attach. ment, which can be adjusted so as to strike at regular periods. The Pinfold metronome has no clockwork. It swings silently on two stcel points balanced on a tripod, and is set in motion by the finger. Both of thise are on tho double pendulum principle.

Inotlier hind consists of a circular case containing a tape measure, which can be un wound to any given point and swung from the hand, the case forming the weight. When not in use it can be coiled up by touching a spring, and carried in the pocket. It is handy for an emergency, but is open to the objection that it cannot be in action simultaneously with musical performance.

The use of the metronome is to ascertain the general specd of the music; it should not be employed throughout a piece, except in very stubborn cases of faulty time, which it may help to correct.

MEZZANINE. This term is used in architecture to describe a storey or floor introduced between two principal lloors, thus forming one small room within a larger one, lighted by a large window or windows which give light to the mezzanine floor and the other part of the Hoor hencath it. The arrangement of the mezza. nine floor is largely governed by the architecture and plan of the building as a whole.

MICA. A mineral of complex and variable composition, mica is used in domestic work for windows for anthracite and other heating stoves, and for all purposes where translucence is desired and great heat has to be resisted. It is characterized by easy cleavage in a single direction, and may be divided to very thin shects. When used in front of a stove it is generally about $\frac{1}{2} \frac{1}{2}$ in. thick.

Mica can be purohased from any good class oil and colourman. It is generally stocked in various sizes and shapes, and a size most appropriate to the joh in hand should always he sclected. If due care be exercised it can he cut to shape with a strong pair of scissors. See Stove.

MICE : How to Destroy. Both poison and traps are employed to destroy mice, but there is no more eflicient remedy than to keep a cat in the house. Where no cat is kept mice appear sooner or later. Very often what attracts them, cven where there is a cat, is a plentiful supply of food in the shape of breadcrumbs, scraps of cheese, or other fragments, or seed from bird-cages, left lying on Hoors or tables or shelves of cupboards.

The first precaution to be taken, therefore, is to see that all these tempting morsels for mice are carcfully swept up, and cheese, sugar, grain, bread, etc., covered up, especially at night. Where poison is resorted to only small quantities ahould be employed, not in any case larger than a small haricot bean. Great care must be taken to prevent food from coming in contact with preparations sold for killing mice, as these usually contain phosphorus, strychnine, or arsenic.

An effective method is to bait cheese or bread with barium carbonate. After the poison has been laid all the holes should be stopired up, and a good material to use for this purpose consists of equal quantities of barium carbonate and dripping, made into a paste. The mice usually eat the poison in trying to nibble their way out. Whenever a mouse hole has been treated in this way a piece of paper may be pasted over the hole as a safeguard for pets.

Mouse Trap. The simplest pattern of nouse trap in use consiats of a small piece of flat wood on which is fixed a powerful spring Which operates a square-shaped wire. After the trap is baited the wire is pushed back and held by a catch, one end of which is inserted in a piece of metal on which the bait is laid. The slightest movement of the bait causes the catch to be released, and the sharp recoil of the wire, due to the spring, instantly kills the mouse. This break-back trap has almost entirely superseded the old-fashioned box trap, with wires, which closed on the mouse when it nibbled the bait. Either toasted cheese or a scrap of fat bacon is the customary bait employed, and the trap can be kept clean by being occasionally plunged into boiling water.
MICE : As Pets. Of the amaller animals that are kept as pets white or mottled mice give the least trouble. They should be purchased when quite young. For food the mice are given warm bread and milk, dry breadcrumbs and stale calie, dandelion and lettuce leaves, pieces of apple and carrot, and mixed birl seed. They slionld be licpt in a glass fronted and well-ventilated wooden box, in a perfectly dry and quiet place, away from direct sunlight.

The cage must be kept perfectly clean, and it is an advantage to have two cages in order that one may hic in use while the other is being cleaned and dried.

A convenient cage for mice is easily made from $\ddagger$ in wood and a few lengths of stiff wire. The base is 15 in . by 5 in ., the lixed cage 10 in . long by 10 in . high, and a revolving wheel is formed from two 5 in . disks joined by 4 in . lengths of wire. The fixed cage is divided into tivo parts. Onc, 4 in . wide, is clused with a plain door, the other has a barred door formed by lengths of wire driven into strips of wood ; botll are hinged by naila driven in through the top and bottoin pieces. Three 14 in . holes are bored in one disk and is similar hole in the end of fixed cage, and the revolving portion is hung so that the holes will coincide. The end supports of the cage are 7 in. by 5 in., with 2 in. cut from corners, and are joined with a 1 in . strip.
MICHAELMAS DAISY. This is the popular name of the hardy perennial aster, an important group of allumn Howering plant.s. They thrive in ordinary well cultivated aoil and are increased by division in spring. They may be planted in autumn or spring. In the course of two years the plants form large clumps and must then be lifted, divided and replanted. The finest hlooms
of this plant are olitained by replanting small pieces in spring and setting several together in groups.

In recent years many beautiful new varieties having richly coloured flowers have been raised. Of the large-flowered varieties some of the best are leauty of Ronsdorff, lilac mauve; King George, violet-blue; Perry's Favourite, rose; and Preziosa, violet-bluc: these grow about 2 feet high and bloom in Scptember.

Barr's Pink, carmine rose, $4 \frac{1}{2} \mathrm{ft}$ : Mrs. Rayner, rose-red, $5 \mathrm{ft}$. ; Anita Ballard, lavender-b!ue, $4 \frac{1}{2} \mathrm{ft}$. Beauty of Colwall, lavender-blue, 4 ft . : Ethel Ballard, pale pink, 4 ft . : Maid of Athens, pink, $4 \frac{1}{2} \mathrm{ft}$. ; Mons, rose, 4 ft ; Mrs. George Monro, white, 4 ft ; and Peggy Ballard, mauve, 3 ft . : these bloom in September-October.

Climax, lavender-blue, 5 ft ., and its white variety, alba, are handsome October-flowering varieties. Little Pink Lady and Little Boy Blue anc two charming large-flowered varieties, 2-3 ft. high, which bloom in Scptember. Acris, $2 \frac{1}{2} \mathrm{ft}$., bears a profusion of small lavender-blue flowers in August; Blue Star and Silver Gem yield dainty sprays of small Howers in September-October. Michaelmas


Michaelmas Daisy. Purplish-lilac flowers of a tall free blooming variety
daisies can he raised from seeds sown in boxes of soil in a frame in spring.

MICROBE. The word microbe is applied to inicroscopic living things, animal and vege table, particularly the latter. They are of various shapes, some being globular (micrococci), some like straight rods (bacilli), some wavy, some curved. Most microbes arc harmless to man; many arc very useful, is, for example, those which produce vinegar, the ripening of cheese, the nitritication of soil, etc. On the other hand, microles are the cause of the great army of infectious discases. See Bacteria.

MICROMETER. As a precision measuring instrument the micrometer is generally used in metal work, but it is applicable to the measuring of any material where extreme accuracy is called for. The principle of the micrometer is based on a screw calibrated so that readings of 1000 th of an inch, or even finer, can be taken directly.
The ordinary type of micromcter is illustrated in Fig. 1, and comprises a $U$-shaped body. At one end is a circular projecting portion called a sleeve, which has a screw thread cut in a portion of its length. In the type of instrument to which the following description applies the pitch of the threads is $\mathbf{4 0}$ to the inch. Into the slecse is screwed a spindle rotated by an outer portion called the thimble, which is milled to afford a sure grip. In some patterns this and the thimble are rigid, but in the Browne \& Sharpe instrument, illustrated, a ratchet device is provided in the form of a subsidiary and smaller handle which is situated at the end of the thimble.
Its function is to rotate the thimble to open the jaws of the micrometer, but to close them with a pressure determined only by the amount of friction on the spring pawl of the ratchet. When the detcrmined pressure hetween the measuring faces has been reached, the ratchet will slip and the screw cannot be turned any more. As a consequence of this, it is impossible to strain it. A locking device is provided in the form of a litile milled ring, situated in the upper part of the frame. This, when rotated, grips the spindle rigidly, so that if the instrument is required to incasure
several pieces of tho same sizr, it can be using n micrometer, it is better to think in locked and used as an ordinary fixed type of limit gauge.
The anvil is movable, and by means of the milled nut at the end of the frame opposite to the alceve it can be drawn back, to increase the measuring range of the instrument The pattern illustrated can measure up to 2 in. in diameter with the anvil drawn back. and from zero to $I$ in. when the anvil is pushed forward. To set the instrument, the spindle is set at zero, the anvil drawn back. and $n$ limit gauge in the form of a circular disk inserted between the end of the spindle and the anvil. The latter is then pressed into contact with the disk, and locked in that position.
 thousandths than in any other figures. For example, $t \mathrm{in}$. is more quickly remembered as ${ }^{2} 1000$, and similarly with other fractions Thereforc, to measure the bar known to be $1 \frac{1}{1}$ in in diameter, it is better to think of it as one inch, plus $\frac{13 A}{1800}$, which is exactly $\frac{1}{k}$. Measuring this will neccssitate setting back the anvil, adjusting it to zero, and then unscrewing the thimble sufficiently to mata T0,
 making $1800^{\circ} \sigma$ in all. Therefore rotate the thimble until the line marked 1 is visible, when the zem on the thimble scale is exactly opposite the horizontal line. This is $1800^{\circ}$. and the thimble is then rotated to add the


Fix the spindle in this position, and apply it to the bar. The jaw's should just go on to it amoothly and certainly, but without forcing, and without the least trace of slackness. Suppose it will not quite go on, as the bar is, say, n few thousandths over size.

Fig. © shows the anvil drawn back and the testing disk in position
In use, the instrument is simply applied to the ohject to be gauged, the thimble rotnted until it is almost in adjustment, and the final turn completed with tie aid of the ratchet handle. This drives the spindle intu contact with the object to be mersured. The same principle is applied no matter what the shape of the object may be, so long as the spindle and anvil can bear upon it. Supposing it to be a bar of metal $1 \frac{1}{8}$ in in dianeler, this reading would be taken as thousandths of an inch. as, practically speaking, all micrometers anc calibrated in the same way, or else have metric readings.

Care must he taken that the netal to be gauged has a true and smonth surface; otherwise it will be impossible to obtain an accurate measurement. On the bevel edge of the thimble is a series of lines and marks, beginning at 0 , the next marked division being 5 , and so on by regular steps of 5 up to 20 . The zero mark will also be read as 25 . Therc are thus 25 separnte divisions around the odge of the thimble. On the sleeve is a series of numbers and division marks commencing at 0 and numbered consecutirely to 9 nnd 0 . There are thus 10 spaces, each sub-divided into 4 spaces.

As the spindlo is screwed, the thimble when rotatod travels up and down along the sleeve, and, as it works outward, the marks on the sleeve gradually appear in regular order, 1, 2, 3, etc. The distance which is traversed by one revolution of the thimble is determined by the pitch, or number of threads per inch cut on the spindle and, as this is 40 , it follows that one revolution of the th:mble draws back the spindle ${ }^{\frac{1}{2}} \mathrm{f}$ in. The calibrations on the sleeve arc apaced it in. apart, and, being further divided into 4 , one complete $r$-volution of the thimble will draw it back exactly this amount. that is $\frac{1}{40}$ in. But as the rim of the thimble is divided into 25 , if the thimble is only rotated to move through, say, one space on the thimble scale, the exact amount which the spindle has been drawn back will be $x_{0}{ }^{\frac{1}{0}}$, in. because the spindle has maclo of $n$ revolution, that is of dos in., that is to say, Io ${ }^{\text {d }} \sigma \sigma$ in
All the readings aro taken from the horizontal line marked on the slecvo and from the zero mark on the thimble. Consequently it is perfectly simple to measure ro'sg in., or any other number of thousandths. When


Micrometer. Fig. 1. Complete instrument with adjusting spanner and gauge disk. Fig. 2. Setting micrometer with inch gange disk

Release the clamp and then further unscrew the thimblc. counting the number of spaces on the thimble scale which pass the zero line on the slecve until the spindle has been drawn back sufliciently to fit on to the bar. Supposc that this is 7 spaces. This means yove in. and thus the true reading is $1 \cdot 132$ in. In actual practice the readinga can be taken direct by simply reading of the scale, counting the numbers of thousandths as explained ahove. See Gauge; Limit Gauge.

MICROPHONE. The microphone is in reality the electrical counterpart of the humian ear In the ear the cound waves vibrate the car-drum, and such oscillations are then trans-


Microphone. Pig. 1. Type
of contact microphone usent in telephone apparatus mitted mechanically to the brain.

An electrical microphone has $n$ diaphragm corresponding to the eardrum. The oscilla tion alters the number and pressure of a series of contacts in an elec. tric circuit, thus varying the electrical resistance and the strength of the current. The electricity is normally flowing steadily, but the current is altered by the vibrations of the voice. These


Microphone. Fig. 2. Pair of Reisz carbon microphones, as used in broadcasting studios, showing pulley suspenslon which allows for varying heights Courless of British Broudeasting Cormoration
current variations are then converted back into mechanical vibrations to give speech. The microphone, which forms part of the ordinary telephone, is shown in section in Fig. 1.

The broadcasting microphone is the first link in the transmission chain. The sound waves in the hroadcasting studio are picked up by the microphone, which converta them into electrical currents These currents arc then amplified and caused to modulate the carrier wave sent out by the broadcaat transmitter. Microphones are alao used in conjunction with public address amplifying systems. See Carricr Wave; Modulation; Tolephone.
MICROSCOPE: Its Mechanism. When choosing a microscope the essentials specified below should be borne in mind. As good an instrument as the purchaser can afford should be bought, since a pound or two more on the price will add a great deal to the scope and utility of the microscope. Several firms stock second-hand microscopes, and can usually be relied upon to furnish a satisfactory instrument at a moderate price. What are known as student's instruments are turned out by leading opticians at quite low prices, and the stands cmhody the essential qualities desirable in a microscope for ordinary use.

The chosen instrument should be of good workmanship, rigid, firm, and free from vibration, whether it is being used in an upright, horizontal, or sloping position. All movements should work smoothly, at the same time being free from such defects as slipping. The lower priced stands are generally of the vertical or non-inclinable type. The coarso adjustment should be a rack and pinion movement, and the finc adjuatment should never depend upon the direct action of springs. Instruments may be met with having a screw fine and a sliding tube coarse adjustment. A stand with a rack and pinion adjustment is preferable, even if this is the solc means of focusaing the instrument. With a good coarsc adjustment alone objective glasses up to $t$-in. can be focussed.
The stage should be rigid, and large enough to afford a safe support for any glass vessels the contents of which may have to be examined. The stage should be provided with spring clips, removable at will, to secure the glass microscope slides, usually 3 in . by 1 in . in size.
The best form of diaphragm is the iris pattern, similar to the arrangement for stopping down a camera. This diaphragm is necessary, since the light has sometimes to be cut down or increased, and forms part of the sub-stage condenser, or that part of the instrument found under the stage. The func tion of the latter is to collect into a cone of large aperture the beam of light rays reflected by the mirror. This is achieved by means
of a short-focus system of lenses, and the aperture may he reduced at will, by means of the diaphragm Tho mirror below the condenser is reversible, one side being plane and the other concave. The plane inirror is usually ent. ployed, but the concave The concave Reader for fine
aje should the astment
side
utilized when milled Head utilized when Milled Head using low fine adjustmen powers.
The choice of eycpieces and objectives is governed by the olass of work it is desired to undertake. A pair of cyepicces, magnifying the image formod by the objective 5 and 9 times respectively, and two oljeotives. tin. and t-in., would bo a gooll selection. This is the equipment suggested for the Baker Mic stand illustrated, giving a inagnification of 53 to 406 . The lieck microscope shown, with two eyepieces ( $x 0$ and $x 10$ ) and a $\frac{2}{3}$-in. object glass, magnifies from 62 to 110 .

There remnins the question of lighting, and rs in Great Britain daylight of the necessary quality is usually lacking, it is better to provide an artificial light. A small incandescent mantle is suitable, but electric light ;s best. The bulb should be of ground glass,
 light is required, the bull) may be tinted blue. $A$ very ensy way of doing this is to strenk the glases with a blue grease pencil -of the sort which are sold for writing on glass -turning on the light and distributing the greasy material over tho whole surfacc by means of $a$ piece of cotton-
wool, when the bulb has warmed.

Before plac. ing the slide on the stage, to which it will be secured by the spring clips, the eyepicce ahould be reMicroscope. Sectional diagrain moved, and the from the reflecting mirror mirroradjusted through the condenser to the to givethe best object on the slide, and thence illomination up through lenses to the ege the tube, the iris diaphragm being fully open. The eyepiece should then be returned and the diaphragm closed down until a dim light only comes through. This should all be done with the objective nearly touching the stage. Now rack up the body tube ahout $1 \frac{1}{2} \mathrm{in}$., place the slide in position and, using the low-power objective and coarse adjustment, anck the tuhe down slowly until the hlurred image of the specimen can be seen. Ottain a sharp image by means of tho fine adjustment, and if the light is too dim open the diaphragn a little until the necessary illumination is
as the pinky part of middlings contains the wheat phosphates and the product known as cereline, whioh acts as a digestive agent to the rest of the meal. Middlings contain albumen, 15.6 p.c., carho-bydrates 60.7 p.c., and fat 40 p.c. Giving an albuminoid ratio of 1 to 4 , it is almost ideal for feeding poultry. Sec Chicken ; Poultry.
MIDGE. To prevent the unwelcome attention of midges, nothing is more efficacious than rubbing the neck, wrists, and other exposed parts of the body with olive oil to which is added sono oil of rosemary. lavender, eucalyptus, or pennyroyal. Ono teaspoonful of any one of these should be added to 1 or 2 oz . of olive oil.

The irritation from bites can sometimes he removed by applying chloroform or weali solution of ammonia. The following preacrijption is uscful for the same purpose:

## Menthol

$\qquad$ .. ......... 10 g
4 drams
Strong Solution of Ammonia
$2 \begin{gathered}4 \\ 2 \\ \text { Irams } \\ \text { irams }\end{gathered}$
The menthol should be sliaken up in the

microscope. Leti, simple vertical stand, with rack and pinion locussing. Right, inclinable stand with rack coarse and screw fine adjustment
Courtesy of $B$. Beck and $C$. Balier district council
spirit until it is dissolved, and the mixture ded to the ammonia See Bite; Sting
MIDWIFE: Her Qualifications.
A woman who attends women in childbirth is a midwife. In an emergency any woman may have to stand by another and give her what lielp she can, but it is unlawful for any woman to act in this way, habitually and for gain, unless she is a qualified doctor or has passed an examination and received a certificate of competency from the Central Midwives l Board. The penalty is a fine of $£ 10$. To ohtain a cortificate by false atatements is punishable by 12 months' imprisonment.

The Central Midwives Board has power to register midwives, to hear complaints ahout them, and to suspend or dehar them from practice. The county (or county horough) council is the local supervising authority with power to investigate all charges of


Mignonette. Fragrant blooms of the giant variety of this old-fashioned plant. See article below
malpractices, neglect, and the like, and with power to report to the central board A county council may dolegate its powers to a
$\Lambda$ person who acts as a midwife-except a neighbour acting in an emergency-is liable for damages for negligence if, through her incompetence, any harm comes to the patient. It is no answer for her to say she did her best, unleas she diaplayed the skill and slowed the knowledge of a competent midwife.
The address of the Central Midwives Board is 1, Queen Anne's Gate Buildings, London, S.W.1. The Central lBoard for Scotland is at 49, George Square, Edinburgh.

## MIGNONETTE.

This favourite annual Rcseda odorata, bears sweet-scented Howers which in modern varieties are of various shades of colourreddish, brown, yellow, and white. This plant is rather capricious and may fail unless suitable con. ditions are providerl. Serds should be sown
in April on well tilled soil to which lime has been added if necessary; the soil must be made firm before sowing. The secdlings must be thinned out to give the plants room to develop. Reseda glauca, with grey-green leaves and white flowers in summer, is a hardy border perennial.

Mignonette will bloom in winter under glass if secds are sown in 5 in . pots in August, the seedlings being thinned out to three in each pot: they must not be transplanted. Firm loamy soil containing mortar rubble or a scattering of lime suits them best. A temperature of 50 degrees is suitable.

MIGRAINE : The Headache. Migraine or megrim may be due to such widely differing causcs as eye strain, worry or fatiguc of the brain, want of exercise, or a too rich diet. Not infrequently it appears to be hereditary.

There may be a sense of depression for some hours preceding the onset of the pain, which commonly begins on one side of the head. The pain is of a throbbing character, and is aggravatcd by noises, jarring and bright lights.
Regular daily exercisc, open bedroom windows, and attention to chewing of food may help in preventing an attack. The diet should be plain. Examination of the eyes by an oculist, attention to decayed teeth and to discased conditions of the nose and ears will be found to be worth while. When an attack threatens, a cup of hot ten or weak coffee may prevent it. Druge are to be avoided until other measures fail. An ersential part of treatment is complete rest in bed in a darkened room, with cold compresses, constantly changed, over the forehead. See Biliousness; Headache.

MILDEW : How to Remove. In appear. ance resembling a blue or a green mould, mildew is found on jam, checse, oranges, and orher fruit, on bread that has been kept too long, and on many other foods, as well as on |cather coverings of furniture, and on linen and cotton. When closely examined the fungus plant is seen to be a collection of fine threads with spore-bearing branches, which may extend in all directions if the mischief is allowed to remain undiscovered. There nre several forms of mildew which may develop as a mould on food or a rust on plate.
Causes of Mildew. Damp is nearly always the predisprosing cause. Clothes or food stored in damp cupboards are always liable to be affected, and such cupboards should be inspected at intervals and their contents carefully examined for any traces of mildew. Where linen or cotton are affected the marks are easily removed if the articles have not been left too long unexamined. A good plan is to wet the mildewed parts, rub them with ordinary laundry soap, and cover them with précipitated chalk, which should be rubbed well in. The clothes are then allowed to remain undisturbed for an hour or more, after which they are thoroughly rinsed out. If any traces of mildew still remain the operation should be repeated once again.

When the mildew has been allowed to spread or become settled, damp salt should be rubbed in and the clothes exposed to warm sunshine if possible: the process may have to be repeated on several days, but is nearly always successful. Strong soapsuds may be used as well as the salt. Nildew on leather can be removed by rubbing with vaseline. In the case of food it is generally sufficient to excise the portion affected.

Besides soap and water, sour milk may be used to remove mildew much in the same manner, the stains being soaked overnight and the article placed in the sun without rinsing. Lemon juice may be employed, and is effective in removing slight stains. l'or old and persistent stains on white fabrics
potassium permanganate is sometimes cm . ployed. It is prepared by dissolving a tcaspoonful of the crystals in a pint of water.

An American remedy is javelle water, which is made by dissolving 1 lb. of washing soda in a quart of water, and adding $\ddagger \mathrm{lb}$. of ordinary bleaching powder. It should not be applied to coloured materials. It is allowed to remain on the fabric for 1 min . only, then oxalic acid solution is applied, and the stain is dipped in water. Sce Damp.

MILDEW : In the Garden. This is one of the most troublesome disenses which affect plants and trecs. It is easily recognized by plants and trecs. It is easily recognized by
leaves and shoots. Its effect is seriously to cripple growth. Fallen leaves from diseased trees and plants ought to be gathered and burnt in autumn, for mildew is carried over the winter by resting spores. Sulphur is the best antidote. Green sulphur scattered on and among rose bushes in winter does good and in early summer spraying with liver of sulphur (potassium sulphide), 1 oz . in 2 gallons of water, is advised. Fruit trees should be sprayed with lime sulphur in spring before the blossoms open. See Lime

Milfoil. Many plants suitable for the border or the rockery are comprised in the milfoil family, also known as Achillea (q.v.).

## Milk: Fresh and Preserved

Food Vaiue and Use of this Important Article of Diet
The reader is referred from this entry to those on Diet: Invalid Cookery, and to the many on the foods in which milk is an ingredient, e.g. Butter: Checsc: Custard: Junket and the various milk puddings. See also Basin: Jug: Lactometer: Saucepan

Milk is called a perfect food, hecause it contains all the substances necessary for the growth and the work of the body. For any young animal its mother's milk normally contains these substances in the correct proportions. In the artificial feeding of infants, and when using milk in a sick or an ordinary dietary, cow's milk is generally used, though recourse is sometimes had to the milk of other animals.

Analysis of Milk. Cow's milk varies widely in quality, but it should have about the follow. ing composition :
(lactose or milk sugar) differs from cane sugar. It is more easily assimilated than cane sugar, and should be used to swecten the feed of cow's milk when the greater cost is of no consequence.

Digestive Qualities. The digestibility of milk varies according to its condition as the following figures prove. Boiled milk takes longest to digest, but this must not be taken to mean that it is not quite as completely digested as raw milk.


Milk clots quickly after reaching the stomach. It is sometimes advisable, therefore, to dilute it with water, lime water, or barley water for an infant, while adults should sip the milk slowly, dilute it if necessary, and eat a biscuit or a piece of toast. For infants a good plan is to add some citrate of soda, in the proportion of 1 to 3 gr . to 1 oz of milk. This can be obtained in 5 to 10 gr tablets.

Milk is so readily contaminated that it should be kept with grent care It should be delivered in closed vessels, glass bottles theing best, as they are easily kept clean. It should be stored in a cool place, separate from other articles of fond it shoulds never be kept in an open vessel or allowed to liccome contamin. ated by dust or llies. The common practice of lenving the milli outside the door in an open vessel in the morning is a dangerous one.
Contamination. The dangers arising from the contamination of milk by microbes can be largely avoided by the process known as pasteurization. To accomplish this, milk is heated to $145^{\circ}$ or $1.50^{\circ}$ and liept at this temperature for 30 min . An apparatus may be purchased for the purpose, but certified pas teurized milk can he olitained from a dairy in a scaled receptacle In using the apparatus the water in which the bottles are placed or in the outer receplacle is brought almost to hoiling, removed from the fire, and covered with a cloth for half an hour, then the milk is cooled rapidly and stored in a cool place. To protect against tuberculosis, milk should be boiled for a few minutes; this should be done where any doubt exists Infants fed on heated milk should be given a teaspoonful of orange or grape juice once or twice a day.

Peptonized or pancreatized milk is often ordered in place of ordinary milk for invalids, infants, and persons of weak digestion. A simple method of peptonizing milk is as follows: To ${\underset{3}{3}}^{2}$ pint of milk add ? pint water and bring to a temperature of $1411^{2} \mathrm{~F}$. Tho required temperature may he obtained by halving the diluted milk, bringing one-half to the boiling noint and mixing it with the ot her. To this milk mixture are added 2 drams of pancreatic solution and 20 gr of sodium
bicarbonate. The mixture in a covered jug is kept in a warm place for 10 to 20 min ., is then brought to boiling point and immediately emoved from the heat.

Artificially Soured Milk. Skinmed milk contains alout $\ddagger$ of the fat of whole milk: separated milk contains little or none. Buttermilk is n thickish, somewhat acid residual milk left behind after churning and removing the butter. It is often a valunble food for invalids and sickly children. Soural milk may be prepared with one of the ferments sold for the purpose, or it may be hought from a reliable dairy. 'lhe Bulgarian bacillus i the organism mainly used for the purpose.

Whey is the fluid squeezed out when milk is clutted with rennet or an acid such as white winc. It contains very little nutritious matter except sugar, but is a refreshing and slightly laxative bevernge. To make whey, add I tensromiful of rennet to 3 pint of milk which is warmed to $104^{\circ}$; with n spoon hreak up the clot that forms and strain through muslin. Junket is milk clotted and partly digested with rennet. It is an cxtremely digestiblc and nourishing food.

Condensed Milk. Sold in three formis, condensed milk is either whole sweetened, whole unsweetened, or skim sweetened. In making the unsweetened variety, 3 pints of whole milk are, as a rule, evaporated down to 1 pint This contains all the nutriment of the 3 pints, and when 2 parts of water are added to 1 part condensed milk the result is the equivnlent of good cow's milk For infants, further dilution and the addition of sugar and cream are necessary. This is an excellent foorl, its one disadvantage boing that it keeps good for only a very short time after the tin has been oplened.

Condensed whole sweetened milk is usually evaporated to the same degree. But to this is added a large quantity of sugar, which in infants may give rise to gastric fermentation. If the various brands of condensed whole milk are diluted according to the directions on the tin, the chilll gets insufficient fat. It may be plump and heavy, fattened by the sugar, but generally is pale and not so robust as he should be. Condensed milk is more digestible as a rule than ordinary cow's milk, and often agrees when the latter does not, but it should only he used for a few wecks at a time, and attempta should he made to replace it as soon as possible by ordinary milk. Ohviously, to supply the deficiency of fat some cream should be added. Cod-liver oil serves the same end.

Condensed skimined milk is wholly unfitted for infunts. It contains only a trace of fat, and is so sweet that if diluted sufficiently to suit the cliild's taste the child will be slowly starved. This should only be used for cooking purposes.

Several reliable brands of milk powder, consisting of milk from which all the water has been removed, are sold; when these are made up with water a quite satisfactory milk food for infants is obtained.
Casein, casumen, plasmon, protene, etc., are highly nutritive and very digestible. They can be added to other foods, such as puddings, soups, etc., and form an excellent article of dict for weakly people and in fevers.

Milk for Invalids. Milk and its various modifications form a most valuable foorl in many diseases, especially in typhoid and other fevers, acute kidney disease, ulcerated stomach, etc. In diabetes the place of milk may be taken by so-called artificial milk, which can be made as follows: Mix 4 tablespoonfuls of good fresh cream with a pint of water, and let it stand for 12 hours in a covered vessel. Then skim of the cream, and beat it up with the white of one egg, a little flavouring of salt, and $\frac{1}{2}$ pint of water.
A few small points are worth mentioning. If milk produces costiveness add some mag-
nesia or brown sugar to it. If it lies heavy on the stomach dilute it, or eat a biscuit with it. If it causes biliousness add half a teaspoonful or less of salt to each pint. A very good way to take milk is in a custard made with gelatin, i.e. milk jelly.

Milk should not be taken at the same times as medicines, or for $\frac{1}{2}$ hour before or after. Never give a child castor oil or other medicincs in milk, which would make him dialike it as a food. Remember that many infectious diseases are conveyed in milk, namely, tuberculosis, diphtheria. scarlet fever, infantile diarrhoca, so fatal in hot weather, and typhoid fever. To avoid these always boil or pasteurize the milk when there is any possibility of its being containinated Sometimes, but rarely, milk also causes ptomaine poisoning like meat

Use in Cookery. Milk forms the basis of many puddings and sweet dishes, and is introduced into soups and sauces, not only to improve the colour but to enrich them and pro vide extra nourishment. Milk also, if made into custard with eggs, becomes a substitute for cream, and can be served with fruit pies and puddings or with stewed fruit.

In hot weather milk should be scalded in order to keep it sweet. If it should become very slightly soured it can be restored by adding a pinch of bicarbonate of sods, and it will often boil without curdling. If really sour and unfit for table use it should not be thrown away, but used in the making of cakes. Cream cheese can be made from sour milk. Wrap it in mualin and allow it to hang until all moisture has dripped from it, scald the curds, dry again, and beat up with salt and pepper to taste.
Testing the Milk. By using a simple con trivance the housewife can easily test milk at home, in order to see whether or not it has been akimmed or adulterated with water. This form of tester somewhat resembles a pocket thermometer, and is marked to scale. When slipperd into the milk, it will sink until the top of the milk reaches one of the coloured divisions. The deeper the tester sinky the greater is the dilution.

Sale of Milk. In Great Britain certa in standards for dried milk liave been fixed by regulations for the protection of the public. No person can sell dried milk for human consumption unless it is properly labelled to show that it contains (1) dried full cream milk, (2) dried partly skimmed milk, or (3) dried machine skimmed milk. Each class must conform to certnin' standerds of milk fat. Some classes of dried milk must show printed warnings as "Should not be used for babies except under medical advice," or "Unfit for habies." The object being to warn parents of the abstraction of fat. l'rovision is made in the reguIations for samples to he taken to sce the public is being protected

No person must put into circulation condensed milk which is not labelled in accordance with the condensed milk regulations. 'lhese have heen deaigned to protect the public and to give them an indication on the labels as to the guality of the contents of the tin. Several grades are mentioned surh as "condensed full creain milk." swertened or umsweetened es the case may be. In the case of skimmed milk it must show on the label "condensed machine skimmed milk" or "condensed skimmed milk." "Sweetened" or "unawectened" to indicate what the tin contains. Standards of milk fat are fixed for each grade and samples are taken periodi. cally to protect the public and to see if the regulations are being carried out.

MILK BISCUIT. A variety of milk biscuit especially useful for the preparation of savouries can be made thus: Warm 1 oz. butter and $\ddagger$ pint milk in a saucepan over the fire, and when they are hot pour them gradually
on to $\frac{1}{2}$ lh. flour previously sieved with teaspoonful baking-powder. Add $\frac{1}{2}$ teaspoonful salt. Stir all to a smooth paste and roll it out as thinly as possible on a floured pastry board. Cut it into rounds each about $1 \frac{1}{2}$ in. in diameter, prick them, put them on a greased baking tin, and bake for about 20 min . When cold pack them in an airtight tin.

MILK FEVER. Fever occurring ahout the third day after childbirth, when the secretion of milk by the breasts is becoming established, used to be called milk fever, but the term and the idea underlying should be dropped. Its existence should always be brought to the notice of the doctor.
MILK JELLY. This dish, which is suitable for invalids, is made as follows: Heat a pint of milk with the thinly cut rind of a quarter of a lemon, but do not allow the milk to hoil. Then add $1 \frac{1}{2}$ oz. White sugar and $\frac{1}{2}$ oz sheet gelatine, and stir the mixture until it is dissolved and is the consistency of cream. Pour it into a wetted mould and leave it until set.

Milk jellics can also be mate by using the ordinary packet jcllies and making them with milk instead of water. A little hot water, not hoiling, should first make the jelly liquid, a pint packet of jelly being made up to $n$ pint with cold milk. Stir it well and pour it into a wetted mould to set.

A double colour effect cart be ohtained by the use of two jellies, lemon and raspberry, the raspberry bcing made with milk, ns alieady described, to fill half the mould, and the lemon, which has been made in the ordinary way, alded before the raspberry jelly is quite set.

MILK PUNCH. To make this, takic a pint of milk, 2 oz . loaf sugar, $\frac{1}{2}$ gill cream, and a tahlespoonful each of brandy and rum. Boil the milk, dissolve the sugar in it, strain it, and when it is cool freeze it partly. Then add the cream, which should be well whipped, and the two spirits. Mix them all together and freeze the mixture further. It should be served in small china cups with a little nutmeg or cinnamon grated over it.
MILK VETCH. This shrub and perennial (astragalus) bears pea-shaped flowers in summer, and thrives in ordinary soil. Most of them are of little value as decorative garden


## Milk Vetch, clump of an effective rockery plant

plants. The goat's thorn (tragacantha) is a low shrub, with spiny branches, which bears lilac-coloured blooms. Monsjessulanus, a trailing plant for the rockery, has reddishpurpl flowers. Propagation is by seeds sown as sonn as they are ripe in late summer.
MILKWEED. The best of the milkweeds (Asclepias) for the garden is tuberosa, commonly called the butterfly weed. This is a perennial, 2 ft . high, which bears showy orange-coloured flowers. It needs soil consisting largely of peat or leaf-mould, nnd must be planted in a somewhat shady place.

MILKWORT. This is a genus ol slıubs and perennials (Polygala) вome of which are suita dle for the greenhouse, others for planting out of dours. They bear pea-shaped Howers of


Milkwort. Yellow flowers of the speciea chameebuxus in a rock garden
various colours. Polygala dalmaisiann, which bears purplish fowers in spring, thrives under glass if potted in o compost of loam, peat and sand. Propagation is by cuttings in summer. The piants should be pruned ns soon as the Ulowers are over. Polygala chamaebuxus is a :ow-growing rock garden plant with pale vellow Howers, needing sandy, penty soil. It is propagated by seeds and division.

MILLET. This name has been applied indiactiminately to the plants of at least four different families, but the generally accepted millet is the hardy annua! Panioum, which thrives in any ordinary soil and position on a sunny border The sceds should be sown in March or April, and the plants thinned out Inter on, as desired The llower sprays will be ready for cutting for the purposes of induor decoration about the month of July

Millet is not used as a food in.Great Britain In countrics where Indian corn and othel grains do not grow well the saeds arc ground into meal for bread. See Bread.
liILLIAMMETER. This is a form of ammeter designed to measure current in thousandths of an ampere. It is a useful instrument for the owner of a bruadeast reoriving set. With the aid of a milliammeter it is a simple matter to determine the anode curtent taken by the valves, and thus to make sure that they are being operated correctly. In making such a teat thic millianmeter is connected between the high tension lend from the H.'I'. battery or climi nator and the appropriate H.T. + terminal on the sct. (The + terminal of the meter is joined to the hightension lead.) For sets employing up to four valves, a meter having a range of $0-25$ milliamperes is suitable. See Anode: Eliminator: High Tension.

MILLINERY. The term millinery coin grises the making and trimming of women's hats and also the fashioning of various trim mings and shapes. See Hat; Head Lining

MILLING. This is a process of removing metal ly a rotating cutter from a piece of work which is bolted down to a tuble capable of sliding sideways and endways and vertioally. In effect, milling is the exact opposite of turning. Tbe tonl used in a lathe is held in slides ngainst the rotating work. In a milling machine the work is held and the cutter, which may be provided with several cutting edges or tecth on its periphery and sides, is rotated.

Small lathes are olten fitted with attach sents which, in effect, convert the tool into a specics of milling machine. Some have only a vary limited range. Where the lathe
has a cumpound rest, the most obvious additional devioc which will provide the third direction of movement is the vertical slide The work can be bolted to this and brought up to a milling cutter fixed in a chuck on the lathe mandrel. Slotting and grooving can be accomplished in this way within the limits of the stroke of the vertical slide. In some cases the vertical slide is arranged to hold a spindle, running in plain or ball bearings, with a pulley at one end and a chuck for holding the cutters at the other. The body of the appliance is bolted to the vertical alide of the milling attachment, and the spindle is driven by what is termed the overhead gear in referring to foot lathes.
This gear consists of an overhead countershaft driven from the foot motor, and $n$ system of pullcys which will drive the milling spindle, but at the same time allow for any change in the position of the milling spindle, both in setting up the work and during the cutting operations. Where the cutter is driven from such n separate and self-contained spindle, the mandrel would he fixcd. The worls is bolted to the face plate or otherwise fixed to the mandrel. The mandrel may be held by tightening the bearings, but this is an expedient which should only be adopted in an emergency. The Inthe should be fitted with a dividing apparatus.

MULLIPEDE. This is a troublesome soil peat which may do much daniage to bulbs and the roots of plants. It is black or brown, with numerous fcet, and curls up when disturbed. It should not be confused with the beneficial centipede, which is tlat, lighter in colour, and has only onc pair of feet to ench sogment of the body. A fumigant of llb. of naphthaline and 1 stone of lime, mixed and used at the rate of 1 lb . per equare yard, should be dug in infested soil. Millipedes are frequently found in lange numbers in leaf mould; this should be sprayed with formalin, 1 tableapoonful to a gallon Centipede: Insccticide

MILTONIA. An casily grown family of orchids suitable for cultivation in a heated


Milling. Complete Indexing, milling and rear cutting attachment fitted to a 3 k ln . centre lathe Courleall of Drummond Bros., Led


Miltonia. Bothouse orchid, the flouers of which
glasshouse. They prefer a shady corner of the house, and may be cultivated in pota or pans in a mixture of peat, moss, and charcoal. They need an average temperature of $70^{\circ}$ in summer, $60^{\circ}$ in autumn and winter, with plenty of water, except when the temperature is at its lowest. They rest during winter, and the bulbs ahould be separated parly in the yenr to increase stuck
Miltonias llower in summer. They are excellent orchids for beginners and amateurs who have the necessary heat at their disposul There are many benutiful varieties of Miltonia vexillaria, the chief species See Orchid.
MIMOSA. So extremely enensitive is the mimosa or sensitive plant (Mimoss pudica) that the leaves will fold up at the slighteat touch. The plant belongs to a small family of greenhouse perennials with diminutive acacialike foliage.

Mimosas should be grown in a mixture of two parta loam, one part leaf-mould, and a good aprinkling of sand. While young the plants require warm-house trentment, bût a cool greenhouse will suit them in the mature stage. Propagntion is by sceds sown in heat in spring.
MIMULUS. This is the scientific name of the musk, or monkey Hower. The cominon yellow musk (Mimulus moschatus) has unfortunately lost its fragrance.

MINA. This half-hardy climhing annual, Mina lobata, bears showy yellow and crimson Howers in summer. It is raised from seeds sown in a heated grecnhouse in early spring and the plants are set out of doors in May agninst a trellis, arch or veranda The secd. lings may be repotted and grown in the greenhouse

MINCE: How to Prepare. The colou of a meat mince must be appetizing and the consistency creamy. It must be thoroughly hot, yet must only just reach boiling point, or the fragments of meat will resemble scraps of leather. It must also be skilfully sensoned

Cut about 1 lb cold meat frec from bones and unentable picces into very sinall cubcs, or man it through the mincing machine. Fry 1 tablespoonful finely chopped onion and 1 oz flour a rich brown in 2 oz hot beef dripping. Stir in gradually fint good stock, and continue stirring it until the sauce toils Cool it a littie and lay in the meat.

Bring to the boil, then cover the pan and let it stand by the side of the fire until the ment is well Havoured with the gravy and
soft through ; this will take at least $\frac{1}{2}$ hour. Serve in a hot dish within a border of toast sippets or mashed potato. A savoury method of using up the renains of a cold joint or portions of game or poultry is to mince the meat and heat it in thickened gravy or sauce. Remove all the flesh from the bones and clear it from skin and gristle. The bones and trimmings should be added to the stockpot. Now chop the meat or pass it through the mincer and mix it in with the gravy or sauce, which should be ready boiling.
Slightly season the meat before adding it to the liquor. Boil it up and let it simmer for 8 min ., never longer. The sance should be brown or white, according to the nature of the meat which is to be used, and a plain dish of minced poultry or game is always garnished with sippets, toast for brown meate and fried bread for white meats

Mince can be adapted for various side dishes or entrées, but the foundation is the same, only the solidity and flavour of the sauce is altered according to the character of the meat See Croquette; Cutlet; Galantine; Shepherd's Pie.

MINCEMEAT. The ingredients for making mincemeat vary considerably, almost cvery cook having her own recipe.
To make a plain mincemeat, pare, core and chop up lincly 2 lb . apples, then add 1 lb . each of currants, stoned and chopped raisins, and brown sugar, $\ddagger \mathrm{lb}$ very finely chopped suet $\ddagger \mathrm{lb}$. candied peel, chopped very small, a level dessertapoonful powdered allspice, a pinch of salt, and the juice and grated rind of 2 lemons. A little brandy or rum may be used to moisten it, and a little raisin or other wine. Mix the ingredicnts very thoroughly, cover with a cloth, and let the mincement stand for some hours before putting it into small jars and tying them down.

A rich mincemeat is made as follows. Chop $\frac{b}{f} \mathrm{lb}$. beef suet very finely, and mix with it $\frac{1}{2} / \mathrm{b}$. curranta, and 6 oz. mixed candied peel, cut up very amall. Add $\frac{1}{2} \mathrm{lb}$. chopped, stoned raisins, 1 lb . apples, pared, cored and chopped, and 2 oz. blanched shredded almonds, and mix all together. Next chop up $\ddagger \mathrm{lb}$ lean cold roast bcef, or of fresh boiled ox-tongue, and add it to the other ingredients, with 6 oz of brown sugar, $\frac{1}{2}$ oz. of allspice, $\frac{1}{2}$ a grated nutmeg, the juice and grated rind of a lemon, and a teasponnful salt

it be too moist, or the undercrust of the mince pies will not rise.
Mince Pie. To make mince pies, grease some rather deep patty pans, and line them with good short or llaky paste, rolled quite thin. Put in plenty of mincemeat, and cover with another round of paste, moistening the edges and pressing them together Make a little bole in the top of each pie, and brush them over with beaten whitc of egg, before baking them in a good oven for $20-30 \mathrm{~min}$.

They are best re-heated by being put on a baking-sheet in a moderate oven for a felw minutes. If the oven is too hot, and there is risk of their burning, it is desirable to leave the oven door ajar. See Christmas; Pastry.

MINCING MACHINE. Frequently known as the mincer, this is a useful kitchen appli ance for desiccating foodstuffs; for instance. cutting up pieces of cold beef or cold mutton so that they can be cooked in various savoury ways. There are several kinds on the market, most of them being made so that they can be fastened quite easily on to the edge of the kitchen table. Before it is put away all the component parta of the mincer should be carefully cleaned and dried

A typical example of the popular type of machine comprises a cast-iron receptacle with a bell-mouthed top and a acreu clamp arrangement at the bottom for attachment to a tahle. The bell-mouthed opening or hopper, with spiral grooves at right angles, forms part of the tunnel in which a screw or worm rotates. Onc end of the tunnel is closed and formed into a bcaring for the spindle of the worm. The other cond is open and has an outlet for the minced food. The outlet aperture is covered by a circular steel plate with holes. The second plate is attached to the outer edge of the worm spindle, and this also has holes in it, but of smaller size. A crank and handle arc provided for rotation of the worm.
The food is cut up and put into the hopper mouth. and as the handle is rotated the pieces are

pressed down on top of the worm, whicts forces them through the tunnel and out through the apertures in the steel plates or knives As one of these knives is fixcd and the other movable, the action is analogous to that of cutting with scissors. The function of the worm and the shaped grooves in the funnel is to propel the fordstulfs towards the cutting knives. These knives cut up the food as it emerges and deliver it in small pieces, when it is ready for whatever cooking operation is necessary.
Parts of the Mincer. Fig I shows the mincer in use, and Fig. 2 the component parts. It will be observed that the crank is attached to the end of the worm shaft by a thumb. screw, and that the boss of the crank has a triangular-shaped hole in it, which fits on a corresponding boss on the end of the worm spindle. The thumb-screw forces the crank into close contact with the tapered triangular end of the shaft. The other end of the worm is provided with a thumb nut, and the end of the worm is formed with a pair of flats, which engage in a slot formed in the centre of the moving knifc. The fixed cutter has a circular hole in the centre in which the worm shaft rotates. The cutter is prevented from moving by a small projecting peg, which engages in a slot in the top of the mincer
Fig. 3 shows the fixed plate in position. the fixed blade fitting into a recess formed in the end of the mincer. It is important to see that the fixed blade fits properly into the recess, and that it is free from little picces of bone or other hard material which would prevent it bedding down flat. The moving blade should bear cvenly against the fixed blade: the pressure between them is regulated by means of a wing nut and can be varied by tightening or slackening the nut. The crank should always be attached firmly to the worm spindle, as if it is allowed to get slack it will specdily wear the hole and the boss will no longer function properly. The crank ought always to be placed and tightened on the spindle before tightening the cutting blades: if this is not-done, the blades may draw the worm too far through the tunnel, with the result that when the thumbscrew is tightened up on the crank handle, it will be found to jam the spindles

Usually this class of mincer is made of malleable cast iron galvanized, and with ordinary care it will give years of satisfactory service. Spare knives are generally supplied with it. When they hecome badly worn it is possible to re-sharpen them by grinding the surfaces, or by cleaning out the holes so that the cdges are perfectly mquare and clean. Grinding may be effected by sprinkling emery powder on a piece of sheet glass, moistening it with oil, and then grinding the knives by press ing them down on the glass and rubbing them on the surface with a slightly rotary movement
Other varietics of mincer are made larger in capacity than the small household type illustrated. In some varieties the knilc blades are attached to the worm shaft, while others have a glass hopper,

MINDERERUS SPIRIT. The solution of ammonium acetate, or mindererus spirit, is a useful and much prescribed diuretic. The dose is from 2 to 6 fluid drams. It has also a mild diaphoretic action, and is thus a valuable ingredient in fever mixtures. See Diuretic.

MINERAL WATER. In a popular sense effervescent watere containing carbonic acid gas only, such as soda water, or carbonic acid
and some tlavouring substance, as lemonade. When spots of mildew appear they should be ginger ale, etc., are classed as minerals or mineral waters: but more strictly mineral waters are those which contain inarganic salts in sofficient amount to be active. These are of two classes: effervescent waters containing carbonic acid and some medicinal salte such as Seltzer, A pollinaris, Rosbach, and sparkling Malrem: mineralized waters which contain no carbonic acid and do not effervesce.

All aerated or carbonnted waters have a soothing effect on the mucous membrane of the stomach, and assist digestion, but if taken in excess they cause indigestion and Hatulence. Mincralized waters are used as table waters or for the medicinal effect, according to the quantity of mineral matter contained.

Kinds of Mineral Water. Table waters should not contain more than onc per cent of mineral matter. Most of them are slightly alkaline, and when used to dilute acid wines they partly neutralize the retarding influence of the wine on digestion. Among these are Apollinaris, Johannis, Kmnthal, Perrier, Seltzer, sparkling Malvern, and Vichy. Some act on the bowels, some on the kidneys

The laxative waters, having a mild effect on the bowels, include Contrexeville, Harrogate, Kissingen, Kronthal (red In bel), Seltzer. The purgative waters, containing sodium and magnesium sulphates, and known as bitter waters, include Apenta. Franz Josef. Hunyadi Janos, Kissingen. Among tho diuretic, kidney-stimulating waters are Apollinaris, Cheltenham, Harrogate, Johannis, Kronthal, Marienbad, Seltzer, Vichy. At various spas there are waters containing iron and arsenic.

Indiscriminate indulgence in active mineral waters is to be deprecated just as much as indiscrimin. ate drugging of any sort. The water used must be appropriate to the unhealthy state which it is proposed to remedy, and this necessitates expert advice. Morenver, the use of any mineral water at home may fail to benefit, whereas its use at the source, whers the treatment may also include baths and other means, and which entails rest of body and mind, may be thoroughly successful. See Ginger Beer: Lemonade, etc.

MINIATURE. These portraits were at first painted in body-colour on vellum or on playing-cards, and afterwards on ivory or paper in transparent colour. An interesting class compriacs those done in plumbago, and also in Indian ink, sometimes imitating the effect of line-engraving.

The posscssor of portrait miniatures should guard them frmm excessive licat, damp and sunlight They are quickly ruined if hung in window embrasures or beside the fireplace. Those which are painted on ivory, after the Cosway manner, are liable to fade if frecly exposed. Should they be valuable it is hest to keep them in closed cabinet-trays.

Ivory miniatures are hest mounted, not on stout card, which tends in oxpand and contract, but on thin notepaper, with dilute gumarabic. After being pressed dry they may be bound to the glass with gold-beater skin, or surrounded by a velvet pad to exclude dust.


Mint Culture. 1. Root of mint. 2. Same planted in box: $a$, fine soil : b, rough soil: c, crocks. 3. Cutting badly cut and planted. 4. Properly prepared cutting. 6. Same wall planted on sand base. B. Wrong way to use dibber. 7. Correct use of dibber

MINORCA : The Fowl. Black minoreas enjoy a reputation as layers of large white egga, and their precocity, hardiness. and adaptability to all soils and place, confined or otherivise, make them one of the most useful of all breeds. In general apprarance they are not unlike the leghorns, having the red face and white ear-lohes, but a much larger comb. They also average in weight 2 lb . or 3 lb . heavier and, though not gener ally ack nowledged as such, are not to be despised as table birds. In addition to the single combed variety of ininorca fowl there is also a rose comb and a white varicty, hoth of which have $n$ large following. See Fowl ; Poultry.


Minton Ware. Porcelain boul dating from about 1800, decorated with Greek key pattern and fanres British Muscum

MINT. This is a hardy perennial plant. with aromatio herbage, which flourishes in ordinary soil. It should be planted in early spring, and. as it spreads freely, the plants should be lifted and replanted once in every 4 or 5 years, otherwise it runs to stalk instead of to leaf. To force mint the roots should be liftedin autumn and placed in boxes of potting soil in a slightly heated glasshouse. Maisturcand warmth will cnsure a crop by Christmas time. Onc of the numerous varieties of mint. Mentha Requicni. is peppermint, and is best grown as a tiny trailing plant in the rock garden. For the purposes of distillation the shoots should be piclied when the flowers are upon them. Shade and moisture are the two chief requirements of inints of all kinds.

Uses for Flavouring. On nccount of its aroniatic propertics mint is much used in cookery for tlavouring sauces, salads, and soup. It is also employed in the preparation of a drink called mint julep Spearnint is considered the best variety for culinary purposes. Mint is full grown in June and lasts well till August, when it begins to llower. It ghould then be plucked, dried, and stored in airtight tins or bottles, for winter use. Dried mint is served with some soups and added to scasonings occasionally. When fresh mint is not obtainable. powdered mint mav be used as a substitute
Mint Julep. To make this, place 3 sprige of fresh gathered young inint in a tumbler and partially fill it with sherry. In a second tumbler put sufficient pounded ice to half fill it. I'our the mint and sherry over this. Transfer the julep from one tumbler to the other several limes, then place it on ice for a fow minutes.

Mint Sauce. To make mint sauce, chop finely the lenves from 6 or 8 sprigs of mint. and put them into a sauce tureen with 8 lumps sugar, pour over them 2 tablespoonfuls boiling water, stir well, and let all stand for a few minutes; then add about $\frac{1}{2}$ pint vinegar.

Mint Vinegar. This is made by filling loosely a pickle bottle with leaves of young mint, and adding sufficient white wine vinegar to cover them. Tie the bottle down securely, and after 3 weeks strain into another buttlo and cork it firmly. This is good for winter use.

MINTON WARE. The productions of the Minton works nt Stoke stand in the front rank of modern Staffordshire cerainics. They embrace a wide range of styles, both useful and ornamental. Some carly Minton resembles 1)erby and Spode, and may sometimes be recognized by its nark, such as
the double L of Sèrres enclosing an M , or later on the arrowhead device which represents ermine in heraldry. There were also descriptive marks, such as Amherst Japan. Later productions included vases and plaques in a white refief called pâte-sur-pâte, which rivals in beauty Wedgwood jasper. These wares usually bear the name Minton sometimes inscribed upon. a globe, or surmounted by a crown.

Among the new developments were Parian statuettes and groups, and reproductions of
medieval majolica, besides Persian style, faience, and Nèvres porcelain. A fine liard paste body was introduced for the manufacture of domestin china A distinctive shape of tea-cup has been given the name of Minton. The Minton works have also played a predominant part in the development of the manufacture of tiles for paving floors and lining walls. See Staflordahire Chinaware.

Mirabilis. The botanical nanic of the plant

## Mirrors for Decorative Purposes

## Choice and Arrangement of Antique and Modern Styies

Other aspects of this subject are dealt with under such headings as Cheval Glass: Dressing Table: Toilet Mirror. See also Dining Room: Hall: Living.Room : and the entrics on Gesso: Gilding: Lead Art Craft; Silvering

A mirror miny be described as a reflecting surface usually made of glass and lined at the back with silver or nnother brilliant metal. Nirrors are often given pride of place in rooms and halls to-day as they are not only decorative, but lend an appearance of space and, by reflection. increase the light in dark corncrs and passages. Another use of mirror glass is for framing and lining niches or the upper parts of glazed cupboards or recessos, so that the ornaments on the sholves may be reflected and their decorative value enhanced. Finger plates for doors and curtain pelmets arc also fashioned of mirror glass, while whole panels are introduced into doors for rooms and cupboards and as rellectors on walls
In the case of such panels they are most effectively used where it is desired to give an air of brightness. as, for instance, in a basement room or darli hall; othorwise the effect might be rather garish and reatless. In page 734 an excellent example of the use of mirror panela in a dark corner is illustrated. The mirror inset of the heavy wooden overmantel is now less frequently seen, the place of the latter being taken by one of the charming morlern mirrors, with inlaid or marquetry decorstion, or by an antique exnmple of beantiful workmanship. Mony clever reproductions of old mirrors ane obtninable. The frame in others is genuine. but the glass has been replared so
skilfully that it is quite difficult to detect the modern touch

In buying an old misror this inatter of the glass is one to which the purchaser should give nttention. Often it is so spotted owing to the corroding of the silver backing, that its decorative value is reduced to a minimum unless it is resilvererl. For practical purroses also, nothing is more uncomfortable than a reflecting surface pitted with spots. With the exception of a really valuable antique piece. which should not be tampored with, the practice of resilvering is quite legitinate. Many mirrors of comparatively recent date have become spotted through carelcss usage or damp.

Mirrors should be hung in such a position that they aro not above the cyc level, and are not crowded by pictures or other mural decoration. In the case of a small fromed mirror, it is best given a slightly forward tilt, as this allows the air to get to the back. The back board of the inirror should not be cracked and left unrepaired, or such a crack will, in the course of time, appear as a mark on the face of the glass.

When choosing a mirror for a room it must obviously be in harmony with the style of the furniture and decorations. An old gilt frame will look merely shably nmongst very new surrnundings which deniand severity of


Mirror. Figs. 1 and 2. Examples of the Queen Anne period: left, in walnut and marnuetry: right, with walnut and gilded frame

outline or at billiant surface to all accessories and ornanients.

Early English Mirrors. 'The carliest domestic mirrors used in England were of polished stecl, which were found in large houses of the lifth and early lith centurics. A cor poration of olass mirror makers, however, wha formel in Venice in $\mathbf{1 5 6 4}$, and proliably a lew examiples of their work filtered through to England, being sent as gifta to members of the roya fanily and other important perso: ages. Glass mirrors, therefore werc very rare in the time of Elizabeth and Janes I, and authoritice are inclined to suspect the genuine ness of any that are said to date from that perio:d
Mirror makers were brought to lingland. and the first putent for minnufacture was obtained by Sir Rohert Mansel in 1615. But the most important manufictory establisherl was that of the duke of Buckingham at Lambeth ahout 167:3: to collentors of old furniture mirrors inale there are usually regarded as the carliest specimons ohtainahle They had hevelled ongos which in themselves show certain charncteristics of genuine hand work. Ihe angle between the bevel and th? llat surface of the mirror is not mechanically


Fig. 3. Early eiphteenth century mahozany marror with gilt moulding inside the frame
sharp: but is somewhat round, and ocea sionally various facets can he distinguished gralually melting from the level plane of the glass to the angle of the bevel.

Although few examples of the actual glass used in mirrors of the late 17 th century are still in existence their frames are of much interest. Gitinling Gilhons carved at numher of then very elaborately, and some frames aro to be found embroidered with panels of needlework. Others are male of silver or of marquetried end lacquered wood. In the Stuart period framza were usually rectangular, with or without a perliment, and this style was still made in the carly part of Queen Annc's reign. A heautiful example of such a mirror in walnut and marquetry, with a semiciccular perliment is shown in Fig. I

Queen Anns Mirrors. A faniliar form of Queen Anne mirior frame has a graceful arched top, somotimes surmounted by a cresting

elahorately ornainonted. The lovely example shown in Fig. 2 is framed in walnut partly gilded. The bird on the podiment is an exquisite picce of carved decoration. Owing to tho dimeutty of making large-sized platea at this period a tall mirror would show two p!ates of glass joined in the middle just bencath the spring of the arch Nearly all Quecn Anne mirrors now show considerable defects, being spotty and damaged at the back

Although the most beautiful frames were designed nt or $n$ bout this time, the mirrors made in the William and Mary and Qucen Anne periods were not all graceful. Some were, in fact, ugly, owing to their over elahorate crestings or pediments which exaggerated fashion made the rest of the frames appear insignificant, while the carving and ornaments were occasionally conrse and of poor design


Mirror. Fig. 6. Modern mirror wall decoration made in pames and studded with roseftea of glass Ilumplires \& Vera Joel


Mirror. Fig. 4. Mirror in carved mahogany irame. English make, dating from about 1740. Fir. 5 . Convex mirrar in an elaborately carved and gllf wood frame, with candle sconces, datlar from about 1790 Fia. 4. by permiasion of the Director, Victolia d Albert
Museum. S. Kenalngton Fiy. 5, courlesu of Bill it
Reigale

A favourite frame for the commoner type of mirror was a prominent half-round section of walnut. Many examples of this style are seen in toilet mirrors, and some of these are inlaid. Such frames arc reproduced to day for socalled Qucen Anno style cheval glasses. Other mirrors were decorated with lacquer work, and gesso was used throughout the 18th century on many gilded frames.

To collectors the most prized mirrors are those contrining the original Vauxhall glass of the carly pirt of the 18 th century. The best are the wide bulbous ones inlaid with floral arsbesques, and having mouldings which may be as much as 7 in . wide. Some valusble ones have marquetry frames, the marquetry being designed in elaborate seroll work.
Georgian Mirrors. An carly Georgian mirror with a mahogany frame is illustrated in Fig. 3, and a somewhat later example in Fig. 4. The former has gilt moulding on the side of the frame, while the latter, which is elaborately decorated, is also gilded and carved. The workmanship of these is very fine, and they are typical of the early Georgian period, but they lack the supreme grace of the best Queen Anne mirrors. The superior beauty of Fig. 2 to that of Fig. 4 in the balance of the design exemplifies this

Wall mirrors deaigned by Chippendale, the brothers Adain, Hepplewhite and Sheraton were often elaborately carved with classical decorations following in the ma in the French atyles of the period. Chippendale designed many mirrors in Gothic and other architectural styles. During the mid-Georgian period framea of a more severe outline were fashionable Robert Adam introduced Wedgwood plaques or medsllions in the centre of surmounting decorations to mirrors which were sometimes composed of threc plates of glass, n larger one in the middle, and smaller ones at the sides.

Circular convex mirrors were introduced towards the conclusion of the 18th century, and the fashionable furnisher of the day produced a great variety of frames. The one illustrated in Fig. 5 has a deeply moulded gilt frame enriched with balls and sumnounted
by a carvod Lird. Candle sconces are titted to the sides. In some examples these had out glass drops suspended from them.

Pier glasses date from the end of the 18th century, for it then bocame possible to get much larger sheets of glass than wore hitherto available. Moreover, plate glass, which had been first made in France a century before, was now to a certain extent used for looking glasses.

These large mirrors were fixed to the walls between windows, with console tables hencath ${ }_{1}$ or over the mantelahelf, a position which was utilized for their display to evon greater elaboration in the Victorian period.

It was in the early part of the 19th century that the mirror began to be employed in the backs of sideboards, at first in a simple circular convex form Mirrors were also fitted into the lids of worktables, and the toilet table was developend with the mirror as part of the piece of furniture. Cheval glasses were more commonly scen at this time, for the sizes of slicets of glass had increased so that it was possible to provide a mirror to give a full reflection of the figure at a reasonable cost.

In modern furnishing coloured mirror glass is utilized for wall decoration. Mirrors are alao scen with chromium plated frames in severely simple outlincs. Pewter frnmes, with inner borders of coloured glass, ornamented with glass rosettea and studs, are copied from Italinn work Mirrors composed of separate panels and studded with glass rosettes form beautiful mural decorations, as shown in Fig. G, with its Gothic design. Another beautiful modern mirror decorated with a marquetry panel is illustrated in page 769

MIRZAPORE CARPET. Large quan. tities of these Indian floor-coverings arc imported into Great Britain. They arc woven in symmetrical patterns supplied by European buyers to the factories, which turn out each quality at a uniform price per square yard.

Those which are loosely woven, of short staple wool, are the least durable. Large numbers have a light cream tone predominating in the field, with strong reds, blucs, and grcens, which do not mellow with age, but acquire a faded look. Nevertheless, they are nnong the least expensive of any oriental Hoor-coverings, and are often useful for hall or landing in small sizes, and for study or smoking room furnished in simple hut so!id style. They are unsuitable for living-rooms as they are not sufficiently hard wearing to stand family use.

MISTLETOE. This is a parasitic ever. green which grows on the onk, puplar, apple


Mistletoe. Sprig of this iraditional Christmas decoration and other trees. Its berried shoots are in great demand for Christmas decorations. The mistletoo is dioecious, i.e. male and fe. male flowers are on separ. ate planta, therefore all mistletne dors not bear ber. rics. It is esta blished by rubhing $n$. few ripe sceds in ctaoks of branches of suitable trees in Mareh. The secds must be protected from birds by netting or other
covering. Slistlatue grows very slowly for several gears.
In Christmas decorntion schemes mistletoe is general!y a characteristic feature, its pale colours contrasting witl, the vivid hucs of the holly See Christmas.

MISTLETOE CACTUS. The popular name of the genus of llowering plants Rhipsalis is suggested by its appearance. These plants are morecurious than beautiful, and are little grown. They thrive in loam, with a liberal proportion of brokion crock at the bettom of the pot, in order to ensure good drainage. Propragation is by cuttings in sandy lonm. It is wise to leave them in tho sun for a few days before inserting them, as this reduces tho tendency to dnmp. ing off. Cassytha is the bestknown species of this cactus.
MISTRESS. A lady who cmploys a servantis not bound to give the servant a character, but if slic does she must give ono leaves of the species cosagtha honestly. A mistress is not entitled to hreak open a servant's box without a search warrant, or to doduct for breakages from the girl's wages unless tho servant has expressly contracted that this may be donc. Shie is entitled to obedience to all reasonable commands; and it is a reasonable command to request the eervant to wear a proper uniform and also to keep reasonable hours. See Master; Servant.

MITE : In the Garden. Onc of the most seriuls garden pests is the mite, which attacks black currant bushes, cansing the buds to become sivollen and usrleas. Swollen huds should be picked uff and burnt and old brunches or parts of them must be pruned out is soon as the fruits are gathered. The best treatment is to spray with lime sulphur every 10 days between mid-March and mid-May.

The pear-leaf inite forms blister-like spots on the surface of leaves. All leaves attacked should be removed and hurnt; trees should be given a lime-sulphur spraying in early spring. The filbert hud is a microscopic mite which is found on tho huds of filhert, hazel, and cob-nut. The damage is similar to that done by the big bud, and similar treatment is required. See Isig Bud; Insecticide : Lime

MITE : On Poultry. Poultry suffer from the attacks of certain mites. Some live on the birds at night, the red hen-mite, for instance; others are permanent parasites, e.g. itch mites, which live at the bnsc of the fenthers, and cause the birds to eat thein; and others live under tho skin and cause scabby growths, such as are sometimes seen on the legs of fowls.

The best method of dcaling with these mites is by cleansing operations. The poultry house should be fumigated with bi-sulphide of carbon or another agent, while some paraffin in the cleansing wash is excellent for the perches For the mites that cause feather-eating the hird should be isolated and oil of cloves ruhbed into the affected part. See Poultry.

## Mitre Joints in Woodwork

## How to Make and Use a Mitre Boz and a Shooting Board

This contribution supplements those on Moulding and Picture Frame. The principal woodwork ioints are dealt with under apeclfic headings, and other valuable hints are given in the general artiele on Joint. See Cabinet Making: Door; Draver, etc.
The tern mitre is applied to various kinds An example is given in lig I, and Irom of joints formed between two pieces of this it will be seen that the parallel lines material, as, for example, in picture frames and representing the mitreing intersect at the mouldings. The ends are butted together in corner, or angles, as at A. B and C. The such a way that the joint between them correct angle to cut tho mitre is determined bisects tho angle between the external edges by joining the interscctions of the two inner of the matcrial. A right-angle mitre is one lines to that of the two outer lines, as at D, C. in which the mouldings are nt right angles, Having ascertained this angle. the bevel the angle of the joint being therefore $45^{\circ}$. The squaro is set to it, and the angle marked particular object of using the mitre is two-fuld: upon the moulding, which is then sawn off, the contours of the moulding should exactly and tho ends planed or shot true.
meet and flow into each other at the joints, and the inner and outer finces of the moulding shou!d not expnse any end grain.

Mitred jointa are often keved at the corners with a plain or dovetniled key, examples of both of which are illustrnted The simple, flat key shown in Fig. 2 is fitted in very small work, by making a saw-cut in the ends of the mitred parts of the frame In stronger work the key is sawn from hardivood, say; about $\$$ in. thick, and is fitterl into slots made in the ends of the mitred joints by sawing nnd chiselling. The grain of the key is set to run parallel with one of its edges. with the result that when
$\qquad$


In this work. the lengths of all mitreings may be menqured to the inside or from the outside, the latter being usually the most convenient method. Fig. 4 shows how the mitre is marked with the bevel square. Tu facilitate marking a standard mitre template can be used. This is a combination of a mitre template and a square. It can be purchased, or a similar instrument made up from a picce of wood. The wooden tempiate is simply a piecc of wood with a lip, or guide surface, upon it, and the ends accurately mitred to the angles dcsired.

Mitre Box. A box for the cutting of material up to 5 in square can be male from ed in place it has the greatest strength. 3 picces of deal, planel up true on the faces The keyed dovetailed mitre joint in Fig. 3 and edges and measuring 6 in. wide and 1 in . is suitable for framing intended to withatand thick. The length of the 3 pieces should be considerable stress, and is simply an ordinary about 2 [t. (Fig. G gives the dimensions.) mitred joint with a double dovetail formed across it Into the double dovetail a piece of X-shaped hardsood is fitted; when this is pressed into its place in the slots which are cut for the purpose. the joint is firmly held. One of the
 difficulties in mitreing a joint is to determine the correct angle for the mitro. Normally, the The next step is to mark out the sides fur willbcupright, block a line at right angles to the length of or atright the box: project this line to the face of angles to the oach of the side pioces, and saw through to flat surface this lino. Then sct a bevel squaro exactly but it will be at $45^{\circ}$, mark this angle on the upper edges of the side pieces. square off on each of the outer sides of the side pieces, nud agatnsaw through Repeat this operation on the opposite hand, and the mitre box is complete and ready for use. Fig. 6shows the plan of the Lox and the correct angles marked out. Fig. 5 shows how the hand saw should bo held in sawing the moulding, and how it works through the saw-cuts.

The moulding to be cut is pressed into the lower corner of the box and he!d with the
left hand while the saw is manipulated with the right.
A mitre block, useful for cutting small noouldings, is illustrated in Figs. 7, 8 and 9 . It may be composed of a basehoard, 18 in . long, 6 in wide and 1 in thick. and a second board of the same length, about 3 in wide and a hout $1 \frac{1}{2}$ in thick, which is glued and dowelled to the bascboned. It is marked of with angles and sawn thmugh as before. This type is used in a similar manner to the mitre box The first pattem fer The pis is gencrally more convenient for amateur usc, as it keeps the saw upright.

If it is intended to use either of these blocko for a great deal of work. an improvement


Mitre Boz. Fig. 5. Home made mitre
boz in use
 and have strong battens screwed to it to prevent it warping or winding; when not in use it should he hung up and given a prer:autionary roat
of varnish or paint. of varnish or paint.
MITTENS. Knit. ted mittens for men may be worked in a gond 5 -ply fingering. which makes then comfortable in wear, yet warm and strong enough to be worn for ordinary sports, and for shooting and motoring when it is desirable to have the fingera free and uncovered.
Fig. 6. Plan of mitre box, showing correct angles. Fig. 7. Solid mitre block. Fig. 8. Section of block showing necessary measurements

Another piece of batten is ghued and dowelled to the top of the fence at ahout the middle of its length, and this piece has its edges cut and planed to the desired angles, forming a mitre template. The complete shooting hoard is shown in Fig. 11. The work to be planed is held against this angle block with the left hand, and a jack plane is laid on its side. resting upon the haseboard, with the sole of the plane against the edge of the with the right ne is pushed up and down towarls it, thereby cutting the end of the noulding and produeing a surface which is flat, but is inolined at the same angle as that of

Guide pieces or blocks can be made to any desired angle and interchanged according to requirements If the board is intended for regu!ar use it should be grooved on the underside of the bascboard
is to line the guide faces with strips of brass, to prevent the sides of the saw wearing away the material and thereby making it inaccurate and unrelialile in use
Mitre Shooting Board. After moulding has licen sawn to the requisite angle to make


Tomake a pair big enough to fit a hand that usually takes size 8 in kid, 3 oz . White Heather 5-ply fingering will be required, with No. 14 stee knitting needles. The one illustrated had the top of the hand and the top of the thumb where the single ribbing occurs worked with ncedles one size smal!er than the rest of the mitten. This helps to close them to the hand, but it is not ahsolutely necessary to nes other necdlea if they are not at hand, as the ribbing serves the same purpose.

How to Knit. To hegin, enst 24 stitches on each of 3 needles, making 72 altogether; join them into a round as for stocking knitting, and work a plain round through the back of the stitches to give a firm edge. For the wristlet, work in ribbing consisting of knit 2 stitches and purl 2 alternately all round; this is known ns double rib, to distinguish it from the single rib at the top of the mitten, which consists of knit 1 stitch and purl 1 all round. Repeat the double rib for 32 rounds, then linit a
plain round, taking together every fifth and sixth stitches to reduce the round to 60 stitches. Knit 6 more plain rounds for the hand on these 60 stitches, then begin the making of the thumb gusset.

Arrange the stitches on the needles as follows : 24 on each of 2 necdles and 12 on the third, which is the gusset needle. The first round begins on the needle containing 12 stitches, and is worked as follows: Knit 12, then lift up the loop right under this last stitch and knit it : finish the round plain. Now knit 3 rounds without any increase on the gusset. For the fifth round, hnit 12 stitches on the gusset needle, lift up the loop below the 12th stitch and knit it. Now lift up the loop below the last stitch on the needle and hnit it, then linit the last stitch Finish this round plain, then do three more complete rounds plain. In the next round increase again alter the 12th stitch, and again below the last stitch before knitting the latter off the necdle. Continue working in this way with three rounds between every increase round, unt il there are 29 st it ches on the gusset needle altogether. This completes the thumb gusset.

The top of the hand is now continued a hove the thumb. To divide the thumb stitches, first knit 11 stitches off the gusset needle, and pass the remaining 18 stitches on a safet $y$-pin to put them aside for the present. Cast $\mathbf{4}$ stitches on the same gusset needle, and these will come at the back of the thumb, and link up the hand
 stitshes intn n complete round. Knit the remainder of the stitches in the round, then knit 18 rounds of plain knitting on all these stitches. Finally do 10 rounds of single ribbing to close in the top of the mitten, and cast off fairly loosely, so that the edse is not too tight. Tocomplete the thumb, take the stitches off safety-pin and divide them equally betureen two needles, then lift up 4 stitches at the back of the thumb, where they were cast on beforc, putting the needle through the edge of these 4 stitches and knitting the loop so picked up. Join these stitches into a round and knit 6 rounds plain. In the next round knit together the second and the third of the 4 stitches that have been picked up at the back of the thumb and do 5 rounds of single ribbing to match the top of the hand, and cast off. The second mitten is the same, as they are reversible. Sce Glove.

MIXED GRILL. A good mixed grill is provided by cooking together in front of a clear fire or beneath a gas or electric grill a sheep's kidney, a slice of bacon, a chop or a piece of steak, and two or three mushrooms, or a tomato. Trim the chop or steak neatly,
cut topen the kidney and remove the skin and part of the shoe, which is finished by thonging core, peel the mushrooms or cut the tomato in half. Brush all over with a little melted butter, and sprinkle them with pepper. Rub the gridiron with a piece of suet and heat it.
Cook the meat for 10 or 15 minutes, adding the mushrooms when it is half done. Serve the grill on a hot dish, with a little lemon juice sprinkled on each mushroom. See Grilling.

MOCASSIN : How to Make. The N. American Indian word mocassin describes a st yle of hcelless slipper. As worn by the
Indians, it is made of deerskin and ornamented with embroidery and bcadwork. Monas. sins are easily made at home. Soft suède, which can be bought in many colours, is a suitable material. The lining can be of lamb's wool, or any soft, lleecy woollen material, while appliqué suède flowers in contrasting colours


Heavy wool-backed velour, the kind of which curtains and furnishing coverings are madc, is a suitable material for mocassins.

Mocassins made in this way look well lined with the same material, so that the velour should be cut out and made to fit the foot on the wrong side as well as on the right side. Stitch all the pieces firmly in position, then slip the lining right side out and into the outside piece. Sew the elges together and bind them with a ribbon ruching or narrow fur. Cut out a single triangle in velour for the top piece and embroider this boldly in thick wool or chenille, then tack it in position. See Leather; Poker Work.

MOCHA : The Coffee. Mocha is a variety of Arabian coffee, excellent in Havour and quality, which is used in the
or coloured beads are effective for decorating. Mocnssins are made in one piece, which is cut large enough to cover the sole of the foot and to draw up round the instep. To make them from suède, procure two good-sized skins of the desired shade. Use the sole of a shoe as a guide in cutting out and cut the skins in an oval about 3 in . larger than the sole all the way round. Punch holes $\frac{d}{d}$ in. apart with a stiletto round the edges and cut some thin strips of the suède, about $\frac{f}{} \mathrm{in}$. thick. Thread these in and out of the holes, leaving plenty of length of the suede as draw strings. Put the foot into the flat part and draw up the suede strings round the instep, fastening securely when the right aperture is secured.

The mocassin should fit snugly and yet be loose enough to allow the foot easily to be slipped in. If the size should be too big, make the mocassin smaller by punching an inner series of holes and drawing the thread through these, cutting away the surplus material. The fullness should be arranged to come at the toe end and at the heel. If jreferred, instead of gathers at the back, the fullness can be folded in two pleats, or a slit can be made and a triangular piece cut out, the ends being neatly drawn together with strong thread.

When the mocassin tits correctly, cut out in the same way a piece of rabbit fur for lining, making it about 1 in . larger than the sucde. P'in it, or tack it over in pleats, to make it the same size in the foot, then cut away the surplus fur underneath the pleats and sew the pieces securcly together, on the wrong side.

Next turn the fur right side out and slip it into the suede mocassin, allowing the fur edges to overlal, the suede and to form an edging. Cut out a triangle of suede to cover the toe front and nick this along the edges to make a fringe. Tack this on to the top of the mocassin to neaten the part that has been gathered, using a contrasting coloured thread. This triangle can be trimmed with beads, or have a design cut out and a strip of brightly coloured suede slipped underneath to show the pattern.

If lambswool or any woollen material is used as a lining, the two edges should be sewn together, and bound with ribbon or narrow fur. Mocassins can also be made from coloured pigskin and decorated with poker work. The we piece has a suitable design traced on it. This is outlined in poker work and afterwards coloured.

The mocassins illustrated are thonged round the toe piece, and this is attached to the main
ame way as other varieties of coffee, but rather less is required, as the Havour is strong. The name of mocha is often given to cakes, biscuits, cte., in which coffee flavouring is used. See Coffee; Coffec Cream Sandwich.

MOCHA : The Glove Leather. Rea Mochn leather, as used for gloves, is a strong heavy skin prepared with a soft, velvety surface and wears better than suède, with which it is sometimes confused. Suèle is glove leather finished flesh-side out, but in moclia the hair side is uppermost, although the grain surface is rubbed away.

Mocha is an especially suitable material for men's and winter gloves, for slippers, tobacco pouches, sports coats, and aviation clothing. Its freshness can be renewed by the use of a wire-bristled brush. Mocha is obtainable in sc:veral colours, and especially in brown shades. See Glove; Leather; Tobacco Pouch, etc.
MOCHA FINGER. To make the iced, finger-shaped cakes known as mocha fingers, break 2 eggs into a basin, add to them 3 oz . castor sugal, and whisk them well for about 10 min . or until they are thick. Fold in $\frac{\mathrm{l}}{\mathrm{l}}$. sieved flour, adding a little milk if required, and put the mixture into somo well-greased tins.
Bake the cakes in a hot oven until they are of a pale biscuit tint, and leave them to cool on a sieve before coating them with coffee icing. A small piece of shelled walnut mav be placed in the centre of cach cake. See Cofice Icing.

MOCK HARE. To make this, fry 3 oz. bacon cut into dice in a stewpan, and when it is lightly browned add $1 \frac{1}{2} \mathrm{l}$. stewing beef, cut into small pieces and coat with sensoned flour. Continue frying for a few minutes, then add 3 pint stock, a bouquet garni, some grated lemon rind. and an onion stuck with cloves. Stew all slowly in a covered pan until the beef is tender, then put in a wineglassful of port. some lemon juice and red currant jelly and gerve it with forcemeat balls. See Bouquet Garni ; Forcemeat.

MOCK ORANGE. This is one of the loveliest of all hardy lowering shrubs Its botanical name is Philadelphus. It is often miscalled syringa. The mock orange flourishes in well tilled soil, flowers in early summer and is increased by cuttings inserted out of doors in autumn. The common mock orange (coronarius) grows 10-12 ft. high, and bears white fragrant Howers; grandiflorus has finer flowers but they have little scent. In recent years many heautiful cross-b:ed
mock oranges of less vigorous gmwth have been raised: they are ideal flowering shrubs. Some of the best are Virginale, Rosace, Bouquet Blane and lame Blanche, all bearing white double flowers. Lemoinci, a slender growing shrub 4 ft . high, bears small white llowers frecly. These newer linds must be prined as soon as the flowers have faded by cutting out old branches and shortening others to where fresh strong shoots are developing.

MOCK TURTLE SOUP. Blanch half a calf's head for 10 min ., put it into a stewpan with a gammon rasher cut into dice and about 2 lb . knuclile of veal, well chopped, a carrots. 2 turnips, 2 leeks, $\frac{1}{2}$ head celery, or a teaspoon ful of celery sced tied in muslin, an onion stuffed with 2 cloves, a bouquet garni, and 2 shallots. Acld 3 quarts cold water and set the soup on the fire to boil ; skim it well and let it simmer gently for about 3 hours.

When the head is tender remove the pan from the fire. Take up the head on to a dish and bone it. removing the tonguo. Strain the etock and put it on to boil, and while it is heat ing up brown 2 oz Hour with $1 . \frac{1}{2}$ oz butler in a small saucepan: stir continually with a wooden spooin, and when it is a dark brown colour mix in by degrees suflicient of the hot stock to make a thin paste. Pour this to the stock, which should now be boiling, and cook for 5 min , stirring all the time. Remove the scum as it rises.

Add 2 glasses sherry, the juice of $\frac{1}{2}$ a lemon. and seasoning to taste. Cut about half the meat fmon the head into dice, lay these in a tureen and pour over them the boiling soup.

Mock turtle soup may also he served clear in which case follow the above recipe, but omit the butter and llour. Also after the stock is made it must be allowed to get cold so that every particle of fat may be removed. It should be clarified as described for clear soup. See Soup.

MODELLING. The modolling of animals is an attractive pastime. Bears, lions, and many other animals can be sawn to shapo from thin pieces of wood, provided with sep arate legs obtained from similar pieces, and assembled logether. They should be very strongly made, and all the joints well glued and pinned together. Bright colours and simple outlines should be the guiding features

Plasticine, plaster, and similar materials also lend themselves to the construction of toys Modelling in cork may also be included and may coinprise nothing nore elaborate than $n$.few quaint figures oil painted. or may


Mock Orange. Fragrant white blooms and glosss leaves of this heautiful hardy flowering shrub
take the form of a model of a house, bridge, or any other building made up from small pieces of cork fixed together with seccotioc and pins
The use of lagge pieces of cork, toycther with other materials. such as cardboard, stiff paper, brown paper, green baize, and linen, enables more ambitious worls to be carricd out Particularly interesting is the modelling to scale of an old village Papor pulp, made by soaking old newspapers and then thoroughly atraining out the water, provides a material, when mixed with gum, that can be modelled into shapes that are difficult to oblain in any wther way further particulars are given in the article on Papier Màché.
An interesting occupation is to reproduce to a small scale either a favourite seaside resnrt or some notable or historic sceno. In carrving out this work, cork should be the main material used, as it is ensily shaped with a sharp knife. large pieces of work may lu modelled in sections and glted together, and if the surface of the material is coated with size, oil paints can lee employed with considerable effect.

Another excellent material for modelling is chalk, which is obtsinable quite easily in many parts of the country. It can be cut to all sorts of shapes with no other tool than a penknife, and it forms an ideal material for relief carving Scalc morlels of stone buildings may be made by using sawn blocks of chalk: a fine tenon saw will serve, and the surfaces can be joined by first coating them with size and applying seccotine when dry
The chalk can be atained and coloured with water colour. Various stages in the development of architecture may be shown by utilizing cork and chalk, and the materials may be combined in maling scale models of famous buildings and old ruins. If chalk in blocks is not readily obtainable, a good subs'itute, easily worked, can be made from plaster of Paris mixed with water and poured into rough moulds Gesso and barbola paste can also be used for this purpose
Modelling Wax. For modelling flowers and fruits pure beeswax is used with a small proportion of lard or olive oil. The wax employed for kindergarten purposes contains becswax, paraffin wax, sesame oil and sulphur. See Gesso: Papier Mâché. Sealing Wax.

MODILLION. This is a word used in architecture to describe a block or bracket used beneath a Curinthian or other cornice, and when so used it is generally enriched or modelled. When employed in a cornice of tho Roman-lonic order, it is plainer in character to suit its surmundings See Capping
MODULATION. In wireless telephony. this is the procedure whereby oscillations of audible f́requency (speech. music, etc.) arc caused to vary the amplitude of tho carrier wave (e.g. that sent out by a broadcast transmitter). See Carrier Wave: Microphone: Telephone.
MOELLON. A mixture used in mason's work, and composed of rubble, stone, and mortar, is known as moellon. It is employed as n tilling to fill up the cavitics between two wall faces built with blocks of stone.

MOHAIR : The Fabric. Properly used, the term mohair signifies yarn or fabric made from the bair of the Angora goat The fabric resembles alpaca, though somewhat coarser. Mohair goods are familiar in several forms, and at one time the braids used on coats and costumes were of this material, instead of artificial silk, as at present. The bootlaces described as mohair are actually cotton Mohair mats and door slips are much used, and must astrakhan, Persian lamb, Teddy bear fabrics, and imitation tiger skin rugs are molhair.
As a dress stuff mohair is generally mado with half cotton, and although cool, clean, bright and durables it is somowhat stiff and
not suitable for draped dresses. Manufactured hy a special process, mohair and mohair and wionl dress goods can be made more lisson. Mats and rugs are often made partly in plain and parily in curled plusle When used as lloor rugs the materia! is sewn upon n heavy jute hacking Mohas plush travelling and motor rugs wear well, talie little damage from wetting, and dust is easily shaken from them. Upholstery mohair fabries are durable and enssess a good dust resisting surface. See Bootlace: Upholstery

MOIRÉ. In order to see a moiré appearance take any light. plain, open-textured fabric like thin silk or canibric, fold it lightiy whid hold the doubled material up to a nond light. An irregularly clouded figure formed by the crossing of the lines will ve seen. These markings, or waterings as they are called, can be permanently fixed upon suitable cloths Goods with ribbed surfaces give the best resulte, and the larger and less uniform these figures are the more they are admired.

The markings are made by laying one wet surface of cloth over another and using very heavy pressure to impress the ribbedness of one surface upon the other. That is not the only method, for moire markings of a less uneven character are obtainable by embossing the cloth between engraved, countersunk rollers under henvy pressure Moiré markings are seen on silk ribbons and dress silks, on velvet, worsted moreens and the cotton material known as moiretto, as well as on book binding cloths.

MOLASSES. The term molasses is seldom used in English cookery books, but in America the word is used synonymously with treacle. Molasses are the drainings of the raw sugar ; while treacle is the syrup which runs from sugar during the process of refinement See Sugar; Tracale.

MOLASSINE. This name is that of a varicty of meals and biscuits designed to meet the requirements of dog owners and poultry keepers. The biscuits are liked by dogs, and for the poultry farmer practically everything is supplied from chick food to meals for laying hens. See Dog; Poultry.

MOLE: The Fur. This is not a hard. weating fur, the leather being very thin, but what it loses in wear is compensated to some extent by the artistic shapes into which its pliancy and softness allow it to be made. Moleskin may he cleaned by means of hot bran


Momordica. Climbing plant with ornamental foliage aud reddish fruit, also known as balsam apple
which is rubbed in with tho tips of the tingers For cutting the sking of the mole an extremely sharp knife should be utilized, the skin split up the belly, the head and feet cu of, when the carcass can be readily removed The skin, freed of dirt and biood, should be stretched on a board, fur side under, and fastened at the corners with tacks It should be allowed to dry, and when a sufficient quantity has been collected the skins should be sent to a furrier to be dressed See Fur

MOLE: On the Skin. Certain tumour formations in the skin are known as moles In one form they exist as slight elecations of the skin of a light brown to a black colour, and are not infrequently the site of hairs.

Several ways of removal of moles are avail able to the surgeon, including carbonic acid snow, electrolysis, X rays, and excision

It cannot be loo strongly emphasized, how eier, that any altempt al home treutnent of moles by caustics or any similar means is most danjerous, nearly always increasing the disfigurement, and possibly converting i into a malignant growth.

## See Birthmark: Electrolysis

MOLE: In the Garden. Generally the mole is of service wagriculture as an exter minator of grubs, slugs, wireworms, and other harmful things, but it can only bo regarded as a pest where the flower or vegetable garden is concerned. Unless quickly caught it will cause great harm, particularly among rows of potatocs or other vegetables growing in well manured, loose drills of soil.

The best way to capture moles is by mean ${ }^{2}$ ul an iron mole trap, sceking the run with a spade, and setting the trap across with a covering of earth. When handling the trap gloves must be irorn, otherwise moles, with their acute sense of sme!l, will avoid the trapped run, and take to another. It is usc less to place the trap in a mole-hill. Anothe: remedy is to make holes here and there with a dibber, drop in picces of carbide, filling the holes with soil packed fairly tight. Doga such as the sharp fox terrier, mav quickly be trained to watch for moles at work.

The animals usually work at 2 a in., 6 a.m., and again at 9 p in . Round about these times their heaving up of earth may be noticed; but the watcher must approach his quarry very gently, as they are extremely sensitive in vibration and smell.

MOLE CRICEET. This fierce-looking insect with lobster-like, head and clawed forefect is sometimes seen in the garden. It lacerntes the roots of plants as it burrows with its mole-like forelegs. It may bo drowned with paraffin emulsion poured down ite holes. In some localitics a thin stick is thrust down and often the insect will grasp this, allowing itself to be drawn to the surface and killed

MOMORDICA. These climbing plants are valued for the sake of their ornamental fruits, which are suitable for cultivation in a hothouse. They are raised from seeds sown under glazs in spring, grown in large flower pots or planted in a border of soil and trained on a trellis or other support. The balsam apple (Momordica balsamina), an annual with orange coloured fruits. is one of the chief species.

MONARCH OF THE EAST. This is a half-hardy tuberous rooted plant (Sauromatum guttatum), which will flower on the mantelshelf of a living-room. The inflorescence is in the form of a greenish-purple spathe, some. what similar to that of the arum lily. The tuber should be purchased in the autumn and will then come into bloon during winter or early spring. When the stem has died down the tuber should be potted or it may be planted out of doors for the summer months. The leaves will then develop. When these have died down the tuber is taken out of the soil and again placed on the mantelshelf.

MONARDA. This is the botanical namo of a acented-lea ved hardy herbaceous perennial. known as sweet bergamot and bee balm See Bergamot.

MONEY ORDER. In Great Britain moncy can be sent through the ordinary post by means of money orders and postal orders. Money orders are more suitable for uneven sums of money, such as $£ 27 \mathrm{~s} .8 \mathrm{~d}$., and for comparatively large ones. They can be purchased from any post office that is also a money order office, for any amount up to $£ 40$. The charges for an order are 4 d . for one under $£ 3$; $6 d$. for one between $£ 3$ and $£ 10$; 8 d . for one bet ween $£ 10$ and $£ 20$; 10d. for one between $£ 20$ and $£ 30$; 1s. for one between $£ 30$ and $£ 40$.

An order is made payable at a particular money order office, and there the person to whom the money is sent must go to obtain it. On giving his name, the amount of the order and other particulars, it will be paid. Money orders can be sent by telcgraph from any money order office, the extra charge being the cost of the telegram and 2 d .

Money orders can also be sent to ncarly all parts of the British Empire and to France, Italy, and other European countries, also to the U.S.A. and Japan. The charges vary, but particulars can be obtained from any post office. To certain countries money orders can be sent by telcgram. See Postal Order.

MONEYWORT. This is the popular name of Sibthorpia europaea, a hardy creeping plant with small, pale pink, anapdragon-like flowers in summer. A shady place in the rock garden is suitable, or it and the colouredleaved varieties may be grown in suspended pots or baskets in the greenhouse. Propagation is by division in spring.
Monkey Flower. This is another name for the plant usually known as musk (q.v.).

MONKEY FUR. Employed almost ex. clusively for trimming purposes, monkey fur has a somewhat shaggy unkempt appearance, and takes the form of narrow strips which may be purchased by the yard. Like all other dark. coloured skins, monkey fur may be clenned by means of silver sand.

MONKEY NUT. In Great Britain the monkey nut, or pes nut, is a hothouso annual. The seeds may be sown in a temperature of about $70^{\circ}$ in springtime, in pota, in a mixture of loam, leaf-mould, and sand. The yellow flowers are borne in May and June, and the sced pod den plant. See article above the sced pod
usually droops
and ripens in the soil. There is only one and ripens in the soil. There is only one
species, Arachis hypogaes. species, Arachis hypogaea.
MONEEY PUZZLE TREE. The name of monkey puzzle is given to a cone-bearing tree, Araucaria imbricata, with wide-spreading branches, which curve upward. The foliage is stiff and sharp at the edges. This tree thrives best in country gardens in deep loamy soil. It is apt to lose its lower branches in towns and suburbs. The only other Araucaria which is cultivated in Great Britain is A. excelsa, which is a half-hardy tree; small specimens make good room plants.

MONESEOOD. Monkshood is the common name which is given to aconite by reason of its hooded flowers. Although poisonous in all its parts, monkshood is an attractive and frec-flowering perennial of distinct value in the garden, especially in shady placer The common blue monkshood is Aco. nitum napellus; the blue and whitc variety, bicolor, is more attractive. Wilsoni and Fischeri are other good blue monkshoods. The plants, which grow 3-5 ft. high, should be left undisturbed, as they are slow in establishing them selves. See Aconite: aiso illus. below.

## MONOGRAM.

 Two or more capital letters combined in one form what is termed a monogram. A good example of this is scen in the diphthong A. Initials formed into a monogram and cut out in thin tin or zinc can be used for marking linen, books, etc. Another method is to engrave or etch the monogram on silver.In designing a monogram, legibility must be considered, and in arranging initials it is often advisable to give prominence to the initial letter of the surname; this may be cffected by enlarging the letter or by utilizing colour. Roman lettering lends itself to gristic arrangements, the best method being to commence with the principal letter, work out as many combinations as possible, and then decide on the best. A symmetrical letter is the easiest to commence with, and where other letters can be arranged in an 0 or C , the work will be comparatively simple. Some combinations of letters are very awkward to arrange, but it is generally only a matter of practice.

Examples of two and three letter symmetrical as well as non-symmetrical arrangements are illustrated. All the examples are suitable for stencil cutting, but care must be taken to arrange the ties between the letters. Monograms are quite as effective in embroidery as initial letters, the method employed in stitching being the same. Interlaced letters as the $O$ entwined, or the C placed back to back, are often mistaken for monograms, but they are ciphers. See Initial; Lettering; Stencilling.

MONSTERA. Only one species of this evergroen climbing hot-house plant, Monstera delicioss, is usually cultivated. It has large green, lace-like leaves and many surface roots; the flowers, which come in summer-time, arc ycllow, and are followed by fruits. The plants require a danip, warm position in the heated house, in the usual mixture, and should be inserted in springtime. They require liberal syringing during the summer months, and may be propagated by cuttings.

MONTBRETLA. This is a splendid late summer flower in shades of orange, orangecrimson and yellow. The flowers are in spikes which rise above the iris-like leaves. The older kinds, e.g. crocosmiaeflora and Pottsii, may be planted out of doors in spring and left undisturbed for several years until they become overcrowded; they ought then to be lifted, divided and replanted in autumn. Recently many handsome new large-flowered varieties have been raised; it is usual to start the corms of these into growth in pots
of soil placed in a frame in March and la plant them out of doors in May. They should be lifted and stored for the winter to obtain the finest results. A fow of the hest of the newer sorts are His Majesty, crimson and old
 gold: Goldfinch ycllow; Lemon Qucen, pale ycllow ; Marjoric, orange yellow and crimson There are numerous others. Montbretias thrive in ordinary well-tilled soil ; on heavy land leaf. mould and sand should be mixed in.

## MONTEITH

The name is given to a vessel made in the eightecnth century, and used for cooling wine glasses. Not unlike a punch. bowl, it is usually of silver, and has a scalloped edge and a inovable or open work rim. See Punch Bowl.
MONIH. This is a period of time. There are 12 months in the year, known as calendar months, to distinguish them from the period of 4 weeks, which is known as a lunar month. The number of days in each calendar month is as follows :

| Jan. 31 | May 31 | Sept. 30 |
| :--- | :--- | :--- |
| Feb. 28 or 20 | Junc 30 | Oct. 31 |
| March 31 | July 31 | Nov. 30 |
| April 30 | Aug. 31 | Dec. 31 |

Legally a month usually means a calendar month. A person whose salary is paid by the month reccives 12 payments a year, receiving the same amount for the 28 days of Fetruary as for the 31 of March. Likewise a person who gives or receives a month's notice must reckon it, not as four weeks, but as a calendar month. A notice given on Feb. 19 takes effect on March 19, and so on. Each of the months las certain special features for the gardener and the housewife, and these are given in this


Montbretia. Hardy plant with brilliantly colourod fowers ranging from red to pale yellow
work under the various headings See April Calendar: February; March, etc.
Monthly Rose. This is another name for the China rose. See China Rose ; Rose.

MOODS: The Game. The game of moods affords a pleasant varinnt at parties, especially those for adults or elder children. One person leaves the room, and the others decide what mood they will be in. They may choose a laughing nood, an insolent mood, a sorrowful mood, or any other. Then the person outside returns and asks questions from the players in turn, the object being to find out from his method of answering what mood has been chosen. When he has guessed correctly another player takes his place. Any question is permissible. The game is also known as ndverbs.
MOON DAISY. The moon daisy (Pyreth. rum (chrysanthemum) religinosum) will grow almost anywhere under any conditions, reaching a height of 4 ft ., and flowering profusely with large daisy-like thowers during late summer. It is excellent for garden decoration or for yielding llowers for cutting. It should be planted in nutumn or spring, and increased by division of roots during the same periods. It is advisable to lift roots and divide them every threc years. See Chrysanthemum; Daisy.

MOONSEED. The leaves of the moonseed, or Menispermum, are not unlike those of the ivy. The plant is a hardy flowering climber with yellow blossoms in summer and grape-like black fruits later on. Menispermum canadense is of rapid growth, and suitable for covering walls, arbours, fences, pergolas, trellises, etc: Moonseed thrives in almost any soil and situation, and is propagated by cuttings or division of the roots. It should be prined early in the year.

MOONWORT. Soldanella, or moonwort, is a family of rock garden plants oi the primula order, with bell-shaped, nodding, fringed flowers in spring; height about 3 in .


Moonwort. Bell-shaped flowers of this Alpine plant The favourite is Soldanclla alpina, with violet - coloured llowers; pusilla has blooms of similar colour The moon. worts like a compost of loam and peat with sand. They are best suited by a damp position, and will not thrive on a hot, dry site. They protected by raised pieces of glass in winter to keep off excessive rains. Propagation is by division in the case of strong tufts in September. The plants may be raised from sced sown in a frame when ripe.
MOP : For House Work. There is a use for mops of all sizes in the ordinary household. Most people are familiar with the long-handled $t$ ype, invaluable for dusting and polishing Hoors and wainscot. Such mops, if well shaken after use, do not need washing often.

A small mop, the head of which is made of unbleached coston, soft and absorbent, may be used for washing up. It anves the hands, and is particularly biseful for cleaning juga or cupls or any kind of lluted work. These mops should be treated lilie dishcloths, and be washed


Moon Daisy. Profusely flowering plant useful both lor Rarden borders and for bouse decoration
in soda-water after use, and hung up to dry Their cost is so moderate that they can he replaced frequently, and there is no need for them 10 grow dirty or straggly. They are usually provided with a loop at the end of the handle by which they can be suspended a hove the sink.
MORAINE GARDENING. The possession of a morainc, which, in gardens, is a mixture 12-18 in. deep of stones with a little sifted soil added, enables the gardener to cultivate certain difficult ligh alpine plants with greater success than is possible in the rock garden proper. The reason is that the perfect drainage afforded by the moraine l-aeps the plants reasonably dry in winter yet conserves the moisture in summer. Such difficult alpine plants as eritrichium, Centiana verna, Dianthus alpinus and others should be planted in a moraine; there also the silvery saxifrages, dwarf campanulas and others llourish.
MOREEN. Shiny on the underside, ribbed and with wavy moire markings on the upper surface, moreen is usually self-coloured. 13oth
moreen and moirette can be used with good effect to make blotting book covers, stout curtains for cuphoards and alcoves, and they wear well as covers for cushions and chairs See Moiré.
MOREL. The edible fungus morel, similar to the mushroom in appearance, is considered by epicures to be superior to it in Havour. See Mushroom.

MORELLO CHERRY. The dark-red morello cherry flourishes in chalky soil, and may be grown as a standard in the open or against a north wall. The morello cherry is not suitable for dessert purposes, as its acids never turn to sugar so completely as they do in other varieties, and its flavour is not pleasing to the palate. See Cherry; Cherry Brandy; Fruit.

MORINA. The chief species of the harily herbaceous perennial morina is longifolia. This has thistle-like, spine-edged leaves and whorls of purple flowers in summer; its height is about 2 ft . It likes a friable soil. Propagation is by division in autumn or spring, or by seeds. See illus above.

MORNING GLORY. This is one of the many names of the genus of plants Ipomea. It includes stove, greenhouse and hardy annual and perennial climbers, all belonging to the order Convolvulus (q.v.).
MORNING ROOM. As its name implies, the morning room serves the purpose of a
breakfast room or a sitting room in the early part of the day.
A morning room should face south-east, more east than south, so as to make the most of the morning sunshine. Its furniture may consist of $n$ round or oval table for breakfast or an informal lunch, a bureau for correapondence and the keeping of the household books, a firm table which can be used for sewing. a cupboard for keeping needlework and odds and ends, or an oak chest, and a couple of comifortable chairs in addition to those needed for tho table. See Sitting Roon

MORNING SICKNESS. One of the earliest signs of pregnancy is sickness, which conmonly occurs when the patient riscs. It commences towards the end of the first nonth, and continues for a month or two, not usually lasting beyond the fourth month. Sometimes it occurs in the evenings, and at times the sickness may continue throughout the day. In that case nedical treat. ment is neces. sary.

In ordinary casca no treatment is called for. It is a good practice, however, to take a tuinbler of hot water or a cup of very weak ten on awakening, and to remain in bed for an hour after


Morina. Thistle-like qoliage and purple flower of the species longifolia. See article below constipation exists, a purgative chould be taken occasionally. A useful lavative consists of 1 oz each of confection of sulphur and confection of senna.
MOROCCO. This is a variety of leather Originally it was made from goat skin by the Moors, and won a great reputation owing to the way in which it was prepared, one point heing that it was dyed before it was tanned To-day, in addition to genuine morocco made from goat skins, there is imitation moroceo


Morning Glory. Specimen of the flowers produced by this climbing plant
made from calf skins and sheep skins. Indeed, owing to the fact that the graining and finish, which are the distinctive mark of morocco, can be imitated by machinery, morocco can be made from all varieties of thin leather. It is used, among other things, for binding books, handbags, and covering furniture. See Leather; Upholstery.

MORSE CODE. This is a system of signals for radio, telegraphio or visual communica. tion, whereby letters of the alphabet, numerals, punctuation marks, etc., are transmitted either as a series of dots or dashes, or as a combination of both. The International Morse code signals are given below.
A dash is of longer duration than a dot, being equal in length to three dots. The time interval between signals which together make up any particular letter is equal to one dot. The interval between any two letters is equal to three dots, and the interval between any $t$ wo words is equal in duration to five dots Full details of the various signals and abbreviations used in radio are given in the Handbook for Wireless Telegraph Operators published by H.M. Stationery Office. This can be obtained from Adastral House, Kingsway, London, W.C., or through any bookseller.
INTERNATIONAL MORBE CODE BIGNAL8


MORTAR. Mortar is a mixture of lime and sand, or similar materials used for making the joints between brickwork and in numerous other building operations Its purpose is three-fold: to distribute the pressure or weight through the brickorork, to cause the bricks to adhere, or bind together, and as \& non-conductor, preventing the transmission of heat and sound, and rendering the wall impervious to water. These functions are governed largely by the proportions of the mortar and the method by which it is applied.

The strength and impermeability of the wall depend very largely upon the mortar. Bad mortar allows wet and rain to find a way through the wall; it rapidly crumbles away, and is invariably the chief cause of the rapid deterioration of the building. On the other hand, a good mortar makes a wall drier, stronger, and more durable.

In many districts of England and Wales the by-laws provide for the quality of the mortar which shall be used, and generally these require that all brick and stone work shall be put together with good mortar, or good cement, and that the mortar must be composed of lime and clean sharp sand, without earthy matter, in the proportion of 1 part of lime to 3 parts of sand. Portland cement mortar may be made with good quality Portland cement, in the proportion of 4 parts of sand to 1 part of cement.

In the preparation of ordinary mortar the first consideration is the quality of the lime. Excellent mortar can be made with lime, such as lias limes, mixed with sand in the proportion of 1 to 2. The Portland cement should conform to the standard specification of the British Portland cement manufacturers. It is best to purchase the lime from a reliable builder's merchant, and to specify a hydraulic lime, such as, for example, blue lias

## Slaking the Lime

Lime has to be slaked, by adding water to quicklime. One way is to excavate a cavity in the ground, line it with rough boards, put the rough, or lump, lime into the hole, cover it with water, and leave it for about a month, at the end of which time the lime will be in a soft, creamy-like state, and should be entirely free from lumps of any kind. The lime should be kept covered while it is slaking, to prevent the dust and dirt getting into it, but the covering should be supported on rough bricks or posts, so that air can have free acoess to the surface of the lime.
If the lime is not properly slaked, it will continue to work and expand, with the result that the mortar joints will be cracked, or, in bad cases, the brickwork itself may be displaced. Another method sometimes used, especially for small, quick jobs, is to mix the lime and sand together in the proportion of 2 parts of sand to 1 of lime, and sprinkle them with water from a watering-can having a rose head, applying as much water as the material can absorb, repeating the process from time to time during the day, continuing until the lime is thoroughly slaked. In any case, the lime should be left as long as possible to temper.

When Portland cement is used for making mortar, the mixture should be knocked up, or prepared, immediately prior to its applica. tion, as cement mortar sets hard very quickly, and must be used immediately it has been prepared; otherwise it will become set. After that stage has been reached, if it is again knocked up, and more water is added to make the mixture workable, it will seriously diminish its strength. Lime hardens by exposure to the air, whereas Portland cement hardens by the presence of water. For this reason, lime mortar should only be used in dry situations, and cement always where dampness has to be resisted.

When applying the mortar, the bricks should be dipped in water or otherwise wetted, as if they are used dry, they will absorb moisture too quickly for the mortar, with the result that it will crack or may possibly crumble.

Lime mortar works with a fat or greasy feeling, whereas cement mortar is very harsh, and far more difficult to use, for which reason a common practice is to make up a mortar composed of 1 part cement, $\frac{1}{2}$ part of lime, and 2 or 3 parts sand. This mixture works much better, and for many purposes is quite satisfactory. Mortar is applied with a trowel or

Hoat, according to the nature of the work. In bricklaying, it is most important that the vertical joints between the various brick courses be thoroughly filled up, or flushed up, as it is termed, with mortar. Walls are covered with mortar, the process being known as rendering (q.v.). Various modifications of the constituents of mortar are used for such specific purposes as plastering the interior of a room, or plastering on lathing.
Mortar Board. Boards that are lastened together with battens to make a table or platform about 3 ft . square are used to support a quantity of mortar, and should be placed adjacent to the spot where the work is being done. Almost any strong, fairly smooth boards will do, the only requirement being a level and solid surface The boards should not be badly split, nor should they have holes through them: otherwise a large quantity of mortar will find its way through and be wasted. See Brick: Cement; Plaster.

MORTGAGE. A mortgage is a sum of money borrowed on the security of buildings and land. The person who lends the money has control of the property, which is conveyed to him by legal documents. He is called the mortgagee ; the person who borrows the money is the mortgagor.

Many houses are built with borrowed money, and building societies, bankers, insurance companies, and private individuals, usually through their solicitors, lend money in this way. In each case a mortgage is created. They will lend usually up to two-thirds of the value of the house or land. The interest charged de pends upon the state of the money market, and is usually paid every six months. The mort gagee can withdraw his money at any time upon giving the necessary notice, which is normally three months.

If the money is not repaid, or if the interest is in arrears, the mortgagee can either sell the property or foreclose. In the former case he must hand over to the owner of the property any balance that remains after the mortgage, interest and expenses have been met. Foreclosing means that the mortgagee becomes the owner of the property. To do this he must obtain an order from a court of law that unless the borrower pays up within a fixed time he shall lose his equity of redemption, i.e. the right to repay the mortgage. If the mortgagee sells the property and does not realize sufficient to pay the principal, interest, and costs, he can sue the borrower for any balance. Sometimes second mortgages are created, but these rank, both as regards capital and interest, after first mortgages.

Stamp Duties. The stamp duties payable when mortgages are created are at the rate of $2 / 6$ for every $£ 100$. Under $£ 100$ they are 3 d . for $£ 10,8 \mathrm{~d}$. for $£ 25$, and $1 / 3$ for $£ 50$. Persons who lend money on mortgage should see that the mortgaged property is fully insured by the borrower. Those who borrow should see that the interest is paid promptly, while it is to the advantage of both to keep the property in good condition, although the mortgagee has no liability in this direction. Borrowers are well advised if they provide for the gradual repayment of the money borrowed. Building societies usually stipulate that this shall be done, and arrange for mortgages to be repaid by instalments extending over a fixed period of years. In sucb cases a payment weekly, monthly or quarterly, as the case may be, includes both the interest and a sum towards the repayment of the debt.

The power to cull in mortgages, and the raising of interest thereon beyond a certain figure, is restricted at the present time under the Rent Restriction Acts, which were introduced during the period of the Great War and have since been extended several times. See Building; Building Society ; House; Rent.

## MORTISE AND TENON JOINTS

## Methods of Making and Their Use in Amateur Carnentry

For fuller information our readers are advised to turn to the wood-working articles, especially Amateur Carpentry; Chisel: Dowelling: Joint: lock; Tenon: and to those on the various pieces for which mortises are necessary, e.g. Cabinet: Cuphoard: Door; Dresser

In woodwork and building construction a mortise is a rectsngular hole formed to receive a peg, or tenon. shaperl on the part to be jointed. Of its varicties the simplest consists of a mortise. or slot, cut in the centre of a beam, to reccive the tenon on the end of an upright. as shown in Fig. 1.

The bare-faced tenon in Fig. 2 has only one ahoulder, the other side being Hush with the face of the post. It is used when one side of a rail has to be flush with the atile, or post, while the other side is set back from the face The tenon inay or may not pass through the post where the mortise is cut In the

parts of the framework separaterd, thus tightening up the canvas.
When the tenon does not pass right through the mortise it is known as a atub tenon The ollique mortise and tenon in Fig. © is used for joints on the ends of braces and struta, and a part from the fact that the shoulders and end of the tenon and two sides of the mortise have to be cut at an angle instead of square, they follow the same principle as the ordinary mortise.
The mortises for a corner post have to be cut with all faces at right angles to each other, consequently the two inortises will have to meet in the centre of the material. They are therefore generally haunched and the rail is mitre tenoned, as in Fig. 7. A douhle mortise (Fig. 8) is often used in jointing a broad rail into a stile or post.

A good method of making a rigid mortise and tenon joint is known as the fox wedge tenon (Fig. 9). The mortise does not go right through the wood, but terminates at a distance from the face, and the walls of the mortise are cut to an angle, so that the bottom of the mortise in the wood is wider than the mouth, or entrance. The tenon is cut to a width that will

clused mortise the tenon is surrounded by wood on all four sides and the end. and the mortise dues not pass right through the wood, but terminates at a distance from the face When the work is completely finished, the joint between the rail and post is not visible, except as a line of demareation between the two parts It is therefore often used in cabinet work, and is also used for the better class of door frame

The joint shown in Fig. 3 is a haunched mortise; the tenon is cut back for the bulk of its length, but a small projecting portion is left at the side to provide a maximum grip on the post. The slot mortise in Fig. 4 is merely a slot cut in the end of one part to receive the tenon formed on the other part. The adjustable slot mortise and tenon in Fig. 5 are only used where it is desired to exert pressure upon some projecting part of the framework, as, for example, the canvas of an oil painting. The wedges are driven in, and the wedges for securing tenon into mortise
just enter the mortise. Two or more "edges are then made of hardwood and inserted in saw cuts made in the end of the tenon When the joint is to be finally assembled the parts are glued, the wedges just inseited into the slots, and the joint driven home with a mallet, or clamped up tightly, with the result that virtually an internal dovetail joint is formed which possesses very great st rength. A similar systenn of wedging is often adopted where the tenon passes right through the mortise. In this case the wedges are driven in from the outside and scrve to make a perfectly rigid joint IVedges of this class are always used when the end of the tenon is aecessible.
General Principles. Usually, mortise and tenon joints are secured by glucing and wedging, by pins or by draw horing. The proportion of the mortise and tenon in the casc of a stub and through mortise should be about one-third the thickness of the minterial. It is imperative that the walls of the mortise be square to ench other and to the joint faces. Similarly, the tenon must be square on all its sides, the two shoulders in line, square with the joint faces.
The general procedure in the making of any mortised joint consists firstly in niarking accurately on the wood. This should be done with a scriber and set-square, and the lines should be squared right around the material, inarking first the length of the mortise. The width is set out with the aid uf a mortise gauge (Fig. 12), which is used to seribe lines on both sides of the part to be nortised. There is thus a rectangular space marked out on opposite sides of the wood, indicating the material to be removed. The tenon should similarly be marked out, with the same setting of the mortise gange.
The mortise is then cut by drilling holes in the material with a centre-bit, keeping just within the lines. This removes the bulk of the timber and the remainder is cut out with a chisel, preferably a pattern known as a mortise chisel, which has a very strong handle and is used with a mallet (Fig. 10). It is driven down into the wood as far as possible, withdrawn, and the chips removed from the hole: further chiselling continues until the bulk of the holc has been cut half-way through. The timber is


Mortise. Showing examples of the legding types of mortise joints. Fig. 1. Plain mortise and tenon joint. Fig. 2. Simple mortise and bare-faced tenon. Fig. 3. Haunched single mortige and tenon. Fig. 4. Slot mortise and tenon. Fig. 5. Adjastable slot mortise and tenon, as used on stretcher of an artist's canvas. Fig. 6. Obllque mortise and tanon. Fig. 7 . Mitred tenons and mortise for use in table legs, etc. Fig. 8. Double haunched mortise and tenon. Fig. 9. Fox
then turned over and similarly cut from the opposite side.

The final fitting may be completed with an ordinary firmer chisel by careful paring. As a
 guide to the eye, an ordinary set-square should he set by the side of the work, this being an aid to keeping the chisel correctly upright while cutting out the mortise. The tenon may he cut out almost entircly with the aid of a liand or tenon saw, as shown in Fig. 11, by carcfully arwing down the
alot in the door stile, to the ordinary type of for its ornamental effects. The materials mortise lock about the same size as a rim lock. Another type is that known as the harrel mortise lock, which may he fitted into a hole boied in the door with a twist bit or auger. Mortise locks are gencrally of the warded tumbler type, and in the case of some of the smaller varietics, such os the smiall harrel mortise lock, only one bolt is provided, which is locked by the key, and whichalso prevents the handle from being turned. Instructions for fitting mortisc locks are given in the article Iock ( $\mathbf{q}^{\circ} \mathrm{v}$. ).

MORTLAKE WARE. The earthenware produced at the Thames side village of Mortlake, for about 70 years after the middle of the 18th century, was almost лs famous in its day as its pictorial tapestry. Any pieces offered as Mortake should be viewed with the utmost reserve, bесяияе there have not been identified enough typical specimens on which to hasc an nssured judgement. There was a factory for common tinenamelled or delft ware, ranging from large punch-bowls, painted with Howers and medallions, to hlue landscape tiles. Annther factory, founded by Joseph Kishere, who marked the ware with his name, turned out a sound, domestic stoneware of the drab or brown typle, which was also produced at Iullam This was sometimes dccorated in low-relief with hunting and convivial scenes, but apparently never reached a high standard of artistic merit. It is not unlikely that pieces of Mort-

Mortise Fig 10. Showing method of using mortise chisel. Fir. 11. How the tenons are cut. Fir. 12 .
Mortige gauge, which marks two lines simultaneously that pieces of Mort Talie origin are concealed in museums

MOSAIC : As a Decoration. This attrac. tive process consists of embedding small picces of stone or other material in cement to form a pattern or design. It is much employed because of its durability, clennliness and comparative noiselessness to the tread, as well ns

mployed comprise marble, pottery, and glass
There are two varieties of mosaic paving, known respectively as the Roman and the Venetian In the former, a foundation of concrete is prepared and the top of it conted with a thickness of ahout $]$ in of neat cement This is lloated off to a level surface, and into it are pressed small pieces of marble, of various colours, principally white, red, black, cream, hrown and green.
Burnt clay or ceramic mosaic, with blocks $\frac{1}{2}$ to 1 in square, beside heing cheaper and more durable, is a vailable in a wider range of tints. Clay cube is best adapted for regular geometrical designs, because it does not udinit of heing trimmed, as marble clocs, to fit the interstices of a pictorial design. When the mosaic consists of a groundwork of stone of one colour with a simple lorder in another liind of stone the border nnay be set in position first and the remainder of the spaces filled in with self-colour stone.

When a pictorial design is wanted the design is first drawn up full size on a large shect of paper, or several sheets if the area to be covered is of any size. The stones are glued to the paper, placing the face side of the atonc against the paper The concrete foundation should previously have been prepared, and when the design is finished on the paper, a lloating coat of neat cement is worked on the concrete. The paper is lifted and turned over on the wet cement and pressed into position. The stones should be pressed into the cement sufliciently to hold them in position, and ns soon as the cement has become thoroughly set, the paper is damped and removed from the stones.
The design will appear in outline form on the foundation, and the spaces between the outline of the design are filled in with other pieces of stone bedded in cement, the whole being levelled as much as possible and finished by polishing. The cement joint should form an integral part of the design ; when the blocks are fitted so closely to obliterate the joint the result is artistically weak.

Venetian Mosaic. Venetian or terrazzo mosaic employs marble chips, that are crushed into irregular shapes and sorted out into grades ranging from ${ }_{i 8}^{3} \mathrm{in}$. to $\frac{3}{3} \mathrm{in}$. mesh. In this style the cement hecomes a filling rather than a joint, and is usually coloured in a cont rasting tint. The marble fragments are spread upon the cement, larger pieces heing strewl upon them here and there, thickly or sparingly, and the interstices filled with smaller chips The whole is then levelled by heavy rollers. Sometimes a border is formed in a darker tint, or in marhle cube design.

When mosaic tesserac are applied to walls and ceilings they arc usually only half as thick as paving cubes $\mathrm{Vall}^{-}$mosaic is most satisfying when carried out in simple and unpretentious designs, with restrained colourings in the borders.

Glass Mosaic. The use of glass mosaic for mural decoration, in emulation of the Byzan. tine examples, is associated with public rather than domestic buildings. The tesserae, vary ing from $\frac{1}{\mathrm{in}}$. to ${ }_{3}^{3} \mathrm{in}$. square by $\frac{3}{16}$ in. thick,


Mosaic. Fig. 1. Roman mosaic. The pattern has been drawn on paper and the process of sticking on the cubes begun. Fig. 2. Desirn transferred to slab and rroundwork being flled In. Fig. 3. Venetian mosaic. showing gronndwark laid before rolling: two of the wooden battens have been removed
are minde of opaque glass pastes, and are available in thousands of tints. Glass-andgold, formed by fusing gold-leaf between two layers of transparent glass, is commonly employed as a filling for the pictorial design.

Fig. 1 shows the pattern drawn on the paper and the process of sticking the stones thereon. Fig. 2 illustrater a mosaic design transferred to the slab and some of the stones standing up in readiness for filling in tho groundwork. Fig. 3 shows the Venetian system with some of the wood battens in position and others removed to receive the coloured stones for the border design
MOSAIC: In Potatoes. This disease, which attacks some varieties of the potato more than others, is frequently responsible for light crops in gardens and allotments. It may be recognized by the mottling of the foliage. Coupled with this there is usually a crinkling oi the leaves, a waviness in the outline of the leaflets, and other indications that the leaves are not normal. In severe attaclis "dwarfing tendency is frequently seen, and with it goes a marked reduction in the yield. The diseasc is distributed by means of the seed tubers; therefore tubers from infected plants should on no account be put aside for seed. Infected plants should be immediately destroyed, as they never recover from an attack. See Potato.
MOSELLE. The vineyards of the lower Moselle yield very fine white wines of the hock character, d:y, delicate, and with an attractive bouquet The best are Piesporter, Brauneberger, Zel. tinger and Berncastler Doktor. Moselle is an excellent beverage drink, going well withmost sorts of food. Sparkling Moselle though apt to be a littleoverswet, is a pleasant wholesome wine. The alcoholic strength of the Moselle wines ranges between 17 per cent and 25 per cent of proof spirit. See Hock; Wine.


Moss Rose. Varlety of rose so called from a mossy growth on the stems

## MOSQUITO. As some kinds of mosquitoes

 carry the infection of yellow fever and malaria it is important in infected districts to take active measures to destroy the larvae. An efficient method is to pour paraffin oil on all ponds and stagnant pools, using one pint to each 200 sq . ft. of water surface. Cisterns and water barrels should be emptied once a week. Old tins, tubs, and other receptacles for water should not be left lying around the dwelling. Oils of pennyroyal or Invender sometimes keep mosquitoes auny if a few drops be sprinkled on the bedclothes, or on exposed parts of the body.Where the insects abound, mosquito curtains should be used round the bed, and windows that are kept open in the evening should be guarded by fine wire or muslin netting.
Mosquito Bites. Mosquito bites are often very troublesome. As a preventive for
warding of the attacks of these insects the following lotion will be found uscful


A little of the lotion should be applied to the skin of the hands, wrists, ankles and the neck when the mosquitoes are about. For relieving the irritation the following preparation can be used

## Menthol

15 gr.
Alcohol ( 80 per cent)
13 oz.
Dissolve the menthol in the alcohol, and then add the ammonia. Dab on to stings and bites as often as required.

MOSS. The popular name moss, which belongs strictly to plants of the Musci family, is applied indiscriminately to many plants Moss is generally a nuisance on gravel walks. The method of eradication usually practised is to sprinkle the walks well with rock-salt during showery weather. A better way, however, is to brush the surface of the gravel with a strong solution of bluestone, or sulphate of copper. The brushing should be done carefully, and the copper solution kept away from turf edgings or bed or border plants.

Fruit trees are often attacked by various grow the which are loosely described as mosses. A precautionary measure is to spray with caustic soda ( 1 lb . in 10 gallons of water) in winter. When moss is found on lawns it is usually a sign of malnutrition. Rake the surface of the lawn over and give it a dressing of rich sifted soil in springtime.

MOSS CAMPION. A very beautiful plant for the rook garden is Silene acaulis, or the moss campion. It is of low moss-like growth and bears rose-pink flowers in spring. It is most likely to bloom well if grown in a moraine. See Moraine Gardening.

MOSS ROSE. The variety of rose known as the moss rose is interesting owing to the mossy growth which surrounds its stems and the bases of its flowers. The principal varieties are as follows: Blanche Moreau, white; Crested Moss, rose; Little Gem, crimson; Mdme. Moreau, rose. Moss roses should be grown in rich soil: pruning in March is done by cutting out weak shoots and shortening the others. See Green Fly ; Rose.

MOTH. These winged insects, though similar to butterfics in general appearance, are as a rule not so brightly coloured. The body is usually larger and more furry, and most varieties fly principally at night.

Moths in the Garden. The caterpillars of three moths do great damage to fruit trees in the spring These are the winter moth, the mottled umber, and the march moth, all being sometimes known as winter moths. Practically every form of standard and bush fruit is attacked by these pests. The caterpillars appear early in spring and feed during the entire period in which fruit trecs are making their foliage, causing sometines great havoc.

Winter Moths. Winter moths may be controlled both by grease-banding the trees in autumn, to catch the wingless females as they ascend the trunks, or by spraying the foliage with a tar-oil wash in winter, to kill the larvae. After the blossoms have fallen in spring, spraying with the poisonous lead arsennte, 4-5 lb. in 100 gallons of water, is recommended. See Buff-tip Moth; Figure of Eight Moth; Grease : Hornct Moth; Insecticide, ctc.

MOTH BALL. The round balls sold as moth balls consist of naphthalene, a product of the distillation of coal tar. Naphthalene is a cheaper substance than camphor for placing among furs and woollen goods to preserve them from inoths. The smell of naphthatene is considered objectionable by many, and on
this account moth bricks are made from a mixture of equal parts of cedar dust, camphor, and naphthalene, made into a brick by mixing with strong soap and water. See Clothes; Clothes Moth; Fur.

MOTHER. The mother of a legitimate ohild is its guardian after the father. The father is entitled to name a guardian for his children after his death, but the mother is entitled to act with that guardian. A court of law will not allow a man who separates from his wife to take away from her young children. If he dues so the court will invariably order them to be returned to their mother, unless she is not a fit and proper person to have the custody of the children.

In the matter of religious education the father is entitled to the deciding word. If, either before or after marriage, a man and woman have agreed that the children, or some of them, shall be brought up in one creed, the father can in law go back on his word and bring them up in another. But if they have begun to be educated in one religion, so that a change would unsettle them, the court will forbid the change

A mother who has property or means is liable to maintain her children. She is also liable, along with the father, under the various statutes which relate to the care of children The mother of an illegitimate child is its only parent in $\ln w$, and the putative father bas no control over it. If the mother of a child marries a man, that man becomes responsible for the maintenance of the child until it can maintain itself, just as if it were his own. See Child: Father; Husband : Illegitimacy, etc.

MOTHER-EVE'S PUDDING. To make this pudding, allow 6 oz. breadcrumbs, 5 oz . castor sugar, 6 oz . currants, 6 apples, 3 eggs, a pinch of salt and of nutmeg. Crumb the bread very finely, and pare and chop the apples. Clean the currants and stone them Mix the dry ingredients together and beat the egys, then beat in the eggs and stir all well together Butter a pudding basin and put in the mixture. Cover it with greased paper and steam the pudding for 3 hours.

MOTBER-OF-PEARL. The oyster shells from which the chief supply of mother-of-pearl is obtained are found off the coasts of N. Australia and New Guinca, some of the slecimens measuring from 6 in. to 9 in in diameter and weighing several pounds each. The inside surface of the shell is mostly white, but some are of a smoky black colour.

By jewellers and silversmiths mother-ofpearl is very largely employed. It is used for buttons, studs, and cuff links; for the handles of fruit knives and forks and pocket knives It is cut into round or oval-shaped beads for necklets and rosaries. Cabinet makers use it for inlaying, and large quantities are employed for this purpose in the manufacture of Oriental furniture, especially small decorative tables.

MOTHER OF THOUSANDS. This is the only species of the saxifrages, $S$. sarmentosa, which is commonly grown under glass. It is useful both for hanging baskets and pots.

The soil should be threc parts loam, one part leaf-mould and sand. Propagntion is by inserting the plantlets in sandy soil in the propagator in spring or summer. A cool greenhouse suits it well, or it is a valuable adjunct to the indoor ruck garden or fernery. The pariety tricolor likes a warm greenhouse The time for re-potting is the spring.

Linaria cymbalaria, also known as pedlar's bnsket, is sometimes given this name. It is a creeping outdoor plant suitable for rockeries and old walls.

MOTHER'S HELP. The duties of mother's help are not very clearly defined, but should be arranged definitcly between employer and employee at the time of
engagement. As a rule, the post involves work ranging from that of a nursery governess to that of an ordinary nurse, a certain degree of education being generally expected.

Primarily, the post means care of the children and charge of their wardrobe. The mother's help is expected to be a good needlewoman, able to make simple frocks for her charges, and to do any necessary mending. She may also be expected to do a certain amount of washing, and to be responsible for the general turn-out of the children. If there is also household work to do, it will usually be only of the lighter kinds. See Insurance.
MOTE ORCEID. The hothouse orchid belonging to the genus Phalaenopsis, and known as the moth orchid, requires a stove temperature, and should be grown in pans or baskets suspended from the ronf of the house. The handsome varieties of Miltonia vexillaria are most popular. See Orchid.
MOTIF : In Needlework. A motif is a piece of lace or embroidery set into a background of ordinary material to form a trimming. There are crochet and knitted lace motifs in ovals, oblongs, circles, and squares, embroidery motifs of all shapes and sizes, and real lace motifs such as those made with Honiton braid and pillow laces, which take the shapes of flowers, butterflies, etc.
There are several methods of mounting motifs to the material. The first is to tack the motif on the right side of the material, then sew down with a small hemming stitch,
in the case of knitting or crochet, taking one hemming stitch through each stitch of cut away at the back of the motif, leaving about $f$ in. to turn back a little hem, or only leaving about $\frac{1}{8} \mathrm{in}$. and buttonholing the raw edge. A second method is to button hole the motif to the material on the right side, and cut away the material at the back of it just below the wrong side of the buttonhole stitches.

Another method which gives a strong edge and a neat finish is carried out thus: Lay the motif on the right side of the material and pin it down so that the edges are quite taut and in the correct position. Now draw a pencil line on the material right round the motif, then remove the latter from the material. With embroidery cotton and a tine crewcl necdle, buttonhole all round the pencilled outline so that the pearl edge of the buttonhole stitch comes right on the pencil line. When the buttonholing is completed, take the inotif and sew it, stitch by stitch, to the buttonholing. If the pencilling and sewing are on the correct line, the motif should be an exact fit, and the material at the back can be cut away. See Appliqué ; Embroidery; Lace, etc.

MOTOR. This name is employed for any machine which changes some form of energy into mechanical power e.g. an elcctric motor, petrol engine or water power motor. See Electric Motor; Internal Combustion Engine; Mangle; Water Motor.

## Motor Cars: Hints for Owner-Drivers <br> How to Choose a Car and Maintain it Economically

The important sublect of the motor car is dealt with in this Encyclopedia in this article, In one on Motoring and in a number of subsidlary entries, e.g. Brake: Clutch; Front Axle: Gear: Internal Combustion Engine: Live Axle: Lubricatlon. See also Garage

The prospective purchaser of a car should carefully consider his requirements before placing an order. There are hundreds of different models from which to choose, which perhaps renders the question somewhat difficult to the novice, but he need have no fear about the capabilities as an efficient touring machine of any car now made, whatever its price. The suitability of a car, therefore, is narrowed down to requirements.

For example, it would be unwise to decide on a baby car if the purchaser's family party consisted of four stout persons, for although the car would carry such a load, and the engine have no difficulty in propelling it, the party would hardly be comfortable. On the other hand it would not be wise to buy a large car because of its good value (there are many such cars now available) if the taxation and general running expenses rendered motoring costs a severe drain on the buyer's income.

The Horse Power of Cars. Motor cars are taxed on what is known as the $£ 1$ per horse power basis, the horse power being calculated on the Royal Automobile Club formula, which takes into account only the diameter of the cylinders of the engine and not the stroke. The R.A.C. rating is also accepted as a guide when the question of insurance costs is being considered.

Modern cars may roughly be divided into four different types. (1) Small cars of 750 c.c. to 850 c.c. ( 7 and 8 horse power for taxation purposes). (2) Light cars between 850 c.c. and 1,300 c.c. ( 9 to 12 horse power, R.A.C. rating). (3) Medium cars up to 2,000 c.c. ( $13 \mathrm{h.p}$. to $20 \mathrm{h.p}$. ). (4) Large cars, over 2,000 c.c. ( 19 horse power and over).

A large car is very little more difficult to handle than a small car, but usually the novice has more confidence if he begins with a small car. The cost of a small car is as low as $£ 100$, and may be as high as $£ 250$ if the bodywork be of a special character. The running costs are exceptionally low; 40 or more miles to
the gallon of petrol and at least 1,000 miles to the gallon of lubricating oil are obtainable. The licence costs $£ 8$ and the insurance about £8 to $£ 10$ per annuin. The fee for a driving licence is 58 ., so if it is possible to garage a small car at home the total overhead charges are about $£ 185 \mathrm{~s}$. Od. per annum.
Should it be necessary to accommodate the car in an outside garage, the charges vary according to locality, but 68 . a week may be regarded as a fair charge for a small car. In the provinces this charge may be lower, while if the car be kept in a public garage with a number of other cars it may be lower still. The latter procedure involves a possibility of the car sus.


Motor Car. Fig. 1. Sectional diagram ol typical modern six cylinder engine with principal parta indicated


Motor Car. Fig 2. Table of average annual costs for typical cars
about the aame figure. The driving licence remains the same ( 6 s .) irrespective of the type of vehicle. Although the majority of cars in this category are of the four cylinder type, a number bave six cylinder engines.

Everything else being equal, a six oylinder engine is much better balanoed and smoother in its operation than the four cylinder engine, alfhough it is an axiom that a good four is better than a poor six. A car with a six cylinder engine costs a little more to run, both in fuel and taxation, the extra expense amounting to about 20 per cent.

Medium Size Cars. Next in popularity to the small car, this class contains mostly six cylinder engines, though there are a number with four cylinder engines, and eight cylinder power units are included in the specification of a few. The "eight" if of equal quality is slightly superior to a "six," since tho turning effort is almost as smooth as that of an electric motor, and gear changing is reduced to a ininimum.
The Large Car. Among the large cars are to be found some of the cherpest now on the market. These are of American design, of the mass production type, and are most efficient, althongh the costs in fuel, taxation and insurance are necessarily high compared with the smaller British designed cars. The horse power is 20 or more.

Coachwork. There are several different methods of constructing coachwork, including 1, all steel: 2, metal panelling. 3, fabric
covered; 4, coach built; and 5, flexible construction

The all-steel body is constructed of sheet steel pressings, and is unly found on cars sold in large quantities, since the tools necessary for their production are very costly and thousands of bodies of one pattern must bc made to make the proposition an economical onc. All-steel bodies are immensely atrong, and a car may roll right over in an accident with little tisk of tho body collapsing.

The metal panelled body has a wood frame (ash) to which the steel or aluminium panels ane affixed. This system of construction is more costly than the one described above, but it allows of economical production in smaller quantities.

The fabric-covered body is similar to the last dealt with, and where small outputs are concernerl is probably the cheapest form of construction, since the panelling beneath the fabric, when such is used, need not bc of the high quality necessary with the metal panelled body.

The coach built system differs only in detail from the methods of the old fashioned coachbuilders. Every body so made may be regarded as built to measure. For that reasun it is very costly, and is only to be found on the highest priced chassis.

Flexible construction is a method embodying special means of isolating each wooden frame member from those immediately ad. jacent. This method ensures an absolutely
silent body, free from the minor squeaks and rattles which in time develop in most other forms of motor body. The inetal panel method is generally adopted for open loodies with folding lioods, but any of the methods described are used for the popular saloon or closed body.

Running Costs. It is possible to arrive at a fairly accurate estimate of the probable running costs of a car, though the actual figure will be largely affected by the annual mileage and the general character of the roads over which the car is mainly used. If the vehicle is driven in all weathers, winter ns well as summer. this must be taken into account also.
The tabulated costs given in Fig. 2 will serve as a basis for the intending motorist, who will thus be able to form an idea beforehand of his likely expenditure on the type of car in view Actual running costs in the first few weeks can be compared with those given here, and the latter adjusted as necessary to the case in question.
The table deals with $8,12,15$, and $20 \mathrm{~h} . \mathrm{p}$ cars, but it must be pointed out that the weight of the car has to be taken into consideration, since a light car rated at $8 \mathrm{~h} . \mathrm{p}$. may weigh from 8 or 9 cwt . to 18 cwt . (the latter figure applying to a saloon hody). Thus, while the running costs for the lightest might be less than those specified, the saloon type ? ) h.p. car might be practically as expensive to run as a $12 \mathrm{~h} . \mathrm{p}$. car of 19 cwt . or so. The table is based on a new car used over a period of three or four years.
The expenditure falls under three main heads, depreciation, standing charges, and running expenses. A new car falls in market value directly it is brought into use, and depreciates by about 30 per cent in its first year, so that this loss in capital value must be reckoned with. In succeeding years the rate of depreciation is less, but the motorist, to be on the safe side, should write ofl his purchase price over a period of at lenst six or seven years, as after this lapse of time the car may fetch leas than 10 per cent of its original cost.

Standing charges, including items like tax, licence, insurance, association subscriptions, and the rent of a garage, are independent of the annual mileage or the use made of the car, and are governed only by time.

Running expenses include petrol, oil, tires, and such costs as repairs, maintenance, and the special erpenses incurred on the road, i.e. occasional garaging, parking, etc.
Some motorists lay up the car during the winter months. If in any case the car would


Two-Seater


Open Touring


Closa Coupled Quarter L'gbt Saloon


Enclosed Limousine


Clover Leaf Coupé


Saloon


All-weather


Single Cabriolet


Coupé Cabriolet


Close Coupled Saloou


Limousine


Three Quarter Cabriolet

Motor Car. Fig 3. Types of bodies with descriptive titles adopted by British Engineering Standards Association. Collapsible boods are indleated by dotted lines Courlesy of B.B.S.A.. and. the ' 1 ulocar


Motor Car. Fig. 4. Overhead view of typical light car chassis with principal parts indicated Courtesy of The Autocar
not be much used during the period, the ouner will be able to make a substantial cut in his annual expenses, since the amount of tax and insurance premium payable are lessened, and the running costs cease for the time being. The question of insurance is gone into fully in the subsequent article on motoring.

Care of the Car. We now proceed to consider the question of kecping the car in good condition. The information given here will enable the motorist to detect running and other faulta and to apply the necessary remedies before they develop into serious defects.

By consulting the fault-finding tables Fig. 8 , p. 812, in conjunction with the numbered para graphs, the motorist may obtain considerable assistance when endeavouring to ascertain the cause of a hreakclown.

At a first glance the magnitude of the tables may lead him to suppose that the possible troubles of mechanically driven vehicles are legion; but, in point of fact, it is quite common for a car to remain in very fair order for a whole season without mechanical adjustment.

The procedure by which defects may be traced is simple, as the following example, taken from the first of the tables, will show. Suppose, for instance, that the engine will not start. On inspecting the carhuretter it is found to flood properly, and a spark is passing across the points of the sparking plug. Then the explanation of the trouble will prohably be found in para. 1 or 2, and by carefully reading these the motorist should in most cases have little difficulty in remedying the defect.

Before passing to the 34 detailed paragraphs it is essential that the term good running order should be properly understood, since the meaning conveyed by it to the ordinary motorist is very different from that placed upon it by the enthusiast. The former is content so long as the car does not actually break down, and loses sight of the fact that some of the faults enumerated may be actually in existence, and may sooner or later cause serious trouble. The enthusiast is never satisfied unless the engine is in perfect tune, developing its full horse power with a reasonable consumption of petrol and oil, the transmission is working efficiently, and the chassis and hodywork generaliy are in good order and condition. To ensure this over a long period calls for regular attention.

The hook of instructions sent out by the maker of the car should be carefully read, as it will amplify the hints given in this article, and will further deal with the special characteristics of the vehicle in question The following numbered paragraphs are intended to be used in conjunction with the fault-finding tables:

1. When the spark is too weak to fire uncler compression it will prohably be found that the points of the sparking plug are too far apart. This may be the case even though a spark is obtainable when the plug is taken out and laid on the engine with the lead still connected to it. The points should be adjusted to give e gap of $6 \mathrm{in} / \mathrm{m}$ or $\cdot 025 \mathrm{in}$. for coil


Motor Car. Fir. 5. Sparking plur, show-
ing how gap hetween inR how gap between points of plug ma be measured
to a chafing of the insulation caused by contact between the leads and some nietal work
4. The magneto sometimes fails because the pivoted rocker arm of the contact breaker stick. The bearing pin works in a fibre bush, and in damp weather swelling of this bush may occasionally cause sticking or a sluggish movement of the rocker arm. (See Fig. 7.) The trouble is only likely to occur with new magnetos, in which the hush may be a very close fit on the pin. It is usually only necessary to clean the pin with metal polish, hut if that is insufficient fine emery cloth may be used with care. The pin should be slightly moistened with thin oil before reassembly
Should the rocker arm be free, the platinum points may be dirty or pitted ; in which case, clean them and, if necessary, very carefully file then dead Hat with a jeweller's file, removing only the smallest possible amount of metal. Now reassemble the contact breaker on the magneto and rotate the armature so as to bring one of the cams into action, and thus keep the points separated; then, by means of the adjustable contact, adjust the size of the gap to $4 \mathrm{~m} / \mathrm{m}$, or 015 in . ( है $^{\frac{1}{2}} \mathrm{in}$.). A feeler gauge should be used, or a special magneto spanner set provided with a file and feeler gauge can be obtained for this purpose (See Fig. 6.)
5. Faulty electrical contacts may arise from dirt or from pitting of the platinum points; or the points may be too far apart when separated by the came, or loose in their scatings. Adjustment of the gap is dealt with in para. 4. Loose platinum points may be riveted by a few blows with a small hammer, which will cause them to become firmly seated; but any serious defect or very deep pitting calls for replacement. A broken carhon hrush is best replaced by a new one. The springs which hold the hrushes against the slip ring, or other part, should he looked to.
6. It is very seldom that the ignition fails on account of a breakdown in the magneto insulation. A repair of this nature is quite outside the scope of the average motorist, and the best plan is to send the complete magneto to specialists in this class of work Complete rewinding is best, although it is more expensive than "baking," which will soot, caused by an over-rich mixture, may more expensive than "baking," which will
cause a short at the sparking plug, this is often effect a temporary improvement, hut is cause a short at the sparking plug; this is best cleaned with petrol and a hard brush, such as a atencil brush.

Sometimes a plug that appears to be quite sound when tested off the engine will short when in use. One reason for this, apart from an excessive gap, is a flaw or crack in the porcelain which closes up when the plug is cold, hut opens when hot, thus allowing the high-tension current to short to earth-that is, the cylinder head and cylinder hlock-instead of jumping the points of the plug.
3. A short circuit may be caused by a faulty connexion at any point of the ignition wiring or a law in the insula. tion. The wiring should be gone over, piece by piece, beginning at the source of the current, i.e. the mag neto, or the accumu lators, according to the ignition system fitted. The occa sional short circuit can often be traced


Motor Car. Fig. 6. Rotating type contact breaker for magnetos. Combetween points may be measured Fig. 7. Details of Fig. 6 failure of the induction coil in a coil ignition system, it is best to replace the unit, this being usually a simple operation:- many motorists carryas spare induction coil.
7. Neglect of lubrication of the bearings is a likely cause of controls sticking or becoming sluggish in action The driver may lose control in an emerg. ency, or in any case may he misled as to the effict of his manipulation on the parts operated. It is well to check the controls separately to sec that they are actually imparting the correct amount of movement indicated by the position of the controlling levers operated hy the driver. Wear at various points often upsets the original setting after a prolonged period of use. Clutch slip may be due to


Motor Car. Fig. 8. Fault-anding ohart which in oonjanction with numbered paragraphs in the tert will asaist in tracing oanse of a defoot or breakdown
maladjustment of the controls, so that the springs cannot properly engage the clutch members.
8. Unless the engine has recently been dismantled it is improbable that the valve timing will be incorrect ; but if an overhaul has just been completed, search should be made for the timing marks usually provided on the timing wheels so that the original setting shall be given, thus ensuring that the cams open and close the valves at the oorrect instants relatively to the crankshaft. Where no marks are provided it is a good plan to mark the wheels at the base of the teeth with a centre punoh before disturbing the gear. Failing this, obtain a chart of the timing. Reference may be made to the typical valve timing diagrams shown in Fig. 9.

A back fire may be caused when starting by hand by the ignition being too far advanced. The engine and starter motor may be pulled up by excessive advance although there may not be an actual backward rotation of the crankshaft. The current from the mag. neto, if it is too far retarded at starting, may not be powerful enough to create a spark at the plug. It may be necessary to adjust the position of the magneto armature slightly relatively to its driving shaft by means of the vernier coupling usually provided so as to obtain a more powerful spark when the ignition is retarded. The ourrent for coil ignition is equally strong whether it is advanced or retarded.
9. There are numerous olasses of air leakage into the induction system which may
upeet the carburation. Wear may occur clearance between the pistons and the cylinder between the valve stems and guides, in which walls. In this case there is loss of power case new guides should be fitted. Air leakage due to leakage from the cylinder during the may also occur through wear at the throttle compression and working strokes and also bearings. The remedy in this case is to excessive oil consumption. This is dealt with rebush or pack the bearings. All joints of in paragraph 11.
the induction system should be overhauled 10. When a petrol stoppage occurs, make and bolted up tight. Another source of leakage certain that the petrol is turned on and then, may be the connexion to the suction-operated if the engine still refuses to start, test the wind-screen wiper, which, if faulty or broken, petrol pipes for clearness. With a gravity. may quite upset the carburation, particularly led system, the petrol will not be able to When starting. flow out of the tank if the vent hole in the A different class of air leakage that will filler cap is ologged up. On the other hand, only be manifest after a considerable mileage failure of the petrol supply may be oaused has been run is that caused by excessive by dirt in the jet of the carburetter. The


Motor Car. Fig. 9. Approzimate timing of inlet and exhaurt valvea. A, induotion ; B, compresion ; C, worting or power stroke; $D$, exhaust strole. Cyoje of operations is then repeated float needle may be sticking, and by remaining on its seating will prevent the petrol from entering the float chamber; the cause will be either dirt a bent float needle, or jamming of the toggle levers
A partial stoppage of the petrol may be caused by loose pieces of fibrous matter at the jet or the fluat chamber of the carburetter, the petrol tank, or the filter. A failure of the petrol supply
with the autovac and fuel pump systems may be caused by air leakage into the suction passages and can only be located by careful examination. Should the autovac become empty it may be found difficult to start it in operation again until the engine is running fairly fast. The autovac tank may be filled with petrol through the plug provided at the top, or the float chamber of the carburetter may be filled after the cover has been removed to enable the engine to be started and operate the autovac.
11. Poor compression hay be due to various causes; for instance, the valves may require grinding in or the pistons a nd cylinders may be hadly worn. Other canses include : a broken piston ring; piston ring slots in line; piston rings loose in their grooves; and a scored cylinder wall, due to the gudgeon pin working out at one end of the piston. Defective pistons or piston rings must be replaced. If the valves are properly ground in, they will not give any trouble for some consideralile time.

## Avoidance of Poor Compression

The joint hetiveen detachablc head and cylinder casing should he examined, as the gasket may be defective, or the holding-down bolts not tightened up uniformly. If the cylinders are worn oval or scored, regrinding and filling of the scores will be necessary Thin, hard steel liners may be forced in after the cylinders have been suitably enlarged. in which case it may be possible to utilize the old pistons. A gasket which is defective in any way should not he used. It is advisable always to keep a spare gasket in hand.
12. Loss of power will occur if the valves are not a perfect fit; but if they are nccasionally ground in, for instance, whenever the engine is decarbonized, trouble from this source will be rare. Where the faces are very bad it may be necessary to have them trued up with a special valve-scating tool before grinding.
The modern valve grinding and decarbonizing equipment now einployed by many repairers trues up the valves and their seats independently, and when skilfully used gives better results than can be obtained by the usual grinding compound.

A weak valve spring should be replaced by a new one since it will not return the valve to its seating quickly enough when the engine is running at high specds. It is futile to attempit to stretch it. The only remedy for broken valve springs is a replacement. When a valve is titted the scating should be re-cut, as the original face angle will probably have been altered during regrinding. The stem of the valve must move frcely, but inust not be loose in the guide, and it shonld be the same length as the old one.

An elusive cause of loss of compression is a stretched valve stem or too little tappet clearance preventing thic valve from scating properly when the engine is hot. The engine should be turned until the can is clear of the tappet, the valve then being seated, and the tappet should be adjusted to give the clearance specified by the makers of the engine. (See Fig. 10.) This varies considerably, but for most side valve engines a tappet clearance of 004 in . is suitable for the inlet valve and -005 in. for the exhaust valve. For overhead valve engines the clearance is slightly grenter. A feeler gauge should be used, and the adjustments should be made when the engine is warm. It is safer to have too much than too little clearance.
13. If the silencer is allowed to become choked with soot the exhaust gases will not be able to escape quickly enough to allow the engine to develop its proper power when running at high speeds. This trouble may never arise if the silencer is of sufficient size and of good design and if carburation is satisfactory.
14. The air supply to the carburetter must be properly proportioned to the amount of petrol supplied if even running and full power with economy of petrol consumption are to be obtained. Carburetters valy so grently in construction that it is impossible to give any rules for the adjustment of air and petrol which would he generally applicable. It may be stated, however, as a general rule, in the case of an over-rich mixture, that it is safer to increase the size of the choke than to decrease the size of the jet, while for a weak mixture it is better to increase the size of the jet.

To obtain maximum power at high speed it is advisable to keep the diamcter of the choke tube as large as possible, thereby avoiding throttling of the gases. The carburetter should always be kept correctly adjusted for slow running, such adjustment being made when the engine is hot. Instructions for tuning can usually he obtuined from the makers.
15. Excessive carbon deposit is most frequently caused by badly worn pistons and cylinders and also by worn piston rings or worn grooves. Through excessive clearance at theso points oil is sucked up during the induction strake and deposited in the combustion chamber and on the piston, and is burnt by the heat generated during the power stroke, thus forming, together with road dust, a hard deposit.
This deposit is liable to become incandescent and ignite the fresh mixture before the end of the compression stroke. When this happens it will be seen that instead of the piston rising on compression, it will be rising against the very high pressure of the prematurely exploded charge. This fault is commonly known as pre-ignition, and can only be cured by a renewal of the worn parts responsible, or by frequently removing the cylinders or cylinder heads and carefully scraping away all signs of carbon deposit Pre-ignition causes knocking, and reduces the power which can he developed
16. Over-heating of the engine may arise from various causes, such as complete or partial


Motor Car. Fig. 10. Tappet or valve clearance is measured by a leeler gauge inserted between end of valve stem and head of screw A, which is screwed into
or out of tappet $C$ to adjust clearance, and is locked or out of tappet $C$ to adjust clearance, and is locke
in position by lock-nut $B$

> Courtesy of Messrs. Armstrono Siddeley Motors
failure of lubrication, shortage of cooling water, choked water pipes or cooling elements, a worn water circulating pump, a slack belt driving the fan or water pump, a choked silencer, imperfect carburation or ignition too far retarded.

The oil level in the sump should never be allowed to get low; it is hest to replenish it frequently and keep, the sump full If the oil is dirt $y$ or contains sludge it must be drained off, the sump Hushed out with flushing oil, and refilled; this should, in fact, be donc about every 1,500 miles or according to maker's instructions.

If any of the oil pipes or passages have become choked they must he cleaned cven though the engine may have to be partly dismantled. If a plunger pump operated in one direction by a cain and returned by a spring is used, the spring, if weak or broken, must lise replaced; it is not suflicient to stretch a weak spring. If the plunger is worn a new one must be fitted. Pumps, whether of the
gear wheel, plunger, or rotating vane type must be replaced or repaired if they do not force oil through properly.

The racliator should always be filled and replenished with rain or other soft water, thus a voiding any deposit of line in the system, which would result from the use of hard water; such deposit, unless very hard, can he removed by running the enginc for a short time with a strong solution of common soda and water in the cooling system. After this mixture is drained off the system must he well washed out before it is refilled with soft water.
17. An imperfect mixture results from the carburetter not being properly adjusted, or not of a suitable size for the engine to which it is fitted Until this is correctell unsatisfactory running at varying engine speeds will be certain to occur. Sec para 14 above.
18. Since water is heavier than petrol aull the two do not mix, the water remains at the bottom of the tank or in the Hoat chamber of the carburetter. With a properly designed tank, water can be present in some quantity without any getting through into the carburetter, since the outlet pipe usually projects slightly above the bottom of the tank. If, howewr, only a little water passes into the float chamber it may get into the jet orifice and cause irregular running. If sufficient water passes through it will entirely stop the flow of petrol, thereby making it impossible to kecp the engine running at all. The tank and the Hoat chamber must be drained com pletely and thoroughly cleansed.

## Points About Ignition

19. If the ignition is too far advanced the explosion will take place against the rising piston. On the other hand, if it is too far retarded the explosion will not take place until the piston has travelled some distance down on the power stroke. Either fault, but particularly the latter, is fatal to power development. With fixed ignition, the timing should be such that the spark takes place just before the piston has reached the top dead centre on the compression stroke. The spark occurs at the instant the points of the magneto or coil ignition contact-breaker separate.

When the timing of the spark is controlled by hand or by an automatic advance-andretard, the setting should he such that the spark occurs at or just after the crank is on the dead centre with the ignition fully retarded This is the adjustment for starting. When the engine is running fast, the ignition may be advanced so that the spark occurs with the crank about thirty degrees ahead of the dead centre. When the engine is pulling hard up a hill the ignition should be retarded so as to avoid knocking and get the hest results
20. Frequent causes of clutch slip are faulty adjustment, insufficient spring pressure or the presence of oil on the friction faces, but the different types of clutch vary greatly. I weak spring or springs where no adjustment is provided should be replaced by new, and this should be olitained from the makers to ensure correct strength. With clutches working in oil, slipping may be duc to worn plates, worn or missing cork inserts, or weak springs : or a thorough cleansing and freah lubricant may be necessary A little oil on a dry plate clutch is soon burnt off, but continued leakage from the engine into the cluteh pit may account for persistent slipping.

Some clutches have an adjustable stop by which the position of the clutch peedal can be determined, so that it is advisable first to make sure that this stop is not preventing the clutch from entering into full engagement. The clutch cannot engage properly if the pedal arm is forced hard up against the under side of the floor board. It should be half an inch clear when the clutch is engaged. Unnecessary wear of the ball thrust bearing wi!! also result frow this defect. A slipping
clutch, if allowed time to cool, will often hold for a short period, thus enabling the motorist to reach a garage or his home if only a short distance has to be travelled.
21. Assuming that the engine is in good condition, difficulty in hill climbing may be due to a change down made too late. With the internal combustion engine the power developod is proportional to its speed of rotation, and the turning effort exerted by the engine, once it has attained a certain speed, is approximately constant. Unless a change down is made sufficiently early-that is, before the engine slows down greatly, the engine will not be able to accelerate again, and a further change down to a lower gear will be necessary. If the engine and car speeds are allowed to fall too low the vehicle may stop before the next gear can be engaged.
22. Stripped timing gears, broken driving keys, or a broken timing chain are causes of breakdown that seldom occur. In such a case no attempt should be made to rotate the crankshaft, as a broken chain or other part might be wedged and cause further damage.

## Flooding of the Carburetter

23. Flooding of the carburetter may be evidenced by overflowing of petrol from the jet into the main air passage or by fuel running out of the top of the flasat chamber. Among the more probable causes may be mentioned dirt or fibrous matter preventing proper seating of the needle valve, wear of the end of the needle valve, binding of the valve in its guide, due, for instance, to its being bent, movement of the collar which engages the ends of the toggle levers, derangement of the toggle levers themselves, or a punctured float. A worn needle valve may be replaced or it may be ground in on to its seat with fine pumice powder and oil, but it should preferably be first trued up conically on a fine emery wheel. If the float is punctured, only a very small hole will generally be found, but this, by allowing the petrol to get inside, will cause the float to sink.
To repair such a defect the hole should be slightly enlarged, the petrol drained out, and the Hoat left for several hours in a warm place to make sure that every vestige of petrol has evaporated and thus avoid risk of explosion. The hole should then be soldered up, using as little solder as possible to avoid making the float heavier and thus upsetting the level of the petrol at the jet. If an increase of weight cannot be avoided, the petrol level may be adjusted in any suitable way, such as by moving the collar on the needle valve.
24. No attempt should be made to run the engine in the event of a sudden loss of compression. The cause may be a broken piston ring, which is likely to score the cylinder wall. Badly worn piston rings must be replaced. Gumming up of the piston rings is due to an accumulation of semi-burnt oil choking up the grooves in which choking up the grooves in which the rings within the insulation, assuming that the ter-
should move freely; should this occur it is minal connexions have been examined and best to remove the rings and carefully clean the grooves. New rings may be necessary and should be fitted if the old rings have lost shape or elasticity.
25. Breakage of the piston, connecting rods, or crankshaft is seldom met with, but no attempt should be made to start the engine if such trouble is suspected, or if there is any


Motor Car. Fig. 11. Ezamples of wheel non-alinement. A, front wheels inclined out wards; $\mathbf{C}$, anles not parallel ;
suspicion that a big.end or crankshaft bearing has run-that is, that the white metal has question can be mended by welding, and specialists in this class of repair will guarantee a satisfactory job, it is usually better and quicker to obtain new parts from the makers Fitting new white metal bearings or remetalling a bearing is a simpler matter than a breakage, and can be done by any competent repairer.
26. Failure of the magneto or coil ignition condenser is exceptional, and can only be dealt with by the makers or by electrical ignition experts. In general a defective condenser will cause excessive sparking at the points of the contact-breaker, resulting in considerable burning or pitting, also a loss of intensity of the high-tension current. Internal short-circuiting of the magneto due to moisture is sometimes experienced during the winter. It can often be cured by removing the magneto from the engine and placing it in a warm, not hot, dry place, such as a mantelpiece, for a few hours.

If this is not successful, it should be taken to pieces and thoroughly cleaned, care being taken that the timing of the high-tension distributor in relation to the armature is correct when reassembling. Over-oiling may result in oil reaching the slip spring, contactbreaker or armature, and so causing internal short-circuiting Excessive moisture, overoiling, or too large a gap between the contact breaker points may damage the insulation of a magneto armature or induction coil, and necessitate rewinding or replacement

## Faulty Wiring

27. When the ignition wiring is removed in connexion with a repair or overhaul, the different leads should be marked carefully to ensure that they are replaced as before. In some cases different coloured insulation is used or the wires are arranged in some special manner which ensures that they cannot be displaced. Should they be wrongly connected up so that the engine fails to start it may be found difficult to rearrange them properly.

Faulty wiring should seldom occur for a number of years if reasonable attention is given to cleanliness and to ensuring that the leads do not chafe against any metalwork. Oil and dirt will frequently be found responsible for many faults, principally owing to their deleterious effect upon rubber or similar insulation. All terminals should be kept clean and dry. It will sometines be found that the wire itself hidden within the insulation has fractured, or that some of the strands are broken, giving imperfect conductivity. Finely stranded wire may be found to be oxidized, probably owing to moisture.
The reason for a short circuit or a defect in a connexion can sometimes not be ascertained even after the most careful search. The most probable cause in such cases is a frac. ture of a wire itself found satisfactory.

To test this defect one end of the suspected wire may be connected to a terminal of the accumulator and the other end connected in circuit with a voltmeter or an electric light bulb of the same voltage as the accumulator. If the bulb fails to light, or burns intermittently or is dim, or if the voltage shown by
the voltmeter is less than that of the accumulator, the whole length of wire should be replaced. It is not satisfactory merely to replace or repair part of a damaged load. The voltmeter is more sensitive than tho bulb, since even a small drop in voltage will be indicated.
28. Non-alinement of the steering whecls should not appear until a considerable mileage has been covered; this defect usually results in the wheels spreading somewhat at the front, as shown at A in Fig. 11. It may be due to worn pins or bushes in the steering heads, or to wear in the joints


Motor Car. Pig. 12. Measurements to check alinement. See text should be between $\frac{1}{8}$ and $\frac{3}{18}$ in., and is measured between the inside edges of the rims with the front of the wheels spread apart to take up any slack there may be in the connexions.
The front and the rear axles should be parallel to one another, and the wheels should track properly. When steering straight ahead want of alinement occasionally occurs through, for example, slackness in the connexions between the springs and the axlos, or may be due to the springs on one side flattening out more than those on the other. Defective springs should be set up by the spring smith and properly hardened and tempered. The wheels may be lined up, should this be necessary, as shown in Fig. 12, the measurements being taken between the points indicated by the arrow heads. The surrounding line represents a cord tightly stretched from crossbars temporarily secured to the frame side members, the cord being level with the centres of the wheels. Corresponding measurements on the opposite sides of the vehicle should be equal.

## Defects in Steering

29. Defects in the steering of a vehicle may arise from a number of causes, and it is first necessary to make sure that the tires are both inflated to the correct pressure. Soft tires or tires which are inflated to different pressures will make the steering stiff and may create a bias or drag towards one side. When the steering stiffens suddenly, or pulls the car to one side a soft or deflated tire is the most probable reason. A burst tire at speed may causedeflection of the vehicle and result in a serious accident. The tires should therefore be kept in good condition and the steering hand-wheel grasped firmly when driving fast.

Assuming that the tires are properly inflated, a persistent drag to one side may be caused by excessive wear in one of the steering head bearings, thus preventing the tire of the road wheel concerned from making contact with the road at the proper point and upsetting any centre-point steering
features which the vehicle may possess. An excessive amount of free play will be due to wear of the worm or other steering mechanism and possibly the joints of the steering transmission In most cases adjustment is possible In worm gearing the worm can often be turned to a new position Should the steering bocome stiff, attention should be given to lubrication, particularly of the steering heads and the worm, screw, or other operating mechanism
30. The bolts holding the body down on to the frame may slack back, or may become slack through the packing perishing or being compressed. This is a frequent but unsus. pected cause of intermittent body noises and is particularly noticeable when driving over a had road surface. New felt packing should be fitted before tightening up the bolts. In older vehicles therc is sometimes a certain amount of settling down of body or frame which may cause doors to jam, and with lightly built bodies this can only be remedied by attention to the packing between the frame and body side members
31. Lack of proper attention to the lubrication of such parts as the spring shackle pins, the brake control joints, and the leaves of the springs, is a frequent cause of intermittent squeaks and rattles while the car is travelling. Other causes may be loose mudguard stays, slack holding down bolts for the running boards, worn windscreen fittings, perished felt, leather, rubber or other seating strips on which the edges of the bonnet rest.

The hinges and the door fittings and the hinges of the hood framework may work while the car is running, and the various lugs and spring brackets, riveted or bolted to the frame side members, are liable to slacken in time. The spring leaves and the shackle pins (other than those fitted with rubber Silentbloc liners) need regular and frequent lubrication, and a little thin penetrating oil applied occasionally to the various joints will check noise. Slack screws and bolts should, of course, be tightened up, and rivets which are slack in their holes should be replaced. They cannot be properly tightened up.

## Failure of the Current

32. Loose battery counexions may result in failure of the electric light or of the starter motor, and attention should always be given to this point first. Failure of the current due to a discharged accumulator may result from slipping of the driving belt, where this method of drive is employed, or it may be due to some defect in the dynamo or to a short circuit or bad connexion in the wiring, the causes of which are dealt with in paragraph 27. Should the lights fail through blowing of the fuse, two causes should be looked for, namely, either an excessive charging rate due to some defect in the dynamo or a short circuit in any of the main wires in the charging circuit or in any of the wires leading to the lamps or other electrical components. Dynamo repairs should only be entrusted to the makers or to some firm specializing in this work.
33. Binding of the brakes or slipping of the clutch may be responsible for poor acceleration. Causes of clutch slip are dealt with in para. 20. The hand brake may have been left on. Want of lubrication, apart from increasing the difficulty of applying the brakes, may cause them to remain in engagement after the hand lever or pedal has been released. One or more of the holding off springs may have broken, leaving the brake shoes in contact with the drum. If the shoes are set too close to the drums the flexing of the springs may cause intermittent contact between shoes and drums.

If the brakes are not used for any part of a run the drums should be cool to the touch. If they are hot or even warm there is some continuous or intermittent binding. One way of


Motor Car. Fig. 18. Tgpioal ohasgis lubrication calendar, giving a general indication as to how often the diferent points should be labricated it satisfactory performance and long life are to be secared. If
the mileage is small the car should reeeive some attention overy week
testing brake adjustment is by feeling whether the drums have heated uniformly at the end of a run when they have had normal use. The operating connexions on an overheated drum should be slacked off, or vice versa.
34. A fierce clutch which grips suddenly and starts the engines with a jerk may cause serious damage to the transmission, and may even twist and ultimately break the axlo driving shafts. A possible but not very likely cause is want of alinement, due to wear of the central spigot bearing between the rear end of the crankshaft and the forward end of the clutch shaft.

The different types of clutch differ so much from one another that it is difficult to give any generally applicable rules, but mention may be made particularly of the following. In the widely used single plate clutch in which friction disks made of asbestos fabric reinforced with brass wire are interposed between the metal driving and driven disks, fierceness can be cured by injecting a little thin oil into the clutch. Very little is sufficient to soften the asbestos surfaces slightly, although any excess is soon burnt off.

Metal to metal single-plate or multiple disk clutches and clutches employing cork inserts engaging metal plates always run in oil, and
fierceness may be due to the oil being too thin or the clutch requiring cleansing or renewal of the wil. The cone clutch, which is seldom seen to-day, may require relining or redrcsaing, or the rivets securing the lining in position may project above the surface.

Breakdowns on the Road. Should the engine fail to run or to start, the trouble is probably some comparatively minor derangement of the ignition or the carburation. In the event of a breakdown on the road the cause should be investigated as follows. First make sure that the petrol is turned on and is available at the carburetter jets. Then find out whether there is a spark at the plugs by removing one of the high tension leads from a plug terminal and holding it so that the terminal on the wire is close to but not touching some metal part of the engine. Then get an assistant to turn the engine by the starting handle and watch for a spark to jump across the intervening gap.

Should the spark be present, the question as to whether the gap between the points of the sparking plug is correct should next be investigated and the procedure outlined in the various headings above may then be followed; it is probable that the trouble will be located long before a more serious breakdown need be contemplated.

## Motor Cycles: Buying and RunNing Them

## Facts and Figures as Aids to Economy and Efficiency

> The information given In thls article is supplemented by that in the entries on the various parts of the machine, e.g. Brake: Carburetter. See also Garage: Gear; Lubrication and the article following on Motoring

The prospective motor cyclist should refer bound to make calls in muddied overalls, to the legal portion of the succeeding article on Motoring, where full particulars are given about the necessary preliminaries such as registration, the procuring of a car licence and a driving licence, and insurance.

All types of motor cycle are essentially more economical than cars, and the lighter machines afford the cheapest possible form of travel, for their cost is less than that of a season ticket on the railway. The chief objection to using a motor cycle for business purposes throughout the year is the exposure of the rider. This is not particularly serious when direct transport from the home to the office or factory is desired; a machine of moderate horse power can be equipped with windscreen and legshields, so that the driver can keep dry and warm in light waterproof overalls. But, if the rider's duties involve numerous stoppages, he will be
bound to make calls in muddied overalls,
which is usually objectionable. No elderly person with a weak heart or chest should face the exposure of a motor cycle, or the exertion of using the foot starter; but to the rest of the community, including women, the motor cycle offers the cheapest means of private transport, available either for pleasure or for utility purposes. Serious stoppages are extremely uncommon with a machine of good class, and petty stoppages are soon set right on the road.

It is not possible to generalise about the cost of owning and running a machine, as the market embraces a great variety of types, ranging from the motor-assisted bicycle, selling at $£ 15$ and weighing no more than 100 lb ., up to the 8 horse power leviathan, capable of 100 miles per hour and catalogued at $£ 150$, whilst sidecars and three-wheeled runabouts are obtainable at any figure from $£ 50$ upwards.


Motor Cycle．Fig．1． 98 c．c．Excelsior two－stroke light－weight．
Fig．2．Ariel＂Square－FTous，＂with four－cylinder monobloo engine and two－geared tly－wheels Courtesy of The Motor C！⿰亻⿻乚㇒

The $£ 15$ machine will go anywhere，and costs about 2 s in out－of－pocket expenses for every 100 miles it covers，whilst its annual overhead charges are limited to tax and insurance， possibly $£ 3$ in all．The expenses rise in pro－ portion to the cost，weight and power of the machine．Some suggestions on choosing a machine follow．

The $£ 15$ Lightweight．These machincs have been recently introduced as the result of their popularity on the European Continent，where they are sold by the thousand to the artisan class，and employed for travelling to work during the week and for pleasure at week－ ends．They are taxed in Great Britain at a reduced rate of 15 s per annum．When the machine has licen lought，it can be run $\mathbf{5 , 0 0 0}$ miles for a total outlay of about $£ 8$ to £10．It is actually easier to ride than a pedal cycle and far more comfortable，as its extra weight（ahout $1(0) \mathrm{lb}$ ．）steadies it，and the large tires and saddle insulate the rider from bumps and vibration．It will climb any main road hill，and though its maximum speed does not exceed 35 miles an hour，it will average over 20 miles per hour all day long．

Larger Bicycles．The touring classes include machines from $2 \frac{1}{2}$ horse power to 8 horse power， varying in price from $£ 25$ to $£ 150$ ．The more powerful a machine is，the more it will cost to run，and the more difficult it will be to handle when its engino is stopperl；for examplo，in wheeling it out of its shed In this touring class the machine of 350 c．c．（about $23 \mathrm{~h} . \mathrm{p}$ ．） is the most practical．Smaller engines must be geared rather low to enable the machine to climb steep hills and to maintain a good speed against a head wind．

But a $2 \frac{3}{3}$ horse power engine has ample power for all ordinary purposes，and can be rin quietly like a good car．It is the best all－round machine for young and middle－aged people，and is quite suitahle for the beginner，heing easy to start，inexpensive to maintain．not cumbrous
to handle in the garage，and a splendid goer． The more powerful types of 500 c．c．（ $3 \frac{1}{2}$ h．p．） and upwards may fairly be compared to the sports cars．They are unnecessarily powerful． and are chiefly bought by the sporting type of rider，who has no objection to weight，and indulges at times in very high speeds．Alter－ natively，the big－engined bicycle may be used for pulling a sidecar．

Pillion Riding．Coroners and magistrates often denounce the practice of carrying a passenger on the carrier of a motor cycle． It is by no means so dangerous as might be supposed．The insurance companies frame their premiums in accordance with accurate statistics．If a motor cyclist wishes to carry a pillion passenger，he must pay an extra 50 per cent on his premiunı．Obviously two people will be endangered in any accirlent with a pillion rider aboard，and we should therefore expect the premiums to be douhle that for a solo machine，instead of being only 50 per cent higher．
Undoubtedly the presence of an extra weight of perhaps 10 st．，high up at the stern of the machine，must affect control to some extent；but the insurance data suggest that the added risk is negligible，and is really limited to the chance of two people being hurt instead of one On the other hand it is obvious that nobody should carry a pillion passenger until he has ridden soveral thousand miles alone， and has becone a tolerably expert driver．It is an offence to take a passenger on anything but a proper seat（see page 821 ）．
Sidecars．Despite the introduction of the $£ 100$ motor car the sidecar retains its popu－ larity．Quite a serviceable sidecar outfit of 2\＄－3 horse power can be bought complete for about $£ 50$ ，half the cost of the smallest new car．Running costs show a similar ratio， as the tax and insurance，fuel bill and tire bill of the small car will be twice as heavy．It is true that $n$ second hand amall car can he hought
for £50，but its maintenance costs will exceed those of a new 8 horse power ear，and com－ pare somewhat unfavourably with those of a cheap sidecar．An 8 horse power sidecar is probably slightly more expensive to run than a bahy car．

Three－wheelers．There are several excellent three－wheelers on the market，which on the average cost about the sume as a small four－ wheeled car both to buy and to run．Having three tracks，they are less comfortable than a baby car on an inferior road；but，as they have plenty of engine power in proportion to their weight，the road performance is extremely vivacious by comparison，and this attraction explains their continued survival．
Specification．As motor cycles are designed by experts who are themselves practical riders，and who can only keep in business by offering the public a machine which is good value for the moncy，it is unnecessary to dis－ cuss specification in detail，with one crception． Some of the cheaper machines have acetylene lamps，or some other inexpensive form of illuminant．There is only one really satis－ factory type of lighting，namely，electrio lighting from a battery，the hattery being charged by a dynamo driven off the engine． Except where every shilling counts，this type of lighting should be specilied，as no ot her system is really efficient and convenient at night．

Purchasing the Machine．The motor oycle should be bought locally．if possible．The agent receives a commission on the sale of a new machine，and is expected to give his customer a certain amount of sorvice，esperi－ ally if the customer is a beginner．But if a customer residing in Westmorland，for example，buys from a London dealer，he cannot hope for any free service．There is only one exception to this rule of buying locally．If a man is buying his second or third machine he may wish to＂trade off＂ the old machine in part payment for the


Motor Cycle．Fig．3． 500 c．e．Royal Enfeld sidgcar outtit．Fig．4．B．S．A． 1,021 c．c．three－wheeler，with 9 b．p．air－cooled V－twin engine Courtesy of The Motor Cycle
new one. If he lives in a remote place, his local dealer may lack facilities for re-selling second hand maohines, and may make him a much poorer allowance than a big London dealer will. In such cases it may pay to sacrifice the service facilities in return for a higher exchange allowance.

Learning to Ride. The three requisites are a good handbook, a friend to act as a tutor, and a suitable machine. Excellent handbooks are published by the motor cycling journals and other firms. A local rider will always give the initial instruction on some quiet road. and confidence comes with amazing rapidity, as the machine is so low and steady that from the outset it feels much safer than a pedal cycle. An initial apprenticeship on a pedal cycle is always desirable, as it familiarises the rider with various road emergencies, and givea him a certain amount of road sense. But such an apprentice:hip is not essential, and many men and women take up motor cycling without ever having learned to ride a pedal cycle.
The beginner need not be afraid of damaging the machine. It is not in the least likely that he will clo it any harm, provided always that he lubricates the engine adequately. If he under-oils it he may wreck the engine in five miles. Therefore he should not attempt to run it until he has had the lubrication system thoroughly explained, and ever afterwands he should verify his oiling nt short intervals until he learns to recognize, from the beat of his engine, whether it is properly oiled or not. The working of a typical simple splash lubrication system is illustrated in Fig. 6. The toolbag will contain a booklet explaining this important matter in detail, and any local rider will demonstrate its action to him.

Before he risks a solitary ride, he should further ask his dealer or a friend to show him how to mend a puncture. In all probability his tires will not puncture for 3,000 iniles, but he cannot turn a heavy machine upside down to get at the tire, as he would with a pedal cycle, so a practical demonstration will be of real value.

Before taking to the road the beginner should master the art of stopping the machine. The engine can be stopped in two ways, either by shutting the throttle or lifting the exhaust valve. Two brakes are available for bringing the machine to a stop-a rear brake, operated by a pedal, and a front brake operated by a pull-up lever under the right grip of the handle bar. Some novices are a little apt to become excited in any sudden emergency, and to lose their heads. They should school themselves to shut of the engine and apply the brakes instinctively.
The ordinary traffic signals must be given. These are explained and illustrated in the article on motoring that follows. Very abrupt braking should never be attempted on wet, greasy surfaces, or on loose gravelly roads. Except on firm surfaces the brakes should be applied progressively and firmly, rather than abruptly. Generally speaking, all changes of speed should be executed smoothly without jerk. High speed should be entirely eschewed except on deserted roads, and the novice should not attempt high speed for at least three months after starting to ride.

Starting the Engine. A lonely novice is all diagnosis of motor troubles is briefly apt to experience some trouble in starting engines of 350 c.c. and over; the smaller engines never give any serious trouble in this respect. Such an experience should not discourage the tiro. Even racing engines of 500 c.c. arc tolerably easy to start when they are tackled in the right way, and the owner will soon learn how to operate the controls so as to obtain a prompt start. If his diffioulties persist, he should ask the dealer or an expert local rider to give him a demonstration, both with the engine cold and with the engine warm.

The first cssential is that the engine should be free: it is quite impossible to start a stiff enginc easily. For this reason the proper amount of the correct oil should be used, since cold oil, used to excess, gums up a piston rather tightly. If the engine is cold the carburetter should be tickled rather liberally, but this should be omitted when the engine is warm. For the rest the spark should be advanced about two-thirds; note the cxact setting whenever a specially easy start is obtained. The throttle should be opened very little. Here, again, it pays to note the exact position when success results.
If there is an air lever, it should be shut


Motor Cycle. Fig. S. Diagram illastrating operation of the valves of a singlo-cylinder four-stroke engine. Fg. 8. Diagram illastrating typical emple aplash labrication aystom
Courtesy of The Motor Cycle
A petrol engine muat work subjec o three conditions, namely: (1) If it is in perfecl order mechanically. (2) If a proper spark is occurring a! the points of the sparting plug. (3) If the carburetter is delivering the correct charge of gas. In other words, the cause of a stoppage is concerned with the ignition, with the gas charge, or with the engine. If the beginner can clear up this initial problem, he can at once dismiss from his mind two-thirds of the polenticl troubles and concentrate on tracking down his actual trouble in a very restricted field.
The trained rider looks th: machine over swiftly when a stop occurs. He makes sure, perhaps, that petrol is reaching the carburetter by pressing the tickler. He eyes the engine to see if he can spot any broken part, and touches his kick-starter to see if the valve tappets are working normally. (The operation of the valves of a single cylinder side-valve, four-stroke motor cycle engine is diagrammatically shown in Fig. ©). If all is well so far, he forms a preliminary expectation that the trouble is ignition, and unscrews his sparking plug. Very probably the point? are fouled with carbon or bridged with soot or oil; he cleans the plug and goes on his way in $\pi$ couple of minutes
Sometimes matters are not so simple as this. Perhaps the plug looks clean and healthy. In this case he may test the spark. This is done by jamming it (with cable still attached) in some nook on the cylinder head. so that only the thick end of the plug touches the machinc. He then raises the valve-lifter and kicks the starter. A splendid spark jumps the plug points, so that his trouble is not connected with the ignition Perhape 90 per cent of motor cycle stops arc due to dirty plugs, and if the novice carries a spare plug and inserts it under such circumstances, he will surmount most of his early stops. shade when the engine is As the spark is perfect the rider has eliminated warm. If there is a mix- a third of the field of possible trouble, and he ture lever, it should be next suspects his carburetter. 'This enubodies set. at "rich" with a cold engine, and at "weak" with a warm engine. The kick starter should be gently felt until it encounters the maximum resistance, from which it should be allowed to return to its topmost position. It may then be eased a fraction of an inch past this position by gently pressing it with the valve lifter raised. The engine should then respond to a strong downward thrust with the foot, the valve lifter being dropped as soon as the kick starter begins to move down.

Trouble on the Road. Nothing is more bewildering to the novice than a complete stoppage of his engine when he has not the fainterst conception of the cause. The handbooks referred to above will give him an encyclopedic analysis of the various possibilities, together with much assistance in effecting a diagnosis and in executing a repair. Such a handbook should be carried in the pocket. At the worst, he need not be seriously disturbed, as there is a splendid camaraderie of the road, and before long some more expert rider is likely to come to his assistance.

However, it may set the beginner's mind working in a scientific direction if the key to one or more very fine holes through which petrol is forced to vaporise it into gas. It is a simple matter for a speck of dirt to seal these spraying holes and in this way to stop the production of gas.
His next atep will be to take out the jet, as it is called, hold it up to the light and peep through it. A carburetter booklet in the toolbag will contain sketches indicating the jet and the manner of dismantling the carburetter. If the jet is stopped up, he blows through it or clears it with a fine wire, and all is well He must, however, be very careful not to alter the size of the jet by using the wira or a needle roughly. Only in the case of a mechanical breakage will further progress be impossible. This is an extremely rare happening, and is best solved by "flagging" a passing lorry and getting the driver to t.ransport the machine to the nearest garage. The principles and working of two. stroke and four-stroke engines are dealt with in the article on Internal Combustion Engine ; systems of Lubrication are explained under that entry, while there is much information of use to the motor cyclist in the article on Motoring.

## MOTORING AND MOTOR LAW

## Instructions for Driving, Licensing and Insuring the Car

As a preceding article has dealt with the choice and care of the car, thls one dealawith the duties and respansibilities of the owner and the driver. especially as affected by the important Road Traffic Act of 1930 . In the legal section the prospective motarist will find information about the necessary preliminaries such as regisiration, the procuring of car licence and driving licence, and insurance. See Number Plate
'The management of a motor car cin the roal gear. In top goar the engins shaft rotates is perhaps a nervous undertaking for the about five times to one of the road wheela, first 100 miles or so, but afterwards, when in the middle gear of a threespeed gear box the handling of the car has beceme more about nine to one, and in the bottom gear, or less automatic, there is a danger that about fourteen to onc. When a lower gear the driser inay become too confident, too is to be engaged, therefure, it is first necessary casual, or too daring. It is not possible to to inerease the engine speed with the gear teach onesclf to drive from books alone, and it is inalvisable to learn to drive on ones own car. The dealer who supplics the new car can usually provide a suitable tutor, and a car. There are also motoring schools where one miny learn the essential mechanics of a car and how to drive it.
The new motorist should get accustomed to the controls before he ventures out alone. He must feel at home in the car and shonld have reached that stage when the various scquences of operation are more or less automatic. This is not so difficult as nuight appcar, although when gear changing the novice may at first be somewhat awkward. To change gear without noise tequires a great deal of practice and is a matter of doing the right thing nt exactly the right time.

Changing Gear. The speced of the sliding gear wheels on the main or final driving shaft is controlled by the speed of the road wheels. The fixed geais on the lay shaft are alwnys driven by tho clutch shaft, their speed correaponding to that of the engine when the clutch is engaged. Therefore, if a silent gear change is to be made, the speeds of the teeth of the two whecls to be engaged must bo as nearly as possible the same at the instant the change is made.

Chancing up from a low gear to a higher is easier than changing down. Wiith most cars all that is necessary is to de-clutch with the accelerator pedal raised so that the engine sped will decreasc. After a secund or two the higl:er gear may be quietly engaged and the clutch may then be reengaged and the engine acceleratel.
Brictly, this procedure is as follows:

1. Accelemte the car up to alrout 8 miles per hour in first gear.
2. Let the accelerator perdal come right up. 3. I'ress the clutch pedal right down.
3. Move the gear levet out of the lirst gear nutel.
4. Wnit for engine speed to decrease a little.
5. Move gear lever into the second gear noteh.
6. Let the clutch pedal in smoothly but quickly.
7. l'ress down the accelerator pedal.
The same procerlure is fullowed when changing up into higher gears.

The main point to re member when changing dlown to a lower gear is that the engine speed is higher in relation to the apect of the car when one of the lower ration is used than when in top

To change down, by the method known as double clutching, the accelerator perlal should be eased slightly, the clutch pedal pressed down and the gear lever moved into nentral. The couine will accelerate when free


Motoring. Fig. 1. Goas soleoting lever lor Wilson gear boz. Vig. 2 (Top). Diagrammatic skotch showing arrangement of gear wheel

This procedure may be yummarised as follows :

1. Ease the accelcrator perdal slightly.
‥ Depress the clutch perlal.
2. Slip the gear lever into neutral.
3. Engage the clutch again to speed up the clutch shaft and countershaft gear wheels.
4. Depress the clutch pedal
5. Slip the gear lever into the lower gear position.
6. Let the clutch pedal up again, quickly but smonthly.

It is possible after some practice to make these changea so rapidly that they may be described as two quick dabs on the cluteh pedal made in time with the two movements of the gear lever. Whether

1. Improved Giears, Lia. 2. 'The Autocar ${ }^{\circ}$
and the clutch should be quickly re-engnged. This raises the speed of the gears on the counter-shnft. The clutch pedal should again be depressed, and the gear lever moved into the desired position when the clutch is once niore engaged, and the engine accelerated. If this operntion is well practised, slowly at first, and gradually speeding un, the driver of the car will be enabled to carry out this apparently complicated operntion in about a second of time at any speed.
tho accelerator pedal is kept hard down or is cased slightly depends upon the characteristics of the car. The former is better if it can be managed.

Gcar changing difficulties are, however. entirely eliminated in the Wilson pre-selective gear box, in which a small lever, carried on the stcering column, as shown in Fig. I, is set by the fingers before making the change. The gear is not changed until the clutch pedal is depressed and ro-engaged.

The gear itself is shown diagrammatically in Fig. 2 with the several epicyclic groups spread out, but actually all four groups are close together. Each group consists of a central sun whecl, an outer toothed ring or annulus, and several planct pinions meshing with both the sun wheel and annulus, the different sets being interconnected as shown. To engage the several lower gears, brakes (not shown in the drawing) are applied to one


Motoring. Fig. 3. Skidding. A. How to steer ont of a skid. B. How stoering the cas in the wrong direction will increase skid
or more of the outer members as required. The direct speed is obtained by engaging the top gear clutch.
The reader is reminderl that the brakes, clutch, and nccelerator pedals should not be preased or released violently. A progressive nction is desirable, cepecially in the case of the accelerator. Further, excessive usc of the brakes is not recommended; in fact a gond driver rarely usos his brakes, but relies generally upon his engine and supplements its ictarding effect by the brakes when descending steep gradients or stopping. An exception to this occurs, however, when the roads are slippery, ns mentioned in the section below.

Skidding. Side slipping or skidding with rare exceptions always affects the back wheels, and is due to excessive retardation by the brakes acting on the wheels themsclves or on the propeller shaft, or hy the engine acting as $n$ brake. The last mentioned is often overlooked, but it is sufficient to start a skid on mads which are only half wet, as when rain has just started or when the surface is drying. It is inadvisable at such times cither to apply the hand brake or to use the engine as a brake, since both act on the rear wheels only. Brakes applied to the front wheels alone cannot cause a skid, and skidding is very improbable with cars hnving four wheel brakes properly adjusted. Fig. 3 shows, A, how th steer out of a skid. and B, how to steer the car in the wrong direction will increase skid.

The New Car. The following hints will be found of valuc to the owner of a new car. When taking delivery ask the agent to explain thoroughly the controls and gencral details of the car, and to go over the important subjects dealt with in the instruction book. The first 500 or 1,000 miles are the most important in the life of n new car, and a limit of 30 miles nn hour on top gear during this period will save a considerable amount of expense in the future, while in addition it will improve the ultimate performance of the notor car when it has leen "run in." I.ower limits should be observed on the lower gears in order to avoid exce.sive cngine sperd.

An enginc should always he given thic opportunity of warming up from cold for a few minutes hefore starting off on the road, to enable the nil to thin down and pass thmugh the bearings and on to the cylindor hores When the oil-pressure gange drops back to the normal running point the engine will be warn enough. After the first 500 miles change the oi! in the engine sump. The old oil has been subjected to heavy work with tight engine hearings, and will have lost its viscosity and contain impurities. Check thic tire pressures at regular intervals. A tire gauge is cessentia! for this purpose.
The new owner should learn how best to start the engine without using the starting motor several tirnes on each occasion. There is a certain position for the thmttle. ignition, and strangler controls which will give thic quickest start, either by hand or when using the starting motor. Learn to underatand the ammeter on the instrument hoard, and the readings shown when some or all of the lights are used, and when the dynamo awitch is in the "off," "charge." or "summer charge" and "winter charge" positions. Remember that coil ignition takes a fair nmount of current from the nccumulator and that. if the ignition is left in the "on" position for some time when the engine is not running, there will be a considerable drain on the accmulator. The accumulator sinould he inspected every fortnight or less nccording to mileage, and the level of the acid mantained about $f$ in. above the tops of the plates by adding distilled water.
Washing the Car. Some sort of routine in washing $n$ car is exsentia! if time is to be saved. (Sec Figs. 4-9.) A good strong sponge should be used for the oxterior, including wings, but not for the wheela, humpers, and so forth. The chamois leather which is used for drying off the exterior of the car can he used for cleaning the interior, and this leather should be kept near the driver's seat for occrasional cleaning of the windscreen or windows on a long journey. A spot of grense will ruin $n$ chanois leather; and it is well to beware of the grease that exules from lubrication nipples and spring leaves under the car The lnw requires a firc extinguisher or supply of sand to be kept in the garage when petrol is storal there Any in tho tank counts ns stored petrol.
Motoring Holidays. The cost of motoring holidays varies enormously. On the one hand they can be very expensive, and, on the other hand, the cost can he actually leas than that incurred when stnying at home. Onc expenae that is often overlooked is that of buying meals away from home, an item which alone can easily excced the entire cost of keeping the car in commission. It is worth rememhering that pienic incals cost little, if any, more than those partaken at home. A tomr in which the party puts up at a different hotel every night is the most expensivo way of holiday-making with a motor car. To tour from a centre is cheaper. In this ease the party stays for some time at an hotel, hoarding-house or rooms and explores the neighbourhood in the car. The other oxticme is to carry tents for camping. Tents and equipment may be hired at very reasonable charges. It is possible to sleep in some cars. (See Figs. 10, 11 \& 12.)
Another form of !noliday is a camping tour


Motorin


Motoring. Washing and cleaning the car. Fig. 4. Articles needfal for thorough washing. Fig. 5. First clean areasy parts with parafin. Fig. 6. Use $\quad$ entle flow of water and sponge for coachworle ; and Fig. 7. Powerful stream of water and stiff brush for undersides of wings. Fig. 8. A long handled mon is helpful for quick wash-down. Fig. 9. Finish off with coachwork nolish Heproducell bll courles!! af tive L/ulil Car d-Cuelcear
with a caravan towed by the car. Caravans along different roads, the policeman faces may be hired at very reasonalile rates, and the vehicle to be stoplied
any car over 9 horse-power will be found sufficiently powerful for this purposc. An actual holiday for two persons with a car and an $8 . f t$. trailer caravan worked out at under $£ 19$ for three wecks, or about $£ 33$ s. per head per weck.
Traffle Signals. The Highorny Code issued by the Ninistry of 'Transport includes a system of standard signals to be used by the polica or other official traffic controllers, and also signals which the driver of $n$ car should employ to give notice of his intentions. The police signals are as follow
(I) A vehicle approaching the policeman is halted hy ex. ending than is halted hy ex. vehicles from his right, he looks towards the tending the right arm and driver and beckons him on with the right arm hand at full length upwards but without turning his boly. with tho palm of the hand (i) When bringing on vehicles from his lefit towards the vehicle. Wherc he looks in that direction, and gives o similar two vehicles are approaching signal to that in (5), but with the left arm.

The recognized signals to be given by the driver are as follow :
(7) A warning that a driver is going to slow down or stop or turn to the left is given by extending the right arm and hand horizontally towards the offside of the car with the palm downwards and moving the hand slowly up and down.
(8) When about to turn to the right, the right arm and hand are extended horizontally straight out from the offside of the vehiclo with the palm towards the iront.


quoted. Most makers give guaranters with their cars and several include free service for some time after delivery. This guarantee and service only apply to parts of the car which the makers have themselves manufactured: it will not apply, for example, to the lighting system and tires.

In the casc of second hand enrs there is no maker's guarantec, but some dealers themselves guarantee the car for some months. In most cases, however, the purchaser must take the car as he finds it, and so, unlces he knows


From the Highuay Code, by permission of Controller of H.M. Stationery Oflice
(9) An invitation to a following vehicle to overtake on the right is given by extending the right arm and hand downwards and moving them backwards and forwards so as to beckon the vebicle forward
(10) The desire to go straight abead is indicated to the traffic controller by moving the band and forearm well forward and back ward in a vertical plane.
(11) When desiring to turn to the left the hand and arm are pointed in that direction across the body in a definite manner so that the signal may be radily seen.
(12) When wishing to turn to the right the arm should be extended horizontally with the palm towards the front, this sigmal being identical with number (8) above.

Legal Considerations: Buying a Car. A motorist who proposes to sell his present car and buy another one will, as a rule, receivo a larger price for his old car if he arranges to get a new car of the samemake and "trades-in" his old car in part exchange. It is always advisable to do business with a dealer who holds an agency for the car to he bought. The terms of the sale of the old car should be put into writing (a letter signed by the purchaser will be sufficient), otherwisc the purchaser can legally refuse to take the car. The agreement does not require any stamp. If any accessories fitted on to the car are not to be sold this should be made clear at the time of sale and committed to writing also.

The prices quoted for new cars are usually ex-works, that is, the purchaser will he required to pay the cost of delivery from the manufacturer's works in addition to the price
something of its history, he will usually be well advised to spend a few pounds on having the car overhauled by oome expert and a report obtsined before purchasing. The motoring associations make examinations of this kind for a small fee.
A prospective purchaser should remember that the mere fact that the seller holds a registration book for the car in which his name appears as that of the registered owner does not necessarily mean that he has any right to sell the car. Cars held on the hire purchase system are registered in the name of the hirer and not in the name of the hire purchase company to which the car really belongs. If the hirer sells the car he does so in breach of his contract with the hire purchase company and they will be entitled to retake the car from any purchaser, who will thus lose the car without compensation, although he can recover the money he paid for it from the seller if he can find him

Reglstration and Licence. Before the purchaser can drive the car he must see that it is repistered and licensed and provide himself with an insurance certificato and driving licence. An insurance certificatc or cover ante must be produced before a road licence can he obtained. If the car is a new one, the dealer will usually arrange for its licensing and regiatration, and hand to the purchaser the registration book. If the dealer does not do this, the purchaser must himself obtain the registration book and licence from his local council. In the case of second-hand oara, the purchaser must get the registration bnok from the seller, insert his own name and auldress in
the book and send it at once to his local council Any licence in force for the car at the time it is bought will continue in force until the date on which it expires
A licence may ba taken out either for the whole or the remainder of any current year, ending December 31st, or for the whole or the remainder of any of the four quarters of the year ending March 31st, June 30th, September 30th or December 31st. If a licence is required, say, in Nay until the end of August, two licences will liave to he taken out, one for the remainder of the quarter ending of that quarter, nnother licence for the quarter ending September 30th. If the car is not to be used in September, a rebnte will be made if the licence is surrendered before the end of August.

Cost of the Licence. The annual duty on a car used for private purposes is $£ 1$ for every unit of horse power, with a minimum of $£ 6$ Where the engine of a car was manufactured before January 1st, 1913, the full licence must be paid in the first instance, but a quarterof the amount paid can then be reclaimed. Goods vehicles are taxed according to unladen weight the minimum (for vehicles under 12 $c w t$.$) being £ 10$ a year. The duty on motor cycles is 168 . for velicles not over 150 c.c. capacity. 30s. for vehiclea over that capacity but not excceding $224 \mathrm{1b}$. in weight, and $£ 3$ for vehicles over that weight. 'The duty on a sidecar is an additional $£ 1$.
The licence may be renewed at any time within the fortnight preceding the date on which it expires. The nuthorities usually allow also $n$ fortnight after the expiry of a licence for its renewal, but motorists should be careful not to use a vehicle during the periorl after the licence has elapsed unless they intend to renew the licence, as the police frequently take the registration numbers of vehicles seen on the mad during that period and institute proceedings if the licence is nnt ultimately renewed. The maximum penalty for using a vehicle not properly licensed is a fine of $£ 20$ or three times the licence duty, whichever is the greater.
If any alteration is made to the car-e.g. by painting it nnother colour, or using a vehiole licensed for private use as a commercial vehicle, or if the owner changes his address, the book and licence must be sent to the local council with particulara of the alterations. It should be noted that the owner must not himself alter the book, but must leave that entirely to the officials.


The Insurance Certificate. The insurance certificate will be obtained from the company with whom the vehicle is insured. Every motorist is now compelled to insure against injuries to third parties, excluding passengers travelling in the car, otherwise than for hire, or servants of the owner.

The first step in taking out an insurance colicy is the filling up of the proposal form. This form contains a number of questions which the motorist must answer relating to (1) the occupation of the motorist: (2) the nature of the risk to be covered and particulars of the vehicle; (3) the previous driving record of the motorist, including details of any accidents in which he has been involved. It is most important that all these questions should be correctly answered, for an inaccurate answer, even if made innocently and even if quite immaterial to the risk, may enable the insurance company to escape liability under the policy. In addition to answering carefully all questions that he is asked, the motorist must also disclose any fact known to him which would be likely to affect the mind of the insurance company in deciding whether or not they should accept the risk.

When the insurance company receive the pmposal form they may not issue a policy at once. There may be some inquiries to be made in consequence of the answers in the proposal form, and until these inquiries have been completed no policy is issued, but a cover note is sent to the motorist. Once this has been issued, the motorist is as fully insured as though he had the policy, but the cover note is only valid for a short timeusually 14 days.

If the policy has not been issued before the expiry of the 14 days the motorist nust apply to the insurance company to have the cover note extended. When the company have made all inquiries as the answers in the proposal form they will either issue a policy or else refuse to accept the risk and return the premium paid, less a proportionate suin for the period during which the motorist has been covered by the cover note.

## Penalties for Non-Insurance

It is nuw a very serious offence to use or to allow anyone else to use a vehicle which is not covered by insurance. The insurance must be against injury to third parties; a motorist is not required to insure against injury to himself or to his non-paying passengers, or against damage to the property of third parties, although every motorist should include these risks in his policy. The penalty for using a vehicle not properly covered is a fine not exceeding $\mathbf{5 5 0}$ or three months' imprisonment, or both. Disqualification from holding a driving licence for at least 12 inonths will follow automatically, unless there are special reasons why the disqualification should not be imposed.

The insurance certificate or cover note must be produced on demand to any police constable while the vehicle is on the road, and also after an accident (see below). If the driver is unable to produce the certificate at the time, he may avoid a prosecution by taking the certificate in person within five days to some police station which is selected by him at the time he is asked to produce it.

The Driving Licence. A driving licence may be obtained at any time from the local council. A form must be filled up stating (1) whether the applicant suffers from epilepsy or sudden attacks of giddiness or fainting; (2) whether he can read at a distance of 25 yards in good daylight (with glasses if worn) a motor car number plate; (3) whether he has lost either hand or foot or is suffering from any defoct in uny limb: (4) whether be is suffering from any other disease or disability that
would make it dangerous for him to drive. If all these questions are answered satisfactorily the licence will be granted automatically.

If questions (1) and (2) are not ansuered satisfactorily the licence will be refused, if (1) and (2) arc answered satisfactorily but the applicant is suffering from some disability under question (3) he will be granted a licence if he passes a driving test (fee 108.). For the purposes of the test he will be granted a provisional licence (fee $\overline{\text { ös. }}$ ) valid for three months. The test involves the usual operations of driving, e.g. stopping and starting on gradients, reversing, turning, etc. No one under 16 can obtain a licence to drive a motor cycle, no one under 17 a motor car, and no one under 21 a heavy motor car (such as a charabanc or lorry) unless, in the case of applicants under 21 , the driver can show that he was driving a heavy car in the last six months of 1929 .

As soon as the licence is issued the driver must write his name in it and must carry the licence with him whenever he is driving a motor-vehicle. He must produce his licence to a police officer when asked, but, if unableto do so, he may escape a prosecution if within five days he produces the licence in person at a police atation selected by him at the time $\mathbf{w}$-hen his licence is demanded.

When a driver has been convicterl of any r.otoring offence, particulars of the conviction
tires of some soft or clastic material until January lst, 1940. All tires must be kept free from any defect likely to cause danger. No vehicle must be excessively noisy, either on account of lack of repair of the vehicle or the faulty packing or adjustment of its load. Both owner and driver will be liable to a fine if this icgulation is not observed. The driver must be at all times in a position from which he can have full control of the vehicle.

Every motor car must carry two white lights to the front and onc red lamp to the rear during the hours of darkness. In " summer time" this means from one hour after sunset until one hour before sunrise, and during the


Motoring. Fig. 11. Tent trailer ready for the road. Fig. 12. Rigid type
Fig. 11, courtess, of Car Trallers, Led. Fig. 12. Eceles Mator Caravans. Lid
rest of the year from half an hour after sunset until half an hour before sunrise. Bicycles without sidecars require only one front-lamp and a rear lamp. Lampa which swivel when the vehicle is in motion (other than dipping headlamps) are not permitted. Draft regulations have been issucd governing the use of dipping headlights and the size of bulbs permitted, and if and when they come into force they can be obtained from
may be orrlered to be endorsed on his driving licence, and these endorsements will be copied on to any new licence. It is a serious offence to apply for a new licence without disclosing the fact that the old one was endorsed. When three years have elapsed from the date of an endorsement, and if no further endorsements have been made meantime, the driver is entitled to a clean licence-i.e. one without any endorsements.
Disqualification from driving may be imposed on a conviction for many motoring offences, and in the case of some offences-o.g. driving while under the influence of drink or drugs-must be imposed unlers special mitigating circumstances are present. While disqualified, the driver is liable to imprisonment if he drives any motor vehicle. The disqualification may be for any period, varying from a few weeks to life. Where the disqualification is for a longer period than six months, the driver may apply to the court after six months to have the disqualification removed, and if this application is refused, he may repeat it at intervals of not less than three months.

Brakes and Lights. Every motor vehicle must have two independent brakes in good working order. Every motor car the unladen weight of which exceeds one ton and which is first registered after January Ist, 1933, must have pneumatic tires, but vehicles registered before that date mav be fitted instead with
the local council. In many towns local regulations permit vehicles to remain in parking places without lights. Information as to local regulations is contained in the Motorist's Pocket-book, which may be obtained from the local registration authority.

As from January 1, 1932, every motor vehicle other than a motor cycle must carry a reflecting mirror. Vehicles first registered after January lst, 1932, must also be fitted with safety glass windscreens, and after January Ist. 1937, all vehicles must be so fitted whenever registered. Every driver will reccive with his driving licence a copy of the Highway Code.

Speeds and Driving Offences. The speed limit. is now abolished for private cars, but local speed limits of 10 or 20 miles on hour still exist in eome towns. Dangerous driving is a serious offence, and a new offence of careless driving, or driving without due care and attention, or without reasonable consideration for other persons using the road, has been created by the Road Traffic Act, 1930. Anyone who drives a motor vehicle while under the influence of drink or drugs is liable to a fine not exceeding $£ 50$ or imprisonment for not more than three months, and to more severe penal. ties for later convictions. Pillion riding otherwise than astride on a properly secured seat is illegal. Drivers must strictly obey all police signals, and stop when requested to do so by a police officer, under penalty of a fine of $£ 5$.

It is an offenco to leave a vehicle standing in a dangerous position, whether in the town or country, and also an offence to obstruct traffic. No motor vehicle must be driven on to any land that is not part of a road, or on to any common land. A vehicle may, however, be parked on any land (not common land or private property) within 15 yards of a road.

Motorists entering strange towns should proceed carefully until they have familiarised themselves with any local by-laws relating to the passing of tramcars and automatic signals, ctc. The useful Motorists' Pockt Book, already referred to, contains a list of these local regulations, and may be obtained from most local councils. In many towns in Scotland it is an offence to pass a tramcar on the near side while passengers are boarding or alighting. Although such regulations are not found in England, the same cffect may be producerl by a prosecution for dangerous or carelces driving.

Accidents. When a vehicle is concerned in any accident causing injury or damage to any person, vchicle or animal (including sheep or dogs but not poultry) the driver must stop and, if required, must give his name and address and produce his insurance certificate. If for any reason he does not do this, he must report the accident and produce his certificate at a police station, or to a police officer, as soon as possible, and in any event within 24 hours of the accident.

A driver concerned in an accident should be carcful not to make any admissions as to his liability, for if he does so his insurance company may repudiate liatility. He shou!d get the namo and address of the person injured, or the driver of the other velucle, and also the names and ardrcsses of any witnesses. He should also find out if he can whether the witnesses think he is to blame for the accident.

The points of importance to be considered are (1) the side of the road on which he was driving at the time of the accident; (2) the speed at which he was travelling ; (3) the exact width of the road and the state of its surface, etc. ; (4) the place on the road at which the collision took place, measured exactly from the kerb or other mark; (5) the position ineasured in the same way of the vehicles after the accident ; (6) the movements of the other party immediately before the accident, including such matters as apped, signals, ctc. No attempt should be made to dcal with any rlaim. The accident should be notified to thic insurance company and the whole matter left in their hands.

A motorist is liable for all damage to property or iniury to persons caused by his negligent driving. It is impossible to say generally what constitutes negligent diving. It may not bo negligent to drive at 60 miles per hour on a clear straight road, whereas it may be grossly negligent to drive at 10 miles per hour in a crowded strect on a wet night. Each case must be decided on its own facts. It may be said that anyone who departs from the ordin. ary rules of good driving will probally be held liable for any accident that may result.

Where both persons concerned have been negligent, neither will be able to recover damages against the other. This will not affect persons who are passengers in a vehicle which has been negligently diven. Thus, if Jones and Smith both drive negligently and collide, neither can recover against the other, but any passenger in either vehicle can recover against either Joncs or Smith or toth. Persons who give lifts to strangers in the country would do well to bear this in mind. Insurance against injurics to passengers (not carried for gain) is not compulsory and diivers who wish to be covered againt this tisk should see that it is included in their policy.

When anyone is killed as the result of an accident the driver of any vehicle concerned
will be required to give evidence at the inquest safes or pantrics at about freezing temperaand the coroner's jury may bring in a verdict of tures With care mould growths can be manslaughter againet the driver. In such a case the driver will later be tried for this scrious crime, but before he can be convicted it must be proved that he has been guilty of gross negligence, something more than the negligence necessary to make him liable in a civil action for damages and amounting to a reckless disregard for human life.

MOTTLED SOAP. The name is given to a variety of soap containing coloured markings similar to the veins in marble. The mottled soap was formerly made from kitchen refuse, and the inarbling was produced naturally from impurities in the fats or alkalis employed in the boiling.
The red mottled soap known as Castile soap owes its colour to the addition of green copperas, and being made with olive oil or similar oil produces a pure soap. See Soap.

MOULD : On Meat. Meat which is kept too long is acted upon by certain bacteria which cause it to become unfit for food. With the increased use of small household cold storage safes, various kinds of moulds will be seen upon meat, especially raw meat awaiting cooking. While harmful bacteria develop very slowly under cold storage conditions, moulds of fungous origin are frequently seen on the surface of the meat. Unlike bacteria, these moulds do not give rise to substances which are poisonous to human beings, and therefore do not render the meat unfit for food. In most cases the moulds are superficial and can be wiped off with a cloth. Black spot mould is the worst kind and penetrates most, but even this can be cut away with a very thin layer of meat, and the joint cooked with safety.
A common mould is the white one, the product of a moist atmosphero in the cold safe. In appearance it is very similar to that often scen upon checse.

The most favourable condition for the growths of moulds is a humid atmosphere in
avoided; they are unsightly even if harmless.

MOULD : The Disease. The term moulid is applied to a fungoid disease nttacking plants in garden and greenhouse. For practical purposes it is synonymous with nildew (q.v.).

MOULD: In Gardening. Mould or loam in gardening is the top spit of earth which has been acted upon by atmospheric influences; it. forms the base of potting composts. Commonly the term is used to express soil suitable for potting purposes, such as that obtained from old turves stacked and limed until they are well matured. See Compnst: Potting; Soil.

MOULD : In Cookery. This is a shape made of tin, aluminium, china, glass, pew'ter, or enamel, into which jellies, blanemanges, cake and pudding mixtures, etc., are poured. These moulds vary greatly in size and design.

Where kitchen equipment is limited and only two moulds are provided, it is a good plan to choose one rather plain oval shape and one border mould. Both sweet and savoury jellies can be moulded in the former and the latter can be used for fish or poultiv or meat mousse or galantine dishes, the centre, when turned out, being filled with a salad covered with mayonnaise sauce. The border mould is also useful for shaping lioine-made sponge cakes.

Ordinary pudding basins can be used as moulds should there be a shortage of the latter. When greasing fancy moulds it is nccessary to go into every part of the design. Pure olive oil is more satisfactory to use than butter for this purpose. See Butter; Cheese; Ice; Jelly.

MOULDING. A moulding is a strip of wood or other material worked to an ornamental pattern on one or more of its faces. In architecture, mouldings may be worked in stonc or brickwork, or other material of which the building is made, to relieve the surface


Moulding. Figa. 1-34. Stock patterns which the home worker can procure from a timber merchant.
The principal types are described in the text
praun from material supplied bu llandicrafls
and act as an adormment. They are generally found in the form of curved section strings at the bases and jambs, and arc used round openings for doors and windows. The householder is mostly concerned with mouldings for the embellishment of the interior of the housc. Patterns are obtainable from timber inerchants. Figs 1-34 illustrate a number of useful mouldings which the amateur can procure from Handicrafts, Ltd., or their agents.

In the first row are beads, astragals and pancl mouldings; Nos. 10, 11, 12 are rehated panel mouldings: 16, 17, 18 are for lid or plinth; 19 is a grooved drawer bottom moulding. In the fourth row are grooved corner moulding, edge moulding (23), glue blocking (24,25), and a door closing moulding (28). Bottoun row shows tray moulding (29, 30), solid cornice (31), door frame moulding (32), and cornice (33). Nos. 13, 14, 20, 26, 27, 31 and 34 are in oak, 16, 17, 18 in hazel walnut, and the rest in suitable hardwood.
Cabinet mouldings are made in a variety of patterns and in many different sizes for the decoration of furniture. Picture anouldings are in a class by themselves, and arc dealt with in the article on picture framing. See Capping; Ceiling: Chest: Corner Dresser; Cupboard I)oll's House; Door: Grandfather Clock; Picture Framing; Wardioke, etc.
MOULTING : Of Birds. Moulting is the process by which every vear birds renew their phomage, shedding their old feathers and growing new ones. As far as the ordinary householder is concerned its interest is confireed to the fowls, ducks, pigeons, parrots, or other kinds he happens to keep.

Although not a disease, moulting is a certain strain on the constitution of the bird, and care should therefore be taken that it is in good condition when the season for it begins. l'recautions should be taken against damp, liut ar a rule very little change of diet is dexirable, although this does good with some binds of birds-pigenns, for instance.
Fowls. In the case of the domestic fowl the process of putting on neiv plumnge starts in July and goes on until September, some birds moulting early and ot hers late. Poultry keepers should endeavour to get their fowls to moult early, so that the birds may recover and get their new plumage before the cold wenther sets in, and much can be done by judicious management. As a rule young hens moult far more casily than old ones, the average time occupied by the former heing from if to 8 weeks. An old hen will sometimes take 3, 4 , and even 5 months. Generally speaking, the average time is about $\mathbf{3}$ months.

The easiest way to accelerate the moult is to curtail the fool supply of the birds, feeding yparingly for a bout two weeks and then giving them plenty of fond of a nitrogenous character. Extra feeding should not begin until the fowla are actually in moult, that is to say, when the new feathers are growing. Feathering will be greatly assisted by giving each fowl a pinch of smphur in its soft food every day. A little suntlower seed or hemp seed with the evening grain food is helpful.
Warm weather is more conducive to a rapid moult than when it is cold and wet, and care should he taken throughout to kecp the birds warm. While the inoulting season is on, the run will be littered with feathers, and these should te cleared away daily.
Pigeons and Canaries. With pigeons moulting usually begins in April, and attention should be paid to the diet and general conditions. In particular the bird should be kept warm and protected from draughts, as a chill may have the effect of stopping the moult and will affect the health of the bird. It is well during moulting to feed a pigenn on hread soaked in water to which a little salt has been added.

Canaries require special care when they are moulting. They should be kept in an even temperature, and for this reason the cage should be hung in a fairly warm room during winter, and well covered up at night. The bath need not be altered in any way, but it is of ten beneficial to add to the water some imon in the form of citrate. See Canary ; Parrot : Pigeon; Poultry.

MOUNTAIN ASH. A summer-leafing tree, with ornamental foliage, flowers and berries, the mountain ash (Pyrus aucuparia) is particularly suited for culture in suburban gardens, as it will flourish in a smoky atmosphere. Its usual leight in and about London is from 15 ft . to 20 ft It may be increased by secd. The white flowers are borne in May and Junc, and are followed in the autumn by deep orange or scarlet berries.
MOUNTAIN AVENS. A family of hardy evergreen trailing rock garden julants, of which the species Dryas octopetala, a native plant of great beauty, is found on the mountains of various parts of the United Kingdom. The flowers have eight petals, arc about 1 in . in diameter, and arc white, with conspicuous yellow stems. Dryas Drummondii has yellow Howers; both bloom in summer.

Propagation is by division in spring, or by seeds sown in the spring when available They flourish in a moist, peaty soil, and should be planted in autumn or spring.

MOUNTAIN BLADDER FERN. The common name of Cystopteris, a genus of bcautiful hardy ferns which flourish in a compost of loani, leaf-inould, sand and mortar rubble in a shady part of the rock garden Fragilis and montana are two favourite sorts of the fern.

MOUNTAIN BUCKLER FERN. This is a species of Nephrodiunn, a genus of easily cultivated and strong.groving ferns which embraces the cominon male fern. It is useful for odd shady corners or exposed portiuns of a fernery where choicer kinds would fail. Ordinary soil with which leaf-mould has been mixed is suitable. See Fern; Garden.

MOUNTAIN CLEMATIS. This is a beautiful climbing plant (Clematis montana) bearing white Howers in May; it is ideal for trellises and pergolas, as well as for covering porches and the fronts of houses. Clematis montana rubens has rose-red flowers. See Clematis.


Mounteln Buckler Fern. An easily caltivated fern which grows to a height between one and two delicate variety would fril. See above

MOUNTAIN SPINACH The mountain spinach, or Atriplex hortensis, is raised from seed like the ordinary spinach. The leaves are cut, cooked, and eaten as spinach. I redleaved variety is sometimes grown in the flower garden for the sake of its colour in summer. See Garden; Spinach.

## MOUNTING: Of Pictures. Photo.

 graphs and pictures are usually improved by careful mounting, the mount consisting of a sheet or frame of paper or cardhoard, of white or that colour which most heightens the effect of the picture. It may vary in size from onc very little larger than the picture to one several times its size. Occasionally, when used simply for stiffening, it is of the same size.Phelographs, prints, etclings, pencil and black-and-white drawings, etc., and also small lightly-tinted water-colours look well when fixed before a solid mount. Mounts of larger and heavier pictures should be in the form of


Molldain Avens. Delicate Bowers of an evergreen trallir plant resembling those of the anemone
frames of cardhoard with be velled edges. Such mounts are not infrequently a part of the frame, in which case they may slope slightly back from frame to picture. By means of a mount an oval, round, or ohlong picture can he inserted in a square frainc. Oil pictures rarely equire mounts.
The size, shape, and colour of the mount depend entirely upon the picture, and can only be decided by individual judgement. The picture need not necessarily be placed in the centre of the mount; it may be nearer the top than the button, though not vice verse. It is well to note, also, that a bold or darkly. coloured picture will be enhanced hy a dark or dull-coloured mount, while a picture in pencil or delicatcly tinted will be killed by a dark onc. The mount sloould never be bright in colour.
Cutting the Mounts. Mount-cultiag is simple work, and iequires but a few tools. Although a penknife may be used, the best results are obtained with a mount-cutter's knife, as ilhustıated in Fig. 1 on page $8 \mathbf{2} 4$. In addition a steel straight cdge with one edge bevelled, a $\because \mathrm{ft}$. rule, a pair of compasses with a pencil point, and a tec square, are necessary. First cut the mount to fit the frame, and then inark the amount of opening required. There are two methods of doing this; either rule the lines very faintly on the mount or place the picture in position on top of the monnt, and then prick the corners carefully with a pin.

To cut out a square or rectangular mount as shown somewhat exaggerated in lrig. $\stackrel{2}{2}$, place the straight cdge a little way from the
line or points, grasp the handle of the knife only be used, rubbing it well into the back of firmly in the right hand, and with the left the print. Other mountants are made of paste pressing on the straight edge make a complete slanting cut along the line as in Fig 3. Repeat this on the three sides, and if necessary ease the corners so that they come away clean. The picture is fastened to the back with a little fish glue smeared on the extreme edge, or it may be secured by pasting narrow strips on the back of the picture and mount.

It is essential to the appearance of a cut-out mount that the mitre cut at the corners should be clean. Thelong cuta should be made in one stroke, and this is not difficult with thin mounts, but in cutting thick cardboard the knife must be very sharp, and it must go through the materials, as two attempts will spoil


Mountidg. Fig. 1. Knife for cutting a mounk. Fig. 2. Mount cut, showing bevellod odge of oponing. Fig. 3.
Diagram showing angle at which knite is beld the effect. The cut ting of round and elliptical openings must be done freehand. It is not possible to have a stock of shapes to suit all openings, but with practice in straight cutting without a straight edge it will not be found difficult to round corners and follow curves. Mounting boards, which are obtained from dealers in artist's matcrials, are supplied in thicknesses known as $4,6,8,10$, and 12 sheat, and in sizes from quarter royal, $11 \frac{1}{\frac{1}{2}} \mathrm{in}$. by $9 \frac{\mathrm{f}}{\mathrm{in}} \mathrm{in}$, to antiquarian, 53 in. by 35 in.

Gilt mounts are often used for water colours, and although the cut edges will be white, they can be gilded by using gold lcaf. Brush the back of the leaf with gold size, both being obtainable from an artist's colourman, and when dry cut into strips a little wider than the bevelled cut. Moisten the size with a camel-hair brush dipped in water, and place the strips on the bevel with the top edge true with the surface. Press gently with a soft rag, and when all the edges are covered turn the mount over and press the projecting edges of the leaf on the back and give a final rub with the rag. See Passe Partout ; Picture Framing.

## MOUNTING: Of Photographs. When

 an adhesive is to be applied to the whole of the back of a print, for mounting it on a card or heavy paper, it should contain a minimum of moisture, and be used very sparingly to a void cockling of print or mount. The best adhesive for this purpose is that sold as photo mountant, of which dextrine is the principal component.A similar paste mountant can quite easily be made at home as follows: Mix $\frac{1}{\frac{1}{l} \mathrm{lb} \text {. of }}$ the best white dcxtrine (the best quality only should be used) with cold water to make a smooth creamy paste, taking small quantities of dextrine with a very little water and adding further dextrine and water as required. When the paste is thoroughly mixed, stir in 20 or 30 drops of oil of cloves or cinnamon and 5 oz of water.

Boil in a clean saucepan until clear. Set it aside in a straight-mouthed jar, such as the white jars used for holding marmalade, to cool, and keep it covered. These mountants are very economical in use, and a small quantity on the tip of the finger or brush need
within a comparatively short time.
If photographs or prints are not to be mounted close up, i.e. the mount is to show, the print should be arranged so that it is exactly central on the mount but with moro margin below it than above. If the margin is equal top and bottom as well as both sides it will give the appearance of being mounted too low. The best rule is to have the margins at top and sides equal, and the bottom margin half as deep again. The place to be occupied by the print on the mount should be measured out and marked at each corner with pencil dots. A little mounting paste is then rubbed into the surface of the mount and the whole of the back of the print is treated with mountant.
The print is placed immediately in position on the mount and pressure applied by rubbing all over with a clean rag or handkerchief. A roller squeegee may be used instead if clean paper is interposed between the photograph and the roller. As soon as it is seen that the print adheres all ovcr, it is put away under pressure.

For photographs or prints that are to be mounted in portfolios or albums, or framed up by passe-partout method, it is sufficient to mount them by the corners or edges with gum or seccotine.

The most effective and permanent method of mounting photographs and prints, and one in which there is no risk of damaging the print, is that described in the article Dry Mounting. In any mountant that is used, particularly in the case of photographs, it is essential that no acid should be present, since this will almost certainly cause stains and spots to appear on the face of the print after a little while. See Dry Mounting; Passe Partout; Paste ; Photography ; Picture Framing.
MOURNING. The conventions governing the wearing of mourning have been greatly relaxed, and the mourners themselves usually decide how long they will wear black, and to what extent it shali be unrelieved. Heary crape is now seldom worn, but no hard and fast rule can be laid down in these matters. Purple in all its shades, black and white mixtures, and greys are considered as half mourning.

For a very near relation, i.e. for a parent, it is usual to wear mourning for a year, and it is quite permissible to wear white collars, furs or scarves to relieve the black Mourning is worn at a funeral by persons attending as a mark of respect, cuen if they are not closely related.

Mourning for men is simpler than for women. It is usually considered sufficient if a man wears a black tic and a black band on his left arin. At a funeral the ordinary black morning coat with dark striped trousers is the correct wear. See Crape: Funeral.
Mouse. See Mice.
MOUSE-EAR CEICKWEED. This ram. pant perennial creeping plant is suitable for rockeries or edgings to borders. It should be planted in autumn or spring. The flowers are white and the leaves silvery green. Cerastium tomentosum and C. Biebersteinii arc the chief kinds. They spread very quickly and are easily propagated by detaching rooted pieces.
MOUSSE : How to Make. Literally mousse means something of a light, mossy texture. In cookery it is either a very delicate steamed pudding, a meat dish made with cream and gelatine, or a kind of ice pudding, packed into a mould or case and immersed in ice or placed in an ice cave without the contents having been frozen in a cylinder or freezer. The mousse is sometimes served in pyramidal form, but more often turned out of a plain mould whole, when made as an ice pudding; but it is the texture which is most important, and this should always be spongy.
To nake the steamed mousse, cream together 4 oz. butter with four tablespoonfuls pounded lump sugar, add the yolks of 8 eggs and vanilla or some delicate flavouring. Whisk over hot water until the custard thickens, then fold in the whites of the eggs, beaten to a stiff froth. Turn the whole into a plain souffle mould, prepared by being greased with olive oil and lightly floured, and steam it in the oven


Mouse-ear Chickweed. White flowers and silvery leaves of a plant suitable for edging. Bee above
for 35 min . To steam it, place the mould into a pan three-parts filled with boiling water. The mould and the pan must be covered. Serve the monsse with a custard sauce.

To make an iced mousse, beat up over hot water $\frac{1}{2}$ pint syrup with 0 yolks and 1 whole egg until the mixture is thick enough to coat a spoon ; it should resemble a sponge. Remove it from the heat and continue beating until it is cold. Add any flavouring desired, sugar, a wineglassful of liqueur, and $\frac{1}{\frac{1}{2}}$ pint whipped cream. Turn it into the mould, and plunge into ice and salt, making sure that no ice can penetrate it. As the mixture is very light, it requires careful handling when being turned out.

Chicken and ham mousse is a favourite buffet dish for parties The ingredients
required are 4 breakfastcups cold chicken and both in silver and Shefham, $\frac{1}{2}$ pint chicken stock, $\frac{s}{1} \mathrm{oz}$. gelatine, 1 gill cream, and seasoning. The meat is finely minced and pounded in a mortar or rubbed through a sieve Dispolve the gelatine in a little stock and add it with the reat of the stock to the meat. Season with pepper, salt and a squecze of lemon juice. Whip the cream stiffly and fold into the mixture Put in a mould to set. Garnish with chopped parsley and serve with aslad. A recipe for a chicken mousse which is suitnble for invalids is given in page 2:36 See Chicken; Ice; Mould.

MOUSSELINE. The usual French form of the English word muslin is appliod especially to mousselines de soie, or silk muslins, which are thin, light, and usually coloured silks. Mousscline de laine, or wool muslin, is also known as delaine.

MOUTBWASE. The following are useful mixtures for cleansing the mouth and preserving the teeth. A teaspoonful of the first is diluted in half tumbler of water :

Thymol .
Benzole acid
OIf of cucalyptus
Oil of pepperinin
Rectifed spirit
Carbolic acld
Bicarbonate of sodis
Glycerin
Rose water to make


15 minims
2 drams
1
8
oz.
oz
8 oz.
A third mouthwash is composed of compound solution of thymol IB.P.C. mixed with 3 or 4 parts of water. Sce Tecth.

MUCOUS MEMERANE. The membrane which lines the mouth, nose, respiratory passages, gullct, stnmach, intestine, eto., is called a mucous membrane, and it always secretes mucus, a viscid and tenacious fluid. Its structure varies greatly in different parts. A cold in the head is inflammation of the mucous inembrane of the nose chambers caused by microbes.

MUFEIN: Bow to Bake. A kind of light yeast dough is made up into flat cakes, called muffins, and baked on a muffin plate or griddle. Sift into a basin $1 \frac{1}{2} \mathrm{lb}$. fine flour, adding 1 teaspoonful salt. Cream 1 oz . dried ycast with $\frac{1}{2}$ oz. castor sugar until it liquefies, then mix in very smoothly l pint warm milk. Make a well in the centre of the flour, pour in the liquid, and work in sufficient flour to make a batter. Cover the basin with a clean thick cloth and stand it to rise in a warm place.

Rubl oz. butter in 2 oz flour till quite fine, then beat in by degrees $\&$ pint warm milk; stir this into the risen batter and beat all together well: $\frac{1}{\frac{1}{2}}$ hour is not too long. Now add sufficient flour to make a soft dough-very little may be required. Set it to rise again antil it is very light and spongy. Make it up into round flat caker, and bake them on a griddle greased lightly with mutton fat, turning each cake over as it begins to colour. A little extra flour may be needed when making the muffins in order to mould them.

Muffins should be toasted gradually or they are inclined to become heavy. Warm the muffin and nearly part it before beginning to toast it. Then toast each outer side, pull them apart, butter the inside of each half, set one on the top of the other, and keep very hot while dealing in like manner with the remainder. Muffins must not be cut with a knife, but should be pulled with the fingers. A proper bright bakestone is made for baking muffins, but a thick griddle makes a good substitute.

MUFEDNEER. This word is used for a pepper castor greatly valued by collectors. They were first made in England about 1700, the early ones being shaped in the form of a cylinder with a domed or curved top, and with a lid that can be taken off. A little later the more graceful, vase-shaped article was introduced into the country. Muffineers are found
ficld plate and in a great variety of shapes. Some are plain, but others are decorated, piercing being a form of ornamentation used on them. Some are part of a set that includes salt cellars and a mustard pot, and a few have glass liners inside. The perforations for the pepper are often artistically done.

Small muffineers arc sometimes filled with salt and placed on the afternoon tea ínblc. They thus serve the purpose' of season-
 Courteay of Chapple \& Mantell
ing muffins or crum
pets. See Pepper Pot; Sifter; Silver.
MUFFLE. In a particular type of furnace the heat from the fire is made to pass around an inner or oven-like member. This is termed a mufflc furnace, and a small one may be used by the home worker. The muffle furnace is employed in the enamelling of jewelry, and also in the heating of tools for hardening. See Enamelling: Furnace.

MUFFLSD GLASS. This term is used for a particular type of glass, the characteristics of which are similar to shect glass. It is blown into cylinders in a similar fashion, but is distinguished by a surface ripple, which is more marked on one side of the sheet than on the other, and varies considerably. It possesses considerable brilliance, and is sometimes used for leaded light work. Muffled glass takes its name from the fact that the cylinders in which it is made are gencrally known as muffs.

MUFFLER : How to Knit. This article, strictly speaking, is a square of silk or other material measuring about 30 or 40 in ., used for tying round the neck. The word is, however, chiefly used for a scarf worn as a protec. tion against the cold and may be woven or knitted of sill or wool.

A knitted muffler is very simple to make, and can be easily adapted to college or club colours, or striped with two other shades or colours. The amounts of wool used are given below, so that the corresponding quantities can be obtained in any colours desired.

For a muffler measuring 41 in . long by 9 in . wide the following quantities of 4 -ply Beehive Scotch fingering will be required: 4 oz . in the main colour, loz. for wide dark stripes, and $\frac{1}{2}$ oz. of a lighter shade for the narrow stripes. Use No. 9 bone knitting needles for a fairly close stitch at a tension of 7 stitches to the inch in width. The pattern is moss stitch, which is compact and very suitable. It consists of knit one stitch and purl one stitch alternately to the end of the row, then as an cven number of stitches is cast on, the second row will begin with purl 1, then knit 1 , and repest alternately to the end of the row. For this width cast on 70 stitches and pro-


Muffu. Plate of the favourite tea cares ready for tosating, splitting and buttering
ceed in the moss stitch, changing the colours as follows: Work 3 in . in the main colour, then $\frac{1}{2} \mathrm{in}$. in the light, 2 in . in dark, $\frac{1}{2} \mathrm{in}$. in light. Now work 30 in . in the main colour, and work off the following end in colours to correspond with the first end of the muffler. Always change the colours on the same side of the knitting, and when changing to the new colour cut off the old, leaving a few inches hanging, and knit it in with the new, doing one stitch with the first colour and the next stitch with the second colour alternately until the old end is knitted in. At the end cast off fairly loosely so that one end is not contracted any more than the cast-on cdge. See Knitting : Scarf.
MUG. The mug is an old form of drinking vessel, still used by children and in publichouses. It is really a small edition of the tankard. Mugs are
mostly made of the cheaper kinds of earthenwarefor children, with the exception of silver christening mugs. They are also made of silver and Sheffield plate. The silver mugs sought by collectors sometimes date back as far as the late 17th cen. tury. See Pewter;


Mug. Silver mag, barrelBhaped, with engraved lines, 1795 Silver; Tankard.
MULBERRY. The mulberry tree is valuable, for its appearance, its flowers and its fruit. The black mulberry, Morus nigra, may be grown anywhere in light, deep loan. It should be planted in autumn. In addition. the white mulberry and the red mulberry are well known. All these have heart-shaped leaves with toothed edges, and inconspicunus, greenish-white unisexual flowers, produced in spikes and wind-fertilized. The tree takes some time to establish itself and is slow growing
The method of propagation is by cuttings or even by pieces of the branches broken off and stuck in deep, noist soil in the autumn, or seeds may be sown in sandy soil in the greenhouse in spring.

The leaves of the inulberry are the best food for silkworms. For this purpose the white mulberry is particularly grown in. China and elsewhere. To feed home-grown silk worms, however, the leaves of the excellent fruit-producing black mulberry will be found equally efficacious.
The fruit, which resembles that of a large raspberry or blackberry in appearance, should not be gathered until it is ready to drop. As a matter of fact, it usually drops unexpectedly before it is gathered, and therefore the mulberry should always be planted as a lawn


Mulberry. Rich frult somewhat resembling that of the raspberry or blackberfy, excellent for dessert?
tree; where this is donc the fruit can then drop uninjured into the grass.

How to Cook. Mulberries may be eaten as clessert, preserved by bottling, made into wine or jam or a flavouring syrup, and also included in fruit compôtes, salads, and ices. They can be cooked in the same way as raspberries, and are particularly good when stewed in syrup and served with custard or cream, or made into pies and tarts.

Mulberry Cream. This is prepared by stalking I pint mulberries, putting them into a pan with $\&$ th. sugar and the juice of a lemon, and cooking them gently until they are tender. When cold, put the fruit into a glasa dish and pile on top of it $\frac{1}{2}$ pint cream and the whites of two eggs whipped separately, then stirred lightly together, sweetened to laste, and flavoured with vanilla. A cheaper dish can be made by covering the fruit with custard und just before serving adding a meringue of whites of eggs and castor sugar. (See Meringue.)

Mulberry Jann. To malie mulberry jam put 2 lb . stalked and rather unripe inulberries into an enamel pan with $\downarrow$ pint water, stew thein gently until they are soft and then add if lb . preserving sugar and the grated rind and strained juice of a lemon. Bring all these to the boil over a low fire, stirring all the time, and continuc boiling until the jam will sat when tested on a culd plate. 'l'ake off any scum that rises, then pour the jam into pots and tie them down. This will make only a small amount of jam.

Mulberry Wine. To make this drink, pour 1 gallon hoiling water over 2 lb . mulberries, let them stand for 24 hours and then


Mulching. 1. Need for mulching: $a_{0}$ cracked dry soll. 2 and 3 . Wrong ways of mulching bushes. 4. Correct method. 5. How to mulch a standard. 6. How to mulch a wall tree. 7. Good method of mulching plants
strain off the liquor, pressing the fruit against the side of the vessel to extract the juice. Measure the latter and put it into a preserving pan, with $f$ oz ground ginger, a clove, and sugar in the proportion of 2 lh. to every gallon of liquor. Boil the whole gently for about an hour, skimming it whenever necessary; let it coul to about $98^{\circ} \mathrm{F}$, and stir in $\frac{1}{f}$ teaspoonful of brewer's yeast. Pour the wine into a cask, cover the bung with acloth, and let it stand for two weeks; then add $\frac{1}{d}$ pint brandy, and cork tightly. The wine will be ready for usc in about six months.

MULBERRY BUSH : The Game. This is one of the inost familiar of the singing games All the players join hands in a ring, and dance round and round singing :
Here we po round the mulleery bush, the mulberry bush, the mulherry bush

## Here we go round the mulberry bush on a cold and

 frosty morning.This serves as an introduction, and is sung to the saine tune as "Here we go gathering nuts in May." The next movement is for thic children to drop hands and sing: "This is the way we wash our hands," repeating it in the same fashion as hefore, with appropriate gestures, and ending with the same refrail. "This is the way we go to school" shows the children crawling round with drooping heads and depressed fuces, while "This is the way we cone home from school" is the signal for them to skip round.

Hair brushing, putting on shoes, going for walks, learning to dance, and a host of other movements miay be introduced, and between cach the opening verse must be sung, during which the players join hands again and dance round in a circle

MULCHING. This term is applied in gardening to the act of apreading a layer of some protecting inaterial upon the ground above the roots of plants to preserve thein from frost or drought. The mulch generally consists of well-rotted stable manure, tan, coconut fibre, decaying leaves or the leaves of fern or of brackon. See Ioganberry.

MULLEIN. This is a hardy biennial or perennial of great decorative value in the gaiden. Most of them are vigorous leafy plants with tall spikes of hloom in summer. The best perennials are Chaixii, yellow, 3 ft. ; nigrum, yellow, ㄹ-3 ft. ; densiflorum, yellow, 3 ft ; and phoeniceum, various colours, 2 ft . Of the biennials (those which bloom the year following seed sowing and then perish) one of the hest is olympicum, yelluw, 4 to 5 ft . Many beautiful cross-bred varieties have heen 1 aised: one of the best is named Cutswold Queen, of salmon. bronze colouring. The mulleins thrive in ordinary soil and may he planted in autumm or spring. The perennials can be increased by division at these seasons: the biennials arc raised from seeds sown in May.

Mullet. This is a general name for two different tish, both of which are good eating. See Fish; Grey Mullet ;

## Red Mullet.

MULLING. Heat. ing, swectening and seasoning wine or other liquor with spiccs is called mulling. Wine can be mulled hy heating it to a certain temperature and then adding to it some sugar and alsoa little nutmeg.

Mulled Ale. The following is a good recipe for mulled ale: Put pint ale, a little ginger, a clove, a small piece of butter and teasioonful sugar into a sancepan and bring to boilingpoint. Beat up 2 eggs with a tablespoonful cold ale, pour the builing ale into them and then into a large jug. Pour the contents rapidly from one large jug to anotlicr for sume minutes; then return the liquor to the sancepan and heat it again to nearly builing point. Serve the ale very hot.

## MIULLION WINDOW. This is a winduw

 in which the upright divisions are huilt in the window frame, and generally form a pait of the structure of the building, the mullion being more or less in the nature of a post or support for the lintel. The type is part ieularly applicable to constructions in stone. See IViadowMUMPS: The Treatment. The chief characteristic of mumpre is the swelling of the salivary glands, the disense, which is highly contagious, being communicated by the breath and saliva of the patient. The incubation period is from 2 to 3 weeks: the quarantina preriod is 25 days.

Languor and feverishness are amungst the earliest symptoms with pain in the glands, expecially near the angle of the jaw, and swelling of the parotid gland near the lobe of the ear. The breath becomes offensive, and there is an increased flow of saliva.

The patient should be kept in bed for a weeis or 10 clays and in his romm for another weeh.


He aloould
have a tluid dict. A warm poultice or a pad ul cotton wool should bo npplied to the swollen face. Tho mouth must he frequently rinsed with warm water containing a littleper. manganato of potash. Whentho patient leaves the sick. room, tho bedding, curpet, "ull everything in the room thoroughly disinfected.
Mullein. Yellow blooms of a
MUNTIN. This is the name given to that portion of a door framing which forms the centre uprights between the iniddle and top and botton rails. It is tenoned into then, and is used in all panelled doors, and in other cases where the widlh of donrs or the framework of panelling is divided into two or more panels. See Door.

MURIATE OF POTASH. Used as a fertilizer, muriate of potash, which is a mineral salt containing ahout 48 per cent of pure potash, is very s slublo and is readily absurhed by plants. The sulphate of potash is nore generally accepted as a plant food. mixing well with other components and giving good results. Muriate should not be used in larger quantities than $\& \mathrm{lb}$ to the square rod

MUSA. The musa, or Lanana, is a hothouse family of vigorous, large-leaved perennial plants. The height is from 4 ft . to 10 ft . Musas are licst started in pots or tubs in enrly spring, in a misture of loam and sand. Tlie plants should he well watered and syringed


Musa. Leaves and fruit of the large hothouse plant, better known as the banana
frequently. Musn ensete is chiefly used for decorstive purposes in sunken pote or tubs in the aub-tropical garden. It may be safely placed out of doors in June and taken in again in Septemher. If the plante are grown under glass to yicld fruit Musa cavendisiliana is recommencled
MUSCADEL. The name of musendel is given to strong French and Italian wines, both whito and red, such as the Lacryma Christ (q.v.) of Nnples. See Winc.

MUSCAT. The name is given to one of the most highly eatecmed grapes in cultivation. One of its most deliciously llavoured varieties, Muscat of Alexandria, was introduced from the East some two centuries ago, and from its amall Lerries are obtained the sultanas of conmerce Other gond muscats are Mrs. Pince, Lady Hastings, and Prince of Wales Under proper cultivation muscats bear long. tapering bunches of sweet, rich, fleshy berries, but they require a ligh temperature. See Dessert; Grape; Vine
MUSCATEL. Muscatels are a variety of sun-dried raisin that is appresiated os $a$ deasert diah. The muscatela are large and jusev, of a purplish colour. and are usunlly served piled on a dessert dish, the raisins being retained on their branches. Shelled alnonds are served with muscatels.
Muscatel Pudding. A baked fruit pudding is made with muscatels by mixing I lb. self. raising llour with $\frac{1}{2} \mathrm{lb}$. finely chopied suet. $\ddagger \mathrm{lb}$. sugar, $\frac{3}{4} \mathrm{lb}$. stoned muscatels, $\ddagger \mathrm{lb}$ candied peel cut into small pieces, and a little grated nutmeg; th these add $n$ beaten egg previnusly mixed with \& pint milk and water used in equal proportions. Beat the whole well, and then pour it into n greased pie-dish. Bake the pudding in a moderately hot oven for $1 \frac{1}{2}$ hours. This is suflicient for about 8 persons See Dessert; Raisin.
MUSCLE. Muscles are of various shapes Some, like the biceps, are rather spindleshaped; others, like the sartorius, form long, narrow ribhons, and others atill, like those in the anterior abdominal well, form broad, thin sheets A muscle is enclosed in a sheath, ruld is found to be male up of bundles of fibre, separated by connective tissue.
Muscle porsesses irtitability; that is. it responds to some kind of irritation. Normally, the excitation is nervous energy, but an electric current, the striking of a muscle, and other causes will also evoke $\Omega$ reaponse.

This takes the form of contraction; a muscle fibre, and therefore the whole muscle, becomes shorter and thicker in response to the excitation.
Muscles perforn a large volume of work They are enabled to do this by the oxidation, or combustion, of sugar aupplied to them by the blool, of which they receive a generous supply. But just as the combustion of fuel may not only supply energy for an engine, but also heat, so the combustion of sugar in a muscle liberates heat, so that blood coning from a muscle is hotter than that which goes into it. This, in fract, is the chief source of the heat of the body, and explains why a person who is cold desires to move about.
Fatiguc supervenes sooner or Inter when $n$ muscle is being continuously exercised, and is due rather to the accumulation of waste products and, notably, sarco-lactic acid, than to the using up of available fuel. Massage, by improving the circulation through a inuscle and washing out this acid, helps to remove the sense of fatigue.
Injuries and Diseases. Overstretching of a muscle is dessribed as a strain. There is pain and stiffness. The murcle should be rested and, if necessary, loot or cold spplications will relieve pain. Early masange and gentle
movements are neccsary. A muscle miny be ruptured by violent stretching when it is contracted, or by a blow when it is in this condition. The severed fibres contract and leave a gap which is more evident if an effort is misle to move the muscle, the wevered ends gathering into knots The linnb should be placed in such a position as to put the muscle at rest and shorten it as much ns possible.

Inflammation of a muscle. or nyositis, miny be due to one of the causes of inflammation (q.v.) in any situation, nnd if this cause be a macrohe an aloscess miny result. The general symploms and tratment of these conditions nre described under their respective hendings. Muscular rheumatism is inflnmmation in the connective tissue mingled through. out a muscle-a fibrositis

A painful spasm of a muscle is usually referred to as cramp. Pain in a muscle without obvious signs of inflamnintion is spoken of as mynalgia; it is generally due to rheumatism. An intensive use of muscles lends to nn incrense in their size, or hypertrophy. Disease, on the ollier hand, causea $n$ dininution in size, or al rophy. There may be a progressive muscular atrophy involving all parts of the body. See Backache; Cramp; Fibrositis; Lumbago ; Rhcumatiam ; Sprain.

## Mushrooms: Growing and Cooking

## Advice About an Appetizing and Nutritious Food

## This article descrihes in detail various ways in which mushrooms can he grawn, afterwards dealing with methods of cooking them. See Frame: Hotbed; Manure: Savoury, etc.

Rich in nitmgenous matter and easily digested, the mushroom is a highly nutritious fungus which grows luxuriantly and very rapidly in warm, showery wenther. The utmost carc, however, is necessary in detecting the nature of the fungus, as the nonedible variety, which is poisonnus, is similar in appearance to the cdible fungus.
The adible mushronm has a dry pleasant smell, its llesh is dry and brittle, and the outer skin peels off easily. Deaths occur annually through the eating of poisonous fungi, under the impression that they are mushrooms.
Testing Mushrooms. To test mushronms, sprinkle a little salt on the spongy part and leave it for a few minutes. If the flesh turns yellow, the fungus is noisonnus; if it turns black it is wholesome. Annther test is to use a silver sponn while cooking the mush. rooms. The silver will be blackened if any injurious property is present. When poisonous mushronms rire eaten, if the effects come on quickly the early symptoms are giddiness, diminess of sight, and weakness. If the poisonous effects are delayed, the symptoms are irritation, pain, vomiting and purging An emetic of tivo tablespoonfuls of cominon salt in a glass of water should be given at once, and afterwards a dose of castor oil. Hints on Growing In England numal. rooms are generally gathered in the fields during the late sum mer nonths, and are most easily found in the early morning. They can, however. be cultivated, andinlaf. let 276 the Ministry of Agriculture give some information on this subject. If kept for any time after heing gathered, mushrooms become unwholesome. and may become poisonnus. Any por tion that is not eaten should be thrown away, ss there is some risk of the develop-


Mushroom. Plate of the nutritious edible fungus which can be grown from spawn in a cellar or shed, and cooked in many attractive ways
opened up it should be hot and ateaming, with a fork and placed on the top, bringing moist, but not wet, and should smell stiongly of ammonia. If in this condition it is ready for making into beds. Where possible the manure should be prepared under cover but in open sheds. If prepared in the open the heap should be protected from heavy rains.

For indoor culture almost any place can be used providing an equable temperature of about $\bar{j})^{\circ}$ can be maintained. Indour beds, except in glaschouses, may be made at any time. The beginner should not, however, attempt to make beds during the months of May, June, and July, as the higher atmospheric temperature during these months neccssitates considerable judgement in the use of water in the preparation of the manure and berls. Outuloor beds are usually made up in late summer
Beds for Mushrooms. The most common types of beds are flat and ridge For indoor culture. where space is limitel, flat beds are chiefly used. The size of the hed will depend upon the weight of manure available, one ton naking 6 sq. yd. of hed !) in. deep Where artilicial beat is available, a depth of 6 in . may be sufficient, but where there is a possibility of low temperature, the bed may be made as deep as 15 in ; 9 to 12 in ., however, is the common range of depth. Before commencing to lay the bed, the site which it is to occupy should be carefully cleaned and dusted over with slaked lime.
The site shou!d then be carefully marked out, and the manure spread evenly to a depth of 10 in , beating it down with a fork as the spreading proceeds. It should now be trodden down compactly. This will reduce the depth to about 6 or 7 in.
The successful construction of a ridge bed requires considerable experience. The usual ridge bed is, in section, the shape of a triangle with the top cut off, 2 ft .6 in . along the base, 2 ft 6 in . high, and 8 in . along the top. The length will depend upon the amount of manure and space available, 1 ton of mamure usually making $2 \frac{1}{2}$ yd of berl. When the base has been accurately marked out, the manure should be carefully and evenly spread the whole length to a depth of 18 in . and firmly trodden down. A further 18 in . should then be added and trodden down in a like manner.
The bed should now be 2 ft . high of tightly packed manure with a lot of loose overhanging material on the sides. This should be removed
the height up to 3 ft . The top and aides should be thonoughly beaten until perfectly compact, smooth and even, any luose material being swept up and set aside for use in the next bed. To prevent evaporation, the beds should be lightly covered with the long litter, previously shaken, and protection from rain should be provided for all outdoor beds.

If the processes described have been properly carried out, the temperature of the beds should now commence to rise, and to follow the progress of the heating a thermometer should be inserted in the bed, the bulb being at least 3 in . deep. Special thermometers reading up to $160^{\circ}$ to $200^{\circ} \mathrm{F}$., protected by a wood or metal case.

When the temperature at 3 in. below the surface has stealily dropped to $85^{\circ} \mathrm{F}$. for flat, and $80^{\circ} \mathrm{F}$. for ridge heds, the beds are ready for spawning. There is much difference of opinion as to the correct temperature for spawning, but as the spawn is only inserted on the surface there is no risk of it being killerl unless the inside heat again rises above $85^{\circ} \mathrm{F}$. If the temperature is allowed to drop to $75^{\circ} \mathrm{F}$. it is possible that the spawn will not develop or will develop very slowly and cause long delay in the production of mushrooms

## Insertind the Spawn

The bricks of spawn, if very dry and if the bed is also rather dry, shonld be dipped in water before use. Each brick should then be broken into 8 pieces, as nearly as possible of equal size. The pieces of spawn sliould be inserted in the bed in diagonal lines as nearly as possible 9 in apart in all directions. After spawning it is advisable to allow the beds to rest a few days before soiling or casing, in order to give the nyycelium in the spawn a chance to start running into the manure.

In casing a ridge bed it is best to begin to apply the soil to a height of 1 ft . and a thick. ness of about 2 in., beating it lightly with the smooth back of a spade to make it bind. This process is repeated another foot in height, leaving only the top and a small portion on each side to be completed in a similar manner.
The casing of a flat bed is a comparatively simple mattcr, but care should be taken to see that the soil is uniform in thickness and firmly beaten down. The bed should now be covered to a depth of 12 in to 18 in ., according to the atmospheric temperature, with the straw litter shaken out in preparing the manure, supplemented if necessary with new straw. Outdoor beds in cold weather will need atraw mats or hurdea in ardition. In frosty weather a little artiticial heat will be needed in vinewies or ot her glasshcuses and in unprotected sheds. In normal circum. stances mushrooms "ill begin to appear in six to eight weeks.

Mushrooms will thrive best in a damn atmosphere, and the beds should, therefore, be watered until damp but not wet. If the casing of soil becomes dry, it should be very lightly watered with a fine rose, koing over the bed several times if necessary. On beds in unheated sheds the water used in cold weather should be
lukewarm. Watering, if properly done should not be required more than once a week.

In normal circumstances the bed will need picking over three times a week, but in cold weather the progress of the crop will indicate how often pioking is required. The bed should ho uncovercd piece by piece, each portion being covered again as sooll as the mushrooms have been picked. They should not be cut, but carefully pulled, bringing away a little soil with the root-like threads of mycelium. The ends are now cut off into a refuse basket and the mushrooms freed from any soil, placed stem upwards in the basket. The holes made by pulling should be filled with new soil

How to Cook. Mushrooms can be cooked in many ways and cumbined with other foods They are also used in sauces and ketchups while button mushrooms are excellent pickled The recipe for mushroom ketchup is given in page 655.
To prepare stewed mushrooms, rub off the outside skin with a flannel dipped in salt and put them into a stewnan with 2 oz butter that has first been melted. Add 1 teaspoonful salt and half the quantity of pepper and stew gently until tender. Serve on a hot dis! Stewed mushrooms can also be served on toast. Stew as above, but add 1 teaspoonful grated lemon rind and a blade of macc. Add a white roux made from a dessertsnoonful of flour stirred into a tablespoonful of melted butter Stir this into the mushrooms, and serve them on a slice of fried bread or buttered toast.

Creamed mushruoms make a good entrćc Trim and rub with a tannel dipped in salt pint button mushrorms. Dissolve 2 oz . butter in a stcwpan, and stir in 1 teaspoonful Hour add the mushroums, 1 tablespoonful chopped parsley, and $\frac{1}{2}$ teaspoonful salt. Stir, cooking slowly, for about 10 min ., then beat up the yolks of 2 egis with 1 tablespoonful cream, and add this gradually to the mushrooms. Stir together for a few minutes, then serve the mushrooms in the sauce.
To grill mushrooms, cut away the stems and rub off the outside skin with a flannel di-pped in salt. Butter the bars of the gridiron and place the mushrooms on the bars, sprinkling them with salt. Serve them, when thoroughly cooked, on buttered toast, or as an accon paniment to grilled steaks, chops, bacon, etc.
Mushroums and scrambled eggs are made by melting 2 oz butter in a pan and simmering in it a \& lb. prepared muahrooms cut into small pieces. When they have cooked tor about $\ddagger$ hour, add salt and pepper to taste, and when tender add 2 heaten eggs, and stir all together until the eggs are cooked. Serve the mixture on hot butterod toast.
Mushroom Croquette. Croquettes or fritters made from mushrooms and boiled rice are prepared thus: Peel and stalk $\frac{1}{2} \mathrm{lb}$. nush. rooms, put them into a saucepan with sufficient milk and water to cover them, and stew them for about $\frac{1}{2}$ hour, or until they are tender. Then strain off the stock, chop the mushrooms coarsely, and mix them with 1 teacupful boiled rice, 2 teaspoonfuls chopped parsley, and the same quantity of chopped onion. Melt $\frac{1}{2}$ oz. butter in another pan, stir in $\frac{1}{2}$ oz Hour, add the mushroom stock, and stir until it hoils.
Put in the mushrooms, etc., and $n$ beaten egg, and atir all over the fire unt il they are well mixed. Season the mixture carcfully, turn it on to a plate to cool, and then shape it into even sized balls. Brush these over with egg, coat them with breadcrumbs, and fry them in smoking hot fat When they are a golden brown colour drain them on kitchen paper, and serve them garnished with fried parsley and cut lemon.
Mushroom Patty. Mushroom patties are made by cutting up into dice and then stew. ing $\frac{1}{2}$ (b). mushrooms, and stirring in about two

[^6]tablespoonfuls white roux or plain white sauce Line some patty tins with puff paste and fill them with the mushroom mixture, placing a cover of pastry on the top. Bake them in a moderate oven for about half hour.

Mushroom Pickle. Button mushrooms only should be used to make this pickle. Stalk, wash and dry them thoroughly, and then rub off the skins with salt. Put them into a pan at the side of the fire and let them cook slowly in the liquid which the salt draws out of them. Continue cooking until this liquid has been evaporated; then season the mushrooms to taste with mace and pepper, cover them with vinegar, and bring the whole to the boil. Boil it slowly for a few minutes, and let it cool slightly before pouring it into bottles or jars. When the pickle is cold tie it down, making the jar airtight.

MUSEROOM CAEE. Mushroom-shaped cakes coated with almond paste and chocolate butter icing, to give them a realistic appearance, can be made from a rich plain cake mixture baked in small cake tins for about 12 min ., or until they are spongy.

When the cakes have cooled, level them to the required shape, and brush the sides and bottons with white of egg. Cut the almond paste into rounds, stand a cake on each, and then mould the paste round it, leaving the tops uncovered. Trim off the rough edges, and place the cakes in a warm oven for 20 min., so that the paste may set. Then leave them to cool, and reserve any trimmings of almond pastc for the stalks. Nake the butter icing and ice the tops of the cakes by forcing the icing through a rose tube fixed to an icing bag. Start from the centre of the cakes and continue in straight lines to the edge where the


Mashroom Cakea, consisting of a plain cake mizture coated with almond parto and ohocolate batter
icing to give them a realistio appearance
almond paste begins. Mould the remainder of the latter into thick stalks, and stick one in the centre of each cake. See Almond Paste ; Chocolate Roll; Icing; Madeira Cake.

MUSICAL CHANRS. Musical chairs is an indoor game, the popularity of which is by no means confined to children. A line of chairs is placed down the centre of the room, there being one chair fewer than the number of players. They are arranged alternately, one chair facing one way and the next the other. Somebody then plays the piano, and the players run round the line of chairs until the music suddenly stops, when each person sits down in the nearest chair. The player who fails to secure a seat is out of the game. A chair is then removed from one end of the line and the game continues with the recommencement of the music. It ends when only two people are left to circle round and round a single chair, the one who first occupies it when the music stops being the winner.

Where there are many players and not sufficient chairs available this game can be played equally well by putting a line of people instead of chairs, standing each with one hand on his hip, alternate left and right. The players have to put their arms through the arms of the improvised chairs when the music stops.

Musical bumps is popular with children. I is played in the same way as musical chairs, but when the music stops all the children sit down on the ground. The last one to do this is out of the game. See Children's Party.


Musk. Oae of the handsome monkey masks
MUSE: The Plant. The favourite musk is Minulus moschatus. Before it lost its scent this was a popular window plant, seen in almost every cottage window. The variety Harrisoni has larger flowers. Rooted pieces should be potted in March, several in a 5 -in. pot in a compost of sand-and leaf-mould. Mimulus moschatus may also be grown out of doors. Other showy musks are lutens, yellow, and the numerous highly-coloured hybrids which have been raised between lutens and guttatus. They are commonly known as monkey musks; the large flowers are very handsome. Seeds are sown in May to produce flowering plants the following year.
MUSE: The Perfume. One of the strongest of perfumes, musk is a dried glandular secretion obtained from the musk deer. Musk is very expensive, but it retains its odour for a long time, and for this reason is added to other perfumes in order to render them more durable. A cheaper substitute is synthetic musk, which is made from a coal tar product, toluene. See Scent.
Musk Mallow. This is a hardy lierbaceous perennial plant, also called Moschata. See Malva.
MUSE ROSE. The popular name of Rosa moschata is musk rose. It is a very vigorous climber with clusters of white flowers. The leaves are groyish-green. It should be planted in autumn and allowed plenty of room for development, for it makes rampant growth. See Rose.

MUSLIN. The successful employment of white muslin is a matter of skill and taste in adding colour touches in the form of a simple ribbon or in other ways. Muslin is again used for dressing table flounces over pale coloured sateens, and cushion covers and curtains to match look dainty in a country bedroom. Sprigged or embroidered muslins are pretty for sum. mer curtains. Madras muslin and silk muslin are obtainable for this purpose in exquisite designs and colourings.


Musk Rose. White flowern and
greyish-greea leaves of this climber

White muslin is easily tinted with the dyes and dolly-sticks used for curtains. In washing spotted muslin it is well to see whether the dots have actually been woven in or merely attached.

Plain muslins equally suitable for dresses, glass or long window curtains, bedspreads, and cushion covers are always procurable, and when they have served for one purpose they can frequently be turned to another. Muslins which have been soft can be stiffened by starching and ironing, and be used for foundations for other light stuffs. Spare muslin comes in for wrapping up food, making flyproof covers for meat and milk. A heavy bead edging round a little mat of spare muslin converts it into an efficient cover for milk-jugs.
Kitchen strainers can be improvised from muslin, and it has many other household uses in making poultico covers, bandages, stretched on frames to prevent the entry of flies through open windows, diffusers for amateur photographers and for drying and polishing. See Dressing Tablo: Organdie.

MUSLINET. Made with coarser threads and in more open texture than fine muslin, muslinet is intermediate between muslin and net. Muslinet makes cheap window curtains.

MUSQUASE. Used mainly in the manufacture of fur coats, musquash, which is obtained from the musk rat, is a somewhat coarse but hard-wearing fur of glossy appearance. Usually dark brown in colour, it is frequently shorn and dyed to imitate sealskin. A more valuable type is known as natural black musquast. See Fur.
MUSSEL. Of all the shell.fish mussels are the least digestible, and should be eaten sparingly. They have a redeeming feature in that they cleanse themselves of any pollutions in about four days if put into water free from contamination. In order to make mussels quite safe for human consumption, a medical man has invented a system by which shellfish are immersed in a large volume of sea water freshly sterilized by means of chlorinc for periods of 24 hours In the case of mussels two such periods only are neccssary. The mussels so treated are packed in bags and have special labels attached to them which the public are advised to look for.

To prepare mussels for eating, they should be allowed to soak for some time in cold water and the shells scrubbed with a stiff brush. The water should be frequently changed in order to get rid of sand. When the inussels have soaked sufficiently, put them in an iron saucepan, without water, over gentle heat. As soon as the shells open they are ready to be served in the shells with brown bread and butter after all foreign bodies have been removed, special carc being taken to remove the green grass-like "beard" that is to be found in every mussel. Vinegar or lemon juice should be taken with mussels to counteract any irritants or poisonous substances.

Stewing the Mussels. To stew mussels, boil them, then take them from their shells Fnd carefully remove the beards. Strain all the liquor from the mussels into a pan. To every quart of mussels allow 4 oz butter. Roll this in flour and melt the butter with the liquor Add the mussels with a spoonful of chopped
parsley, a sprinkling of pepper and salt, and a spoonful of lemon juice. Shake the contents of the pan and simmer for about 10 min Serve with sippets of toast.
Scalloped Mussels. To make acalloped mussels, propare them as directed above. Take the mussels out of the shells and remove the beard. Strain the liquor and add to it 4 o7. butter rolled in flour. When the butter is melted, add the mussels and simmer for 5 min . Butter a scallop shell and sprinkle it with browned crumbs. Put in a layer of mussels, then a layer of crumbs with a piece of butter on top. Continue this until the shell is filled. Pour the liquor over and brown the disli under the browning shelf of the oven.

Poisoning by Mussels. The popular idea that cooking destroya all poisons does not a pply to mussels, which are often virulently pnisonous whether raw or cooked. There is nothing to indicate this fact before they are eaten. The poison is present chiefly in the liver of the mussel.
The symptoms are of two typer. In some cases the patient suffers from irritation in the stomach, colic, vomiting, purging, cramp in the limbs, and nettlerash. In others he becornes numb and cold, the pupils of his eyes dilate, paralysis may develop, and he may become comatose. So virulent is the poison that death sometimes occurs within two hours.
As quickly as possible give an emetic composed of a tablespoonful of mustard in a large tumbler of warm water. As soon as the patient has vomited, give him a dose of 1 to 2 o?. of castor oil. If he becomes very weak before the arrival of the physician, weak brandy in tablespoonful doses every half-hour may be administered. The patient should be kept warm, and poultices or hot-water bags may be applied to the a bdomen.
MUSSEL SCALE. Mussel scales are injurious to apples and lese frequently to pears and currants, black and red. The insects also attack hawthorn, broom, and other plants Trees that grow against walls suffer more than others, as the pests flourish most in warm, sheltered situations. The injury to the tree is caused by the loss of sap which is sucked up and devoured by the pests.

In the case of a bad attack, the trees or bushes should be sprayed when dormant, November to February, with an oil emulsion made as follows :
l'arafln oll
oft soan
1 gal
Water
10 gal.
The soap is first dissolved in about a gallon of boiling water. The soap solution is then removed from the fire, and the paraffin is at once added, the whole being emulsified by squirting the liquid back into itself with a hand syringe. The strong emulsion may be kept until required for use, when the remaining 9 gallons of water should be added and the whole thoroughly stirred or emulsified again with the hand syringe.

If the pest has not been dealt with in winter -the best time-it may be greatly reduced by spraying when the eggs are hatching, about the end of May or early June. At this period a weak paraffin emulsion has proved satisfactory, and probably any other contact insecticide, such as nicotine and soap, would do as well. A suitable paraffin emulsion may be made as recommended in paragraph above, but using the ingredients in the following proportions :


See Apple ; Insecticide; Pear; Spraying.
MUSTARD : The Plant. The hardy annual mustard plant is usually grown for table purposes in conjunction with cress. Secds may be sown on the surface of fine soil at the
end of March, watered in, and followed by successive sowings every week until September.

Mustard and cress may be grown indoors all the year cound by sowing seed on the surface of shallow pans or boxes of soil, watcring in with tepid water, and keeping wet and warm. It may also be grown on flannel placed in a dish and kept moist in a sunny window. The truc mustard is Sinapis.

Use for Sandwiches. The young leaves of mustard, which have a pleasant and rather pungent llavour, can be mixed with cress into a green salad or may be used alone with bread and butter and salt. Mustard and cress makes excellent light sandwiches. The leaves should be washed thoroughly in cold, slightly salted water, to renove any seed cascs or grit, and then swung in a salad shaker until dry. As a garnish for cold meats, etc., must ard and cress is invaluable; also, if a little is thrown into a saucepan of soup a few moments before serving, the flavour of the soup will be very much improved. See Cress.

MUSTARD : The Condiment.
Two variet ies of mustard plant, the black and the white, are cultivated in England, the mustard of commerce being the powdered sced of both. The black variety contains a volatile oil from which mustard derives its pungent odour, and this is accentuated by the use of turmeric for the bright yellow colour of the powder.

As a condiment mustard is taken with beef, pork, bacon, checse, and other foods, though not usually with mutton ; it also enters largely into the composition of most piquant sauces and dressings. To prepare it for table use, a amall quantity of the powder is mixed in a cup with a few drops of water to the consistency of a thick paste, all lumps being broken up. More water is added, stirring all the time, until the mustard is just thick enough to lie on the edge of a plate without running down. The addition of a little salt is held to improve the flavour of mustard. It is best to make only a small supply at a time, and to replenish the mustard pot with freshly made condiment.

A very pleasant table mustard and one which will keep can be made by dissolving $1 \frac{1}{2} \mathrm{oz}$. salt in 1 pint boiling water, then pour it upon 1 oz . grated horse-radish, and let it atand 24 hours. Strain it and mix in, by degrees, sufficient dry mustard to make a smooth rather stiff paste. Equal quantities of horse-radish, chilli and tarragon vinegar can be substituted for the water.

French Mustard. French mustard is made from the black mustard seeds. which are much more pungent than the white or yellow seeds. Steep them in vinegar, garlic, thyme, mint, and tarragon until a full-Havoured vinegar is obtained, then grind the mustard seeds and pound them, adding vinegar by degrees to work them into a paste. Season it with salt.
Mustard Pots. A mustard pot is one of the nembers of a cruct or condiment set. It takes a large number of forms, and is in various sizes, but is usually fitted with a hinged lid and supplied with a spoon to match. Sets are made in glass and in coloured pottery, com-


Mustard Pot. Three gilver mustard pots of the Georgian period. 1. Erample with beautiful pierced body abowing blue inner receptacle, 1770. 2. Pot with domeshaped lid and finted base, 1802. 8. Octagonal apecimen mounted on a pedeatal, 1775
prising a mustard pot, one or two pepper pots and salt cellars. Mustard pots should match in style the other condiment containers on the table. The better pieces are in silver with glass liners.
Old silver mustard pois are much valucd by collectors. They date, as far as England is concerned, from about 1750 , and were often, as they are to day, made with salt cellar and pepper pot to match. The majority are glass lined, the glass being usually bluc, but occasionally rose in colour. The marks may be on the front, near the handle, or on the bottom, and, like all lidded articles, the cover should bear the sane initials as the body. Some cxamples are beautifully decorated, those pierced and engraved with festoons and rosettes being especially noteworthy.

The three inustard pots illustrated on this page are beautiful examples chosen out of a large selection in order to give an idea of the varied shapes in which these articles were made. Mustard pots, remarkable for the beauty of their chased work, were made in Sheffield plate, and there is a representative collection of these in the Victoria and Albert Museum, South Kensington. See Silver.

MUSTARD : Its Medical Uses. In medicine mustard is used as a handy and reliable emetic, and also as an external application. As an emetic, the dose for an adult is a tablespoonful in half glass of water. Externally, mustard acts as a counter-irritant, and may be applied as a plaster or a poultice. The most convenient form for use is the mustard leaf.
Mustard Plasters. To make a plaster, mix the mustard with cold water to form a thin paste, and spread upon brown paper. A little vinegar incrasases the strength. The mustard may be covered with a layer of muslin. poultice is made by sprinkling a linseed meal or other poultice with mustard and covering it with muslin. The plaster or poultice may generally be kept on for $15-30 \mathrm{~min}$., but for not more than 10 min . with young children or sensitive and delicate adulta. A safe plan in the case of children is to mix the mustard with $\underset{\sim}{2}$ or 3 times its weight of common or corn Hour. The part may then be covered with a layer of cotton wool. When the plaster or poultice is removed, the skin should be wiped clean from all traces of the mustard, using for the purpose a very soft cloth.
Mustard Bath. For a bath the mustard should be made into a thin paste with culd water. and then stirred into the bath. For a foot bath add 1 to 2 tablesjoonfuls of mustard to each gallon of water; the water should be as hot as can be comfortably boine. For a sitz bath, a tablespoonful of mustard should be used fur cach gallon of water. For the full bath of about 30 gallons of water, $\ddagger \mathrm{lb}$. to $\frac{1}{2} \mathrm{lb}$. of mustard may be used. The temperature should be about blood temperature. This is an admirable cure for chills, commencing colds, sleeplessness, etc.
MUTISIA. The kind generally cultivated is Mutisia decurrens. a climbing perennial which is not hardy except in a few exceptionally mild places. The Howers, which open in summer, are of orange-sellow colouring. Propagation is by cuttings under glass in spring. The plants mayle grown in as greenhousc from whicli frost is excluded.

## MUTTON: VALUE AND COOKING METHODS

## The Housewife's Guide to a Popular Article of Food

In addition to similar articles on Beef: Lamh: Pork, readers arc referred to Boning Breast: Corving: Diet: Food: Meat, etc., and other entrics dealing with the subject of food. See also Caper Sauce: Cold Meat: Cutlet; Haricot Mutan. Mince. Onion Sauce

Bcing highly nutritious and yet easy of digestion, mutton is preferable to beef for delicate persons or young children. The best meat is obtsined from a sheen from 3 to 6 years old; under that age the flesh does not acquire the Havour of choice mutton. The leg is the most economical joint, as there is ess hone and waste in proportion to the flesh : but it is liable to become tainted sooner than other portions of the carcass, especially if the kernel is not at once removed
Leg of Mutton. A leg of mutton about - lb. in weight and a shoulder about 5 lb . are good average joints for family consumption. Mutton should be cooked rather longer than beef in proportion to its weight, as it should not he underdone, with exception of chops and cutlets, which may be slightly undercooked if preferred. Mutton requires due attention when roasting, for if not thoroughly hasted and the temperature regulated it will be dry and hard.

The leg can be boiled or roasted, but somelimes it is boned, stuffed with sage and onions. and trussed in an oblong shape, slightly Hattened both sides, and baked or braised. It is then called mock duck. If intended for invalid diet, vegetalles must be omitted when boiling a leg of mutton; but when served as a family joint it is usun) to cook carrots and tumips with it, and to hand then separately as a vegetable, either whole or mashed
For a braised leg of mutton a very small joint is the best. Remove the kernels and trim the leg neatly; it should then be partly roasted and afterwards braised on a hed of vegetahles, adding 1 or 2 slices of fat bacon and a bouquet garni. Care must be taken to tum the meat in the braise. The gravy, after being strained, must have the fat skimmed off before reducing it and pouring it over the meat.

Shoulder and Other Parts. Shoulders of mutton should never be boiled; they are too fat to allow of the meat looking appetizing, and the llavour is insipid. They should either be roasted or braised-roasted for preferenceand served with a sauce which has some distinct llavour, such as onion. 'They may be boned and stuffed by the method described earlier in this article for the leg

The haunch (hind quarter) should hang as long as possible without heing allowed to become tainted; then the shank should he removed and the flap trimmerl, and it should he roasted and served with rich gravy. Red currant jelly should always be served as an accompaniment to this joint.
'I'he saddle (double loin) Irefore lieing roasted must be trimmed and the flaps folded under A smoll skewer must be run through the kidney in each loin to prevent it becoming detached. The tail is left on, but is split in half and curled over each side the reverse way A 10 lb . saddle will take from 2 to $2 \frac{1}{2}$ hours to roast. It must be remembered that the loin is not such $n$ thick joint as the leg, and does not take so long in proportion to cook. Serve with good gravy and red currant jelly.

Loin of mutton can he roasted whole, but must never be boiled. When roasted, superfhous fat must he cut away, and it is easier to carve if the chine bone is sawn off.

The brcast is usually hoilerl, but can be boned, coated with stuffing, rolled up, and roasted, as described under the heading l3reast. The neck is an economical joint for family consumption. When sold in the piece it is known as the target and comprises the best end, middle neck end scrag end, and is
very cheap if the whole is bought. The best end can be roasted or made into cutlets, the middle neck can be used for Irish stew, or a ragout with or without the scrag, while the tter can be made into broth
Mutton Broth. Cut up I Ib. scrag into small pieces, and put these, together with the hones and a quart of cold water, into a saucepan over the fire. Add a little salt, bring the broth to the boil, and after skimming it add $1 \frac{1}{2}$ dessertspoonfuls rice, a leek, and a piece each of carrot, turnip, and celery cut up small. Simmer the whole for ahout 2 hours, then skim t again; take out the bones, add $1 \frac{1}{2}$ teaspoonfuls chopped parsley and seasoning to taste, and serve. Mutton broth is often made with hones only, no ment

Mutton Chop. Grilling is the best way of cooking mutton chops, but they may also he fried or steamed. For grilling they should be at least I in. in thickness and should be cut from a well-hung piece of mutton. Rid them of skin and any superfluous fat, and after trimming the edges llatten them with a cutlet bat and brush them over with melted butter. Place them on a hot gridiron before the fire or under a gas griller and cook them for nbout 10 min . 'This is the approximate time reyuired, but it will naturally vary with the thickness of the ment. Serve the chops garnished with watercress, and with a pat of maitre d'hôtel butter on top of each

To fry mutton chops, prepare them in the same way as for grilling. omitting, however, to brish them over with butter. Melt a lump ol butter in a frying-pan, and when it is smoking hot put in the chops. Brown them on hoth sides, and when


Mutton. Left. side view of the carcass of a sheep, showing position of joints into which it is cut by the butcher. Ripht, back view, showing the position of the joint known as the saddle
cooked, as they should be in $8-10 \mathrm{~min}$, drain and serve them in the same way as grilled chops.

Mutton chops may be steamed by trimming and flattening them as already described, and placing them on a grensed plate over a pan half filled with boiling water. Dust them lightly with salt, cover them with greased paper, and then with a basin. Take care that the water in the pan continues to boil, and add more if necessary during the course of cooking. After ahout 15 min . turn the chops, and continue cooking them for another 15 min .

Kebobbed Mutton. Mutton kebobbed makes a choice dish, and one that can be cooked in the Dutch oven. Remove the meat whole from a loin of mutton and cut it into steaks, trim ming off some of the fat. Mix with some breadcrumbs a little sweet herbs, a sprinkling of grated nutmeg, salt and pepper. Dip each steak into beaten egg, then into the prepared crumbs: place the steaks together as if they had not been cut asunder, and tie them back into shape with string. Cook them either in the Dutch oven or in a baking-tin in a fire oven, hasting them with good dripping and $\pi$ small lump of butter. When serving pour off the fat, sprinkle a little lour over the tin, mix it with the sediment from the meat, and stir into it by degrees $\frac{1}{2}$ pint of good gravy. Adil a little mushroom ketchup, boil up well. and pour this liquor round the meat.

Uses of Cold Mutton. Suggestions for doing up cold mutton are given under various headings. Excellent minced, curried, stewed in a casserole or made into a shepherd's pie, it may also he used to prepare the following dish :

Free the meat from skin and gristle, then weigh out ${ }_{3}^{3} \mathrm{lb}$. and mince it finely. Melt a lump of butter about the size of an egg in a saucepan, add a breakfastcupfil of tomatoes-previously skinned and rubbed through a fine sieve-the minced meat, three well-beaten eggs, pepper and salt. Stir the whole over the fire, taking care that it does not burn, and when it is thomughly hot, dish it on slices of toast, with chopped parsley on top.
To utilize the knuckle end of a conked leg of mutton, trim it neatly and then put it into a pan containing a pint of hot hrown gravy made from meat extract. Add a tablcspoonful of Worcester sauce or ketchup, a little allapice, and a large grated onion. Cover the pan, and let its contents stew slowly at the side of the tire for alout an hour, or until the meat is thoroughly heated. In the meantime, cook 2 oz. macaroni, cut into short lengths; wash and peel 2 large carmts and turnips, cut them with a vegetable cutter into balls about the size of marbles, and cook them in hoiling salted water until they are tender. Dish tho stewed knuckle on a hot dish, place a paper frill round the bone, and strain the sauce round. Around the meat arrange alternate heaps of vegctable and macaroni, sprinkling a little chopped parsley over the latter as a garnish.

Another good way of using up cold roast or curried mutton is to make it into croquettes. To prepare these wash $\ddagger \mathrm{lb}$. rice and boil till tender in plenty of fast-boiling salted water.

Drain off the water thoroughly, and put the rice on a plate in the oven to dry.

Fry a teaspoonful chopped onion in 1 oz dripping in a saucepan, and when it is well browned add $\frac{1}{2} \mathrm{oz}$. flour and $\frac{1}{2}$ dessertapoonful curry powder, frying theae for a coulple of minutes. Pour in $\ddagger$ pint stock, stir the mix ture until it hoils, and then add $\frac{1}{\mathrm{lb}}$ finely chopped cold mutton, 1 teaspoonful lemon juice, the cooked rice, some salt and pepper to taste, and lastly the beaten egg. Mix all these ingredients thoroughly together, spread the mixture evenly on a plate, mark it into even-sized divisions, and leave it until it has become cold.
Shape the divisions into neat balls, brush the latter over with beaten egg, and cover them with breadcrumbs. Put plenty of frying fat in a pan over the fire, and when a bluish smoke rises from it put in the croquettes, frying them a golden brown. Drain them, and serve them on a lace paper garnished with pieces of fried parsley
Either the shoulder or the neck may be done up as a stew or ragout in a casserole. Cut up 2 lb . into neat pieces, removing any superfluous fat and bone, and fry them. lightly in 1 oz. butter melted in a cassero slightly browned on both sides, take out the meat and put in its cut into dice, and oz. flour. When these ingredients have browned thoroughly, pour in $1 \frac{1}{2}$ pints warm stock or water, stirring all the time, and bring the whole to the boil.

Then put in the meat, a bay leaf. 2 oz. pearl barley which has been soaked overnight, and seasoning. Place the lid on the craserole and gently simmer its contents in a moderate oven until the barley is soft. Then skim off the fat, take out the bay-leaf, and servc


Mutton : the jolnts. 1. Shoulder. 2. Loin, showing position of kidney under the fat. 3. Ler. All are good joints for roasting. 4. Target, showing the positions and shape of the scrag end, middre neck and best neck

MUZZLE. In Great Britain the Ministry two kinds, the leather and the wire cage shape to make orders regarding the muzzling of dogs, in outbreaks of rabies. It is not as comfort. the seizurc. detention and disposal (including able as a leather one, and if the latter fita


Muzzie. lig. 1 (lett). Wire muzzle for a Pexinese or other small dog. Fig. 2 (above). One made of leather and wire, suitable for a terrier destruction) of uninuzzled dogs, and the animal's jaws too closely together. See Dog.
recovery from the owners of the expenses incurred in respect of their detention. The same authority may make orders as to collars for clogs, and so also may a local suthority ; but the latter cannot make such orders in respect of packs of hounds. A muzzling order may be revoked nnd may be made to apply either to the whole country or to a particular area.

The effect of a muzzling order is that any person who kecps a dog is liable to $n$ fine and to pay the cort of the summons if the dog is found in any public place unmuzzled, whether it is the person's fault or not. It will not avail him to prove that the dog was muzzled when he let it out and that some one must have stolen the muzzle; nor that the dog esoaped unmuzzled through the negligence of $a$ third person.

Apart from mizzling orders, the Town Planning Act, which applies to most towns in England, makes it an offence to allow a ferocious dog to be at large unmuzzled, i.e. to be in a public street or place. The word allow implies knowledge on the part of the dog owner. It is a moot point whether this means knowledge that the dog is ferocious, or knowledge that the dog is at large.
Types of Muzzle. Dog muzzles are of of Agriculture and Fisheries possesses the power The latter is usually ordered by the authoritics properly it should be equally effective. In the wire muzzle for a toy dog, shown in Fig. 1, a small pad has been arranged so as to avoid pressure of the wire joint on the animal's head. Fig 2 shows a combination of leather and wire for a larger dog. Whichever type of muzzle is used, care should be talien to get one of the proper size that does not pinch the

MYOPIA. The technical name for short sight is myopia. Parallel rays of light falling on the cornea are focussed in front of the retina, or, in other words, the eye is too long.

The condition may be progressive, and it is lesirable that children who are shortsighted should not have their books or similar work too close to the eyer, not nearer than 10 to 13 in, also that the type should be large and the light good. See Eye : Spectacler
MYOSOTIDIUM. The perennial plant myosotidium also known as the Chathain Island for. get - me -not, is a difficult plant to grow, but when it succeeds it becomes a very handsome object, bearing flowers like very large forget-ine-nots. It requiresa moist, sheltered position, and must be roown in lon my soil. It does best in maritime counties in the south. west district. Propagation is by seeds, which should be sown in the summer.
Myosotis. This is the botanical name for the popular hardy plant forget-me-not (q.v.).
MYRICA. Of thesc hardy shrubs, one, Myrica gale, grows wild in boggy ground in parts of the British Isles. Myrica ecrifera is known as the wax myrtle; it has fragrant eaves and the fruits exude a wax-like substance. Another kind is Myrica californica.

Using the Wax. The was from the minute fruits, which arc knows as candle berries, can be obtained in the following way : A pot of boiling water is prepared, into which the herries are placed; the wax melis and floats on the surface of the water, from which it is collected and farhioned into little candles, which give off a delightful fragrance when hurnt. Such candles would make excellent Christmas decorations.

MYROBALAN PLUM. Used as an alternative to privet and quick the myrobalan plum (Prunus cerasifera) is often seen in heriges. Its variety atropurpurea has purplish leaves When full grown the
myrobalan plum is from 8 ft . to 10 ft . in height, and in favourable situations has reddish fruit in the autumn. Plants may be successfully raised from fruit stones. See Hedge.

MYRRH: The Herb. Myrrh, or sweet cicely, Myrrhis odorata, is a hardy perennial herb with sweet-smelling leaves and white


Myrrb. Mucb-divided leaves of the sweet-scented berb Myrrbis odorata
Howers. It thrives in the opien border in any soil, and reaches a height of about 2 ft . Propagation is by seed, or division of the roots.

Medicinal Uses. The gum resin known as myrrh is the product of the balsamodendron, a small tree grown in Arabia and elsewhere in the East Combined with horax, as in the following prescription, myrrh is a favourite gargle in inflamed conditions of the tongue, cheeks, or gums, and in a relaxed thront.

Tincture of mytrh
Borax
Eau-de-Cologne to inake
4 fluid drams

| 24 gr |
| :--- |
| 1 llui |

2 oz. Jram
A teaspoonful of the above mixture should be used in a small glass of water as a mouthwash or gargle. The tincture of myrrh is given in doses of $\frac{1}{2}$ to 1 dram. See Mouthwash.

MYRTLE. The fragrant inyrtle (Myrtus communis) is a greenhouse and half-hardy evergreen shrub, which can only be grown out of doors in mild distriots, or against walls with winter protection in cold localitics. The Howers are white and fragrant ; thev produce black fruits. Myrtles do best in fertile loany soil, well lightened with leaf-mould and sand. They require a good deal of water in summer, and will benefit by frequent syringing. Any necessary pruning should be done in spring. Propagation is by cuttings in sandy soil under a hand-light in summer.


Myrtle. Fragrant white flowers of the evergreen shrub which needs a sheltered outdoor situation

## Nails and How to Use Them

## The Various Kinds and their Proper Uses

This article suggests reference to almost all the woodworking articles in this work. Of these
only a few can be mentioned, e.g. Amateur Carpentry: Cabinet Making: Capping: Door only a few can be mentioned, e.g. Amateur Carpentry: Cabinet Making: Capping; Door Drawer. See also Brad; Clasp Nail ; Clout Nail

Of the many varieties of nail in use a number are illustrated in Fig. 1. Iron and steel nails are liable to rust if exposed to the air or nllowed to becoine damp. They should be liept in their original packets or arranged in a box divided into sections.

French or wire nails are made in sizes from 1 in . to 6 in . long, and in various thicknesses. Useful sizes in the 1 in. length are known as 16 gauge, in the $1 \frac{1}{2}$ in. 13 gauge, in the 2 in. 11 gauge, and in the 6 in. 4 gallge. The oval wire nail or brad does not hold so well as the French nail, but it has bess tendency to split the wood, and for internal work the head, being long and narrow, easily sinks into the grain of the wood and is almost invisible. The shanks of the oval and wire nails are generally roughened near the head, so that they hold better in the wood and there is a sinaller chance of their coming loose.

Cut nails are made by punching from sheets of thin metal. They are rectangular in section, and generally tapered or wedge-shaped. The amateur will find it wise to use this class of nail only when the work is fairly substantial and not less than 1 in . in thickness, otherwise the wood is likely to split. The ordinary cut clasp nail is provided with a T -shaped head, so that when driven into the wood it draws the two parts firmly together.

The floor nail has an L-shaped head, and is used almost exciusively for nailing down floorboards to the joists, the purpose of the projecting piece on the head being to draw the floorboards tightly against the joists. The wall nail is a stout round nail, resembling a thiek French nail, and is intended generally for driving into brickwork. Rose-header nails are made witlı a round and modelled head and long, flat pin: they are used in exterior work where the head will be exposed; the large area under the head serves to hold one part to another.

Joiner's brads are a variety of floor brads, ranging in length from $\frac{7}{2}$ in. to 2 in. ; being small in size they are useful for nailing on the baoks of furniture and similar purposes. Hob nails are generally used on the soles of boots, but as they are of variously shaped heads they are often employed as a decorative device on doors. The lath nail is a form of wire nail with a broad, flat head, intended chiefly for nailing laths to the stud partition intended to be plastered: a variety is made in the form of a cut lath nail.

Cast wall nails are often utilized for garden purposes in the training of plants; they should he driven into the mortar joints in the brickwork, since, not being very strong, they are liable to break if driven into hard material. Clout nails have a very broad head circular in scction, and are made in the form of a wire or wrought nail. They are employed for fastening roofing felt and similar material.

Brass-headed nails are made in many fancy patterns, the heads being of polished brass. They are intended for the support of pictures or for fastening an overmantel or similar pieces of furniture to the wall, the brass heads alone being visible. Brass-headerl nails of small size are used for many decorative purposes. The panel pin is a fine wire nail with a conical. shaped head of small dinmeter. It is invaluable for fastening two pieces of thin material together and should always he used with thin wood of any description. Although the nails are small in diameter, they are very efficient and hold well.
Use of the Hammer. The whole secret of driving a nail lies in the use of the hammer. It should be held rather loosely and near the end of the shaft. The nail must be struok fair and square on the head, and the liammer should fall in a straight line with the path of the nail otherwise the nail will not be driven in straight. There are other methods, however, beside the ordinary one of driving the nail straight in. For example. if a nail be driven $n t$


Nail. Fig. 1. Typical varieties of nails; their uses are described in the text
an angle through a piece of wood it will drive the wood in the direction in which the nai! is pointing. Consequently, if two bnards are to be nailed on to joists or battens, the joint between the boards can be brought close up by first nailing one of the boards and then nailing the sccond with the nails inclining toward the hoard already fixed This is illustrated in Fig. 2. Another way of driving nails is known as dove tailing, in which each nail is driven at an angle into the wood so that it can be drawn out readily A common method of driving a nail to prevent its being withdrawn is known


Nail. Fig. 2. Nails set diagonally draw a joint up ighty. Fig. 3. Clenching a nail right to left
are shown the three sfages in the process
right through the material so that about $\frac{1}{2}$ in projects on the opposite side. This portion is then stmack with the bammer near the point so that the pointed end of the nail is hent over. Further blows drive the remainder of the projecting portion down into the work. The object of first knocking over the point is that the point may then be driven into the wood, thereby holding the clench firmly.
The work to be nailed should rest upon a solid base, as it is very difficult to drive a nail into a springy piece of wond. If no support is availahle, it will be neceasary to hold a hammer, or some heavy tool; bshind the place where the nail is to be driven through the thinner piece of material into the thick.
Splitting of the wood is a frequent cause of trouble. It is always advisable to make small holes with a bradawl through wood that is liable to split, and then drive the nails through the holes. In very hard wood it is sometimes difficult to drive a nail unless a hole is bored first, but in this case the hole should be somewhat less than the diameter of the nail, so that the latter may get a firm hold. Another point is to a void having two nails in the same grain of wood. The nails should be rig. zagged, or staggered. Re in Fig. 4, so that each nail is separated by as much untouched wood as possible.

Secret Nailing. When several hoards are to be laid and nailed so that the joints do not show a great deal, a method of diagonal nail. ing may be used. The nailscan then be driven diagonally into the edge of one plank so that when the next plank is placed against it and driven home the nail will be invisible. Generally this method is adopted with rcbated boards on that the scconil plank may interlock the
 first Another method of secret nailing consists of making an incision into the wool with a tool like a very line gouge. This raises a shaving, which is bent hack and the nail driven in the cavity and punched well down, as in Fig. 5. The shaving is glued and then pressed back into position, and after the glue has set the face should he sandpapered till smouth and all traces of the nail is lost. In good work the nails are always punched helow the surface of the wood, and cspecially should this be done when the work is to be finished by painting, as the nail holes may then be filled with putty or one of the numerous stoppings on the market Nail punches or nail sets are made for this special purpose, but almost any plain punch will answer. Cross nailing, Fig. 6, or skew nailing, as it is sometimes called, is generally used to fix the uprights on to the bottom pinte. It consists in driving the naile diagonally through the lower part of the upright into the bottom plate.

NAILS: Their Care. Growth at the root of the nail constantly pushes it forward, hence the need for cutting or filing. In the case of finger-nails the points may be rounded ; toe-nails must be left square.
Nail-biting is a habit with many children, sometimes persisting on to later life, and mothers cannot be too decided in checking it while the child is young. Something bitter, such as aloes or quinine. should be put on the finger-tips. If this fails, mustard may be used, but only while the mother or nurse keeps watch, as he might put his fingers to his eyes. A child who is inclined to bite his nails will generally do so on first waking


Fig. 4. Corfect spacing of each nail in different grain of wood. Fig. 5. Secret nailing, left to right: Chip turned up: nail partly driven home; punching nail home; opposite arrow, chip pressed home on nail head.
Fig. B. Skew nailing an upright to a hoizontal member
from sleep, so it is well to put the hands in gloves when putting him to rest.

If nails are filed daily with an emery board, instead of cutting them once a week, they will be kept nicely shaped and always the desired length. The skin will not encroach unduly on the nail if an orange stick is dipped in peroxide of hydrogen and passed all round the cuticle, pressing it down. A well-manicured look is thus easily maintained, especially if occasionally the nails are first soaked in soapy water and then a cuticle cream is applied to solten the skin before using the orange atick. A nail varnish can be made of paraffin wax I drachm, chloro. form 2 fluid ounces. A good cuticle cream is composed of powdered white castile soap 1 drachm, white vaseline $\frac{1}{2}$ ounce. Discoloured nails can be bleached by mcans of peroxide of hydrogen or lemon juice.

Abscess in the Nail. An abscess may form under the nail or at the root as the result of some injury, or a small infected wound such as may be caused by a splinter of wood. The pressure of the confined pus (matter) causes severe pain. When an abscess threntens, the end of the finger should be wrapped in lint soaked in hot solution of boric acid (one teaspoonful to the pint of water). The lint should be removed frequently or covered with oiled silk or a large rubber finger-stall. The hand should be kept well raised by means of a sling. If the abacess forms, relief can be obtained only by haring it opened and letting the matter escape. Inflammation of the nail matrix, or onychia, may arise from several causes, including infection by the microbes which produce suppuration.

Toe Nails. With ingrowing toc nails the edge of the nail, by pressing against the soft skin near it, may set up great irritation. They are caused chietly by weuring boots and shoes which are too narrow. Harm is also done by rounding the toe nails when cutting.

Keep the edge of the nail from getting em. bedded in the flesh by forcing a small piece of cotton wool under it. The pressure can be eased by soaking for 10 min . in very hot water, and gently scraping the centre with a sharp knife. It will be easy to raise the corner of the nail and put in the cotton wool, which should be well pressed in under the nail. This wool must be renewed morning and night. Keep the toe nail out square and in a perfect state of cleanliness, and wear sufficiently easy boots and shoes, and the trouble will disappear.

The Nail Brush. The choice of a nail brush ranges frum a very plain, cheap article to the superior varieties, which may be regarded as a better investnient.

A convenient addition is often made by firing a thin brush of one row of short, stiff bristles flat to the back, this being helpful in cleaning the under surface of nails. A concave back may have two or threc rows of knots so arranged that each row brushes a different part simultaneously. In all qualities the knots may be either punched into holes by a machine process or hand-made, the knots being drawn into position by wire.
Ton hard a nail brush is deleterious to the nails. On the other hand, a brush of which the bristles have become soft can be slightly stiffened by being rinsed in cold water after each time of using. The brush should never be allowed when wet to rest on the back, as if this is done frequently the bristles are apt to rot at the root. See Brush; Foot; Hand.
NAINSOOK : The Material. Although a very thin cotton material, a good quality of nainsook wears fairly well for children's finer undergarments. It has not quite the strength of a cambric made with more threads in the square inch and should be washed and ironed with extra care.

## Names: Some Legal Considerations

## With Suggestions on the Choice of Christian Names

This contribution concludes with a list of some of the more popular Christian names in use in Great Britain with the meaning of each. See Christening ; Naturalization

The names given to a child, together with its surname, are told to the registrar when the birth is registered, and are recorded by him. When a child is baptized, its Christian names are pronounced by the clergyman or other person officiating at the baptism, and are cntered in the parish or other register. The names are thus on record for all time, and cannot legally be changed except by deed poll, although in practice many persons add an additional name to those given at baptism. This should be done cautiously, however, as it may be difficult for a man who has made himself known as Thomas Wilson Jones to prove that he is the Thomas Jones entitled to a legacy of $£ 5,000$ under an uncle's will.

Changing a Name. In Great Britain an alien is not allowed to change his name without the leave of the home secretary. A British subject can, however, change his name and can in effect call himself anything he pleases. This, however, is subject to the requirements of the Business Names Regis. tration Act, which makes it compulsory for anyone who carries on a business not in his own name to register the name of the busincss and his own name as proprietor, and to put his real name on all his busincss notepaper, cte.

Subject to this, anyone who wishes to change his name may do so without any formalities at all. If, however, he wishes for any reason to put the fact on record so that it sball be easy to trace the fact that he has changed his name, the easiest. way to do it is to have a deed drawn up in which he declares that he, John Scott, intends for the future to take the name of Moncrieff. This deed he can enrol at the royal courts of justice. He will be well advised also to advertise in a fow leading newspapers. There is a 10s. stamp on the deed and a small fee for enrolment. Some persons, however, obtain a royal licence, the fee for which is about $£ 40$.

Wills and settlements relating to family properties sometimes contain what is called a name and arms clause. The estate is given to somebody, very often a man who has married the female heir to the property, upon the condition that he shall assume for himself and his children the name and arms of the original family. In such a case it is proper to apply for the royal licence and also to the College of Heralds for a grant of the arms.

Glving a False Name. Anyone, other than an alien and except under the Business Names Act, may call himself any name he likes, unless he assumes a name which he has never previously been known by for purposes of deceit. In such cases he may easily find himself prosecuted for obtaining money or goods by falsely pretending he is Jones when he is really Smith.

It is also an offence to give a false name on applying for a licence or publication of banns for purposes of marriage. But supposing a man for some reason of his own, as, for instance, that he does not like his father's name, chooses to call himself by another name, any legal transaction that he enters into in his adopted name is perfectly good.

No one may change his Christian name, i.e. the name in which he is baptized. But anyone can use any first name he pleases and give up using his Christian name. If within 12 months of the registration of a birth the parents wish to add a name, as, for instance, on baptism, or a mistake has been made about the name, the new name can be added by the registrar of births But if, however, the new name is one which has been added on baptism,
a certificate from the clergyman or minister must be produced. Every limited company must show in all trade circulars and letters the present Christian name and surname of each of its directors and also any former Christian names and surnames, nationality if not British, and the nationality of origin if he lias changed his nationality.
Christlan Names. An enormous number of Christian names, both for boys and girls, are in existence, and parents are sometianes bewildered when thcy have to choose a name for a child. This is especially so in modern times, because so many children are given two or thrce Christian names. In former days one was deemed sufficient. The choice is usually fairly easy in the case of an eldest son or daughter, for there is almost always a family association with ccrtain names.

Long association has in practice given certain families a claim on certain names. The eldest son of the Knightleys must be Rainald, and the eldest son of the Wakes, Hereward. The Percies have a long associa. tion with Algernon, the Bridgemans with Orlando, the Curzons with Nathaniel, and the Yorkes with Philip. Parents bearing the surname of Ralcigh can hardly refrain from naming a son Waltor, and the Sidneys have a like affection for Philip. Some persons like to go back to a fairly remote ancestor for a name. An early Winston Churchill accounts for the names of the English politician and the Amcrican novelist.

## Reasons for the Choice

Associated with this practice is that of giving children a surname as a Christian name. This is frequently the maiden name of the mother; less frequently that of some dis. tinguished family to which the child is allied. This accounts partly for the use of Percy, Douglas, and Neville as Christian names, and for the linking of Gascoyne Cecil, Spencer Churchill, and Godolphin Osborne.

Millions of persons, however, are without known associations with the distant past, while younger sons and daughters must be named, for boys cannot, in practice, like the ex-princely family of Reuss, be all named Heinrich and then numbered.

A favourite plan is to give a child a name or names borne by a godparent, and this, a practice of great antiquity, accounts for many Christian names Another plan is to name a child after the saint on whose day it was born. Thus a child born on Oct. 18 will be named Luke if a boy and Lucy if a girl. A boy born on Nov. 30 will be named Andrew. Associated with this is the practice of naming a boy Noel if born at Christmas, and a giri May or June if born in one of these months.

Fashion, however, plays a large part in the naming of children. Sometimes it shows itself in vagaries which cannot aliways be explained. A name, Joan or Alan, suddenly becomes popular. At other times the fashion can be traced, and in this royalty plays a large part. This accounts for the popularity of George and Charlotte for a century after the marriage of George III; for the later vogue which Albert enjoyed, and the still later one of David used in the royal family for the Prince of Wales.

Great men, too, leave their mark on Christian names. The vogue which Arnold and Stanley enjoyed in the 19th century was due to the fame of the schoolmaster of Rugby and the explorer of Africa. Gordon is another case in point, while later Peter became popular owing to the play Peter Pan. The Great War
led to a demand for names borne by the soldiers and sailurs who distinguished themselves during that period.

The most popular Cbristian names, however, are still the simple ones originally borne by the saints, John and Mary, Margaret and Thomas, for example. This is due, perhaps, less to their religious associations than to the fact that they are found in a!most every family circle, and are, therefore, sure to be chosen very frequently. Allied to this are the patriotic associations which are responsible for the frequency of Rovert and Andrew in Scotland and Pritrick in Ireland.
One class of girls' names consists of those which are formed from masculine ones, thus following a Roman model. These include the many feminines of John-Joanna, Jane, Joan, and others-while Philippa, Josephine, and Wilhelmina are other examples. In this way girls can perpetuate the name of a father or a distinguished member of the family. Another class of names for girls is taken from flowers and plants, Rose, Lily, and Ivy, for instance, the one chosen being perhaps the mother's favourite flower. Another draws upon the various Christian and other virtues, whether in English, as Hope and Faith, or in Latin, as Vera.
In choosing a name it is well to consider whether the child can in this way be linked to the family to which he or she belongs by blood. On the other hand, this should not be carried too far and relationships with great families assumed without examination. If the names of the near rclations, parents, and grandparents are alrendy taken by elder brothers and sisters, a search may be made for more distant ancesturs.

A consideration of inportance is euphony. Preference should be given to a name that sounds well when linked with other Christian names and with the surname. Henry Higgins or Robert Robertson do not sound particularly well ; still lese so does Montagu Tigg. Combinations such as Victoria Alexandra and Irene Phyllis also lack cuphony. On the contrary, Mary Morrison and John Lindley have simple dignity. Algernon and Reginald go well with some surnames but ill with others, and the same can be said of many other names. In some cases the obstacle to euphony is in the surname, and the choice of a Christian name should avoid accentuating this. Parents and godparents should also avoid giving children names the initinls of which may form an unpleasant word. For instance, a girl whose surname is Dawson or Davis should not be named Margaret Alice, nor a boy with the surname of Gillespie be christened Douglas Orme.

Below we give a list of many of the names in general use in the British Isles for both girls and boys, with the meaning of cach.

Names for Girls


Helen-torch (Gr.) lllda-battle malden

## renc-peace

rig-a ilower

| Jane or Janet) |  |
| :---: | :---: |
| Jean | fem. of |
| Jesale |  |
| Joyce-merry |  |
|  |  |
| Kate 1 |  |
| Katlierine | Catherine |
|  |  |

Katlierine Catherine
Kathleen-Irish form
Kathleen-Irish form of
Cathicrine Catherine
l.aura-laurel (Lat.)

Lily or Lillan-Uly
Mabel-lovable
Madge-dim. of Margaret Margaret-pearl
Marjorie or Marjoryforn of Margaret Marion-form of Mary Mary-bltterness Matjlda-mighty malden
Maud or Maude-form of Matilds
May-dim. of Mary or Margaret
Mililred-Rently strict
Millicent-strong in work Murlel-myrrh

## Names for Boys

Adam-man (Heb.)
Adrian-from Adria (the town)
Alan or Allan-cheerful
Albert-nobly bright
Alexander-helfer of
men (Gr.)
Alifed-wise in counsel
Algernon-whiskered
Andrew-manly (Gr.)
$\underset{\substack{\text { (Celt) } \\ \text { Agreat virtue }}}{ }$ Anthony
Anthony or Antony-
worthy of praise
Archibald-holy prince
Arthur-noble
Basll-kingly (Gr.)
Bernard-bear-like
Bertrain-bright raven
Brinn-3trong (Celt)
Cecil-blind
Chnrles-man (Tent.)
Christopher-Christ bearer
Clarence-famous or bright
Claud or Claude-lame Cuthbert-great splen-(•rll-

David-beloved (Heb.) Denis or Denye or Dennla -from Dlonysos (Gr.) Donald-proud chlef Douglas-dark water Duncan-brown chief
Edgar-rich spear Edmund-great protection
Edward-rich guard Eric-powerful
Evan young

Francla or Frank-free
F'rederick-peaceful ruler
Geofirey-God's peace
George-husbandman
Gerald-firm apear
Godirey- (lod's peac Guy-sense (Celt)

Harold-warrior might
$\left.\begin{array}{l}\text { Harry } \\ \text { Henry }\end{array}\right\}$ home ruler
Herbert-bright warrior
Huniphrey-support of peace
Yan-Gaellc form of John lvan-Kussian form of John
James or Jacob-supplanter (Heh.)
John-God's gift (Heb.) Joseph-increase (Heb.) Julian or Jullus-downy

Nancy-grace (Heb.) ar diml. of Honorla or Eleanor

Olgn-looly or light Olive-fem. of Oliver

Pamela-all sweet ness Patience-patience
Peggy-dim. of Margaret
Pliyllis-green bough (Gr.)
Polly-
Polly-form of Mary
Prudence-prudence
Kachel-a ewe (Heb.) Khoda-rose (Gr.)
Rossilind
Rose or Ross I rose
Ruth-friend (Heb.)
Sarah or 8ara-princess (Heb.)
Shells-blind (Lat.)
Sophla or Sophie-wisdom
Stella-star
Susan-lily (Heb.)
Sybil or Sybyl-prophetess
Uraula-little bear
Vera-truth
Violet-violet
Winifred-friend of peace

Lawrence-laural crowned
Leonard-llon strong
Leopold-prince of the people
Lewls-famous in war
Lionel-young lion lewellyn-lion like

Maloolm-servant of Columbla
Marcus-English variant of Mark
Mark-sprung from Mars Marmaduke sea leader Martin-of Mars, warlike Matthew-God's gift Maurice-Moorish (Lat.) Michael-Uke God (Heb.)

Nicholas-victory of the people (Gr.)
Noel-Christ mas Norman-Northman

Oliver-ollve tree Oscar-bounding warrior Owen-young warrior wen-young warrior
(Celt)

Patrick-noble (Lat.)
Paul-small (Lat.)
Paul-amall (Lat.)
Percy or Percival-mean ing doubtful
Peter stone or rock Philip-lover of horses

## Ralph

Randolph $\}$ wolf of fame Raymond-wise protectlon
Reginald-great sense Richard-stern king Robert $\}$ bright in fame Robln $\}$ bright in fam Roger-spear of fame Ronsld great sense Rowland or Rolandfame of the land Rupert-form of Robert
Samuel--asked of God (Heb.)
Slinon-abedient (Hel.) Stanley-a place name Stephen-crown (Gr.)

Theodore gift of God (Gr.)
Thomas-twin
God (Latonoured by

Victor-conqueror (Lat.) Incent-conquering (Lat.)

Walter-great warrior
Wilifred-great peace illiam-helmet of reso Iution

## Name Plates for Private Houses

Graceful Styles and Novel Ideas for Town and Country Homes
Several ways of making name plates are suggested in this article and practical directions are given. See also the articles on Chip Carving: Lead Art Craft: Lettering: Repoussé Work; Stencilling: Wocdcarving

While the chief use of a name plate is to indicate the house as a guide to visitors and tradesmen, the decorative side of this accessory need not be overlooked. In choosing a style the type of house will be borne in mind. What would look pretentious on a cottage porch may be quite in keeping with the entrance of a large house on the outskirts of a town, and what would be somewhat aggressive on a terrace door, will be pleasantly arresting on that of a seaside bungalow.
In town streets of any length it is always advisable to have a number as well as a name on the gate or door. There is nothing so irritating for those visiting a house for the first tinie as the search for a name only, without the assistance of a number, in a row of villas which all look alike. It is also a convenience where the front door is only a little way from the gate, and the latter does not mask the former, if name and number are repeated on the door. Taxi-drivers and tradesmen frequently only look at doors in such cases. At night the name on the door can be lighted by a lantern fitting, or, where there is a porch by a lighting fixture in the roof of this. If there is a glass fanlight the number can be written on the middle pane, or better still for visibility, on a glass lamp projecting from it.
For houses where the front door is concealed behind a high gate and brick walls the name plate can be placed symmetrically to balance the letter box or number, or can be affixed to the gate where this is of wrought iron, the plate taking the form of a circular iron disk with the name in neat lettering.
As a general rule, in choosing a name plate for a town house the simpler it is the better


Name Plate. Fig. 1. Name plate for a town house which, by means of plain but dignifed lettering, does not detract from the beautiful design of the doorway chosen.


The first illustration shows an example of a suitably designed and perfectly placed neme plate for a decorative door. For the 18th century style of entrance the name plate looks best either just above the door, or on the upper part of the door itself when the panelling permits. Displays of name and number on the walls at the side of the door, or painted on the columns, when such an entrance possesses these, take away from the beauty of the doorway. Any exaggerated type of lettering would be disfiguring.

In the country, signposts and wrought iton brackets are sonetimes utilized to carry more ornamental name plates. Such a stylc can be delightitul for a picturesque stone-tiled house or a thatched cottage, as shown in Fig. 2. The name plate illustrated is cut out of wrought iron plate. It will never wear out, warp or crack, and such plates can be obtained in a variety of designs. Painted signhoards are suitable and gay for a seaside bungalow, if carried out in a modern design descriptive of the title, and liave the advantago of being little likely to be passed by unnoticed when suspended from a wrought iron bracket. As the colours used to paint such a sign will be exposed to the weather, paints with a hard glossy surface should be

Suitable for a sedate littlo house, either in town or in country village, is the nane plate shown in Fig. 3, with its white painted wooden letters on a base which matches the door in colour. Perfectly simple in form, it is the position of the plate which attracts the eye in this case and is far more effective placed on the wall than on the door itself. On a chestnut pale gateway, or any rustic most suitable.
Constructive Details. For a house the size of a name plate varies not only in accordance with the amount of the lettering thereon, but also with the style chosen. The smallest size is about 10 by 3 in. Brass plates used for business or professional purposes vary from 8 by 5 in . to 18 by 12 in . on the average, and are engraved with one line or two line lettering in sizes from $\frac{1}{2}$ in. to $3 \frac{1}{2}$ in. Name plates are also employed indoors for various purposes, to distinguish particular 100nns, or for drawer fronts and boxes.
Name plates can be made up from various materials, the choice being governed to some extent by considerations of durability and appearance. For exterior work oak, copper, brass, and lead are good both on the score of durability and of general suitability. Urnamentation may be effected by various processes. In the casc of a wooden name plate, the letters may be incised as in Fig. 4, or may be raised by carving. Another method is to cut the letters to shape from comparatively thin material, and apply them to the plate. Such a plate is seen in Fig. 3. Here the wooden letters are painted,


Name Plate. Fir. 2. Name plate on a sign-holder Name Plate. Fir. 2. Name plate on a sign-bolder design is cut out of wrought iron plate Courtesu of Capt. G. C. Clarle
but wooden letters may be left in the natura colour and glued and tacked to a dark atained luase, or the letters might be dark and the base light. Poker work and chip carving are applicable to wooden plates; stencilling and painting in colours are also employed

A name plate may be made in wrought iron Pierced metal, and applied metal lettors are other processes. For brass and copper, engraving is generally adopted. Leaded letters applied on glass is another suitable
method of making a name plate, which is described in the article on Lead Art Craft.

Wooden and lead letters can be obtained in various aizes. All that has to be done with these is to get a haseboard, say a piece of oak, and clean it up amooth in the vice, and mould or otherwise decorate the edges. The lettering should be set up by temporarily fixing a batten towards the lower part of the plate and placing the separate letters upon it, arranging them until the space between them is accurate and pleasing to the eye, noting each of the characters, marking their position on the basehoard, glueing and pinning if necessary. When dry, the edges of the letters can be modelled or left plain, and the background coloured, oiled or polished. If the name plate is not exposed to the weather, the letters could be cut from good plywool. In making a repoussé name plate the deaign should be drawn and a tracing made. The latter is transferred in reverse to the back of the metal plate, which is then mounted on to a cement block and the work of eminossing proceeded with The article on Repoussé work should bc referred to

A simple way to make a name plate for a pratected doorway is to build the letters up from thin strips of from thin strips of Fig. G. Fixing the letters by means of glue wood, such as can be obtained for atrip work. to secure good nankeen waistenats. In order The lettering is marketal ask and and pieces of the wood strip cut off to the laundered by immersing it in cold salted right length. These have then to be glued and water for 24 hours before washing and pinned to the haseboard. The construction is hanging it up to dry without wringing it.


Name Plate Fir. 3. Suitable for a small house standing baok from the stret, the colour contrast of the unobtrusive name plate catches the eye. Fig. 4. Incised lettering on a wooden base forma a simple but effective name plate for the chestnut pale Rateway of the coltage type of residence Humplireu \& Vera Joel

NANRGBN LIIY. This is the popular name of the beautiful hardy lily (Lilium testaceum) that owes its name to its nankeenyellow flowers. See Lily.
NAP: The Game. Nap or Napoleon is a card game for any number of players, but it is best played by five or six. An ordinary pack of 52 cards is used, and the cards rank as in whist.

In the simple game of nap each player is dealt five cards, and the eldest hand has the right of first call, the call passing as usual to the left. Each player calls according to the number of tricks he can make up to five tricks, or nap. Any player who cannot beat the previous player's call says " pass." Whoever makes the highest call has the privilege of leading, and all the other players play against him. The first card led by the player making the highest call makes the trump suit. Players must follow suit if possible, but if not may trump as desired. They are not bound to try to win a trick. The winner of each trick leads for the next.
The caller is only paid for the number of tricks he declared, though be may make one or two more. Similarly, if he fails to make the number of tricks nominated, he only pays on the amount of his call. The game is usually played for money, and payment given for each trick. Thus at halfpenny nap a player will receive $1 \frac{1}{2} d$. from every other player for a successful call of three, and pay out $1 \frac{1}{2} \mathrm{~d}$. to every player if he fails to make his call. Usually, on the Napoleon call, he receives double stakes for winning, i.e. 5 d . at halfpenny nap, but only pays out normal stakes, $2 \frac{1}{2}$ d., if he loses. Often even money is paid out on this call, i.e 6 d . and 3 d . respectively.

Variatlons of the Game. The above is the ordinary game of nap. In the first variation there is a call known as Wellington. By this call the player undertakes not only to take all five tricks, but at double the usual stakes Wellington can only be called if nap has already been called by a previous player.

An adaptation from solo whist is the call misery, by which a player undertakes to lose all five tricks. There are, of course, no trumps, and the call ranks between the ordinary calls of three and four tricks, and is paid for as for a call of three.

Sir Garnet is an extra hand of five cards dealt face downwards on the table. Each player in turn has the privilege of taking the hand up and combining it with his own, throwing away the five cards he does not want, but any player who does this must declare nap.

NAP CLOTE. An old favourite for winter coats, woollen nap cloth is warm without being unduly heavy. The nap is produced by a process of rubbing, and the motions of the rubbing surfaces control the pattern. Besides the pimples, large or small, of Petersham nap there are also wary naps, known sometimes as Elysians or Witney naps.

The weakness of nap cloth is that the surface rubs amooth at the points of most friction, and in the cheapest qualities this defect soon appears. Nap cloths aro made at widely differing prices, and the best are much the most satisfactory in the end.
NAPRTREA. The liquid product obtained by distilling wood or paraffin is known as wood naphtha or mineral naphtha. Wood naphtha has solvent properties similar to methylated spirit; it is used by French polishers as a solvent for shellac.
Mineral naphtha is not so volatile as petrol, but it possesses similar cleansing properties, and can be


Naplin. Wethod of mating the bishop style. Pis. 6. Naplin vith one-third of width tarned op. Fig. 7. Upper single layor iolded between lower layers. Fig. 8. Threo-iold length with onds tonching. Fig. 9. Top right and bottom left corners turned to centre. Mig. 10. Naphin turned over. Fig. 11. Top folded over to bottom. Pig. 12. Turned over, dotted lines showing fold to which the point E must come. Fig. 18. Point E tacked in. Fis. 14. Naphin turned over again. Fig. 15. Finished shape resalting from other point being tacked in

in. $\mathrm{Ba}^{2}$
made slightly to overla!, and then soft soldered, as in Fig. $3^{\text {a }}$ Allowande for the jointing must be made when fixing the proportions of the strip

Having soldered the joint, all six iaces should be cleaned up with fine emery paper and ncatly grained. Then the finest grain emery paper should be atrucli across the surface in one direction only until the whole exhibits a uniform surface. The next step is to decice upon n suitable design, such as that shown in Fig. 1,
fold lengthwise in two so as to inake a crease, and turn it back again. This crease is represented by the dotted line. From the middle, fold over the right side as seen in Fig. 2; then turn the napkin over and do the same thing on the other side This produces Fig. 3. Turn the napkin over again, foid up the bottom ends, Fig. 4, and then complete the shape by taking the bottom corrers and inserting them well into each other.

The bishop, style is achieved by laying the napkin Hat on the table and bringing the bottom edge up in one fold, making the size of the whole one-third less. A reference to Fig. 6 will make the process clearer. Fold the single layer of the upper part in between the two layers of the lower half, making three thicknesses, as in Fig 7, and then, by creasing over, find the centre of Fig. 7, and fold in the edges at each side to meet this line, Fig. 8.

The top right-hand corner must now be brought down, and the bottom left-hand corner up, as in Fig. 9. Turn this over and lay it on the table according to Fig. 10, and fold the top over to meet the buttom, Fig. 11. Turn this over to get Fig. 12. The dotted lines show the fold on which the right-hand part must be brouglit over, the angle E being tucked under tho folds. This gives Fig. 13. Turn the whole over again to produce Fig. 14. Tuck in the right-hand corner of this exactly as in the last process and the finished shape, Fig. 15, will result. This must be opened out by pushing the fingers into the opiening underneath. See Drawn Thread Work; Embroidery ; Hematitch; Linen ; Table Laying.

Napkin Rings. The most important point about a naphin ring is that it should be individual, so that napkine shall not get mixed u] when laying the table. Various devices are adopted for distinguishing rings, the simplest being to have an initial or monogram engraved, carved, or painted on them. Sometimes they are numbered, or, in the case of childien, wooden rings are painted with some simple design and with the child's name in block letters. More elaborate enamelled ringa may have a different design on each one of a set of rings, or they may have the same design but a different colour for the background
Siniple but pretty rings are inade of strips of white linen, cut with one pointerl end and just long enough to go round the napkin when rolled up. Each ring is fastened by means of a loop and button, and has $a$ different Hower, fruit or bird design em broidered on it. A tiny single hem is turned up all round and the edges are buttonholed.
Wooden rings can be obtained for enamelling or painting. Having sandpapered the ring, the selected design may be stencilled and painted in oil colours, afterwards


Fig. 2. Showing how to bend the metal strip on a large hexaganal nut held
in the vice. Fig. 3- Soldering the ends together. Fig. 4. Application of prepared enamels with a small brush. Fig. 5. The inished ring
varnishing the ring. Bronze colours may be and carry it out with some of the specially
used or the ring may be decorated with Chinese prepared enanel as descrihed in lacquet used or the ring may be decorated with Clint by piercing or by repousse work Instructions for carrying out these processes will bo found under their own headings.

Making the Rings. A pleasing type of ring takes the form of a hexagon and can be made froin brass, pewter, copper or silver. A sct of such rings could be worked out using a different predominant colour for the baclsground in eaclı case.
Suitable proportions are given in Fig. 1, and it will be seen that in the first stages the metal is simply a strip. It should be perfectly tlat and accurately marked out where the bends are to be made.
The next stage is the bending of the strip, as shown in Fig. 2, to the correct angle This must be bent very carefully, otherwise the ring will be unequal and look very bad. A large size hexagon nut such as is used by engincers for large-size bolts is very useful as a guide in bending
 vori on metal in page 681, or with the regulation stove enamel. The paint is applied with a very small brush in the manner illustrated in Fig. 4, and naturally calls for the greatest care if a satisfactory result is to be achieved. When this part of the work has been finished, the ring must be dipped in laçuer varnish in order to pacserve it from the atmosphere The result is seen in Fig 5. See Embroidery: Enamelling: Lacquer Work: Piercing; Re-


NAPKIN: For the Baby. Turkish towelling is the best material to use for infants' napkins, owing to its a bsorhent quality. The squares may be bought separately or the material may be purchased by the yard and cut up and hemmed at home. See Baby.
NAPLES CAKE.

This is a mixture which is buked in six rounds, each rather less than $\frac{1}{2} \mathrm{in}$. thick When the layers are coolied and cold they are piled one on the top of the other, with a lilling of preserve between them. The preserve must be rich and should be passed through a hair sieve, or ininced nuts and whipped cream may he used us a filling

The top of the cake is decorated with an even coating of almond icing and finished with sugar icing and a horder of crystallized fruits or flowers, as shown in the illustration in the next page. For the mixture $\mid \mathrm{lb}$. fine flour will be required, also $\frac{1}{2} \mathrm{lb}$. butler, $\frac{1}{2} \mathrm{lb}$. castor sugar, the grated rind of a lemon, one teaspoonful orange-flower water, 7 oz ground sweet almonds, and 1 oz . pounded bitter almonds. Rub the butter into the flour, add the other dry ingredients with a pinch of salt, mix well, and then make into a paste with the yolks of 4 egge.

The mixture is made up into rounds and baked in a slow oven till crisp and firm and


Naples Cake, consisting of lagers of cake with fllings of preserve, the top layer being iced
about the colour of shortbread. Small flan hoops may be used to keep the rounds in shape. See Almond Paste; Icing.
NARCISSUS. This is the innst popular of all the spring-flowering bulbs; there are many types or classes and numerous varieties of each type. The classification is based on the length of the cup or crown, the central part of the flower, in comparison with the nuter psurt called the perianth
The first class or group is the trumpet, in which the trumpet is as long ns or longer than the perianth Varietios in this eroup are usually called daffudils Soine of the best are King Alfred, Emperor, Empress, Horsfieldii, Glory of Leiden and Mime. cle Graaff.
The second group of incomparabilis or chaliceoupped narcissi consiste of flowers in which the cup is not less than one-third the length of the perianth Populas varieties are Sir Wethin, Beauty, Gloria Mundi, Stella Superba and Frank Miles.
In the Barri or sta, narcissi the cup is less than onn-third as long as the perianth. Favourite varictios are Barri ounspicuus, Albatross, Agnes Barr and Seagull.
The Leedsii narcissi are beautifll flowera with pale perianth and cup. Mre. Langtry, Waterwitch, Duchess of Westminster and Minnie Hume are well known varieties. Then there are the poet's narrissi, jonquils, double daffudils, and various species or wild types, among which are many charming miniatures.
In recent years innumerable new and beautiful varieties have been raised; some of them cost as much as 30 guineas a bulb. The greateat advance has been in the intense and brilliant colouring of the cup or crown, which iq in striking contrast with the pale or yellow perianth. One or t.wo new trumpet daffodils are of pale salmon colouring, and no doubt as the vears pass this will be intensified.
Narcissi thrive in ordinary soil, but flourish best in that of loamy character, which does not dry out in summer. The bulbs whould be planted in September-October, about 3 in. deep. They are invaluable in spring flower beds, in the herbaceous border and shrubbery, and look particularly well in grass. If grown in grassland the grass must not be cut until the leaves have died down. Bonemenl, to the amount of 2 oz for every square yard, is the best fertilizer to mix with the soil. The bulbs may remain undisturbed for years, until they become orowded; they ought then to be lifted in July, separated, and replanted at once or in early allumn


Narcisaus. Blooms of the lavourite

In Pots and Bowls. Daffodila and narcisa make admirable pnt plants for the greenhouse in early spring. The bulbs should be potted in September-October, in loamy soil, placed out of doors and covered with old sifted ashes In six or eight weeks they will be well rooted and should be taken out, shaded for a fow days and then placed under glass. After the flowers are over the bulhs may be planted out.

Narcissi and daffodils do well in bowls of fibre in the home: they should be kept in a cool, dark jlace for six weeks before being brought to the light. The bunch-fowered narcissi may be grown in bowls of fibre or in bowls of pebbles and water
A few of the most beautiful of the minia ture kinds, suitable for well-drained snil in the rock garden, are angel's tcars daffodil (Narciseus triandrus). hoop petticoat daffindil (Narcissus bulbocodium), and Narcissue cycla mineus. These are also admirable bulbs to grow in pots in the unheated greenhouse

Pests of the Bulb. The chief pest is the bulb mite. The simple romedy is to dust the affected part with flowers of sulphur. To bulbs in the ground the application of a tepid solution of sulphide of potassium, 1 lb . to a quart, is recommended.
The narcissus fly sometimes affects the bulbs. The presence of the fly can be detected by pinching the neck of the bulb. If the neck feels soft, the bulb should be cut open at the top and the eggs taken out and burnt. There is, of course, a risk that the bulb will be killed also, but this is a risk that is necessary to run for the sake of the others. It has been found by experiment that immersinn of bulbs in hot water for one hour at a temperature of $110^{\circ} \mathrm{F}$. is fatal to the larvae of narcisaus flies. This investigation has been carried further, and developed also in the direction of eelworm control As the latter is the more serious pest and most difficult to kill, the treatment found efficient for its eradication may be adopted as a combined measure for both eelworm and narcissus fly Jarvae. This consista in soaking the bulbs at a temperature of $110^{\circ} \mathrm{F}$. for three hours. Sec Bulb: Daffodil ; Flower Garden : Jonquil, etc


Nasturtium Cultare. 1. Seeds correctly sown. 2. Seedlings ready for planting out. 3. Support for climber. 4. Planting on wall: a, boards.; to carl roots round pot. 9. Roota ourled and top dressing (c) added

NARTHECIUM. A hardy herbaceous, iris-like plant, Narthecium ossifragum, the hog asphodel, is suitable for moist snil by the side of ponds. Planting is done in spring or autumn in bnggy peat, or ordinary soil mixed with annd and leaf-mould. Planta are best propagated by division in apring or autumn. Narthecium grows 10 in. high and bears yellow flowers during July.

NASAL CATARRH.
Inflammation of the lining membrane of the nose is usually acconipanied by a mucous discharge, and hence is known as catarrh. This may occur in an acute or chronic form, and be due to such irritants as dust. snuff, tobacco smoke, or other irritating vapours, or to microbic infection, the most frequent example of the latter being the common cold.
In acute cases smoking should be discontinued, the room should be kept at an even temperature, though well ventilated, while quinine and other remedies prove useful when given inwardly. A chronic nasal discharge calls for douching or spraying, and probably surgical treatment of sources of irritation within the nose. See Cold; Nose.

## Nasal Douche. See Douche

NASTURTIUM. The most important of the true nasturtiums is the watercress, but the name is commonly used to describe the annual tropaeolums, of which there arc both climbing and low growing varieties. The former are useful for covering trellises, fences and other supports in summer; the dwarf varieties are invaluable for poor soil and dry sunny places. Seeds are sown out of doors in April, where the plants are to bloom. There are numerous varieties with blooms in yellow, orange, crimson and other showy colours. See Tropaeolum; also illus. p. 841.

Uses of the Plant. Both the flowers and leaves of the nasturtium plant are used for salad making, and as a filling for sandwichos, while the seeds are pickled as a substitute for capers. The flowers, because of their bright colour, also form an excellent garnish.
Nasturtium Pickle. The seeds required for making nasturtium pickle should be gatherod ripe in dry weather, as any dampness may spoil the pickle Spread the soeds in one layer over a large dish, leave them for 1 or 2 days. and turn them about each day. Then put them into a jar and aprinkle with salt.

To prepare the pickling vinegar, simmer for 40 min . some white wine vinegar with garlic and spice, allowing 1 olove of garlic, 1 chopped shallot, and $\frac{1}{2}$.oz. mixed allspice, cloves, and mace, to each quart of vinegar. The spices are tied in muslin and afterwarde removed.
When the vinegar has simmered the allotted time, give it a quick boil up and pour it over the nasturtiums. Let all go quite cold before bottling the pickles, and remove the spices. Keep the pickle 4 months before using.

Nasturtium Vinegar. To make nasturtium vinegar, fill a widemouthed bottle with some full-blown nasturtium flowers, ndd ${ }^{1}$ a clove of garlic and a finely-chopped shallot, and pour over them as much vinegar as the bottle will hold. Let the whole stand for two monthe before


Nasturtium. Brilliantly coloured flowers of the rubbing it through a fine sieve ; then add a little cayenne pepper and salt, and keep the vinegar corked until required. See Vinegar.
NATIONALITY. In Great Britain nationality depends in the first place upon birth. A person born within the British Dominions is of British nationality, but, subject to the rule that if he be born of a father who is an alien, he cain, when he is 21 , or as soon thercafter as possible, renounce his British nationality and take that of his father.

In some countries a child takes the national. ity of the father wherever the birth takes place. so that it is quite possible for a bo to be English by English law and German by German lan. It is also possible, according to recent Jinglish decisions, for a person to have no nationality at all. If, according to the law of the state of which he was a natural citizen, he was entitled to renounce that nationality and he has renounced it, and has not acquired another nationality, then he is not a national of any country for the time being.

A woman on her marriage at once takes the nationality of her husband, and if he changes his nationality she automatically changes hers. See Naturalization.
NATIONAL MARK. This consists of a map of England and Wales in silhouette, with the words "produce of Fingland and Wales" inscribed in a circle placed centrally in the map within which circle is a design representing the Union Jack. Its object is to sccure for home.grown meat, poultry. fruits, vegetables, eggs, canned goods, etc., the same commercial advantages as are at present enjoyed by impoited supplies. Among foodstuffs to which the scheme is applied are eggs, toinatoes, apples, pears, broccoli, wheat flour, canned peas, fruits, cider, etc.
The packer is bound to state on the label of the package the variety of the article, his own name or identification mark, the grade, the date of the packing, and either the weight or the nuinber of the contents. The advantage of this lahel is that it gives the purchaser all the inforination required, and it is not even necessary for him to see the contents of an unopened packare. In 1931 a shop for the sale of national inark goods was opened in London.

NATURAL COLOUR. Any fabric which has not been treated with a dye is said to be of natural colour, but the tern is applied particularly to woollen underclothes of a grey or hiscuit colour, and to shantung silks. One advantage of buying natural-coloured clothes is that they cannot fade through exposure to the sun or lose their colour in the wash, as most dyed materials may do.
The term natural colour is also applied to flesh-tinted face powders.
NATURALIZATION : The Law. Naturalization takes place where a person is made a British suhject by a certificate of the home secretary. A natural-born British subject is one born within his Majesty's dominions and allegiance; one horn out of 13ritish dominions, but whose father was at the time of the child's birth a British suhject, either by birth or naturalization; or one horn on hoard a British ship in foreign or territorial waters.

The child of a British subject is to he deemed to have been horn within his Majesty's allegiance if horn in a place where by treaty or otherwise his Majesty exercises dominion over British subjects, e.g. if horn in Turkey before the aholition of the capitulations by the Treaty of Lausanne, or in one of the independent native states wherc the British are not subject to the local native courts. A child born on a foreign ship in l3ritish territorial waters is not born British by reason of that fact.

An alien who wishes to become naturalized must make application to the Home Oltice in writing, and must show that he lias cither resided in British dominions for not less than 5 years, or heen in the service of the crown for not less than 5 years during the 8 years preceding the application. The residence required of not less than 5 years must not he less than 1 year immediately proceding the application, and 4 years in any British dominion, the whole 5 years to bc within the 8 years preceding the application. The applicent must show that he is of good character, and has an adequate knowledge of the English language. Further, he inust satisfy the Home Olfice that he intends to reside permanently in a British dominion, or else to enter or continue in the service of the crown.
Change of Nationality. When a British woman marries an alien she takes his nationality, and on his death or divorce may wish to resume her British status. The home secretary may grant to such a woman a certilicate of naturalization without any requirements as to residence; he inay also dispense with the residential qualification in other sıecial cases to the extent of not requiring that the 4 years' residence or 5 ycars' service shall have been within the 8 years preceding the application for naturalization.

An appplicant who hases his certificate on service under the crown should procure a certificate from the department under which he served (c.g. foreign oflice, colonial office, etc.). The home secretary may also treat a period spent in the service of the crown abroad as equivalent to a period of residence in Great lbritain. If a person applying for naturalization has minor children not British born, he may apply to have them included in the certificate. If they are so included they become British, but on attaining majority may inake a declaration of alienage.

When douhts have been raised the home secretary may grant a certificate to anyone upon whose British nationality questions have arisen. This certificate must state that it is given to resolve doubts, and is not an admission by the holler of a certificate that he ever was an alien.

When the home secretary is satisfied that a certificate of naturalization has been obtained by false representations or fraud, or suppres-
sion of material facts, or that the person in question has shown himself by act or speech to be disaffected or disloyal to the crown, the certificate is to be revoked.

In addition the certificate is to be rev ked if the home secretary is satisfied that the holder has during any war unlawfully traded or communicated with the enemy, or with a subject of an enemy state, or has knowingly engaged or assisted in any business which might help the enemy. A certificate must also he revoked if it is slown that the holder: was not of good character at the date of its grant. or that since the grant of the certiticate he has resided out of the British dominions, unless he was in the service of the crown abroad, or was the duly occredited representative of some 3ritish subject or firm. The home secretary shall also revoke the certilicate where the holder within 5 years of the date thereof has heen sentenced by any court in a British dominion to imprisonment for not less than 12 mont hs, or penal servitude or a tine of not less than $£ 100$

The consequences of revocation are that the person hecomes an alien again, and the home secretary may order that his wife and children shall also cease to be British suhjects. In default of a special order the wife and children remain British. But such an order is not to be made against a woman who was by birth a British subject, unless she personally has been guilty of such conduct as would have been, sufficient to justify revocation if she had held a certificate. See Name.
NAUSEA: How to Treat. The sensation of sickness or an inclination to vomit is, denoted by the term nausea; them may be retching at the same time. The most frequent causes are sea-sickness; food not easily digested or even poisonous; pregnancy (morning sick ness); olfensive smells or tastes; poisoning; indulging too freely in fermented liquors; tick. ling in the throat, as in chronic pharyngitis; the onset of febrile disorders; stones in the kidney; diseases of the stomach, ete. A severe knock on the head will often give rise to a feeling of sickness, and with some people any. acute pain, or even excitement, may produce this effect.

The patient should lie down on his left side in a quict room in a subdued light, with the head on a low pillow, taking care that he is comfortably warm, but not overheated. He should not be permitted to talk much or make any attempt to amuse hinself by reading. Slowly sipping a glass of soda-water or other effervescing drink may help to relieve the condition. Should the feeling of nausea continue, a mustard plaster may be applied to the pit of the stomach.
If the feeling of nausea still continues, or constantly recurs, it is inost important that the cause should be ascertained. If it is likely to be caused hy irritants, food, or poisons in the stomach, give an emetic consisting of a tahlespoonful of mustard in a glass of warm water. Afterwards give sips of cold or of sodawater, though some get more benefit from sips of hot water.
If the nausea is caused by tickling in the throat, or violent coughing, a draught of cold water, if it can be swallowed, will be found helpful at the moment. A gargle should be used to tone up the throat, such as the following :
Tincture of myrril
$2 d$ drams
Glycerin of buras
1 oz.
8 oz.
For the feeling of nausea induced by seasickness it is well for the traveller to lie down, if possible, on deck, but weather will not always permit of this. He should be warmly covered with a rug. Chloretone is often successful in preventing this complaint. As soon as he feels equal to it the patient should have a light meal, such as a hasin of soup or gruel, or perhaps
some cold chicken. He should avoid any rich or greasy food. See Biliousness; Gastritis: Morning Sickness, etc.

NEAPOLITAN ICE. To make this sweet. meat beat the white of an egg and add to it a tablespoonful of water strongly flavoured with liqueur. Rub llb. icing sugar through a fine hair sieve, and into the white of egg, etc., stir enough of it to make a dry yet pliable mixture which can be easily moulded in the fingers. Dust a pastry board with some more icing sugar and knead the mixture on it until it is smooth. Divide it into 3 portions, colouring one with cochineal and Havouring it with raspberry essence; another with finely grated chocolate and using vanilla essence to flavour, and leaving the third portion its natural colour and using any flavouring desired.

Roll out each piece to about $\frac{1}{8} \mathrm{in}$. in thick ness, arrange the colours one on top of the other, brushing between each slab with a little cold water. Press them firmly together, trim the edges evenly, and brush over the top with a little melted coating chocolate. Let this surface dry before turning over the sweetmeat and coating the other side in the same way. Sprinkle over all a little finely desiccated coconut, and with a sharp knife cut the sweetmeat into slices or cubes. They will require about 24 hours for drying. See Chocolate.

Neapolitan Violet. This is a favourite double mauve variety of the sweet violet. See Viola : Violet.

NECE: In Equan Beings. It is most important that nothing tight should be worn round the neck; giddiness is often due to this cause. Special care on this point should be taken by people who are inclined to suffer from apoplexy or any kind of fits, or those with short necks. During sleep always leave the neck as free as possible, and take especial care that in a child's night clothing the neckband is loose.

Stiff neck is a form of rheumatism of the muscles, generally caused by a chill. A person who is liable to suffer in this way should be careful never to sit in a draught. Discretion must be exercised in the use of furs, etc., round the neck, as they may make the part too warm and expose to chill later.

Glands in the Neck. In swollen glands the condition may arise from a bad oold, adenoids or diseased tonsils, bad teeth, or in young children from the cutting of teeth. A more serious cause is tubercalar disease. No treatment other than the removal of the cause may be noeded. The glands should be protected from irritation. When the enlargement is caused by the tubercle germ the general health should first be attended to. Do not paint the enlarged glands with iodine unless instructed to do so by the doctor, who should always supervise the treatment.

Wry neck may be an affliction from birth or have come on later. It is caused by the muscles of the neck contracting, and so drawing the head to one side. When the condition is congenital treatment by manipulation may be successful if it is commenced early enough, so no time should be lost in procuring medical advice. Full throat results from enlargement of the thyroid gland in front of the windpipe.

Care of the Neck. The back of the neck should be protected from hot sunshine, as this part of the body is particularly sensitive and blisters are painful. Sunburn and freckles on the neck may be reduced by a bleaching lotion composed of equal parts of lemon juice, rosewater, and peroxide of hydrogen. This lotion is also helpful for removing discoloration after wearing a dark fur round the neck. Suitable emollient or astringent cosmetics used for the face should also be applied to the neck to keep the skin smooth and firm.

A good line of neck is best preserved by proper carriage of the head. An ugly defect
noticeable sometimes in middle age is an accumulation of fat at the back of the neck. The following exercise will help to correct this condition and restore suppleness :
Stand erect, with hands on hips. Bend head and rotate it very slowly up towards the right, then, with head back, down to the left and round. Repeat several times and then reverse the direction, keeping up on the left and down on the right. See Face: Goitre : Stiff Neck: Throat.
NECE : In Cookery. In beef that portion of the ox which lics between the head and the chuck ribs is called the neck.
In mutton the neck portion extends from the head to the loin, and is divided into the scrag, middle neck, where the shoulder has been detached, and best end of the neck. In veal, as in mutton, all meat bet ween the head and the loin is called the neck. The scrag piece is used for boiling or stewing, and the best end can be either boiled, stewed, braised, roasted or divided into cutlets.

In pork, that part of the neck which joins the hcad is called the spare-rib, and can be roasted, or it is sometimes added to the head when making brawn. When cured as bacon the neck part next the head becomes the collar and is a good piece for boiling.

It must be remembered that meat is cut up differently in various parts of Great Britain, and that the joints are not always named alike. See Beef; Joint; Mutton; Pork, etc.
NECKLACE. Of the expensive necklaces pearl ones are the most generally worn. Filigree necklaces and varieties of designs in enamel work, or composed of medallions or jewelled plaques, are worn when fashion permits.

In choosing a necklace, whether of a valuable or inexpensive kind, regard should be paid to the shape of the neck. Women with short, thick necks should not wear large ornaments round the throat, but select a necklace which by falling well below the base of the neck has a slimming effect. A woman or girl with a thin or long neck is usually suited best by a necklace which fits the throat closely. While pearls suit nearly everyone, coloured necklaces should be chosen with due regard to the eyes of the wearer. For instance, gold and amber shades are particularly becoming to brown eyos, while jade enhances hazel eyes, and blue stones will give a deeper colour to grey or blue eyes. See Jewelry : Pearl, eto.


Nectarine. 8mooth-nkinnod type of peach which is a delicions dessert fruit
forwards through an emery cushion. In warm weather this makes them easier to use if it is done occasionally while working.
The threading of a needle is facilitated by holding the eye before a sheet of paper or any white object.

Other kinds of needles used in the home include knitting needles, varieties of which are deacribed in the article on Knitting, special packing needles, larding needles. and gramophone needles.

When a splinter of a ncedle is broken off in the palm, the finger, or elsewhere, a doctot should be consulted at once with a view to its removal. If there is any delay the splinter may move away from its point of entry X-rays are invaluable in localizing such frag. ments. It is usually necessary to open down on the needle, but this is often possible under a local anacsthetic.

Needle Case. Various kinds of needlc cases are easily made, and provide a good means of saving needles which might otherwise be lost or allowed to rust. The simplest is made by sewing together in the form of a book a few small pieces of flannel cut to a uniform size. Flannel is preferable to other cloths for this purpose because, being composed of wool, it is a better preventive of rust. A small leather case to which the leaflets can be stitched, or some stiff cardboond covered with satin, makes the whole stronger and more compact. Ser Gramophone: Knitting; Mending; Needlework; Woolwork

NEEDLEWORK. The art known as needlework can be summed up as a knowledge of how to make the best use of needle and thread. Under this wide term come many variations, such as tapestry, crewel. and appliqué work, other embroidery of all kinds, lacc and beadwork in which a needle is used. clarning, and plain sewing, as well as knitting. netting, and crochet.

Plain needlework is the first essential to learn Besides its practical value, it teaches neatness, cleanliness in handling delicate materials, and accuracy, and gives scope for artistic expression. Those who have all their needlework done for them need a knowledge of it in order to be able to distinguish good work from bad, and those who must do their own will find a good groundwork of plain needlework helpful for everyday use, and with such a knowledge, proficiency in fancy work is more easily achieved.

Objections are raised against handwork on the ground that it is not worth while, as machines can copy most of the stitches, and that it is unhealthy work. Machine work may be a good substitute, but for fine materials it can never equal handwork, and a certain amount of the latter is always necessary.
Conditions of Work. For the sake of one's health it is important never to sit in a stooping position; see that the chair and table suit NECTARINE. This is a smooth-skinned each other in height, and hold the work so that type of peach, and is cultivated in cxactly the same way. Some of the best varieties are Downton, Lord Napier, Early Rivers, Elruge. and Spencer. See Bottling; Fruit; Peach.
NEMDLE. Needles for sewing purposes are sold chenply in small packets, and can be bought either in one particular size or in vary. ing sizes. Needles used on damp materials should be wiped thoroughly before being put away, or they will rust and become unfit for further use. A little asbestos powder in needle packets will present rust. Rusty needles should be passed backwards and
it is only necessary to bend the head a little. When doing a piece of work that requires pinning down, such as the stroking of gathers on a large piece of work, never pin to the knee, but use a weighted cushion placed on the table, so that when pinned the work is at a convenient height for manipulation. Always sit so that the light comes over the shoulder; never work in a dim light, and avoid uaing black or very dark materials when working in an artificial light. Choose a steel thimble rather than a silver or bone one. The latter soon splits and silver ones wear thin quickly.

Needles, Scissors and Thread. Use rather short needles for ordinary plain sewing and longer ones for dressmaking, while darning needles should be longer still, with a long eve. The nsedle should be a little thicker than the working thread, so as to make a smonth passage for the latter through the material. Bent needles should not be used.
Two kinds of scissors are indispensable, a large pair with a blunt and sharp end (the latter always being kept down) for cutting out large pieces of material, and a small pair with two very sharp proints for cutting fine materials and embroidery. See that the handles are large and smoothly rounded, as if they are too tight they mark the liand and hurt the thumb.
When using tacking threars keep a reel of tacking ootton, which is much cheaper than sewing cotton, and answers the purpose just as well. The most efficient work is done through the work being tacked into the correct position first: sticking pins in is the lazy method, except in very few instances. Do not put a long thread in the needle for ordinary sewing ; a hout 18 in is quite enough. looi tacking, a very long thread can be used, as several stitches can be put in at once before drawing up the whole length of thread. Ir the casc of cotton from the roel, thread the needle with the end just cut off the recl, as the opposite end is likely to be more trouble to thread through splitting. Cotton for sewing, whether from skein or reel, should always be cut, as breaking weakens it at that point See Buttonhole: Embroidery: Hem : Seam; Tapestry

NEEDLEWORK PICTURE. Piotures worked with the needle are rarely of carlier date than the middle of the 17 th contury; they hear a resemblance to tapestry on a small scale. The design is worked in silk on a brownish linen canvas in tent stitch or petit point. The costumes of the figums are easily recognizable and often date the picture
More valuable are the examples of stump work, which is a form of raised and embossed needlework in feather stitch. A typical example of the Stunrt period consists of figures of the king and queen, trees, birds, marine monsters. caterpillars, and other sub-


Needlework Picture. Beantifal example, aboat 100 years old, of this torm of embroidery. The picture is worked in black silk on a white corded silk background, the clouds being put in with Indian Ink
jects all quaintly woven together in a picture measuring, perhaps, 2 ft by 13 ft . The caterpillar, being an emblem of the Stuarts, gives the date to the picture, which is encrusted with seed pearls, sequins, and apangles.
The stumps were followed by elahorate beadwork depicting animals, fish, trees, etc., with a landscape background. Many tentstitch pictures of Queen Anne's reign are extant, and they show a considerable advance in workmanship. Somewhere about the close

## Negatives and Their Care

## Some Useful Information for the Amateur Photographer

A negative is a photographio plate which after development shows the image reversed, blaoks being represented by clear spaces nnd high lights by dense portions, varied according to the high and low tones in the origina object. When sensitive paper is placed in contact with it and exposed to light, a positive is produced showing all the tones and details of the original. Negatives may be on glass, roll films, Hat films, when they ale thicker and stiffer than roll films, or else on paper.

It is open to the amateur to vary the quatity of his negatives in the course of development according to the purpose for which the negative is required. Ruughly speaking, negatives may be divided into three classes, vigomus or contrasting, normal, thin or soft This is most satisfactorily achieved, not by varying the developer, but by increasing or reducing the time of development. The amateur will always find it best to cunfine himself to the use of a particular developer which he knows well, and he will find that the makers of practically all the standard plates and films give development tables with several standard developers showing the time of devclopment required for each of the three classes of negatives deacribed.

The vigorous or contrasting negative is roughly one which gives a brilliant print on silver paper (P.O P) and a very brilliant one
of the 18th century Georgian black and white pictures were produced; in these a drawing was made on white satin or sarsenet, and worked upon in black silk or in colours to imitate engravings of landscapes and buildings, as well as figures. Sometimes parts af these pictures were done in Indian ink. Sampler and fire-screen work in wool came later. The techinical name for needlework pictures is acupictura. See Embroidery; Fire Screen; Sampler; Tapestry; Woolwork.

> This article, which contains a sectlon on the storing of negatives, sugrests reference to other articles dealing with photography. Among such arc Developing: Enlarging: Film Flxing; Panchromatic; Photography; Plate; Washing
with sharp blacks and whites, on ordinary gaslight paper. It gives prints whioh are particularly suitable for reproduction by the half-tone process in newspapers or magazines The normal negative gives good prints on either silver or gaslight paper, and, although it is not so suitable for half-tone reproduction, prints made from it are somewhat more artistic, contrasts being not so strong. The thin negative is always required when it is to be used for onlarging, unless great controst is required; it also gives the most pleasing results in portrait work

Defects and Stains. Defects of various kinds, chemical and physical, are liable to occur in negatives even with the careful worker. Treatment of the negatives after development, fixing, and drying are complete ia always a risky matter, involving the possibility of making things worse and sometimes of ruining the negative altogether. In all photographic processes prevention is better than cure, and the amateur should take every possiblecare to ensure cleanliness at all stages: this clennliness is not a mere matter of soap and water, but is a chemical question, as described under Developing. Fixing, and Washing.

Chemical dust in the dark room, caused by solutions spilled on the floor and allowed to dry, often gives rise to spots on a negative. Dust in a dark slide or in the air of the dark room when the slides are heing loaded will cause pinholes on the plates.

By taking care in these and similar directions negative defects may he very largely prevented It is not a wise plan to wipe a plate to free it from dust before placing it in the slide. The photograplier can rely upon the plate being absolutely free from dust when he unpacke it from the maker's. since extrandinary care is taken to prevent the deposit of dust at all stages of the manufacture. In fact, brushing the plate attracts dust to it by slightly electrifying the film. When the plate is removed from the slide after exposure it may be tapped sharply on the glans side with the knuckles to remove any dust particles that may have settled on it during exposure in the camera. This will prevent. to a large extent, the pinholes caused by dust on the plate during de. velopment.

Physical defects in a negative most often met with are frilling, blistering. smal! holes, pinholes due to dust, as explained above, and drying marks. The treatment of pinholes consists in filling up or spotting up the holes in the negative with Indian ink.

Small round holes larger than pinholes are due to air bubbles which have clung to the plate or film and have prevented the developer acting
nt that particular spot They are best Probably more damage is done to negatives avoided, particularly if tank development is in the way of scratches, finger-marks, etc., by employed, by getting rid of the air in the water. This can be achieved hy boiling the water steadily for ten minutes before use and allowing it to cool undisturbed. In dish development wipe over the plates gently in the ileveloping dish with a pad of cotton wool
Frilling, in which the edge of the film is separated from the glass, and blistering, in which the film rises in small blisters. are both due to solutions of different temperatures, and are particularly liable to occur if a some what warm de veloper is followed liy a cold fixing solution Thicir occurrence in hot weather may be pasily avoided by the usc of a cont bined fixing and lhardening bath.
Drying marks aredue to unequal drying of the negative after washing, and are very troublesome If a number of negative are put in a according the plotor negative loctween them, particularly in in damp wir space it is probable that they will be found after some hours to have dried round the colges, but still to be wet and swollen with muisture in the middle. The centre will dry if the negative is taken out of the rack, but will show a permanent mark or line round the part that was dried last Re-soaking the negative for an hour or more in water that is not too cold, i.e. alout 60 degrees, and drying with the negative stood on elge in a place where air has free access, will sometimes remove or reduce the mark. Gencrally it cannot be so cured. It is hest prevented by secing that air has free access to the negative when drying and a voiding the use of racks in which negatives are not well spaced out.
Chemical defocts, i.e. stains, are largely due to lack of cleanliness in the various processes as already explained. Stains may also arise from specific chemical causes. Contact of a negative with sensitive paper in the presence of moisture will cause silver stains, which, if large, may be reduced by careful rubbing with a pad of cotton wool and a little globe polish or finely powdered pumice, followed by a strong hypo bath. A small stain may be almost entirely got rid of by prolonged immersion in the ordinary toning and fixing solution used for silver prints.
Pym stain can be removed if the nega tive is not allowed to dry after the ordinary washing, by a clcaring bath made up as follows:


Thesc haths are also useful as general cleaning baths, where marks or stains cannot be removed by other methods.
Ordinarily there is no objection to pyro stain, as it improves the printing quality of the negative, unless it is very deep.
How to Store Negatives. The amateur photographer is quickly faced with the pro hlem of storing his ncgatives. When the numher to be kept rises above forty or fifty, some methodical arrangement becomes necessary
ated liandling than by any other means.
Many devices are on the market, but it is casy to contrive an arrangement which is both less expensive and bulky than many of the commercial negative cabinets. For negatives that are not more than a quarter plate or 9 by 12 cm . in size an ordinary 6 by 4 card. index box, as seen in the illustration below, supplies the best solution of the problem. The negatives are kept each in a negative envelope, with short details and a number out. sidc. Proper negative envelopes, or ordinary envelopes of the best quality only, should he used, as the chemicals used in making cheap paper are liable to affect the negatives.
The negatives should be classified under a few general headings interests, such as landscapes, portraits, family groups, sport, etc., devoting a box or a portion of a box to each classified heading. Under each heading the negatives are arranged in alphabetical order, with guide cards, as seen in the photograph, on the ordinary card-index system. The negatives thus supply their own index, and no other is required. In this system film and glass negatives can he kept together without harm.

Another method, where shelf room is avail. able and a large number of negatives of larger sizes have to be stored, is to arrange them in envelopes in a mumhered order, standing on edge on the shelves with partitions for every fifty negatives. Short details are noted on the flap of the envelope and a separate index is kept. A small number of negatives may be kept in their original boxes, separated by means of sheets of pure paper, with a list on the top of each hox. Film negatives are much more easily stored than glass negatives Special alhums are sold for them of the correct size, consisting of transparent envelopes into which the films are slipped, space for a list of the contents of the album being provided.

NEGLIGENCE : In Law. Negligence has been defined as the doing of something which a reasonably prudent man would not do, or the omission to do something which n reasonably prudent man would do, having regard to the circumstances. In practice, the juige or jury has always to find whether the act complained of amounts to negligence; but no action will. lie for damages unless the plaintiff can first establish that there was some duty cast upon the defendant to be careful.
Such a duty may arise by contract or otherwise. For example, if $A$ engages to drive $B$ from London to Brighton in his motor car for payment, A is clearly under a contractual duty to be careful both as to the condition of his car and as to the manner of his driving ; and should any injury hefall $B$ because $A$ drove rashly or carelessly, or hecausc the car had not been properly overhauled for the journey, $B$ can sue $A$ for negligence. The duty to be carcful may be a puhlic one, c.g. it is cverybody's duty to walk, rile, or drive in a public highway carefully. To rush along without any heed to the safety of others is negligence.

A duty may arise by implication. If a man nvites people to come on his premises on
business common to both, e.g a gasfitter ordered to come and mond a pipe, it is his duty to have the premises in such a state as to he reasonably safe. Invitation in this scrase may lee implied; for instance, a shopkeeper is said to invite people to enter his premises with a view to becoming purchasers. To a guest a man merely owes the duty not to have traps on the premises, by which is meant concealed dangers.

Negligence in Driving. The nost frequent cause of action is for negligent driving by the driver of a public or private vehicle. When anyone undertalies to do anything which requires special skill or knowledge, and which may cause injury or damage when performed unskilfully or ignorantly, it is no defence to say, "I did my best," unless, indeed, the act was done in an emergency, as where a layman, no doctor being present, tries to help someone who appears to be in a dangerous condition; and where an unskilled person tries to mend a bruken pipe because no plumber can he found, and only succeeds in making matters worse No action can bc brought for negligence unless the plaintiff has suffered injury or pecuniary loss.

The damage nust not be too remote. Thus, if $A$ is run down by $B$ 's negligent driving, and has to suffer the amputation of an arm or the loss of an eye, and A's rich uncle, who had left A all his property, alters his will and cuts $A$ out on the ground that he will not leave his property to a fellow with only one arm and one eye, or A was to have married an heiress, who jilts him because of his altered appearance. A cannot claim against $B$ the loss of his uncle's fortune or the profitable marriage. The loss is too remote.

The damages in such a case will be loss of wages, salary, or profits of business or profession while laid up; medical expenses; expenses of convalescence, and any extra nourishment required; depreciation in the labour market, if any; compensation for pain, suffering, and disfigurement.
Other Kinds of Negligence. Therc arc other forms of negligence that concern the householder. For instance, when coal is delivered it is often shot into the cellar through a coal shoot or hole in the pavement covered with an iron grating. Care should be taken not to leave the shoot unguarded, and the occupier of the premises should make sure that the grating is replaced after the coal has been shot into the cellar

Damages may be recovered where a fire that has been caused through negligence spreads to adjacent property. Thus, if a haystack takes fire and some cottages near are burned down, the owner of the haystack is liable. A tenant is responsible for the condition of the chimneys of his house ; if one which lias not been swept gets on fire and the sparks set light to a neighbour's fowl. house or other building, danages may be claimed against the tenant. Areas or cellars adjoining a street must be kept properly fenced to prevent accident, and the occupier is responsible if any person falls down and sustains injury through insuflicient fencing. See Accidents; Driving ; Flat; House; Landlord; Motoring; Repairs.

NEGUS. Wine, usually port, mixed with hot water, spiced and sugared, is known as negus. Port wine negus is made from the following recipe : Put l pint of port wine into a jug, into which pour the juice of a lemon, lb . sugar, and a little grated nutineg. Add 1 quart boiling water and serve when cool. Sherry negus is inade in similar fashion, and a wineglassful of noyau or maraschino nay be added. Sec Wine

NEIGHBOUR. Disputes between neigh. hours arise about such things as fences, overhanging trees, party walls, rights of way and water, rights of light, and rights of support.

The remedy for interference with any of these rights is by injunction and damages
The right of support for and of one neighbour by the adjacent land of another is a natural right of property, so long as the land which clajms support is in its natural state unencumbered by buildings. In other words, B must not excavate his land so near to the edge of A's as to cause the latter to fall in. If A has a build. ing on his land, and his neighbour B digs on his own land in such a way as to cause A's building to crack or fall, A may or may not have a lcgal remedy He has such a remedy if his building has stood with the support of his neighbour's land for 20 years, hut not otherwise, unlcss, indecd, B may have granted him by deed or sold to him for calue the right of support for his building.
When two houses or more are built so that they support each other if they are built at the same time, the law implies a mutual easement or right of support If the owner of a middle house in a row wishes to pull down and retuild, he must prop up the houses on hoth sides during the process.

If a neighbour's tree overhangs a man's fence, he can cut it off level with the fence, but must not pluck the apples from the overhang. ing boughs. If the tree is a poisonous one, and his cattle eat of it and die, the neighbour must pay their value

A man may not take or collect upon his land anything of dangerous character which, if it breaks loose, will damage his neighhour or his neighbour's property. ujon penalty of being liable to pay all the damage done if the dangerous thing escapes This not only applies to dangerous animals, but also to auch things as artificial collections of water Where a man made a reservoir and it burst, he was held liable for the damage caused to his neightoour's property by the flood, though he was able to prove that he had not been guilty of any negligence, having employed skilfal engineers, nnd supplied them with the best of material for the construction of the reservoir See Fence; Hedge: Nuisance.
NEILLIA. These are spiraea-like hardy, leaf-losing shrubs of which Neillia opulifolia is the most useful. It bears white flowers in May. A variety named lutea, which has yellow leaves, is ornamental. These shrubs thrive in ordinary soil and are propngated by cuttings in sandy soil in a frame in summer.

NELUMBIUM. This is a greenhouse aquatic perennial plant belonging to the waterlily family. The rhizomes sliould be planted in a pool or tub of tepid water at the bottom of which a layer of loam has been placed The chief kind is Nelumbium speciosum, with white, sweet-scented flowers tipped with rose

NEMESIA. This benutiful half-hardy an nual, 8-12in high, bears brilliantly-coloured flowers in blue, crimson, orange, yellow, rose and other colours. It is invaluable for summer flower-beds and for groups in the herbaccous border. Blue Gem is a particularly attractive variety. Seeds are sown under glass in March and the seedlings are planted out of doors in May.

NEMOPHILA. This pretty. low.growing, blue-flowered hardy annual is easily raised in ordinary soil in a sunny border. Seeds arc sown out of doors in March-April where the


Nepaul Poppy a show biennial for heltered spot in the garden
plants are to blonm in sum mer. A sowing may be made in September to provide spring flowers

NEPAUL POPPY. This is the popular name of Meconopsis nepalensis, a Invely biennial plant which bears yellow, poppy-like flowers in summer It is raised from sceds sown in fine soil in a frame in May and the seed lings, when large enough, are planted in well. drained, loamy soil in partial shade. It is a good plan to place a covering of glass over them to keep off excessive wet in winter.

NEPENTHES. Pitche, plant is the popular name of nepenthes, which is a very curious and interesting family of hothouse shrubby perennials. The different sorts have pitchers of various colours. See Pitcher Plant

## NEPETA. The favourite

 plant in this group is the mauve catmint (Nepeta mussinii) which has grey leaves and bears a profusion of lavendermauve flowers in June and July. It Hourishes in ordinary well-drained soil and is easily propagated by cuttings in summer. The mauve catmint is a delightful flowering plant, often used as an edging : it also locilis well in a wall or by the side of garden steps The variegated ground ivy (Nepeta glechoma variegata), with green and white leaves, is a usefu! carpeting plant for damp placesNEPHRODIUM. Many species of nephrodium are tropical ferns which need to be grown in a moist, warm glasshouse. The commonest hardy kind is the male fern (Nephrodium filix-mas), of which there are many beautiful named varieties; these are admirable ferns for $n$ shady border. Jeaf. mould should be added frcely to the soil Planting is best done in autumn


Nemesla. Brilliantly-coloured blooms of a hali-nardy annual which flowers all through the summer

Nerine. This is an alternative name for the bulbous flowering plant known as the Guernsey lily (q.v.).

Nerium. The greenhouse evergreen flowering shrub nerium is better known under its popular name of oleander ( $q . \nabla$. ).

NERTERA.
The small perennial nertera is also called fruiting or coral-berried duckweed. Its tiny flowers are followed by round berries of reddish - orange. Although the plante are of perennial character they require protection during hard weather, a suitable place to plant them being a moist and sheltered position in a shady rockery. Spring is the most suitable lime for plant. ing, and propagation is by means of division. Nepeta The mauve catmint, a Nertera makes a pretty pot plant for the greenhouse
NERVOUSNESS. 'The apprehensive ex. citable atate of mind and hody connoted by nervousness is a sure sign that the general health is not at its best. It may be brought about by exhausting mental work, or by some occupation which does not allow of sufficient exercise for health. Another common cause is exhausting the hody by leading a dissipated life. Nervousness may be the result of n sudden shock or accident: in some cases it is inherited

In every way a quiet, healthy life should be led. A daily cold or tepid bath must he taken in the morning followed by a rub down with n fairly rough towel Diet should be plain but nourishing. Tea or coffee inay be taken weak and in moderation, but alcohol in all forms should be avoided. Strictly regular hours should be observed Plenty of fresh air is another essential

In Children. A child witli any tendency to nervousness demands constant and careful watching Treatment is on the lines described above for diet and exercise, with a warm bath at night to promote sleep. Such $\pi$ child should not be left alone or forced to go to sleep in the dark It is most important that his nurse, or whoever has charge of him, should be kind and patient, but firm. He must be taught as far as possible not to give way to his temper, which will naturally often be irritable. At the same time, constant scolding and worrying over trifles likely to annoy the child must be avoided, and the pcrson with him should be of a cheerful disposition.

Under these conditions the child may be the better for a tonic, and one likely to suit him is:
Iron and quinine citrate
Spirit of chloroform
Water to make
45 gr.
40 m.
4 oz.

The dose for an eight-year-old child is a teasponnful three times a day after meals. Nervous children sometimes develop St. Vitus's dance. See Hysteria; Neurasthenia St. Vitus's Dance.

NET. Net is an open fabric of twine, silk, or other material, and is employed for a great numher of domestic and other purposes. Nets are used for several games, e.g. lawn

Iennis and table tennis, and are much em ployed in the garden for keeping birds away from fruit See Radminton: Buttertly: Netting: Tennis Net.
NET: The Dress Material. Nets are made chiclly in two materials, cotton and silk, cotton being most employed. They are made with both coarser and finer threads. and in meshes of different shapes and sizes. Hexagonal mesh is the most common. Mechlin is hexagonal, Lille is dinmond shaped, and some are square or filet, much used in dyed shades for curtains. Network forms an integral part of the design of hand-made laces. See Filet Lace ; Lace
NET BALL. This is played with a large ball and two nets for the goals. The ball is the same as is used in Association Football The field of play should measure 100 ft . long and 50 ft . wide, but the game can be played on a smaller piece. The uswal number of players is seven a side, but this, ton, can be varied
In the centre of each end line the goals are tixed Each goal is a single upright post. to which an iron ring, 1.5 in. in diamcter, is fitted. This should be 10 it above the ground and should project $i f$ in froin the post. Attached to a ring is a net. open at the bottom, and the ball must pass ihrough this in order to score a goal. Around each goal a semicircle, having a radius of 16 ft ., is drawn; this is known as the shooting circle. In the centre of the field is a circle 4 ft . in diamcter. If a smaller field of play is used, these measurements should be reduced in proportion. The playing field is divided into three courts of equal sizo by lines drawn from side to side
The seven players, in a full game, are: goal scorer. attack. attacking centre, centre, defending centre, defence, and goalkeeper. The game begins with one of the two umpires bouncing the ball in the centre circle, while the players stand. each party on its own side of the circle. the centres in front and the


Net Ball, an outdoor game for girls. The illustration shows a shot being made for goal
others behind them After one of the centres has caught the ball, the game proceeds, the aim of each player being to throw the ball to a colleague or prevent an opponent from securing it. They try to get it to tho player who stands within the shooting circle; when he or she gets it. his or her aim is to thow it into the net

As in foot ball, there are penaltics for getting offside and other offences, and the rules for throwing the ball in after it has gone out of play are very much the same as at association football. Two players of one side must not hold the ball at the same time. nor must $a$ player carry it. Obstruction is also an offence. The penalties arc a free pass or a ree throw at goal.
NETTING: How to Make Netting for la won tennis, fishing, garden purposes and haininocks is usually bnught, but it can be made at home. The neceranary implements consist of a piece of hone, steel, or wood, made with notched ends, called the needle (Fig. 1), and a smooth flat or round rod called the mesh or gauge. The circumference of the mesh used controls the size of the loops, and meshes can he bought in numbered sizes. A lead-weighted heavy cushion is required, or in the case of conrse twine netting, a stirrup to slip over the left foot and provide a fixed point to pull upon may be used. To this cushion or stirrup a cord is attached to form the foundation loop : the first loop or loops of the net are cast upon this foundation. Netting consists of loops of thread called atitches, secured by knots.
The thread inay be fine silk for netted purses, knitting cotton, crochet cotton, cabled twines, or tarred string. Knots of different kinds are inade for different purposes; lonps of different shapes and sizes can be worked into a pattern, and different colours of thread can be introduced. The work is done a row at a time, and sufficient thread for one row should be wound upon the needle at the start.
Netting stitches are oblong or square and the patterns are produced in plain netting by the different ways of passing the thread over the mesh and the manner of connecting the loops, as well as by the various sized meshes Plain netting is given the simplest form of pattern by the last method. Two or threc lows are worked over a narrow mesh and then the same number over a coarser one, continuing the use of lirst one mesh and then the other at regular intervals.

Plain netting is the one to learn first. The mesh is taken in the left hand, thumb on top and fingers beneath. The mesh is held close to the foundation loop and the thread is passed over the mesh and two forefingers. The thread is brought under the mesh and placed under the thumb; then it is put round the hand and held by the little finger. The needle thus brought in front of the mesh is passed under the first loop between mesh and finger, and into the foundation loop and the thread is drawn tight close to the niesh.

The fisherman's knot is made by holding mesh and needle in the manner descibed, and passing the thread round the mesh but not over the fingers. then passing the needle upwards through the loop that is. to he made, drawing the loop up to the mesh and holding the thread tight under the thumb. The thread is allowed to fall to the left, and the needle is put upward behind the loop and the thread is drawn tight.

The work may be begun, with only a single loop directly attached to the foundation; or as many as 100 lomps of fine silk may le cast on the foundation, as in maling jong netted silk purses. Steel or ivory netting nendles are used for finer work of this kind. An example,
showing the stages of constructing the simplest form of wide meshed netting, is illustrated in Figs 2 to 8 . A foundation stick is used for this; in the casc of finc netting, $\Omega$ foundation loop of coarse thread takes the plare of the stick. The first stage is to wind the string on to the necdle. One end of the string is looped and tied over the centre prong, as shown in Fig. 2, and the string is then turned around the needle lengtiways between the jaws of the slouted end, passed over the point of the prong at the top and on alternate sides of the prong, until sufficient string has been wound This operation is shown in Fig. 3.

The next step is to provide the foundation stick. Make a bridle of string and attach it to a nail or other convenient point of support on the wall, work bench, or any other suitable place, and attach the free end of the string to it by means of an ordinary reef knot. Then, holding the mesh stick in the left hand, pass the needle behind it, underneath and ncross the front of the mesh stick and on to the back of the foundation stick to the josition shown in Fig. 4.

Next bring the needle with the string down over the front of the foundalion stick and pass the point of the ncedle between the strings (Fig. 5). This forms a knot and the string is then drawn up tight, thereby bringing the mesh stick nearly into contact with the foundation stick, as in Fig. 6. The requisite number of throws are then cast in this manner on the foundation stick until the end of the stick is reached or the requisite number of casts have been made. The foundation stick is then removed, the mesh stick turned over and the finishing point made the starting. point of the next row.
Then, holding the mesh stick in the left hand, the needle is passed over the mesh stick, hehind it, and then through the first mesh of the row. as shown in Fig. 7. The thumb is then placed on the string around the mesh stick and the necdle passed beneath the first mesh of the completed row, making sure that the string is tight round the mesh stick: this is accomplished by the pressurc of the thumb and forefinger of the left hand, as shown in Fig. 8. The needle is then drawn right through and drawn up tightly, thus


Netting a strawherry bed, showing method of andporting the mesh on atakes driven into the groand Courlety of Amateur Gardening
completing the mesh. This operation is com- out quitc suddenly and often vanish just as decayed tooth is probably the most frequent
pleted until the end of the row is reached, the mesh stick turned over, and the operation repeated until a sufficient size of net is completed
For garden purposes old fish netting is uscful in several ways Gencrally it is used
quickly. They itch, sting, and burn as when one is stung by a nettle. In infants they are very common, appenring as red pimples.
In older children and adults the following

to cover young growing fruit trees to protect thein from the ravages of birds and frost. Pockets of such netting are also uscful if suspended in hammock-like fashion beneath tish, mushrooms, wall and standard fruit-trees in order to catch the ripe fruit when it falls. It is likewise employed to ksep off the attaclis of wasps and other flying pests. See Hammock; Knot: Wire Netting.

NETTLE. The stinging nettle is one of the inost difficult weeds to eradicatc; the only way is continually to hoe olf the tops of the plants as they push through the soil. If this is done for 2 or 3 years the plants will dwindle and perish. The variegated leaved variety of the dead nettle (laminm) is worth growing in an odd corner in poor soil.

Uses of the Plant. The young shoots of the stinging nettle can be cooked and served in the same way as greens, hut they make a more palatable dish if they are blanched first, and then cooked like spinach. Nettles are also used to make broth or vegetable soups, or added as a llavouring, but they have a bitter taste.

The traditional remedy for a nettle sting is to rub the part affected with a bruised dock lea', and this is usual!y efficacious; but a better cure is to use cold water. A handkerchief should be soaked and tied over the part stung, when immediate relief will usually follow. If the sting is very severe, the bandage may be changed as soon as the cold feeling dies away. A solution of bicarbonate of soda and water is also useful in this connexion, while leaves of rosemary, mint and sage also afford relief. See Sting.
Nettle Toast. This is a good substitute for spinach on toast. To prepare, wash and boil about 2 lb . of young nettle leaves and tops, chop them finely, and put them in a pan with 1 oz . butter, a little lemon juice, salt and pepper. Stir these over the fire until the butter has melted; then pile the mixture on 3 or 4 rounds of buttered toast.

NETTLERASH. This skin ailment, the medical name of which is urticaria, is characterized by whitish firm elevations or wheals surrounded by a red basc. They come
 cheese, eggs, crabs, lobsters, pork, pickles. pastry, strawberries; wearing rough flannel garments next the slin; violent emotion; the irritation caused by worms in the intestine; goutiness; taling certain drugs, such ns quinine, copaiba, turpentine; the use of irritating cosmetics and hair dyes; the bites and stings of wasps, bees, caterpillars, jelly fish, bugs, and lice, and oontact with nettles and otherstinging plants
In treatment the causc should first be ascertained. If it is acid indigestion, a dose of 10 to 15 gr . of bicarbonate of soda in a wineglass of plain water may bring relief. If the affection is severe in children and accompanying digestive disorders, give an emetic (q.v.), and when this has acted give one to thrce teaspoonfuls of castor oil. Regulate the diet, experimenting to find out the food which secms to diangree. If Ilannel irritates the skin, wear cotton, linen, or silk
To relieve the itching (q.v.) many simple remedies are available, among which the following are the best: Dissolve a teaspoonful of bicarbonate of soda in a tumbler of warm watcr and sponge the itching part with it; sponge with solution of carbolic acid (1 in 40); apply calamine lotion with $n$ soft sponge or piece of lint.
Young children should he prevented from scratching by sowing the sleeves of their nightdress to the body of the garment, or by loosely tying the hands to the waist.

NEURALGIA. The acute, paroxysmal pain that is usually known as neuralgia is most often felt in the head or face, though it may attack any part of the body. In neuralgia attacking the nerves of the face and head, a
origin of the mischief. Other common causce are eyestrain, irritation in the nose or ears, and exposure to cold. In the cases of persons predisposed to neuralgia, sitting in a draught may suffice to set up a severe attack.

If the tneth are decayed, the dentist's services must be sought. If the patient is suffering from eyestrain, an oculist must he consulted. When gout, rhemnatism, Bright's disease, or any other general affection is present, it inust be treated appropriately at the same time that local measures are taken to relieve the pain

Change of air is often one of the bost remedies, especially in the case of nervous women. The patient must have plenty of sleep, and spend a good part of the diny in the open air. The diet should be gencrous and contain abund. ance of fats, such as fat hacon, butter, and cream. When the patient is gouty, however, a strict vegetarian diet often effects a speedy cure. Neurotic patients sometimes derive much benefit from ammoniated tincture of valerian. Cod liver oil is a valuable medicinc in many cases, and may be combined with malt and hypophosphites.


Netting. Fig. 2. First stage in loading needle. Fig. 3. How gtring is wound on needle. Fig. 4. Preparatory stage in netting. Fig. 5. Forming first knot Fig. 6. Tging frst knot. Fig. 7. How a new row is begun. Fig. 8. How knot is made at beginning of each row

There are many uselul measures for the relief of pain during an acute attack. Let the patient have perfect quiet. Warmth to the affected part will frequently give relief, such as a llannel or sponge dipped in water as hot as can be borne. Dry heat is sometimea preferable. Rolays of heated ilannel or cotton wool may be applied, or a hot-water bottle is cffective

For neuralgin in the face or head $n$ bran poultice will often prove a good remedy. Let the patient go to bed and be warmly covered. Make a poultice of bran and put the face down on it After using heat great care must be taken not to get fresh cold in the face. Have ready a shawl to throw over the head in passing from one room to another through a cold passage or staircase.

The number of drugs that may give relief in onc case or another is considerable. If one fails, another should be tried, but always under medical direction Sce Faceache :

## Tic Doulourenx

NEURASTHENIA. This term, as generally understood by the layman, refers to all those forms of nervons disorder which are functional in character, such as hysteria. The medical profession, however, limit the term to a particular form of these disorders charactcrized by increased susceptibility to fat-igue.

Neurasthenia in adolescence is often associated with the difficulties arising from
physical development. Failure on the part signals received from of parents or teachers to nppreciate these difficulties and impart clean, wholesome, and truthful information on the essential facts of life often contributes to the condition. Later in life neurasthenia may result from any form of mental strain, such as overwork, anxiety, fright or shock; physical accidents, particularly in circumstances in which the individual has no timo to pull himself together to meet the shock, as, for example, a railway accident, or chronic ill-health.

The most marked symptom of neurasthenia is the readiness with which the person complains of fatigue with either physical or mental effort. Other noticeable symptoms are pain or fecling of pressure in the head, pain in the back, disorders of sensation, insomnia, and indigestion. Flushing of the skin and sweating may be present, and there is often oonsiderable loss of weight

In adolescence treatment should be directed towards establishing a more normal and healthy frame of mind. Difficulties should be investigater and explained, carc being taken that nothing is said that is calculated to reduce self-respect or inerease any apprehonsion or ferling of guiltiness

In older persons only palliative mcasures, as a rule, can be adopted When the condition results from strain or overwork, a holiday, rest in the country, or a sea voyage may bo recommended. In cases due to clironic illhealth efforts shouid be directed towards cemedying the bodily condition which is at fault, particular attention being paid to the state of the bowela and to the condition of the teeth and of the gums. Druss to produce sleep should be avoided if posaible Alcohol, if taken at all, should be indulged in very sparingly.

NEURITIS: Its Treatment. Inflammation of a nerve is known as neuritis, and it may be limited to one nerve, as in sciatica and inflammation of the facial nerve ; when it affects a number of nerves it is termed multiple neuritis. Exposure to coid is one of the commonest causes of local neuritis.
Multiple or peripheral ncuritis is the result of poison in the blood, the most common cause being the taking of alcohol continually over a long period. The symptoms are tingling in the limbs, twitching of the muscles followed by loss of muscular power, and acute pains.
Rest and warmth arc essential conditions in treatment. Cover the part with a thiok layer of cotton wool, and bandage it loosely. If the arm is affected, put it in a sling; if the leg suffers, the patient must lie down a good deal. Drugs such as those used in neuralgin may be given to relieve pain. In chronic neuritis massage and minersi baths are recommended with occasional blisters and full doses of iodide of potassium.

NEUTRALISING: In Wireless. This is a method whereby the effects produced by the inter-electrode capacity of a high frequency amplifying valve in a wireless rcceivor are balanced out by the application of an external capacity or neutralising condenser connected to suitable puints in the grid and anode circuits of the valve.

The capacity betwcen the anode and grid of a three electrode va!ve employed as a high frequency amplifier is sufficient to cause energy to flow from the anode oircuit back to the grid oircuit, and thus to produce insta. bility. This effect may be counteracted or neutralised by a suitable circuit arrangement, utilising a very small variable condenser which when correctly adjusted permits a reverse flow of energy equal but spposite in phase to the energy flowing through the internal capacity of the valve.
A common method of neutralising is to adjust the neutralising condenser on the
a powerful local station. The station is first of all tuned in with the neutral. ising condenser set to about one-half of its maximum valuc. Next, the positive lead to the filament of the high frequency amplifying valve is disconnected from the valve holder, or alternatively a piece of paper may be wrapped round the positive pin of the valve, so that the pin is isolated from the positive socket clectrode capacity of the valve.


Neutraíising Condenser, a device used in wireless reception during the summer. the handrail.
of the valve holder, thus paircase, and be in thus permitting no L.T. keeping with the architecture of the home high to pass through tho filament. The itself. See Staircass act as an ancy valve will, therefore, no longer act as an amplifier, but signals from a powerful station will still be audible in the loudspeaker or telephones, owing to the inter-

The adjustment of the neutralising condenser may now be carried out, the objcot being to find a position in which the signals from the station to which the receiver is tuned cease to be audible. It will be found that as the neutralising condenser is adjusted, signals will gradually decrease in volume until the
"silent point" sreached. Further ad. justment ol the condenser will cause signals again to becoine audible. The silent point is the correct neutralising adjustment, and the condenser should be locked in this position. The positive filament of the bigh fre. quency ampli. fying valve may now be connected up, so that the low frequency current passes through it in the normal manner and the set will be stable.

NEVIUSA. The deciduous flowering shrub called neviusa alabamensis belongs to the order of Rosaceae, and bears the popular name of Alabama snow wreath. The plant bears whitish flowers along its shoots during summer. Ordinary well-drained soil suits it. It is propagated by cuttings of half-ripe wood inserted in sandy soil under a hand-light or cold frame

NEWEL POST. The post in which the steps of a winding stair are fitted is called a newel post. The term is also applied to the posts situated at the top and bottom of an ordinary staircise, which act as supports for

In a small house the neivel post may be made from deal about 3 in. square, and tenoned into the timber framing of the staircase, if on the upper floor. On the ground flour suoh a post would be similarly mortised into the Hoor joists and into the string of the staircase. It is often capjed with a rectangular block.

NEWFOUNDLAND DOG. With the St Bernard, the Newfoundland shares the distinction of being essentially a life-saving dog. His powerful frame, deep chest, capacious ribs, broad loins and heavily-boned legs, together with his thick coat, mark him out as an ideal water dog. He can swim in almost any sea, and many stories are told of Newfoundlands that have rescued human beings.
They may be all black, or white and black, or white and bronze, the latter being popularly called Landscers, after the painter who immortalized them. The eyes should be dark brown in colour, light ones being objectionable, as they are in most breeds. The head is, less massive than in that of the St. Bernard, but at the same time if should be big and broad, as befits the body. The coat is flat and dense, rathet coarse in texture, and of an oily nature, so as to resist the water: The gait usually has a slight roll. A weak loin or cow. hocks are most undesirable. The height of a dog is about 28 in ., weight from 140 to 150 lb ., bitches being 2 in . less, and weighing from 110 to 120 lb . See Dog; Kennel.

NEWMARKET. This card game, sometimes called stops, can be played by any number of persons between three and eight. Two packs are necessary, also a number of counters, which should be distributed among the players.
To begin the game, four cards arc taken from one paok and are laid out upon the table. On these each player puts his stake, whatever he pleases, although sometimes a limit is agreed upon; he can put it all on one card, or divide it between two, threc, or four. The cards of thc other pack, having been shuffled and cut, are dealt out one one to the players, and an extra card in every round is placed on the table. These extra cards are known as the stops.

The deal over, the player on the loft of the dealer leads. He can lead any card in his hand, provided it is the lowest of the suit in question, and he continues to place cards upon it as long as he can keep up a sequence. When the sequence fails, the next piayer continues, and so the game goes on until the sequence is broken, because the necessary card is among the stops. The one who played the last card before the stop then leads, and so the game continues until the cards are all out. The interest of the game lies in the fact that when a player plays a card that is a duplicate of one of the four cards of the other pack, he is entitled to all the stakes that have been placed thereon. In this game the ace is counted as the lowest card.

NEW YEAR. In Scotland New Year's Day is still regarded from the popular standpoint as a more important festival than Christinas, although the latter has acquired greatly
increased importance of late years, and is almost universally celebrated exactly as in the south. The closing week of the year has thus a double significance across the Tweed, and also in a lesser degree in the north of England, where the Now Year ceremonies are popular. In Scotland New Year's Day is a bank holiday.
Parties arranged for New Year's Eve usually begin at 9 o'clock, and should be so arranged that the guests are all together by a few minutes before 12. In many houses it is customary to brew punch or some other liquor, and hand it round, so that, when the clock strikes, the health of the New Year may be drunk with due honours. The darkest member of the party should slip out of the house at the crucial moment and demand entrance so that the first footing shall be lucky. Alter the New Year has been thus ushered in the guests, host and hostess join hands and sing Auld Lang Syne. See Christmas; Hogmanay.
NEW ZEALAND BROOM. The broomlike half-hardy evergreen shrub, bearing the name of New Zealand broom or Notospartium Carmicheliac, requires the protection of a wall, except in the wariner parts of the country. It bears pink, pea-shaped Howers during late summer. Propagate by seeds.
NEW ZEALAND FLAX. This name is given to an omamental plant, Phormiun tenax, a striking perennial distinguished by its long, erect, dark green leaves, a hout 4 ft . in height. The yellow or reddish-yellow Howers are produced in August.

This graceful plant looks well in a sheltered position near water, but it is rather tender, especially while young, and should have the montstock protected with ashes or litter in winter. It likes a friable. sandy toam. Pro-


New Zealand Flax. Bardy perendial for the waterside
garden, with long, erect leaves and reddish flowers
pagation is by seed in heat in spring, or by division at that season. There are several varieties, with variegated leaves.

NEW ZEALAND HOLLY. This name is given to a group of evergreen shrubs which thrive in loamy soil and peat in a sunny position. The chief kind is Osmanthus aquifolium. a Japanese shrub, 5 ft . high, with holly-like leaves; it hears white flowers in winter.

NEW ZEALAND SPINACH. A hardy annual plant, the New Zealand spinach is cuil. tivated in many gardens as a substitute for summer spinach. The seeds may be sown in March in sandy soil in the heated greenhouse, and the young plants placed out-of-doors in May. Seeds may also be sown in the open ground in May if heat is not available. The tips of the shoots should be picked off frequently, whether required for cooking or not. The plants should be put out in rows ahout 3 ft apart, and the leaves cut and treated in the same way as spinach (q.v.)


Nicandra. Trumpet-shaped flowers of the annual
border plant sometimes known as apple of Peru
NICANDRA. This tender border plant is sometimes called the apple of Peru. It is an annual plant, growing about 18 in . high, and bearing showy white and violet-hlue Howers during summer. It shonld he raised from seeds sown in heat during February or March, the seedlings being transplanted to hoxes, hardened off, and planted out in June. See Border

NICHE. This shallow recess in a wall can always be used to good effect in the decorative scheme of a room, hall, landing or staircase. Niches are usually either domed or rectangular, but occasionally the top is in the form of a pointed arch. A delightful fitment for a living-room, when building, is a larger domed niche with shelves for china, flanked by two smaller rectangular niches with bookshelves, the lower part of each recess being fitted as a cupboard.
Simple decoration sets off a niche either by framing with narrow mirror glass, or woodwork, or plaster ornament and moulding, using a contrasting colour for the interior of the niche to that employed for the walls, or by painting a design within the niche itself as shown in the illustration. In this case recesses either side of the chimney breast have heen utilized to hold decorative china, the design of the rising sun being painted in gold. A niche over a fireplace forms a pleasing alterna tive to the conventional overmantel, and can be either lined with mirror glass, gold or silver leaf, or merely contain some beautiful object See Drawing Room; Recess; Shelf.

NICKEL. Nickel is a white metal which takes a brilliant polish and resists atmospheric corrosion very well. Numerous household articles made of iron or steel are often nickel plated, for instance, scissors, thimhles, pins, pliers, and other small tools, small keys, etc. The process is used also for handle hars and other parts of bicycles, and similar metal fittings. Nickel-plated articles that get rubbed in usc keep themselves bright, but such as are not exposed to occusional friction get dull in time, though slowly; they may then, however, be polished in a few scconds by merely wiping
or washing off dirt and rubbing with a cloth or leather.

The nickel coating generally adheres firmly enough to stand service conditions, but it may sometimes get chipped or worn off in places, exposing an ugly black patch due to the corrosion of the underlying steel. Nothing but replating will then restore the appearance of the article. See Electro-plating; Enamelling.
NICOTINE. Tobacco contains, amongst other substances, a liquid alkaloid called nicotine. The drug has been used in medicine as an anti-spasmodic in tetanus and strychnine poisoning hut is rarely employed. It has a marked effect in raising blood pressure, resembling adrenaline in this respect. Pipe mixtures are said to contain most, cigarettes less, and Havana cigars the least nicotine. Many, but not all, of the evil effects of smoking to excess are due to the amounts of nicotine constantly being absorhed

This alkaloid or juice plays an important part in the colouring of pipes; but it is injurious to the tongue and throat of the sinoker, and should not be allowed to accumulate in the stem, where it forms a soft, dark deposit. It may be removed with a small wire brush.
Where boiling water is availahle, a simple and effective method is to hold the bowl of the pipe tightly againat the hot water tap, so that a strong jet of boiling water is forced through the stem and thoroughly cleanses it of the nicotine. The process is much accelerated if the mouthpiece is removed and the end of a wire covered with soap is inserted into the stem, and the soap well worked in. This absorbs or loosens the nicotine, which is then easily washed a way when the pipe is held under the tap. Any ordinary wire is suitable; a wire paper clip may be straightened out and used effectively as a pipe cleaner.

Another method is to heat the wire in the fire until it is red-hot, and then plunge it into


Niche in a chimney recess. It is ornamented with a design of a rising sun and contains old china llumphrell \& Vera Joel
the stem of the pipe The nicotine is burnt up in this way by repeated applications of the wire; but the use of soap and boiling water is clenner and more effective The mouthpicer can be treated in the same manner

Garden Uses. Nicotine is also useful to the gardener. Nicotine soap wash, as it is called, is a very useful contact insecticide which is recommended for the destruction of apple aphis by the Ministry of Agriculture (Lentlet 330 ) It is made up as follows
Nicotine ( $95-89$ per cent)
Soap (anft)
$30 \%$
$\frac{1}{2} 16$
Winter (soft)
10 gal
If the water is hard, $\mathfrak{i}$ ib. of вол phould be used. Dissolve the soap in hot water, dilute to the required strength, add the nocotine, and stir well. If soft soap is unobtainahle, hard soap should be used instead. It will also kill apple sucker, capsid buga, young caterpillars, and other garden pests. See Apple: Insecticide; Pipe; Smoking; Tobacco.

NIELLO. This Italian word is used for a process of decorating metal with incised designs filled with a black alloy. To some extent it resembles both inlaying and enamelling. The alloy is one of sulphur with silver, copper, or lead. Nicllo is used also for the piece of work decornted in this fashion, and for an impression on paper taken from the engraved and incised surface before the niello alloy has been laid thercin. See Enamelling; Inlaying.

NIEREMBERGIA. The species rivularis is a protty creeping plant suitable for the rock garden. It bears white pink-tinged flowers


Nierembergia rivularis, a beautiful creeping derennial for the rock garden
and thrives in a compost of loam, leaf-mould and sand. Propagation is by division in spring. Nierembergia fruteseens grows $18-20$ in high and bcars beautiful blue flowers in summer; it is increased by cuttings which should be taken in July or Inguat.

NIGELLA. This is the botanical name of a favourite hardy annual, love-in-a-mist, which bears blue Howers in summer. Seeds are sown out of doors in apring where the plants are to bloom

NIGHT BLINDNESS. The condition of partial inability to see at night or at other times when the light is dini is known as nyctalopia, or night blindness. Sometimes it may be cansed by the eye having been exposed to too strong a light. In most cases the abnormality is hereditary.
It may be a symptom of changes in the eye due to syphilis, when treatment for this disease will be urgently necessary. Apart from congenital cases treatment must commence with complete rest of the eyes, and it is usually neccssary to improve the health by a generous dietary and tonics. See Blind; Eye.

NIGHT LATCH. This is a kind of latch which can only be opened by a key on the outside, but can be opened on the inside by turning a knob with the hand. It is a very convenient form, as it enables the door to be securely fastened against anyone who is not in possession of $n$ key. It can be obtained in either the warded or in the lever pattern, and also in the pin tumbler form

The keys are generally small, and so are convenient for carrying in the pocket, and owing to this advantage night latches arc often fitted to hall doors The latch is fixed to the door so that the case is on the inside, while the keghole is cut through from the outside. The carc and attention which should be given to this type of latch is the same as should be given to other locks and latches, and includes periodical oiling See Latch; Lock

NIGHT LIGHT. A form of short candle that gives a feeble light over long periods, as during the night, is termed anight light. It is often used in the nursery, and is also employed in photographic dark-lamps as an illuminant

The two varieties in use consist of the short, thick cylinder and the pyramid shape. The former consists of a paper case into which melted paraffin wax or candle material has been poured, having in the centre a Hax wick supported upon a tin disk. The night light of this form is placed in a sancer of water in use. It lasts about 8 hours. The pyramid or cone form of night light has n base of plaster of Paris, which supports the wick of rushpith. This variety is generally burnt in glass dishes without water

NIGHTMARE. The feeling of oppression and terror, accompanied by horrible dreama, to which the name of nightmarc is given, is not uncommonly the result of some digestive disturbance. Either the evening meal has been too heavy, or something lias upset the stomach. People who suffer from nightmare should take their last heavy meal not later than three hours before bedtime. and avoid all mental work, such as study or engrossing reading, for the last two hours before retiring.
The mattress should be hard and smooth. The pillow should be just thick enough to leave the neck comfortable. The bedclothes should be light. The feet must be kept warm, if necessary, by wearing socks or by the use of a hot-water bottle. The patient must not lie on his back. To prevent this, if necessary tie a cork or large spool over the lower part
of the back where the spine is prominent. Constipation must be prevented When an attack of nightmare is followed by inability to sleep, a glass of warm water with a tablespoonful of whisky, or a teaspoonful of sal volatile, will often prove an effectual remedy.

Nervous and delicate children often suffer from night terrors, and will wake crying out in fear. In nervous children the injury of iepeated attacks may be considerable. The trouble is often due to a badly ventilated ronm or the use of heavy bedclothes. A noor common cause is indigestion, resulting from faulty feeding. Over-pressure at schooi, great excitement before bedtime, $\Omega$ fright, or a creepy story told to the child may sometimes give risc to one of these painful attacks.

The child should be examined by a doctor for adenoids or other affections. The hedroons should be airy, and the bedclothes light but sufliciently warm. If the child is constipated, an aperient, such as castor oil, $\frac{1}{2}$ to 1 teaspoonful, should be given. The mother should see that the child has only a light supper, no pastry, meat, or anything difficult to digest. Milk and biscuits or bread-andbutter will generally be found the best fare for a child late at night. In some cases a small cup of bcef tea given the last thing at bedtime will stop the trouble.

When the child cries out, it is generally best to go to him quickly, as the presence of a grown-up person will tend to soot he his fears. When he is quiet, give a small drink of water and change his position, and it will be found that he readily sleeps again. Never under any circumstances speak impatiently to a child who wakes in fear, as it will only increase his distress. It is a great mistake to send a child to bed in a dark room when he dreads the dark. In these cases where night terrors are troublesome a night light should be placed in such a position that it will not 1 hrow shadows on the ceiling or walls, and if possible the child should not be left alone

NIGHT-SCENTED STOCK. This is the popular name of Matthiola bicornis, a hardy annual, 10 in . or so high. It bears small lilac coloured blooms which give off a delicious fragrance in the evening. Seeds arc sown out of doors in spring where the plants are to bloom.

NIGHTSHADE. The deadly nightahade is Atropa belladonna, the berries of which are poisonous. See Atropine; Belladonna: Deadly Nightshade.

## Night Wear Cases and Sachets

## Decorative Suggestions for these Bedroom Accessories

For further helpful information the housewife is rcferred to the articles on Appliqui Work;
Drawn Thread Work: Embroidery; Leather Work: Painting on Textile Fabrics; Ribbon W'ork; Richelieu Work
Cases to hold nightdreases and pyjamas organdie would be charming; on an art silk can be made of n variety of materials, such as linen, silk or suede. The term sachet is usually employed for such cases when made without a flap and when padded with a layer of wadding, which may or may not be perfumed with lavender or a sachet powder. Satin and silk taffeta, trimmed with tinsel lace, or frilled or gauged georgette, are often selected to inakc up into sachets; if padded these cannot be laundered, but have to he dry cleaned, so that such unwashable materials are liked when it is wished to make this bedroom accessory a particularly decorative one.

Whether the case or sachet is simple or elaborate, it should always be chosen with due consideration for the colours already in the room, and in particular to accord with the belspread. For instance, on a lace and linen spread a black satin night wear sachet would look out of place, whereas one in pale blue talfeta, broderie Anglaise, or frilled pink of talfeta, broderie Anglaise, or frilled pink of linen ineasuring about 8 in. and, after
embroidering it, faggot it to, or use ornamental hlanket atitch to attach it to, the centre of the flap
The night wear case illustrated in Fig. 1 is cut out to the measurements given It is made of a decp ahade of lavender linen and embroidered and scalloped in a pale shade of green. Welicate pink and bluc coulit be used for the floral detail of the initial, or all embroidery could be carried out in white. the edges of the third Before being made up forms the flap are traced the length which lots are embroidered in satin stitch. The design for the required initial is also transferred and embroidered in raised satin stitch and stem stitch. 'The superfluous raw edge is then cut away from the scalloping. Press the embroidery on the wrong side and fold the linen into three. 'rack the sides of the plain two-thirds to form the pocket together and seam neatly so that they do not show beyond the scalloped edges of the flap.
Edges may be hemstitched instead of scal. loped; the flaps of such cases may be embroidered in Renaissance or Richelieu work, in broderie Anglaise or in cross stitch If the last is employed, the edges should have a fancy cross stitch border. Crash may be used to make the case and woolwork for decoration in bright colours. the elges being finished with ornamental blanket stitch.

Flaps niay be rounded at the corners or made envelope shape if liked and bound with a contrasting colour Stranded cotton is best used for embroidery on linen cases. The simplest stitches are employed for floral designs, such as satin and stem stitch, buttonhole, rose and lazy-daisy stitches for stalks, leaves and flowers and French knots for the centres of the latter. These stitches are illustrated in pagc 419. Plain blanket stitch is the same as buttonhole stitch, with a coarser threal and larger stitches and spacing.

Velvet sheep skin or suède finished splits for pyjamia cases can be cut out to the same measurements, the edges thonged, and a design or monogram stencilled on the flan which is usually lastened down by means of one or two press studs (see Leather Work).
Noah's Ark Case A delightful case for the pyiamas of nur sery folk is illustra. ted in Fig. 2. It is made of linen, red for the roof, fawn or cedar brown for the walls and bright blue for the hull. The cmbroidery, which is of the simplest description, is done with one skein each of red. blue, cedar, darker brown and black stranded cotton. The preliminary stitching of the edges of the various pieces must be done firmly



Night Wear Cases. Fig. 1. Case made from linen, with scalloped edges and initial embroidered on flap
and neatly or the case will not wash and wear well.

First cut out the linen according to the dingrams in Fig. 2 Turnings are allowed for. Tack down a neat hem all round the red roof piece, sloping sides first and then the two straight edges Hem the tops and bottoms of the two cedar pieces, using one thread of matching strander cotton and tack down a single $\frac{1}{4}$ in turning along the sides.
back, but leaving the front loose open Slipstitch together the ends of the boat projecting from the walls A transfer (No 166) for the embroidery, which is used to decorate this Noah's Ark Case, may be obtained post free from Good Needlework Magazine, Transfer Dept., 291, Oxford Street, London, W 1 The cost is threepence, which may be remitted in postage stamps.

More Elaborate Sachets. Benutiful nightdress sachets are made from shot silk The simplest is an oblong bound with a heavy silk or tinsel cord For this cut four pieces of taffeta shot mauve and blue or llame and gold or whatever colouring is most suitable for the room-measuring 17 in . by 13 in Cut two shapes of cotton wool half an inch smaller than the taffeta all round. Lay one piece of taffeta for lining on a top picce and seam all round the edges, leaving about if in. open Tack a warlding shape on the lining at the

Along the bottom of the front
wall, having first drawn or traced the design, embroider the figures, door and windows. Fold the blue piece for the hull in half lengthwise and join the sides with French seams. Then tack down a single $\}$ in. turning all round the remaining edge

Next tack the walls into position in the hull, the hem just under the turning, making sure they are in the centre of the hull and using three blue threads and $\}$ in. long blanket stitches with $f$ in. spaces between. Blanket stitch all round the top of the boat, thus attaching the front walla to the front of the loat and the back wall to the back ol the boat. Tack the walln together at each side and hlanket stitch them together with matching cotton, using $\Omega$ amaller stitch and spacing.

Fold the roof in half and stitch the top edges ( X and Y ) firmly to the top of the front wall (points A and B). Tack the lower back edge of the roof to the back wall. Now blanket stitch in sed, as before, all round the roof, fastening down the


Cedar front wall


Fig. 2. Noab's Ark in colourad linen makes a practical pyjùma case for a child. The roof lifts upfor tha night wear to be placed inside Courtes, of Good Nèdlework Maoazinc


Fig. 3. Nightdress sacnet in black satin, trimmed witr a border of kold lace, and a basket of flowers in bright colours Courtes" of Good Needlework Mayazine
extreme edge and turn them all inside out Finish off the last 6 in. invisibly and prepare the second paided half of the sachet in the same way. Stitch the two pads together and leave one side open to slip the nightdress in Trim with the cord and a motif of padded flowers or one in gold or silver embroidery. Such motifs can be olitained ready made o hand embroidered as desired. Gold is uscd for a shot silk with yellow in it. silver for blue or mauve.

A pretty trimming is made by using $a$ 2 -in. wide tinsel gauze ribhon and a gold or silver lace to finish the front of the sachet. Take running stitches along the edge of the riblion and draw up to fit the sides of the sachet. Tack it into position round the edges and atitch a narrow tinsel lace on one side of it facing to the centre of the sachet, and another on the outside of the ribbon and on the erlge of the sachet. The inner lace trimming should lie flat on the edge of the gauze and on the sachet and the outer lace trimming should be slightly gatherel.

The black satin case illustrated in Fig. 3 is comnosed of two ovals of black satin, two of pink talfeta and two of wadding and trimmed with a basket of silk flowers in vivid colourings and with $\Omega$ gold insertion and lace each $\frac{3}{4}$ in. wide. First cut a pattern of an oval measuring 16 in . by 19 in . deep.

Lay this pattern on double black satin and cut out two ovals; then cut out two more of the same size from rose pink taffeta and two more $a$ trifle smaller from wadding.
On one of the black satin ovals the basket ol flowers is arranged A suitable design may be accomplished by means of appliqué work (q.v.) by painting on the satin, by embroidering the Howers or by making them in ribbon work (q.v) The basket is made from five rows of the gold insertion sewn over a piece of gold coloured satin shaped like a basket. Stitch it down on the sachet and arrange the flowers over it.

Lay a taffeta and a satin oval face to face and seam them together three-quarters of the way round. Lay a wadding oval on the taffeta one and catch it down with slip-stitches all round the edge. Turn the seamed ovals right side out, and the woulding will be in its correct position between them. Finish off the last part of the seam invisibly. Seam the remaining three ovals in the same way Slip-stitch the two padded halves together, leaving them open for about eight inches at the left-hand side. The nightdress is alipped in here.

All round the edge of the top oval, with the basket on it, stitch a strip of gold insertion $\$ \mathrm{in}$. wide, gathering it on the inner edge to fit the curve of the oval. Then. round the extreme edge of the sachet stitch a strip of gold lace about $\frac{3}{3} \mathrm{in}$. wide gathered slightly along the straight edge These laces must, of course, be stitched only to the top oval where the sachet is left open at the side.

A circular sachet can be made in the same way as the oval one previously described, merely cutting out and making circular pads instead of oval ones A pretty finish is shown in Fig. 4 This sachet is lined with pink silk and covered first in black satin, and then has a top covering of gathered black georgctte The trimming consists of a large shaded pink silk rose and green silk lesres (q.v.).

Nine Bark. This hardy deciduous shrub is known botanically as Neillin (q.v.).
NIPPLE : Its Care. That portion of a woman's breast by which milk is conveyed to the child should be prominent in the healthy, well-developed woman, and especially so during prognancy and after childbirth. Great care should be taken that the clothing is never sufficiently tight across this part of the body to crush the nipples.

If through pressure or any other canse the nipples are not sufficiently developed for it to be easy to suckle the child, the following treatment should be carricd out. During the last few weeks of pregnancy the expectant mother should gently pull out . the nipples each day, using cotton wool and n little vaseline. For the last two months before the child is born bathe the nipples night and morning with ean-de-Cologne (1 part eau-deCologne to 3 parts of water). After bathing, dry with a soft clotl or piece of flannel.

After childtirth the nipples must be carefully attended to. They should be bathed with boric solution (a teaspoonful of boracic
ncid to the pint of water) before and after suckling, and then carcfully dried with cotton wool. Should crack. ing or chapping take place, amear with a paste made of equal parts of bismuth carbonatc and castor oil between feedings, and have a nipple shield for the child to draw the milk through.

Sometimes when the nipples are very sore it is necessary to keep the child from suckling for a few days, and then the milk must be drawn from the breast by means teat attached, or a shield with tuhe and teat attached, or breast pump. Sometines while a woman is nipple. This should be opened by the doctor. and dressed with antiseptic lotions, etc.
Eczema of the nipple may he very troublesome. It results from neglect of cleanliness a fter suckling. The nipples swell, and become more or less raw. There is usually some pain and itching and the skin around the nipple may become involved. If the outbreak of eczerna is severe, the child should be weaned. Bathe the parts with an alkaline lotion such as bicarbonate of soda (l dram to $\frac{1}{2}$ pint of water), carefully dry with a piece of clean, soft linen, then apply zinc ointment, lanoline cream, or the paste above mentioned, and cover with lint or linen See Bahy

## Nit. See Lice

NITRATE : For the Garden.
In gardening the term nitrate usually means nitrate of soda, though sometimes it is applied also to nitrate of potash. Nitrate of sod a is a particularly good stimulant for vegetables in spring and early summer, as it helps on the growth. It must bc used with care. as it promotes luxuriant leafage. One oz. per sq. yard is sufficient. One oz. dissolved in 1 gallon of water makes a good plant stimulant. Nitrate of potash is very stimulating, as it contains 15 per cent of nitrogen and 40 per cent of potash, but is too expensive for general use. See Garden; Lime: Manure.

NITRATE OF SIIVER. Also known as lunar caustic, nitrate of silver is much used in medicine, in the form of crystals or moulded into pencils or sticks. It is largely used as a caustic for the removal of warts, proud flesh, etc. A solution forms a useful astringent spray for an inflamed pharynx or larynx, and a weaker solution may be used as a gargle. If it is desired to stop the local action of the nitrate use a little common salt. Internally it is frequently prescribed as a remedy for gastric or duodenal ulcers, diarrhoea, and chronic catarth of the stomach.

In poisoning by nitrate of silver there is vomiting, purging, severe inflammation of stomach and intestine, and also violent pain. The treatment while awaiting the doctor consists in administering a strong solution of common salt, keeping the patient warm, and giving milk, olive oil, and soothing liquids.
NITRE : Its Household Uses. Potassium or sodium nitrate, known as nitre, is chiefly used in the household as a meat preservative, retaining the red colour of the meat better than common salt. For making a pickle for hams, a mixture of common salt 3 lb ., nitre 2 lb , and boric acid 1 lb . is usually employed

Nitre is also a constituent of fertilizers. As nn example, a mixture of equal parts of nitre and phosphatc of potash is employed. One teaspoonful of this powder dissolved in a gallon of water is used for watering plants in pots; for outdoor plants the proportion is one iablespoonful to every gallon.

In medicine nitrate of potassium, also known as saltpetre, is frequently used in fever mixtures on account of its mild diuretic and diaphoretic effects. Poisoning may result from large doses, usually taken in mistake for sodium sulphate or for Epsom salts. The symptoms are vomiting, purging, with blood in the stools, suppression of urine and sometimes convulsions. While awaiting the doctor, if vomiting has not occurred it may be induced by giving an emetic, e.g. common salt, or by tickiling the back of the throat Thereafter milk and olive oil may be given, and hot poultices or fomentations applied to the abdomen to relieve pain.

Nitre Paper. The breathing in of the smoke from burning nitre papers often gives relief to pcople who suffer from asthma. Nitrc paper niay be prepared at home in the following way: Take $f$ oz of saltpetre and put in a pint of water, which should be nearly boiling. Let the saltpetre thonoughly dissolve, and then dip into the solution pieces of white blotting-paper a few inches square Let them thoroughly soak, and then lift out and allow to dry, but not near a fire. To use them, fold like a tent, then place on a dish or in the fender. and light at the folds so that they burn slowly. Two or three nay be burnt one after the other in the patient's room See Asthma.
NITRIC ACID. Aqua fortis or nitric acid is a strong mineral acid which gives off irritant fumes when exposed to the air. It is a powerfill caustic. Poisoning by nitric acid is indicated by yellow discoloration of the lips Alkalis such as chalk, bicarbonate of soda, etc., should be administered as antidotes.
Nitric acid has many applications in industry for such purposes as the inanufacture of explosives and aniline dyes.

Nitric acid is poisonous and the fumes given off are injurious to health. It shotuld never be left loose, but leept in a well-sloppered bottle, stored in a safe place, and prominently labelled.
The use of nitric acid in the home is restricted chiefly to such operations as the etching of metals, although in the form of a salt, such as nitrate of silver, there are important applications in photography. Barium nitrate and strontium nitrate are used for the namufacture of many kinds of fireworks. When used as a very weak solution in water nitric acid forms a useful cleansing agent for badly discoloured brass, copper, and similar alloys; but the metal must be thoroughly scoured in boiling soda water immediately afterwards, as the action, unless stoppcd, will corrode the metal. See Caustic ; Poisoning.

NITRITE OF AMYL. This very volatile liquid is usually inhaled, but it may also be swallowed. Nitrite of amyl is much used in angina pectoris and other convulsive attacks. The dose for inlialation is 3 to 5 minims. This is supplied in thin glass capsules, one of which the patient places in a corner of his handkerchief, crushes bctween finger and thumb, and then inlialea the vapour. This should be done slowly, for the action of the drug is extremely sudden, and at first may cause alarm.

## NITRO - CELLULOSE FINISHES

 These are enamels and lacquers prepared by dissolving nitro-cellulose in special solvents and incurporating pigments to give the desired colour or tint. The drying, which is rapid, takes place by evaporation of the solvent. Cellulose finishes, as these products are usually deacribed, are prepared specificallyfor apraying or for brush application. The former class is extensively used for industrial work (c.g. in enamelling coachwork, furniture, etc.). The home worker can obtain a portable spraying outfit with" pistol," foot punip, and air reservoir, for about 50 s.

Brushing finishes are ohtainable in a wide range of attractive colours, and, though slower than the spray class, are comparatively rapid in drying. The technique of their application presents no difficulty, It is described in detail in the article on Enamel
The brushes used should be rubber set ones having soft bristles, and care should be taken not to mix together the products of different makers, since the hasc or solvent used might be different in nature and composition. For a like reason both undercoating and finishing cont should be those of the same maker

The solvents employed are inflammable, and the material should not be used near a fire or any open flame. When the uork is done indoors the room should be well ventilaterl

NITROGEN : For the Garden. Plants need nitrogen when they are without vigour and their foliage has a washed-out, pale-green appearance. Application of a quick-working nitrogenous manure, such as nitrate of soda, in amall quantities will rapidly encourage new growth, and reatore health to a sickly plant.
Soot contains a percentage of nitrogen, and apart from its value in this respect is useful in making a plant's immediate vicinity dis tasteful to slugs and other pests ; it must not be used carelessly, however, as it is injurious to the leaves of tender plants.
Sulphate of ammonia is preferable to nitrate of soda, 1 oz. to the sq. yd. making a good ground dressing, or 1 oz . to the gallon in solution. Generally it is unnecessary to apply nitrogenous manure to leguminous crops, as these naturally draw the element from the atmospherc and in conjunction with bacteria convert it into fond form See Fertilizer: Guano: Manure.

## The Noah's Ark and its Contents

## How to Make a Popular Nursery Toy

This work contains numerous articles dealing with children's amusements and nursery matters generally. Among them are Doll; Knitted Toys: Rocking Horse; Toys. Sec also Nursery

Arks containing animals can be hought n a number of sizes, from small ones including only a dozen or so animals to quitc large ones with two or three hundred. The animals are almost always in wood. In the larger arks they are made in pairs, each pair representing an animal or bird, with other wooden figures representing Noah and the members of his family.
A typical ark (Fig. 1) is made with $\ddagger$ in. and ${ }_{1}^{3} \mathrm{in}$. wood. The base is $12 \frac{1}{2} \mathrm{in}$. by $3 \frac{1}{2} \mathrm{in}$. by tin., shaped at cach end and chamifered along the lower corners. The ends are 5 in. by 27 in by $\ddagger \mathrm{in}$., with the top corners sloped off to $3 \frac{1}{2}$ in., and the sides are cut from $\frac{3}{16}$ in wood to $8 \frac{1}{2} \mathrm{in}$. by $3 \frac{1}{2} \mathrm{in}$. Ghue and brad the sides to the ends, and then attach in the same way to the base, leaving an equal amount at the sides and ends. The slope of the ends should he carried along the top edges of the sides with a smoothing plane. The roof is made from two pieces of $\frac{3}{16} \mathrm{in}$. wood, hoth $9 \frac{1}{2}$ in long, one $2 \frac{5}{8}$ in., and the other $2 \frac{1}{2}$ in. The wider piece is glued and bradded on one side, over-lapping the npex of the ends by $\frac{3}{16} \mathrm{in}$., and the other piece is attached with two or three strips of linen or canvas, which measure about 1 in . by $\hat{E}_{8}$ in

The outside of the ark is coated with white or cream paint and the imitation timber work and windows indicated by grey and black paint. The effect may be brightened up by using red and blue if desired. A narrow slit should be made in the hinged lid and a piece of wire cut from the end of a hairpin driven in the side to project through the opening. The roof should be coated with glue, and covered while
sticky with finely granulated cork and flat particles of straw. A catch is attrched to the top to fit in a loop made in the wire.

Any number of ligures and animals may be placed inside They should be cut out with a

fretsaw from planed fretwood; yellow pine is best, but either whitewond or satin walnut may be used. The simplest way of making the figures is to shape them out of round wood, as in Fig. 2. Pine or deal is the easiest to cut, but whitewood is stronger. First cut off a number of lengths about is in from $\frac{3}{3} \mathrm{in}$. round, and mark off $\frac{7}{8}$ in or so and $\frac{1}{2}$ in. ahove, as indicated at A. Place a knife on these marks and cut into the wood, molling it backward and forward to form the cuts shown at $B$. Cut down as at $C$, and then make other cuts as at $D$, these being $\frac{1}{8}$ in apart. and finish with a file

The next stage, shown at $E$, is done with a narrow-bladed penknife and finished quite round. This leaves the back to be cut flat, as at $F$. To complete the ligure, the arms, $\frac{3}{3} \mathrm{in}$. by $\frac{1}{8}$ in. by $\frac{1}{1}$ in., should be tapered slightly and glued on, leaving the painting to finish. Much time can be saved in making these figures by turning them on a lathe to the stage shown at E, the back, arnis, and
painting only being left The hody is usually painted in one colour, the top. forming the hat, in another, and the head palc pink, with the features indicated by spots of black paint.

The Animals. Thesc are drawn on the wood and cut to shape, some from $\frac{3}{1}$ in., others from $f$ in and is in iwood Three typical exainples are illuatrated. The horse, cow, pig, shcep, and similar shaped animals, are made by taking the block shape as left hy the fretsiw (shown in Fig. 3, A), and forming the legs by making a tenon saw cut across, as indicated at $B$. The ears are formed hy cutting a V-shaped nick, as at $C$, and the horns of the cow by fitting in a shaped piece of $\frac{1}{16}$ in. wood in a saw-cut made in the head. as at $D$.

Most of the blanks, after they liave been divided by the saw to form the legs, are given a slight shape by cutting off the sharp erlges. Some of the animals will bear a little more modelling to give a good shape to the head, particularly with the dog, sheep, and hirds. In the latter the benk should be brought to a point by cutting the wood outwards as in sharpening a pencil. It is usual to give a little shape to the sides of the birds, slightly tapering them towards the tail. but keeping the latter portion full width so that it will stand properly. Both the cat and the cow are made wider at the back: this can be done hefore the lege are cut, but it is not difficult to cut a slice off each side when cutting the corners off. As it is usual to make the animals in pairs, time is saved in cutting out if two pieces of wood are frastenel together. To prevent the saw from catching, both of the pieces should be pasted on a sheet of paper.
Although ordinary paint may be used for finishing the animals, it is usual to employ a spirit varnish coloured with aniline dyes. Ordinary shellac varnish is expensive for large work, but a coating of size applied to the work beforehand will prevent the varnish soaking into the wood. A good varnish paint may be made by disalving reain in methylated spirit and adding a little dye, but this method is not suitable for bright colours.

Another method of forming small animals is to cut the plain shape out of thin fretwood and form the legs with scparate pieces of


Noah's Ark. Fig. 3. A, fretwood block: B, legs formed by tenon saw-cut; C, ears formed by $\nabla$-shaped nick: D. use of a shaped piece of wood for borns

wood. The legs may be made movable by cutting to a larger shape and riveting them By using this method, which is only suitable for animals more than 1 in high, the trunk of the elephant, the horns of the cow ears of other animals, or wings of birls may be made to move, as shown in Fig. 4.

A good method is to cut the animals out in $\frac{3}{18}$ in. fretwood and mount them on suitable bases. Unlesa it is desired to model the shapes, they may be rapidly sawn from prepared wood, sycamore, satin or black walnut being suitable. The shapes are drawn out on thin white paper, keeping as closely as possible to the proportions shown in Fig 5 Ordinary drawing-paper is too thick for this purpuse. In order to obtain a good line for the saw to run against, the pencil lines on the drawing should he outlined in Indian ink.
The usual method is to fill the whole of the shape in with black; the white paper shows up clearly against the black, and helps in cutting a true shape. The paper is pasted to the woorl, which must have a true and smooth surface. In order to ensure that every portion of the paper adheres to the wood, it is advisable to use a roller or a solt piece of rag, and carefully preas down the surface, working with another piece of paper over it from the centre to the outside. (The article on Fretwork should be referred to for useful hints on this point.)

When the paper is dry, drill holes in all the enclosed spaces. In dealing with the slephant, for instance, five holes will he required, one between the trunk and the tusk, three underneath between the lega, and the fiftl at the back for the tail. If possible, the continuation of the lines of the limhs, indicated by hlack lines on the illustrations, should be made by saw.cuts; this is only possible when the figures are mounted All the lines should be sawn square, and particular care exercised in turning the corners. The shape of the head may be quite spoilt if the saw-cut is allowed to stray, and as the animals are so small, even a slight difference in a saw-cut may be disastrons. When all the shapes have been cut out, both surfaces should be rubbed over with glass paper; the paper is cleaned off with a coarse grade and finished with a fine.

Methods of Attachment. There are various methods of attaching the animals to a hase : one is to glue them on as in Fig. 5. The basea are $\frac{3}{16}$ in. thick, $\frac{7}{4}$ in wide, and long enough to take the whole length of the bottom strip with about $\frac{1}{8} \mathrm{in}$. to spare at both ends. In order that the gluc joint should hold
securcly, the surface of the slape fitting on the Lase must be quite level; this may he ensured by rubhing each strip on a llat piece of fine glass-paper. holding it quite upright.

Another method is to fit and glue the cutout shapes in a grooverl base, as in Fig. 6 . A long strip of $\frac{3}{3} \mathrm{in}$. by $\frac{3}{16} \mathrm{in}$. wood can bc prepared hy using plywood and gauging lines in the centre to the required width. The cutting edge of the gauge nust he sharpened, and the cut must be decp enough to carry it below the thicliness of the first layer of the plywood; the waste can be removed with an f in chisel.
The strongest method of securing the shapes is to tenon and glue them into slots cut info the base, as slown in Figs. 7 and 8 . If this method is decided on, there is no need, as a general rule, to make more than two slots, and in many shapes one will be sufficient. The wolf requires three slots, the hear two and the chicken one; these will scrve the purpose of examples.
Larger fretwork sets of moving animals can be made by utilizing the samc shapes drawn out to a larger scale and cut out in thicker wood. The four legged animals are the most difficult to nake. For the hull, one piece for the head is cut out as indicated at A, Fig. 9, two pieces for the hody, two picces each !or the front legs ahove and helow the knee, as indicated at $B$ and $C$, similar pieces for the hack legs $D$ and $E$, and one for the tail $F$. Small round hearled nails and thin washers will be required for fixing, as shown in the section at $G$. If the joints are riveted up tightly by tapping the end of the nails with a hammer, it is possible to stand up the animal in any position. The separate rars and liorns that are to he fixed to the hearl are shown at H and K
The ostrich shown at Fig. 10 may be jointed up in the same way as the bull, but it will not be necessary to joint the legs.

NOGGIN. A messure of capacity for the sale of liquids known as a noggin is normally a gill, or quartern. By liquid mrasure, the noggin has a capacity of 8 -665 cubic in., or 1420 of a litre. In old wine measure 4 gilla or noggins made a pint. The measure is a variable one, and to some extent is used as a convenient term to describe a portion, or helping, rather than a unit of measurement. For instance, if the liquid purchased were measured by the old Winchester gallon, one of which is only 8831 of the imperial gallon, the noggin would he 14 p.c. or there about less than the imperial. The word is also applied to a small wooden vessel.

NOGGING: In Brickwork. Although mostly found in brickwork, nogging may also consist of pieces of wood built into a masonry wall upon which to fix other woodwork, such


Nogging Example of nogging in brickwork in on old half-timber bouse
as a window Irame ; or it nuay be used as a tie, or stiffener for the wall. In half-timber work, in which the houses were built with a franework of lieavy timber, the spaces between the parts of the framing were often filled in with hricks in the manner illustrated, and this is known as nogging. Most of this old work is held in high esterm, owing to the arrangement of the bricks (often in a herringhone or other ornamental pattern), and the natural weathering which has produced fine colouring effects. Ses Brick.

NOISETTE : In Cookery. Noisette is the name given to small round pieces of meat cut from the fillet or loin, all fat removed. and fried quickly in dripping without coating. The noisettes are then served with a garnish of vegetables. Sometimes they are covered with brown meat glaze. See Beef

NOISETTE : The Rose. This is the name of an old-fashioned type of rose, raised by a Monsieur Noisette, by cross-breeding betwcen the musk and China roses. Few varieties are grown nowadays, hut W. A. Richardson, orange yellow, and limée Vibert, white, are still popular. See Rose.

NOLANA. Sonetimes called the Chilian belltlower, this is an annual. It may be raised from seeds sown in heat during spring,


Noab's Ark. Figs. 5-8. Animals cat out in fretwood and monnted on suitable bases, showing use
of glue joint, groove, and tenon respectively. Figs. $\boldsymbol{\theta}^{2}$ 10. Fretwood anlmals with movable limbs of glue joint, groove, and tenon respectively. Figs. 9 10. Fretwood anlmals with movable limbs
which can be jointed with small nails and washers. An explanation of the lettering is given in the text
and transplanted in May, or it may be sown in patches, in $\Lambda$ pril, where it is to tlower. Atriplicifolia, with hlue Howers, is the chief species

## NONPAREIL.

 The handsome cago bird called nonpareil is a native of warmer parts of N America, and is nbout the size of the British linnet. It is kept chiefly on account of its hright plumage ; the song, though soft and pleasing, being little more than a repctition of short notes, like the song of the

Nolans. Blue flowers of the yellow hammer
The head and neck above are rich purple blue, the other upper parts are diversified with yellow, green. and red, and the lower parts are red. The hen bird is more soherly coloured ; the upper parts green-olive and the lower parts yellow. Its natural food is seeds and insects. In the aviary it should le given sceds : millet, rice, canary, and poppy: alan llies and other small insects.
NOODLE, or Nouille. A paste made from flour, eggs, and salt, which is known as noodle or nouille paste, may he used with equal success as a foundation for savoury dishes, a pudding, or as a garnish. It is also known as ribhon macaroni.
To make it, sift $\frac{1}{2}$ lh flour on a pastry board. then melt $\frac{1}{2}$ teaspoonful salt in sufficient water to dissolve it. Nake a well in the centre of the Hour, add the salt and the yolks of 5 eggs and incorporate these ingredients, working in the flour from round the hollow first. The paste must he kneaded thoroughly and vigorously When well worked, sprinkle it with a few diops of water, make it into a ball, roll it in a clean cloth and let it lie for an hour or two. or till wanted. If the eggs are small an extra yolk may he required, hut the paste, although pliable, should be very stiff

After standing an hour or so roll the paste very thinly and cut it into strips six to seven inches wide. Roll the strips up tightly and cut them across with a sharp knife into narrow strips about an eighth of an inch wide Shake these out and straighten them, dredging them with a little flour. Put them into fast boiling salted water, stir them for a few minutes to keep them separated, and then boil then for 10 minutes. Lift out and drain them through a sieve or colander and put them in layers in a huttered haking dish, with grated cheesc between the layers Put a good layer of grated cheese and fine breadcrumbs on top, pour over a little oiled butter and bakic in a quick oven until well browned.
Noodle Dishes. A savoury dish is made by cutting the quantity of noodle paste given above into strips and parboiling them in hoiling water to which salt las been added. and draining them on a sieve. Then put thein into a stewpan with 3 gills strong well-Havoured chicken or veal stock, 1 oz. butter, a little grated nutmeg, mace, pepper and salt. Place the lid on the stewpan, with a piece of greaseproof paper underneath it, set the pan on the stove over slow heat, and simmer gently until the noodles have absorhed all of the stock.
Then take it up, add a teacupful cream, $1 \frac{1}{2}$ oz butter and mix these in with the contents of the pan by lifting them up with a fork and turning thein over. Pile them up on a
hot dish. scatter over a thick layer of grated chicese and the yolk of a hard-boiled egg whioh has heen passed through a wire sieve Put the dish in the oven to colour the cheese, and sen it to table garnished with croûtes of fried bread

To make a sweet pudding, prepare ith noodle paste, then lay aside $\frac{1}{s}$ of it. Treat the remainder as in the recipe for a savoury but substitute 3 gills milk for the stock and add also 2 oz . hutter, 4 oz . sugar, a pinch of salt and flavouring of vanilla or any other essence preferred About $\frac{3}{3}$ hour will he sufficient to allow for the pastry strips to absorh the milk When ready mix in 4 well-heaten eggs Take the remainder of the pastry strips and coil them closely round a well-buttered plain mould. Turn into the centre the prepared noodles. put the mould on a thick haking sheet and hake till it is a fawn colour. Ser Ravioli.

NORFOLK CAKE. To make a Norfolk cake. which is a kind of rich bread, take $1 \$ 1 \mathrm{lb}$. flour and sift it into a hasin with $\frac{1}{2}$ teaspoonful salt. Cream 3 oz. (light weight) yeast with 1 teaspoonful castor sugar Melt 6 o7. butter in 3 gills water, and when cool mix it smoothly with the yeast Turn the liquid into the centre of the llour, make it into a dough, and knead it thoroughly. Set it to rise. covered with a cloth, and when very light make into round cakes and bake about 20 min in a hot oven Brush over the tops of the cakes. when baked with nilk or eggs See Yeast.

NORFOLK DUMPLING. Nortolk dump lings may be served either with hoiled meats or as a sweet with butter and sugar preserve, or a sweet sauce. They should be made with about 1 lh of very light white bread dough and each piece of llough should weigh roughly about $1 \frac{1}{2} \mathrm{oz}$. before it is hoiled.

Make up the dumplings into smooth round halls and drop them, if to he served with meat into the pan in whioh the meat is hoil ing, ahout 20 min hefore it is cooked If they are intended as a sweet, drop them into a pan of fast-boiling, clear water and cook them from 15 to 20 min . When placed on the dish. each should he torn apart with two forks, and a lump of hutter and sugar inserted. the halves being closed together again. Sometimes jam sauce accompanies the dish, hut on no account must these dumplings he cut asunder with a linife

As it is not always possihle to be provided with yeast dough or to make it, use instead a dough made with Hour, salt, baking powder, and suflicient milk or water to mix it to a stiff paste. Knead quite smooth and shape and boil as directed ahove. One teaspoonful baking powder should raise $\frac{1}{2} \mathrm{lb}$ flour See Dough ; Dumpling.

NORFOLK ISLAND PINE. This is the common name of a half-hardy tree, Araucaria excelaa, which in Great Britain must he grown under glass. It is familiar as a pot plant, and is largely used for room and window decoration. Propagation is by cuttings in spring under glass. It should bc potted in a compost of sandy loam with a little peat added.

NORFOLK LATCH. This is a form of thumb latch. It comprises three parts. One consists of a metal plate on which is fixed a handle, a hole heing formed in the plate at a convenient distance ahove the top of the handle, through which passes the latch The end of the latch is flattened so that the thumb can be placed upon it while the fingers grip the handle The other parts consist of the catchi and the keep, the catch being operated by the latch, while the keep engages the catch so that the door cannot be opened unless the catch is raised.

When fitted, the Norfolk latch should be sos placed that the handle and latch are fixed on one side of the door. while a hole is formed through the door so that the latch canoperate
the catch, which is placed on the opposite side of the door. The keep is placed on the door post to correspond with the catch The door may be opened on hoth sides, on one by depressing the latch and on the other by raising the other end See Door: Isatch
NORFOLK PUDDING. lor this pudding take $1 \frac{1}{2}$ th good cooking apples: any sort which are quick cookers will he suitable Make a hatter with 3 eggs. $\frac{1}{2}$ |b flour, salt. and I pint new milk. Greasc a pic-dish thickly with hutter. lay in it the apples, which should havc been peeled and cored Fill the hole where the core has been with sugar well flavoured with pounded clove or grated lemon rind Pourover the apples the hatter. and bake in a moderate oven ahout half hour Try the apples to see if they are quite cooked hefore removing the pudding from the oven
NOSE. The nuse consists of hone and cartilage. Two nasal bone compose the bridge, from which are continued the cartilages or movable portion of the nasal organ. The interior is divided into two portions by a partition termed the septum. From the nostrils the cavities run backwards for about 2 in and open into the naso-pharynx.
The nasal organ is very liahle to catarthal inflammation, as in what is popularly termed a cold in the head. Adenoids tend to keep up a chronic catarrh, and hoils often cause troublo.
Nose Bleeding. Bleeding of the nose, of epistaxis, may be due to such general causes as severe anacmia, scurvy, or plethora, a full-blooded condition of the liead Lncal causes are blows, ulcers, and picking of the nose. In cases where the bleeding is exccssive any of the following measures may be used to stop it: raise the arms above the head and have someone apply cracked ice in a towel to the nose and back of the neck; or lay a cloth soaked in very cold water over the nose; inject very cold water into the nostrils: gently squeeze the nose hetween the linger and llumb, the patient lying down quietly. Sit on a chair with the head thrown back as far as possible and put the feet in hot water. Relief can generally be obtained by snufling up a weali solution of alum such as 10 gr to 1 oz of water
Injuries to the Nose. Children sometimes push into the nose peas, fruit stones, buttons, or even slate pencils, which lead to swelling, discharge, and blecding. Before this foreign body has hecome fixed it can be treated by pressing the finger on the other side of the nose while the patient blows down forcibly. Another methorl is t.o administer snuff or


Noriolk Latch. Door in part section, showing bow latch and catch are fitted a feather to induce snee. zing The nostril may he syringed gently with warm water. The mother should never attempt to remove the obstruction by pressing any instru. ment into the nose, as this inay lead to serious damage to the organ.

Most frcquently chronic red. ness of the ก ose is caused by
indigestion Some people are particularly prone to this disfigurement, and suffer after exposure to wind or sun. The indigestion must be prevented by proper dieting. The following may be applied nightly to the nose with advantage


For this trouble, too, everything should be done to improve the general circulation. A daily tepid bath, followed by a brisk rub down with a rough towel, and regular brisk outdoor exercise are two invalua ble measures. A tonic suol as Easton's syrup should be taken for a few weeks. For covering over the disfiguring redness, a liquid to dry on and leave a powder is sometimes to be preferred to the ordinary face powders. The following is a simple preparation of this sort


Cisence of nose ..
Before applying, shake the bottle well, and then pour a little into a saucer and, with a fine brush, paint the liquid lightly over the nose. Then gently remove with a soft linen handkerchief any excess of the powder, and allow the remainder to dry in. See Adenoids; Blackhead; Breathing; Cold; Douche; Eustachian Tube; Nasal Catarrl.
NOSE BIT. This is a brace bit in the form of a semicircular sectioned tool with a lip at the cutting end. It is used for boring holes in wood, particularly when the hole is to be bored in the same direction as the grain of the wood, as the lip at the end of the bit enables the core of the hole to be drawn out. See 13it.

NOSING: In Woodwork. This is a term commonly applied to any projecting rounded edge. A typical example is that usually found on the tread of a step in a flight of staira

plane to form a plain nosing
There is also the nosing of flat lead roofs, a roll placed on the edge of the lead flat when the sides of the roof are slated.

Other ex. amples of nos. ing are found on the edges of window boards, or the projecting portions of a table. It is one of the most practical finishes, as it does not hold dust, is easily worked, and has no sharp corners to wearrapidlyor give trouble.
In working nosings the rough and ready way, which often gives excellent results, is to plane over the two corner edges at an angle of $45^{\circ}$ and then plane off the 4 corner edges which will result from the first planing. This produces 9 flat surfaces on the edge, and it only remains to plane off these edges one into the other. Another plan is to use a hollow plane, or spokeshave, and produce the required shape by virtue of that of the cutter. Generally, however, both of these implements are used after the edge has been roughly rounded. In either case, the finish should be effected with fine sandpapering.

NOTEPAPER : Its Varieties. The sizes of notepaper in most general use are Czarina ( 6 by $4 \frac{1}{2}$ in.), Octavo ( 7 by $4 \frac{1}{2}$ ), Viscount ( $6 \frac{1}{2}$ by 5), Imperial ( $7 \frac{1}{2}$ by $5 \frac{3}{3}$ ). Some people prefer single sheets to folded notepaper, and these are usually in sizes known as Post Octavo, Diamond, and 6th Avenue.

There are various finishes in all the qualities. The best known of these are linen finish, which is a trifle rough; white wove; and cream laid, which is smooth. Parchment is more expensive. Bond is another white, smooth finish. Vellum is not much used in notepaper as, although quite amooth, it has rather a dull appearance. Hand-made deckleedged paper is the most expensive. Notepapers are obtainable in various shades, including mauve, yellow, orange, green and blue, in linen and smooth makes. Envelopes are sold to match, generally at the rate of 100 envelopes to 120 sheets of note paper (5 quires).

The water mark in notepaper is not peeuliar to any particular make or size. It appears in every quality except the very cheapest.

The best kind of mourning paper is called Italian, and can be bought in all the finishes except cream-laid, where the colour is unsuitable. The black border is in three sizes narrow, medium, and broad. These vary somewhat according to the make.

If it is desired to have an address at the head of the paper, an addrcss die can be purchased. Einbossing presses for home use, complete with die and counterpart and brass paper gauge, are obtainable.

NOTICE: In Law. When the occupier of a house or flat intends to leave at the expiration of his tenancy the landlord has a right to be informed in good time, so that he can arrange to find another tenant. What notice is required in a particular instance depends almost entirely on the nature of the tenancy and the terms of the agrecment. An important point to bear in mind is that the notice must be given by a certain date, and failure to observe this condition will invalidate it.

When a house is taken on a three or five or seven years' lease the tenancy determines automatically when the last year has expired, and no notice is legally necessary; but if the tenant stays on without entering into any fresh agreement he becomes a yearly tenant. Six months' notice has to be given on a yearly tenancy, and it must expirc on that day of the year on which the tenancy commenced. For example, if a yearly tenancy commences on June 24, notice will in that case be given on the following December quarter day, this being six months prior to the date on which the tenancy expires.

Small houses and tenements are taken by the quarter, month, or week, as the case may be, and the notice required on either side is three months, one month, or a week. Thus in the case of a weekly tenant he must give seven days' notice, expiring on the day the rent is due, usually a Saturday. Unfurnished apartmenta are commonly engaged for a year or for six nontha, and a quarter's notice is stipu. lated for. Furnished apart. ments are usually engaged by the week, and subject to a week's notice being given on either side.

Should a tenant fail to give notice at the proper time the landlord may and generally will hold him to the terms of his agreement, will hold him to the terms of his agreement, Nottingham in the 17 th and 18 th centuries.
with the result that he becomes liable for It is a fine stoneware with a lustrous brown
another quarter's rent, and so has to remain considerably longer than he had intended. He should be careful not to make any agreement, either verbal or written, in respect of any new house he intends to move into until he has given proper notice to his present landlord.
Another form of notice is that given to or by a servant. Domestic servants being almost invariably engaged and paid by the month, a month's notice on either side is the general rule. If it is desired to terminate the engagement at short notice, a month's wages must be given instead. A servant is always entitled to her proper notice unless she has been guilty of serious misconduct. See Distraint; House; Landlord; Master; Rent.

Written Notices. Even where there is a written agreement, a verbal notice is perfectly in order; but it is best to put it in writing, with date and signature. It may be delivered into the landlord's own hands or sent by registered post or delivered at the door. In the latter case the correct procedure, although it is not always done, is to keep a copy of the notice and get it signed with the date by the person who receives the original document on the landlord's behalf. These regulations were modified to a large extent by the operation of the Rent Restriction Acts.

NOTIFICATION. The occurrence in any dwelling of certain diseases must be notified to the medical officer of health as soon as the diagnosis has heen made. The discases to be notified are as follows: smallyox, scarlet fever, cholera, diphtheria, membranous croup, erysipelas, typhus fever, enteric fever (including typhoid and paratyphoid), relapaing fever, continued fover, puerperal fever, acute primary pneumonia, acute influenzal pneumonia, tuberculosis, ophthalmia neonatorum, cerebro-spinal fever, acute poliomyelitis, acute polio-encephalitis, encephalitis lethargica, plague, dysentery, and, if contracted in England or Wales, malaria. From time to time other diseases, such as measles and chicken-pox, may be made notifiable.
The word dwelling includes every ship, vessel, boat, tent, van, shed, or similar structure used for human habitation. Legally the obligation to notify falls on the doctor, and also on the householder or person in charge of the patient, but in practice it suffices if the doctor notifies. The object is that the disease may be prevented from spreading.
When lead, phosphorous, arsenical or mercurial poisoning, or anthrax, is contracted in any factory or workshop, the fact must be at once notified to the chief inspector of factories by any medical practitioner called in to visit, or attending on the case, who believes the patient to be suffering from any such condition, unless the case has been previously notified. To the Home Office must also now be notified cases of epitheliomatous ulceration due to tar, paraffin, and similar substances, and of chrome ulceration due to chromic acid and some of its salts.

In towns and districts where the Notification of Births Act, 1907, is adopted, the birth of a child must he notified within 36 hours after the birth to the medical officer of health. This applies to stillborn children. In addition to this it is necessary to comply with the requirements as to the registration of births. See Birth; Death; Infectious Diseases.
glaze, and is representer to day chiefly by jugs and pots. A good example is shown in the illustration Nottingham ware is not unlike that known as Fullam ware, which was started by John Dwight about 1670. The Not. tingham potters, who flourished in the 18th century, owed something to the influence of Dwight, and something also to the German stoneware that was imported into England in the 17th century. See Stoneware.
NOUGAT. The
blanching of 3 oz . almonds and a few pistachio nuts is first a to be talien in making French nougat. After and boil till the temperature reaches $244^{\circ}$ the skins have been removed, dry the nuts Rinse out a bowl with cold water and pour thoroughly and put them on a plate near the augar into it, stir it round with a wooden the fire to warm. In the meantime, stir spoon till creamy, and then add 2 tableapoon2 oz. each honey and icing sugnr, together fuls honey, which should be liquefied by being with the whisked white of an egg and a few heated over boiling water. Add also some halved glacé cherries, in a pan over the fire, delicate Havouring, such as orange fower water and continue stirring until they are cooked. or vanilla.
Drop a little of the nougat into cold water, when it should break evenly and be erisp.

Move the pan to the side of the fire, stir in the nuts, and then turn the whole on to a slab sprinkled with icing sugar. Mould it first into the shape of a ball, and then press it into a small shallow confectionery box lined with wafer paper. Place another sheet of this on top, and then leave the nougat to get cold, when it may be cut into square or
oblong-shaped pieces.

Another kind of nougat


Nougat, a delicious sweetmeat made with icing sugar, almond, honey, and white of egg
can be made by blanching and cutting up and then drying $\frac{1}{2} \mathrm{lb}$. almonds. Put $\frac{3}{\frac{1}{l} \mathrm{~b}}$ castor sugar and a dessertspoonful of lemon juice into a lined saucepan, stir them over gentle heat with a wooden spoon until they acquire a pale brown colour, and then add the almonds. Turn the whole on to an oiled or huttered slab, press it out with a hot, wet knife, and then mark it into squares or strips, breaking these apart when the nougat is cold.

For chocolate nougat, cook together 1 oz ench butter and grated chocolate, $\frac{1}{2}$ gill water, 1 teaspoonful glucose, and 1 lb . sugar, and When they are dissolved boil the syrup to $240 . \mathrm{F}$. Then draw the pan to the side of the fire, add 2 oz . shredded nuts and some vanilla flavouring, and stir the whole till it thickens. Let it cool in a tin lined with waxed paper.
Another variation of chocolate nougat is made by cutting the ordinary nougat into squares and dipping them in coating chocolate. See Chocolate

NOUGATINE. To make these cakes, prepare about 6 oz . short crust pastry, and with it line some greased cake tins Beat 2 oz butter and the same quantity of castor sugar to a crean, then beat in an egg, and add also 1 oz . cake or breadcrumbs. 1 oz . ground almonds, and about $\$$ teaspoonful ratafia essence. Half fill each pastry case with the mixture, sprinkle the top with a few

The noyeau must now be worked like fondant, and at the same time $\mathbf{3 o z}$. almonds, blanched, dried, and cut into halves or quarters, according to size, must be introduced and mixed in. When ready to mould the swect should be soft and creamy, and then should be pressed into a shallow, oblong box if there is no noyeau frame available.

The box should be lined with wafer paper, but it is sufticient to line it with wax paper and have merely a layer of "afer paper at the botton and on the top. The mixture should be about 3 in. thick and quite level. Just before placing the wafer paper on the top, hrush it over lightly with cold water. Weight it to keep it in place and put away the noyeau in a cool place to grow firm When set cut it into bars.

Noyeau can be inade with preserve instead of honey. The janı must be pressed through a hair sieve and the colour reatored with cochineal if red jam, or a little saffron colouring if yellow ; jam invariably loses colour whon sieved Either apricot or raspberry jam is most suitable. Add some suitable essence, such as vanilla, orange, or almond, as well as a few drops of llavouring corresponding to the fruit of which the jam is composed.

Flowers
Precant luardy leaf-losing and hardy herlinecous percnnials
Plant May-flowering tulips
Finish planting suring bulbs, walllower, forget-me-not, polyanthus, and other carly plants
Dig and manuure vacant ground and lime the surface
Apply sand to laivas on clayey soil
dead don7 and burn the dead atems of harily ierbuccolls planta
Begularly garden refuse regularly and thus
stroy many pests
stroy many pests
Maintaln a $u=m p e r a t u r e ~$ of 50-55 degrecs in the grcenhouse to ensure a
display of pernetual carmition, primula, etc.
Water greenhouse
plunts very carefully. moistening the soil oniy when it is moderately


Novemper 9.-Lord Mayor's Day
November 30.-S. Andrew's jay
chopped almonds, and bake the cakes in a moderate oven for about 20 min . When the cakes have cooled brush a little warmed apricot jam over them. See Pastry.

Noyau. Noyau, or creme de Noyau, is a sweet cordial llavoured with burnt bitter almonds. See Liqueur.

NOYEAU. This is a rich, creamy sweetmeat. To make noveau with honey, dissolve $\frac{7}{4} \mathrm{lb}$. granulated sugar in a scant gill of water and when no grains of sugar are left whole place the pan on the fire. Just as
boiling add $2 \frac{1}{2}$ oz. glucose

$\qquad$
 fo
$\qquad$ somblic health sense consists of the doing of puract which constitutes an interference with public rights to use what may be termed public property. Such nuisances may be a

## NOVEMBER

## What to do in the Garden

dry. Ventilate reqularly in inild weatlier
Bulles of dalfortil, liyacinth, and tulip may still he potted

Fruit
Begin to jrune fruit trece out of dhors as soon as all the leaves have fallen
koot prune vigorous fruit trees which do nol
crop wel! crop well
look over fruits in
store and remove storc and remove any which show signs of decay
plant

Plant fruit trees in deeply dug soil, usiag little or no manure

Apply busic slag to fruit plantations, using $40 \%$ per square yard of gronnd
Strawberrics in pots should be placed under klasy to provide carly frnits
indes and peach trees
hass khothd

## Food in Season

## Game \& Poultry

Black game; caperunizie; cupon; chicken; Hrouse; fowls; gerse ; landraila; purtridees: phersants; jlgeons: pintail ; plover ; ptarmiLan; pullets; rablits snipe; teal; turkey wook jonts ; widgeon woodeock

## Vegetables

Artichokes ; beetruot ; broccoli: Brusaels
sprouts; cabbage: red

## Notes for the Month

Novemabr 1.-All Saints' Day. Stock Exchanges closed
November 1.-Elections for city and torough councils outside London
attorney-general. The latter is, however, as a rule, only the nominal plaintiff, merely lending lis name to the real plaintiff. Instances of public nuisances are ohstructions on a highwny and to navigation of rivers

Private Nuisances. Private nuisance, which gives rise to an action for damages and an injunction. consists in some interference by the defendant with the plaintiff's right of property, that is, with his enjoyment of his own property, but not amounting to trespass. Thus, to interfere with a right of way is a nuisance; so it is to block up or diminish another's ancient lights; so also to use adjoining land or buildings in such a way as to unduly interfere with the reasonable comfort and enjoyment of his own property by a neighbour, as by setting up a noisy or evil. smelling or smoky business next door
It must not be supposed that everything of which neighbours may complain amounts to a nuisance. For example, a man may object to a butcher's shop being set up next door to him; but so long as the butcher conducts his business properly he need take no notice of such complaints. On the other had, if he allows offensive smells to penetrate into adjoining property, a nuisance will be created for which he is liable. The principle is that every man has a right to enjoy the comfort of his house or to conduct his business without let or hindrance, provided that he on his side does nothing that can reasonably be held to be prejudicial to his neighhours. See Animals; Drains; Negligence; Pig; Tenant

NUMBER PLATE. This term it used to describe a plate which bears a numher, such as may be seen attached to an entrance door or gate. It is often made in china or earthenware, with a glazed white surface bearing the number in black. Others are engraved or etched in copper or carved in hardwood.
Motor Car Plates. All cars must have number plates attached at the front and back in prominent positions. The plates must be rectangular, the letters and figures being in line or the letters above the figures. Each letter and figure must be $3 \frac{1}{2} \mathrm{in}$. high and every part of it must be in wide The space between adjoining letters and figures must be $\frac{1}{2}$ in. A margin of $\frac{1}{2}$ in. must be beft between the nearest part of any letter or figure and the top and bottom of the black surface upon which they are inscribed When the letters are placed above the figures, a space of $\frac{子}{3}$ in must be left between the two lines, but when the identification marks are in line a gap of $1 \frac{1}{2}$ in. lontween the last letter and the first figure is required.

The plate itself should be black, and the letters and figures painted on it with white or aluminirm paint, though sometimes they are stamped on the plate, the raised marks being painted or stove ennmelled The driver must do nll he can to prevent the plates from being obscured by dirt, luggage or straps, and to ensure that the rear plate is oo illuminated that it can be read easily at night. If he faile to show he has taken all reasonable steps to beep them clean and clear of obstruction he will be liable to $n$ fine not exceeding $£ 20$ for a first offence and $£ 50$ for subsequent offences.

On metor cycles the front plate may be placed parallel with the front wheel. The rear number plate of a motor car may he illuminated at night, but a motor cyclo may have ita front number plate illuminated instead. When a vehicle is being towed, the towed car must have its back number plate obscured and must show instead at the back the index mark and registration number of the car which is towing it. See Motoring; Name Plate.

NUMBNESS. Generally numbness is caused by bad circulation, and often takes place in one portion of the body only, especially the fingers, which will become white and
almost without feeling. Treat by rubbing gently till warmth is reatored. Keep the patient in a warm room and give him hot drinks People who suller in this way should not use cold water to wash with, and should take great care to keep both feet and hands thoroughly warm cluring the winter.

Numbness may be caused by pressure on a nerve supplying the part. This sort passes off as soon as the pressure is removed. Numbness is not uncommon in hysteria. neuritis and other nervous diseases.

NUN'S VEILING. As a light, warm wool material giving good wear and less inclined to shrink than flannel this fabric is popular for babies' frocks and children's dresses. It is an excellent material for winter nightdresses. Cream nun's veiling yellowed by age can be improved by bleaching, and re-dyes well.
NUPHAR. This is a hardy aquatic plant of the water-lily family. Nuphar lutea is the commonest; it bears yellow nymphaea-like flowers in summer. One better suited to small ponds is Nuphar minimum. Planting should be done in April-May: the roots are put in a basket of soil anil sunk to bottom of pool.

NURSE : For Children. I nurse's work in any household consists of the care of the children, their clothes, and the rooms they use. If she is engaged as fully trained she must understand the diet suitahle for varying ages and conditions, and the amount of sleep, air, and exercise necessary to health. In most bouscholds the nurse will undertake the wash. ing of the baby clothes and the woollies of the older children If she is also able to make, inend, and knit, all the better. Instead of being off duty one half-day or evening
a weck, many children's attendants prefer to have a whole day free once a month. It makes a bigger break in the monotony of nursery routine, and as they are out of doors every day, they do not require the fresh air like other maids. Time of during the Sunday should be given to the nurse as a matter of course.

An under-nurse, or nursemaid working under an experienced nurse, receives from her training in the handling of children nad nursery routine. She must be healthy willing, obedient and teachable; not ton sinall or young, or she will be unable to do the heavier work, such as carrying coals and trays, scrubbing floors and general cleaning of the nurseries. Her duties usually include the washing and dressing of the older children It is wise to leave the training of her to the nurse in charge, and her off-duty time should never he the same as that of the upper nurse.

The Uniform. The indoor uniform of a chikdren's nurse may be somewhat similai to that of hospital and district nurses, and consists of a washinble linen frock, a bibhed apron of white linen, and a small cap to match. In some cases a white overall is wonn and the cap is replaced by a square of linen, folded triangle-wise, and fastened round the head. The colour of her outdoor uniform ia generally of dark grey or other subdued shade. such as navy blue or dark brown.

There are institutions for the training of nurses, and from these they can be obtained One such is the Norland Institute 10, Pem. bridge Square, London. W.2. Nurses must be insured under the National Health Insurance scheme

## The Nursery and Its Essential Features

Pleasing and Healthful Arrangements for the Children's Quarters

## This article deals with the decoration and furniture of the nursery. Entries bearing on the same subiect are Baby Chair ; Baby Walker; Cot; Play Pen. See also the articles on Babr; Child; Toys; and those on Central Heating; Electricity : Frieze

'The ideal arrangement in a roomy house is to have separate ilay and night nurseries, with bathroom exclusively devoted to their occupants. Unfortunately this is not possible in a big percentage of homes, nnd the tendency in modern building is rather to decrease than increase the number of rooms, while the rents of town fats and maisonettes necessarily limit space for many families. 'I'he essential thing nbout nursery quarters, whether combined or in scparate parts, is that the children may lee able to develop in them to the best advantage both mentally and physically.

Where only one room is available it should be particularly light and airy, and if possible have a S.W or S. F. asperst. It should he large enough to allow of proper air upace at night, and, to accommodate one nurse and child, should not be less than 12 ft . square or, if oblong, ahout 14 ft . hy 10 ft Windows should he large enough to admit plenty of light and air, and sloould in all cases be effectually barred across the openings. In town houses where a nurse is in charge nurseries aro best situated at the top of the house. The children thus get better light and air and are awny from the coming and going of the bousehold on the lower Hoors. There should be a sufety gate at the top of the stnirs.

If two rooms are available it is better to keep the larger for the night nursery. 'Ihe size of the room for play and meals is not so important, hut naturally the more space there is here, too, the jollier it is. For a small playroom the lighter and scantier the furniture the hetter. Many pieces get in the way of free movements nnd cause unnecessary knocks and fa!ls Warmth and nir without draughts, so essential for children, are more
difficult to regulate in the very small room in cold weather and there should be an upper ventilator to the window.
Perhaps one of the greatest advantages of two rooms is that as children are sensitive to their surroundings the disappearance of all suggestion of daytime activities and exciting toys or games and the apprearance of all that gives the idea of quiet restfulness is conducive to sleep. Certainly the two rooms give delightful scope for decoration The brighter colours and gay cretonnes, pictorially drainatie events painted on screen, frieze or furniture. or worked on rugs and cushions, are usually kept (with discretion) for the day nursery, while the quiet tones presominate in the night nursery and the furnitute is of simple bedroom type
Suitable Decoration. It is pleasant to think that the days are gone when anything was good enough for the nursery, nnd that architects and furniture designers have concentrated in producing charming quarters for amall chiddren; that shops and stores and firms dealing in floorings, wallpapers, fabrics, furniture, chinn, bed and oneal time accessories, stock and manufacture all kinds of pleasing articles especially for the use of nursery folk On the other hand, in some of the super-lecorated nurscries, specialization is overdone The colours employed are too glaring, the white fumiture is varnished to a dazzling deg*ee, stencilled or painted with strange creatures, while the antics of a medley of grotesques straggle over the walls and screens, appearing on chinaware and table cloths at meal times---to say nothing of bils and feeders - on the down quilt and toot of the cot nt night, all over the linoleum and the cretonne curtains. Mother Goosc.


Nursery. Fir. 1. Day nursery with plenty of window, lizht, air, and floor space. Tbe walls are bung with gaily patierned paper and the rest ot the equipnient is simple but charming
in some cases, is cven painted flying across the ceiling with favourite characters attendant, to aidd to the restless effect

All this Invish ormamental stimulation is probably as bad for quick-witted or highly strung children as the neglect of their neculiar requirements was in the past. Modern life tends to make children more active minded. Mechanical toys and gramophones, the ordinary events of an everyday walk, for those who live in large towns, the general noise and bustle around then, are quite sufficiently exciting without the distracting turmoil of a nursery where things appear seldom to stand still and nearly every spot tells an adventurons story.

Small chiddren certainly like bright colours, but it is not necessary to surround them with these. Instead of highly decorated walls, flat paint in a pale shade is desirable; but the colour chosen should he soft and beautiful. Rushing from the iden of exuberant ornament one does not want to fall into the other extreme of a nursery like a hospital ward, so severely painted in white and so strictly hygienic in its furnishing that no child could regard it as a homely playroom or place for cosy rest. Ifter all the room is for the child not an exhibit for visitors. or a place where clcanliness, however important, is the only consideration. It serves his purpose if he can live his life happily in it, and his life is mainly occupied in cating, sleeping and play. 'lhe last is of immense importance to himi and means not only amusement, but development and education. He wants to bring furniture and accessories into his own scheme of things, and up to this point specially designed surroundings are helpful, beyond it they probably retard his mental growth. as they provide too many cut and dried idens and do not allow scope for his inventive mind or individuality.

Choice of actual colour for the walls must be governed, as in ot her rooms, by the aspect. When there arc two nurscries, either a pleasant pale green, dove grey or blue are gool for the slecping room, as these shades are conducive to rest. Should the room be dully situated palc pink is more soothing than yellow, which, however, is an admirable choice in a clear shade for the playroom. Dark or violent colours are obviously a mistake for walls, but a lighter colour or deeper tone may be employed for skirting, door and window frames.

When possible enamel should he used Although the first cost is greater, it lasts far longer than listemper and can be washed clean from grease and finger marks, which distemper cannot be. Where expense has to be considered, the part of the wall above the painted dado can be distempered to match, or in a lighter tone which is carricd over the ceiling. A varnished or washable wall paper with an unobtrusive pattern is a better alternative to paint than is distemper. A paper with a deep cream ground looks well with either a coloured paint to tone with the pattern, or with natural onk woodwork White should not predominate on the walls, either painted or papered, as the glaring effect of this may have a deleterious effect on
children's eycs. The smaller and darker the nursery the more important it is to keep the mural decoration plain and of a pale colour that is also suitable for the ceiling (such as pink, primrose, or deep creain). so that the impression of space may be given and the light increased by reflection.

For a day nurscry a plywood dado has heen employed with success. Blackboard panels are placed at intervals. These are covered with a specially prepared black paper on which the children can draw with chalks to their heart's content. The drawing can be casily rubbed off and the hlack rencwed occasionally by an application of special waterproof ink. The rest of the dado is painted in a light colour to miatch the walls ahove it. The children use the plywood as a picture gallery, and with drawing pins affix any posters, prints or cards which they fancy. Sometimes unbleached calico is used as a surface for the dado, and decorated with cutouts of gummed coloured paper. The children copy simple designs, directed and helped only when necessary. These pancls and blackhoards afford endless amusement and waken the child's creative and artistic powers. Another idea is a notice hoard covered with serge or baize on which cuttings from a children's paper or cards which he receives are pinned
Where there is only a single nursery these excellent idens need not be abandoned if one end of the room is kept as the playroom and the plywood dado or board is limited to that part. When pictorial wall panels arcemployed these also need not be repeated on those portions of the wall visible from the cots, which can be further separated by the use of draught screens. Nursery pictures, whether applied or detachable in frames, should be hung at a level where they can bc easily seen by the children. Where the latter are old enough they should be encouraged to choose such things for themselves. Pictures, if any, should be few and restful in the night nursery.
A nursery hathmom provided with a sink. gas ring, a baby's bath, as well as the usual one, and a lavatory basin, and large enough to contain $a$ gas fire and plenty of


Nursery. Fig. 2. Small nursery, a feature of which is the folding wooden play pen get on a thick ruab mat. This is a boon to busy mothers, for a toddling child can thus be left in satety

Courles! of lleal \& Co
airing accommodation solves the pmblem. of where to wash up the meal crockery, etc., and where to do the essential laundry. In the bigger household friction is often avoided by making the nursery quarters self-contained with store cupboard on the landing and built-in cupboards for linen and utensils.
Heating a Nursery. Central heating is a desirable method of warming the nursery Gas fires combined with rings are very suitable and economical, especially for the night nursery, where a conl fire which requires making up is disturbing. On the gas ring foods are heated and also water as needed.

A closed anthracite stove or fire is suitalle and ensures a warm room in winter. The open coal tire, though it means more work, is often liked for the day nursery. If the cxisting grate is unsatisfactory, a slow combustion stove may be chosen and if it has hobs on either side, these will heat irons, water or food. The day nursery should be kept at a temperature of $60^{\circ}$ to $65^{\circ} \mathrm{F}$., while that of the night nursery should be at least $55^{\circ} \mathrm{F}$.

In districts where gas and electric light are not available a modern type of oil stove, provided it is of good solid make with a firm base, is suitable for warming the night nursery. A strong fireguard of wire mesh must be placed round an open fire, electric, coal, oil or gas stove. The top of the fireguard should be securely fixed to the mantelpiece or wall with neat iron hooks. A useful type of inner firo guard is illustrated in page 458, but a nursery fender should be used as wel!, with an outside rail for airing clothes.

Electric lights should be shaded. If oil lamps are used these should be placed on brackets or shelves at such a height that there is no possibility of their being knocked over. A hanging green nursing lamp is useful for the night nursery. Dark blinds or practical curtains of light resisting fabric are essential for the windows. These curtains should be of a wrishablematerial such as Bolton sheeting. Cretonne should be lined unless blinds are also provided for the night nursery

Floor Coverings. Cork carpet is much used for floors, but is not so suitable as


Nursery. Fig. 4. An attic is here shown adapted to a sleeping and play room. There is a comfortable window seat with toy cupboards underneath, and a delightfui iaea is the notice board
linoleum. The rough surface of the former allows dirt to penetrate, so that it is less easy to clean thoroughly with soap and water. Carpets are not recoinmended, as they hold both dust and dirt. Linolcuin on a Linovent underlay is the best choice, with one or two washable rugs. Inlaid rubber floorings are suitable, as they are waterproof, warm and noiseless Where there is a good floor of wood blocks, these are left bare with the exception of the rugs. Sometimes the floor is coloured or stained and finished with waterproof varnish; but thesc bare floor treatments have the disadvantage of not heing so coinfortable for the toddler, who spends much of his time on the floor. Also, nursery Hoors should not be polisherl, as this leads to
many tumbles and accidents. Practical floor cushions which harmonize with the room and are covered in terry cloth or some such pleasant material should be provided. A cretonne floor minttress is also a very usefu! accessory.

Furnishing the Room. Furniture for the nursery should have rounded corners, be light, strong and washable. In the night nursery natural oak is often used. Here the furniture should be that of an ordinary simple bedroom, the cots standing out in the room with air circulating round them, but free from draughts. A cot should be on enstors and should not be placed between a vindow and the fireplace, or between a window or door without the protection of an efficient draught screen. A really comfortable bed should be provided for the nurse. There should be neither cot nor bed valances. Pretty washable hedspread and cot coverlets should tone witb the curtains. A trolley service wagon is useful when the nursery is in a flat, or when day and night nurseries are on the same floor.
The day nursery may have oak or painted wood furniture. A firm table is essential for ineals, an ironing table, a confortable armchair and one or two ondinary sized chairs; and $\Omega$ baby's chair. Otherwise the furniture for sinall children should be to scale. It should include low shelves for toys, or a practical cupboard, low tables on which to place toys or games while being used, low chairs, and if possible an indoor play pen and a wide cushioned window seat or a settee.

Painted furniture can be renovated with a coat of fresh enamel at small cost. Elm or oak lasts well, but mahogany is not so suitable for the nursery. The old wheelback windsor chairs are hardy and ornamental and hare no sharp corners. They can frequently be picked up inexpensively at second-hand shops A plain kitchen table is not to be despised, and an oak chest of drawers and linen chest may be acquired. Some modern nurseries have cupboards built into the external wall, with ventilators, and these make an airy and cool receptacle for milk and food. The nursery crockery and table linen should be chosen to tone with the scheme of decoration, and bright colours with cheery but not ugly designs are desirable.

- Planning of Nurseries. Our first illustration is of n nursery in a modern house planned with wide bay windows, of which the children
have the benefi on the first floor There is a wash able wallpaper in softly multi coloured pattern but the curtain: are of heavy cotton fabric with a unobtrusive floral sprig and the aimple wicker chairs and table are of plain type, o that the pat temed effect is not overdone. Jaspe inoleum in a soft hade of blue, to tone with tho ground of the wall. paper and curtains, would provide the fooring The two pieces of oak fur iture enhance the light colours o
he rest of the room, while the toy chest on wheels, the little gate-leg table and low chairs could be painted in dove grey, the colour used for the woodwork of the room There is nothing exciting or ugly in the whole scheme. The night nursery (not shown) is furnished in the same style, hut with plain walls
A day and night nursery combined is shown in Fig. 2. This is planned on simple but pleasant lines. No childish decorations appear on walls, floor or furniture. The few pictures arc restfully coloured, the linoleum and curtains could be in soft leaf-green, and the walls of rose pink with a paler shime of pink for the ceiling. The furniture is of natural, unstained oak, light in colour and unpolished except by hand rubbing. Comfort for the toddler, when husily engaged within the folding play-pen, s insured by the thick rush mat.!

A large room in a town house has been converted into the day nursery seen in Fig. 3. The windows are high up, so a play house has been constructel by a handyman with a stairease and roof sufficiently strong to hear the weight of the children with perfect safety. The roof is on the window level. It is in turn a roof garden, $\Omega$ fortress, and a place for playing games where toys will not be disturbed. The ower part of the window, hidden by the safety surround of plywood, is well harred. The door into the play house is practical and there is an electric light fitting inside.


Fig. 6. Comfortable work chair for mother or nurse. Under the seat are two large hinged drawer and a sliding lea rest
Courtesy of Gill d. Relgate, Ll


Nursery. Fig. 5. Ingenious piece of furniture which iolds into a compact capboard when not in use and when open provides a desk and many shelves Courtesy of Gill it Reigate, Ltd

There are also shelves and an individual locke for each child. In this room there are no decora. tions beyond the pleasant colour scheme of corncoloured paint for the dado, with deep cream distempered walls and ceiling and paint work in bright bluc in order to match the curtains.

A modern day and night nursery is shown in Fig. 4. This is a country attic room, and the delightful window trentment, with its dainty voile curtains, dark blinds and cushioned seat, is the principal feature The linolenn is in two shades of brown, and is laid over a sound-deadening felt paper. More decoration is allowed on the walls in this room, but the cots (not seen in the picture) are placed and screened, so that no erciting things are visible to their occupants at night. Favolurite nursery rhyme figures have bect stencilled on the frieze, and a few on the picce of wall by the novel book-house, and on the wastepaper basket. There is snfety ventilator for the lower part of the sash window. The walls and ceiling are painted decp cream, and the woodwork ivory
The nursery cupboard, made of oak, illus trated in Fig. 5, is most useful. When not required for play it folds awny into a compact cupboard. When open it is a delightiful piece of furniture on whose shelves toy-rooms or shops can bo built. There is also space for picture books and a lift-up flap deak at which painting or scrihbling can be done in comfort.
The chair shown in Fig. 6 is a particularly useful and conifortable one designed for mother or nurse. It is well upholstered and possesses two large hinged box drawers for all sorts of requisites and a sliding leg rest. There are also receptacles for books and oddments under either arm.

## Nursing in the Sick Room <br> Simple Suggestions for Looking After Invalids

In addition to the articles on the various illnesses, e.g. Chickenpox; Measles, the readcr is
advised to consult the entries Bednaking; Bedroon; Disinfection; Hot Pack; Hot-water Bottle ; Infectious Disease. See also Invalid Cookery

Home nursing comes into the experience of alnost everyone, and there are certain general rules which should be ohserved. The sick room must be clenned and dusted every lay ; ashes raked out of the fire and cleared awny ; no soiled linen or dressings left littered ahout. All these matters may be attended to when the patient is the least fatigued or distressed, and with as little fuss and clatter as possible Unless the doctor in nttendance orders otherwise, the patient must be washed all over once daily.

The process is as follows: Take the patient's temperature Put the fresh clothes to warm if the weather is cold. Fill the hot bottle. Shut the window. Fill a basin with water as hot as the hand can bear. Have soap and towel handy. Remove shcets and superfluous cover ings from the licd, remembering always to Leep one of the blankets over the patient. Now roll the patient into an old blanket or thick bath-towel, and wash quickly and thoroughly, not forgetting to wine quite dry. Wish and dry each part separately, and cover immerliately with the bath-llanket. IVash the back especially well, and note any pressure marks which might develop into hed sores. All sores should be reported at once to the doctor Water beds and ring pillows can always be borrowed or hought if required.

Remove the bath-blanket, still keeping the patient covered with the upper blanket, put ous warm, fresh clothes, and brush and comb the hair. If the doctor permits, the invalid can be lifted out on to a clair or conch when the bed is re-made, hut this is not at all necessary, for the under-sliect and blanket can be rolled under the body and renewed. It is important that all under-sheets and blankets be free from creases and crumbs. All this is best done in the morning; but restlessness and slecplessness in the evening are often relieved by sponging the face and hands.

In all cuses of pneumonia, high-fever, or gastritis, the mouth should receive special attention. It should be cleaned out before and
after food with glycerin and horax, or glycerin and lemon.
The diet of all invalids should be light and easily digested, and the doctor's orders must be obeyed implicitly. The foorl should be given at regular intervals in appetizing form, and never kept in the sick room. Medicine and trentment must be given at the hours ordered but the patient should not be wakened.
The regular action of the bowels should be encouraged daily, and the urine measured and saved for the doctor if required. The hedpans and urinals must he kept apotlessly clean and well scoured with hot sola water or disinfectant every day; they should be covered with $\Omega$ cloth when carried to or from the room. It is a great conifort to an invalid if such utensils are warmed with hot water before use and warmth also aids the evacua tion of the bowels and the passing of urine. If the patient is in a recumbent position a small pillow or pard placed under the back relieves pressure when the hedpan is in use. Excent in chest or kilney cases the windows should be opened wide after the action of the bowels. Any dificulty in the daily functions must be noted and reported.
All matters likely to alarm or agitate must be kept from the invalid, and visitors to the room should avoid any appearance of anxiety or fussiness. Every effort should he made to ail suloquate reat and sleep. A gloved hand may be used for putting conls on the fire or lumps may be wrapped in newspaper. Small coal and damp dust in a blue sugar bag. if placed at the hack of $n$ fire, will keep it in or hours at night.
Infectious Diseases. Infectious illnesses reguire special preventive measures in a private house. i shect soaked in a strong solution of carholic or lysol should be hung over the bedroom door and kept damp. Carpets and curtains must he removed at once from the hedroom and suitably dis. infected, and the floor must he washed over at least once a day with disinfectant. All soiled clothes and bed linen must he removed
in a covered pail, and immersed in strong disinfectant if they cannot be at once boiled in a copper. With typhoid all the motions and urine should be disinfected for 4 hours before being emptied down the drain.

An enveloping overall and cap should be worn by anyone entering the room, and removed on leaving. Hands and nails must be well scrubbed and disinfected, and if possible different shoes worn outside tho sick room. Anyone nursing an infectious case, especially measles, diphtheria, and scarlet fever, should gargle her throat 2 or 3 times a day with a very weak solution of disinfectant. All cups, spoons, and utensils of every description must be kept apart.
Looking after the Nurse. Special care should be given to the health of the friend, relative, or trained nurse upon whom falls the responsibility and care of the patient. Her meals must be regular and sustaining, and always served in a room other than the patient's room. A trained nurse takes her meals with the family, never with the domestio staff. If she is on night duty she must be given a good digestible meal on rising and before she returns to her work. Provision must also be made for a meal or meals during the night.

Most trained nurges are prepared to do 12 hours' continuous duty, but the untrained woman should not undertake more than 8 or 10 hours'. On being relieved from duty, all persons would be well advised to take brisk outdoor exercise. If the case is specially fatiguing, a long bus or motor ride is refreshing, or a seat in a quiet part of the garden with a congenial book. The recreation should extend over a minimum of two hours. Night nurses will find outdoor exercise especially beneficial, as it stimulates the circulation and produces a certain amount of fatigue, so that sleep, even by daylight, comes more easily.

The minimum of sleep allowed is seven hours, and if possible eight hours' consecutively. Those doing night work should be shown especial consideration, and be given the quietest room in the house, at the greatest possible distance from the siok room. All members of the household should be warned of her hours of slumber. Where a trained nurse is employed, her advice must be followed as to her own mcals, etc.

A trained nurse can usually be procured from the private staff of one of the great hospitals, from a co-operative society, or on the personal recommendation of the doctor in charge of the case. In the two former cases the nurse will be under the rules laid down by the hospital or institution from which she comes, and the fees will not be paid to her direct, but to the hospital. Should she be a private individual working single-handed she will have her own regulations and will be paid direct. The weekly fee does not include the nurse's laundry, whioh is also payable by the employer.
As a general rule a nurse supplied by a society or institution is not allowed to remain more than three months with one case. It is, however, usually possible to have this time extended under certain circumstances, but six months is the extreme limit allowed. Nurses working privately are froe to make their own arrangements. Male nurses are procurable for chronic cases with male patients who require much lifting or moving, or for mental cases. As to off-duty time, they must be treated exactly as the female nurse.
NURSING HONE. The charges made by a nursing home vary with the locality and with the room; but the charge invariably includes the patient's entire board and ludging together with expert attendance by trained nurses. As a rule the doctor's fees are extra, though where a patient is in the
doctor's own nursing home the medical fces baking-powder, 1 teaspoonful bicarbonate of are occasionally included. In surgical cases soda, and 1 cupful chopped walnuts. Add the surgeon's fee is paid separately, but his a pinch of salt, and mix the whole to a fairly visits to the patient while in the home are stiff paste with 1 pint milk, either fresh or included in the charge for the operation.

People who cannot afford nursing home fees can frequently arrange to be taken into a private ward of one of the great hospitals, where charges are considerably lower. In London and many other large cities there are also institutions endowed by charitable bequests where persons of small means are received at almoat nominal pricos.
NUT: In Enginearing. A nut is a fastening device, generally with a hole in it, the sides of which are screw threaded. It is employed in conjunction with a screwed bolt or stud, or fized on to a cylindrical piece having screw threads corresponding to those in the nut. See Bolt: Castle Nut; Lock Nut ; Stud.

NUT: The Shrub. The name nut is generally applied to the genus Corylus, which inoludes the oob, hazel, and filbert. All are summer leafing shrubs, and may be grown in any open sunny position, either as a plantation or as hedge plants, for which latter purpose they are splendidly adapted. A stock can be raised from nuts sown in the open garden in autumn. Suckers may be taken from old plants in October, and replanted. See Chestnut: Cob Nut; Walnut, etc.
NUT: As Pood. highly nutritious food is provided by nuts, but they are indigestible unless very thoroughly masticated. When eaten largely it is best to grind them, or to buy one of the preparations sold by vegetarian depots. Nuts contain a large quantity of both protein and fat. Coconuts and Brazil nuts are very indigestible. Chestnuts are the most easily digested, and next in order come walnuts and pea-nuts. Walnuts are said to be laxative when eaten between meals.

The following table shows the average composition of nuts in common use :

| Nuts | Water | CarboHydrate | Pro- teln | Fat |
| :---: | :---: | :---: | :---: | :---: |
| Almond | 6 | 10 | 24 | 54 |
| Brasll | 5 | 7 | 17 | 07 |
| Cheatnut (freah) | 38 | 45 | 6 | 8 |
| Pea-nut . . . | 9 | 10 | 28 | 42 |
| Coconut | 47 | 8 | 5 | 36 |
| Walnut (dried) | 4) | If | 151 | 63 |
| Filbert | 38 | 13 | 16 | : 6.5 |

The chestnut is especially useful as food ; it is rendered far more wholesome by being thoroughly boiled for 10 min ., and afterwards roasted. Nuts can be dangerous to people with weak stomachs and to young children.

Nuts are employed in cake-making and confectionery, and form an important in. gredient of such foods as nut butter, nut galantine, nut sandwiches, etc. Chestnuts are used in a variety of ways, which include the making of a special forcemeat for foods, while almonds, walnuts, coconut, and pistachio nuts, somotimes shredded and coloured, decorate cakes, trifles, fruit ices, chocolates, and creams.
Nut Bread. Nut bread can be made by mixing together 2 breakfastcupfuls wholemeal flour, half that quantity self-raising flour, I breakfastcupful brown sugar, is teaspoonfuls


Futoreckers. 8trong plated eilver nutaraokers, the pair on the left being provided with special teeth lor cracting Brasil nats sour. Turn the mixture into a greased tin and bake for about 1 hour in a fairly hot oven, testing with a skewer to see if it is done.

Nut Butter. To make nut butter, shell and skin some nuts of any kind, grind them to a powder, and then pound them in a mortar with the butter. When a smooth paste is formod, the butter may be put into jars and used as required. See Almond; Brazil Nut; Chestnut; Coconut; Vegetarian Cookery ; etc.

NUTCRACEBRSS. The implement that is used for eracking a nut consists of two levers, or hand grips, joined at one end by a small link piece on which each of the levers is separately jointed. The nut is placed as near to tho joint between the two levers as possible, and when pressure is brought to bear on the ends the shell of the nut is cracked. Nutcrackers are made of steel, brass, and other metals, usually electro or silver plated.
The designs vary, some being grotesque in appearance, others ornately carved, and the rest plain. In some varieties, of which the pair of nutcrackers on the right of the illustration is an example, the levers are so jointed to the link piece that when they are turned over or reversed they come close together, and are used for cracking small nuts, but when turned in the opposite direction the space between the levers is larger, and will take any size nut.
NUMMEG. The fruit of a tropical plant known as Myristica moschata is the nutmeg of which there are many varieties with different names, but none are suitable for practical cultivation in Great Britain.

In a grated form nutmeg is used as a flavouring for various kinds of food, and to milk puddings particularly lends a distinctive taste. The essential oil is used as a perfume, and also made into a flavouring essence which is useful in cookery and confectionery. It is made by adding 102 of the essential oil of nutmeg to 1 pt . of rectified spirits.

In medicine nutmeg acts as a carminative and may be given in indigestion accompanied by flatulence. It is sometimes used in mixtures as a flavouring agent; for example, it does well in a mixture containing ferrous sulphata. It has also a somewhat narcotio effect. Its preparations are: the powdered seed, dose, 5 to 15 gr ; the oil, to 3 minims ; and the spirit, 5 to 20 minims. Large doses produce poisonous effects.

Nutmeg Grater. This is a small device of pierced tin by means of which nutmegs are grated to powder. See Grater; Junket.

NUTRIA. The durable fur obtained from the rodent known as the coypu, a species of beaver, is of a warm golden brown shada. Nutria is specially dressed to resemble the more costly beaver. Sometimes it is given a silvored effect. It is chietly used for fur coats and for winter trimmings for women's cloth coats. See Fur.
NUTS IN MAY. This popular game can be played by any number of children up to 20 ur a few more. It is most suitable fur indoors, but can also be played outdoors.

The players are divided into two equal parties and, standing in line and holding hands, these face each other, leaving as much space as possible in the centre. One line then advances and retreata, singing this verse as they march o and fro:

## Here we come gathering nuts In May <br> Nuts in May, nuts in May <br> Here we come gathering nuta in Bay <br> On a cold and frosty morning.

The other side does the same, singing the second verse as they march :

Who will you have for nuts in May.
Nuts in May, nuts in May
Who will you have for nuts in May
Un a cold and frosty morning?
The first side quickly choose one of their opponents, whose name is inserted in the verse which they sing as again they march to and fro.

We will have (Ethel) for nuts in May
Nuts in May, nuts in May,
We will have (Ethel) for nuts in May,
On a cold and frosty morning.
The side to which the chosen player belongs takes up the song, asking :

Who will you send to fetch her away,
Fetch her away, fetch her away?
Who will you send to fetch her away.
On a cold and frosty morning ?
The side which has named the player names one of its own members to fetch her away thus :

> We will send (Mabel) to fetch her away.
> Fefch her away, fetch her away,
> We will scnd (Mabel) to fetch her away.
> Ou a cold and frosty morning.

The two chosen players advance for a tug of war. A mark is made on the ground by laying down a handkerchief or in some other way, and the two, having clasped hands, tug. The one who is pulled over the mark joins the side to which the winner belongs. The verses are then gone through again with the side that sang the second verse last time now taking the first and it can continue until one side is reduced to few or no players. See Children's Party.

NUTMALIA. This is a hardy leaf-losing shrub, Nuttalia cerasiformis, which grows 4-5 feet high. It bears white flowers in early spring: the flowers are not particularly attractive. A crop of red fruits will result if bushes bearing male and female flowers are planted. It thrives in ordinary soil, and may be increased by division in autumn.

NUT WEPVIL. There are two weevils destructive to nuts, one attacking the kernels and the other the foliage. Remedies are free dressing of soil round the bushes with a soil fumigant during winter or early spring, and apraying with a good wash in May. Where bushes are badly infested with leafweevil the branches should be shaken over sheets of paper smeared with some sticky oubstance to catch the weevils as they fall. See Insecticide.

Nymphaea. This is the botanical name of the family of aquatic plants called water lilies (q.v.).

OAR: The Tree. The chief native British tree, Quercus robur, or the oak, is useful alike for timber and ornamental purposes. There are evergreen oaks and others, the bark of which yields cork. Ordinary trees for lawn and specimen purposes can be raised from acorns planted in autumn at a depth of about 6 in . When the trees are about 1 ft . in height they should be planted out about 1 ft . apart every way, and again transplanted, when the sturdiest specimens still survive.

The planting of oak trees in gardens is not recommended; it is a task for the forester in the plantation. An ocoasional tree to celebrate a coming of age or other festive event will be
quite sufficient for the welfare of an ordinary garden. Acorns gathered in autumn will germinate if sown during the following spring.

OAS: The Timber. There is no other wood equal to English oak in durability, hardness, toughness, weight and flexibility. It has great strength in proportion to its weight and is subject to very little warping and shrinking. If only one or two of these qualities are wanted to predominate, other woods can be found that are superior to oak in one or two respects, but are inferior to it in others.

A good proportion of oak is cleft instead of sawn, that is, it must be sawn across the grain but is split lengthwise. The cleavage follows the grain, and for many purposes the wood is stronger than it would be if sawn. The cleft pieces are not so straight as sawn ones, but they may be planed or turned and retain the advantages of
cleft wood. Wheel spokes and ladder rounds are made in this way. Pales for fences and hurdles are used roughly cleft, and rails for field gates are often cleft. Sawn wood, however, is cheaper than cleft.
No wood, except perhape mahogany, has been so much used for English funiture. Oak is also used in building. Rooms are occasionally panelled in oak, while in large houses and public buildings it is sometimes used for floors, staircases, doors and other interior woodwork. Oak contains
present this face. The silver grain seen in radial cuts is much more marked in oak than in any other wood. Cleaving should alwaye be done in the radial direction.

Wainscot oak means the same as quartered oak. Pollard oak has twisted and knottec grain, due to the tree having had its top and branches lopped.

Bog oak is found in Ireland in a fossillized state underground, still hard and sound but black in colour : it is occasionally used for veneer and for small fancy articles.
How to Polish Old Oak. There aro several polishes for old oak. One of the best is made wood around the metal.

Difference in Grain. In reducing logs to boards a large proportion of oak is quartered, that is, all the saw cuts or lines of cleavage are in a radial direction from the centre of the trunk, the same as the medullary rays. A $\log$ is treated in the first place as in Fig. 1, which gives eight radial surfaces. A thickness is sawn from each of these and then further radial cuts may be made on the remainder, or it may be cut in any way which happens to be most economical. To cut a log entirely in radial directions wastes material, because a number of comparatively useless wedges are left after pieoes of parallel thickness have been cut. Quartered oak, therefore, is more expen. sive than plain oak, for the amount of waste is a great deal smaller when a log is sawn in parallel slabs, as in Fig. 2.
The difference in appearance is shown in Fig. 3. At A in Figs. 's and 3 there are quar. tered surfaces, showing what is called the silver grain. At B and C the appearance changes, being farther a way from the radial direction and cutting at a tangent to the annual rings. The surface at A (Fig. 3) is preferred, partly for appearance, but mainly because the piece is supposed to be more tlexible and will shrink and warp less than that at C, besides which it is more waterproof. For the latter reason the staves for liquor casks are always cut to


Oak. Pig. 1. End view of quartered
log. Fig. The least wasteful way
of cuttang logs
Oak. Pig. 1. End view of quartered
log. Fig. 2. The least wasteful way
of cutting logs to get dry, when it will be ready for the necessary repairs. The work corrodes iron and causes a dark stain in the must next be oiled with linseed oil and given
a coat of yellowish polish. When this is dry it should be rubbed with fine glass-paper, and any new wood shaded by mixing a little vandyke brown with yellow polish or gas black, if necessary. It should be laid on with a camel-hair brush. To remove the linseed oil, the whole of the work should be rubbed over with a little turpentine and should then be
wax-polished. with a little turpentine and should then be
wax-polished.
Use of Stains. Oak is brown of various shades, and in finished work its colour is often darkened or otherwise changed. It is easily darkened and improved in a number of ways. Oil may be rubbed into it for this purpose, or a solution of bichromate of potash and water applied, or it can be fumed with ammonia. Stains used are vandyke brown, burnt umber, yellow ochre and others, generally with am. monia. Brunswick black and turpentine make a brown stain. All these can be diluted to
make the shade required. Aniline dyes are a brown stain. All these can be diluted to used also, sometimes for other colours than


B. it should be mbin wine


Oak. Fig. 3. Oak cut longitudinally, but at diferent angles in relation to
Oak. Fig. 3. Oak cut longitudinally, but at diferent angles in relation to by dissolving $\&$ oz each of shredded beeswax and brown sugar in a pint of warm beer. This should be applied while it is warm and then allowed to dry on the wood, afterwards being polished with a soft cloth.

To restore dirty old oak furniture, it is well to clean it thoroughly first. This can be done by adding 1 lb . of American potash to 3 pints of boiling water and applying it with a swab made by tying a piece of coarse rag round a stout stick or lath. The hands must not be put into the mixture or the skin will be injured. After going over the work a few times it will be soft enough to be scrubbed off. This must be done with a fibre brush, not a hair brush. When all the dirt has been removed the work must be allowed the work must be all


#### Abstract






 rings and medallary rays of trank
the natural ones of wood. Care should he or varnish, but it inust not be lustrous, or the taken, when reproducing the oak colour for Jacobean style furniture or panelling, not to err on the dark side. The wood should show a rich brown finish

## Finishes for Oak.

Antique oak, as it is callerl, can be made by darkening the wootl, which must be straight.grained oak, with hurnt umber, or vandyke brown, or a mixture of both, or with burnt umber and drop black. Antique oak stain can be made from 1 lb . of raw umber, 2 lb . of vandyke brown, and $\frac{1}{2} \mathrm{lb}$ of drop black, all ground in oil. Mix them all with a pint of the beat brown japan, and thin the liquid for use with turpentine. Several coats of ammonia water will also give the antique appearance, which can be simulated in another way with a stain of iron filings in vinegar or with a concentrated solution of permanganate of potash.

Cathedral oak is another good finish; it slows best on white oak nicely preparcd. To make it the surface should first be glasspapered smooth, after which n stain made from 2 oz . of jermanganate of potash in two quarts of water should be applied. Let this dry, and then rub it over lightly with fine glasspaper. Give it another coat of the stain, and when this is dry glasspaper it again lightly and apply a coat of black filler. Wipe this off at once and let the work stand for the night ; in the morning glasspaper it lightly, and give it a coat of white shellac. When this is dry, glasspaper it lightly again and wax finish the oak. As the finish must be quite Hat, the wax should not be rubbed.

## Flemish Finish for Quartered Oak

Flemish oak finish can only be used on the best quarter-sawed oak. The wood should be glasspapered and then a coat of Flemish water stain applied. This is made by dissolving $\frac{1}{2} \mathrm{lb}$. of bichromate of potash in a gallon of water. Having been strained, this should be applied witl a briatle brush. When it is dry, glasspaper the oak again. Mix up some japan and droj black with turpentine, making it very thin, and give the work a coat of this stain. Wipe it off clean in a few minutes, and then apply a coat of orange shellac. After the work has stood for a few hours it should be smoothed up with glasspaper and another coat of shellac given. When it is hard it may be rubbed with pumice-stone powder. Flemish oak should never be finished with a lustre, nor should the wond pores be filled.

Mission oak can be produced in several ways, the idea being to show a dead black effect in the grain of the wood with a kind of grevish cast to it. The stain should be made from i lb. of drop black, in oil, and $\frac{1}{2} \mathrm{oz}$. of rose pink, in oil, thinned with a gill of good japan drier and $1 \frac{1}{2}$ pints of turpentine, the whole being strained through double cheese cloth. Japan colours can be used in place of oil colours, but in this case the drier must be omitted and a litile rubbing varnish added to bind the stain. It should be finished with wax.

For forest green oak mix together 1 lb . of chrome green and $\frac{1}{2} \mathrm{lb}$. of chrome yellow, both of medium shade. Apart from these, mix 3 pints of turpentine, a pint of raw linseed oil and a little gond white japan. Thin the colour mixture with the latter, and apply one coat of it to the wood. When it is dry apply to it a coat of white shellac coloured with a little turmeric and a few crystals of green aniline. This, too, should be finished with wax.

For silver-grey oak, make the surface perfectly smonth with sandpaper and then stain it with a preparation of silver nitrate, 1 part in 50 parts of water, both by weight. Apply two coats of this, then a coat of commercial hydrochloric acid, and when it is dry apply a coat of ammonia water of ordinary strength. If the work can be left to dry in the dark the effect will be better. The finish may be in oil
or varnish, but it inust not he lustrous, or the
cffect will be spoiled. Sce Fumed Oak: Furniture ; Graining; Hall; Panelling; Stain.
OATMEAL. For growing children oatmeal is a valuatile food, as it is rich in phospliates and promotes the formation of bone and the nerve constituents of the body; but it must always be given with discrotion, and be discarded for a time if it causes any apparent digestive trouble. For delicate persons or those pursuing sedentary occupations oatmeal is considered rather difficult of digestion, and if served to invalids it should be considerably thinner than for those in health, and on no account should butter be dissolved in it. Some people should never cat oatmeal at all in bulk, and if cakes or scones are made for them, a proportion of ordinary houschold llour should be mixed in with the meal.
Oatimeal con be cooked in many ways, the most common preparation licing porridge, but a variety of other (lishes can be made, and it is also employed for biscuits, cakes, scones, and puddings

Oatneal reguircs to be stored with care, and should never be used if it is stale or is im. pregnated with a strong taste of some article of food with which it may have come in contact. It should always be placed at once in a well-covered store-jar or a wooden receptacle, and it should bo examined frequently to see that it is in good condition
Oat Cake. To each Ib. oatmeal allow I pint hoiling water, with $\frac{1}{2}$ oz. salt butter or lard inclted in it to make the cakes crisp. The water should be noured over the meal, and the whole made up very quickly into a fairly stiff dough
Roll it out about as thin as a half-crown piece, form it into a round, and cut it across and across again. Balie the cakes on a girdle and. when they are a light brown underneath set them before the fire to dry and colour slightly on the top: also to induce the edge to curl over a little. When quite dry and crisp the cakes may be stored really for use.

A recipe containing a proportion of flour, more suitable for people who cannot take ontmeal in bulk, is as follows: $\frac{1}{2} \mathrm{lb}$. medium oatmeal, $\frac{1}{2}$ teaspoonful salt, $\frac{1}{4}$ teaspoonful cream of tartar, 4 oz . flour, 3 oz . butter or lard, \& teaspioonful bicarbonate soda, 3-4 tablespoonfuls milk. Mix all dry ingredients thoroughly, rub in the fat, and form into a stiff paste with milk. Bake as in previous recipe.

Oatmeal Biscuit. A good biscuit is made by mixing together $\frac{1}{2} \mathrm{lb}$. medium oatmeal, 4 oz flour, $\frac{1}{2}$ teaspoonful salt, and $\frac{4}{}$ teaspoonful bicarhonate soda. Dissolve 2 oz . butter in 3 tablespoonfuls of warm milk, pour this into the dry ingredients, and make the whole up into a dough. Set it aside to become firm, and then roll it out and cut it into biscuit sha pes: then prick each and bake them in a good oven about 6 min . To make these biscuits sweet add 1 to $1 \frac{1}{2}$ oz. castor sugar to the llour.

Oatmeal Cake. Small calies are made with oatmeal flour and golden syrup, from the following recipe : Sicve together lb . fine oatineal, $\frac{1}{4} \mathrm{lb}$. Hour, and $\frac{1}{2}$ level teasponnful bicarbonate soda, adding to then 2 oz . candied peel cut into small pieces. Into a saucepan over the fire put 4 oz . margarine, the same quantity of granulated sugar, and $\frac{\mathrm{l}}{\mathrm{z}} \mathrm{lb}$. golden syrup, heating them until the sugar has dissolved, but taking care that they do not boil When they have cooled, pour them into a well made in the centre of the oatmeal, etc., and mix the whole to a rather stilf consistency. Turn the mixture into some small greased cake-tins, and bake the cakes in a moderately hot oven for about 20 min.

Oatmeal Scone. Mix together 3 oz. medium oatmeal, 2 oz. flour, a pinch of salt, 1 teaspoonful cream of tartar, and $\frac{1}{2}$ teaspoonful hicar bonate of soda; rub in 1 oz . fat, and then add 3 oz . mashed potatoes. Mix these ingredients
well, adding enough milk to form a dongh; then turn the mixture on to a Houred boaid, roll it out about $\frac{1}{2}$ in thick, and cut it into rounds Bake the scones on n greased tin in a hot oven or on a girdle. They can then be buttered, and caten hot or cold Sec Gruel;

## orridge ; Scone

OBESITY: Its Treatment. The abnormal development of fat throughout the body produces ohesity, and an excess of fat is a menace to health. Nornally fat is chiefly found under the skin, under the membrane lining the abdomen and covering the bowels, and between the muscle fibres. Any large increase of this fat is nssociated with weakness of the muscular tissue. Hence arises sluggish action of the bowels and inability to take much cxercise on account of the state of the muscles generally, and because shortness of breath and palpitation are easily induced through enfeeblement of the heart muscle. Stout neople stand acute diseases badly. There is a tendency for any individual to put on fat after the age of 40 , more capecially women. But the condition is largely due to over-eating and over-drinking, combined with too little exercise.

A person who is in danger of becoming stout should increase his outdoor exercise, and restrict his intake of fat-forming fonds, i.e. fats and carbohydrates, especially the latter, e.g. sugar, bread, milk, milk puddings, malt liquors, and sweet wines. He should be sparing in liquids at meals. Green vegetables may be taken frecly.

When an unwholesome degree of corpulence already exists, vigorous exercise may be impossible, and to begin with gentle walking on the level may be all that can be attempted. As the powers increase, the rate should be faster and the hills should be taken. In some cases it may be desirable that a course of massage should precede or supplement cxercise out of doors. In thesc cases, a strict diet must be prescrihed and sustematically followed.

After the patient's weight has been reduced one or two stones or so, a special diet which he can keep to indefinitcly should be devised. This should be moderate in amount, with no potatoes or sweet foods, no sugar in the tea or coffce, and a minimum of bread-about 4 oz . In place of sugar in the tea or coffee saccharin tablets, which can he obtained from any chemist, may be employed. Fatty meats, such ns goose and pork, also salmon, cels, and herrings should be strictly forhidden.
The diet, however, should include plenty of such vegetables as cabbage, spinach, etc., as on account of their bulk they give a sense of satisfied appetite, Peas, broad beans, lentils, carmots, parsnips, and beetroot should be avoided. Alo, beer, stout, sweet wines and spirits should be given up entirely.

Artificial nostrums should be avoided and drugs are only to be taken on medical advice. Some of those popularly recommended are useless, others are harinful. A Turkish bath may be useful, but must only be taken after the patient has been examined by a doctor as to his fitness for it. See Diet ; Exercise.

OCCASIONAL TABLE. By this name is understood tables that are only used occasionally and for casual purposes, being thus the opposite of dining tables, kitchen tables, and others that have a definite use. They are generally small and light, so that they can easily be moved about, and are chosen to suit the other furniture of the room. Nests of three or four tables are useful and obtainable in lac quered, painted and polished voods. When not all required the largest of these tables gives accommodation for bnoks and Howers, etc., the smaller sizes being neatly stowed a was under. neath it Low tabler are convenient for uso heside a settee or divan; Moorish designs look well with oriental surroundings and small gate-leg tables are popular for oak furnished
rooms. Reproductions of the table illustrated are suitable with mahogany furniture and are particularly graceful in shape. See Gate. leg Table : Table.

ODONTOGLOSSUM. One of the most benutiful orchirls, this is suitable for cultiva tion in a glasshouse having a minimum winter temperature of 45-50 degrees. During summer cool moist conditions, ensured by free ventila. tion, shade from sunshine and syringeing between the plants, are necessary. The pots should be filled to the extent of one-third their depth with drainage: a suitable compost consists of orchid fibre, peat and sphagnum inoss in equal parts Repotting is done in February or towards the end of summer; the peeudo-bulbs must be set on the surface of the compost.

Odontoglossum crispum and its varieties, which are heavily blotched with various colours on a white ground, are particularly beautiful, the long arching sprays of bloom being most decorative. Other easily grown kinds are harryanum, Rossii, luteo-purpureum, grande and citrosmum. Innumerable crossbred or hybrid odontoglossums are raised an-
OCTOBER

## What to do in the Garden

## Flower.

Plant hyacinth, tull $p_{2}$ daflodll and other springflowering bulbe in beds and borders
llant wallfower, for-get-me-not, polyanthus and other spring-flowering plants
Lay down turf to make a new lawn

Prepare the ground for rose trees by digging deeply and manuring

Lift and atore tuberous begonia and dahlia as soon as the plants are spolit by froat

Plant border carnation, sweet william, Canterbury bell and bulbe of Spanish and English irises
Sow sweat peas in pota Sow sweet peas in pots garden frame Take cuttings of leatloaing surndy soll out of doors

Insert cuttings of evargreens In sandy soll in a frame or on a sheltered border

Lift nummer bedding plants and place in pote or boxes of soll under glass to supply cuttings In spring

Move Chinese primula, cineraria. and herbaceous calcoolaria irom the frame to a greenhouse Lift and repot arum Illies and place under glass

Pot spring-flowering bulbe, set them out of doors and cover with old ashos for 6 weoks
Re-arrange and repiant the hardy flower border

## Fruit

Gather applea and pears on dry daya only Lift. root-prune and replant frult

Take off runnera rom atrawberriea and manure between the
Cut out old frulting nea from raspberriea Take cuttinga of goose berries and curranta and set in sandy soll out of doora
prune black-ourrant bushes by cutting out old branches or parta of them
Prune loganberries and blackberries by outting out the canes which have borine frult
Food in Season

| Fish |  |
| :---: | :---: |
| bel | el ; |
| brill ; carp; cod; dory ; |  |
| eel ; flounder: gurnet; |  |
| addock: | ak hake: hall- |
|  |  |
| erel i mullet (red and |  |
| gray): perch; plize; |  |
| plalce; salmon (Cans- |  |
| dlan) ; | skate; smalt |
| spratí; |  |
| Shellitsh |  |
| Crabe; cravish |  |
| 10bete | er; mustels; |
| oystera; prawna; seal- |  |
|  |  |
| Meat |  |
| Beot: ark: v | lamb ; mutton ; veal: venison |


| Poultry and Game | cress; cucumber; en- |
| :---: | :---: |
| Black game; caper- | dive i greens; horse- |
| callze; capons; chick- | radish; leeks; lettuce; |
| ons; ductes; fowls ; | mushrooms ; |
| geese; grouse; hares |  |
| larks; partridges; phea | scarlet runners ; |
| ; plgeons ; pintall; | aplnach; \& \% m |
| lets; rabbits; snipe; | turnjps; vegetable |
| teal; turkey; turkey poults ; widgeon | marrow; watercress Fruit |
| Vedetables | Apples; banana <br> blackberries; cra |
| Artichokes (globe | berries; damsons; fig |
| d Jerusalem) : auber- | grapes; lemons; lime |
| glnes; beans (French) ; | medlars; melons ; nec |
| beetroot ; broccoll ; | tarines; nuts (varlous) |
| Brussels sprouts; cab- | Orangea; peach |
| bage ; cardoons: car- | pears ; pineapple; |
| ts ; cauliflower ; cele- | (Callfornian) ; pomeg |
| ; celery ; chervil | ate; quincea; sloes |

Notes for the Month

Ocrobge 1.- Pheagant shooting begins
OCTORER 21.-Trafaigar Day
Ootorer 31.-Hallow-0 on

To ripen late grapee ventllate the glasshouse ireely, keep the hotwater plpes uarm and the atmosphere dry

## Vedetablea

Lift and store beetroot, carrot and late potatoes

Dig and manure all vacant land, leaving the surface rough

Lift and force rhubarb roots for an early supply of produce
plant lettuce and endive in a cold frame Plant apring cabbages as and place in a box in a warm room to ripen in a warm room toripen Lime land which if in fected
disease

Look over potatoes in are and remove decay ng tubers
Burn the haulm of potatoes to deatroy dis ease apores
Complete the earthing pof celery
Sow seedn of Brussels prouts in a frame
Pot caullfowers and keep them in a frame for

nually, and these are now chiefly grown : the flowers are of brilliant and fascin. ating colours. Orchid growers' catalogues should be consulted. See Orchid.

OFFAL. The term includes the heart liver, kidneys, head, tail, and most edible pieces of an animal killed for food which are not sold in joints. In fish, ofial denotes low grade and very inferior fish. See Heart: Kidney: Liver.

OHM. The chief unit of electrical resistance is the ohm. It is that resistance which will limit the current produced by a pressure of one volt to one ampere. Other units are the megohm (a million ohms), and the microhm (one millionth of an ohm). See Electricity

OII: For Domestic Use. The grade of mineral oil mainly used as fue in the house is that known as kerosene or paraffin oil. The heavier grades of petroleum known as fuel oil are used to fire domestic boilers and to a limited extent for cooling purposes. A steam or air jet is required to atomise them before burning and a gravity or pressure fced is necessary.

Kerosene can be applied practically to all the domestic heatinf ${ }^{\prime}$ and cooking purposes to which
coal gas is put, and it has the advantage that the applinnces employed in burning it are self-contained and do not involve the installa. tion of permanent piping. For heating, various forms of oil stove can be purchased. Needing no Hue, they can be moved about from place to place as required ; and as all the heat they produce passes into the room, they are very efficient and can warm the air of an apartment to a comfortable temperature in a very short time. On the other hand, they do not ventilate the room, and the products of combustion are not carriod away. Further, the effcct of such stoves soon dies away after they have been extinguished
For cooking, oil-burning appliances are made in many sizes, from single-burner stoves that serve to boil a kettle up to those with an oven and several burners which will boil, steam, fry, and bake and perform every cooking operation required. Representative types are illustrated in the artiole Cooker.

The burners fitted in oil heating and cooking appliances are of two kinds. In one the oil is sucked up from the reservoir to the flame by means of wicks, either straight or circular, which resemble those employed in lamps except that they are larger. In the other form the oil, bv a slight pressure produced in the reservoir by a hand pump, is forced up to a point above the flame, and after being vaporized by the heat passes to the burner, where it is mixed with air and burnt as a gas. In this form there are no wicks, and consequently the trouble of trimming is avoided. Oil stoves of any kind must be kept scrupuloukly clean.

With the pressure type of burner, the nozzle through which the vaporized oil issues before being burnt has first of all to be heated up (usually by burning a small quantity of methylated spirit in a small trough surround. ing the burner), before the issuing oil will ignite. Also the pressure inside the oil container has to be pumped up before lighting up, and from time to time during use, in order to force the oil out through the nozzle in a fine spray. Fig. 1 shows a pressure type heater in which an asbestos mantle is raised to a high degree of incandescence, a copper reflector projecting the heat out into the room. It holds 14 pints of oil, which is enough for ten burning hours.

Of the wick burner pattern the heater illustrated in Fig. 2 is typical. It consumes about half a pint of paraffin per hour. If the wick of this stove is kept free from carbon deposit (which can be rubbed off with a piece of newspaper every time before the stove is lit), and the burner kept clean, there is very little danger of smell, and the stove needs no special atten. tion when starting up or burning.

Smalloil engines are useful as a means of providing power for such purposes as driving electric generators or pumping water from wells. In the article on Internal Combustion Engine is illustrated type which is started up on petrol and then runs on paraffin oil.


Oil. Fig. 1. Presure type of oil beating lamp Courtesy of tilley lamp co.


Oll. Fig. 2. Dsefal wick type beating stove. It consumes aboat ball a pint of parafin oil per bour

Anolo-American Oil Co., Lid

Oil Fuel for Boilers. 'The use of fuel oil for central heating and hot-water supply presents a number of oulvantages, apart from the question of cost, in which latter respect fuel oil at about 75 s per ton compares with coke at 35 s per ton A fully automatic system can be arranged, controlled by thermostats. Therc is a saving in labour, of course, since no stoking is needed nud there are no clinkers or ashes to

volving at high speed, and is thrown off the edge in a finely divided spray The air necessary for combustion is sup plied by a fan, driven by a small electric motor Fig. 6 shows the burner fitted to a central heating boiler. The oil feed is by gravity, from $\Omega$ storage tank (capacity 3(H) gallons) a few feet above the burner level. When arranged for automatio control the ignition is by means of an incandescent electric element at the nozzle, which is switched on and off by thermo static control.

A burner of the pressure jet cluss is illus trated in Fig. 4. Oil is fed under pressure through an stomizing nozzle and issucs as a fine snray, being mixed with air supplied by a blower. A smal electric motor drives the oil pump and blower, and a transformer furnishics the high voltage ignition ourrent. The apparatus once startex, is sutomatio in action, and needs no attendance. A thermostat in the flue sluts off the ignition current as ooon as the burner is alight and functioning regularly Another thermostat. connected with the boiler, shuts of the apparatus when a pre arranged water temperature is reached, and a room thermostat in one of the apartments switches off the burner when the desired room temperature is attained. A temperature drop of from two to ten degrees (as pre arranged) causes the switches to be operated in the reverse manner, so that the burner is. started up again and the atomized oil spray simultancously ignited.

Householders who desire fuller information about oil fired boiler plants should write to the fuel oil department of Shell-Mex, Ltd. P.O. Box 148, Kingsway, W.C.2. This firm does not supply oil burning equipment, but maintains a stall to advise intcrested persons on the selection of appropriate equipment See Conker : Fuel: Heating : Lamp: Lighting
remove Fuel oil can be hought economically in lots of two tons (approximately 500 gallons), and costs from 3 dd to $4 d$ per gallon. A atorage tank holding 3 tons is desir. able, and this if rectangular in shape would be about 6 ft . by 5 ft . by 4 ft . The tank need not be indoors, but can be located in some corner of the garden and screened by a hedgo, ets. Delivery from the oil wagon is carried out in a few minutes, the oil being pumped direct into the consumer's tank
Two representative systems are here illus. trated. Fig 5 shows a hand-operated oil burner working on the rotary principle. a system which is applicable to quite small installations. In this type of burner the oil is delivered into a cone shaped cup re-


Fig. 3. Section of Ideal Britannia boiler showing oil firlag. Fig. 4 Automatic oil burner for central beating boiler
Courtesy of National Radiator Co.. Lld.: and of York Automatic Oil Burnera


Fik. 5. Ray Mideet fuel oil turner with hinge plate mounting. Dermitting easy access Courlesy of Ran Oil Burner Products

OII: In Cookery. Olive oil is the best of all oils for the purposes of cookery. When pure it is practically tasteless and of a pale yellow colour with $n$ slight tinge of green Only the best quality should be employed Olive oil is the foundation of mayonnaise sauce and most salad oreams. It also enters into the composition of dressings for plain salads. It renders fritter batters exceedingly light, and is often used for the purpose of fry ing. In Jewish cookery oil is always used.

When moulds or slabe have to be greased in sweet-making oil is employed. Creams and delicate


Fir. 6. Ray Midget burner fitted to central heating boller dinner sweets areset in oiled moulds. Almond oil may be used in place of olive oil for this purpose. Oil of any quality or description is not adapted for making pastry or good cakes, but fish may be preserved in oil. If oil has been kept in store some time and has deteriorated it can be improved by turning it into a larger hottle and pouring upon it cold water, then shaking it vigorously and letting it stand two hours. When decanting the oil the rancid matter is detained by the water
OIL: In Medicine. There are two distinct classes of oils. The tirst consists of the fixed oils, such as linseed, flaxseed, olive, nimond coconut, castor, cod liver, and other oils Except for cod liver oil all these are of vegetable origin. The second class consists of the essential or volatile nils, including the oils of peppermint, cloves, caraway, oinnamon, lill, lemon, juniper, rosemary etc.
Some of the fixed oils are nourishing foods, and most of them form soothing applications to inflamed surfaces. Others are valuable medicines, e.g. cod liver oil in consumption and other diseases. The essential oils, which are distilled from plants, stimulatc the appetite and promote digestion, or act as an anti septic. See Castor Oil : Cod Liver Oil : Linseed Oil, etc.
Oilcloth. See Linoleum
OILING. Suitably prepared oils are employed for lubricating machinery of all kinds, and oil serves also as the vehicle for many semi-liquid lubricants. The oiling of domestic appliances is dealt with in the article on Lubrication, which is followed by one devoted to the oiling of motor vehicles See Grease ; Lubrication: Motor Car.

OILSKIN. Cotton cloth coated with boiled linseed oil and dried takes the yellow appearance of a cured animal skin and becomes waterproof and airtight. Seamen's overalls made frmm this material arc called oilskins. They are stiff and heavy, and cold to the touch

Lighter oilskins made in oiled silk are translucent and made into women's wetweather coats. The fabric is lighter in weight and dyed in pretty colours, hit it tends to tear easily. Efficient ventilation is a difticulty, as body moisture condenses upon the underside of the cold, wet garment Oiled silk is used for hathroom curtains.

OILSTONE. Various kinds of hard stone, composed mainly of silica and quartz, when smoothed and polished and suitably mounterl are invaluable for sharpening knives and tools of all kinds. Oilstones are usually luhricated with machine oil; in a few cases water is used for the purpose.

For the amateur, who will mostly use the oilstone for sharpening chisels, plane irons, gouges, and the like, the Wrshita stone is as good as any. A convenient size is a bout 9 in . long, 2 in wide, and 1 in thick. The stone should be fine in grain, frec from cracks or hand places, and should cut freely and not exhibit any tendency to choke readily. These features are only detected when the stone has been in use for a time; and when a good stone has been found, it should be retained and used until it is entirely worn out. A liner-grain stone, known as the Arkansas. is also a natural stone. It is more expensive than the Washita, but more useful for sharpening delicate tools requiring a very keen edge

Rougher oilstones, such as the India, are made of various compositions, employing emery and carborundum; they are very quick cutting. A carborundum stone will cut almost as quickly as a fine file, and if much work is to be done, it will pay to have one of this class of stone for rough sharpening, and a finer-grained stone for the setting and finishing-off touches For sharpening gouges, a


Fig. 4. Showing use of oilstone slip for sharpening edge of hollow-ground gouge
sistent with easy sharpening, as the longer the cutting edge, the keener will be the tool After the stone has been in use for a time it becomes hollow in the centre and generally rough towards the ends, and will then require rubbing down. This can be donc by grinding, holding the oilstone against the side of the revolving grindstone and luhricating it with water and a little sharp sand.
What are known as ragstones are a rough sort of whetstone, and the coarsest $k$ ind is the sandstone, with which gardeners sharpen scythes. This is an example of dry sharpening. See Grindstone; Hone: Knife; Kazor.

OINTMENT. A preparation that has the consistency of butter and is intended to keep some inedicinal agent in close contact with a skin or other surface is called an ointment. The hasis may be lard, lanoline, vaseline, cocoa-butter, goose fnt, or a mixture of one or more of these with sweet almond oil, olive oil, g'ycerin, sjeermaceti, wax, suet, etc. Water is added for the elled slips are ob tainable, shaped to suit the curva
ture of the gouge. Diagonal shaped stones, square, and tapered slips, as they are called, are also a vailable for appropriately shaped tools.

Using the Stone. The whole secret of tool sharpening consists in rubbing the tool on The stone so that the cutting ellge is formed at the right angle. Figs. $1-3$ illustrate the correct methods of holding a chisel, plane iron, and gouge on an oilstone In the case of the chisel, this is first ground on a grindstone to the proper angle, and then the extreme end, or cutting edge of the tool, is sharpened on the oilstone by rubbing the chisel on the stone, using the greatest length of the stonc
and pushing the chisel backward and forward with a regular, steady motion.

Press upon the chisel with the fingers of the left hand, while the right hand guides the direction of the tool. If the chisel is allowed to mok a bout the cutting edge will he rounded instead of Hat, with the result that the tonl will not hold its erlge for any length of time The great object should be so to sharpen the edge that the end of the chisel is straight and square with the sides, but the face in clined at a slightly steeper angle than the other hevelled portion produced by the grinding process.

The plane iron is sharpened in a similar manner, except that, as it is much broader it inay be necessary to sweep the imn diagonally across the stone, so that all the parts receive their full share of it. The gouge is sharpened by rolling it to and fro, and at the same time traversing it up and down on the face of the stone, thus sharjening the whole of the cutting edge. In general, when sharpening cutting tonls, keep the handle as low down as is con-
 I.

 is solinght when necessury. Sleeplessness hypnotic drugs must be used with great caution.

An old man or woman requires only a sniall quantity of food compared with a young and active adult. As age advances the quantity of food taken must be diminished, or otherwise indigestion, rheumatism, skin troubles and other penalties will have to be paid. In middleaged and elderly people all the organs work less actively than in the vigorous period of life.
The food should be light and given in small quantities. As a rule four light meals a day should be given. The principal meal should be taken in the middle of the day. Although the diet should be varied, not more than two, or at the utmost three, dishes should he partaken of at anyone menl. Most old people should eat vegetnbles sparingly, as thcy are apt to cause fatulent indigestion Fruit is most suitable in a cooked state. If eaten raw, it should be perfectly ripe. If inclined to put on fat, an elderly person should be sparing in the use of sugar, starchy foods, and fats. Oatmeal is too difficult of digestion, but on the other hand the prepared or patent wheaten foods are especially suitable.

An old person should depend largely on milk for his nourishment This he should take in sips, spending about 20 min . in drinking a half pint. If stimulants are taken at all, the quantity should be small-not more than $n$ single glass of the stronger wines, or two glasses of a light dinner wine, or a little whisky or hrandy well diluted. The heat time to take any of these is at dinner. Sometimes, a tablespoonful of whisky in hot milk at bedtime will prevent sleeplessness. See Diet; Sleep.

OLD AGE PENSIONS. In Great Britain most persons are entitled, on reaching the age of 70 , or in certain cases 65 , to receive an
uld age pension. The amount of this is normally 10s. a week, but those with a certain amount of unearned income are only entitled to smaller sums Normally the pension begins at 70, but persons who have insured under the national health insurance scheme and their wives are entitled to pensions on reaching 65, without any inquiry as to their other means.
To be entitled to a pension at the full rate a person's income inust not exceed $£ 2058$., or £52 10s. in the case of husband and wife living together, but in arriving at this figure no account is taken of the first $£ 39$ of unearned income, or in the case of a married couple the first $£ 78$ Thus, a person with a total income of just under $£ 655$ s. a year or a couple with just under $£ 130$ 10s can receive old age pensions at the full rate.

I'ensions below 10s a week are given tu thuse whose incomes, after the first $£ 39$ has been deducted, are as follows:
Between $£ 20358$. and E 31 103

## $\begin{array}{ll}£ 31 & 108 . \\ \text { £38 } & 158 .\end{array}$ <br>  <br> ${ }_{\text {£ }}{ }^{247}$ 5s.

88. Od. per week

| 447 | 58 |
| :--- | :--- | :--- |
| 49 |  |

In the case of a married couple living logether, these sums are doubled.
To receive a pension a person must have been a British subject for 10 years, and must have resided within the United Kingdom for at least 12 years since reaching the age of 50 . A British subject is defined as a person born in the United Kingdom, or the child of a British father, or a person who has taken out a naturalization certificate. Persons who receive outdoor relief can also receive pensions, but indoor paupers are not eligible, nor are persons who have been treated in a poor law infirmary for any period exceeding three months in one year.

Blind persons are entitled to receive pensions when they are 50 years old, the conditions being similar to those for others at 70. To secure a pension on this account the person must be so blind that he or she cannot perform work for which sight is essential.
Estimation of Income. In eatimating the income account is taken of the income the person is likely to receive during the succeeding year and of the yearly value of any advantage or benefit enjoyed by him, such as the right of living rent free. No account, however, need be taken of the yearly value of any advantage accruing from the use or enjoyment of furniture or personal effects or of the first $£ 25$ of capital in possession of the claimant. The next $£ 375$ of capital is regarded as earning interest at the rate of 5 per cent., and all capital in excess of this at 10 per cent. In the case of a married couple living together these figures are doubled.

When a husband and wife are living together in the same house the means of either is taken as one-half of the total means of the couple. Thus, a man who has an income of $£ 50$ a year is entitled to the full pension if he has a wife living with him who is without separate income, or if the incomes of the two do not exceed $£ 5210$ s. a year. Old age pensions cannut be alienated.
Method of Application. The conditions outlined above permitting, the first step is to apply for the necessary forms at any post office. These must be filled up by the claimant and the statements made attested by reliable witnesses. They should then be returned to the postmaster of the post office where the pensioner wishes to receive his pension, or to lis lical pension officer.

The pensions are paid every Friday at the various post offices, generally to the pensioner in person, although a relative or friend can receive them in case the pensioner is unable to get about. The pension book must be presented and stamped each time. In each locality a pensions officer controls the dis-
tribution of pensions, and to him all com plaints in connexion therewith should be made. He is also responsible for investigating cases

Ireland was included in the scheme of old age pensions, but this liability was transferred in 192: to the Parliaments of the Irish Free State and Northern Ireland, who now pay them. Australia and New Zealand have also old age pension schemes. See Insurance : Pension.
OLD MAID. This card game is suitable for two or more players. One card is taken from the full pack, usually a queen; a variation is to take out one card haphazard, the


Oleander. A favourite greenhouse and conservatory shrub which bears rose-coloured blooms in summer
card not being shown. Supposing, however that a queen is removed, the cards are shuffled and dealt round one at a time to all the players until the pack is exhausted. Each player then looks at his cards and throws out of his hand into the centre of the table all pairs, e.g. two kings, two sevens, etc.

When all pairs have been thrown out by each player, the one on the left of the dealer offors his cards, face downward, to his lefthand neighbour, who can draw any card he chooses. If the player draws a card which pairs with one in his hand he throws the pair so made into the centre of the table; if not, he places it amongst the cards he already holds, and offers his cards in turn to the next player to draw from, and so on.

In the course of time all the cards, except one queen, are paired. It is the object of each player to try to pass this queen on to the next player. The holder of the unpaired queen is old maid. With the variation of discarding any unknown card no one has any idea of which card in the pack will make him or her old maid, and this form of the game is often preferred.

OLD MAN. This is one of the many names of the slirubby perennial artemisia. It has fragrant foliage, and is known also as lad's love, wormwood, southernwood, and by many other names. It is an old-fashioned country cottage garden plant See Southernwood.
OLD MAN CACTUS. A member of the Pilocereus group of cactaceous plants, and one of the most popular in small collections is $P$. senilis. This name, in conjunction with its remarkable covering of long white hairs, has made it familiar as the old man cactuo See Cactus.

OLD MAN'S BEARD. This is one of the popular names for Clematis vitalba, which is

Pamiliar in British hedgerows and also known as traveller's joy. Its roots are in demand as a stock upon which to graft the ohoicer kinds of clematis. It blooms in July and beara large clusters of greenish-white Howers. The seeds are provided with long hairs which become covered with a soft pale grey Hluff, from which the jlant takes this name. Old man's beard is useful for covering bare banks or for training over trellises and tree stumps See Clematis.

OLEANDER (Nerium oleander). This is a beautiful flowering shrub suitablc for cul tivation in pots under glass. A temperature of 45-50 degrees is high enough in winter: its rose-coloured blooms are borne during the summer months. It should be potted in pots or tubs of loamy soil enriched with decayed manure. During the summer months the oleander requires an abundance of water, and must be fully exposed to the sunshine in order that the stems may be well ripened The oleander often fails to bloom well because of the neglect to remove the shoots, while they are small, that develop at the base of the Hower buds. If allowed to remain they grow and the flower buds perish. This shrub flowers most freely when well rooted in the pot or tub: weak liquid manure should be given occasionally in summer.

OLEARIA. This is the name of a group of evergreen shrubs of which the favourite kind is Olearia Haastii. This reaches a height of 3 or 4 ft . and bears white daisy-like flowers in August. It makes a useful ornamental garden hedge as it is of compact growth Olearia stellulata, 2-3 ft., bears white flowers in early summer; it blooms very freely in a sheltered place in mild districts, but it is less hardy than Haastii. Olearia macrodonta, a more vigorous shrub, is suitable only for the milder counties of England. These, shrubs need no pruning other than that required to keep them shapely, which should be done after flowering. Propagation is by cuttings in a frame in summer.

OLIVE : The Shrub. A group of evergreen trees and shrubs is called the olive. It includes the common olive (Olea europaea), which is a distinctive feature of the landscape in southern Europe, and may be grown in this country only in mild places or against a wall in other gardens. The olive oil of commerce is obtained from the fruits. Propagation is by means of cuttings or seeds.

Uses of the Fruit. The green fruit of the olive yields olive oil, and is, also pickled and sold in bottles and tins for cooking purposes. The oil, which is contained in the flesh, and not in the stone of the olive, is the very finest which can be used for all purposes of cookery. It is excellent for, dressing salads, frying, making light batters, and for preparing entrées.

Stuffed olives make an appetizing dish for hors d'oeuvres. Spanish olives should be used, as the Italian variety is small and more oily to taste. Various mixtures can be prepared for the filling, which must be of a savoury character, or a savoury butter can be used. To prepare the olive for stuffing or cooking by other methods, it must be stoned or turned. To do this, start from the top and pare it round and round, using a small, sharp-pointed knife and shaping it like a spiral. Keep the knife close to the stone all the time to avoid losing the Hesh. After the stone is removed and the filling inserted, form the olive into its correct shape again. A special fruit stoner, which is scissor-shaped, holding the olive in a metal circle and cjecting the stone by means of a prong, can be obtained cheaply. The stuffing is in serted in the cavity.

A good way of preparing these savoury olives is to fill them with anchovy butter and
serve them on small, thin rounds of bread and butter, each about the size of a two shilling piece. Shell 2 or 3 hard-boiled eggs and separate the whites from the yolks, chopping up the former and rubbing the latter through a sieve. Spread some of the yolk on the rounds of bread and butter, press an


Oliv: Savouries made witu nara-oolled egrs, olives and small rounds of bread and butter
olive on each in an upright position, and garnish with the ehopled white

Olịves à l'Indienne provide another way of preparing stuffed olives Cut a hardboiled egg into halses, remove the yolk, and slice the white into rings. Pound thic yolli with 1 oz butter, a teaspoonful of mustard and 2 oz chutney, and use this mixture for filling the stoned olives. Cut some brown bread into small rounds, spread any remaining stufling over them, place a ring of white of egg on each, and put an olive in the centre. Arrange them on a glass or silver dish See Anchovy Butter: Hors d'Ucuvres

Olive Oil. By pressing the ripe Iruit of the olive tree olive oil is obtained It is a valuable food, and is also a mild aperient. For people who suffer from mild constipation, a tablespoonful taken every night will often prove most lenoticial. As an enema it is very useful for constipation with tho presence of hardened faeces in the bowel. Large quanti ties are sometimes given to people suffering from gall stones. For burns and scalds olive oil is one of the best remedics for immediate use when the slin is not brolien.

OLIVINE. The word olivine is used to deseribe a large number of stones of the semiprecious variety, among which are the chrysulite and peridot. Usually they vary in colour from straw yellow to dark yellowish green, but the best specimens are of a rich green hue

OLLA PODRIDA. The Spanish national dish linown as olla podrida consists of a stew made with fresh and salt meats, poultry, and vegetables, all cut small and highly tlavoured with garlic and pepper. The whole is stewed for a considerable time in a closed pot or iar.

OMELETTE. An omelette is a preparation of egga fried in a amall pan with butter, and served either as a sweet or savoury. Success depends largely on the dexterity with which the pan is handled as well as on the quality of the ingredients and the way in which tho egga are beaten. The yolks and whitea should be well mixed but not frothed except in the case of the soufté varieties. The best pans for the purpose are those with slightly sloping sides, and the pan must not be either too thin or tou large If it is too thin the omelette will burn before it is conked through, and if it is too large tho mixture will spread like a pancake The omelette pan should be kept for omelettes only, and should not often be washed out. Rub it with soft paper to clean it. The egga should bo new laid and the butter perfectly fiesh.

If a savoury omelette is made, with the addition of meat or fish, this must be ready cooked and seasoned and all bones removed When the omelette is nearly tinished tho savoury mixture is laid on it, and the sides folded over with a Hexible or palette hnife. Checse or tine herbs are mixed in with the cerrs. For kidney omelettes the kidney is first chopped up finely and cooked 10-15 minutes in butter before putting in the centre of the
plain omelctte It shalluts are used they must always be chopped and fried tirst of all. Three or four eggs nay becooked in a 7 -in pan, and 2 eggs should be allowed for each person

The most appruved method for making omelettes is to heat 2 oz butter in the pan till smoking hot, then pour in 4 eggs well beaten and scasoned if for savoury omeletto Sti, thom and as they begin to set and brown underneath, fold over the side of the omelette near the handle of the pan into the middle then fold over the other side, making an oval cushion shape Add meat, lish, kilney mushrooms, etc. tefore folding for savoury omelcttes 'lurn it on to a hot dish.
Sweet Omelettes. Thesc are made and Iried as savoury omelettes, but $\frac{1}{2} \mathrm{oz}$ sugar is adderl to the ergs instead of scasoning and jam is laid on the umclette before folding When dished sugar should be sprinkled over Use a stiff lind of jam . Lemon omelettes are made by adding lcmon curd instead of jam For rum oneleties the spirit should be poured over just before serving, and lighted
A gond-sized omelette can be made by breaking 2 eggs into a basin, beating them slightly, and then adding teaspooonful of chopped parsley, and some salt and pepper to taste. Melt $\frac{1}{2}$ oz butter in an omelette pan pour in the egg mixture, stir it for a few secunds, and as it sets, lift it up and allow the liquid portion to How to the bottom of the pan Lift this again. and then double the omelette over and slip it on to the paper doily arranged on a hot dish The omelette should be quite soft and Haliy in the middle. It can be varied by adding a tablespuonful of grated cheese, chopped cooked ham or meat, or couked and seasoned tomato, or cooked tish, liaked and seasuned, or coolied mushrooms immediately before it is doubled over.
Friars' Omelette. This is made with a purée of apples sweetencd and ila voured, then butter and eggs mixed in, $1 \frac{1}{2} \mathrm{lb}$. apples requiring 2 oz . butter and 2 eggs Butter a baling.dish and coat it with a thick laver of breadcrumbs. Pour in the purce, cover it with another thick layer of crumbs, strew over it small pieces of butter, and bake it for 15 min in a moderate oven Serve the umelette with crean and sugar. It will be found sufficient for 4 persons.

Omeiette Souflle. To make omeictte souffic work togother the yolks of 4 eggs and 3 oz . castor sugar until they torm a thicli yellow cream then add $\frac{1}{2}$ oz. Hour $\frac{1}{2}$ teaspoonful vanilla and 0 stiflly beaten whites of eggs. Puur the mixture into a well-buttered augratin dish and bake it in a moderate oven for 10-15 min or until it is pale brown in colour and spongy to the touch Dust it with castor sugar and serve it immediately A !ittle jar may be put in the centre of the souffle befors it is bakeal See SoulHé

OMPHALODES. These are annual or perennial plants with forget-me-not-like Howers. Nust of them are auitable only for the rock garden The chief kinds are cappadocica 12 in : nitida 12 in verna 6 in. and lusiliac 6 in All have blue flowers They need slight shade and well-drained, gritty, sandy loam During winter they should be protected by pieces of glass raised a few inches above them to keep of excessive rain Propagation is by seeds sown in spring Omphalodes linitolia is a hardy annual. 8-10 in. which bears white flowers. Seeds are sown in the rock garilen in spring tor summer flowers All bloom carly in summer

ONCIDIUM. This is the name of a slow y group of orchids some of which must be grown in a hot house, while others flourish under the same conditions as oduntoglossum (y.v.). Tho prevailing eolour of tho llowers of many kinds is yellow with reddish brown marlings. Tho plants must be watered sparingly after the year's growth is linished Kramerianum and papilio are favourite sorts for the hot house : concolor, varicosum and marshallianum are among those suitable for the cool house

ONE STEP. The one stcp is similat to the quickstep in construction, but is danced to 2-4 instead of common time. Sonic of the steps in this dance may be used in the one step, but owing to the quicker time the simplest ones are best. The dancing should be very smooth. The three step turn is used, that is, turning on every third step, both to the right and reverse As in tho quiclistep, the man begins with the right foot and the girl with the left. Sec Dancing; Fox Trot : Quickstep.

## Onions: In Garden and Kitchen

The Growing and Cooking of this Useful Vegetable

For additional information on this and kindred subjects see the article Kitchen Garden also Chive: Flavouring: Garlic: Goosz; Leek. Pickles; Shallot; Vegetarian Cookery

The culture of this vegetable is not difficult if the soil is suitable, but for good results a deep rich loam is necessary.

In preparing the soil, the best manure is undoubtedly well-rotted stable manuro, ap. plied to the ground in the autumn before cultivation commences. Soot, soon after sow. ing, and nitrate of soda when the plants malie their appearance, are also recommendel as stimulants. A dressing of salt applied a fort. night before sowing, and dug in if the rain has not already washed it in, is alan a useful aid If the soil is light, cow manure is necessary.

The main cropl of onion seed should be sown in March, choosing a day when the ground is as dry as possible. It should be put in in drilla or rows about 9 in. or 1 ft. apart, and lightly covered with soil. After sowing, however, the surface of tho soil must be dusted with soot, and pressed down firmly by a light rollor.

A second sowing of onions should be made in August, when the method of procedure is similar. As soon as the young onions are large enough they should be thinned out. The thinnings are useful as spring onions. the plants should be left at 6 in. apart.

For pickling onions, seed may be sorrn in May, in ponr suil 'Thinning need not be drastic, and the bulbs will be ready for pulling by the
autumn. The crop of ordinary onions will be ready for handling about the middle of September, when they should be taken up, cleaned, and put in a dry shed or sunny prosition in the onen air, if the weather is favourable, until thoy are ready for storing.
Thero are many different sort of onions Ailsa Craig is one of the best as regards shape, size, flavour, and kecping properties Otheis for various uses are Lemon Rocca, Giant Rocca, and 'Tripoli, usually sown in August. White Sjanish, Nuneham Park, James Long Keeping, l'remier and Cranston's Excelsior. are suitable for spring sowing.

Gathering the Onions. The time which is best for gathering onions is about the middlo of Septenber, when the tops hegin to wither and the plants can be pulled up easily. They must be laid out to dry in a cool, airy place, and then mado up into reeves. This is done by fastening the tails together with a strand oi matting, and forming them into a rope with the onions appearing in even rows all along. This rope should be about I yard long, and is called the reeve. It can be hung in a corner of the larder for convenience. Onions keep better when reeved.

Diseases of Onions. One of the chiel diseases of onions is known as the white rot. In sone


Onion. Weil-grown bulbs of a variety of this aseful and antartions vegetable
parts of England it is called mildew and in Bedfordshire it is mouldy nose. In Leaflct 345 the Ministry of Agriculture deals with the best method of combating the disease. Widely distributed throughout the country, it is specially common where onions have been cultivated for a long time. During the early months of summer it causes much destruction, both to spring and autumn sown plants.

Onion Pests. The worst trouble with which growers have to deal is the onion maggot, which may ruin the young plants if not checked or destroyed. In some gardens the crop is more liable to serious attack than in others. When the seedlings are thinned out carc must be taken to trcad the soil firmly alongside the remaining plants. Sawdust soaked in paraffin and scattered alongside the rows helps to keep away the onion Hy, and frequent dustings of soot are helpful. Seedlings which are attacked by the maggot should be uprooted and burnt, together with a little of the surrounding soil. An occasional sprinkling on the soil of nitrate of soda or sulphate of ammonia, 1 oz . to the yard run of row, stimulates the growth of the seedlings and thus does good. Mildew often attacks the onion crop: Badly affected plants should be pulled up and burnt and the others sprayed with a solution of liver of sulphur, 1 oz in 2 gallons of water.
The Cooking of Onions. By the cook the onion may be regarded equally as a vegetable and a condiment, and is, in fact, almost indispensable as an adjunct to souns, stews, and made dishes of all kinds. When eaten raw it is nourish. ing and stimulating, but difficult to digest. Much of the pungent property of the onion is dispersed by boiling, and if blanched before the actual cooking commences it is much less likely to disagrec, and forms, to most taster, a pleasanter and milder vegetable.
When roasted, the onion should 10 previously blanched or parboiled, and it will be more wholesome and lose some of its richness. Fricd onions, also, might with advantage be subjected to this treatment.
The amall round onion is the correct kind to use for making pickled onions or for mixing with other vegetables for this


How to Grow Onions. 1. Seed sowing in box ; $a$, crooks: $b$, leaves ; $c$, compost : $d$, fne sandy soil : $c$, slass, 2. Seed sowing in pot: a. crooks; $b$, leaves : $c$, rough soil ; $d$, compost ; $e$, sandy soil. 8. Exhibition growing: a, sandy soil : b, rich compost ; c, leaves: d, crocks. 4. Transplanted seedlings: $a$, rough soiling ont. compost: Planting : $a$, wrondy soil ; d, how to lift for plenting out. 5. Planting : $a$, wrong; $b$, right. 6. Soil proparation $a$, sood manare or vegetable rofuse ; b, top soil it $c$, top dressing of
soot, wood ashes and soil. 7 and 8 . Onion fy and its reault. 9. Thinning : $G$, fine bulb resulting. 10. Soil dearing to mature buibe. il. Top aing : $G$, ancing for exhibition. 12. Rope of onions for storing
purpose. Spanish onions are in scason in the autumn and winter, when they are imported in a dry state. The Spanish onion is much larger than the British variety, and is better for serving as a vegetable and also for roasting. Being milder in quality, it has not the pungency that is required for flavouring soups and stews. Other varieties of the onion used in cookery are leeks, shallots, chives, and garlic.

Onions leave a most pungent and unpleasant odour on any cookery utensils used in their preparation. Table knives and forks, also, if onions form part of the menu, require special cleansing: this applies particularly to onions served in a raw state, as in salads, etc. The forks should be cleansed in hot suds, with a small piece of whiting in the water, and may be rubbed lightly with cut lemon: if so, they must be rinsed before being wiped. The knife blades, after washing, should be thrust into earth or coffee grounds and then rinsed, wiped. and cleaned as usual.
The board on which onions are cut should be rubbed with vinegar or lemon before being acrubbed. Silver sand should be sprinkled on the board before the brush is applied.
Never use a pastry board in preparing any kind of vegetable ; a distinct board must be kept for this purpose. It is better, also, to keep one knife only for onions, and to mark it in some manner that can be easily recognized. To remove the odour and stain of onion from the hands, rinse them well in cold water, and rub with cut lemon or pumice-stone before washing them with soap.
Bralsed Onions. To braise onions, remove the skins from medium-sized Spanish onions. Heat a piece of butter or good beef dripping and fry the onions (whole) lightly on all sidcs. Then pour in brown stock or gravy to come half-way up the onions, season with pepper and salt, and let them cook gently in the oven or on top of the stove until tender when tested with a fork or skewer. Then thicken the stock with a little flour or cornflour and pour over the onions to serve.

Roasted or Baked Onions. Remove the untidy outer skin from the onions, but do not peel them. Put them, with their skins on, into boiling salted water and let them boil quickly for an hour. Then take them up. dry them, and wrap each in a piece of buttered paper, and bake in a moderate oven about
two hours or until tender. They may be served in their skins and melted butter handed with them ; or pecled, with niled butter or brown sauce poured over.
Onion Sauce. This sauce is served usually with roast mutton or boiled rabbit. When apple sauce does not accompany goose or ducks onion sauce may take its place. It forms sometimes a garnish for cutlets or, if made rather thicker, a coating.
To make it, boil till tender I lb. onions. Peel and blanch them, then drain and chop very fine. Put 1 pint milk into a bright saucepan, add onions with 1 tablewpoonful flour mixed in with them. Bring all to the boil, stirring to keep the sauce smooth ; add I oz. butter and seasoning of salt and pepper Simmer it for 5 min . and serve very hot.
Onion sauce for an entrée is prepared thus. l'cel and boil in salted water 1 lb . onions After 55 min . pour off the first water and boil till tencler in fresh water; drain and chop very fine. Return them to the pan with 2 oz . butter, $\frac{\{ }{3}$ oz. flour, $\frac{1}{2}$ pint milk, 1 gill cream, and seasoning. Simmer for 10 min ., then pass through a hair sieve or a tammy cloth.

Onion Vinegar. All that is required to make onion vinegar is to steep 1 oz . of chopped onion and shallot in 1 pint of white wine vinegar for a fortnight. This condiment gives a piquant flavour to salad dressings and mayonnaise.
Medical Uses. Boiled Spanish onions, taken frecly, are said to benefit people suffering from boils. A poultice made of onions is an old. fashioned remedy often used to hasten the brcaking of a boil. To use in this way, roast the onions, and mash them before sprcasling on a piece of muslin or linen and applying to the spot. Both onions and garlic are slightly aperient and diuretic.

Onion Sellers. In the autumn, generally in October, the onion sellers from Brittany arrive in Great Britain and inay be seen at all coast towns and villages, and even far inland, going from door to door, offering their wares for sale. These consist of strings of French onions slung from long poles which the Breton fishermen carry on their shoulders.

These onions are somewhat milder in flavour than those which are grown in British suil, and consequently they are of practical use to many housewives for the preparation of dishes in which onions form an ingredient, eapecially when only a mild fiavouring is desired. The Breton onions are plaited together in strands, a convenient arrangement for hanging up in the pantry or from the rafters of country kitchens. They are specially good for flavouring soup.

ONONIS. This is a low-growing hardy shrub or herbaceous perennial which bears pea-shaped Howers in summer. The pink Howered rest harrow (Ononis spinosa) is a British plant. Some of the beat kinds for gardens are fruticosa and rotundifolia, with rose pink blooms, and aragonensis, yellow, which reaches a height of 18 in . or so. They need well-drained soil and a position fully exposed to the sun ; they are usually grown in the rock garden. Propagation is by cutting: in a frame in summer or by sowing seeds. It is important that the shoots should be shortened after flowering.

ONOPORDON. This giant thistle-like plant is suitable for the wild garden, edge of the woodland, or the back of a large herbaceous border. They reach a height of 6 ft . or even 8 ft . in good soil. and have pale purplish Hower heads. One of the best is Onopordon acanthium, known as the Scotch thistle. They are raised from seeds sown out of doors in spring.

ONOSMA. This is the name of an important race of rock-garden plants. The species demand hot and dry positions, with
ight, well. drained loam and a little lime. The plants are of varying heights, ranging rom merc inches to a foot or so Onc species, Onosma taurica, is the old garden favouritc golden drop. But there aro esser known and cqually attractive kinds, including albo-roseum, white, changing to pink; and caurica, yellow All bloom from
 June onward,
and can be raised from seed or propagated by cuttings. Protect in winter by raised picces of glass. See Golden Drop; Rock Garden

ONYX. A variety of tinted agate, onyx is formed of alternative lavers of white and coloured chalcedony. It is used in jewelry for bead necklaces, and fancy ornaments Blac nyx is used with liamonds in rings pendants, and other ornaments. Sec Jewelry

OOLONG TEA. Oolong is a black China tea somewhat resembling in llavour a green tca, and of a rather light character. Oolong teas are sometimes exported from Japan. See China Tea; Tea.

OPAL. The most costly of these gems are known as precious opals, and have rainbowlike tints of pink and red ; fire opals are of a rich orange-red colour, while cat's eyc opals which are rare and usually of a green colour, have in their centre a wavy line similar to that in a cat's eye. Other kinds include the black and the common opal. The latter is the least valuable. Opals are cut in cabochon form and never into facets. They combine especially well with diamonds or silver See Jcwelry.

OPERA GLASSES. It is desirable that the selection of opicra glasses should be made by the person who is going to use them. Those with bending bars in the middle, so that they can be adjusted to the width between the eyes arc a convenience; also it is desirable to have large dianteter lenses in both the object glasses and eye pieces. The
 and ivory; fancy glasses are
made with small lenses to kcep down the weight. The aluminium pattern enables glasses with large lenses to be practically the same weight as others with small lenses.

Opiera glasses are miade so that very little dust can penetrate, and with ordinary use they should last many years without being touched inside. When they liave to be cleaned on the inside all that is necessary is to unscrew the cell which holds the lens and wipe it lightly with clean chamois leather, which will not scratch or injure it. The lenses should be taken out one at a time, cleaned and replaced; this ensures their going back in their original position. The outside surfaces should be cleaned with chamois leather The lenses ought not to be touched cxcept when they require cleaning, as small particles of grit are liable to get on the surface of the glasses and will greatly impair their value.
The usual magnification of oper glasses is about $2 \underline{d}$ dianieters. A simple way to judge the magnification is to look at a brick wall through the glass with one eye only, but keep, ing both eyes open The image seen through the glass will cover the space of $2 \sharp$ bricks which are seen with the other eye.

Ophioglossum. This is the botanical name for the adder's tongue fern (q.v.).

OPHRYS. The wild orchids of Great Britain are called by this name. The favourites are the bee orchid (apifera), purplish and green ; spider orchid (aranifera), brown and green; and tly orchid (muscifera), green and reddish. They are all low-growing plants which flower in carly summer. They should be planted in the rocls garden in slight shade, in loamy, chalky soil.

Ophthalmia. See Conjunctivitis
OPIUM. The dried juice obtained by cutting into the unripe capsules of the white poppy (Papaver somniferum) is a useful remedy in medicine. Crude opium contains a number of alkaloids, of which morphine. which may he present to the cxtent of 12 p.c., is the most important. Opiuin acts as an anodyne and narcotic almost entirely in virtue of the morphine it contains. It is used
in various forms 10 relieve pain, and in the treatment of insomnia, but should never be given except under medical supervision. It is delinitely dangerous to young clildren

The best antidote in poisoning by opium is permanganate of potassium, enough dissolved in half a glass of water to make a decp red solution. After this hot, strong coffee should be given freely, and the patient must at all costs be kept awake.

In 1925 an international convention was signed at Geneva. This provided for the establishment of a board of control to suppress the illicit traffic in drugs derived from opium and other came into This 1928, when, accord. ing to agreement, it had been ratified by ten countries.

OPIUM POPPY. This is a very showy and easily grown inardy annua! (Papaver somni(erum), of which there are many brilliantly coloured varieties, e.g The Mikado, Cardinal, White Swan, and Carnation - llowered. The plants grow 18 24 in . high, and have greyish leaves. Seeds are sown out of doors in March-April where the plants are to bloom in summer. The opium of commerce is obtained from Papaver somniferum.


OPOSSUM : The Skin. There are two varieties of opossum, onc of a delicate bluishgrey colour and the other a hard, wiry fur of a brownish shade, known as American opossum. Both kinds are used for trimming purposes, especially on winter coats of velour cloth. Sce Fur.

## Optical Lanterns in the Home

## The Nature and Use of Projection Apparatus

## The reader is referred from this article to those on Lantern Slide and Lens, where relaled

The optical lantern is generally understood any form of illuminant that may be con to be a modern form of magic lantern, taking venient. The actual lantern remains the the standard 3 f in . square slides and having same, but the chimney and internal arrangean improved optical system with an efficient ments will dejend upon the kind of light used. and powerful source of illumination. The Bi -unial (double) and tri-unial (triphe) lantern most frequently consists of a well- lanterns are used for dissolving views. A ventilated box of wood or metal in which lantern-slide picture is projected in the is an illuminant with a reflector behind it. usual way by one of the lanterns upon the Opposite the light is a condenser, which is an screen; the second picture is then shown arrangement of one or more largo lenses. Its purpose is to collect the light rays and throw them through a lantern slide placed on the other side of the condenser. The picture is thus cast into the front lens, usually called an objective, which focusses the picture and throws it in a highly inagnified form upon a screen.

For home work the common form of japanned tin o: Russian iron lantern, burning oil, has been very popular, but acetylene, spirit, electric and other illuminants have displaced the oil lamp. Many of the modern electric lanterns are specially suitable for tho ho me, hecausc of the possibility of connecting them to the ordinary housc supply. High power metal filament lamps are used. Most lant. erns are made to take


Various parts of the optical system. A, illuminant : B, condenser: C, slide stage ; D. objective
over the first onc upon the screen, whell the first one is made to fade out, usually by lowering the light. In this way day scenes are made to dissolve into night scenes and summer scenes into winter scenes.

The Optical System. Standard lanterns have condensers measuring 4 in . to $4 \frac{\mathrm{t}}{\mathrm{in}}$. in diameter. The circular condenser must be at least 4 in . in diameter to illuminate the standard $3 f$ in. square stide. The condenser consists usually of two lenses, called a planoconvex compound, mounted in a cell with the Hat surfaces outward. A condenser should never be suddenly heated or allowed to cool too rapidly, because of the danger of cracking. The lenses should fit loosely in the coll, and the latter should bc provided with suitoble holes for

are wanted, it is not enough to hang up an ordinary white linen or calico sheet and project the picture upon it. A lantern shect or screen should be quite white and absolutely opaque. Opaqueness is necessary to keep the light and the picture upon the surface, and so reflect rather than absorb it. When an ordinary sheet is used much of the light cast upon it goes through and is lost, the picture suffering from lack of brilliancy and clearness of outline.
ventilation. The heat generated during a show causes the glass to expand slightly, and if this expansion is not allowed for the glasses will crack.

The objective is often a lens of the Petzval type, like a photographic portrait lens; it is generally about 2 in . in diameter and from $5 \frac{1}{2} \mathrm{in}$. to 6 in . in focus. Upon the focus of the lens depends the size of the picture upon the screen: or, in other words, the distance of the lantern from the screen.

The $5 \frac{1}{2}$ or 6 in . focus lens commonly supplied with lanterns for use at home gives, approximately , a 5 ft . picture 10 ft . from the screen, a 6 ft . picture at 12 ft ., a 7 ft . picture at 14 ft ., and so on, the picture being half as high as the distance measures. For large halls, objectives of longer focus are used. Thus with
an objective of 12 in . focus the lantemist an objective of 12 in . focus the lanternist would get, using the same lantern and condenser, a $2 \frac{1}{2} \mathrm{ft}$. picture at 10 ft ., and 3 ft . picture at 12 ft . Put in another way, if the lantern is 12 ft . from the screen, then a 4 in . objective would give a 9 ft . picture, a 5 in . one of 7 ft ., a 7 in . one of 5 ft ., and an 8 in . a picture of $4 \frac{1}{2} \mathrm{ft}$.

The size of picture obtainable depends upon the quality of the light employed. With an oil lantern it is rarely possible to enlarge the $3 t \mathrm{in}$. slide to more than 5 ft . and get at the same time a brilliant picture. It is better to have, say, a 4 ft . bright picture than a dull one of 6 ft . in diameter. With incandescent gas or acetylene good 6 ft . pictures are possible if the illuminants work well, while with the electric gas-filled lamps 8 ft . can casily be obtained.

The Screen. The screen upon which the pictures are shown deserves more attention than is usually given to it. If the best results


Optical Lantern: action of condenser lens. R. sonrce of light: A and B, normal path of light ray, if no condenser is ased: $L$, objective lens on which tie lijht raya are made to converge by the condenser uens, C: 8, slida


Optical Lantern. Above, electric projection lantern for lecture hall or clasaroom ; adapted for lensei of 8 to 18 in . focus. Below. epidiascope, for projocting an image of opaque objects, or tor tranaparent slidea ; it is converted to either nat by moving a lever. Part of casing removed to thow interior Courtesy of Ensiun, l.id.: and af Chas. Baker

The best screen on which to show lantern pictures, small and large, is a whitewashed or distempered plaster wall, which absorbs no light ; for the same reason white cardboard is also excellent. Opaque screens of a size large enough for home work are to be had front the makers of lanterns and accessories.

The aluminium lantern illustrated is one of a class developed in recent years. It has a superior lens system, and the illuminant is a 500 -watt electric lamp which can be con. nected to the housc lighting circuit. The back
of the globe is silvered to act as a reflector. The bellows extension permits the usc of lenses having a focus of 8 in . to 18 in ., giving a distance from the screen of 20 ft . to 75 ft ., according to the lens employed. This model is particularly suitable for lecture halla, or classrooms, but a smaller one, designed on similar principles, is available for home entertainment.
Projection of Opaque Objects. At lectures, demonstrations, etc., it is often necessary to show an enlarged image of an opaque ohject, such as a picture, diagram, or jage of letterpress from a book. An optical lantern for projecting on to a screen the image of an opaque object is known as an episcope. Such an apparatus is generally, however, designed to show transparent slides also, when it is termed an epidiascope. The opaque object is placed on a platform beneath the apparatus and is illuminated by one or more powerful electric lamps. The light rays reflected up ward from the object are passed through a lens system and projecteil on to a screen We illustrate a type of epidiascope in which one objective is used for the dual purpose, the movement of a lever converting it from episcopic projection to lantern slide use, and vice versa.

OPTICLAN. A person who makes or aells spectacles or other optical instruments is called an optician. A doctor who specializes in dis. arders of the eyc is an oculist, and his work deals very largely with errors of refraction, for which glasses have to be prescribed. Many opticians also test vision and prescribe glasses where these are necessary.

Pcople who bave little knowlelge of optical work, and who are in no sense opticians, frequently undertake to supply glasses, which may be either unnecersary or actually harmful. The bona-fide optician is skilled in making up and fitting glasses; he is depended on to supply lenses of the precise kind and strength required. He also may have skill in sighttesting, and amongst opticians there are many who have qualified for a diploma in the subject. See Eye: Sight Testing

OPUNTIA. The cactaceous plant called opuntia includes the Indian fig, prickly pear, Barbary fig, and other natives of Central America. Nost of them need ordinary treatment in the grcenhouse in rich loam, with a liberal admixture of lime or old mortar: they must be watercd sparingly in winter. The hardy species need similar soil in a sunny, sheltered situation in the garden. Propagation is by seeds or cuttings. Among the hardy kinds arc monacantha and raffinesque See ndian Fig: Prickly Pear.
Oranges and Orange Dishes

## A Popular and Health-giving Fruit in Appetizing Forms

## Marmalade is one of the entries in our work to which reference should be made; others are Candied Peel; Crysullized Fruit. See also Diet; Fruit; Icing; Jelly : Tangerine

The orange is an evergreen flowering shrub telonging to the Citrus family, which embraces the lemon, tangerine, grape-fruit, and citron, as well as the Seville or marmalade orange. Uranges may be grown from pips planted in pots in loany soil. The temperature of a cool greenhouse is all that is necessary, and the pots or tubs inay be stood out of doors on verandas or in porches during the summer months. The small Utaheite orange is the best fruiting variety for amateurs. Seedling plants are slow in reaching the fruiting stage.

Chief Varieties. Of the two main varieties of this fruit, sweet oranges are used for eating and dessert purposes, while the bitter sorts are employed chiefly in making marınalade. There are a large numter of varieties of the sweet orange, each having its characteristics. The
tastc, and dark coloured with a rough skin.
Azores has a specially choice flavour and is juicy and seedless. Majorca also produces seedless oranges, while Malta is celebrated for its blood oranges, the pulp being of a dark crimson colour and very sweet and juicy. The Lisbon variety has a thick rind like that of Jaffa, while the China orange is thin, and the juice very abundant. The rind of the Mandarin is thick, heavy, and loosely attached to the pulp, the fruit being of excellent flavour. Tangerines are amongst the smallest of oranges, being flat in shape and possessing an aromatic flavour.

Sweet oranges are imported from Alicante and other parts of Spain, but the most important variety from this country is the Seville orange, which is extremely bitter in Sweet oranges of good size and excellent
quality, both seedless and other kinds, are grown in Australia and South Africa, and are on sale in most towns in Great Britain. One of the largest varietics is the American navel orange, so called from a characteristic formation on the top of the fruit, which is oval in shape. This variety of orange is also grown in South Africa.

Amongst the many uses of the orange, the fruit may be preserved in sugar as a sweetmeat. The peel of the bitter orange is candied and is much employed in confectionery. In an early stage the small green fruit, no larger than berries, is used in the manufacture of the liqueur known as curaçao The bergamot perfume is distilled from the rind of Italian oranges, and a liqueur named rosoglio is a lso made in some parts of Italy from oranges. An essential oil is obtained from the rind of both sweet and bitter oranges, and is sold by most perfume dealers.

Medicinal Value. Both sweet and bitter oranges are used in medicine, but chiefly the latter, which are of great value in the sick room. Only the juice, however, should be given to invalids or young children, as the pulp is very difficult to digest. Squeeze the orange juice into a glass and give in that way. A teaspoonful of orange juice should be given once or twice a day to hand-fed balies to prevent scurvy, for which it is also a reniedy

For a patient who is thirsty, a welcome drink can he made by pouring over the thinly cut peel of an orange a pint of nearly boiling water. Add 4 tablespoonfuls loaf sugar. and let it stand fo: aul hour ; then put to it the juice of 3 oranges, and strain. Serve quite cold
An excellent tonic for promoting appetite and aiding diges. tion can be made by taking 2 oz dried orange neel, the fresh rind of 2 lemons, and pouring over them 1 pint boiling weter. Let it stanil for an hour, then strain. Take $\underline{d}$ wineglassfil twice a day,
half an hour hefore luncheon and before dinner.
From the flowers of the orange a water is distilled which lias a beantiful perfume. Besides this, other preparations of orange used in medicine are the tincture and the syrup, the dose of each being $\frac{1}{2}$ to 1 dram; these both act as flavouring agents, and the tincture also as a tonic and appetizer.
Uses in Cookery. Oranges are a very useful cookery ingredient and can be employed in a variety of dishes, such as pies, tartlets, creams, jellies, cheese cakes, cakes, and salads. The flavour is delicious in icings and sweet fillings, and the juice is in some cases added to rich, made gravics.
Orange Basket. The sweet known by this name is made by cutting 2 or 3 ripe oranges into halves, scooping out the pulp and mashing it up in cold water, making about $\frac{1}{2}$ pint liquor in all. Add sugar to taste, and after letting the


Orange Baskets, a novel method of serving jelly made from the troit
liquor stand for a couple of hours, strain it through muslin.

Add $\ddagger$ oz. isinglass and just warm the whole over the fire until the former melts. Colour it pale pink with a little cochineal, and then pour it into the halved orange skins, leaving theae in a cool place to set. When the jelly is tirm, handles to complete the basket-like effect can be made from thin strips of angelica, bent over

Orange Biscuit. Boil 6 Scville oranges in 2 or 3 waters till the bitterness has almost dis. appeared Cut them in quarters and remove all the inside. Beat the peel very fine in a mortar then weigh the pulp thus ohtained. Add an equal weight of castor sugar and work both to a firm paste. Spread it smoothly on a dish or tin, set it in a cool oven to dry, and when dried sufficiently to shape cut it into fingers. 1)ry these again, turn them upside down, and return them to the oven so that all moisture may be absorbed. Store them in tins. These biscuits should he alout of in. thick, and are useful as wafers to serve with ice cream

A spongy biscuit can be prepared by beating 2 eggs with 4 oz . castor sugar until thick and quite light. Mix in the grated rind of an orange with 1 teaspmonful orange flower water. Sift 4 oz . Hour with a pinch of salt and fold it into the sponge. Bake it in little paper cases, and when almost cooked dredge it with sugar. Finish baking afterwarls. These hiscuits nre sometimes iced, and in that case the icing should be mixed with some of the orange-juice.

Orange Cake. A sandwich cake flavoured with orange can be made by beating $\frac{1}{2}$ tea. cupful butter or margarine and 2 teacupfuls sugar to a cream, adding separately 2 eggs, and then beating the mixture well. Pour in $\frac{1}{2}$ teacupful milk, then add 1 lb . sieved flour, grated rind of the orange, and 1 teaspoonful baking-powder, and continue beating. Line a tin with greased paper, put in the mixture and bake it until it is firm and lightly browned. When cold, split it into two and spread the sides with a gill or more of whipped and sweetened cream, llavoured with orange essence.

Another cake filling is made by mixing the strained juice of 2 or 3 oranges with $\ddagger \mathrm{lb}$. castor sugar, gradually adding to them the grated rinds, 2 tablespoonfuls corntlour and a gill of water. Mix all to a smooth paste, then stir in 1 oz melted butter and stand the basin over a saucepan of hot water Stir its contents over the fire until they be come creamy and taste cooked; then leave them to cool. When cold, stir in the whites of 2 eggs and spread the filling over the cut sides of the cake, afterwards putting the latter toget her again. If it has risen too much in the centre, level it with a knife before icing.

Orange Cream. To make this sweet, cut 2 oranges into halves and remove the pulp carefully, so as not to split the rinds. Extract the pips, rub the pulp through a fine sieve and mix with it 3 dessertspoonfuls castor sugar. Whip a gill of cream until it thickens, add half of it to the orange pulp and sugar and fold in also the stiffly whisked white of an egg. Dissolve $\frac{\ddagger}{} \mathrm{oz}$. leaf gelatine in $\frac{1}{2}$ gill water, strain it into the other ingredients and mix all thoroughly. Half-fill each orange-case with


Orange Cream, halved orange gkins glled with a cream miriore and decorated with angelica
the mixture, and when the latter is set, decorate the top with the remainder of the cream and a few pieces of angelica on top.

Orange Fool. Peel and then mash 3 or 4 large oranges to a pulp, rub the latter through a sieve to rid it. of pips, and then mix it with 1 pint custard. Iet the mixture stand in a cool place so that it may thicken, then put it into custard glasses and pile a little whipped cream on top of each. If preferred, $\frac{1}{2}$ pint cream may be substituted for the custard.
Orange Fritters. These are made by peeling some oranges, breaking them into quarters, removing the white skin, and then sprinkling them with castor sugar. Leave them thus for about 15 min ., then drain and cont them with frying batter. Have ready a pan of smoking hot fat, put in the slices of orange, and fry them till they are a golden brown. Drain them from the fat, dredge them with some more castor sugar, and serve at once Allow half an orange for each person.

Orange Pudding. A small orange pudding can be made ly mixing together $1 \frac{1}{2} \mathrm{oz}$. castor sugar and the grated rind of an orange and putting them into a basin with 2 oz . finely chopped suet, the same quantity of bread crumbe, 1 oz. rice flour, $\frac{1}{2}$ teaspoonful bakingpowder, and a good pinch of salt. Into the centre of these ingredients strain the juice of half an orange and a well-beaten egg, mixing all well and adding a little milk if necessary. Turn the mixture into a greased basin or mould, cover it with a piece of greased paper, and steam it for two hours or more. This pudding should be served with orange sauce.

A baked orange pudding can be made by peeling 6 oranges, breaking them into small sections and after removing the seeds, putting them into a pudding dish. Sprinkle over them t lb. castor sugar, and leave them to soak thercin while preparing the following mixture : Stir together a tablespoonful of cornflour and a little cold milk, and when they are smoothly mixcd add them, together with a well-beaten egg, to a pint of milk that has not quite reached boiling point. Stir the whole until it thickens, then pour it over the fruit and on top spread the stiffly beaten whites of two eggs. Bake the pudding until it is firm and lightly browned.
Orange Sauce. This sauce is made by warming the strained juice of half an orange, together with the rind and 2 oz sugar, in a small pan near the fire. When the sugar has melted, add a teaspoonful of cornflour mixed smoothly with a small teacupful of water Stir the sauce until it boils; then siminer it for a few minutes to cook the cornflour before serving.

Orange Syrup. When orange flavouring is required this syrup may be used with excellent results. To make it, squeeze the juice from 12 oranges, strain it, and then boil it up in a saucepan with 8 lb . lump sugar. When it thickens, skim and bottle it.

Orange Tart. To make this, rub the grated rind of 2 oranges with 2 heaped tablespoonfuls sugar and then cream these with 2 oz . butter. Add to them the yolks of $2 \mathrm{eggs}, 2 \mathrm{oz}$. finely crushed biscuit, and the strained juice of the fruit. Then beat the whites of eggs to a stiff froth, stir them in, and pour the mixture into a tart tin lined with puff pastry (see Pastry). Bake the tart in a fairly hot oven until the pastry is lightly browned and the mixture set. Just hefore serving, sprinkle the surface of the tart with castor sugar.

ORANGEADE. To make orangeade, pare the rinds of 3 ordinary and 1 Seville orange and put them into a jug; pour on them 1 pint boiling water and let them strep, covered up, for $G$ hours. Make a syrup with $\frac{1}{2} \mathrm{lb}$. sugar and $1 \frac{1}{2}$ pints water, and add it ta the steeped rinds, together with the juice of the oranges from which the rinds have been taken, and the juice of 3 additional oranges. Stir the whole well and when cool atrain it through mualin. The juice of a lemon may replace that of one orange.

ORANGE BALL TREE. This is the popular name of a handsome hardy flowering, shrub (Ruddlcia glohora) It. thriver in


Orange-ball Tree. Evergreen ahrub with globalar gellow flowers which will brighten a dall garden
ordinary soil, reaches a height of 8-10 ft., and bears round heads of yellow flowers in summer. Any required pruning to keep the bush shapely should be done after Howeling. Propagation is by cuttings in a frame in August. Buddlleia variabilis and its finer varieties veitchiana and magnifica bear racemes of mauve Howers, which attract the buttertlies and bees, in July and August They must be hard pruned in spring.

ORANGE BITTTERS. An excellent recipe for orange bitters is the following : Take 1 oz . Sevillc orange peel, $\frac{1}{2}$ oz. gentian root, $\ddagger 07$. cardamonıs. Husk the cardamoms and crush them with the gentian root. Place the whole in a wide-mouthed bottle and cover it with brandy or whisky. Allow the mixture to remain for 12 days, then strain it and bottle it off for use, adding 1 oz . lavender drops.

ORANGE BRANDY. March is the best time to make orange brandy. Place in a stone jar the rinds of 6 oranges cut thin and add $\frac{1}{2}$ pint orange juice st rained, and $\frac{1}{2}$ gallon gocd brandy. After 3 days add about 1 lb . loaf sugar, stir till the sugar is dissolved, and lat the liquid stand for a day. Then strain it, pour it into bottles and cork it tightly. It improves with age. See Brandy.
ORANGE LILY. This is the cominon name of Iilium croceum, a hardy lily, which bears billiant orange-coloured blooms in summer on stems $2-3 \mathrm{ft}$. high. It thrives in ordinary soil ; the bulbs should be planted 3 in . deep in the itutumn.
ORANGE LIQUEUR. This drink is made by peeling 2 Seville oranges and 2 small lemons, putting the peel into a jar with $1 \frac{1}{2}$ pt. whisky and 7 oz . lump sugar, corking it down tightly and leaving it for 5 or 6 days. Keep it well shaken daily, then strain it through mus!in, or a very fine strainer, and bottle it for use. See Liqueur.

ORANGE WINE. In making this wine 8 large Seville oranges should be allowed to cach gallon of cold water. Put 4 of these into
the water with the peel on; pare the other four, cut them into halves and then add them to those in the water, saving the peel for other purposes. Leave the whole for 10 days, stirring it two or three times daily; then atrain it through a hair aieve and add 4 lb. lump augar to cvery gallon of liquor. When the sugar has dissolved the wine may be put into a cask. Bung it loosely for threc or four days, then tighten the bung and after six months bottle for use.

ORANGES AND LEMONS. This is onc of the old singing games, and is still much in voguc for amall children Two people join hands, making an arch beneath which the others have to pass. As height is important it is better for adults to take this part. The children then form into a chain, cach child with his hands on the shoulders of the one in front of him, and pass under the arch formed by the two adults. Meanwhile all sing the following rhyme:
Oranger and lemuna, say the Lella of St. C'ement's;
You owe me five firthings. say the bella of St. Martin's.
When will yoin pay me 9 say the brills of Old Balley. When 1 grow rich, say the bella oi shorediteh. When will that br'? apy the bellg of Stepney. $I$ du not know, says the great lell of Bow. Here comes a candle to light you to bed.
And here comea a chopper to chop off your head.
When the last couplet is reached the two adulta drop their hands over one of the chain, imprisoning him. He is then asked whether he prefers oranges or lemons, and having made his choice in a whisper, he is put behind the person representing that fruit, a matter which lias been settled by the two before the com-

## Orchids: Varieties alnd Their Cultivation

## Beautiful Flowers that the Amateur Gardener can Grow

This article is a companion to those on Daffodll ; Iris; Lily : Rose: and others throughout our work. See also Greenhouse and the entries on the various orchids, e.g. Cattleya; Mitonia
Orchids are rightly regarded as the most called the intermediate house, with a mininum fascinating of all Howering plants grown under winter temperature of 60 degrecs, and cool glass: there are many genera or groups, house orchids will thrive in a greenhouse in innumerable species, and an untold number of which the temperature does not fall below varieties and hybrids. Orchid growers raise 45-50 degrecs in winter. Orchids suitable for new hybrids or crossbreeds annually, and these the greenhouse are odontoglossum, Ada now form the bulk of the orchids grown by those who specialise in these Howers

For the purposes of cultivation orchids atc grouped in three classes according to the temperature of the glasshouse suited to their s:eeds. Nome must be grown in a hothouss having a minimum winter temperature of (:5-70 degrecs. Others are suited to what is
mencement of the game. When all the players have been captured in this fashion and are ranged behind one or other of the adults, the game ends in a tug-of-war between the two parties, the first couple still holding hands. See Children's Party.

ORCBARD. The best apot for an orchard or fruit garden is one that is sheltered from north and east winds, as far as posaible, and has a southern or south-western aspect. loamy soil is best, but other kinds can be made suitable by cultivation. A gentle slope is better than a dead level ground, on account of drainage.

Young standard trees may be planted in pasture land in which to form an orchard, and in that case they should be put in about 30 ft . apart cvery way. Such land may be used for sheep, but in the home garden orchard the usual plan is to economise space by planting bush fruits, strawberries, etc., between the large fruits. When an orchard is iirst planted the young trees should be staked until they are thoroughly established, and the soil round the trees must be kept clear of grass.

The grass should always be kept closely grazed, preferably by turning sheep into it, and must never be allowed to get so long and rank that it has to be cut with a scythe or mower. See Apple: Cherry: Fruit: Pruning: Strawberry, etc.

ORCEARD HOUSE. A heated greenhouse used almost entircly for the culture of fruit is known as an orchard house. It may be either lean-to or span in structure. See Apricot: Grape; Greenhouse; Nectarine: Peach: Pineapple, etc. aurantiaca, odontioda, lycaste, cypripedium, and masdevallia.
Those. which should be grown in the intermediate house are cymbidium, cattlcya, laclia, epidendrum, oncidium, miltonia, воphronit is, coelogyne and dendrobium. Orchids which need the conditions of a hothouse are vanda, aerides, phalaenopsis and calanthes. Some of the chief


Epiphytal Orchide. 1. Wood basket for drooping apecies. 2. Another type of hanging basket. 3. Plant grown apon sphagnam covered bark. 4. How to
pot erect-growing kinds : $a$, crocks and charooal: $b$, peat and aphagnum ; $c$, sphagnum moss kinds suitable for cul. tivation by amateurs are dealt with in the following notes. For particulars of specics and the countless beautiful hybrids now available the catalogues of orchid growers should be consulted.

Some Examples. A charming orchid suit. able for the cool house is the orange scarlet Ada aurantiaca. Repotting is necessary when new growths are about 3 in . long, a suitable compost being fibre, oak leaves, and sphagnum moss.

Cattleya is an orchid of exquisite shape and delicate colours, containing species excellent for the warm and intermediate
houses. Pot culture is necessary, in a compost of tibre, peat, and spliagnum moss, plants being repotted every 2 years with removal of all decayed or dead roots and hulbs. Each plant should he dealt with as soon as new growth has reached about 3 in., using fresh small pots in scrupulously clean condition.

The free flowering Coelogyne cristata has blossoms of white and a yellow lip. Being very shallow rooting, it is hest grown in an orchid pan in the intermedinte house. When repanning becomes necessary, an operation not often required, a compost of peat and aphagnuni moss should be employed. Large plants are to be encouraged if free flowering is required
Cymbidium is a magnilicent orchid for aniateurs, suitable for the intermediate or even the cool house. Plants should be repotted very firmly in a mixture of lonm, leaf-mould, peat, and sand, damping it well, and placing upon plenty of well-cleansed crocks.
Cypripedium is an extensive genus containing many species and hybrids. It is a bulhless kind, producing leafy growths, and bearing, as a general rule, large, liandsome hlooms, populatly known as lady's slippors, on stiff, crect spikes. These orchids bloom successfully in turfy prat and a little loam, sweetened with charcoal.
Some of the beautiful genus Dendrobium are suitahle for amateur cultivation, either in cool or warm house, the following being recommended: Falconeri, Jamesianum, which are coul house kinds; nohile and thyrsiflorum, for warm house cultivation. Suitahle compost is turfy peat and sphagnum moss.
Disa grandillora, commonly called the llower of the gods, bear's blossomis of bright scarlet with light markings during October. It requires special cultivation. From spring until autumn the compost must be kept in a state of even sponginess, but without excess of moisture; during winter the plants are best in a light position at the coolest end of the house. From April to September the plants may he placed in shady frames out of doors. A suitable compost consists of equal parts of peat and living sphagnum moss, with a little sand. Pots or plans must be perfectly clean and well drained.
Epidendrum vitellinum majus is the name of an orchid bearing orange-scarlet flowers on


Orchid : three hardy kinds. Left to right: bee orchis, a small orchid for the rock garden; Madeira orchis, a plant needing a dampsituations ard Calgpso borealis, bearing nurple, white-lipped flowers
enect spikes, with summer and autumn flower. ing forms. It may he grown in pote, pans, or haskets, ${ }_{j}$ full of clean crocks, topped with a compost of $\because$ parts lihrous peat, some sphagnum moss, and silver sand $f$ of the whole. All dead and decayed roots, leaves, or hulbs should he renoved before repotting, and the plants kept on the dry side during winter to prevent spotting of leaves.

The genus Laelia contains some bcautiful species. Kinds recommended are ancejs, autummalis and praestans. Laelias have been crossed with Cattleyas, and the hyhrids known as Laelio-cattleyas are vigorous and freeflowering. A fine exaniple of the many hybrids is known as St. George. Flowers are all very widely varied in this section, spikes producing 2,3 , and sometimes 4 and 5 on a spike. No class of orchid is more suitable for a house where a minimum temperature of $50^{\circ}$ can be maintained. A winter-Howering orchid that docs well in a cool house is Lycaste Skimeri


Orchid: some greenhouge varieties. Top, left to right: Laelio-cattlega St George, Coeloggne cristata, and Oncidium papilio. Bottom, Odontcriossum crispum, and Cypripedium Germaine opoix

There are many varicties, the blossoms being usually pale pink, with mottled crimson lip. They are casily cultivated in pots of loam, peat, and sphagnum moss in equal parts, with a surface layer of the latter. Repottin: every second year is heneficial

Masdevallia ignea produces large bright scarlet blossoms during the summer months. This orchid is suitable for the intermediate house.

Miltonia exhibits great variety of colour. from purest white to a lovely shade of rose Vexillaria will grow in a warm, mixed greenhouse if placed in a light position at its warmest end. It is best cultivated in a pot containing 3 parts of clean crocks. then a compost of fibrous peat, chopped sphagnum moss, and charcoal, with a surlace of sphagnum.
The various hybrids of odontioda combine the hright red colourings of Cochlioda with the varied shades of odontoglossum. They should be grown in a cool greenhouse. A compost of osmunda libre and fresh splangnum moss in equal portions is employed, together with a little decayed oak leaves; the whole is made damp and placed in a perfectly clean pot containing $-\frac{p a r t s}{}$ of clean crocks.

Odontoglossum is an extremely beautiful genus of orchids which contains many gems for the cool house, hearing sprays or branching spikes of blussoms, each varying from 5 to about 40 in number. The colour is infinitely varied, langing through transparent white. chocolate, violet-purple, clarct, vellow, lilac, and chestnut, with spottings and markings in perfect harmony. Two of the most popular species are crispum and grande, but there are many othery

Abundant air is essential, with nicely diffused sunlight whenever available. Whein in full growth, and wbile tlowering, water must be copious and free ; but after flowering only sufficient moisture should be allowed to prevent the soil becoming dry. Broadly, the plants require a long reating period, covering a couple of months. Suitable compost contains 2 parts fihrous peat and $\frac{f}{2}$ a portion each of splagnum moss and charcoal, top-dressed with a laver of fresh moss. It is important to notg that regular damping-down must be maintained during summer to keep the atmosphere uniformly moist.

The choice greenhousc varicty Oncidium papilio is illustrated here. Crispum, concolor,

Hexuosum Marshallianum. tigrinum and varicosum Rogersii may be selected. The compost is composed of oak leaves and polypodium fibre. Flowes spikes must be removed directly they begin to fade.

Peste and diseases will not give great trouble amongst orchids if house and plants are kept thuroughly clean. New plants should always be thoroughly inspected for parasites before placing them with general stock; and where insects appear thorough clcansing with insecticide is the rule. The plants may be steeped in warm solution, provided this is done very carefully Common pests are slugs. green-fly, thrips, mealy bug, wood-lice, cockroaches, and red-spider.

Wild Orchids. There are sonie beautiful flowers among the hardy orchids, some of which grow wild in Britain. They are most likely to Hourish if planted in the rock garden in slight shade in a compost of loam, peat, and sand.

The bee orchis (ophrys apifers), spider orchis (ophrys aranifera) and fly orchis (ophrys muscifera) need chalky, loamy soil. Other beautiful hardy orchids are the Madeira orchid (orchis foliosa), purplish. 18-24 in. : the Marsh orchid (orchis latifolia), purplish, 12-15 in. : the spotted orchid (orchis maculata) 8-10 in., with spotted leaves and rose purple Howers: lady's slipper (cypripedium spectabile), 18 in., white and rose ; butterty orchid (habenaria bifolia), 12 in., white; epipactis latifolia, 12-18 in., creenish purple ; and bletia hyacinthina, 12 in., purple.

ORCHIS. This is the name of a genus of hardy orchids. Some of them grow wild in Great Britain. A description of thc different species will be found in the article on orchid above.

ORGANDIE. The thin, semi-transparent material known as organdie is used for summer dresses, women's collars and cufis, for glass curtains, and for night wear cases and handkerchief sachets. It can be obtained in colours, and its chief virtue lies in the stifiness which prevents it from creasing so easily as most of the other cotton summer fabrics. To achieve the best effect, coloured organdie, when used for non-transparent articles, needs a foundation of the same shade, while collars of this material need to be tacked in position, otherwise their stiffness will not allow them to lie neatly over the dress. See Starch.

ORIEL: The Window. This term is used to describe a particular form of window, the characteristics of which are that it is overhanging, or projecting, divided into different bays, and located upon an upper floor. It is also used to describe a recess within a room. See Window.
Oriental Poppy. This vigorous hardy perennial (Papaver orientale) bears large showy flowers in May and June. See Poppy.

ORIGANUM. This is the botanical name of a group of low-growing herbs. The most familiar is the marjoram (Origanum vulgare), which is raised from seeds sown out of doors in spring. Origanum dictamnus, called pink hops and dittany, is a pretty little pot plant with bunches of pink hop-like fowers: it can be increased by cuttings of the young shoots. See Marjomin.


Ormolu. Oblong table with rounded ends, three drawers and futed legs. mounted with chased ormoln. Prench : period of Louis XVI

ORLOFF: The Fowl. This breed of Russian fowl possesses what is known as a raspberry comb with small feathers growing between the little rounded nodules. This distinguishes it above all other breeds in Great Irritain. The Orloff is bred in five colours, mahogany, spangled, black, white, and blue. It is a muffed breed and also bearded, but it is a good laying breed and a non-sitter. Eggs average 7 or 8 to the lb. Adult cocks weigh 8 lb . to 10 lb . and hens 6 lb . to 8 lb . They do well cither kept semiintensively or on free range.

The mahogany variety are the most handsome ; next to them come the spangles. The mahogany chicks are like Rhode Island red chicks. The spangles vary, being either buff or buff with a brown stripe down the back, and sometimes almost white. Chicks of the other varietics follow their colour. See Chicken; Fowl ; Poultry.

ORMOLU. From the time of Louis XIV to the First Empire, French cabinet makers employed for the enrichment of their productions bronze mountings, which were cast, chased, and gilded. Similar metalwork was used for the mounting of porcclain and stone By permission of the Director. Victoria \& Albert Museum, $s$ Kensinuton
vases, and for the fabrication of cluck cases, wall brackets, mirror frames, and the like.
The castings at their best were exquisitely chiselled, and finished with a mixture of gold and mercury, sometimes tinted, such as the greenish ormolu of Gout hière and other masters. Similar mountings were used by some English makers, but very sparingly; Adam is said to have employed French and Italian artists for the purpose. The plain brasswork, gilded or ungilded, to be seen on the door fittings of 18th-century English furniture is not ormolu, which is essentially chased and gilded bronze.
The metal mounts used on modern reproductions of old furniture, although often styled ormolu, are usually finished by more or less superlicial methods of electro-gilding, by cheap spirit lacquer, or by the water-gilding employed by French makers for current styles of ormolu clocks and the like. Copies made by the galvanic battery can be detected by the granulated surface on the back. The modern alloys contain much zinc, with a thin gold or lacquer wash, and readily lose their brilliance, especially when exposed to gas fumes. The imitation mounts may be made to appear old by chemical means. Good reproductions exist, but are costly to make.

Collectors seldom meet with old mountings in a detached form, because anything of the kind worth having can generally be turned to better advantage on faked furniture. Sometimes the metal handles of broken vases, lion masks, inkstands, and other ornamental
pieces may be acquired as examples of French chiselling. They should be examined with caution, and accepted only if they possess some artistic merit of their own. Old ormolu should never be clcaned with metal pastes nor touched up with gold varnish, but should be treated carefully with dry leathers See Directoire Style ; Louis Style; Marquetry.

ORNAMENTAL GRASS. Many beautiful annual grasses are suitable for association with cut flowers in summer or fo: winter decoration, and for growing in pots. Seeds are sown out of doors in March-A pril where the plants are to bloom. The right time to gather these grasses is just before the blooms are fully open. After cutting they should be exposed to the sun until thoroughly dry.

The following are particularly recommended : hare's tail, love grass, Job's tears, animated oat, quaking grass, squirrel-tail, feather, cloud, golden spiked, and three-horned grass. See Flower Garden ; Garden; Grass.
ORNITHOGALUM. This group of hardy and greenhouse bulbs contains several valuable garden flowers. The commonest is the Star of Bethlehem (umbellatum), which bears star-like greenish-white flowers in spring and will thrive in shady places out of doors. Other hardy kinds are pyramidale and arabicum, both with white flowers, and nutans, greenish-grey : they grow from 12-18 inches high. The bulbs should be planted in Septeinber and Octuber. Arabicum and lacteum are often grown in pots in the cool greenhouse.

ORPINGTON DUCK. Although smaller than the Aylesbury, the buff Orpington duck is hardly inferior to it as a table bird, and it is a prolific layer. Its general characteristics are a good carriage and an aspect of alertness. The drakes attain a weight of from 7 lb . to 9 lb ., and the ducks from 6 lb . to 8 lb . There is an offishoot from this breed known as the blue Orpington, which lays large eggs and is a good table bird. Blue Orpingtons are of active habit and mate without the aid of pond or stream. See Duck.

ORPINGTON FOWL. This breed has a reputation as a layer of fair-sized tinted eggs and as a table bird. There are rarieties in several colours, the buff being the most largely kept. They are very hardy and do well under any conditions, and as sitters and mothers they are uncquali. ed. When fully matured themalc birds should weigh between 9 lb . and $10 \mathrm{lb} .$, and the hens between 7 lb . and 8 lb . No other fowl presents such a perfect com. bination of excellent lay. ing and table qualities. See Fowl; Poultry.


Orpington, a breed of Sowl nn-
equalled for its all-round qualities
ORRIS ROOT. The root of the iris, the blue tlag of suburban gardens, is largely used in various toilet preparations under the name of orris root. Roots of the following irises lend themselves to treatment: Iris Germanica, I. Florentina, and I. pallida.

Because its scent resembles that of the violet, orris root is employed in the making of violet powder, and a perfume known as essence of violets is distilled from it. See Flag: Iris; Scent.

ORTHOCHROMATIC PLATE. In phuto. graphy partially correct rendering of colours is obtained by the use of special plates
or filnıs with or without light filters. Such plates or films are said to be orthochromatic or isochromatic. They are made more sensitive to greens and yellows than ordinary plates by being specially sensitized with eosin or erythrosin dyes, and arc intended to be used with yellow light filters. In some cases a yellow dye is included in the emulsion on the plate, no separate light filter then being required.

All these plates give better senderings of greens and yellows in landscape and other objects containing colour. The undue influence of blue and ultra-vioier rays seen in ordinary plates is reduced by the yellow filter or dye without serious increase in exposure. They are still, however, not sufficiently sensitive to reds and even yellows; for truly orthochromatic results panchromatic plates and tilms must be used. In practice the useful. ness of orthochromatic plates lies in the fact that improved renderings of colours are obtained with little increase in exposure, and that the red light can still be used in the dark room if care is taken to sce that the plate is exposed to it as little as possible during development. In sonse plate. in which the filter is included as a yellow dye in the cmulsion the speed of the plate is slightly increased.

Orthochromatic roll films, as well as selfscreened plates, can be used without a filter, but even with these slightly better results can be obtained if a filter is used. Both with these and with the plates designed tor use with filters only a pale screen, such as the Kodak Kl or the Ilford A (alpha), which increases exposure by two, should be used. Deeper filters not only increasc the exposure, but tend to overcorrect and give unnatural results In artificial light and at sunset, when there is a good deal of yellow in the light, all these plates can be used without a filter. Sce Light Filter; Panchromatic.

ORTOLAN. The sinall birds known as ortolans are about the size of larks and are in season in September. They are rare in England, being mostly imported from Belgium, but are considered a delicacy. Ortolans are usually dressed with savoury forcemeats and laid in cases or on crouttes of fried bread.

Cooking the Bird. To cook them make a rich liver farce, using 1 fowl's liver or a corresponding portion of calf's liver to each bird. Fry the liver with 2 or 3 rashers of fat bacon cut in dice, adding 1 tablespoonful dried sweet herbs which have been passed through a line sieve, a little grated nutmeg, and seasoning of pepper and stuce. Pound the liver and press it through a sieve, then mix with it 2 tablespoonfuls panada or fine breadcrumbs and the yolks of two eggoenough for 4 fowls' livers.

Talie $t$ rouncls of bread about $\frac{1}{2}$ in. thick and rather larger than the ortolan, make an incision all round the edge, leaving a narrow border, then fry these crountes to a light brown. Take them up and scoop out a hollow in the centre, which must be lined with a portion of the farce; place in each an ortolan and spread over a small lump of butter. Bake in the oven about 15 min . When ready, glaze them and dish, pouring over and round some rich brown sauce to which has been added a glass of madeira.

These birds are sometimes fried in a small amount of salad oil with a little chopped shallot, a rew chopped mushrooms, chopped truffle, chopped parsley, and a little grated nutmeg. Cook for 10 min ., then add a lump of glaze, 2 or 3 tablespoonfuls brown. sauce, and the juice of half a lemon. Divide the birds in cases or on croutes, pour over them the contents of the saucepan and place them in the oven for 10 imin . to brown. Then dish and serve them with rich brown gravy.

OSCILLATIONS. These are Ligh-tro quency alternating currents which flow round a circuit containing inductance and capacity, when the circuit is supplied with energy from some extemal source, such as a broadcast transmitter or other gencrator of high-frequency currents.
A wireless set may itself produce oscillations through the misuse of reaction. These oscil. lations if permitted to flow back into the acrial circuit may heterodyne the carrier wave of a broadcasting station and thus cause interference to nearby receivers. A condition govern-

Ing the issuo of a receiving licence is that reaction must not be used in this way. A wireless receiver having reaction on the acrial circuit should not be employed in an oscillating condition during broadcasting hours. When a set is oscillating the received broadcasting will be distorted, and if the tuning control is varied squeals will be heard in the loud speakei or telephones. This is an indication that the reaction contiol knob should be immediately readjusted so as to decrease the amount of reaction applied. See $\Lambda$ iternating Current: Heterodyno: High Frequency.

## OSIERS FOR BASKET MAKING

## Apparatus and Weaving Methods Fully Explained

This article may be described as a continuation of the one under the heading of Basket Making. Entries on other related handicrafts will be found throughout the work, examples being Canc: Raffia; Rush W'ork; Wicker Work. See also Linen Basket

In Great Britain there are about 40 varieties paring a path for the insertion ol rods ; a mau of the osicr used by the basket-maker. They (Fig. 6) for a hammer; a commander (Fig. 7 ) are grown in the low-lying land of the river for straightening stout rods Shears for cutting valleys. When cut the osiers are known as rods (Fig 8) are required, and 3 or 4 way cloaves and are sold as cither green, hrown, buff, or (Fig. 9) lor splitting. A shave (Fig. 10) is white. The freshly-out green are partially dried employed for trimming the split rods to form in stook in the field and are afterwards stacked skein, the latter being similar in appearance to in a shed or in the open and thatched until chair cene, and used for finishing handles, etc. quite dry, losing 50 jer cent. in weight 'The worker also needs a lead weight to keep Fully matured brown rods are used for the work on the lapboard, a yard measure,

D
 in position

Osier. Fig. 1. I'ypical rod lor baske! work. Fig. 2. Boarc for holding work and block which secures upright stakes
coarse basketry in making all kinds of hampers and fruit baskets. Buff rods are prepared by removing the bark from either green or brown rods after they have been boiled in water from 2 to 5 hours; they are then dried in the sun to intensify the colour.
White rods are prepared by removing the bark from green rods, either directly after cutting or after they have been kept during the summer stacked with the bottoms in running water. Pecling is effected by splitting the bark by pulling the rods betwcen a pair of upright iron rods, termed a break, and then removing the bark by hand.

A rod has 4 parts, as shown in Fig. 1: the butt A , the top B , the belly C , and the back D All rods are sorted into lengths; the ehort lengths of brown are called luke, the mediunn lengths long small, threepenny, and middleboro, and the long are great or rods. Buff and white rods in the small lengths are termed tack and small. Brown rods must be soaked from 2 to 7 dnys according to size before they can be used, buff and white rods from half to 4 hours, and allowed to mellow for several hours. The uprights or "sticks" used for bottoms are cut from osiers of 2 or 3 years' growth for large baskets. The radials in a round bottom or cover are also termed sticks.

Tools Required. The tools and apparatus used in working osiers comprise a lapboard and a screwblock (Fig. 2), the former for holding the work in progress and the latter for securing the upright stakes in square work. A shop knife (Fig. 3) is used for cutting the rods; a picking knife (Fig. 4) for trimming the short ends and bending; bodkins (Fig. 5) for pre.
a piece of sponge, and a grease-horn for use with the bodkin.

Methods of Weaving. Single weaving (Fig. 11) between stakes is done in square work by sly ping. (Fig. 12) or trimming the butts of upright sticks, and securing them in the screwblock. The rod is slightly bent as it is carried round each stick, and when the end uprights are negotiated, the rod is gradially


Tools used in working osiers. Figs. 3 and 4. Knives Yor cutting and trimming. Fig. 5. Bodkic. Fig. 6. Mzui. Fig. 7. Commauder. Fig. 8. Shears for cutting. Fig. 9. Cleave for splittine, Fig. 10. Shave for trimming split rods to form skein


Scallomed Work. This method (Fig. 17) is used in making a frame for a bottom or cover and also for staking some forms of basket. It consists of making a long cut at the butt end of a rod (Fig. 18) so that the rod may be turned round the frame and held in place by the next stake. It is useful in making light round and oval baskets and all kinds of covers where lightness and strength are required. The frame to which the scallom rod is attached is called a hoop. Any kind of shape can be made. Scallomed stakes are commonly used in the light and cheap hampers made with slewed weaving. This is because they can be inade in much less time.

Preparing Skein. Skein formed by the trimming of split osiers is used in covering handles and for filling up the sides of small baskets used for holding letters and for pienic, lunch, and linen baskets. The method of preparation is to take a long, straight, dry white rod and cut a few inches off the top Suitable cuts are made at the top, either 2 or 3 according
brought upright, passed round the stick and worked down on top of the others. Slewing, as it is usually called (Fig. 13) is a quick method of weaving, several rods being worked at the same time. It is employed for rough work, but is not so neat or strong as single or randed weaving. If, however, the rods are the same size, the weaving can be kept level. Byc-stakes are used mainly in round work, and consist of supplementary stakes inserted between the original stakes and held in place by the first rows of weaving, called the upsett.
Fitching (Fig. 14) is a method of working two rods alternately under and over each other, so as to hold a stake or bye-stake at each turn. It is useful for open work when it is not necessary to fill up the sides of a basket with weaving. It may be commenced with either the tops or butts, and in practice the rods are worked one after the other in the orles: shown. Cross fitching is done with clouble stakes in cases where the stakes are crossed, a common method of dealing with open-sided baskets. The foot of a basket is formed by driving short

Fig20.Rib Randing


Fig. 2l.Simple Border


Fig22. Triple Twist

stakes in the sides when the work is upside. down : the rods are laid down and worked in the same way as a border. Oval bottoms (Fig. 15) are formed by a slath (Fig. 16), and the sticks or radials separated by working a pair of rods together.
A pair of rods worked alternately over and under each other, the reverse of a litch, is called a pair. This method is used in forming round bottoms and also in adding a second round of weaving on top of a fitch.
licking is the operation of cutting off the projecting ends of rods which are left after the weaving is completed. The edge of the knife must be very sharp, and care must be taken at first to avoid cutting the woven rods. Sufficient material should be left to prevent the end working out past the stake. Pricking up the stakes to bring them to an upright position ready for weaving the upright sides is cffected by the point of the shop knife. This operation prevents the bark or skin from breaking, but this is effective only if the rod bas been properly soaked and allowed to become mellow.



Fig. 26


Oder. Fig. 19. Alternative to plaiting. Fig. 20. Efeotive close weaving. Fig. 21. Mothod of woshing a border. Fig. 82. 8trengthening atakes for a border. Fige. 28 -27. Progressive stages in the maling of an upright plati. Details are given in the text
means of the bodkin. In the sides of square bottoms the outside sticks in the bottom must be pierced lyy the bodkin and the pointed stake driven in alter being dipped in water.

In driving a stake home, it should he grasped firmly in the left hand a few inches above where it cuters the weaving, and the right hand should he slid down the rod on to the left. A fair amount of force should be used, especially when the stake is nearly far enough in. An odd number of stakes is necessiny in slewed quired in randed work. After the stalies have heen pricked up, the tope should be gat hered together and held with. in a honp. In siding up or weaving, the stakes muat lie kept upright and parallel with each other when working straight sides, and when doing work where the sides are splayed outward or worked inward the spacing should be quite even. It is important that the rods used in siding up should be worked to the statics by pressure of the left thumb. As it is essential to the appeasance of the resulting work that the stakes should be even, the latter should be held in the right hand while the left hand shapes the weaving. Horein lies the whole art of basketwork.

Tracking. This is a methorl of finishing covers. and is an alternative to a plait. The method is as follows (Fig. 19) : Place the lirst rod hehind the second and leave it in front of the third. The second should be placed behind the third and left in front of the fourth. Pace an extra rod in front of the first, place the two in front of the third, behind the fourth, and leave in front of the lifth. Noxt place the third alongside these two, add a second rod in front of the second. and place them beoth in front of the fourth, hehind the fifth and in front of the sixth, with the fourth alongside. Continue with the lirst two of the threc (the remaining one, the lirst commenced with having done its work), place in front of the lifth, hehind the sixth and in front of the seventh. To continue, place the fifth alongside, dropping the outside of the thice at each atroke, and when the round is complete work each onc of the rods thmugh to its proper place.
l'jpett is the commencement of the weaving in all except the coarsest work and comprises two, three, or more rods worked alternately on the upright stakes to secure them firmly in position. Wale is the name given to the stroke used in upsetting and other parts of weaving, and formed by working two or more rods alternatcly, one by one, in front of two or more stakes, and then behind one. Wenving is effected in osiers hy coarse randing for heavy work with stakes $2!$ in. apart, slight randing with stakes 2 in . apart, light randing with stakes $I_{2}$ in. apart, and fine or close randing with stakes about 1 in . to $1 / \mathrm{in}$. apart, the work heing driven in close with the iron. Rib. randing (Fig, 20) is an effective method of siding up, and consists of working each rod altermately in front of two and hehind one for two strokes before being worked out in simple randing.

Borders. Simple borders are worked as at Fig. 21, but the stakes may be strengthened beforehand by working the triple twist shown at Fig. 2:). This form of stroke may take the

place of fitching where extra fyll. ness is desired. forming a linish. ing border is the plait. of which there are two forms, upright and llat. The upright plait is made by hendingdowneach upright stake, or spolic, in turn, and placing each one behind the next one on the right Fig. 23. When the last atatic is reached it will have to he thrcaded under the first one that has been turned down. A as at Fig. 24. Each stake is now taken in


Osier. Firg. 28-32. Stares in weaving a fat plait, used for arms and backs of chairs, etc.
turn and placed under the next on the right and made to stand vertically alongside the mecond stake, the last one being threaded through, as at Fig. 25. Each stake is now threaded to the front, lrehind the stake next but one to it, as at Fig. 26, and then each stake in turn is crossed over, the two stakice lying together and passed to the inside, as at Fig. 27. Any surplas ends left on the inside of the basket should be cut off.

The Flat Plait. This plait, used for tinish. ing trays, arms and backs of chairs and other pieces of basketwork is more difficult to make than the upright form, but if it is followed out with actual material, the following instructions, with the accompanying illustrations, will simplify the work. On the surface the finished plait appears continuous.

Commence by turning down three stakes as shown at A, B, and C at lrig. 28. The stake at $A$ is curvel round to the right, passed over 13 and $C$ and placed in front of 1 ), which is now turned down over it and the end left in front as shown at Fig. 2!). The stake at 13 is now picked up and carried in front of the nest two and the first upright of those standing is turned over on it as at E . The same method is followed with C , but, before the upright at $F^{\prime}$ is brought down over it, the stake A, which was left on the inside, is brought across C, and then F, as shown at Fig. 30, is brought down heaide it and the two are treated as one stake. At this stage of the
work there are three mods outsidc, one
heing a douhle stake, and two rods inside. The first of the three is taken round the first upright stake to the inside, crossed with the first of the two to the outside and then the upright stake is drawn down. This method is continued, remembering to draw down the upright stake at every conss of the osier. When the double mods are reached they should be treated as one, both inaide and outside. When the triple rods are reached, the two Innger or outside ones are used, the shortest one being dropped and cut off at the finish. When the last upright atake has been turned down, there will he three triple rods outside and two douhle rods inside the basket. The method a- fiar as this is illustrated at Fig. 31 .
The lirst two long rods on the ontside should he passed under the lirst statie $A$, which was turned down. leaving the short one as usual to be cut off at the finish. The next tivo long mols are passed over the first atake $A$, and under $B$, the sccond that was turned down. The remaining two long rods are passed over the first two, $A$ and $B$, and carried under the third, $C$ : this gives five double rods on the inside of the basket. Each two in turn should now be threaded to the outside under each single stake, as shown at Fig. 32, until all the live pairs are threaded to the outside. There are now five double rods on the outaide, and the longer of the two is threaded from the underside, through the first single stake. Follow to the inside of the basket, and out again to make it double, like the rest of the plait. A bodkin will be weeded to lift the stakes in order to make room for the last five single rods.

OSMANTHUS. This is the name of a hardy evergreen shrub. The nost useful onriety is the Japanese Osmanthus aquifolium, which has holly-like lenves, small white fragrant flowers in winter, and grows 4-5 ft. high. l'ent and loam should the added to the soil before planting. Iropugation is by cuttings in a frame in August

OSPREY. Osprey, aigrette, and egret ale terms used to denote the decorative tufted head plumes of the egret, or smaller white heron. Osprey is the trade name for the egret, but the real osprey is a bird of another species known also ns the lishing hawk. See Aigrette.

OSTRICH FERN. This is the popular name of Onoclea sensibilis, a handsome North American hardy fern, 18-24 in. high. It Hourishes in deep, moist soil in a shady place. Like the Royal fern it bears sjores on special fronds, not, ns in most ferns, on the backs of the ordinary fronds. Onoclen (struthiopteris) germanica is another striking species. See Royal Fern.
OSWEGO TEA. This is another name for bergamot, betanioally Monarda didyma, which heals various other popular names, including hice balm and horsenint. It is a hardy perennial, with sage-scented leaves and bright scarlet Howers in summer. See Berganot.

OTTO CYCLE. This is the cycle of operations by whioh many types of internal combustion engines function. The cycle is made up of four strokes: induction, the fresh gases are drawn into the cylinder; compression, the gases are compressed: explosion, the gases are fired (power stroke); and exhanst, the exploded gasas are expelled. See Intermal Combustion Enginc.

OTTOMAN. A stuffed sent without a back, the ottoman is not often seen except in the form of a floor poufie or box ottoman, its place having been taken by the divan. The Victorian types of ottoman are sometimes divided in the centre with a long padded roll about 12 in. in diameter; others have a centre rail, with a padded top. See Box Ottoman; Divan; Poufle; Victorinn Style.

OTTO OF ROSES. Known also as attar or ottar of roses, this perfume is obtained from an oil distilled from rose petals, damask and musk roses being the kinds generally used. Because of the large quantities of petals needed in its manufacture, otto of roses is comparatively costly. What remains after distillation is made into rose water. See Rose Water; Scent.

OUNCE. This measure of weight is in constant use when buying meat, groceries, etc. ; 16 oz . go to the pound avoirdupois and 12 oz to the pound troy. The ounce avoirdupois contains $437 \frac{1}{2}$ grains and the troy 480.
In the ordinary way the ounce is divided into 16 drams, but apothecaries divide it into 8. They usc it for measuring medicines, when one tablespoonful is equal to $\frac{1}{2}$ fluid ounce, as the apothecaries call it. A dessert. spoonful equals $\frac{1}{4}$ fluid ounce, and a teaspoonful $\frac{1}{8}$ fluid ounce. The usual abbreviation for ounce is oz., which is used throughout this work. See Avoirdupois; Troy.

OUTHOUSE. An outhouse is a small shed or building, remote from the dwelling. Most houscholders at some time or other feel the need for a small outhouse, for storing garden tools, minor crops such as apples, potatoes, and the like. Some small buildings are obtainable commercially in the form of sections ready built up, so that the householder can erect them by simply bolting the sections together.

Examples of this class are available in timber, others clotherl with asbestos cement sheets, and in a number of combinations of both methods, varieties being covered with galvanized iron and roofed with the same material, with tarred felt, bituminous sheeting, or otlier proprietary material.

By-laws. An important point before ordering or arranging for the building of an outhouse is to ascertain the requirements of the building by-laws, as there are sometimes certain restrictions to be observed and certain formalities to be gone tbrough, these varying considerably with the particular district.

It is well to bear in mind that to be a tenant's fixture it is generally understood that the building is of a portable nature, resting upon the ground or upon some brick or cement footings, and not a permanent building. See Fixtures; Shed; Workshop.

OVEN. Whereas must of the operations performed in cookery, such as boiling, frying, and stewing can usually be carried out upon an open fire grate, a small oil or spirit atove, or gas ring, those for which an oven is used cannot be mannged at all without the oven.

Nothing can be more aggravating than an ineffective or inefficient oven, and more failures occur in cooking through the use of an underheated or overheated oven than from any other cause. The article on Baking may be consulted by the housewife. Particulars about ovens in connexion with gas, electric and oil cookers are given in the article on Cookers, while further information about ovens is in the entry on Range. See Anthracite; Baking; Cooker; Dutch Oven; Grate; Hot Water Supply; Range; Stove.

OVERALL. This is a garment which is worn by large numbers of men and women as a means of protecting their clothes while at work. Workers in shops, factories and offices, doctors, artists, sculptors, nurses, and the woman at home, all find it equally valuable, while it is also a useful garment for children to wear while at play.

OVERCAST'ING. This is the name applied to a stitch that is largely used in dressmaking for finishing the raw edges of seams, to prevent the threads from ravelling or fraying. As a rule, the stiteh is worked along each edge of the seam separately, though in some cases it is worked over the two edges
at once; but here it shou!d be noted that for the latter method the scam must be well pressed beforehand, as no thorough pressing can be done after the stitch is taken over both edges. The stitch should be worked with cotton or sylko, according to the nature of the fabric.

To work it, secure the end of the cotton in the matcrial at the left-hand end of the seam with one or two back-stitches, and push the needle through the material towards you, a few threads telow the edge; draw through. and again push through from back to front a little further along towards the right. Repent until the seam is done, and lightly press to take out any puckered effect. Do not draw the cotton tightly when making the stitches, or a puckered effect is bound to ensur, and to get a neat effect make the stitches all of the samo size and to slant at the same angle.

When oversewing a curved seam, in order to prevent any dragging, lirst snip the seam edges at intervals with the sci sors, and round off thic corners caused by the snipping. See Scam.

## OVERDRAFT. This is a banker's term

 for a loan made to a customer on a current account. When by chance or design $a$ customer has drawn out from the bank more than he has put therein, an overdraft results. Overdrafts can be obtained by customers from their banks, provided the security offered is regarded as adequate. See Banking.OVERFLOW PIPE. Any pipe that is connected to the water system for the purnose of discharging an abnormal rise in the height of the normal water leved is an overflow pipe. Generally, in the home, such a pipe is con nected to the hot or cold water tanks to avoid the flooding of the premises. In the case of the ordinary cold water tank or cistern, such an overtlow pije should be as large in diameter as the supply pipe. It should have a regular gentle fall from the point where it leaves the cistern to the point of dischurge, which should be over a gutter or in some place where the water can get away without running or splashing on to the buiiding.

It is advisable that the overflow pipe be visible, so that should the water be wasting, its loss will speedily be made apparent, and the cause can be remerlied. Generally, an overHow will be due to the failure of the ball valve In a hot-water tank, the overfow pipc is generally arranged in such a manner that it acts as an expansion pipe. It relieves the tank of all pressure due to the generation of steam or the expansion of the water, and acts as an overflow should the cistern flood.

Such an overllow pipe is usually set in a vertical position and terminates in an elbow or bend at water level. This is because the water as it heats will risc, and a certain amount of such expansion is not detrimental to the system ; it is only when the expansion is above the level of the water supply that it should be possible for it to drain away. The


Overfow Pipe, showing how the pine should slope gradually from the cistern to the outfall
up with leaves. It should be regularly examined nand any obstructions remored
Overtlow pipes generally take the form of a short pipe passing through the wall and mercly projecting into the air. This arrangement is usually satisfactory, as it is seldom, if ever. that the water ovcrllows through it. They arc provided as a safety device The materials for such pipes may be lead. wrought iron, galvanized iron, brass or copper Of these, galvanized iron or galvanized steel is the most durable. See Plumbing: Tap: Water Supply

OVERMANTEL. This, as the name suggests, is a fixture over the mantelpicce. Such fixtures are made chiefly of wood, which may be oak, walnut, maliogany. or enamelled or painted deal. They are made in a great variety of styles, with inset mirrors which may be square round or oval. Unless the overmantel forms an integral part of the chimney piece, it is often the better plan to remove it and to use a panel of embroidery, a flower or landscape painting, a mirror or merely a good ornament on the mante!shelf, according to the typc of fireplace and style of the room. See Chimney Piece; Dining Room Drawing Room; Fireplace; Mirror.

OVOLO PLANE. This is a specially shaped plane, which is used for working an ovolo noulding on wood. The usual form is made in beech, and the sole shaped to a reverse of the shape of the moulding which


Ovolo Plane. A common type of the tool in use
the plane will produce. The plane iron is similar to other plane irons, but is shaped on the cutting edge to correspond with that of the ovolo moulding. In use the plane is traversed along the woorl in the same way as a jack plane, but should be guided on the wood either by a fence or temporary strip tacked to it, or by careful manipulation of the plane. esprecially when commencing operations. If this is not done the shape of the moulding will vary in respect to the edge of the work.
In sharpening such a plane iron, it will be necessary to use an oilstone slip, of a shape and size to suit the curvature of the plane iron, employing this as though it were a file, to work up a keen cutting edge. The care is similar to that of other wooden planes. See Plane

OXALIC ACDD : Poisoning By, Because of its resemblance to Epsom salts, oxalic acid, which is popularly known as salts of sorrel, or lemon, and acid of sugar, may be taken accidentally. When strong oxalic is swallowed violent inliammation of the stomach and intestines immediately follows. Follow. ing on an intensely sour taste, a burning pain is felt in the throat and stomach; vomiting occurs, and often the vomit contains blood. Collapse suon ensues from the severe pain, and this may pass into stupor, and death may spoedily take place.

Treatinent must be very prompt to give any chance of life While awaiting the doctor, if vomiting has not occurred, give an emetic of a tablespoonful of inustard in $\frac{1}{2}$ pint of tepid water, but only if dihite acid has been taken. As an antidote, give chalk, or 2 tablespoonfuls of inagnesia mixed with water. Bicarbonate of soda or potash, or aminonia, should not be given, as these form soluble
compounds with the poison. Put the patient on a couch, cover him warmly and surround his body with 5 or 8 hot-water bottles.

OXALIS. Of these low-growing plants, some of them aro hardy, while others are suitable only for cultivation in the greenhouse. Of the former a charming kind is the unod sorrel (Oxalis acetosella), which grows wild in Britain and is suitable for shady places in the rock garden ; it bears white flowers in spring, and is sometimes sold as shamrock. The two best hardy kinds for the rock garden arc adenophylla, pink, and enneaphylla. white : they like partial shade and a compost of peat and sandy loam. A familiar plant in many gardens is the bronze-leaved yellowHowered Oxalis corniculata rubra, which spreads rapidly and soon becomes a wecd. The rose coloured floribunda is a beautiful piant to grow in pots under giass.

OX CHEEK : How to Cook. Ox cheek makes a substantial and appetizing dish if baked, or it cani be made into $a$ very good soup or stew. The cheek should come ready cleaned from the butcher, but requires soak:ing and well washing before any attempt is made to cook it.

After it is thoroughly clean, place it in a arge saucepan and cover it with warm water, add a teaspoonful of salt, and boil it up. As the scum rises take it off, and, when clear, let it simmer for an hour. Lift it out of the pan. let it cool a little and then bone it carefully. This must be accomplished with a sharp crook's knife to avoid ragyed appearance.

While the cheek is boiling a good stuffing must be made. Spread it in the boned ox cheek, roll it up and tie ur skewer it securely in an oblong shapc. Bake in a moderate oven for $1 \frac{1}{2}$ hours, basting frequently, and serve with a good, thick brown gravy.

To make soup, prepare ox cheek as for baking, and place it in a pan with enough cold water to cover it well, and $\frac{1}{2}$ oz. salt. When it boils, skim it and add 2 onions, 2 carrots, 1 turnip, and $\frac{1}{2}$ head of celery. All vegetables must be prepared and cut up Add a bouquet garni. Let the cheek simmer $2 \frac{1}{2}$ hours, then lift it out and remove the meat from the bones. Strain the stock, clear it of fat, and thicken it with brown roux. Cut the meat into squares, boil it up in the soup, and pour into the tureen. The bones will make $\Omega$ good addition to the stock-pot. See Becf.

OX-EYE DAISY. This is the common name of Chrysanthemum leucanthemum a familiar wild Hower of Britain May Queen is a splendid variety for the garden. The Shasta daisy or hardy marguerite (Chrysanthemunı maximum) is a vigorous hardy border plant, 2-3 ft. high, bearing large, white, longstemmed flowers in summer. Particularly fine varieties are Mayfield Giant and Rentpayer. Buphthalmum salicifolium, another ox-eye, bears large hright yellow flowers in late summer; it grows 2 ft high. Propagation is by division in nutumn.

OXFORD FRAME. A characteristic of the Uxford picture frame ls the arrangement of the corners, which crons or overlap, and are not mitred in the usual way. The frame may be made in any wood, but one of the hardwonds, such as oak, is perhaps the most appropriate. The frame may be plain or have chamfered edges. . See Picture.

OXFORD SHIRTING. The most usual pattern of Oxford shirting is a neat check in blue and white or red and whito. It is rather warmer and thicker than ordinary calico, and hence specially suitable for winter wear There are imitation Oxford shirtings with a printed instead of a woven coloured pattern. In the real article the pattern is the same back and front.

OX GALL. Purified ox bile is sometimes used in medicine. chiefly as a laxative. It
stimulates the action of the liver and emulsifies
fats. It also acts as an antiseptic. The dose is $\overline{5}$ to $\mathbf{7 5} \mathrm{gr}$ of fresh ox bile, which may be taken as a bolus, wrapped up in wafer paper, or in capsules

## Oxidation. See Rust: Verdigris.

OXDDIZING: Of Metals. Oxidizing is a term given to the coloration of metal objects by changing the surface to a brown-bronze or black tint by a chemical or electro-chemical process. As every metal is attacked by chemicals in varying degrecs and with various results, it is best to treat each separately. In general there are three methods, chemical, electro-deposition, and heat treatments, which latter may or may not introduce chemical changes in the surface.

The amateur can electro-plate on hase metals some of the finer metals, such na copper, silver, nickel, brass or gold, with a view to applying an oxidizing process. Among these preparatory processes brassing may be mentioned, silver, nickel and copper plating being reforred to under the heading of electroplating (q.v.). It is usual to adopt a brass coating on the baser metals, iron, zinc, whitemetal alloys, etc. The finishing coat for oxidizing may bo applied as in the case of a solid brass. The electro.deposit should be thick enough to withstand the penetration of the chemicals used in colouring.

31 ost of the chemicals employed are highly poisnnous, and the yrealest care should be taken in handlin! them and in disposing of the spent solutions so that no ilanger to animale or liuman beings is incurred.
The brass plating bath may be made of 1 oz . each of zinc and copper sulphate, 2 oz . of carbonate of potash, and 3 oz . of cyanide of potassium. The first two are dissolved in hot water, the potassium carbonate separately. and added a little at a time. The cyanide is made up into a 25 per cent solution and mixel with the others, stirring the bath all the while, the final result being a muddy yellow liquid of about $2!$ pints in bulk.

The solution is boiled for about half an hour, filtered, and watered out to 23 pints. The intensity of the current largely controls the depositing. If the coating is too white, denoting the zino, a reduction of the current will deposit more copper. Brass may be used


Ox-eye Dass. Larke white blooms of an easily growa plant
for the anode, but separate strips of copper and zinc are perhaps better. It is best to deposit mainly copper towards the end of the process. For coppering only, the solution is the same except for the zinc sulphate, and $n$ copper anode would obviously be employed. The processes involving electro-deposition require clectrical power of low voltage and comparatively large amperage. The article on Electro-plating should be consulted for further details

Treatment of Silver. Silver oxidizing is a proccss with quite a misleading name, as silver oxide is not formed, and is not a part of the colouring film. Sulphur is the chiof agent. For oxidizing silver or silver plated artioles from light golden to brownish black, a hot solution of barium sulphide, I oz. to the gallon of water, is often employed. The work, if not just emerging from a plating process, must be cleaned in a hot potash solution, rinsed, and given an acid dip, swilling afterwards in a large body of water, and then passed through a cyanide dip, rinsed in hot water, and driel. For producing a matt surface, the acid dip is composed of sulphuric acid, 1 part; nitric acid, 2 parts : sodium chloride (common salt) and zinc sulphate, each.ahout one-tenth of an ounce to the pint.

When in the oxidizing solution the silver work is shaken about until the desired blueblack density is obtained. It is a fterwards rinsed in boiling water. Oxidized silver work can be locally lightened as desired. Brushing with bristle brushes and pumice powder will give a grey colour, and the original silver may be exposed where necessary for artistic effect by rubbing in the pumice pow ler vith the fingers. Varnishing may be accomplished with a colourless varnish of the nitro-cellulose type, or one of the proprietary brands of lacquer may be used.

Another oxidizing formula is $\frac{3}{} \mathbf{o z}$. of potassium sulphide and 1 oz . of ammonium carbonate to the quart. The solutions are mixed separately and worked hot. This conting is quite robust, and ivill stand the scratch brushing process employed in ordinary plating. The work only requires immersing for a short period. To produce a matt, or dead surface, the article should be dipped in a sulphate of copper bath, after electro-plating with silver in the ordinary way. A insted white results, and the whole or portions of the work may be treated to obtain the desired effect

The paste method involves a mixture of plumbago (black lead) and turpentine with n little red ochre or muge. It is spread over the work and allowed to dry. The parts in relief in the artiole are then rubbed with a chamois leather or soft rag dipped in methyInted spirit. This is only applicable to engraved, moulded, or chased articles, and, with such, gives the old silver effect. The work can be cleaned off in n caustic potash or cyanide bath. Sulphuring silver gives a blued stecl colour. The work is subjected to the action of sulphur fumes in a tin box with a tray to hold red hot charcoal or cinders. lowdered su/phur is spread over the cinders and the lid closed with the work suspended in the fumcs. The work must be quitc clean both chemically and mechanically

Oxidizing Copper. For copper a solution of amenonium sulphide, $\frac{1}{}$ to 1 oz to the quart of water, is used. The depth of tone, light brown to black, depends on the time of immersion, and the temperature of the bath, and the colour is more completely controlled if the bath is not hot. The work can be lightly scratch-brushed and rinsed. The uniformity of colour, independently of the cleanliness of the work, depends on the purity of the copper; therefore, it is better with objects that have been coppered by electrodeposition. In any case, a copper artiole might be passed through a copper plating
bath as a proliminary, to improve the surface for oxidizing.
Potassium sulphide, $\ddagger$ oz to the quart of water, with a few drops of ammonia, provides a brown tone imitating Japanese bronze work. The solution is used warm. Copper nitrate, 8 oz . to the pint of water, gives a deep black tonc. It is used warm and the work should be immersed several times, allowing it to dry between the dippings. Brass oxidizing is more difficult to control and to predetermine in the matter of colour, because of the varying characteristics of the alloy. Such work is often plated with copper first.

Iron and Steel. In iron and steel oxidizing, brown colours may be obtained by covering the work with a paste of antimony chloride and olive oil in equal parts and heating it slightly for 12 hours. The paste is rubbed off with a suft cloth and finished with a wased brush. The work requires a preliminary cleaning in a picklo of nitric acid. A black colour may be obtained on iron or steel by an inımersion in a hot solution of sodium thiosulphate, $\frac{1}{2}$ oz. to the pint, and greys in $a$ hot pickle made by diluting a mixture of 2 oz of arsenious oxide in strong hydrochloric acid in onc gallon of water. The heat treatment of iron and steel by the BuwerBarff process provides a protective coating of black oxide of iron, $\mathrm{Fc}_{3} \mathrm{O}_{4}$ and involves heating the work to redness in superheated steain.
Perfect cleanliness is absolutely necessary in the colouring of metals by any of the processes described, and it must be remem. bered that acids do not remove grease, and contact with oily or naturally greasy fingers should be a voided. If ostensibly clean objects are handled promiscuously before oxidizing they aro likely to show marks where the oxidizing reactions have been prevented by the finger marks. The use of rubber fingerstalls or gloves is to be recommended in all operations where they can be employed. P'ermanent results are also often dependent on the final lacquering, many suitable coloured and colourless varnishes lring obtainable. ree Bronzing; Electıo plating; Putina.
Oz-lip. This is the popular name of Primula elatigr see Primula.
OX-TAIL SOUP: Cut into juints 2 ox tails, dividing the pieces in as uniform a size as possiblc, and soak them for an hour in cold water, adding $\frac{1}{2} \mathrm{oz}$ salt to 3 pints of water Remove the pieces and wipe them Iry; then fry them in 2 oz. butter or good clarified dripping until of a rich brown colour. Put them into a stewpan with 2 quarts stock, 1 good-sized onion stuffed with 2 cloves, 1 carrot, 3 sticks of celery, or celery seed if the fresh vegetable is not available, and a bouquet garni. Let all boil up. skim and simmer for 3 hours or until the neat is tencler.

Remore the pieces of tail and thicken the liquor after carefully clearing it of fat. The thickening should be made by frying 2 oz . Hour in 1 oz. butter and then thinning it down to a liquid with a little stock. Add by degrees to the soup and boil for a few minutes. Meanwhile boil in clear stock or water a medium-sized carrot, turnip, and onion, prepared and cut in julienne shape. Strain when cooked. Put the pieces of tail into a $t$ ureen and strain the soup, boiling, over them, then add the shredded vegetables. Give the soup a stir and serve hot. Keep the tails hot while thickening the soup. See Carserole.

OX TONGUE. In town an ox tongue can always be procured ready pickled from the butcher, and all that remains to be done is to soak it, thoroughly wash it, and boil it, putting it into cold water and letting it come very slowly to the boil. After it has been skimmed it should simmer $3 \frac{1}{2}$ to 4 hours, according to size, and be allowed to go cold in the water in which it has boiled. Take it up,
remove the white skin and trim the ront. The tongue may then be skewered into shape on a dish, with a rolling-pin unclerneath to support it. When cold, remove rolling-pin and pour liquid glaze over to coat the tongue. Or it may be pressed into a round mould or cake-tin and covered with a plate, and a weight on top. and left till colrl.
A fresh tongue, one that has not been nickled, is sometimes prepared and cooked, but before boiling it blanch it in order to remove the whitc skin. The root must be well trimmed. and it is better to soak the tongue before blanching it Serve hot with a piquant


Ox'Tongue, shaped and pressed, a delicious cold dish tor breaklast of supper
sauce. When boiling a fresh tonguc use stock instead of water, and add soup vegetables to Havour it. See Glaze.
OXYGEN. About one-fifth of the atino. sphere consists of oxygen, which is a colourless, tasteless gas. By the act of breathing, oxygen in the air is drawn into the lungs, and becomes absorbed by the blood, which gives out, in exchange, carbonic acid gas.

Oxygen is also necessary to com bustion. The air in a closed room becomes used up by breath. ing and by using coal gas or candles for lighting, its place being taken by carbonic acid. This carbonic acid if it accumulates beyond a certain quantity makes the air unfit for people to breathe. That is why it is 80 ) necessary to have a room well ventilated. An open fireplace is of greal assistance in this; fresh air should, be admitted by the windows.

Oxygen is sometimes inhaled by perple who suffer from illnesses which cause difficulty in breathing, e.g. pneumonia, and for this purpose it is stored in cylinders, obtained through a chemist. See Ozone ; Ventilation.

OXYMELS. An old-fashioned yet valuable remedy for cold and sore throat is made of vinegar and honey, and is known as oxymel. Mix together 2 oz . of vinegar and 2 o7. of water and add to 1 lb . of honey. Stir well together, and put in a jar, which should be kept covered. Give as a dose a teaspoonful three or four times a day.

13y mixing squill vinegar with the honey, oxyinel of squill is formed. It is obtained made up from a chemist's. This is used as an expectorant, the dose for an adult being $\frac{1}{2}$ to 1 dram. It is a favourite remedy in the bronchial troubles of children. A child of six would be given a fourth of a teaspoonful of it in water every threc or four hours.

OXYTROPIS. This perennial plant, 12 in or so high, is popularly known as milk vetch. It bears small, pea-shaped Howers in summer. They need a warm, sunny place and light soil. Ochrolcuca, yellow; Lambertii, carminc-rose, are two of the best.

OYSTER. Although oysters do not suit everyone, they are to most jeople very digestible when eaten raw. Conking makes them hard and tough, and they are not recommended in this state to peiple whose digestion is weak. The composition of the oyster is as follows: Water, 88 per cent; protein, $i$ per cent : and carbohydrate, 3 or 4 per cent. It will be remensbered that they are out of season during the four months of the
year whose names do not contain an " $\mid$ " in
It is not advisable to and Angust.
It is not advisable to drink spirits with oysters, as this may retard digestion. If from any cause troublesome symptoms should arise after eating oysters, a glass of milk frequently gives relief. Unopened oysters improve if kept some days and fed with oatmeal whieh fattens them and makes them more luscious The sunall native oyster is considered best for taking raw, but the large sorts can be used for soups and stews

To prepare oysters to be eaten raw, first scrub the shells. Hold the oyster in a thickly folded cloth in the palm of the left hand, with the hollowed shell downwards to hold the liquor. Work all oyster-knife, or a sharp tinopener, between the two shells with a sec-saw action till enough of the knife is inserted to force them apart. Renure all bits of shell. Serve the oysters in the deep halves of their shells, standing on ice if pussible. Lemon cayenne, and thin brow'n bread-and-butter should always be served. Grated horseradish Tabasco saucc, and celery (when in season) are also liked by some people. Raw oysters may be served as cocktails ( $q . v$ )

Cooking Oysters. In cookery thie oyster is used for small savoury dishes stufting, and sauce. It is sometimes bearded, blanched and added with the strained liquor to a steak-pie or pudding. It is also fried in a light fritter batter, after coating with egg and brcad crumbs.

Oyster Aigrette. This dish can be made by putting $\frac{1}{2}$ pint water and 1 oz . butter in a pan over the fire, and when they boil adding to thein 4 oz. sieved Vienna Hour. Take the pan from the fire, beat its contents until they are smooth, and then cook them over gentle heat until the panada leaves the sides of the pan. Let the mixture cool a little, then beat in separately 2 eggs and an extra yolk, and add 3 oz . grated Parmesan cheese and season. ing to taste. Turn the whole on to a plate where it may cool; then beard a dozen oysters and season them with cayenne and lemon juice.

Have ready a deep pan of smoking hot fat, and into it dip a dessertspoon. Then half fill the latter with some of the cheese mixture, make a hollow in the centre, and in it lay an oyster, covering it up with a little more of the inisture. Drop the aigrette from the spoon into the pan ; prejare 11 more in the same way, and fry them slowly for about 5 min . After clraining, serve them with thin rolled brown bread and butter, cayenne and lemon.

Oyster Forcemeat. Oyster forcemeat is used for stufting boiled or roast turkey. To make it, beard 18 oysters and cut them into quarters, then mix them with $\frac{1}{\frac{1}{2}}$ pint breaderumbs, $\frac{1}{2}$ teaspoonful dried mixed herbs, 1 oz. finely chopped suet, and seasoning to taste. Bind the mixture with a beaten egg, adding more beaten egg or a little milk if necessary.
Oyster Fricassés. A nice Iricassée of oysters can be made by boiling up a dozen oysters in their liquor, straining them, and then reserving the liquor. Melt I oz. butter in a small pan, stir in the same quantity of flour, and then add the oyster liquor by degrees, stirring the whole until it boils. Continue cooking for a few minutes, then move the pan to the side of the fire and add the yolks of 2 eggs, the oysters, a squeeze of lemon juice, and seasoning to taste. Dry toast should be served with this dish, which is suitable for invalids.

Oyster Patty. The cases are prepared first for oyster patties. Take $\frac{1}{1} \mathrm{lb}$. hest puff paste for these and roll it out abont $\frac{1}{6}$ in. thick or rather more. It is impossible to give the exact depth as so much depends on the pastry maker and the size required. Cut out 10 or 12 rounds of paste with a small round cutter. Mark out a smaller round in the centre, using another
cutter not quite so large, hut do not cut right through.

Cook till the pastry is quite done and a fine brown Now lift the cases on to a wire tray, remove the small centre round, scoop out any uncooked paste and lay aside ready for the filling.

Blanch 2 dozen oysters for a fow minutes, drain and beard them, and cut each in two. Now mix them with a rich white sauce, add a wineglassful of white winc and some of the oyster liquor. Fill the cases, cover with the lids, and re-heat or serve cold. An average size fur the case is $2 \frac{1}{2}$ to 3 in . arross.

Oyster Sauce. Blanch 18 oyaters in their own liquor, adding a glass of white wine : beard them, and clarify and anve the liquor. l'ut into s saucepan 2 oz butter and, when melted, cook in it for 4 min ., without hmonn. ing, the sume amount of flour. Add ly degrecs I pint warm milk or white atock and simmer till all is cooked and quite smooth Add scasoning, a little grated inutmeg, the oyster liquor, 1 teaspoonful lemon juice, also the oysters. Heat up before serving See Patty : Soufflé.

OYSTER GRAIN. This term is used by furniture collectors and others. It refers to veneered pieces of walnut which, owing to the appearance and direction of the grain, resemble tho insides of ovster shells. It is frequently found on Queen Anne furniture See Qucen Anne Style.

OYSTER SHELL. When hented until they crumble, or when ground, oyster shells make a useful addition to potting composts These shells can also he put to good use in a fowl-run if they are first crushed to a fine powder. In this form they supply hens with the necessary amount of lime to ensure the laying of hardshelled eggs.

OYSTER SHELL SCALE. Various fruit trees are attacked by this scale insect. The Ministry of Agriculture suggests the following methods of dealing with the pest.
The oyster shell scale is much reduced in numbers hy the attacks of its natural enemies. One valuable enemy is a jet-black ladyhird with two red spots on its wing cases. When husing young stock all trees hearing scales or showing the characteristio little white scars should be rejected, unless the seller can guarantec that the stock has been fumigated with hydrocyanio acid gas or otherwise cleared of scales. The scale insects can he killed by thoroughly washing the treas in winter with lime-sulphur.

OZONE. When clectic currents are passed through oxygen, as in worling an electrical machine, a peculiar odour hecomea noticcable. This is due to the formation of ozone, which is n form of oxygen. It exists in the air hut in populous neighbourhoods hecomes used up by combining with earhon particles in the air. It is ahundant in the air at the seaside and up mountains. It is a powerful oxidizing agent, and in virtue of this property is employed as a disinfectant. An excess of ozone may produce headache, cough, etc. See Oxyゥe"

PACK. In the medical sense a pack is a covering in which the palient's hody is swathed. A hot pack is used to promote perspiration in disorders of the kidneys and other complaints ; and a cold pack for reducing the temperature in high fevers. See Cold Pack; Hot Pack.
PACKING. In packing clothes, the first thing to decide is the number and kind of boxes required, which will vary according to the conteinplated length of ahsence from home, the number of persons travelling, and the nature of the wardrohe that it will he necessary
to take. The expanding type of suitcase often is suflicient for the short holiday; or another convenient form of luggage is a verv light suitcase, with a stronger onc for heavier articles
To pack, place the suitcases on stands or on a bed, when care should be taken to spread something over the coverlet first. Into one of the cascs should be put, well wrapped up, boots and shoes Books, woollengarments, stockings, coldar hox, and any hard or heavy articles are wedged in as flat as possible, so that at the top there is room to lay lieavy ouler sports clothes and rolled-up felt, wollen or clath hats or caps.
In the other suitcase a woman would put light underwear, night wear and dressing. gown, laid flat het ween lavers of tissue-japer ; then a light coat, frocks or suits, with n good roll of tissuc-paper wherever they are folded

## Paching Men's Clothes

A man might pack the second suitcase in this way: 'To ohtain full advantage of the Hat surface, hegin with evening clathes folded according to the length of the case, with a layer of soft papier at each fold. Then, sandwiched between pyjamas and light underwear, come the shirts. Evening shirts slonuld be reversed the was of the launilry, folding them so that the fronts are inside and thus protected. the ends heing carcfully tucked, into the neckhand. Place all thesc llat with handierchiefs and tie-case nicely levelled against them, and then on the top fold the suits and flannels.

Men's clothes should be tightly packed, so if the suitcase is not quite full, it is hetter to put in an extra garment than to riak the shifting about of all the contents. A heavy dressing gown, if required. may he put into the first suitcase, a thin one into the second. All toilet things, including bottles, can go into the small case. and as this would he carried. there is little risk of breakage.

For the luxurious travellet, the American wardmbe trunk saves much trouble. These travelling wardrobes, however, are too expensive for general use, so where a large quantity of clothes has to he packed, cuening and other dainty frocks can be carefully folded, with plenty of soit paper, in cardhoard hoxes, which keeps off the pressure of heavier clothes, and placed at the hottom of a trunk. When packing hats into a tray or hat hox the insides of the hats may be filled with such articles лs handkerchiefs, gloves, and ties.
A large hold-all and a hig folding hasket are both excellent things to keep ojen till the last moment for forgotten family necessaries A hahy's things can be packed in its hath with fitted lid strapiel securely on to it, and where a perambulator is taken, a number of necessary things can be stowed away in it under the waterproof cover Careful overhauling of the
family wa rdrohe several days liefore the actua day of departure grently facilitates packing

Packing for domestic purposes usually requires a strong container, and some wood wool, shavings, crumpled newspaper, or bran Large articles, such as a piece of furniture or a perambulator, are wrapped up in sacking. making up ropes of straw, and winding it round all the exposed parts, or entirely covering it with the sacking sewn together at the joints hy means of a packing-needle (sce Necdle) and pack thread. which is fine, thin string, but strong cnough to ensure firm stitching. Whecled vehicles should he made up so that the packing does not prevent the wheels rotating, and thev can then he moved ahout as required very easily instead of having to he lifted and carried.

Packing Fruit and Flowers. Fruit is difticult to pack if it is to arrive nt its destination in sound condition, but it can he placed in hay or straw, if both of these are perfectly d.y, firsh, and clean. The householder will generally prefer to use n light wooden box as a container, with paper and bran as pack ing material. This gives entirely satisfactory results, if a layer of hran is placed on the hottom, and then a laver of crumpled paper: as illustrated. Each article should be separatcly wrapped in tissue paper, bran poured round it, then covered with another layer of paper, another laver of bran, and so on until the case is full. Flowers to he sent hy parcel poat are heat packed in a stout cardhoaril-hox They should be made up into bunches and wrapped in tissue-paper with slightly moist ened moss or grass round the stems; this is secured by more tissuc-paper and inserted into the box, and the cavities filled with tissuepapier. See China; Crate; Parcel; Removal.

PAD. This word is used to denote several different articles. There is the writing pad or hlock; the boot pad, made of velvet. for polishing boots; the pad of lint. or gawe and cotton wool, usod in surgical dressings, and the ink pad used with a rubber stamp. Sea 1)ressing; First Aid: Ruhber Stamp.

PADLOCK. This is a form of.detachable lock, intended to hang on the part to he fastened. The usual type comprises a casc containing the lock mechanism having on onc part of it a slackle or curved metal har, so that it can lic hinged or turned, and the opposite end fastened to the lock case by the look holt and mechanism. Patterns are made of japannerl or galvanized iron. Common onea have a one $w$ heel ward, or a sham lever mechanism. Ket ter types have two or three ward wheels and levers, the mechanism being similar in principle to other forms of locks. The cyiinder or pin tumbler system is adapterl to the mechanism of the pradlock, and such locks possess all the well-known advantages of that system. Some very small padlocks ano made with asimplespring lock Another type with a small metal key is convenient for locking small articles, e.g. cash boxes. See Bolt: Door: Lack
Pad Saw. See Keyhole.

PAGODA TREE. This is a small family of hardy and green house flowering shruhe, known as Sophora. The only onc worthy of note, except in large collections, is S japonica, a summerleafing shrub with bluish-green leaves and white flowers. It should he planterl in
autumn, pruned in February, and is propa gated by seeds or by division. There are a fers varieties which need only ordinary greenhousn treatment. See Shrub.

Pail. See Bucket.
PARLLASSE. This word is sometimes used for an under mattres. Originally a paillasse was a small bed of utraw or chaff. As comfort became more general this was used to put benenth mattresses or beds of a better kind

PAIN : Its Relief. Pain is of many differen: kinds It may be constant; or only occurring at intervals. Sometimes it is dull and aching as in chronic rheumatism or sharp and cutting, ns in pleurisy ; throbbing as in the case of an abscess, or burning or smarting. as when the skin is inflaned Pain is not always felt at the exact spot where the harm is For instance. neuralgia may be felt in the head and the cause be a bad tooth
One great use of pain is that it draws attention to disease which might otherwise be overloulied In times of great excitement or when the mind is fully occupied, it is possible to forget even severe pain. Pain is, however very exhausting, and if only for that reason calls for relief.
In treatment the first cunsideration is, it possible, to get at the root of the troublo If an insuund tooth is cousing neuralgin
have it removed An abscess in the same way should be lanced It is generally pussible to relieve pain, for the time at least, by giving drugs, which quicten the nerves and dull the senses, either simple analgesics like phenacetin or aspirin or narcotics Care must bctaken in using ana цcsic remedies, and narcotics should only be taken under medical observation.

For home treatment, nothing is more likely 10 succed in soothing pain than heat. especially when it is combined with moisture For internal pains, a hot-water bo tle mny be useful, or fomentations (q.v.) of hot water. For pain in the chest, arising from cold, a mustard and linsced poultice is a suothing remedy. A mustard poultice may also relieve lumbago

Electrical current: are often auccessful, and in some cases ionization. Friction will sometimes give relicf in muscular pain, as in chronic rheumatism, and the use of a little cainphor, well rubbed in by the hand, will often ease joints that are stiff. A strong cup of coffee will often remove a bad headrache It must be remembered that quiet is often desired by persons in pain, and this. tugether with rest and warmth, will go far to relieve many forms of suffering. Sec Enubracation Fomentation : linsed ; Mustard : Neuralgia Poultice : ctc

## Paints \& Painting in Home Decoration

## The Best Methods and Materials for Paint Work and its Cleaning

The following is one of the many articles that deal with the question of decorating the home, others that fall into this category including Enamel: Graining; Panelling Paperhanging. etc
Certain precautions have to be cxercised in monly called turps, is also used for thinning paint work of almost every kind. If the paint the base and making the paint more easily is to dry nicely, the surface to which it is applied must be clean and frec from grease or dirt ; the paint itself must be of good quality and suited to the class of work; while the material to be painted must be prepared by conting it with mixtures known under such names as fillers, stopping and underconting The brush also should be of suitable shape size and quality.

Paint is applied to impore the appearnnce and to assist in the preservation of the object painted. It bas alsu a sanitary and hygienic value. If the surface to be painted is greasy and dirty, and the paint is applied to it in this state, it is obvions that the dirt will remain, although covered by the paint. The proper method is to remove the dirt and grease bo fore applying the paint, and this can be done by scrubbing with bot water and soda.
The Ingredients of Paint. In connexion with the home, painting is generally done with oil colour paint, but in a more comprehensive sense it includes the use of water paints and other decorative material applied in the form of paint, Therc are also available the various nitro-cellulose finislies (sec Enamel). Oil paints often have white lad an a base, or body. This material has great covering power and weathers well, but as it is very poisonous, a zinc white base, composed of oxide of zinc, which does not possess the poisonous qualities of white lead, is largely employed. The base is diluted with a thinner, generally composed of lin. seed oil, and both this and the hase should be of first quality. Oil of turpentine, com-


Paint. Fig. 1. Implements which are essential lop the amatent painter. Reading in rows from lelt to right: paint kett!e, tin of paint, blow lamp,
patty knife, sponge, dusting brish, backing knife, stripping knile
obtainable, and although the genuine turpen tine is to be picferred, the substitutes answer very well for most paint work Pigmente are finely ground colouring materials used to culour paint for ornamiental purposes and to give opacity. They are made from various animal and mineral substances, and are ob tainable either as finely ground powde: of ground in oil : in the latter case they are paste like in substance, and are used in that form for tinting oil paint. Knotting and fillers ready for use can be purchased from nost oil shops

Ready mixod paints, if made by a reputable firm, are very convenient to the amateur but for matching up existing work, or prepar ing a special tint, it is preferable to use white lead, or zinc white, diluted with linseed oil or turpentine, and stained or coloured by mixing with it sulficient of the desired colull to impart the requisite tint. Nany of the ready mixed puints are available either in the form of the common paint, which drics with a lustreless surface, or with the addition of a !ittle varnish, which resulta in the paint drying with a semi-glossy surtace. Generally the common paint answers very well for the second coat and the varnish paint for the finishing cuat IVater paints are really a form of distemper, in paste or powder lorm, and only reguire to be mixed with water For interiurs they are particulariy effective.

The technique for applying ce!!ulose finishes is explained in the article on Einamel (q.v.).
To carry out painting work properly the amateur should posyess several cleantins with handles, known as painters' kett!ow, a Iarge sized sponge, a goud piece of pumice-stone, a blow lamp for burning off the old paint, a scraper, or stripping knile, hacking and stopping knives for clcaning ont the bad places and working the stopping into them These are illustrated in Fig 1

When the colours are to be hlended, a clean earthenware jar is required for mixing a palette and palette knife, and some fine muslin for straining are necessary A dusting brush leather, clean duster, and regular painter's apron are very handy, and the amateur will find it a good plan to wear a pair of old gloves.
Paint Brushes. A selection of btushes for general use consists of an oval ground brush ahout 2 in . wide, a varnish brush about 1 in . wide, two or thrce arsh tools of various sizes, and a fitch about 1 in. Wide for painting the edges of narrow vork. The best brushes are made of hogs' bristles; some are adulterated by the addition of vegetable fibre

The size of a brush is denoted by a number, $1-0$, up to $8-0$, and $10-0$, the latter being for house painters. In some cases the bristles are bound to the stock or handle with cord or twine, in ot hers with copper wire or tin band or ferrule. The bristles are arranged to form flat, oval, or round brushes, and for general purposes the oval is preferred. Sninller sizes, termed sash tools, are useful when painting the smaller surfaces in door and window frames.

There are also brushes for dusting the surfaces preparatory to putting on the colour They are usunlly round in shape, with much longer bristle than ordinary bruslies, curving olltward. Brushes for varnish are of a finer bristle, and flat or oval; the former are bound with tin, and will be found most useful for general purposes.

A brush known as a stippler is used for going over painted surfaces whilst still wet to remove brush marks. It is a large, llat brush, rather wider than a hoot brusla, and the bristles are set so elosely together that when the brush is lightly and evenly dabbed all over the surface, a minute nid even granulation results.

Brushes for use with cellulose tinishes should be set in rubber, as the solvent. employed
would dissolve the binding material of the ordinary type of brush.

On no account should a new brush he put into immediate use without some previous preparation. The bristles will have become dry since the brush was made, and are liable to come out on to he painted surface apoiling the work and ruining the brush All new brushes should be soaked in clean, cold water for at least $2 t$ hours. This will enuse the bristles and the stock to swell so that they will not 80 readily part company Brushes hound with a tin hand should not be soaked for quite so long, or the band may burat.

New brushes should not be placed in an upright position when soaking, but should be laid in a flat, shallow vessel, and this also applics to brushes that have heen lying aside unused for some time Brushes should never be put away without cleaning them of paint. this can be accom plished by "ashing thoroughly in a little turpentine, and rubbing dry with a clean cloth. A loop of string should be tied on the end, and the brush hung up, the bristles being covered with paper to inside quality, and the work then painted in cxclude dust Treated in this manner brushes will last much longer.

Exterior Work. As an example of outdoor work, suppose it is desired to paint the rainwater gutters and down pipes with, for example, niddle purple brown. The first step is to rub down the old paintwork, if in fair condition, give it a coat of anti-rust priming, and after this is dry apply two coats of ready mixed varnish paint (Fig. 3). A wooden fence, if in fair condition, should first be brushed down with a stiff hristle brush, like a scrubbing brush, dusted with a dusting brush, given a good coat of undercoating of any reputable make intended for outside work, or known ay uutside quality, and then given a coat of the common ready mixed paint; when this is dry and hard a coat of ready mixed varnish paint is applied. If the svork is not in good condition, the old paint should be burned off with n blow Inmp, the surface levelled up with stopping, and the painting operations proceeded with as. if for new work
On the exteriar woodwork of the house the windows may require the old paint to be burnt off with a blow lamp. Fig 4 shows this operation in progress. When the paint is alightly warmed and burnt with the flame from the blow lampi this has the effect of softening it, and it is then cleaned off with a stripping-knife, as shown. The work should receive one or two conts of good quality outside undercoating or stopping, and be finished with two coats of ready mixed paint.

A door is treated in the same way, except that it should receive particular attention in the way of stopping all the cracks and holes. This may be effected with any of the special stoppings sold for the purpose, or ordinary putty may be used if the work be given a primary coat of undercoating, the putty being applied nfter this has dried.

If a particularly good finish is required, the work should be well sandpapered when the undercoating is thoroughly dry. Exterior
stone or cement work should be prepared by brushing it over with a hard brush, filling in the holes or cracks with Keene's cement, and preparing the surface with red lead priming This is followed with a coat of stopping or undercoating of outside quality, and finielied with the paint, or may be pointed with liquid cement, if cement colour is preferred

Indoor Work. Interior work is prepared in the same way as the exterior, except that inore attention should be given to the surface to make it as smooth as possible This is followed with a primer or underconting of with a wire brush before applying a new coat ol naint
dust it down, and give it a coat of undercoating or flat paint, and then linish it with a glossy or flat paint, whichever is desired.

The llat, or wall paints, as they are celled. are intended specially for painting "alls; but if the surface is new plaster the result is scldom entircly satisfactory. The procedure is to apply a priming coat and follow this with a fat colour, using the primer supplied by the miakers of the wall paint. Water naints are generally applied to plaster work after it has been given a coat of size or priming, which ever is recommended by the makers of the narticular paint to be used

Woorlen ..ours are often painted in the same way as any other work, so far as the pre liminary cleaning and preparing are con cerned, but the finishing may be carried out with one of the special floor paints
Ironwork. The decoration or repainting of a stove is often carried out with a goorl quality Brunswick black when a glossy effert is required, but if a dull or so-callerl antique black is wanted, it is best to use Berlin black. If either of these colours is too thick to work nicely, it may he thinned with oil of turpentine For painting radiators, interior water-pipes, cisterns, and the like, an aluminium paint is very effective. The first thing is to thoroughly clean the imonork, removing all traces of rust either by scraping or by using a wirc brush, ne in Fig. 5. Water should never bo applied to metal work; if neceasnry use instead one of the recognized paint removers, or wipe over the metal work with a rag saturated in turpentine
When undertaking any painting operations, it is best to work in dry weather, and this applies specially to outlloor work The paint should never be applied on a dainp surface, as the dampness will almost certainly make the paint crack and peel off. To avoid dust settling on the wet paint surface, when dealing with interior work, water should be sprinkled on the floor, or wet cloths may be placed about the room to keep the dust down, and the doors and windows should he kept closed

Cleaning Paintwork. One of the simplest methods of cleaning painted wood work is as follows: The surface is first washed over with warm water whioh has been whisked into $\pi$ soapy lather with a good soap, clean, soft flannel being used for this purpose. The sufface is


Paint. Fig. 3. Applying anti-rust priming to a rain-water pipe. Fig. 4. Process of burning and scraping of the old paint by means of a blow lampand stripping-knife. Fig. 5. Cleaning radiator pipes
eone over a sccond time with a cloth dipped in clear warm water and left to dry A clean flannel is soaked in linseed oil, and when it has nosorhed all the oil it is put aside until it is just moistened with the oil. The wood work is then wiped over with the oily cloth, rubbing it one way all the time This process makes the paint look like new, and the lin sced oil applied in the operation sets as a preservative to the wood
Where the paint is very dirty the following mothod may be tried : To 2 quarts of hot water allow 2 inblespoonfuls of turpentine and 1 of skimmed milk or mil: and water. Stir these ingredients together and ndd just enough soft soap to make the mixture soapy, but not a thick lather. The paint should be gone over with a clean flannel dipped into the preparation and wrung out so that the woodwork docs not become sloppy. When all the paint has been wiped over, it is gone over again with a clean dry flannel, and will then be found to have taken on a nice lustre.
l'aint that is badly soiled should be cleaned with a mixture of whitening and soaj, flakes To nlake this, a packet of soap flakes is dissolved in sufficient hot water to make a thick, creamy lather. Crush to a powder a lump of whitening, and add enough of this powder to the soapfather to make it creamy
'Two howls of hot water and the whitening and soap mixture in a basin should be at the workor's hand. A clean piece of rag is moistened from the one bowl of water, dipped in the whitening and soap, and then rublied well into the dirty paintwork. It is advisable only to attempt to clean a small surface at once. When the stain has been gone over with the preparation, the rag is dipped in the howl of clean water and the paint wiped over with this. Another dry rag is used for wiping it dry. The whole surface of the paint is cleaned in this way.
White paint can be cleaned with onion water. Hoil 3 or 4 onions, or more if a large surface is to be cleaned, until all the gondness has gone out of them; then strain off the liquid. This can be used without soap for cleaning white paint. A clean rag should be dipped in the onion water and this rublied over the paint. Polishing should be donc with a dry duster, but a very slight rubbing up will result in a high gloss on the paint

Milk can be used for white paint, or milk and water, the same method being followed as with the onion water. Fuller's earth can be used instend of soap for cleaning white or coloured paint; it is useful for cleaning $n$ painted wainscot that hos become very grimis. The fuller's carth is made into a paste with water, and a rag dipped into this is applied to the paintwork. A clean rag is used to wije away the preparation and another rag to polish the paint after it has been cleaned Soda should norer bo used. An excellent result is obtained after any of the above methods of cleaning have becn followed if a little furniture cream is rublied into the woodwork and a final polish given with a duster.

Paint Stains. Paint marks on clothes should be treated while they are still wet, otherwise they may be difficult to remove. Wipe off as much of the paint as possible, then rub the nffected part with spirits of lurpentine or spirits of wine, applying it with a soft rag or flannel. The same method should be adopted for dry paint marks, though the result may be less successful. If preferred, benzine may be used instead, but owing to ts inflammable nature the operation should he carried out in the open air well away from any llaine or fire.

Health Precautions. The sinell of paint is unpleasant to most people, frequently causing licadache and a feeling of nausea. When a house must be freshly painted, have it done if possible, in warm, dry weather, so that the
windows can the kept open and the paint dry quickly. If green paint is being used, special care should be taken that it is free from arsenic. A freslily paintel room should never be slept in until the paint has been dry for quite two days, and in winter a firc will be necessary in the room as well as open windows.

Painter's colic is chronio lead poisoning due to a want of care in cleaning the hands before taking food on the part of those who handle paint. In the case of an attack an emetic should he given at once.

Little children are always inclined to carry cverything to their mouths, and therefore gaily painted toys should not le given them.
PAINT BOX. This may he purchased empty, designed to hold either water colour paints in pans or tubes, or tubes of oil colour, or may be obtained stocked with the requisite colours and brushes. 'The choice of a box depends in a large extent upon the nature of the work which is to be carricd out by its aid. Thus, if most of the work is to be done out of duors, a more portable hox will be necessary than when working in a studio or painting room. The simplest, and probably the inost useful, is the small japanned tin variety with sections for colours, pencils, etc. Wator colour hoxes can be obtained in miniature sizes for sketching at any good artist's colour shop.

For oil colours a convenient size measurcs 10 in . by 6 in . by 1 in ., and contains l! tubes, with two glass bottles, one containing linseed oil (purified), and the other spirits of turpentine, fitches, pencils, ctc., and a palette. If the colours are chosen carefully, with duc regard to the type of work to becarried out. a box of this size will be found to answer
most purposes satisfactorily. Cheap colours naturally lack the purity, transparency of tonc, and smoothness of texture which accompany the better qualities, and they are also inclined to lack permanency.
The particular oil colours and brushes sclected will depend upon the lines to be followed, but the following gives n suitable selection for gencral work: llake whito, vandyke brown, light red, ivory black permanent blue burnt sienna, yellow ochre, raw sienna, and Prussian hlue, in 4 in tuhes: with Naples yellors, chrome No 1. vermilion, and crimson lake, in 2 in tubes

A 4 in. tuhe of McGuilph should be obtained in addition. This is the medium most generally used to mix or thin the colours and consists of a mixture of mastic varnish, linsed oil cte. If it is intended to specialize in landscape work, Indian red, hurnt umber, raw umber and terra vert should be included. in which casc it will bo necessary to substitute 2 in tuhes for some of the 4 in . ones.

A useful selection of brushes consists of 2 sable and 2 squirrel hair brushes, 3 flat hog-hair brushes. French if possible, Nos 1 3, and 5 ; and a larger one, No. 11 A palette knife dippers and cleaning ray aro

PAINTED CUP. This is a half-hitridy perennial, botanically known as Castilleja. with lloral lenves, or bracts. Threo species aro in cultivation, pallida coccinen, and animata, all requiring a very sunny and sheltered position, with protection during the winter Planting is best done in April, from scedlings which are raised in heat and then hardened off in a cold franic

## Painting on Textile Fabrics

## Simple Ways of Decorating Accessories for Home and Dress

Directions for other methods of applying ornamental designs to fabrics-are given in the articles Embroldery; Pattern Printing: Pen Painting; Poker Work; Stencilling. For further related Information see Bag: Fan; Gesso Work; lampshade: Needlework Picfure: Pencil Painting

In common with other decorative arts for the home worker, painting on silk, satin, georgette, velvet, gruze, cloth or linen depends ainost entiroly for success on suitable choico of design and colouring for the article selected to be ornamented in this manner. Painting on linen or canvis can be particularly beantiful when employed for panels to be used as mural decoratio:s or to be framed and glazed as fire screnns. Special mediums are recpuired for painting on woven fabrics and can be obtained at shops which stock colours and matorials for artistic crafts.

Perhaps one of the most important things is to find the correct consistency of the colour for the meterial on which one is working. For instance, $a$ delicate, transparent effect is essential for linen and taffeta, while velvet or cloth must be treated with opaque methoils. Satin in light colours requires the delicnte method, and in dark colours the opaque. Either elfect may be successful on gauze.
lvory coloured inffeta or sation can be painted in a style which has somewhat the appearance of ctching It is done with noist water colours, line sable brushes, pre'erably Nos. 1, 2, or 3 , and delicate effects are obtained by using tints of sepin or black. 'The piece of silk or satin, with white blotting paper bencath, is fised to a drawing-board with drawing-pins, and the selected design is drawn in pencil or transferred by moans of tracing paper. The outline is lightly defined with a brush and the shadows indicated. The brush must not he too full. Details are added and shading accomplished by cross-hatching lines, sky and water being lightly washed in. Seascapes are successfully copied in this method and old prints.

A combination of ncedlework stitclies to raise portions of the design and of painting produces heautiful and uncommon janele for
sminll screens or for use, under glass tops, on dressing tables. Flower pieces can he painted in the same way, but require flat washea of delicato colour after the manner of old prints. loor other atyles of painting on silk suitable for Inmpshades or candle shiclds the reader may consult the article on Inmpasiade. These methods can be adapted for clegigis for dessert doilics and for handkenchief sachets. l3lack or bluc carbon paper should not he used for transferring designs on to delicate mintcrinis, but the design should he triced on to tracing paper, turned so that the heavily pencilled lines face the minterial and these are then gonc over with a hone or ivory tracer. Special tranafers may also be ohtained from a good art demaitinent in a store

Ordinary oil colours or stencil colours can lie employed for painting on textiles, but must be used with the correct nedium to prevent the paint from running or cracking. I'en painting is also used, and is described under a separato heading. It is well to avoid loaded materials. The preparation used to atiffen certail silks miny appear on the paintel surface like specks of gummy substance. Such a material should, if possible, be washed hefore pninting, in order to remove the dressing.

An Effective Method. A good method of decorating gauze, silk, satin or cloth is by using a special outfit of colours made for painting on thesc fabrics. A feature of this style of painting is a ruised edge which forms a setting for the design and makes it effective for such accessories as satin night woar sachets, pochettes, cushions or gauze doilies. Bronze colours are used to outline the work, but these must be employed very cautiously or n garish appearance will result. Special coloured gold and silver flakes are also obtainable.

To paint a set of dessert doilies a 7 -in. square of silk gauze will be required for each piece.


Painting on Textile Fabrics. Fig. 1. Making the raised oulline on a gauze dessert doily. The tin nozzle is screwed on to the tube of special enamel. A hin, even line flows through the hole in the nozzle and resembles a fine Courtcsu of Winsor \& Necton

Place this over the design selected (if a transfer is used, lay a piece of tracing paper between it and the gamze or the transfer ink may spoil the material) on a drawing-hoard covered with clean white blotting paper. Pin the with clean white blotting paper. Pin the for the leaves. Green and gold dlakes
gauze, as shown in Fig. I, on to the board with were used for the enamel outline of the drawing-pins. Do not atretch ton tightly. On leaves and the flower outlines were covered a saucer or china pinlette put out a little of the colours required; thin with turpentine and a little medium. A No. 3 sable brush can be used for filling in the dosign. The colour must be laid evenly on the gauze and the palcr shades used first. When these are dry the darker shades are painted in.
'Jhe blotting paper should not he removed until the patinting is linislied. The colours percolate through the gnuze to some extent, and unless left on the blotting paper or tracing paper till diy, the tints will le very pale.

The raised edge is made almost as if using $\Omega$ funnel for loreing ieing on a decornted cake. A tiny paper cone can be used, filled twothirds full with apecial enamel, the top turned over and pressed down till the bag is taut, and then a minute hole cut at the point. The bag is held hetween tirst linger and thumb and the point must not touch the work or the hole will be stopped up and the line hecome uneven. The enamel flows in a thin line to form a line cord. A tuhe of silver or gold llake or a bronze powder as used in gesso work is liept at hand to sprinkle over the line. This is allowed to dry mid then the surplus fake is removed with 8 soft brush. For rather bolder outline a tin nozzle can he fixed to the tube of enamel end used ns shown in Fig. 1. Nozzles are olitainuble in two sizes.
When painting on dark materials, as, for instance, dark satin for a nightdress sachet, yellow carbon pejer can be used for transferring the design. Fix the work as already described. To paint, first fill in the design with white to kill the dark material and proseal, using steacil oil colours. Outline with the cnamel, putting the small nozzle on the tube, and lust on gold flake for llowers and silver for leaves.
The pochette illustrated in lig. 2 was made of beige suède cloth, but such adesign could


Fig. 2. Suede cloth pochette decorated with a conventional degign in special colours for painting on fabrics and outlined with gold Courlesy of Winsor \& Neulon
with flakes to match. The design is repeated on the other end of the scarf. 'Tlie special paints, medium, tin nozzles, priper cones, ellamel end llakes used for this work are known as Jargeena materials for painting on febrics. Other somewhat similar paints are known us Silkart.

Washable silks and georgettes which have been printed with these colours can be cleansed in a lather of good soap Hakes and warm water. The hest method is to shake the article up and down in the lather in a glass preserving jar with it screw top (p. (i99)).
Having rinsed it, press the article gently with $\Omega$ clean cloth to absorb the moisture, then iron carcfully, placing a clean cloth betwcen the material and the i:on. Iron on the
be equally well wrong sidc, and use a blanket or a soft painted on n moire folded towel to avoid finttening the raised edge. pochette. The design Painting on Linen. When painting on should be tracel by linen, canvas or Arras cloth, oriental designs means of a yellow or simple tapestry oncs are most suitable to carbon. The llowers use. A delicate, dull-surfaced effect is obtainare painted in blucs able on such fabrics which is quite desirable and shades of pink to for these designs when treatel artistically deep rose, and the Oil stencil colours may he used with the leaves in soft greens. correct stencil medium. Use a clean brush for Either barbola each fresh colour. Fora frieze or big panel, lay colours or special the piece of fabric llat on a large board anil silk colours can be pindown the section which is being worked on. used. Outline very The design may be traced, ironed off from it finely, using gold transfer, or drawn freehand. bronze dusted over the chamel.
An idea for a scarf end is illustrated in Fig. 3, which is equally adaptable to a work bag. If using georgette or material in a pale colour for a scarf procced na described for the doily. Tlie art of painting on all such fabrics is to use ns little colour as possilile, leaving the
manterial itself to form the high lights. The design was worked out in pastel sliades of pink, mave, blue and yellow with green e painted is placed over white blotting paper and pinned down to a drawing-board. For a
design similar to the one illustrated a Japanese print could be copied on to the linen in pencil, but the sinateur, unless skilled in drawing, should practise with some simple design, such as a galleon in full sail or a floral pattern which can be traced in the ordinary way. Scraps of linen will do to experiment on before attempting an ambitious panel. Unblcached linen gives a beautiful effect, a white pencil being used for high lights and the colour of the linen being left in places for half tones.

T'o paint. dip a paint bruslı in water and moisten a small portion of the design. The colour is applicd in strokes with the stick or pencil and afierwards distributed evenly with the brush. Be careful not to spread the water over the edge of a piece of the design where a firm outline is desired for the particular colour. Fill in the tints as desired, leginning with the palc ones. Detail can he superimposed by outlining with a pencil dipped in water. Before using carmine, yellow or sap grcen. fill in the portions of the design with the white pencil and work the colours over white.

For darkening red, and for ontlining when shading, as for instance, on the red lapanese


Fig. 3. Geopgette scapl with foral deaign painted in pastel shadea of green, mauve, blue and pink
Courlesy of Winsor \& Newton


Painting on Textle Fabrica. Fig. 4. Linen panel with Japanese design painted with water colonr pencils Courlesy of llazel. IIatson \& Finel
bridge in the illustration, use violet over scarlet. For darkening grecn, as for the detail of the foliage, use dark blue over green ; to darken orange, use carmine for the shaded portions. 'To lighten any colour use the white pencil, either over or under the colour.
After completing thic art work, fllow the materina to dry thoroughly. To fix, dissolve one tableapoonful of plain gelatine in a pint of hot water. When cool lay tho painted linen in it Take out without wringing, lay it tlat on a towel, and leave it for 24 hours to set. Then press out by ironing on the right side. When soiled, the pancl, or other article made of linen painted in this method, can be washed in the following way. Put three tableapoonfuls of table salt in is quart of water and let the fabric soak for five minutes. Then wash lightly in soap finker. Rinsc in clean cool water without wringing Lay smoothly on a towel, roll up for a few ninutes, and then iron on the right side.

Water colour pencil painting can also be used on georgette and other silks. It has a softer appearance on these fribrics than the other colouring mediums already described, but some excellent effecta are possible.

PALETTE. A palette is usually oblong or oval in shape, and occasionally it is made to fold. Artists who work a great deal in the studio often use a large palctic known ns an elbow palette, which is shaped to fit the arm, and may be 16 in . to 18 in . long. $A$ palette may be made of various materials, such as Honduras or Spaniah mahogany, baywood, sycamore, satinwood, 3-ply wood, porcelain, etc. It should be sufficiently light to causc no inconvenience when held in the hand for any length of time, and yet it should be thick enough to ensure it against warping.

To obtain and preserve a good surface on a wooden palette, take a piece of superfine sand paper, rub gently but firmly all over, along the
grain of the wood, and when satisfactorily smoothed pour n small quantity of fat oil on the palette, or usc olive oil if fat oil is not procurable. Then spread all over with a rag, allow it to soak in for $n$ few minutes, and remove the surplus. This process must be repented until the desired gloss is obtained, which will probably take about a week The final result, however, makes the trouble well worth while
No oil colour should be allowed to stay on the palette after finishing for the day All colour must be carefully removed with the palette knife and placed either upon a porceInin palette, into small cups and saucers, or even upon a sheet of glass, and placed under watter. The palette should then he rubbed over until clean with a rag moistened with spirits of turpentine, and finished ofl with an vily rag
A nother variety is the scenepainter's palette, which is really a hoard 3 ft. $U$ in. by 2 ft. (i) in by ? ill thick, around three sides of which are small compartments, wherein are placed the various colours to be used on the screen or cloth, mixed with the fixing medium. size, etc., and blended in the centre space. This palette is stood firmly upon a stand or "pmn a pair of small trestles.
Palette Knife. This is used mainly for scraping the paint from the surface of a wooden palette, and is made of highly tempered steel, tapered to a round end, and fitted in
a wooden handle. It should be kept perfectly clean and bright, and when not in use coated with vaseline or oil. In the bold and massive style of oil painting, the palette knife is often used to spread the colour on the canvas; and, when used with care, paint may be removed from a canvas as from a palette. A paletto knife is a most uscful kitchen implement for turning omelettes, etc.
Pallet. Strictly speaking, a pallet is a mat. tress made of straw. The word, however is sometimes used for a mattress of any kind.

PALLOR. In most people pallor is an indication of ill. health. It is $n$ common symptom among persnns who live without sufficient light or fresh aị, or who are overworked, or have not enough nourishing foud. It is also oftell to be noticed in growing ohildren, who bv their rapid develo!!) ment have exhanated their strength. This must be trented by more fresh air and sunlight, better food and iron tonics, etc A child who is not sent to bed in good timc will invariably have a pale face
A suclden pallor may occur fromemo-


How to Grow Palms. 1. Sowing the Rooseberry-like seeds: $a$, drainage : $l$, eaves: $c$, find sandy peat. 2. Boz planred under frame: $a$, manare $b$, beat pipes. 3. Seed soaking for 24 bours belore sowing: a, heat pipes. 4. Seeding potted : a, crocks: $b$, cinders; $c$, compost. 5. How to water palms. 6. Rool bound plant needing repotting. 7. Repotting in larger pot: $a$, new compost in water for palm manure. 8. Effect ol scale insect on palms

Another fan palm is latania borbonica: both single stem it becomes bushy owing to the are suitable for rooms, though their large development of suckers or shoots which grow leaves take up a good deal of space. Geonoma from the basc.
gracilis, kentia belmoreana and kentia fosteriana are palms which are in great demand for toom and window decoration owing to their graceful habit of growth.

The date palm, phoenix dactylifera, is of less value in greenhouses and conservatories; than phoenix canariensis, which develops into a large specimen. Tho palm called rhapis tlabelliformis differs from the others in habit of growth: instead of being restricted to a

## Palmistry for the Amateur

## An Entertaining Feature for a Garden Party

## This article is one of those that deal with the social and recreative side of life, others in the same class being Evening Party; Garden Party; Thearicals. See also Bazarr

l'he amateur palmist is often a successful entertainer at garden or indonr parties or charity fêtes. Out of doors she should he provided with a small tent, which may le decor ated with stencilled black cats, crescent moons, signs of the zorlinc, etc, and indoors with either ת curtained alcove, or screened corner in which to reccive her clients singly. Sometimes she wears $\Omega$ Spanish gipsy's costume, or eastern garb with a vashmak, and an aromatic brazier may add a touch of mystery.

Sitting opposite her sulject at a small table, she can most conveniently study hands lying loosely on a cushion. A magnifying glass may be used, and a good light is essential The hands should be laid palm downward at first in order to observe the nails and relative length of fingers to thumb. For a strong will the thumb should reach the middle joint of the first linger. Short shaped nails are a sign of critical faculty and fondness for detail; round nails indicate hasty temper; broad nails, aancasm and love of argunent; filhert shaped nails, retinement, but leck of aggressive power unless allied to a stiong thumb. In turning over the hands hold the palins firmly to ascertain whether hard or soft ; the hard palm is one of the signs of strength, the soft of luxury; $a$ long palm denotes obstinecy and selfishness ; a wide palm courage; a narrow, bigotry. It should be remembered that good or bad qualities are often emphasized or neutralized by comparing one point with another.

Types of Hands. When the hands are lying palm upward they should he classifiel as one of seven types. The elementary has short, stiff fingers and palm large in proportion, indicating small brain power or self-control. The spatulate has wide, llattenedout finger tips, and broad rather thick palm equal in length to middle finger, indicating self-reliance, courage, patriotism, love of property; but if the heart line be poor, arrogance and lack of sympathy. The syuare has squared finger tips and firm, flat palm, indicating love of order, business acumen, and conventionality, but with undeveloped mounts of Venus and Luna, hypocrisy.

The conical has tapering fingers and smooth, slender palm, indicating love of beauty, refinement, good taste, but with snall thumb and poor headline, laziness


Palmistrg. Diagram of left hand illustratng principal lines and signifcant parts. Fingers : A, Jupiter ; Bercury ; three phalanges shown numbered. On the band, $1,2,3$, and 4 are mounts of Jupiter, Saturn, Apollo, and Mercury respectively ; 5, mount of Linna; A, mount of Venus; 7 and 8 , mounts of Mars. Péncipal lines : E'E, life; FF, head: G G, heart ; H H, tate ; XX, Apnllo
and discontent. The philosophical has tapering or square finger tips, and knotted joints; a long hand, indicating deep reasoning power and appreciation of beauty, with the dominating interest of truth. The psychical type has rounded finger tips, narrow palm and slender thumb, indicating idealism, imagination, and occultism. The mixed has one finger spatulate, another tapering, and so on, indicating a person with facility for many things; but in a weak hand, indicating instability.

The Mounts. The next points to be studied are the mounts or fleshy risings on the palms Jupiter's mount is at the root of the first finger and shows gencrosity and ambition; if rising excessively arrogance is denoted, or if deficient, selfish coldness. Saturn's mount is at the base of the second finger, and indicates prudence and wisdom ; if highly developed it denotes occultism, if excessively so a tendency to melancholia, and if deficient insignificance. A pollo's mount, at the base of the third finger, indicates love of beauty, artistic talent, and desire for recognition; if excessive it denotes vanity and love of notoriety at any cost ; if deficient, materialism dominates the rest of the character.

Mercury's mount is at the base of the little finger and indicates love of change and excitement, activity and cheerfulness, good practical capacity or inventive power; if excessive it denotes an inordinate desire for gain; if deficient, a lack of brain power. There are two mounts of Mars, one helow Mercury's on the piereussion of the hand and the other helow Jupiter's. If full, hoth mounts denote courage ; the former also passive endurance and coolness in emergency, the latter leadership; if excessive they indicate tyranny and violence; if deficient. lack of sclf command and timidity. Luna's mount is op posite the root of the thumb and indicates imagination and romance; if excessive, it denotes love of mystery, caplice or morbidity; if it is deficient, lack of imagination.
'The mount of Venus is the lower part of the thumb and indicates love of beauty, harinony and pleasure ; if excessive it denotes inconstancy and luxurious tastes; i deficient, coldness and lack of sympathy. A hand in which all the mounts are equally developed shows a well-
spatulate hand a goos Mercury's mount indicates scientific ability, or with hoth mounts of Mars full, a soldier or sportsman. In a mixed hand a good Apollo's mount with Luna's well developed denotes the characteristics of a practical artist.
Meanings of the Lines. The principal lines of the hand are the lines of life, of the heart, head, fatc, fortune and health. lied lines are an indication of cheerfulness and vitality; pale lines of weak character, purple lines of melancholy. Chained or broken lines are a sign of obstacles or weakness, wavy lines of periodical bad luck. Double lines are good; sometimes the second line appears by the side of a break, counteracting the misfortune or ill. health which would otherwise be denoted Many lines on a palm, besides the six mentioned, indicate a nervous temperament, capable of keen joy or sorrow, while few extra lines may be talien to mean that the subject is not easily impressed or worried by sutround. ings. Lines on the left hand are said to denote the character and fate at birth, on the right what the subject or circumstances make them.
A good life line should be clear cut and surround the hase of the thumb, starting from midway between the fork of the thumb and ront of first finger. A break indicates illness or an accident, if shown in the right as well as the left hand. Fine lines crossing the life linc from the mount of Venus indicate the influence of other persons.
The line of head should go right across the palin near the middle and he clearly defined. Should it join the begimning of the life line it shows lack of self-conficlence, but if there be much space hetween the two lines rashness is denoted. Many small lines crossing the head line indicate headaches, and if it lie close to the heart line it is a sign that the heart rules the head. A fork at the end with a good mount of Mercury means argumentative power; with tho mounts of Apollo and Luna well developed, literary ability.
Tho heart line starts leneath Mercury's mount and crosses to Jupiter's. Without branches it indicales a loveless life, forked under the first finger, ideal affection. When it ends lietween the first and second fingers it denotes a temperament lonely from in. adaptahility.

The line of late runs up the centre of the hand more or less to Saturn's mount. If this ine be clear and long it inny balance a poor lifc line, especially with a good mount of Mercury. Age on the fate line is reckoned from the wrist upwards (the opposite epplics to the life line), the head line cutting it ct about :30, the heart line at 45 and the iest of the fate slown above. Should the upper portion be firm and clear, in contrast to the lower, success or happiness will come rather late in life.

Sometimes this line is inissing, in which case the existence is uneventful. If it goes direct from the wrist to Satum's mount it means good fortune without much struggle for its attainment. When broken below the head line it is an indication of mental and moral struggle, hut if the line of fortune le good and the fate line start cgain, success will eventually be achievel. If the fate line is broken, but a second line starts by the break and cargies on to Saturn's mount, it means that a new career is enterel upon; when lined or chained at the beginning it indicates an unhappy childhood.
The line of fortune, or Apollo, may start from near the life line, from the fate line or from the heart line, and goes to the soot of the third finger, denoting success in art, fame, tiches or lionour. Should this line be absent, even with $\Omega$ good fate line, the subject will have to work hard with small success. With a well-developed mount of Venus, music or painting is indicated; with a good mount of

Luna and lorked head line, literature; with spatulate third finger and full mount o. Apollo, dramatic work. Should the line be weak before mecting the heart line and then lear ahove, it shows that difficulties arising in the way of artistic success will be, or have been, overcome.

The insrriage line is on the percussion of the liand, at the side of Mercury's mount and above the heart line, running horizontally with the latter. An early marriage is indiated by the line being near the root of the linger; midway between that and the heart line the marriage would be ahout 30 , lower down at 35 or later. A line from the mount of Venus will probably be found to cut the life line at the age.

Should the marriage line be forked on Mercury's mount it is a sign of separation, and many small lines on the percussion denote short love affairs. A second deep line, if the first he cut through, denotes a second marriage. Small vertical lines to the root of the little finger from the marriage line are said to indicate children. The ring of Venus encloses the mounts of Saturn and Apollo, and when clear and unbroken is is sign of ardour, ability. and a sensitive nature

Three good lines across the wrist at the basc of the palm are said to denote prosperity and to strengthen the life and fate lines. Crosses on lines are indications o! trouble, the nature of which is decided by the line on which they appear. Stars are talien to he circumstances outside control. On Jupiter's mount a star means ambition, gratified by others; on Saturn's, undeserved misfortune ; on A pollo's, selebrity; on Mercury's, dishonesty; on the mount of Venus, a happy marriage. A star on the life line signifies a catastrophe, on the hend line an accident. Squares indicate protection from some evil; a syuare round a star nullifies a bad meaning and intensifics a good one. A triangle, formed on a linc by two other small lines, is an indication of added power
PALM OIL. The yellow solid fat yielded by a $W$ African palm is used in the manu. lacture of soap, and when purified, as one of the ingredients in margarine. On account of its rich yellow colour palnı oil is employed for colouring pomades, only a small proportion, 1 dram to 1 oz , of other fats being required. See Oil

PALPITATION. In health the action of tho heart is not noticed. Under certain circumatances, however, a violent, irregular beating or fluttering may take place, causing distinct and often most unpleasant feelings in tho chest. Any strong emotion, such as fear, joy, sorrow, or anger, may bring this about. A very coinmon cause is indigestion, and a heavy or unwholesome meal taken late at hight will frequently bring on an attack. Too much tea, coffee, or alcohol, or excessive smoking, are other frcquent causes. Palpitation is a symptom of annemia and sone diseascs of the heart.

The canse should be ascertained, and if naemia, indigestion, or any similar condition is present, it should be rectified When associated with a nervous condition, a healthy, regular life is the best remedy
During an attack give the patient air, and let him keep still, lying down, but with the head and shoulders well raised on pillows, as palpitation is wont to give a feeling of suffocaion. A teaspoonful of sal volatile given in threc quarters of a wineglassful of water will help to relieve the patient ; or a little brandy or whisky will answer the same purpose. A large mustard plaster applied over the heart will be beneticial. See Heart.
PAMPAS GRASS. With its tall silvery plumes in autumn the hardy perennial pampas grass attains a height of from \& ft . to 8 ft ;
the sma!! flowers are white, blue, or ye!low according to species It is uscful as a centre kroup or specimen on lawns, and is jropagated by seeds It prefers sheiter to sun, and the plumes may be gathered for the purpose of indoor decoration a eoon as they are developed. The technical nam is Gyncrium.

PAN. A pan is a broad, shallow vessel used for cooking and other purposes in the home Pans are of several kinds, rach made


PANAMA HAT. This is a very light lolding hat made from the young leaf of a palm whieh grows in America. The leaf is finely plaited into hats, which can be rolled up into very small compass, and are prized for their lightncss, flexibility and wearing quality

Thong h Panama hats scldom or never wear out they become tanned with the sun or soiled, and necd periodical cleaning. This can be done at liome by rubbing the hat all over with a clean rag soaked in lemon juice, which has a whitening effect, or by using a straw hat cleaning preparation obtainablc at a chemist's See Hat

PANCAKE: How to Make. The success of this dish depends on the quality of the ingredients employed, fresh eggs and purc milk being cessential, and on the thorough beating. The fat also in which the cakes are fried should be white and tasteless, and should not have been used previously for any ot her purpose.

For family use an economical batter will answer the purpose, and to make this, lake 1 pint milk, 3 eggs, $\frac{1}{2} \mathrm{lb}$. fine tlour, and a saltspoonful salt. Sift the flour and salt together
to suit the purnoses to which it is put, e.g. frying pan, porridge pan, preserving pan, etc. See Baking; Bed-Pan; Bread Pan; Frying Pan: Saucepan, ctc.

PANADA. The meaning of panada is bread soalsed or boiled with milk or water. The term is applied to any thick boiled paste made with flour, butter, and water, or flour and milk, as the basis of a savoury or sweet dislı. For example, water, butter, and Hour boiled together to form the foundation of choux jastry is called a panada

To make a bread panadn, place the crumb of a new roll or a small portion o the crumb of a loal in a stewpan with about a tcacupful of water and alittle salt. Boil until it becomes a pulp and add more water, as that which was first put in boils away or is absorbed When quite soft iemove it from the fire and beat in quickly the yolks of


Pancakes, a dish widely recognized as the Strove Tuesday sweet 2 or 3 eggs, previ. ously whipped togother. to taste Sugar may be added in a basin make a well in the centre of the to taste, also Havouring of nutmeg, cinnamon flour and beat in the eggs one by one, using
or lemon, and a glass of wine, if approved only aufficient of the Hour lo form a thin of, for those who are adults. Milk panada is paste. 13y degrees beat in sof the milk and made much in the same way, but the bread the iemainder of the Hour, and continue should be boiled with ns little water as beating until the whole looks light and possible, and when cooked new milk should frothy. The consistency of the batter while be added to it, and it should be flavoured and sweetencd to taste. The milk should not be allowed quite to boil, but must be very hot. Sec Creanı Bun; Pastry.


Pampas Grass. Tall plame-like seed beads and folizge of a hardy nereanial useful for an open space io a large garden

When mixed, add by degrces the milk left over, pour the whole into a jug and put it by for an hour or two: giving it an occasional stir. Before frying, have ready, melted in a small saucepan, some land or clarified fat l'our in enough fat to cover the bottom of the pan, let it become smoking hot, then add a thin layer of batter, move pan about until batter spreads evenly, and fry it until the underside is a rich brown. Toss the cake, or turn it with a thin aluminium slice, and fry the other side. To toss the pancake, shake the pan gently until the nancake slips down over the edgc of the pan, give pan a sharp, up. ward flick with the wrist, when eake will
turn completely over into the pan. When the eggs are whipped separately. For a dish brown drain it on a hot dish covered with of French pancakes. take 5 eggs ; separate kitchen paper, dust it with castor surgar, the yolks and heat them up with 3 oz casto sprinkle it with lemon juice, roll up, and keep hot until the other pancakes are fried.
Castor sugar should be handed round with them, also lemon cut into convenient pieces. To rary the flavour, jan or orange may be substituted for the lemon. A richer batter may be made by increasing the number of eggs to 5 , and decreasing the milk by 2 table. spoonfuls for each egg thot is added.
Irish pancakes are made with 4 yolks and 2 whites of egg to each $\frac{1}{2}$ pint milk. To make them, melt in the nilk $1 \frac{1}{2}$ oz. butter and $1 \frac{1}{2}$ or. castor sugar Whip the eggs well and stir then into the milk, then beat to them by degrees a small teacupful of flour. Fry these pancakes without turning them, and use n very thin layer of batter. They should be piled, when dished one on top of the other and served with sugar and whipped cream.
French Pancakes. The French pancake differs in method, as the yolks and whites of the yolks and heat them up with 3 oz. castor sugar and the same quantity of very fine sifted flour; add the juice of $\frac{1}{2}$ a lemon and a pint of inilk. Now fold in lightly the whipped whites of the eggs. Half fill buttered snucers with the mixture Bake in a quick oven $15-20 \mathrm{~min}$ Turn out on to sugared paper, put a spoonful of jam in middle, and fold.

Yeast pancalics are made from the sane mixture as doughnuts and cooked in the same way, hut arc rolled into small, round, fat cakes about $\frac{1}{2}$ in thick. Jam is put on one piece and annther pieco put on top and the two pressed well together before frying.
Savoury Pancakes. For savoury pancakes an ordinary batter may he used, and about 4 oz. of finoly chopped cooked ganie or chiclien, well seasuned, should he adtled just before figing. The batter should be flavoured with parsley herlis, a shallot or chive chopped fine, 4 oz. meat to 1 pint of batter.

## Panchromatic Photography

## Modern Methods of Obtaining Correct Colour Vaiues

The usc of panchromatic or "all colours" plates and nims for coricet renderip of colours in photographs is shown in this article to he simple and well. suited for the amateur. see Developirg; Photography: Portraiture
Panchromatic photography is a method by help in dealing with the renderings of reds which correct renderings in monochrome are and browns, and are not perfect in their obtained of all colours. The ordinary photographic plate is far more sensitive to rays of blue light than the eye, and also to ultrnviolet rays, which the eye does not perceive at all. In addition it is very slightly sensitive to rell, which it renders as black (hence the red dark room lamp), and is not sufficient!y sensitive to ycllows and greens The effect given by an ordinary plate is very similar to that gained by looking through dark blue glasses, such as are used by clinabers for overcoming the glare arising from sunlight on expanses of snow.
It is not mercly that all objects are seen through the blue glass as one colour or monochrone. The relative brightness of the different colours has changed ; bright yellows, reds and greens become dark, while blues and violets, which are usually seen as dark colours, become light. Furthor, the clouds in the blue sky have disappeared. Orthochromatic plates and films overcome the difficulty to a certain extent, but they give very litt!e


Panchromatic Photography. Pig. 1. Greek vase in browns, reds and yellows. as photographed on a flm with ordinary uncorrected emulsion. Fig. 2. Same vase photographed on a Kodak Eastman panchromatic film bringing out correctly the colours ss seen by the eyd
ranslation of yellows.
Films with increased colour sensitiveness have recently appeared which give colour correction superior to any orthochromatic medium, especially with filtors. Such is the Kodale 'Verichronie,' a double-coated highspeed film with an anti-halation backing and wide latitude of exposure.
No plate has yet been made which, without a light filter, is not more sensitive to hluc than to other colours. It therefore follows that to get a correct rendering of colours in monochrome a panchromatic plate or film with n light filter must he used
The principal purpose of the light filter is to cut out a portion of the blue rays. The extent to which a correct rendering is then oltained with n panchronatic plate depends upon the depth of the filter, the time of exposure increasing with its depth Even without the use of a filter at all panchromatic plates will give a better rendering of colours than ordinary plates. On the other hanil, panchromatic plates used with a filter will give a correct colour rendering with shorter exposure than an orthochromatic plate us.d with the same filter That is to say, the panchromatic plate is more sensitive and more rapid than the orthochromatic, becanso it is more sensitive to yellow light rays
The best form of light filter is that which consists of dyed gelatine, either uscd alune or mounted with Canada balsam on glass Filters in which the glass itself is stained are not so satisfactory, as it is difficult to get pure yellow in stained glass. The gelatine filters can be bought either as pieces of gelatine or ready mounted het ween plates of thin glass. Ordinary glass or thin
plate which has been optically worked may he used The latter is much more expensive, but with a high-class, long-focus, anastigmatic lens is almost essential, since ordinary glass is liable to impair the definition.
The filter may be placed in front of the lens in a holder with a spring adlapter to clip over the lens mount. Alternatively, if it is cut to size, it may be placel letween the components of the lens, i.e. behind the front lens and in front of the iris diaphragn.
Below are given the filters to be used with the Kodlak Eastman panchromatic filmis and Ilford panchromatic plates. "ith tines of exposure (daylight only), sulyjects for which they should be used, and the comparative exposures :

| l-ilter | His. posure Fiactor (A) | Uses | IRclative Facini (13) |
| :---: | :---: | :---: | :---: |
| K I | 1) | Shapslint: minimunicxiosures | 3 |
| K 13 | 3 | Best errrection for ort hucliro. matic plates | j-8 |
| Ifordmphat (a) | 112 | M nat orlinary silojerts, short t:xpesures | 3-4 |
| K! <br> liford beta ( $\beta$ ) | $\begin{aligned} & 3 \\ & 3 \end{aligned}$ | Gencral isc, lamalscape, portrait, sיipushots with fast lenses | - 8 111 |
| K 3 | 112 | Correct ienderings of dillicult aubjects | - |
| Ilford gamma ( $\gamma$ ) | B | Correct renderinns, all colours, coloured pictures and objects | - |
| Kodak G (orange) <br> llford A viol, 1 and 2 | $\left.\begin{array}{c} i \\ 1.2-2 \end{array}\right\}$ | Telephotograpliv: to overconie lazze in lami. scajcs | 2-3 |
| Koclat 1 (real) | 12 | שurniture ete. witlı roils and scllows | - |
| Kodat F (lleep) red) | 24 | Great cont rast for leepr reds and bruwns in old furnitur: | - |
| IIford delta ( $\delta$ ) | 1 | Fur strong renclering of clouds | - |

(A) Expused iactor on panchrom:atic plates or tilms Jelative cxposure factor os urthorliromatic plates or flinis
For Kodak ' Verichronic 'flm the exposure factore are as follows

Exposure factors of K (Kodak) and Ilford filters are average figures, and only to be considered correct when used with Kodak panchro tilms and Ilford panchro plates respectively. Weather conditions and different forms of artificial light will affect the factors to a very considerable extent. Thus, in a room lighted by gas-filled electric lamps, which give a yellow light containing little blue, good colour correction may be obtained on a panchromatic film without the use of any filter. Conversely, arc light may increase the filter factors.
For general work K 2 or the IIford $a$ is the deepest filter which should be used, otherwise over-correction would result, with harsh, unnatural contrasts, giving in bad cases what is known as the "soot and whitewash" elfect II ith both the Kodak and 1 iford panchromatic plates and films time and temperature development figures, for development in the dark, are supplied with each box of negatives

Care should also be taken to see that with panchromatic plates exposure is reasonably correct. Serious over-exposure will give thi same harsh contrasts as the use of too deep a


Filter. The amateur photographer will be complexionz have amall patches of hardly wise it he makes it an invariable mulc to use visible red, which the ordinary plate repro the exposure meter when working with duces as black blotches. It also accentuates fanchromatic plates. wrinkles and freckles, while red or golden lair
It is a mistake to suppose, as many amatcur comes out much too dark. A panchromatic photographers do. Ihat panchromatic plates plate with a K lf or a filter overcomes these
difficulties without retouching the negative In landscape work the ordinary plate ren ders the sky as a harsh solid white, since it is unduly sensitive to the blue ol the sky, so that the white clouds are altogether lost, that portion of the negative receiving relatively greater exposure than the foreground portion With panchromatic plates it is possible to get clouds and landscape on the same negative, as the filter lieeps back a portion of the blue rays. Moreover, a landscape usually contains many different tones of greens and yellows which the ordinary plates reproduce in one mono chrome tone
Striking examples of the improvenents achieved by panchromatic films and plates are shown in the illustrations. The panchromatic rendering is enormously superior in every case to that of the ordinary plate it is only the tact that photographis talien on ordinary plates have been seen for so many years, and generally but mistakenly accepted as being accurate. that makes it necessary to enlarge upon the superiority of panchromatic plates

There is a tendency to avoid the use of pan chromatic films or plates, since they render impossible the use of the ordinary dark room lamp because of their great sensitiveness to red. This difficulty is largely inaginary All plates can be fogged it exposed long enough to the safest dark room lamp.
With Ifford panchromatic plates no light at all is to be used in developing or loading; this instruction must be carefully observed With Kodak films the Wratten safelight may be used This consists of a large lantern with a safelight which gives a dim green light suffi cient to show after a little time, the position of dishes, etc., in the dark room. Even with this safelight the developng dish must be kept covered with a picce of card. The salelight is actinically correct for Kodak panchromat ic films. and is designed for a maximum total exposure of 30 sec of the negative 3 ft . from the light, the lamp inside being of 16 candle-power.
Panchromatic plates and tilms maty be developed with any ordinary developer de. scribed in this Encyclopedia and the amateur is advised to use that to which he is accustomed.
A simple method of developing panchromatic plates and films which overcomes almost entirely the difficulty of developing in the dark is to use a desensitizung solut.on, wh ch fermits the use of an orange tight as explained under the heading Dosensitizer.
A modern development of the panchiomatic tilm is its application to the hone c:nema. Tho
or tilmes should or need only be used for specia purposes, and that they need a skill only to be acquired in the advanced stages of photography. They will always give with the palest lilters more accurate and pleasing results, and as shown by the talile of relative exposures, they are available for all kinds of snapshot work if a moderately fast lens is used. Ex. posures can only be relative, but to take a specific case, with a lens working at $\mathrm{f} / 8$ (see F/Number) correct exposurc on an open landscape midday sunlight (May to September) will be so second with a liodak pan chromatic film.

Three varieties of panchromatic plate arc made by Ilford, Ltd, the Ilford special rapid and soft gradation panchromatics and the Iford rapid process The first is a very fast panchromatic plate of general utility; the second is claimed to be the fastest colour sensitive plate existing. The third variety, the process panchrumatic, is designed for technical purposes where the maximum contrast is required.

In portrait work, even of the snapshot variety, with portraits taken out of doors, very great improvements will be obtained by the use of panchromatic films Almost all


Above, photograph taken on a plate with ordinary uncorrected emulsion on a sunny Dut misty November day. Detail in the distance is badly rendered and the sky is an unnatural hard white. Below, the same scene taken on a Kodak Eastman panchromatic flm with a Kodak G flter. Panchromatic flms and plates ars particularly valuable in landscape photography

Kodak "Cine Supersensitive panchromatic safety film" (for 16 mm . cameras) permits indoor filming and outdoor night scenes. Without filters it is claimed to be about twice the speed of the ordinary Cine-Kodal panchromatio film. With CK1 or CK2 filters no apparent increase of exposure is required, the stop indicated by the exposire guide being correct. With CK3 the next larger stop is required.
PANCRATIUM. This is the name of a genus of vigorous bulbs of which the chief favourite is Pancratium fragrans. It bears umbels or bunches of white sweet-scented Howers and must be grown in a hothouse in a compost of loam, peat, and sand. During the period when the bulbs are at rest little water is needed, but in the growing season the soil must be kept thoroughly moist. Pancratium illyricum is hardy in sheltered places in mild districts.
PANEL: In Woodwork. The term panel is used for an area recessed below the general surface. Usually the panel is a piece of wood soparate from the framework enolosing it, and in the majority of cases it is thinner.
Roughly speaking, the object of the panel is threefold. It is the result of an effort to obtain lightness in construction without detracting from the strength of the work; it reduces the risk of warping and splitting, and it effects an economy in material. Fig. 1 shows a panel of $\frac{1}{2}-\mathrm{in}$. material surrounded by a framework of l-in. stuff. The requisite strength is maintained by the grain of the top and bottom rails running at right angles to that of the panel, and at the same time preventing it from twisting. Fig. 2 shows how the panel is held in the framework within a groove without being fixed, so that it is free to shrink independently of the frame, thus lessening the risk of splitting. If the panel in Fig. 1 had been glued in, or otherwise rigidly fixed to the frame, the pull caused by its shrinkage, as shown by the arrows, would be opposed by the fixed resistance of the top and bottom rails, and this would result in splitting.
Where a panel is not grooved into the frame, but kept in position by two mouldings, as in Fig. 3, the nails holding the mouldings must be driven into the frame as shown, and must not pass through the panel. When it is desired to groove a panel of more than $p_{0}$ in. thick into a framework of 1 -in. stuff, the panel should be bevelled off at the edges, as in Fig. 2. The panel should fit hand tight in the groove, and the best method of testing it is to groove a spare piece of wood, called a mullet (Fig. 4), with the same size of groove as that to be worked on the frame, and test this round the edge of the panel.
False and Ralsed Panels. A false form of panel is shown in Fig. 5, a moulding being mitred round a solid piece of wood to give a panelled effect. Fig. 6 shows a particularly effective type known as a raised panel. The stuff is first thicknessed. and the width of the bevelled portion and its inner and outer depths gauged round. It is then rebated down to the shallowest gauge line, working across the grain first, and then bevelled down to the lower guige line, care being taken to prevent the corners from chipping out: the small hollow moulding is worked last. First thickness the stuff carefully, or the bevelling will result in the edges being uneven in thickness.

All the stuff used for the panel should be as clean as possible, and when the work is to be polished should, wherever possible, be of one piece. Very wide panels are jointed up in their width, using either dowels or a tongued and grooved joint when the wood is sufficiently thick to take them.

Another type of panel is that used when conditions require that the panel shall finish flush with the framework, as in certain large
table tops. The face side is rebated, form ing a tongue which fits into the groove in the frame, as in Fig. 7 A good plan is to run a bead along the rebated edge of the panel with the grain. as shown. The reason this is done is that in the event of the panel shrinking the open joint will not be so noticeable The best method of securing a panel not grooved into the framework is to pin a bead in the rebate at the back, as in Fig. 8. This not only leaves it quite free to shrink independently, but the panel can be re moved easily by raising the beads. Fig. 9 is a decorative panel for use in oak work; as in the case of the other panels. the mouldings are attached to the frame. work and not to the panel. Fig. 10 shows the main construction, consisting of a plain square edged frame mortised together and having picces planted on to the edge wherever the break. forward parts occur. A rebated moulding is mitred round as shown, and the panel is then cut to a cor-
responding shape and fastened in with insured persons can choose their own doctor, beads. See Cupboard: 1)ado: Door; Hall; but if a particular doctor has already as many Marquetry. etc.

PANRI DOCTOR. A panel doctor is one who attends persons who are insured under the national beath insurance scheme the loctor signs the insured person's card The majority of general practitioners take and the latter is then entitled to free medical panel patients. With certain limitations attention from him. See Insurance

## Panelling: Antique and Modern Work

A Beantiful Form of Household Decoration
Practical advice is given here about the actual performance of the work. Attention may be drawn to such articles as Celling: Chimney Piece: Decorstion: Dining Room: Hall: House Library : also Georgian Style ; Jacobean Style ; Linenfold: Oak; Paperhanging

Panelling may be described as covering the surface of a wall, door, ceiling, or other part of a building with panels, which are raised or sunk compartments, generally framed at the edges. The materials used are wood, stone, and plaster.

Panelled walls in the interiors of houses in England date from medieval times and in crude form appeared before tapestry began to be used. Panelling was not unknown to the Normans, but it was during the period of Gothic architecture known as Early English that it began to develop in this country. In work of the 12 th and 13 th centuries the square panels were ornamented and the larger ones were often deeply recessed, so as to form niches with trefoil heads and sometimes withcanopies.

History of Panelling. In the Decorated or second period of English Gothic architecture, the enrichments of the panel became more elaborate, and the latter were often filled with shields, foliage, or figures. The use of panels became very common in the third period, known as Perpendicular, when the walls of
the buildings of importance were frequently entirely covered with long, short, or square panels, the square ones being frequently filled with almost every kind of ornament Most of the existing examples, however, are not earlier than the 17 th century, though Tudor panelling, often with characteristic linenfold ornamentation, is still seen. All through the 18th century panelling was employed in comparatively small housea, and its use was not seriously interfered with or lessened until the introduction of cheap wallpaper

In Elizabethan and Jacobean work the small wood panel appeared sometimes with an inlay of coloured wood, and with gradually increasing elaboration of the moulding of its frame. The plaster panels of the ceilings of the time became correspondingly rich in decoration.
The beautiful room illustrated in Fig. 1 shows to perfection the fine workmanship in English panelling of the early 17th century. The overmantel consists of the royal arms carved in very high relief and having on either


Panel in Woodwork. Pis. 1. Simple type. Fis. 2. Section ol same, showing how it is held by groove in framework. Fig. 3. Section of panel held between wo mouldings. Eig. 4. Mallet. IFig. 5. False panel. with mitred moulding. fig. 6. Raised panel. Pis. 7. Section through panel ftting fiash with frame work. Fig. 8. Section of panel Axed between moulding and bead. Fig. 9. Oak panal with applied moulding. Fig. 10. Diagram giving details


Panelling. Fig. 1. Panelling. princlpally of oak, and Arenlace from one ol the upper rooms of the Old Palace at Bromley-by-Bow, which was built in 1806 $u_{u}$ permission of the Director, Vietoria \& Albert Muxrum. South Kensington
side a niche between two partially fluted then painted or stippled any desired tint, ivory, columns; the whole resta on a long shelf, decorated with flat strapwork omament, and supported by two terminal figures The panel. ling is divided at intervals by pilasters with flat atrapwork. The cornice is enriched with a dentil noulding and brackets, and the frieze beneath has similar strapwork ornament
After the middle of the 17th century the size of these wood panels was greatly increased, and towards 1700 they developed the long oblong of the Palladian style with bolder mouldings. In the 18th century the taste of Robert Adam reduced the size of the panel to more reasonable proportions, especially in his treatment of doors. About the same time the moulding was simplified, and it lecame the falion to paint panels in white or cream colour.

There is no form of wall treatment which has so satisfactory a relationship to the structure of the building as panelling. It ahould be designed 10 fit in with chimney breast, door, and windows, forming altogether a co-ordinated scherie. The careful design of manelling can correct an unsatisfactorily proportionel room, molifying its apparent length, height, or width. Panelling is in itself a decoration, and although it is a backgiound to furniture, it essentially restricts freedon of applied ornamentation to the walls in the form of pictures and other hanging details.
Modern Panelling. For modern roonis. which are very often too high for their length, it is usually satisfactory to stop the pranelling at about 7 or 8 in. from the ceiling. This leaves a frieze above, between the upjer noulding of the panelling and the cornice. It presents an opportunity for introducing a valuable decorative feature which may be treated in numberless ways. Should the panelling be dark brown, however, it is wise to allow the frieze and ceiling to be cream or a very pale buff or apricot shade to preserve a large area for reflecting light into the room, for one of the draw backs of dark panelling is its absorption of light. It is not a good reflecting surface. On the other hand, a room may be treated with deal or pine in panel formation from skirting to cornice, the whole wall being
then painted or stippled any desired tint, ivory,
pale or deep green, or grey leeing common, and the moulding picked out with a lighter or deeper colour. or with gold or silver leaf.

Painted panelling also looks well with modern furniture when the colour is stippled and shaded to deeper tones towarls the

mouldings Grained effects may be used to imitate cedar, mountain ash, or wainut Beautiful and dignified panelling for hall and stair case or dining roons is carried out in the grained effects enriched with judiciously applied gold ornaments and mouldingr-

British Columbia pine is used for modern panelling either with a waxed satin finish which lends a fawn shade to the figuring of the wood, or stained and finished in brown. Another British Empire timber employed is Canadian birch, with a silver-grey finish which looks well when inlaid with a cross-banding of hlack to divide the panels. The rapid progress made in the menufacture of plywood brings panelling effects within reach of many more peopie. The most beautiful woods, by means of improved veneering mothods, are obtain able at a fraction of the cost of the old style panelling. Any kind of classical panelling can be fitted in an existing house at a reasonable price

A point to be taken into consideration with regard to this form of mural decoration by those who are building or reconstructing houses to be nowly furnished is the fact that far fewer accessories and pieces will be required in a panelled room than in one that is painted or papered Many ornaments or pictures simply kill the design of a well panelled room When building, panelling lends itself naturally to the inclusion in the dining or living-room of built-in furniture such as cupboards, bookcases, niches with shelves and sideboards. A great saving in buying such or equivalent pieces of furniture is therefore effected, and a uniform result obtained which makes a harmonious setting for beautifu furnishing fabrics in styles selecterl to correspond with the panelling of the room

An additional noint in favour of natural timber panelling is that such decoration does not involve the recurring expense of periodical renewal, whereas the sum spent on repainting and papering the walls-for instance-of a


Fir. 2. Example of English old oak panelling. showing the characteristic small size of the panels. Fig. 3. Fine example of early English work in heavily carved panelling But permission of the Dircetor, Vietoria ad Albert Museum. South Kenaington
hall and staincase in one's own house would be considerable over a period of years.
The development of modern wallpaper decoration has placed at the disposal of the builder an almost infinite variety of imitation panelled walls. Many patent materials are employed in the design of papers which closely reproduce the effect of wond. The danger of this imitation panelling is its facility of application, for under inexpert or careless handling it can easily be made to look as though its features do not fit the room, and the essence of the decorative value of panelling lies in its close relationship to existing structural features. The greatest care is necessary to select imitation panelling of such proportions of moulding, rail and panel as suit the size, shape and style of the room to be treated

Repairs to Panelling. The framing of panelled work is not so linble to faults sa the panels themselves, which, owing to exccssive shrinkage or decay. sometimes require attention. Those poitions which, owing to decay, are in need of repair, should becutout as far as possible at an oblique angle, and new material, matching in grain and colour, arrefully fitted and glued into position. The removal of a defective panel is not difficult if the framing is moulded on the edges, the method being to cut away the moulding surrounding the panel in the form of a rebate. After the panel has been repaired or renewed, the original moulding is reproduced in the form of beading and glued and bradded into position.

For plain work, apart from taking the whole of the job down so as 10 work from the rear, the only method of dealing with a defective panel is to cut away aufficient woor from stiles and rails to allow of its removal. In this case the rebates should be very carefully trued up, using a atraightedge, so that new pieces, matching in grain and colour, can be glued in when the panel has been fitted in.

Panelling a Room. Panelling can be done by the home worker in two chief ways. He can use grooved framing, or may employ a perfectly plain framework and secure the panels with suitable beading, the latter being much the simpler method. Although oak is generally used for the whole of the work, n good effect is obtained by using deal for the framework. This can be stained to $n$ suitable colour, and the fitted panels cut from oak plywood. The use of plywood is preferable to thin boards, as the beauty of the grain is retained and it is not liable to shrink. Ready machined oak or other hardwood can be obtained which is grooved for panelling. Some has a $\frac{3}{16}$ in. groove for use with plywood

In the older types of panelling the panela were amall, and two characteristic examples are illustrated in Figs. 1 and $2 . \quad$ Fig. 3 is a close-up of a finely carved example of early English onk panels, which shows the possibilities in this direction.

The preliminary work is much the anme in all the various methods adopted, and consists in working on the wall a series of vertical and horizontal strips of wood known as rough grounds. The grounds should be approximately 2 in. wide and about $\}$ in thick. The purpose is to produce a fair surface on which to work the panelling and fix it to the wall. The room should be planned out and working drawings prepared, showing where each panel is to go, the grounds then being fixed accordingly. In general it will be necessary to have grounds at every corner, on every angle, one almost at the top of the wall, and one close to the bottom,
where the skirting bard is locsted This latter, if only a plain board, should be removed, and can be replaced later

Only a part of the wall will be panelled in some cases, ns. for example a aado, or a ? in pracel taken only to the frieze, or picture rail. The ground having been prepared. the panela are then applied

A simple way of simulating real pane!ling. or procuring a panelled effoct, is by the use of plywoud, or alternatively one of tho modern buildiny or panel boards. If this latter is used as a groundwork the whole wall surface may be covered. and the panelled effect obtained by employing beads or moulded strips of wood properly jointed at all intersections. 'Tlicse strips will be simply nailed to the grounds with amall oval brads, or panel pins, punched lelow the surface of the strips, and the holes atopped with putty. coloured to suit the finishing colour if 3 -ply boards are used as the ground. work they may be attached similarly to rough grounds, and Fig. 4 shows this operation in progress on a ceiling.

Framed Panelling. The forogoing method, although it produces a panelled effect. cannot

be considered us true panclling. The framework, which is represented by the strips, should, in fact. be a framing constructed as such with proper joints, and the edges grooved or rebated to receive the panels, which are fitted in then in the same way as the glass is fixed in a picture frame. The panela may be plain, as in Fig. 1, and the pilaster enriched by carving, or the upper panels only may be carved, as in Fig. 2, or each panel mny be separately carved as in Fig. 3. The examples given will serve as a guide for anateur work. When the wall panelling is framed up, it is fixed to the ground as already described, and the joints are fastened. Care must be taken to ensure that they always meet where they will be
ceiling and sometimes in the walls. Clainis made for this method of warming are that the heat is distri: huted almost solely by radiation at comparatively low temperatures, being projected from the warmed surface of the ceiling: that there is an ahsence of the stuffy condition is an ahsence of the stufy cond ition
sometimes associated with convec. tion warming systems ; and that a tion warming systems : and that a
reasonable amount of air movement for ventilating the apartment is possible without any great heat losses. See Central Heating.
PANICUM. Of this ornamental grass there are both hardy and greenhouse kinds. Panicum variegatum has green and white leaves, and is a popular greenhouse plant. leing useful ns an edging for the
covered by another panel moulding or pilaster. Ceilings may be panelled on the same principle as the wal!s, or by framing the work in sections. Often a ceiling is panelled in fibrous plaster moulds, or enrichments, which are worked on to it while the ceiling is being made. Gond resulta are obtained by the use of strips of rough-hewn oak about 3 or 4 in wide and about $t$ in thick which may be placed on the plaster ceiling, to represent the exposed edges of the joista: when carefully done, it gives an air of spaciousness to the room, as shown in Fig. 5.

Imitation Oak Panelling. Where it is desired to give a panelled effect in a simple and inexpensive fashion, an oak grained paper may be employed. The whole surface is first covered with the special paper, applied in the anme way as ordinary wallpaper, and the panels then formed by pasting on strips of moulded and grained paper. The skirting board should be stained to a dark brown colour, and simply finished with a plain chamfered edge. The frieze or picture moulding is treated in a similar way. If the worker carea to go to the irouble of forming the panels of thin atripa of deal, planted on and ctained to match the grained paper, the rcault, as will be evident from Fig. 6 , is hardly distinguishable from real panelling.

Various methods of employing embossed and other panels with wallpaper are lescrihed in the articles on Paperhanging and Wallpaper.
PANEL PIN. The fine straight nail known as a panel pin is used or cabinct work and other woodworking processes. It has a llat head with a tapered portion that blends into the shank of the nail. For many domestic purpores a panel pin 1 in . long and 16 gauge can very well take the place of a larger nail. See Nail.

PANEL WARMING. This is the name given to a method of central heating in which the heating units (hot-water pipe coils or elec. trically heated elements) are embedded in the


Panelling. Fig. 4. Applying the celling boards before panelling with strips of wood. Fig. 5. Panelling with rough-bewn ag paper and panelled with stained deal strips


Panioum. Green and white deoorative leaves of the greenhouse plant P. variegatam
Courtesu of Amaleur Cardeníno
staging. It is easily increased by division. Panicum miliaceum is the millet. Some of the best hardy kinds are plicatum and virgatum.
PANSY. This is a popular hardy, summerflowering perennial of which there are many fine strains and named varieties Viola


Pansy blooms of mized colours tricolor, or heartsease, is the chiof species or wild type from which the pansy has bcen develop ed during many years. Bedding pansies are commonly raised from seeds sown in boxes of tine soil in a frame in May or June, the seedlings being planted on a reserve border when large enough and finally set out in autumn where they are to bloom the following suminer. Named varieties are propagated by cuttings made from flowerless shoots in July-August, and inserted in sandy


Pansy. 1. Seer raising in pit sheltor: $a$, oinders; $b$, glass. 2. Alternative method. 8. Seed preparstion: $a$, fine soll; $b$, seeda; $c$, soil; $d$, leaves: $e$, drainage. 4. Good type of soodling. 6. Bed outting. 6. siurdy outting with heel (a). 7. Potting a outting: $a$, eand
soil in a frame. Planting out of doors done in autumn or spring.

Named varieties of show and fancy pansics grown for exhibition are given special cultivation, and the number of blooms on each plant is limited. Pansies flourish best in deep loamy soil in slight shade, but they will grow in ordinary well-tilled soil and flower throughout many weeks if care is taken to remove the faded blooms.

PANMERER LILY. This is the popular name of Lilium pardalinum, one of the showiest lilies for the garden. It grows 5 ft . high and bears very handsome flowers, orange tlushed with red nnd marked with dark spots.

PANTILE. This is the name given to a form of clay tile used for root covering. It is usually hollow or semicircular in cross section. Some are not curved in this way, as, for example, the Roman pantile. The pantile is one of the cheapest forms of tiling. It is a thick tile, dark red in colour, and about 155 tiles will be found neoessary to cover a roof surface of 100 sq . ft.. or a space measuring 10 by 10 ft . Some pantiles


Pantile. Two types ot this rool covering : tett, interlooking form : right, Roman pantile
are made of asbestos cement and other materials, and these are light in weight, while retaining the appearance and quality of the old-fashioned clay tile. See House: Roof: Tile.

PANTOGRAPE : For Copying Drawings. This is a simple piece of apparatus made of 4 narrow strips of wood drilled with holes at definite positions and pivoted together. It is used for copying drawings, maps, etc., to an enlarged or reduced scale. It is provided with a screw at one end for fixing to the drawing board, a pointer for following the lines of the original drawing, and a pencil for tracing the new drawing. It is simple in action, does its work accurately, and saves a great amount of time and labour.

In the diagram above the pantograph is set for enlarging to twice the original size. The point $A$ is fixed to the board: at B is a pointer which is moved along the lines of the original drawing, and the pencil point at C traces the lines on the drawing paper. The joint at
$D$ is fixed, but those at $E$ and $F$ are adjustable, and are altered to suit the proportions of the required enlargement. For reducing, the tracing point is placed at C , and the pencil transferred to B. By making


Pantograph. Instrument set for onlarging drawing of vase to twioe its original sise. Soe tert

B the fixed point, with the pointer and pencil at the opposite points $A$ and $C$, a drawing can be reproduced the same size as the original.
To fit up the instrument, the fixed pivot at A is secured to the left-hand side of a drawing board, and the original drawing is pinned so that the tracing point is about the centre of the drawing when the arms of the pantograph are parallel. The sheet of drawing paper is pinned down centrally under the pencil point and set square with the drawing Providing that the point of the pencil is sharp, and the correct distance from the paper, there is no need to watch it, attention being devoted to moving the tracing point on the drawing to be copied. If the original drawing is very small, great care must be taken to move the pointer accurately, as any mistake will be doubled on the resulting enlargement. The instrument may be purchased quite cheaply from a dealer in artist's materials.
PANTRY. In a small house a pantry is an aid to service if it is well fitted with a sink and cupboards, and adjacent to the dining room. Washing up of silver, glass and table china may be done there, and the articles put away on their proper shelves. Dessert, wines or spirits, cakes for afternoon tea, and supplios of tea and coffee may be kept in a cupboard in the pantry and also the requisites for their service. An electric kettle and chafing dish or a gas ring are most useful. Sometimes a small cooker is included in pantry equipment for convenience when the cook is out and the mistress of the house wishes to prepare a hot meal. The pantry is also a place where flowers can be arranged and the silver and ornamental pieces of brass cleaned without disturbing arrangements in the kitchen. Where the latter is of the compact labour-saving type, a pantry is sometimes built in preference to a scullery.

The sink should be placed near a window with a draining board on either side. An enclosed dresser where the best china and glass can be kept on the upper shelves and silver in baize-lined drawers below is a convenient fitment. Shelves for vases and trays, a small cupboard for jam, pickles, sauces and condiments in use, and for supplies from which the dishes and containers can be replenished, are also necessary, together with a small table or a table shelf which can be folded down when not in use.

The most satisfactory plan is to locate the pantry between the dining room and kitchen, as shown in our illustration of a modern labour-saving arrangement in a small house. There are communicating doors and also a service hatch. Used plates and dishes may be placed on the folding shelf, which when closed conceals the hatch. The china is transferred directly from the shelf to the sink, which has


Pantry, Labour-saving paniry situated between kitchen and dining room. Used plates and dishes can be placed on the folding shelf which, whan closed, conceals the service hatch a constant hot water supply. By such an plate, packing dresses, polishing mirrors, clean. arrangement the process of washing up is simplitied

A pantry sink should be glazed white, straight-sided and deep. The outlet should be closed with a plug so that the sink itself can be used for washing up. A papier mâché bowl should be kept to liand for fragile china and good glass.

Where there is choice in the matter electrio light should be preferred to any other illuminant. As the pantry is intended for storage of food and the larder may be situnted here the greatest care must be taken to keep it well ventilated. This can be assisted by fitting an air brick or ventilation shaft in the bottom of the wall, just above floor level. To prevent the entry of llies, the window opening can be covercd with perforated zinc or wire gauze, or a clean muslin curtain can be fixed in a small frane to be inserted in the opening. See Dining Room; Kitclıen; Larder; Service Hatch; Sink

PAPAVER. This is the botanical name of the poppy, a race of showy plants including annual, biennial, and perennial species. The first class contains the opium poppy and the popular Shirley strain, whilst the biennials and perennials include those important garden favourites the Oriental and Iceland poppies respectively. See Poppy.

PAP BOAT. This name is given to a little bowl, good examples of which are sought by collectors They were first made in England early in the 17th century. Usually of sil ver they are about 4 in. long. Some are pinched in the middlc in order to afford a holding grip.

PAPER: Its Uses Lace plapers for tlecorative purposes are sold in packets in the form of doilies and dish papers. Both white and tinted papers of light quality are made into frills for decorating cutlets, hams, or pie-dishes; others are specially madc for sweet cases, dish collars, and tray cloths. Crinliled papers, either quite plain or with designs in colour, are employed for making paperserviettes. Coloured papers are obtainable for lining cupboard shelves and chests of drawers.
Semi-transparcnt creasc-prool paper is used for lining cake tins and for other similar culinary purposes.

Kitchen wrapping papers of cheap quality, white or brown, are sold mostly in double crown size, 20 in. by 30 in ., or demy, $17 \frac{1}{2}$ in by $22 \frac{1}{2}$ in Toilet rolls of thin manilla or other paper are generally retailed in 12-oz rolls. Blotting paper is usually supplied for home uso in pads, but may be purchascd in demy sheets of various colours. Tissue paper, sold in sheets a trifle under double crown size, is used for wrapping
ing lamp glasses, wrapping up tlowers, etc.
For firelighting purposes pieces of twisted paper can be used instead of tirewood. These
are made about the same sizc as the ordinary sticks, and sometimcs bent or even doubled up to suit the requirements of the grate. When properly twisted they burn slowly, giving out a strong heat, and are effictive in kindling coal. In addition these pieces of twisted paper are economical.

Paper, especially coloured ciêpe paper, can be used for decorative purposes in a variety of ways. Artilicial Howers and Christnas decorations can be made from it. See Artilicial Flowers; Candleshade: Christmas Notepaper ; Papier Mâché

PAPER BAG COOKERY. The main principle of this system of cooling is to enclose the food in a greascprool, airtight paper bag, and place it on the wire grid of an oven or on a trivet. It is an econornical method of cooking, as less heat is required in tlie oven than when cooking is done by the more usual means. The greaseproof paper has the effect also of retaining all the natural juices in the food, thus rendering it more nourishing and digestible

Special bags are sold for cooking purposes A bag that is at all damaged should never be used. Before the food is put into the bags they must be well greased inside with butter, lard, or olive oil. Any projecting edges of the food, meat or fish bones that might tear the bag, must be removed. Small fish, fillets of fish, cutlets, chops and steaks can be cooked in the oven in paper bags. Brush over the fish or ment with oiled dripping or butter, scason it with pepper and salt, and slip it into the well-greased paper bags. Place these on the grid of thic oven, which should be hot, turn down the heat alter 5 min., and in 15 to 20 min they will be cooked

PAPER ENAMEL. The name is given to brands of prepared enamel intended for application to prier. A typical use is in the enamelling of a moulded paper ceiling, the enamel imparting a pleasing finish and at the same time making it durable and damp resisting. See Enamelling.

## Paperhanging for Walls and Ceilings

## Practical Instructions on the Re-decoration of Rooms

## This aricle helongs to the important proup that deal with the decoration of the house, among these heing Colour; Dado: Decoration; Distcmper; Enamel; Paint; Panelling; Wallpaper. See also the articles on the various rooms, e.g. Bathroom; Bedroom; Dining Room; Klichen

Paperhanging is the process of covering the but bright colours and deep shades have surface of wall or ceiling with paper manu- definite character and use. Bright yellow factured for the purpose, applied with the aid and orange can be employed for hall and of $a$ suitable adhesive. The tools necessary staircase; amber, maize and golden tints for are a large pair of scissors with blades about sitting room, lounge or dining room. Browns 7 in. long; a large paste brush; a brush and greens are also in lavour for dining rooms with long bristles closely set into the back, Mottled effects resembling vellum and old which is also its bandle, used for smoothing parchment are very decorative.

Choosing Paper. When selecting paper the purpose or use of the room should be given first consideration, and the aspect is of scarcely less importance. Warm tints, such as yellow, brown, and shades of red are helpful in north and east rooms. Blue and grey should be reserved for rooms with southerly aspects. Special types of paper are made for particular purposes. White grounds with "satinette" prints aro made for ceilings, also embossed papers. Some of these with definitely geometrical patterns are also useful for dado decoration. Bathroom papers should be either varnished or of the " sanitary" type. The latter is printed with an oil medium, so that the colour is unaffected by moisture. The most satisfactory treatment for bath. room walls is, however, to hang an unvarnished paper and apply the varnish after it is hung. By so doing the joins of the paper are sealed Two coats of size must be given hefore varnishing.

Quantity of Paper Needed. To estimate the quantity required to cover the walls of a room add the total length of the room to the
width, multiply by twice the height, and divide this total by the area of one piece of paper in square feet, which may be taken as approximately 60 sq . ft. The result is the number of picoes required. When measuring the room, include the window openings, fire place, and doors, as in practice it is found that by including them in the whole area it allows for outting and waste in the paper. The following table gives the number of pieces required for a room, provided the height to cornice and total feet run in inches round the walls are known.

|  | Height in feet from Cornico to Skirting |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 71 | 8 | 81 | 0 | 01 | 10 | 101 | 11 | 111 |
| 29 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| 32 | 4 | 4 | 5 | b | 5 | 5 | 5 | 6 | 6 |
| 80 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 |
| 40 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 7 | 8 |
| 44 | 6 | 6 | ${ }_{6}$ | 7 | 7 | 7 | 8 | 8 | 8 |
| 48 | c | 0 | 7 | 7 | 7 | 8 | 8 | - | ${ }^{8}$ |
| 52 | 7 | 8 | 7 | 8 | 8 | 8 | ${ }^{9}$ | ${ }^{9}$ | 10 |
| 56 | 7 | 8 | 8 | 8 | 9 | 9 | 10 | 10 | 10 |
| 60 | 8 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 |
| 04 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 | 12 |
| 08 | 8 | 0 | 9 | 10 | 10 | 11 | 12 | 12 | 13 |
| 72 | 9 | 10 | 10 | 11 | 11 | 1: | 12 | 13 | 13 |
| 76 | ${ }^{10}$ | 10 | 10 | 11 | 12 | 12 | 13 | 13 | 14 |
| 90 | 10 | 11 | 11 | 12 | 19 | 1.3 | 14 | 14 | 15 |
| 84 | 111 | 11 | 12 | 12 | 19 | 14 | 14 | 16 | 16 |
| 88 | 11 | 12 | 12 | 18 | 13 | 14 | 15 | 16 | 10 |
| 92 | 11 | 12 | 13 | 18 | 14 | 15 | 111 | 16 | 17 |
| 96 | 12 | 18 | 18 | 14 | 15 | 15 | 18 | 17 | 18 |
| 100 | 12 | 13 | 14 | 14 | 15 | 16 | 17 | 18 | 18 |

This scale is for papers of English measure. ments ( 21 in . by 111 yd. approximately). For papers 7t yards long 28 in . wide add to the above table in the proportion of 1 in 7.

In dealing with ceilings, multiply length by breadth in feet and divide by 54 . The result will give approximately the number of pieces required.

Stripping Old Paper. Old paper should be stripped before new is hung, not only for hygienic reasons, but also because paste perishes in the course of time and the applica. tion of new paper is likely to raise blisters which cannot be smoothed out. If, for some reason, old paper cannot be removed, all edges and angles of walls should be carefully examined and loose places pasted down. When dry, s cost of size should be given over the whole surface. It is advisable to obtain the best powder size and mix according to the printed instruotions. Size should be diluted so that when cold it will set in a weak jelly. It is better to apply two coats of weak size than one strong coat.
Old paper is removed by saturation with water until it has penetrated to the plaster. The stripping knife is then used to releasc the paper, and must be handled so that the points do not damage the plaster. The vigorous use of the knife is unnecessary. It is better to apply more water. A large distemper brush is best for wetting the paper. Commence at the top of the wall, working right and left as far as the arm can reach, and proceed downward. A sponge wrung out in clean water must be used frequently to abeorb the water which will collect at the skirting. After stripping, the wall should be sponged with clean water, and when dry a coat of sive should be given.

Papering New Walls. New walls are sometimes distempered and left for a while before papering, on account of the risk of detriment to the colours if papered before the walls are properly matured. If, however, the risk of discoloration is accepted it is wise to hang inexpensive papers at first, choosing those in which shades of maize and yellow predominate, and avoiding blue and green as much as possible. Light grounds with well covered patterns are very serviceablo.
If possible a " lining" paper should be bung as a preparatory whenever good quality
paners are to be used. Lining gives a uniform surface which onables good joins in the finished work to be made more easily. Lining paper is of distinct value on outside walls, especially if their surface is of hard and non-absorbent naturc. On such walls in cold and damp weather moisture readily condenses inside and is frequently the cause of paper loosening nt the edges.

Before hanging, wallpaper needs to be trimmed. It is sometimes possible to have this done by machine when purchased, but it is not difficult to accomplish by hand. Take a low seat and, with the legs extended, unroll a piece of paper, holding the end in the left hand and letting the roll rest on the feet Operate the scissors with the right hand whilst the left rolls up the paper on the lap. The paper must be trimmed to the edge of the pattern, or to the line which on many papers is printed to ensure accuracy (Fig. I).
Making Paste. Good paste powder, to be mixed with either hot or cold water, can be procured in convenient size packages, but the best paste, however, is home-made. To $3 \frac{1}{2} \mathrm{lb}$. of beat household flour add oaly aufficient cold water to make a stiff batter. Mix in a clean pail and add 1 gallon of boiling water in which two small tablespoonfuls of ground alum have been boiled. The batter should be well beaten up as the water is added, and the paste should be free from lumps or it will need straining through butter muslin. When the paste is cool cover the top with a little cold water to prevent a crust forming. and then leave it to get cold. This paste should be of a stiff consistonoy, requiring thinning with cold water before use.

Paste should not be used thinner than can be easily spread A stout paper can be pasted with thicker paste than one of less substance. Heavily embossed papers may require paste to which a little glue has been added. The glue should be made in the usual way and poured on to the paste whilst hot, mixing thoroughly. Alum must be omitted from paste if the latter is to be used for papers with any "gold" or metal in their printing. Washing soda must be added to the water in. stead, but not more than $\ddagger \mathrm{oz}$. for 1 lb . of flour.

Cutting Paper to Length. Before prasting, the rolls must be cut into the required length. If the paper is plain or does not require special matching at the edges, this length will be the vertical dimension of the space to be papered plus six inches, this for trimming at top and bottom (i.e. 3 in . at each end).

If the paper is patterned further consideration is necessary. The design must be examined and choice made of a suitable place for finishing at the top so that the details of the pattern shall be as complete as possible. It is wise to select the most important details and choose a line ncross the width so that these shall not be mutilated. At the bottom of the wall the line is not so important, but with care it is often possible to arrange that the lengths are finished so that both top and bottom are pleasantly completed. Three inches beyond the line selected for finishing at top and bottom must he allowed for trimming.

Always examine the edges of rolls before trimming, to see whether there are marks indicating where the pattern joins. These joining points are given in cases where any difficulty might arise, also arrows showing the correct way up.

Pattern Repeats. In large patterns it may be that the important features do not repeat horizontally on each length but on alternate lengths. This characteristic constitutes a drop" repest, and in such cases the second length requires consideration at top and bottom in the same manner as the first. It is advis able before cutting to unroll three trimmerl rolls on the floor, joining up the pattern and
laying rods at top and botton, the distance between the rods being the vertical dimensions to be papered. Thus the choice of line for finishing on both lengths is casily made.

To take the curl out of the roll of paper unroll about 24 in . and let it drop over the edge of the table and back to it. Hold the opened roll in the left hand on the edge, with the right hand lightly pressing on the face of the paper. Then witn the left draw the paper upward between the right hand and table edge. Repeat the operation two or three times and the most obstinate curl will be flattened.
Pasting the Paper. When the line for cutting and dimension are decided, the paper can be unrolled on the table face upwand, with the uncurled end dropping over one end of the table, the dimension marked off and the required length cut. Repeat this until the roll is finished. Then turn the 'ongths face downward, any surplus beyond the ends of the table being equally distributed right and left. P'ush all the lengths about 6 in . away from the front edge of the table, then bring the top length toward the front, so that its front edge is quite level with the front edge of the table, and at the same time, with the right hand, pull the length so that its left end is rosting on the table ready for pasting. Work the paste from the centre towards the edges, completing the left and farther edge before the front edge. The paper should be lifted between finger and thumb (as shown in Fig. 2), while the edges are pasted, so that the paste does not get on the face of the paper.
When rather more than half the length is pasted it must be folded over, pasted surface to pasted surface, being held as shown in Fig. 3, edges meeting exactly and lightly pressed with the hand. This folded picce can be folded again and the folds drawn to the left end of the table so that the unpasted right end can be dealt with in the same manner.
The right end should be folded over with the extreme end overlapping about an inch and then turned back, so that it can be gripped when releasing the folds for hanging. The extreme end of the left fold should be turned up in the same way, but no pasted surface must be left exposed between these two ends. When complete, the pasted length can be lifted off the table and placed on one side whilst another length is pasted, unless the paper is thin or absorbent, when it may be necessary to hang immediately after pasting. Avoid the use of sloppy paste. Enough paste must be applied so that when the paper is folded over the surfaces will just slide casily under slight hand-pressure to bring the edges together. Heavy papers may require to be "freshened up" with a second applica. tion of paste. It is no use to attempt to hang paper before it has become supple ; this does not mean saturated, however. A little experience will quickly enlighten the worker on these points, and the procerses themselves which, to the reader, may appear claborate will be found simple in practice.
Where to Begin the Work. Paperhanging should be begun at an angle of the room nearest to the light. If there are two important windows, start work centrally between them. working away to right and left. In this way succeeding lengths on each side are laid towards the Jight. The work should be finished in an angle where any join would be inconspicuous
Presuming that the first length of paper is to be hung at the angle of a wall, commence by marking off the width of the paper from the angle at a point at about half the height to be papered. Using the plumb bob and line as a guide, mark several points above and below the centre so that a vertical line can be
male by using a straight edge. This line is toward the centre, upward and dowinward to be the guide in hanging the first length. When the paper is smoothed out hold the If a long flank is to he hung, succeeding surplus top cdge with the left hand and press lengths should br tested with the plumb linc and corrections made, if necessary. It is advisable to plumb a line at every angle. as walls are rarely as accurate as the paperhanger's joins need to be.

When ready for hanging take a length of the folded paper on the left forearm, the top nearer to the body (Fig. 4), mount the steps (which should be placed so that they are opened out in the direction away from the space to be papered), and when sufficiently high casily to reach the top, take the near loosc end between finger and thumb of each hand and let the length fall gently, opening the pasted surfaces in falling Apply the top of the length lightly against the top of the !ine. allowing the $3-\mathrm{in}$. surplus for trimming to liang over. With the left hand holding the left top. use the right hand to adjust the edge of the paper against the line. Run the liand lightly up and down the edge, then use the smooth.
 or picture rail, and then with the back of the scissors, or a soft pencil, run a line along where the paper has to he cut off. Pull the paper away sufficiently to enable the scissors to be accurately handled, and when cut replace the end and fit down, making a good finish (Fig. 5).

The lower portion of the paper has to be dealt with in similar manner. Fig. 6 shows how the lower end is taken between finger and thumb and opened out The bottom edge is finished the same way as the top. Use the padderl roller lightly to get rid of blisters In the case of embossed papers use the sinoothing brush only for this.

The eecond 'ength must be hung to fit closely up to the first (Fig. 7). The position of the steps must be reversed for this length, as the adjustment is to be made in the opposite direction in relation to the plumbed line. When several lengths have been hung the edges should be rolled down, but not immediately after hanging.

How to Paper Ceilings Ceilings are papered in the same way, but the paper has to be folded in a number of short folds after pasting. These are
made under one another in succossion until the length is in a neat pile of folds which must he turned upside down, and can be held on a roll of paper in the left hiand, whilst the right opens out the folds, adjusts and brushes the paper on the ceiling.

Papers in high relief require to be well pasted, and need time for the paste to render them applicable. The raised pattern shonld be carefully guarded, and rollers should not be used except on flat surfaces which adhere to the wall or ceiling. Manufacturers of these relicf matcrials issue special instructions for hanging, and these should be carefully observed.

Borders are frequently used with un patterned papers, and present no difficulty in hanging, cxcept that they must to be placed with accuracy so that paste is not transferred to the paper which the border docs not cover Borders which have a "cut-out" edgc are generally supplied perforated in the roll, and should be pasted before tearing apart Any waste lengths of paper are useful for laying borders on, face downward, for pasting. Use fairly stiff paste for this purposc

Panels. Panelling with borders is a very effective method of decoration and adds im portance to the appearance of a room Spccial borders ternied "stilcs" are made for the purpose and can he obtained in several widths, the narrower being used for bedroom and the wider for reception rooms. Setting out requires to be carefully done, and the proportion of the panels in the relation of height to width is important. A rectangular panel does not look well if the width is more than three quarters its height. A square panel is satisfactory, as is also a double square. Very fine examples of panelling are frequently to be found in Georgian and Adam houses.

General Hints. Old distemper should be removed by scraping and washing before papering. Walls that have been painted should be cut down with coarse glass


Paperhanging. Fig. 1. Trimming edge with scissors. Fir. 2. Pastlng. Edre lifted to prevent paste retting on face of paper. Fir. 3. Folding pasted paper, edges meeting. Left end folded over with turn-up lorgripping. Fig. 4. Carrying paper on the forearm, top end toward body. Fir. 5. Finishing the top. Paper is pressed against picture rail, surplos being held down while a line is marked. Paper is then drawn down slightly, cut, and replaced. Fig. 6. Loosening lower fold. Turned back edge underneath is drawn gently downward ontil fold is ondone. Fir. 7. Making butt ointh the left the edre is adjusted.
light. Paper is held by right hand so that right side does not quite tolich the wall, whilst with the left the edre
from photonraplis apeciall! laken for this work bn arrannement wilh Arthur Sanderson and Sons, Lid
paper, treated with clearcole and then lined, otherwise the paper will not adhere but open at the joins If a straight edge is not available, lines can be "snapped" on a wall by the use of a chalked line, this being a fine cord covered with coloured chalk. Fasten the line with pins at the ends or otherwise hold it tautly in position, lift the centre and let it snap, when a chalk impression will be left on the wall. Printed instructions for hanging papers are frequently enclosed in rolls by the makers Such instructions should be carefully followed.

PAPER KNIFE. Used for cutting paper and opening envelopes, ctc., the paper knife is obtainable in a large number of shapes and sizes in gold, silver, ivory, mother of pearl, bone, wood and other materials. Small paper knives can be madc from old piano keys, which are often discarded as useless a: a piano repairer's. If the ivory or composition is scraped with broken pieces of glass to clean and level the surface. the edges filed to shape and smoothed with glass paper, they may be polished with French chalk mixed to a paste with sweet oil, applied with a nail brush and finished with a soft rag.

The fretworker can exercise his craft to advantage in cutting out shapes both in wood and metal, utilizing initials and monograms as ornamentation for the handle. Boxwood, sycainore, and ehony are all useful for this purpose. The design is drawn out on a shect of paper and filled in with ink, afterwards being pasted on the wood. In working ou: suitable designs, especially in lettering, ties must be provided to keep the design together.

The metalworker can utilizo copper, brass, and silver, working out flat forms with pierced, engraved, etched, or repoussé ornamentation The metal may be left quite smooth and bright, polished up with pumice powder applied with a hard brush, and then lacquered

PAPER NEGATIVE. Negatives on sensitized paper instead of film or glass have their uses, and special sensitized pajer of various speeds can be obtained from the photographic dealers. Exposure and development are on normal lines, but the developer must be a clean, non-staining one, such as metol-hydroquinone, azol, kotol, etc.

The chief use for paper negatives is in the production of enlarged negatives, for producing large prints by the platinotype or carbon processca, as well as for obtaining a considerable number of copies of an ordinary bromide enlargement. A positive or transparency is required for each of these purposes, and can be made by contact from the original negative on a slow-speed plate, the method being the samc as in the production of a nositive transparency for a lantern slide (q.v.). When this transparency has been obtained, it is placed in the enlarging lantern, and the necessary enlargement made on ordinary thin bromide paper or the special negative paper, the latter showing less grain. With the enlarged paper negative so obtained as many large prints as arc required can be made by contact, or the carbon or platinotype processes.

Paper negatives offer special facilities for easy, broad retouching. If for instance in a landscape it is desirable to strengthen the high lights (the parts that print white), it is only necessary to work with a pencil on the back of the paper negative. Similarly, if a light background is required to a portrait, appropriate and judicious working on the back of the paper negative will produce the effect in the positive print, without betraying the fact that retouching had been done. Alternatively strengthening of the shadows can be done by ordinary methods of retouching on the positive transparency before the print is taken of the enlarged negative. See Carbon Printing; Developing; Enlarging; Negative; Platinotype ; Printing.

## Papier Mâché: Plain and Decorated

How to Make Useful Household Pieces

Additional information on the subject of decorating papier mliché articles can be found under the headings Italian Renaissance Work; Laequer Work: Pattern Printing; Stencilling. Sec also Artificial Flowers: Paste Tray: Vietorian Style

Papier mâche is manufactured from highly water until it is thoroughly soaked through,
compressed paper pulp moulded to shape during the pocess of making and then painted and varnished or enamelled. The commercial articles are machine made, but papier mâchí can be made at home Vases, bulb bowls, trays, fire screens, powder bowls, wasto paper tubs, and washing.up basins can be constructed from materials which cost very !ittle bcyond the time and skill expended on them

Although used for the simplest objects, this material affords a light and excellent basic composition for painting and lacquer work and has becn decorated for centuries by artist craftsmen of many nations. Our first illustration shows a beautitul example of must ove


a. Persian papier mâché box with an exquisitely painted design. In the 17 th contury this material was enployed for lovely Persian bookcovers, and much early English lacquer work was done on papier mâché trays.

Moulding the Shape. For a first attempt a bowl or tray should le made, as the method is simple. Procurc a bowl of china or metal to serve as a mould. 'Take any old newspapers or magazines and tear them into irregular shaped pieces, the size depending on whether a small or large object is being made. On no account must the proper he cut; tearing gives it a bevelled cdge, which ensures a bettor fit when pasted on to the mould Leave the paper in and meanwhilc prepare soine ordinary flour paste, to which a litile alum is added, as this minkes the paste more adhesive It should not be very thick, but should be of a semiliquid consistency.

Coat the inside of the bowl with solt soap, to prevent the paper sticking to it. Then take the paper from the water, dipping one piece at a time in the paste and drawing it through the fingers to make sure the paste is evenly distributed. Spread the paper over the lottom of the bowl Repent the process until the whole of the iuterior is evenly covered; each piece must overlap slightly so that they ndhere to each other. Allow the paper to extend from $1 \frac{1}{2} \mathrm{in}$. to 2 in beyond the rim of the bowl, and continue laying on the pieces of paper until the layers are $\frac{1}{2}-\frac{1}{8}$ in deep.

Large objects require to be thicker, whilst small bowls need not be more than $\frac{1}{10}$ in thick. Now place the bow! before a bright firc or in $a$ moderato oven until thoroughly dry l)raw a pencil linc round the rim of the inould on to what will be the outside of the new bowl. Remove the mould, and with a sharp keyhole saw or strong scissors cut of the edge along the pencil line. Rub down this edge as well as the whole of the interior and exterior of the papier mâché bowl, first with a medium, then with a fine glass paper. Number 00 is best for the final rubbing down. To finish, size, paint, and varnish the object. A bowl or anything that is being used for a mould can be equally well coated with the paper from the outside as shown in Fig. 2. This method is necessitated when the mould in use is vase-shaped

For a washing-up bowl, such as that illustrated in Fig. 3. two or threc coats of ordinary white enanel arc most suitable for the intcrior, while blue, grey, or brown can be used for the outside. A niarbled or mottled effect is ol. tained as described in page 681. Vcry attrac. tive and decorative bull bowls can be made by


Papier Miclé Fig. 2. The paper is torn into irregular pieces, soaked in water, then covered ovenly with paste ard spread, each piece overlapping the other, on the surface of the bowl or other mould


Papier Mâché. Pig. 8. Bowl which lessens the risk of breakage when
painting the inside in some bright colour that contrasta with the outside, such as orange and black, primurose or grey and apple green. A still more artistic effect is obtained by lacquer decoration in colours as well as gold, bronze, and silver A fruit howl lacquered hlack with a design of gold or merely lined with gold is uncommon, and goes well with achemes where a brilliant colour would be out of keeping. Stencils can be employed with good results, and so can gesso decoration. A good hard varnish must he used in the case of bulb bowls to withatand the damp from the fibre.

A tray or any article which tapers towards the bottom can be made in the way described. One like that illustrated in Fig. 3 can be modelled on an old tin tray and enamelled in a bright colour.

Should there be no object handy that can be used for a mould, a lump of modelling clay may be shaped into the form desired. A simple method is to roll out the clay on a board in the same way as pastry to a thickness of 1 in., and cut it out into circular pieces vary. ing from the amallest to the largest diameter. Place one on to the board and huild up the mould with the rounds in required order of size, filling in the steps between each layer with clay If the mould is not going to be used immedi. ately, keep it covered with damp cloths to prevent cracks appearing. Well cover the clay model with soft soap and alao the hoard round it for about 4 in., or the edge of the paper will stick to the hoard. The procedure is then the same as before.
Any skilled worker who wishes to produce narrownecked vases, jugs, etc.. in papier máché, can first make 2 models in clay, each one a longitudinal sertion of the object. The edges of the papier mâché, after the preliminary moulding has been completed as already de. scribed, are cut absolutely true and then glued together; when the glue is quite set 2 or 3 coatings of paper are applied to the outside of the vase or jug. These last coats of paper must not be dried artificially, but merely left in a diy room, or the ohject will warp and get
washing op; and a tray ensmelled in bright colonrs Courlesy of Staines Kitclien Equipment

Fig. 4. Beautiful early 18th century example of a papier mathed table top.
Fig. 4. Beautiful early 19th century example of a papier mathé table top.
decorated with shell, bronze and colour
 decrath with brane and
out of shape, as it has no mould inside.
To make a waste paper tub or basket from papier mâché is an casier task. An old size tin, or any other round tin of suitable dimensions, will make a hood model. Failing a tin, a piece of stout cardboard can be rolled to fit a circular bottom, then glued and allowed to harden. Plastioine is used to round off the join on the outside so that anycracks are eliminsted in the finished article and it is given a slightly moulded base. The procedure is the same sa for the bowl in Fig 2. Sperial attention must be paid to the rubbing down, as if the surface is large any rough ness will be very noticeable. The old papier mâché workera used pumicc-stone for the final rubbing down, and then polished the work Inboriously with a chamois leather. This was worth while, as it produced an excellent surface for decoration.
Flower, sporting or other prints form excellent panels for decorating such irticles after the final enamelling is completed. In order to cnsure better wear the whole aticle is varnished after the print or if prcferred. a hand-coloured panel has been pasted on and out lined with black. The top is given a finish of gold or silver bronze paint outlined with black. Mottled paper may be used to line the hasket or it may be finished in enumel. Chinese lacquer designs are particularly suitable for a handsome waste-paper tub. Cheap enamel diahes and sugar basins make serviceable moulds for small trays and lowls

Decorated Panels. A papier mâché panel for a table top or fire screen is madc on any fat tin or metal plate If really good decoration is intended by a skilled amateur, the old method of making the panel may be followed. An odd length of cheap mat-surfaced wallpaper is quite a satisfactory substitute for the apecial paper that was used. Ahout 12 sheets should be cut out of the desired size for the panel.
The metal plate is oiled before the first damped sheet is laid and covered with paste and alum. The old workers used a mixture of
glue, flour and resin Another sheet was laid over perfectly flat and then plate and sheets were placed in a cool oven to dry. The surface was then rubbed down with pumice-stone to ensure amonthness before the next sheet was spplied. All the sheets were thus applied and dried in the oven hefore the panel was completerl and atrong enough for a table top or tray. To form a moulderl edge the paper would be taken over the edge of the metal shaped hy hand and cut off with keyhole saw
In some of the beautiful floral designs of the first half of the 19th century pearl was used, as in the table top shown in Fig. 4. In others large flowers and leaves were painted in bronze colours and gold. After 1845 oil colours and bronze colours were utilized in the same designs. Pearl was atill employed, but was leas scen sa the more gorgeously coloured designa became popular.
The pearl effect was gained by use of thin layers of nautilus shcils and these were stuck on to the surface of the papier mâche with gluc. In modern papier mâché decoration the thinnest ahells ohtainable for artificial flower making can be specially cut and coloured with spirit stains sold for the purpose. Fish scales can also be used. Very rich effects can be ohtained by use of such shells or scales for portions of flowers with oil and bronze colours, for other portions and for leaves, when carrying out a lloral design for a pancl
Care of Papier Mâché. Old pieces of decorated prpier mâché require careful cleaning. Sometimes a beautiful piece has been mo neglected that the original colour and lustre seem quite lost. A soft finnnel, damped with a very little pure curd soap on it is the best cleansing agent. When the dirt has been removed the papier mâché must be gently dried with a flannelette duster, a little furni ture cream put on with the tip of a finger and the surface immediately polished with an old niece of softest silk Valuable decorsted papier mâché articles should not lie exposed to damp, and should liquid be spilt on tray or table top it should be dried off at once
PAPILLON. This toy dog is popularly known as the butterfly dog owing to the sup posed resemblance of the ears to the winge of a butterfly. They were introduced into England during 1923. The papillon has a very profuse coat of a silky texture, and the large ears can be well feathered. It is a loosely coupled little dog with a wedge-shaped head. The bolly colour is white and the markings either lemon, brindle, brown or black. If thesc are evenly distributed it gives a better appearance to the dog. The smaller they are the more highly esteemed, providing the dog has quality in otlier respents. The Papillon Club has done a great deal for this breed. See Dog.

PAPYRUS. The ornainental grass of Egypt that is known as papyrus requires aquatic treatment in a heated glasshouse. It attains a height of about 6 ft ., and has dark green leaves. Cultivation is in pots of loam, leaf-mould and sand, plunged in tubs or tanks of water. Propagation is by division of the root stock. The name papyrus is applied to the writing material made from the stem, and to a manuscript written on this substance.

PARADISE: In Budding. This is the name of a variety of crab which is used as a stock on which to bud apple trees, particularly those grown in the form of pyramids, low bushes, or trained trees. It is known as the dwarfing stock because it induces a dwarf, aturdy and early-maturing growth in the applea budded on it. The true broad-leaved paradise stock is recommended for budding the trees. See Apple; Grafting.

PARADISIA. This hardy perennial grows 2 to 3 ft . high, and has grass-like leaves and white llowers in early summer. Paraclisia
lilinstrum (Anthericum lilinstrum) flourishes in ordinary garden soil. It is known as St. Bruno's lily.

PARAFFIN. The name of paraffin is a pplied to a whole series of organic substances, which includes marsh gas, naphtha, henzine, petrol, petroleum lamp oil, heavier lubricating oils, vaseline petrolatum, cosmoline, adepsine, and the hard paraffin of which candles are made.

Paraffin oil, which is also known as kerosene, is chicfly used for illuminating and heating purposes. The thinness of the oil gives it the peculiar property of spreading or creeping, so that it is important when filling lamps to avoid excess of oil. After filling a lamp all traces of oil on the outside of the container should be wiped off, as otherwise the unpleasant smell of paraffin will be given off when the lamp is lighted.

Heavy paraflin oil forms the base of lubricants for sewing machines and lawn-mowers, and a good deal of petrol is made from paraffin Floor-sweeping compound is made by mixing 1 pint of paraffin oil with 10 lb . of dry sawdust. This is used for hardwood floors, a little being eprinkled on the floor before it is swept. See Burner ; Lamp; Oil, etc.

Parafin Wax. The white solid that is obtained as a residuc in the purification of petroleum resembles white beeswax, for which it is a cheap substitute. The chief commerical use is in the manufacture of candles. As a lloor polish, paraffin wax is made into a paste with either oil of turpentine or a mixture of equal parts of paraffin oil and benzine. Paraflim wax has another important application for electrical insulating.
Some Medical Uses. In therapeutics liquid, soft and hard paraffin and paraffin oil or
petroleum are utilized. It should be noted that liquid paraffin is quite a different thing from paraffin oil. Liquid paraffin is used internally as a laxntive and also in the form of petroleum emulsion to aid assimilation of food. It is often used to spray the pliarynx and the nose. Soft paraflin or vaseline is an excellent basis for ointments. Hard paraffin is sometimes injected under the skin of the nose to correct deformities. Paraffin oil is applied to the head to kill lice.

PARALLEL BARS. One of the most commonly used of all gymnnastic apparatus, parallel bars are subjected to considerable strain, and must be strongly made. The framework may be of deal or pitch pine, but the bars are always of straight-grained ash, and in the best apparatus they have a core of steel. A satisfactory pair of bars (Fig. 1) can be made in the following manner with ordinary deal and two lengths of selected ash. The width between the centres of the bars for liome use ahould be 2 ft., but they can be wider apart if required. The total height is 4 ft ., with fixed bare which are 8 ft . long.

The bottom framework is made from 5 in by 3 in. wood, planed smoot $h$ and true to these sizes; but 6 in . by 4 in . deal can be used, and when passed through the planing machine will not be much larger than $5 \frac{1}{2}$ in. by $3 \frac{1}{2}$ in Two grooves marked out on the long pieces are the exact width of the wood, and 12 in from each end. Gauge lines are marked halfway down, and the waste removed with a chisel (Fig. 2). The
cross pieces are 4 ft . long;
the grooves are the same width and depth as the others, and $0 \frac{1}{2}$ in. from each end. The ends of all four pieces should be rounded.

The four uprights are tenoned into the base, and are cut to 4 ft . from 5 in . by 3 in . wood. The ends are marked down 3 in . for the tenon; then 1 in . from the edges and $\frac{1}{2}$ in. from the sides, as shown at A , Fig. 3. The tenons are then sawn down as shown at B. Corre. sponding mortises are cut in the bottom framing as indicated at Fig. 4; an enlarged view of one corner is shown at C. Each of the uprights is now tapered, lines heing marked as shown at D, Fig. 5, and anwn down; the top is hollowed, $E$; the sides planed, $F$, and finally the top cornery are chamfered, $G$.

The uprights are glued and wedged in position as shown in the section at Fig. 6 leaving the 8 ft . ash poles to fit in position First smooth the wood carefully with glass paper, and then provide eight $4 \frac{1}{2}$ in. ateel ribbed brackets and attach them to the underside of poles and sides of uprights with round-headed screws. The uprights are also strengthened with large steel brackets, 10 in . by 14 in . Owing to the sides being tapered they must be let into the wood as shown at Fig. 7. The bottom can be boarded in by nailing on 2 in. by 1 in . strips on the inside of the long hotton lengths, and then fitting 1 ft .7 in . lengths of I in. Hoor hoarding bet ween. The framework may be painted or varnished, but the bars themselves are left clean from the glasspaper

PARALYSIS: Its Causes. Paralysis is the loss of power to contract the voluntary muscles. There are two sharply divided groups namely, paralyses which are hysterical and those which are of organic origin. Hysterical paralysis may follow a physical or a mental shock. The physical cause most frequently responsible has been a railw'ay accident. Mental causes include disappointments in love, grief, fright, anxiety, overwork, prolonged strain, etc. In a large number of cases, however, these influences are merely the precipitating factors, the condition being due fundamentally to some psychic influence.

Hysterical paralysis differs from organic paralysis in that in theory every case is curable and in practice the great majority are cured. this being effected by purely psychical methods
Organic paralysis is duc to injury or disease of the nerves or brain. A common cause is apoplexy or stroke, due to rupture of a blood vesal in the brain, with resulting damage to the nerve cells in the neighbourhood. A familiar form is locomotor ataxia, a condition characterized in the early stage by inability to control the muscles, thus leading to an irregular jerky gait. Neuritis, or degeneration of the nerves, may result from prolonged alcoholism or chronic poisoning by lead or arsenic. Infantile paralysis is a condition, seen most often in young children, in which paralysis of one or more limbs supervenes The treatment for organic paralysis varics very much with the cause. When due to detinite disease, the treatment must be directed towards combating that elisease. In acute cases the patient should be kept in bed, and care must be taken in preventing the formation of bed sores (q.v.).
Paralysis of the Insane. This disease is due to inflammatory and degenerative changes in the brain, by reason of which both mental disorder and paralysis of muscles occur. It occurs mostly in middle life among men who have overtaxed their brains or put a prolonged strain on the nervous system. Injury to the head, abuse of alcohol, and worry favour the onset of the disease.

In a majority of cases it is advisable to remove the patient to a mental hospital, and very often this should be done early in the disease, both in the interests of the family and of the patient himself. See Infantile Paralysis ; Insanity ; Locomotor Ataxia.

PARAMIDOPEENOL. The photographic developers of the paramidophenol class are very clean and stainless in working and keep well in a single stock solution, needing only the addition of water before use. They are effective for all kinds of photographic work. The best known exainples are a\%ob, kodol, rodinal, and rytol. Taking azol as an example, the following are the quantities to be used:

|  | A 8.01 | Potassium Uromide $10 \%$ | $\left\lvert\, \begin{gathered} \text { Water } \\ \text { to } \\ \text { make } \end{gathered}\right.$ |
| :---: | :---: | :---: | :---: |
| Plates and films (normal develop. ment) | 20 drops | - | 10 \% |
| Gaillaht papers (rolt or normal prades) | 40 | 2 to 5 drope | 1 |
| Do (vigromue qrade) Rromlde papers | 40 15 | 10 |  |

The Watkins factor for development with azol is 30 for average contrast. The detailed tables for development by time and tempera ture for all the plates and films on the market are publisherl hy the makers of the azol developer See Developing.

PARAPET. A low wall or parapet is often used to protect gutters and roofs of houses, and it should be periodically examined to see that it is perfectly sound, and not liable to crash to the ground. A consideration with the roof and guttering, when $n$ parapet forms part of the building, is that the mortar is liable to weather very rapidly, and the result is that a heavy fall of snow or other cause may result in the parapet being entirely demolished. A preventive of this is to rake the mortar joints, and then to re-point them with cement mortar. The parapet illustrated above is shown with simple capping. In many types of building a parapet of stone or cement is employed as a decorative feature. These weather rapidly owing to their exposed position and the smoke from adjacent chimneys, and can be treated effectively with proprietary brands of waterproofing materials.

A simple treatment available to the ninateur is the use of a cement wash composed of equal portions of Portland cement and sand, brushing it on with an old stiff hrush. Where the parapet is painted, it requires to be given a fresh cont at least once in every three yeara with a thoroughly durable and first-grade paint of outdoor quality. See Wall.

PARCEL : How to Pack. If a parcel must be made of several items of divergent si\%es and shapes, the only safe plan is to procure a cardboard or wonden box large enough to take them all. Any creviecs should be tightly packed with n stuffing of crumpled newspaper to prevent the contents from inoving. Breakable goods such as bottles of medicine should be wrapped in corrugated cardboard before being put into paper, the outside of the parcel being marked "G!nsa, with care."

A parcel which is of considerable weight or which is being sent a long distance, should be wrapped in paper, firmly tied with plenty of string and addressed. Then the whole process should be repeated. The second wrapping gives extra solidity and strength, and the second addressing provides for the accident of one being torn off in transit. Photographs should be sent in the special wrappers, backed with cardboard, which are sold for the purpose ; failing these, the parcel or envelope containing them should be stiffened with a sheet or two of cardboard.

Book Parcels. A book should be placed in such a way that the edges of the cover cannot suffer. One method is to enclose it, as shown in Fig. 1, between tivo boards, cut $\frac{1}{3}$. larger on every side than the book covers, and to tie this up carefully before wrapping in


Parapet of brickwork built on a house for the porpose of protecting rool and gutters
strong paper. Another method is to use corrugated card board

This is cut roughly crose-shaped, as shown in l-ig. 2, the hroad centre-picce folding over the spinc and front edges of the book, the narrower length protecting the upper and lower erlges. The corrugated side of the card. board is placed innerinost, and the cut edges must overlap those of the book. If packed in this way, however, it will not travel by book post, which demands open ends. If no cardhoard is available, a book can lie first wrapped in several thicknesses of newspaper.
String of suitable thickness should never be sparel, and it should be fastened tightly. Each parcel should he addressed very clearly, in full, and twice over. This may be done on the outer wrapping itself, if the paper is of a colour and surface to take ink well:


Parcel. How to nack a baok. 1. One method is to place it between boards before wrapping in paper 2 Corrupated cardboard cut to the shape required. Curbbard folded over. 4. Wranping in stout paper 5. One end tolded and strong string tled tightly. B. Finighed parcel calculated to dely rough postal treatment
otherwise labela, one stick on and one tie-on, should always be addressed on an accompanying tie-on lahel and not on the parcel itself, as the heavy stamping of the postmark if made on the parcel, may crush the contents Parcels intended for registration are not accepted for delivery by the post office unless every intersection and knotting of the string is sealed with sealing-wan Also, the outer paper wrapping or cardbnard box must be intact.

All these precautions apply with double barce to the sending of Christmas parcels, for at that season the mails are so crowded that they may receive rougher handling than usual. Gift parcels not intended to go through the post may be wrapped in gaily-designerd papers and tied with tinsel rihbons See Christmas; Packing : Postage

PARCEL POST. In Great Britain gouds, provided the parcel does not exceed 11 lb . in weight, can le sent to their destination through the post oflice. The parcel can be handed in at any post office, where it is weighed and stamped. In rural districts it can be handed to a postnian The chargea (1931) are

> Between 2 iin, a nud a ib). Md
> ketween 616 and 8 ll ., 1 smd
> Hefwen 8 ll . and I: ii ., is. 31

The parcel muat not exceed 3 fk , $\mathfrak{G}$ in in length, nor 6 ft in length and width combined ft should be marked parcel post and bear on it the name and adilress of the sender $A$ pircel can be registered at a cost of $2 d$ which payment carries with it the right to compensation for loss or damage up to $a$ naxinum of $\mathfrak{i} 5$. For 3 d compensation can

be obtained up to a maximum of $£ 20$, and every additional ld means an additional $£ 20$ for compensation up to a maximum of is 10 d . for $£ 400$ Compensation up to a limit of $£ 2$ will be given on unregistered parcels if the sender obtains a certificate when sending To secure compenation the parcel must be securcly packed, while it will not be paid for damage to egga and other very fragile articles

Parcela can also be sent to British possessions and to most foreign countries The maximum weight of the parcel that can be sent varies, but in no case does it excecel 22 lh . Parcela up to this weight can be sent to France. These parcela are subject to the ordinary custom duties The charges and regulations as to size vary, but the information can be obtained from any post office. Parcels sent to most countries can be insured. but not registered. The insurance is limited to $\mathbf{~} 400$, for which a payment of 5 s . 10 ot is necessary.
Parcels by Air. Parcels can be sent by air to foreign destinations under the same general conditions as if sent through the post in the ordinary way. They can be handed in at any post office that accepts parcels for abroad. A special blue air mail label must be nffixed to the address label of the parcel and to the relative despatch note, and the words air mail should be written conspicuously on the cover of the parcel. In addition to the more rapid transit, an air parcel is usually given a speedy clearance at the customs. The Post Office issues regularly nn air mail leaflet which gives full details about this кervice.
PARCHMENT, Made from the skins of sheep, goats, and other animals, parchment is used for book binding and illuminating, coarser kinds being used for drumheads, banjoes, and tambourines. It is prepared by freeing the akin from hair and flesh while it is attached to a stout wooden frame, aubsequent treatment being similar to that adopted for leather.
For the repair of musical instruments it is not necessary to use new material ; old deeds, which are often obtainable, are quite suitnble. For use in the panels of lamp shades, parchment may be made nearly transparent by soaking a thin skin in a strong lye of wood ashes, wringing it out ngain and again until it is fairly transparent. It may then be varnished with mastic varnish. Staining is effected with aniline dyes or waterproof inks, but the skins must be stretched tight while drying. Illuminated parchment which has become dirty and greasy may be cleaned with benzine, and if the colours require touching up, ordinary water colours mixed with Chinese white can be used, but specially prepared colours are supplied for the purpose. Stiff parchment will soften in water, but a fairly permanent Hexibility is obtained by soaking the skin in glycerin. For new drumheads or tambourines preliminary sonking in water will be quite sufficient.
The parchment mainly used in the home is known as vegetable parchment, and is made by dipping ordinary, unsized paper for a few seconds in diluted sulphuric acid in the proportions of one part of acid with half its volume of water. It is thoroughly washed in water and acquires a parchment-like texture and becomes about five times stronger than ordinary paper. It is impervious to water but is rendered soft and limp when dipped in it. The atout qualities are used for bookbinding, and although not so durable as animal parchment, it may be worked up in the amme way. For making lampshades and covering small screens or writing desk sets it is very useful, as it may be varnished to render it more durable; it can be stained to any colour and may be painted.
Such parchment is employed for covering jars containing preserves or anything that can
be contained in n jar from which air must be excluded. Several thicknesses are obtainable. but before use it should be cut to the approximate shape and dipped in water to soften it. Owing to its pruperty of stretching when wet. care must be taken to prevent it soaking too long; if this is allowed and the jar is covered with it and tied up tightly, it is very likely to split when it dries.

Vegetable parchment is an excellent material for making moth-proof baga; it can be obtained in large sheets; it is not expensive, und when the bags are properly made the contents are airtight as well ns moth-proof. The baga should he made with a double fold at the edges secured with thin tish glue nubbed on evenly See Candleshade ; Lampshade.

PAREGORIC. Compound tincture of camphor, commonly known as paregoric, is inuch used in cough mixtures, and also for the relief of colicky pains. It contains, besides camphor, aniseed, benzoic acid, and opium In view of the presence of opium, which gives paregoric its soothing effect, the remedy should not be used except under medical direction.

Parent. See Father; Guardian ; Mother.
PARFAIT. Except for the fact that it is usually richer in cream and served in tall glasses, a parfait is an iced swect, similar to a 3undae, made with fruit syrup, grated nuts, ice cream and whipped cream.
PARGING. The process in building known ns parging renders the inner surfaces of a brick-built flue smooth and fire resisting. Parging is similar in its essentials to cement rendering, and various mixtures are used by different operatives. A commonly used composition is one part of Portland cement to two parts of good, clean, sharp anded, the proportions being gauged by bulk.
In some cases a mixturc of fireclay and cement is used, but generally much ol the parging of a flue is done with ordinary lime mortar. Parging is done sa the work procerds, that is, as the bricklayers construct the Hue; the inner surface is rendered with the cement and trowelled of smooth.

PARIAN WARE. The moat valued period of the statunry porcelain known as Parian ware lasted for about 30 yeara nfter 1845. Invented in the Copeland works, as the outcome of n search for the lost secret of Derby biscuit ware, it was adopted at the Minton, Wedgwood, Worcester, and other factories. Some early figures are recognizable by having a sinall proportion of glass mixed with the body-paste, but the finest were inadic of china clay and felspar alone, in a mixture which enabled them to be fired at a lower temperature than ordinary boneprorcelain.

The best examples, pure white and unglazed, are superior in transparency to the opaque Derby biscuit, and have the general effect of the Carraramarble, which they sought to emulate. Sometimes a lead glaze was added, and this was especially well done at Longton. Unfortunately the designs are not particularly


Parian Ware. Statuette in pure white unglazed dorcelain
good. Unglazed Parian should be kept clean with purc water, in the same way as biscuit, becnuse of its porous surface. See China.

PARING CHISEL. The blade of a paring chisel is considerably longer than that of the ordinary firmer chisel, and there are two forms, the ordinary parallel type of blade, and that with a bevelled edge. The latter is preferable for paring, that is, cutting wood across the grain, as the blade is thin at the edges.
Since the tool is intended chiefly for cutting across the grain, it must be kept in very good condition. properly ground and well sharpened. It is handled in substantially the aame way as the ordinary firmer chisel Under some conditions the extra length of blade is an advantage, as, for exainple, when working at the bottom of $n$ deep slot for a mortiac, or under any other conditions where a deep hole has to be dealt with. P'aring chisela are gencrally obtainable in widthe from $\ddagger$ in to 2 in., and the sizes most useful for the amateur are $f, \frac{1}{2}, \frac{1}{2}, \frac{3}{3}$, and 1 in See Chisel.

PARIS. The hardy perennial known as Herb Paris grows about 10 in . high, bears yellowish green flowers, and is suitable for $\AA$ moist and shady position. It is planted in autumn or apring, and propagated by division of roots during the same periods.

PARIS GREEN. This is an arsenical insecticide made of nccto-arsennte of copper, and is highly poisonous, particularly if inhaled in its ordinary powder form. A preparation known as Blundell's paste is the safeat form in which it can be used. The paste is not soluble, but may be mixed as n Huid at the rate of 1 oz . to 10 gallons of water, with an addition of 4 oz lime. It is used as n fine apray, the mixture being constantly stirred during use. It is efficacious as a wash insecticide for fruit trees, but when applied to the pench, nectarine, or apricot, the quantity of paste must be reduced by $\ddagger$ oz. Trees should not be sprayed when in Hower. It is beat applied just before the buds open, and directly the petala begin to fall. See Insecticide.

PARKIN. This is a Yorkshire speciality. To make it, allow $\frac{1}{2} \mathrm{lb}$. butter or margarine to $1 \frac{1}{2} \mathrm{lb}$. treacle, $\frac{1}{2} \mathrm{lb}$. brown sugar, 2 lb . oatmenl. 1 lb . llour, 1 oz. ground ginger. Dissolve the butter in the treacle over gentle heat or by standing at the side of the fire. Stir in the sugar and the ginger and mix the Hour and the oatmeal together. Stir in the flour and oatmeal and mix with a wooden spoon. Add 1 or 2 beaten egge and a little milk if neccessary to mix to a soft but fairly stiff consistency. Put in a greased pudding tin. It should be 1 in. in thickness. Bake in moderate oven 40-50 min. Let it cool in the tin, then cut in squares and store in airtight tin.
PARLOUR. This oldfashioned name for a sitting room or drawing room is still preserved by some peoplc who own period houses, or who furnish a cottage sitting room in old-world atyle. The parlour should suggest the cosiness of a Queen Anne style (q.V.) of sitting room and stuffiness or formnlity should be wholly absent from its furnishing. See Furniture.

PARLOURMATD. A good parlourmaid can command high wages, and is next in importance to the cook as far as female servants are concerned. Where there is no butler she is responsible for the glass and silver, and for the care and decanting of wines. She also waits at table, answers the front door, ushers in and announces guests, and takes in afternoon tea. All the dining room table work is hers. She is, moreover, expected to act as valet to any gentlemen in the house, laying out their dress clothes and keeping their wardrobe brushed and tidy. See Insurance ; Servant.

PARMA VIOLJT. flowering and fragrant variety bearing blossoms of pale bluish lavender. It is largely grown for market purposes. It is excellent for culture in frames. See Violet.

PARMESAN CBFESE. This is made from skimmed milk. It is not used until it is several months old, and the best varieties are kept for two or three years before being sent to market.

In most localities, Parmesan cheese is bought already grated, as it is used to garnish savoury dishes, soups, and salads, It is however, rather expensive. See Cheese.

## Parquet and Wood Block Flooring

## Effective Methods of Decoration and Construction in Floor Coverings

An article that should be consulted in connexion with this subject is the one on Floor. See also Carpet; Polishing; Rug; the entries on the various rooms of the house, e.g. Dining Room; Drawing Room: and those on the various woods, e.g. Oak

The name is used to denote a floor of wood arranged in diaper formation. It is constructed by cutting thin boards into geometrically shaped pieces, and laying them down to form a pattern, much in the same way that tiles are laid. The thickness of the wood may be as much as an inch, but is usually thinner, $t \mathrm{in}$. being common.
Parquet is mostly laid over existing flowr boards, and may be regarded not as true construction, but as decoration. On the other hand, wood blocks are frequently employed in the way parquet is used, but laid on a solid foundation, such as concrete, forming part of the structural floor; but this is not true parquet. Almost any geometrical pattern can be rendered in parquet, consistent with the limitations of the material, which does not admit of very small detail. Both types of flooring are illustrated and described below. lnstructions are also given for preparing and laying wood blocks which the amateur can make from commercial timber.

Austrian oak is generally used for parquet, owing to its close, even grain and freedom from knots. It has a rich, uniform colour, but is comparatively soft, easily showing marks. English oak is employed, but is uneven in quality, figure, and colour. Russian, Japanese and American oak are also used, and a very fine Hoor can be constructed of teak from Kangoon or Java. The beat kind of parquet is what is called plated, consisting of about $\frac{3}{16} \mathrm{in}$. oak or teak pressed upon a backing of ${ }^{1} \mathrm{in}$. deal. This method prevents buckling and is suitable for the best class of inlaid work. Parquet is usually laid down in made-up panele, varying from 12 in . to 1 yd . square.

Before the laying of a parquet floor can be commenced a design has first to be drawn. To do this, the room is measured, the size of the angles being noted as well as the length. breadth and the various breaks, such as the breasting of the fireplace, and a scale drawing of the plan is made on paper. Two typical designs with borders are shown in Figs. 1 and 2. When a decorative border is required, it is made sufficiently wide to extend beyond any of the smaller breaks or projections of the walls, so that the plain centre portion will thus finish against a straight line, as in Fig. 3. All larger projections or recesses must be followed round. From this drawing, the number of blocks required can. be estimated and the length of the border decided upon.

The next consideration is the groundwork upon which the parquetry is to be laid. In new buildings it is usual first to lay a counterfloor on to the joiste, this consisting of deal battens $f$ in. thick placed diagonally and butted square into each other at the ends so that the joints will run diversely to those of the upper flooring. When levelled and cleaned off, this forms a good surface for the laying. In older houses a common practice is
to disguise well-worn deal floors with a layer of thin parquetry

It is essential that the boards are first levelled, and any weak or creaking boards either replaced or the cause of the trouble rectified. The levelling is done by planing, first transversely across the grain with a jack plane, and finishing off with trying plane, the edges by the walls being brought to the general level with a rebate plane. It is very seldom that all the blocks are laid individually in position direct on the floor. The usual procedure is to build up the individual patterns on a bench and then to apply these patterns to the floor.

Fig. 4 shows a complete pattern ready for fixing. With very thin parquetry and in the cheaper kinds there is sometimes no binding joint between the blocks. In this case the patterns are built up on tho bench and a piece of canvas glued to the back. When set they are placed in position on the groundwork and nailed through the face, the nails being punched in. long thin nails are used, similar in shape to pins used for laying oil cloth, having no heads and tapering to a point. In better-class work, and in the thicker varieties, the sides of the blocks are grooved to receive metal tongues, or are dowelled. Wherever possible the patterns are first built up, this being comparatively easy when the blocks are dowelled. The decorative borders are treated in a similar way, being put together in lengths of about 18 in. to 3 ft ., according to the pattern.

Figs. 5 and 6 show methods of securing the blocks to the Hoor when it is required that no nail holes shall show on the surface. In Fig. 5 the block is fitted over the tongue of the preceding block and a nail driven askew


Parquot. Fis. 1. Deeige in two diflerent coloured woods with simple border. Fis. 2. 8howing use of both reotangular and square slabs. Fis. \& Plan 0 room showing parquet deaign to be used, and arrangement of border

length. In all cases where the parquetry is not finished against a wall, as for instance by the hearth and the door in Fig. 7, a batten should be mitred round as a protection to the edge. When parquetry is laid on an already existing floor, the door, if it opens inwards into the room, must be taken down, and a strip equal to the total thickness of the parquetry sawn off the bottom.

When the laying has heen completed, the whole surface is levelled with a smoothing plane and finished off with a steel scraper and glasspaper. If the blocks have been laid in sections comprising a complete pattern, only the juncture of the several patterns will require planing, the individual eections having been trued up on the bench prior to being laid.

The usual polish for these fliors is was thinned out with turpentine, the mixture being rubbed well in and left to stand for $\pi$ day before heing polished with dry dusters or with a brush. In some cases a hody of french polish is put on to keep the dirt from hegriming the surface. Another method is oil polishing, which bas the advantage of not heing so liable to tread off or mark ; it takes. however, a great deal of labour to keep it in a fair condition of freshncss.

Wood Block Floors. The laying of the thicker wood block floors entaila a more claborate process; no nails are used to fix it, the blocks being held down thmugh the medium of a coating of mastic benenth. Fig. 8 shows sections through a few typers of block, the under sides and edges being grooved in the form of a dovetail into which the mastic is forced, forming an exceedingly strong fixture When the blocks are to be laid on a counter floor, a mixture of glue and whitening is used to fix the blocks, but in other work a mixture of pitch and coal tar is often used.

Fig. 9 shows a section through the flooring. A hed of concrete about 6 in . to 1 ft . in
thickness is first put down and allowed to harden thomughly. It is essential that this should completely dry, as otherwise the moisture will causc the woodwork to swell. This bedding is levelled by floating a coat of cement over the top, and is again left to set,
the time varying according to the weather In aome cases a series of plugs are floated in the concrete level with the surface of the cement at a distance of about 6 ft . apart, as in Fig. 9, and to these the blocks are serewed
The lower sketch in Fig. 8 shows a method of interlocking the blocks with tongues litting into grooves cut in the side of the blocks. Another system is that in Fig. 10, in which the same result is ohtained by dovels. When laying the blocks the latter are stacked in a handy pile, and a small portion of the lloor boarded round to keep the mastic in bounds and to prevent it from spreading over too large an area at a time.

The mastic is then poured within the space at hoiling heat and the blocks quickly rubhed in position, having been first dipped in the mastic up to about half their thickncss. The size of the arca hoarded off will vary according to the number of men engaged on the task. two men being able to tackle an area of alout 2 yards. Fig. 10 shows a herringhone floor, the blocks being numbered to show the order in which they are laid. When the work has been completed it should be left to set for a few days, and is then levelled off
Making Wood Blocks. The amateur can readily construct a wood block floor covering from atrip material. This may be oak or any other ornamental wood, or it may he ordinary builder's deal of the kind sold as door stopping and known as 4 in . by $\frac{1}{i n}$., but which actually measures 33 in wide and $\frac{7}{16}$ in. thick. It is cut to lengths of 11 j in ., as the length of the strip must be exactly equal to three times its width. If some other width material is used the length should he adjusted accordingly. It is important that the atuff should be uniform in width and thickness. The timber merchant will thick ness the strips, and plane them on three surfaces If the whole supply is bought at onc time the wood can be put through the machine without altering the gaugea, so that uniformity is assured Suitable oakstrips, $\frac{1}{t}$ in by 4 in., may be procured from Handicrafta, Ltd., Kentish Town, London, N.W.5.

If the worker has a lathe with a saw table


Parguet. Simple wood block fooring wlich the home worker can prepare. Fig. 11 Cutting strip to length with a sawing Rnidc. Fig. 12. Planing the ends of the blocks. Fir. 13. Testing for length with a simple gaure. Fig. 14. Laying and flting the blocks. Fig. 15. Corner of floor when completed
the work of cross cut. ting the strips to size will he greatly reducer Failing this, a simple sawing gruge should first be made, such as that illustrated in Fig. 11. This eomprises a basebonrd constructed from 9 in . hy 1 in deal. At the left-hand end a cross hatten is secured by screws. Two tapering upright pieces are screwed to the sides of the board, and a vertical saw.cut made through them exactly $11 \frac{8}{6}$ in. from the in side edge of batten. The extra $\frac{1}{6} \mathrm{in}$. is provided to allow of the end grain of the mate. rial heing planed up.
A few pieces only should he cut out at the start, and the ends planed by the use of an ordinary shooting board, as in Fig. 12. A smoothing plane or jack plane may be used To ensure all the pieces of timber being of uniform length, they should he inserted into n gauge, as in Fig. 13, comprising a wooden baseboard to which cross pieces of hatten are fitted to either end, the space between the inner faces being exactly $11 f$ in.

Having prepared a few lengths in this way, they should be tested by laying three of them side by side and placing a fourth at right angles across them. The ends of the cross piece should exactly coincide with the outer sides of the three pieces. Should there be any variation, adjustnient should he made accordingly until the length is exactly three times the breadth This having heen determinell, the necessary number of hlocks may be prepared. If it is desired to stain them, this can he done before commencing to lay the blocks, as the colour effect is hetter than if the hlocksarestained after they are in position.

## Forming the Pattern

The next step is to determine the pattern Generally the blocks can be laid direct on the floor boards, provided the latter are reasonably level and sound. They may be attached by glueing the underside of the blocks and further secured by secret nailing. A long strip of stopping equal in thickness to the blocks nnd about 2 in. broad is fitted all around the walls, butting against the skirting board. If the latter is unequal, or displaced, the stopping should he acurately scribed to fit, so that when secured in its place the narmo strip of wood will fit tightly ngainst the skirting and present a perfectly straight lining on the other aide; the object is to provide a good working surface against which to build the blocks

Fundamentally, all wood block floors are laid on geometrical lines, and consequently they must start on some straight line, and anything in the nature of curved work is practically impossible. Having prepared the atrips for a sufficient area for the mom, and glued and bradded them to the floor, the hlocks may be laid in position as in Fig 14. They are laid one after the other, so that the second row overlaps the first by the width of one block. A fair nuinber of hlocks should he laid, commencing with one corner, before they are glued, juat to get an idea of their arrangement and the way in which they are to be placed, niter which they may be drawn aside and glued and hradded to the floor. In this case 1 in oval hrads will be strong enough for the purpose: they are driven diagonally through the edge of the block, the beads of the nails being punched into the wood.


Parquet. Fig. 16. Wood block flooring, showing good effect resulting from dark-coloured stringing and centre panel in berringbone blocks

The work proceeds in the same manner until the opposite corner is leached, but as it is possible that the distance to be covered will not be an exact multiple of the lengths of the blocks, it is beat to lay one complete row and nscertain whether they will fit exactly, or whether some of then must be cut specially. There are reveral ways of dealing with the problem. In some the blocks are laid from corner to corner, and the closers or sperinlly cut pieces fitted about the middle of the room. In others the fit is arranged in the inost inconspicuous corner, or at some other part of the room-as, for example, where the chimney breast or other projections intercept the natural rin of the blocks. The blocks should he driven up closely into contact with a minlet. The reault of laying them thus is shown in Fig. 15.

Good results are ohtained by the use of strips of darker coloured wond, inserted in the form of $\Omega$ framework or border. Fig. 16 represents a small panel such ns might be needed in a recess, or at the entrance to a room. Alternatively, a series of such patterns can be laid over the whole area of the floor. The method of laving these follows the same lines already indicated, and comprises an outer atring, or framework, and then a row of hlocks, followed by a second string. The panel is filled in with other blocks laid in a herringbone pattern. To complete this. the ends of the blocks are cut to an angle, and other small angular pieces cut and fitted to fill up the odd spaces. If the proportions are carefully arranged. these apecial cut hlocks will bc low in number, but they add to rather than detract from the appearance of the joh when finished. If it is desired to fit the hlocks without any angular cutting, another pattern than the herringhone must be used.
It will be found best to make a large scale drawing showing the arrangement of the blocks, or to lay them out on the floor hefore commencing the actual work, as often a alight modifi. cation in the size and projertion will enable blocks to le used without outling them specially. to fit.

Where the floor is very uneven the blocks may be bedded in mastic cement, or superimposed on thin felt paper, such ns is used under linoleum. It should be a hard variety $t h a t$ will not yield unduly, as if it does the blocks might
he displaced A little care in laying them and especially in the nailing, will result in a satisfactory job. Such a floor covering is extremely attractive in appearance. has the merits of heing durahle, and is by no means expensive when made $u p$, in the manner suggested.
PARRISH'S FOOD. The compound syrup of iron phosphate, B.P.C., that is known also as chemical food or Parrish's syrup, is one of the most useful tonics for children who are weak and annemic and have loat appetite The dose for an adult is to 2 drams, and that for a child can he calculated according to the rule given in the article on dosage Parrish's food is often given in combination with cod liver oil. See Dosage.

PARROT. The method of kecping the bird upon a perch, with a long, light chain attached to the leg, is better than the small cage, for it enables the bird to nove freely, to descend to the floor and to stretch its wings Such a perch may, in fine woather, be trans. ferred to the garden, and if on such occasions the chain con he attached to the hranch of a tree so much the better. Indoors the length of the chain muat not permit the hird to reach any of the furniture, or the latter will he spoiled by the powerful henk
The Cage. In any case, a cage must he provided for sleeping, and the perches should be of two thicknesses, one about $\frac{1}{2} \mathrm{in}$. and the other $\frac{3}{} \mathrm{in}$. in diameter The hest cage is the large square metal one, with a tray floor which can be withdrawn for cleaning The tray should be covered thickly with dried garden mould, which is better than annd. and there should be a block or thick stick of soft. unsplinterable wood to engage the bird's bill. Water for drinking ought not to be kept in the cage : it should he given morning and evening. nncl then withdrairn. The bath should be provided daily outside the cage; if the bird objects to a wet hath, a pan of dusty earth may take its place, and will he used for dusting the plumage.

Food. Food must be varied, and no meat or meat products should be given. Hemp and canary seed may be offered, and to these may he added sunllower, maize and onta The bird will show a marked preference for one or more of these, and an objection to, or at least a distaste for, some others. The favoured food should he ndopted for its staple rations. Nuts should he added as their seasons come round: filherts, Brazil, walnut, chestnut, or a slice of coconut, with an necasional apple, pear, orange, banana, a few dates or a raw carrot. A dry biscuit or an unbuttered crust of hread inay be given at times: also a knob of sugar. Coarse sand must be prave vided, from which the plar-


Parrot. Left, bird of dove-grey plumage, with pink tail, one of the best talkerg. Right, red and blue macaw
w. S. Berridae, F.z.S
grains lor lurnishing its gizzard, without which birds cannot assimilate their food.

It is important to notice the effect of the various foods on the parrot's health. Certain loods may be found to produce diarrhoea, others constipation. Either conditions will be mitigated hy at once giving a few dropa of castor oil floated on the drinking water, and the bill of fare should be amended accordingly. The suspected food may not be a harmful one, but its proportions may need reducing. An unsuitable position for the cage may cause catarrh, bronchitis or inflammation of the lungs A large percentage ol parrots dic soon after their artival, as the reault of the unsuitable conditions of the voyage; and, therefore, if possible, a bind should only be purchased when it is known to have been in Great Britain for several months

Indigestion is probably caused by a lack of grit in the gizzard. Yawning and distaste for rood indicate biliousness. and may be put right by a pinch of carbonate of soda in the drinking water for two or three days. A fit of giddiness may be the result of indigestion and the castor oil treatment may dispose of it : if not, it may be due to the presence of intertinal worms, for whose ejection a little seraped areca nut should be given. In the casc of catarrh, five or six drops of tincture of aconite in water will abate the symptoms. Feather plocking is due usually to the presence of parasites under the plumage, which should be dusted with pyrethrum powder.
The most popular bird, undoubtedly, is the African grey or ash-coloured parrot, which holds the premier position for its linguistic attainments and its general good qualities
Since May, 1930, the importation of parrots into Great Britain has been prohibited, on account of parrot disease. See Psittacosis.

PARROT TULIP. This varicty of tulip has curiously cut or laciniated petals to its llowers, which are vivid nnd of many hues, like the plumage of the parrot See Tulip

PARSLEY: How to Grow. This herb is in great demand for garnishing purposes. It is raised from seeds sown out of doors in April nad again towarda the end of .luly:


Parsleg. Bunct of the curly-leaved variety of this usefal calinary berb
the secdlings should be thinned out till they ame 6 or 8 in. apart.

As the leaves become tough and coarse, cut them off to induce fresh growth, especially when the plants show signs of beginning to flower It may be necessary to protect parsley from frost with mata or a frame. The botanical name of parsley is Carum petroselinum.

Uses in Cookery. To prepare parsley to be finely chopped for garnishing, first blanch it by washing it well and picking it free from the stalks. Put it into a pan with a little cold salted water and bring to the boil Strain off the liquid and dry the paraley in $n$
towel Now chop it with a sharp knife or chopper When finc enough place on a clean towel and hold the paraley under the tap squeezing the towel, until the water tuns away green. Wring dry in a dry cloth, and use. When parsley is being used for seasoning. care should be taken that too much is not used. ns its flavour is extremely penetrating

Parsnip. Fine apecimens of a root vegetable ot considerable food palae
Fried parsley is used for garnishing certain hot dishes After the parsley has been picked. washed and dried well, it should bo put in a wire basket and fried in hot fat for a hout 1 min . It should then be quite crisp If atored in an airtight tin, fried paraley can be kept for some days. To dry parsley for winter use, it should be picked during May June or July, on a dry day. After well washing, strip the leaf off the stalk and diy it in a moderate oven until crisp. Kub it with the hands into a powder, and sieva Store it in airtight bottles, which should be labelled.

Paraley can be preserved wholc by washing and then plunging it into salted boiling water for 2 min . Let it then drain on the hot plate of the atove or in the oven, and when quite dry store it in an airtight bottle in a dry place Before using, soak it for a few minutes in warm water.

Parsley Sauce. To make good parsley sauce, use a tablespoonful each of chopped parsley, butter, and flour, and $\frac{1}{2}$ pint of liquid. which may be either fish stock. milk, or equal quantitics of each.

Dissolve the butter in a sinall saucepan and stir in the flour Cook for 2 min., then add the liquid and stir until it boils Season to taste, and add the parsley. Do not let the parsley boil in the sauce or its colour will be spoiled. See Cod: Fish.

PARSLEY FERN. This is the popular name of Allosorus crispus, a hardy fern, 6 in. or so high. It is suitable for planting in shady crevices in the rock garden or dry wall in a com. post of lonm, peat and sand

PARSNIP. This invaluable hardy root-vegetable is in season from late autumn until early spring. It is raised from sceds sown in March-April in deeply dug land fres from fresh manure ;


Parsnip Growing. 1 and 2 Parsnip fy and laroa. 3 and 5. Wastelul sowing and the resalt. 4 and 6. Economical sowing and its produce. F. Misshapen roots through shallow digzing and obstructions. 8. Resulf of deen digging and no mnnure. Q-11. Exbibition parsnip: 9. Crowhar hole flled with Gine soil (a). 10. Seeds sown. 11. Resulting root. 12. Storing in box ol sand.

How to Cook. The root of the parsnip furnishes a valuable food which contains a large percentage of sugar As a vegetable it can be cooked in a variety of ways, either boiled, fried. stewed or used with other ingredients. It is cooked after the same manner as the carrot, and when boiled or stewed is usually served with lumps of butter.

To prepare then for boiling, wash and scrape them clean or peel them thinly, remove the tops and throw them into cold water Then slice them according to size, and put them into a saucepan of alightly salted boiling water. Cook them sloviy for about I hour tcsting them with a fork to see if they are tender. Serve with white sauce.

Fried parsnips, which are usually served with roast inutton, are prepared by firat boiling them and then cutting them into strips Dip, each strip in batter or in egg and breadcrumbs and then fry in hot fat

Creamed parsnips are made by first boiling the parsnipa, cutting them into alices, and theis spreading the latter with butter. Lay them in a vegetablo diah and cover with white sauce See Carrot: Kitchen Garden
-
 months the soil be tween the rows, which should be 15 in . apart, must be hoed frequently. In lato autumn, winter and enrly spring the roota are dug as required. In frosty weather it is wisc to cover some of the roots with straw or other protective material to prevent tho ground being frozen, and thus allow the ronts to be lifterl. The Student is a popular variety of parsnip possessing laige, long roots. 'Tender and True riable suil which the roots can penetrate
asily is required. The most economical practice is to sow groups of three or four seeds at 9 in . intervals along the drill: only one scedling must be left in each group. The drills should be about an inch deep. Alterna tively soeds may he sown thinly along the drill and the secellings thinned to 9 in . apart

During the summer -
 1  considered to le of better flavour.


[^7]Partan. In Scotland the crab is called n partan, and crab sauce is known as partan sauce. See Crab.
PARTERRE. Used in connexion with gardens, a parterre is a formal arrangement of Hower beds with walks of turf or gravel between See Garden : Italian Garden

PARTITION : How to Erect. An internal wall that divides a room into two compart. ments is known as a partition. When built of ordinary bricks laid with a simple bond auch a partition is fireproof and practically soundproof. Another method is to build it of coke breeze blocks, bedding these in cement mortar.
With the foregoing materials a firm foundation has to be provided. In most cases, where the partition is in the natum of an addition to


Portition. Dingram of nortion of wall, showing
Partition. Diagram of portion of wall, showing
wall boards nailed on cross pieces and studding
an existing building, the only practical plan is to take a piece of stout timber, preferably onk, equal in breadth to that of the building bricks or blocks. In the case of bricks, this mny be reckoned as $4 \frac{1}{2}$ in : for coke breeze blocks or slabs allow $2 \frac{1}{2}$ to 3 in. The timber should be continuous from one side of the outer wall to the other. Alternatively it should extend for the whole length of the new partition, and should be placed in position regardless of any doorvay thnt it may be intended to provide in the partition wall.

The opening will, in any case, have to be made up of a framework consisting of uprights of timber at lenst as wide as the thickness of the intended partition, and 2 in. or more in thickncss. These should he mortised and tenoned into the floor plate, provided with a head or cross piece, as for example at the top of the door, and built into a plate, or piece of timber forming the top of the partition. In some cases the uprights may be joined to existing roodwork, such as ceiling joists. The essential point is to provide continuous uprights from the floor to the ceiling level, or some other strong support at the top The continuous floor plate tends to keep the partition in line, and after the partition is up it is quite aimple to cut away the unwanted piece at the bottom of the doorway opening. The wall is then erected on the top of the floor plate, built up to the framing around the door or any other openings, and continued to the top. The surfaces must be rendered with cement or worked up to a good face with a rough coat of plaster known as a pricking up coat, and finished with a fine or setting coat. The door is then linged in the opening and finished in the usurl way.

Use of Wall Board. A much sinipler partition can be made up with timber framing, covered with asbestos cement sheet, plywood,
or any of the patent wall or building boards The timber is fixed to the floor, uprights erected around the doorway openings, and the other studs spaced so that an upright is available for supporting the edges of each of the sheets. For example, if the wall boarda are 4 ft . wide, the studs may be spaced about 2 ft . centres, three of them being available for the support of one shect. This saves cutting the sheets to waste, and also obviates the need of fitting extra studs.

The studs should be not less than 3 in . wide and 2 in . thick, and should bu supported by uniform braces nailed between them, or jointed with a halving joint or some similar simple joint. Both sides of the work are finished up smooth and level, and consequently all the studs should be of the asme thickness to provide a level surface whercon to nail the wall board One side is fixed first, and then the other side, and the joints covered with strips of wood moulding to form panols, or finished in any desired manner. The result is a very light partition, which is both casily constructed and fairly soundproof.
With some of the patent boards, of which several are obtainnble, the makers advise that the edges should not be nailed, or that one edge only in each direction should be nailed. A gap of about $\frac{1}{}$ in should be left between the edges of adjacent sheets, to allow for expansion and consequent movement.

If a soundproof partition is desired, n special form of building board can be obtained which has sound-absorbing qualities Other varieties are waterproofed, fitting them for external use, and thesc are dcalt with in the article on Wall Board (q.v.)

Lath and Plaster. An excellent partition is made by making up a stud or framework as previously described and covering it with plasterers' laths nailed on with lath nails about 1 in . long and leaving a gap between each lath of in . When completed the surfaces are plastered with a pricking-up coat and the whole brought to a fine and true surface with a hard plaster.

The advantage of this type of partition is that the surface is perfectly amooth and can be worked into any existing wall arrangements. The doorway should be finished with an architrave, and such items as the skirting. board, picture rail and so forth, can easily be matched up to the existing work and continued across the partition at the same levels. A partition made in this way sliould not normally be distempered or papered until at least six months after it has been built, as it may spoil the distemper and discolour the paper. There are compositions nvailable which arc claimed to overcome this difficulty, and can be used on practically wet plaster. One of these may be used if it is impera. tive to complete the quickly.

A point to be noted with all partitions is they should be litted into the existing walls as strongly as possible. In the case of the stud partition, that is, one made of wooden uprights, the uprights should be securely spiked to the wall, taking care to set it up perfectly plumb and true with the aid of a plumb bob and line, or with a plumb rule.

In the case of a partition made of
brick to be bonded intu a wall ul similar material, the plaster should be cut away closely and neatly. If the existing walls are 9 in. thick, a few of the stretchers may be cut out about every 2 ft . apart and the new work bonded into the existing work by setting the brick halfway into the existing wall from which the stretcher has been removed and half in the partition wall. When coke brecze blocks are used, short stout pieces of iron may be embedded between the bricks of the existing wall and set on the top of the breeze blocks.

The amateur should obtain expert advice before interfering in any way with the walls or principal timbers of the house. Apart from considerations of safety, such an operation may be contrary to provisions of a lease or tenancy agreement, or may need approval by a local authority.

PARTRIDGE : How to Cook. For some dishes old birds may be used, but for roasting or broiling they must be young. The flesh of the young birds is easily digested, and is most suitable for invalids, and is highly nutritious.
To distinguish the age of the birds it is nccessary, when purchasing, to examine the bills and the pinions, also to notice the colour of the legs. If they are young, the bill will be of a dark tint, and the legs will be yellow, while the flesh of the pinions will be tender when pressed, and the long wing feathers will he pointed. If old, the bills will be whitish, tho legs blue, and the long wing feathers rounded. If stale, the vent has a greenish appearance. At the present day game is eaten much fresher than formerly, but partridge chould alwaya hang for at least a week.

General rules for cooking partridges and for making pies, puddings, or entrées from these birds are the same as for other game, and will be found under that heading in page 508 of this work.

Cooking with Cabbage. One of the most tasty methods of cooking partridge is to stew with cabbage Savoy cabbage is best, as it seems to impart a peculiarly agreeable Havour to the birds. Prepare and truss a brace of partridges and fry them in a stewpan with 4 rashers of bacon and 1 oz . butter, then add 1 gill stock. Have ready a savoy cabbage well washed and drained. Cut it into slices. pat it in the stewpan with the partridges, and stew for 1 hour, turning the birds occasionally To serve, dish the rashers and lay the partridge on then, and arrange the cabbage and liquor round the dish.
Another way of cooking these birds witli cabbage is to roast them for 10 min . and then cut them into neat pieces. Butter a plain charlotte mould, about a 3 pint size will do, and cover the bottom with a layer of savoy cabbage which has becn cooked, pressed,


Partition. Attic bedrooin panclled in "Sundeala" wall board


Passe Partout. The raised framing of a picture. 0: Fig. 3. A niece of gold passe-partont binding in trips are cut off to the exact length of the glasy. and laid on ic, being flemly pressed down with a bone creaser. Fig. A. Glue is applied llabtly to the two covered strips and they are then placed in position on the glass exactly level with the edge

Courlesy of Dennison Manufacturing Co., L.Id
seasoned and softened with butter. Place on the propared cabhage a layer of pieces of partridge, and fill up the cavities with cabhage to ensure an even surface Lay over the part ridge 6 thin slices of pickled pork, add the remainder of the bird, and over that the rest of the cabbage ; press all well down into the mould and tie over the topl a stout piece of buttened paper. Put the chartreuse into a moderate oven for from 15 to 20 min ., taking care that it does not brown. When conked, turn it over on to a hot dish, lift up the mould, and serve with a rich brown gravy round. This dish can also be made with old birds.
Braising. To braise partridgea prepare 2 or 3 birds as for roasting, with hacon tied over the breasts, put them in a casserole with 1 oz . butter. Moisten with 1 pint good stock and a wineglassful port or madeira, then season, add a bouquet garni and close the casserole tightly down hy laying a buttered paper over the top underneath the lid. Cook gently in a moderate oven till the hirds are tender. Serve then on a hlock of fried bread, and keep hot. Strain the liquor from the hraise, thicken it with llour, skim it free from fat and pour it over and lound the birds. Garnish with fried button mushrooms or any suitable dressed vegetable. If the sauce secms acanty prepare a little extra rich brown sance and serve it in a sauceboat. See Devilling; Game; Pheasant.
PARTRIDGE BERRY. This is the popular name of a low-growing hardy evergreen shirub, Gaultheria procumbens. It bears white Howers in sping and red berrics in autumn, and nceds loamy or peaty soil and partial sliade. Gaultheria shallon, ist. high, is a valuable evergreen shrub, with hlush coloured Howers in spring and dark fruits later on, which is useful for planting in shady places; peat and loam should be added to the soil.
PASQUE FLOWER. This is the common name of the Anemone pulsatilla, a hardy plant which bears beautiful mauve coloured tlowers in April and May. It grows ahout 10 in . high and llourishes in loamy soil with which lime or mortar rubble has heen mixed. It likes partial shade. See Anemone.
PASSAGE. In the domestic sense this word is employed for the space in the house
that leads from one room to another, or from a front or back door to the rooms. It is practically covered hy the articles on hall, landing, and staircase. See Hall; Landing; Staircase.
PASS BOOK. This name is given to the book which shows the receipts and payments of a banking account. The book is supplied by the hank to the customers, and the items are entered by the hank ofticials. It is desirable that a pass book should be sent to the hank for the latter purjose at least once a quarter and that the customer should inspect it now and again. See Banking: Cheque


PASSE PARTOUT. The method of framing by means of passe-partout linding. for photographs, prints small drawings and water-colours, is frequently more effective than by a raised frame. All that is required for framing a picture by this method is a piece of glass, mount, and cardhoard back identical in size, 2 small metal hangers. made much on the principle of brass paper fasteners, a small pot of gum, and a roll of passe-partout binding. The binding should harmonize with the mount, being best, as a rule. darker in colour, while hoth should harmonize with the picture Bindings can be obtained in a large range of colours, widths, and surfaces.
In the cardhoard back, about 1 to $1 \frac{1}{2} \mathrm{in}$. from the top and equidistant from the sides, punch two small holes, and into these fix the metal hangers. It is important that these should he at exactly equal distances both from top and sides, or the picture will not hang straight. Next fix the picture to the mount and the mount to the hack by means of dahs of gum at the corners. Make sure the glass is quite clean, then place it liat on the table on a piece of paper ruled with atraight lines to indicate the required depth of the framing. This will act as a guide in getting the passe partout straight.

Cut 2 pieces of binding 1 in . longer than the sides of the glass, moisten about half the width, and apply immediately to the glass so that the edges just reach the ruled lines and $\frac{1}{2}$ in. juts out at either end. Press them down until firmly fixed. Turn the glass over and put on it the picture, mount, and back. Moisten the projecting binding, fold it over the back, and press it down until set. Cut off the ends, both top and bottom, to about $\frac{1}{\frac{1}{8}} \mathrm{in}$. from the glass.

Cut 2 pieces of hinding 1 in. longer than the top and hottom of the glass and mitre them at each end. so that the shorter side is exactly the length of the space between the side bindings. Moisten the shorter side of each strip, apply them to the glass, and press them down. Be sure that the part fixed to the glass is exactly the same in width as at the sides. Turn the picture over and fix the rest of the binding as before. folding in the ends neatly.


Fig. 5. Two more lengths of cardboard strips aie cut to ft exactly between those glued on the glass, the onds being mitred. and the same process of glueing is followed. Fig. 6. Two pieces of binding of the chosen style are cut 1 in . longer than the picture, gnd laid over the inner binding abont of an inch from inner edge. Picture, backing board mount and glass are placed togather and the binding brought over to the back. The corners are finished as shown. Fig. 7. Two pieces of binding the exact length of the remaining sides are cut and applied. Fig. 8. The finished picture

Courtesu of Dennison Manufaclurinn Co.. I.td

Making a Raised Frame. The passe-partout method of framing can also he applied to make a raised frame. The articles required for this include, as well as those mentioned, some strips of pastehoard, $\frac{d}{}$ to $\frac{1}{2} \mathrm{in}$. Wide, and 2 rolls of binding, one for the frame itself. the other for a frame lining. Fix the metal hangers in the back, Fig. 1 and fasten picture, mount, and back together as descrihed above. Cut off 2 strips of the pastehoard exactly the length of the glass, Fig. 2, and also cut off 2 pieces of gold binding $\frac{1}{2} \mathrm{in}$. longer, Fig 3. Moisten the hinding and cover the pasteboard with it carefully and evenly: then gum lightly the underside of the strips, Fig. 4, and fix them to the glass, level with the edges.

Two strips of cardboard must now be cut for top and bottom, to fix exactly between the side pieces. Fig. 5. These are also covered with hinding, so that the binding projects $\frac{1}{2} \mathrm{in}$. or $\frac{1}{2}$ in. at each end. according to the depth of the pasteboard. These ends of binding should be cut off at an angle of $45^{\circ}$ before the pasteboard is gummed and fixed in place on the glass. Noisten the triangular ends and fix down to neaten the corners. The passepartout framing is then carried out as deacribed in the earlier method, the inner hinding being all but covered by the outer framing, Figs. 6 and 7. Many variations of both these methods will suggest themselves, but should not be tried until the simple passe-partout framing can he carried out easily and with perfect neatness. See Mounting.

PASSION FLOWER. The passion Hower belongs to a family of climbing plants which are mostly natives of Central and Southern America. Most of them need the teinperature of the hothouse, but there are two hardy sorts which are the nost important. These are Passitlora caerulea, the brautiful blue passion Hower, and its white variety, Constance Elliott. They will thrive in any gond ordinary soil with the protection of a south or west wall. When the plants have filled the apace allotted to them they should be pruned in spring; othertrise little pruning is needed.

The hothouse linds have flowers of various rich colours. They must be potted up in the ordinary mixture of loan, leaf-mould, and silver sand, or in heds of 2 ft . Wide by at least 1 ft . in depth. They can be trained up rafters or walls, and need pruning just as do the outdoor varieties. It temperature of between ( j$)^{\circ}$ and $70^{\circ}$ should be maintained.

PASSOVER CAKE. The Jewish cakea which are eaten at the feast of the Passover are made from 1 lb . hest llour, $\ddagger$ teasponnful salt. and enough cream to mix the whole to a stiff paste. Sieve the flour and salt into a basin, "arm them hefore the fire and then stir in the crean. Rull the pastry out thinly on a lloured board, then stamp it into large rounds and cook these on a girdle over the fire. When one side begins to blister, turn the cake and cook on the other side. They should be crisp and of a pale brown colour when cooked.

PASTE : Various Kinds. 1 paste made of tour and water is capable of joining inany light articles. To make the ordinary household paste, mix 1 lb . wheaten flour with 1 oz alum and add 4 pints of cold water, stirring all the time. Run the mixture through a sicve to ensure that no lumpe remain, then transfer to a saucepan and boil for five minutes, stirring all the time. The paste will be thick, and to ensure it keeping for a few weeks add as a preservative thirty drops of oil of cloves and the same quantity of carbolic acid.

For Mounting. As an adhesive for mount ing photographs it is necessary to avoid the use of acid ingredients, such as alum, as this would act on the photograph and cause it to fade. Professional photographers use freshly made starch paste, made by first mixing powdered starch with a little water to form a
paste and then adding boiling water, stirring all the time. Dextrin can he employed for an adhesive that keeps, one pound of dextrin being boiled with 2507 . of water until it has dissolved, then, after adding 30 drops of oil of cloves as a preservative, pour into small ars lor use.
For Paperhanging. Paste for paperhanging is made from 31 lb. llour mixed with cold water to a stiff batter. A gallon of boiling water is then added, in which two tahlespoonfuls of ground alum have been boiled. The top of the paste should le covered when cold with a little cold water to prevent the formation of a crust. This paste should be quite stiff, and requires thinning down with cold water beforc use. It should not be employed thinner than can easily be spread.
For Linoleum. A paste for linoleum is made by mixing the rye flour with cold water to a somewhat atiffer consistency, and adding boiling water. Some glue size is melted down


Passion Flower. The blue passion flower. caeruiea, and its white variety are suitable for planting agains a sunny wall
and added to the paste whilst both are hot. They should be well stirred and allowed to cool, when the paste will he ready for use. The more size that is used, the stronger the paste will be. Alum nay be used as a preservative. In connexion with leather or strong papier mâché work, a paste "hich is similar to linoleum paste is prepared, but instead of employing size, powdered resin is adiled. Boiling should be slow, and the paste should be of the consistency of butter.

PASTE: In Jewolry. A certain colourless llint glars of the hardest and densest kind, known as vitreous paste, is used to initate diamonds: for other stones the glass is melted with various coloured oxides. In the 18th century a Viennese, Joseph Strass, invented a line guality of paste, which has since been known by the name of strass. It possesses almost the brilliancy of diamonds, but as this brilliancy was obtained by a greater amount of oxide of lead in its composition the paste lost some of its hardness. For the best paste jewels, the strass is cut, ground, polished and faceted with exactly the same care as are precious stones.

It is usually set with a solid hacking, as the foil enhances the sparkle of the paste, but some of the finest qualities stand the test of the open setting. This is particularly the case
with coloured strass. So beautiful were the imitations of rubies, sapphires, emeralds and amethysts that in the 18th century some court jewellers preferred to carry out their creations in paste rather than real gems. With the former they could obtain a truer colour in Hawless pieces of exactly the size required. With real gems the design had to be subordinated to the stones, and the matching of Hawless stones of a good colour for a large ornament presented great difficultics, with emeralds almost an impossibility.

Spanish paste of this perind has a great value for collectors, while French and English designs werc also of great beauty. Lovely pieces were made on a background of dark hluc paste with raised Horal designs in diamond paste, a style mostly used in marquise rings and watches. Other beautiful pieces are the miniature frames often surmounted with scroll or ribhon paste work. In the English Georgian paste the stones were cut large and square, well faceted, and often mounted in gold, whereas the French and Spanish designers used silver.

Modern paste is either carried out in replicas of the fashionable jewels, or the old designs are copied for shoe buckles, and other ornaments. In the first case the paste is purely an imitation: in the second, it makes no pretence at being real stones, and if the designs are good it has a heauty of its own. This is especially the case with shoe buckles. The square shapes with large stones well set in straight lines show the Georgian influence; the delicate scroll and spray work, the French.
A paste composition is used to imitate turquoises successfully for fancy ornaments and also for camens, intaglios, and Egyptian scarabs. Paste will not scratch glass as a diamond will, and a test is applied in which an aluminium pencil is drawn across the surface of a jewel to be tested; if paste, a silvery line remains; if natural stone there is no such result.

PASTEBOARD. A form of cardboard composed of layers of thin card united with paste and consolidated under pressure is known as pastehoard. It is a strong material whicli has many uses in the honie, the use to which it is most commonly put heing in maling small boxes and crates for the storage or packing of goods for transit.

PASTEL PICTURE. Although less affected hy damp than are water-colours, pastels should he guarded against it, by using cork disks behind the frames. The effect of fixatives, such as shellac, is always deleterious, and spraying with a diffuser or varnishing with a brush is fatal to the soft bloom of untouched crayon-work. It should therefore be framed and glazed. A grey or stnne coloured mount is most usually suitable, and a narrow black or brown frame should be selected. During the 18th century portrait-pastels were often executed in several media. Thus the portrait might be drawn in crayon on a landscape background in water-colour or gouache, and the detail heightened by the pencil. Mixed drawings of this kind do not hear exposure to strong light with the same impunity as pure pastel, and therefore need special care.
PASTEURISATION. This process destroys nearly all germis. By keeping milk at a temperature between $145^{\circ} \mathrm{F}$. and $100^{\circ} \mathrm{F}$. for not less than half an hour it becomes pasteurised. The milk may be in bottles which are put into a saucepan or a special container, or a double saucepan may be used. It dairies which are nuthorised to supply certified pasteurised milk an approved apparatus must be used. It is to be noted that children fed on pasteurised milk should be given a teaspoonful of grape or orange juice once or twice every day. See Baby; 1)iet : Milk.

# Pastry for Pies, Tarts and Patties 

## Popular Recipes for Plain and Rich Varieties

## Under this heading are included the ordinary pastries pastry are given under their respective headings.  Cream Bun; Patly. etc.

Pastry consists of a preparation of flour, fat and water with the occasional addition of baking powder, eggs, sugar, and lemon juice. The proportion of fat to flour and the methods in which they are mixed make the difference between one kind of pastiy and another.
Flaky pastry is intended principally for covering meat pies, mince pies, sausage rolls, etc., and sometimes ior covered fruit pies. But both flaky and puff pastry are often used to make light fancy cakes with fillings of jam or cream or currants, such as the coses of Banbury cakes, Vanilla cream slices, jam puffs or pattics Short pastry is used for fruit tarts. jam tarts and tartlets, or any sweet pudding where a soft mixture is balied in a pastry.lined dish Hot water pastry makes the correct crust for raised pies, and choux pastry is necessary for éclairs.

Two rules must be borne in nuind for succeasful pastry making. Everything must be as cold as possible, except in the case of loot water crust and the fancy pastries, which are in a class to themselves, and the pastry must be handled as little and as lightly as possible.

An ordinary plain rolling pin is best, not one with revolving handles. The glass rolling pins that can be filled with cold water are excellent for pastry A slah of marble or plate glass or a table with an enamelled metal top is hetter than a wooden pastry board for rolling out the pastry. All baking tins should be thick or they will warp and spoil the shape of small pastries. A thick tin also prevents burning at the bottom of inince pies or pattics.

The best white flour should always be used, and this must he quite dry and cold, and sieved before use. Use a knife for mixing as much as possible, then use the finger tips to finish. Work away from the heat and keep the hands ns conl as possible Margarine alone should never be used for pastry, as it does not contain animal fat, and the oil in it would make the pastry hard and dry. Good lard alone is best for plain pastry, or a mixture of lard and margarine can le used, and butter for puff prastry.

The pestry must be mixed to n soft dough that leaves the sides of the bowl clean. It is impossible to give the exact amount of water required as flours vary in texture. If the pastry is too wet or too dry it will be tough when baked. Use as little Hour as possible when rolling out, as too much spoils its appearance when cooked. Do not press heavily when rolling, but use short, firm strokes. Get the pastry to an even thickness; the edges must not be thinner than the rest
Much good pastry is ruined in baking. A hot oven must be used for ordinary pastry (375 to 380 degrees) and for puff pastry a very hot oven ( 400 degrees). Otherwise the fat will liquefy before the starch cells in the flour have burst to absorb it, and the pastry will be heavy and oily Cold air and sudden draught will cause the pastry to fall and be heavy. The oven door ahould not he opened until the pastry has had time to get woll risen and set. Uncooked pastry will keep fresh for several days if wrapped in greaseproof paper and kept in a cool place. Patty or tartlet tins or pie dishes do not need greasing when good pastry is used, ns it contains sufficient fat to prevent sticking.
Short Pastry. The ingredients required for this are $\frac{1}{2} \mathrm{lb}$. flour, 4 oz . lard, $\frac{1}{4}$ teaspoonful salt, $\frac{1}{2}$ teaspoonful baking powder, and cold water 10 mix Rub the lard into the flour until it looks like breadcrumbs. Ald the dry ingre-
dients and mix well. Mix atiffly with cold water, using a knife Work lightly with the fingers until amnoth, using a little more water or flour until it is quite pliable. Roll out at once on a floured boand and use as required. Flaky Pastry. A good recipe for flaky pastry needs the following ingredients and method of making Take $\frac{1}{\mathrm{lb}}$. flour, 6 oz . lard and margarine mixed, $\frac{1}{3}$ teaspoonful salt, a squeeze of lemon juice, cold water. Mix flour and salt in a basin Divide the fat into four portions. and ruh one portion into the flour. Mix to an elastic dough with lemon juice and water. Roll into an oblong strip on afloured board Flake one portion of the fat down two-thirda of the pastry, leaving the third portion nearest without fat on it. Fold in three from the lower end. Give one-half turn so that open adges are opposite, press these edges lightly with rolling pin to close them, roll nut to an oblong the same as before. Repeat the process until all the fat is worked in, fold up the pastry and set aside for an hour Roll out once nore (fise times in all), cut to required shape and use. Brush with beaten egg and bake in a hot oven. A larger proportion of fat to flour is used for flaky partry, but no haking powder

## is necessary

Puff Pastry. To make this rich pastry take $\frac{1}{2} \mathrm{lh}$. Hour, $\frac{1}{2} \mathrm{lb}$ cooking butter, $\frac{1}{2}$ teaspoonful lemon juice, $\frac{1}{2}$ teaspoonful salt, cold water Press the butter to an even oblong shape in a floured cloth. Rub a small piece of the butter into the flour, add the salt. Mix to an elastic consistency with the lemon juice and water, and work lightly until smooth. Roll out into a square, not too thin. Put the square pat of butter into the centre of the pastry and fold it over, so that there is a parcel of butter wrapped up in pastry. Roll out into a long strip, press. gently at first with the rolling pin so that the butter is gradually ahsorhed into the pastry. Fold in three and roll out again, keeping the open ends to and from you while rolling. Fold and roll out again, then set aside in a cool place for an hour. Roll out twice more and set aside agnin. Then roll out twice more (folding pastry between each time) and use. Puff pastry should be rolled out seven times in all.

Rough Puff Pastry. This is really a simpler form of puff pastry, requiring leas rolling, and less shortening is used. Take $\frac{1}{2} \mathrm{lb}$. flour, 6 oz . lard and margarine mixed, f teaspoonful salt. squeeze of lemon juice, cold whter. Mix the flour and salt, cut the shortening into pieces the size of a walnut and mix then into the flour. Mix to an elastic dough with the lemon juice and cold water. Turn on to a floured board and knead lightly and quickly until sinooth and of an even texture. Roll out and fold four times. Stand aside in a cold place for an hour or longer, then roll out and use. Bake in a hot oven.

Hot Water Crust. Contrary to the general rules for making pastry, this paste must be made in a warm atmosphere, and it aloould never be allowed to get very cool. The ingredients required are $\# \mathrm{lb}$. flour, $\frac{1}{} \mathrm{lb}$. lard, 1 egg yolk, $\frac{3}{}$ teasponnful salt, about a gill of milk and water. Add salt to flour. Put milk and water and lard in a saucepan and bring to the boil. Add egg yolk to flour, stir in the liquid and mix with a knife until smootl. Leave it, covered with a cloth, in a warm place for an hour or so, then knead it for about ten minutes. Keep warm and use for raised piew as required.

Choux Pastry. This delicate type of pastry is used for making cream buns and eolairs.

A good recipe requires 1 oz sugar, 3 oz butter, fi oz. flour, 3 eggs, a few drops of vanilla, $\frac{1}{2}$ pint water Put into a saucepan over the fire the sugar, butter and $\frac{1}{2}$ pint water When these are boiling, stir in the flour quickly, beating the mixture till smooth and cookisg it till it leaves the sides of the pan clear. Then take it from the fire, let its contents cool slightly before beating in the eggs, one at a time, and flavour the whole with the vanilla Spread the mixture on a plate to cool before using it and then bake in a slow oven till it is pale brown in colour.
Pastry Brush. Pastry brushes are used for greasing baking tins and applying raw ogg and other coatings for pastry. They are made of white lirench bristle of various lengths in metal bands or socket handles. For those used in grease it is essential they should not depend entirely on cement to hold the bristles together. Oily substances will penetrate to the roots of the bristles, with the result that loose hairs come out in use. There are various patent or machine-made brushes which claim to be indestructible, and as pressure is employed as an additional security in these, they are to be preferred to ordinary cement-set brushes.

As in the case with all utensils used in the preparation of food, care is necessary to ensure that the brushes are kept clean. Apart from dust and particles of the ingredients used that may adhere to a sticky brush, grease remaining round the roots of the bristles will turn sour, and if in contact with a metal band will produce verdigris. The brush should he thoroughly washed out in a cup of hot water on every occasion after use. Brushes used for egg should not be put into hot water, as it sets the egg. Stand the brush in a jar filled with cold water and ringe under running tap

PASTY. Every kind of meat, fish, or sweet that is enclosed entirely in pastry is called a pasty, if baked without the aid of a tin or dish other than the baking-shcet on which it is laid. The shape is immaterial, but usually it takes the form of a half circle. Pasties make a useful variety of meat pic, especially for picnic open-air luncheons, as knives and forks necd not becarried for service.

The pasty is an economical method of using up, odd pieces of pastry left over from pie-making. A plain whort crust is mont suitable, and the meat or fruit must be cut fine, and well seasoned or Havoured. If the pasty is to be filled with jam or fruit, take care that this is placed right in the centre of the round, so that when the paste is fulded over the jam or fruit juice does not escape through the edges. These should be moistened and well pressed together. See Apple Turnover Cornish Pasty.

PATCHESI. 'This indoor game is a variant of the race game. It is played by fom persons. The board is arranged with the part in which the play takos place in the form of a Greek cross with the home or goal in the centre. The only other implements required are dice. Each player has one arm of the cross, which is divided into squares arranged in three rows, and three counters, which he moves over the squares in accordance with his throws of the dice. Each player must first move his men along one of the outer rows towards the centre, then back along the other outer row, and finally down the centre row to the goal. The one who reaches this first wins the game. See Race Game.

PATCHING. The method used for patching depends upon the article 10 be patched. Usually "patch is sewn on the wrong side, but one made of printed material is best put on the right side. If the patch is to form one with the garment, carc must be taken that the pattern matches and does

wrong side of the hole to prevent the patch For very fine work the hest. The patch
not hreak up the surface This result would obviously be difficult to obtain if the pateh were put on the wrong side of the material
To mend calico articles, cut a patch a little larger than the bole and the worn part round it, and turn down a narrow fold all round on the right side. Place this on the wrong side of the garment, arranging it so that the folds will be inside and the hole in the centre. Pin it in place, tack it all round and then hem it down, taking extra cure at the corners (Fig. 1) Pull out the tacking stitches turn to the right side of the garment and slip the scissors into the hole, cutting it diagonally to within ahout $t$ in. of each corner (Fig. 1). Cut out the worn portion, leaving a narrow edge of uniform width all round; turn this edge in and sew it down neatly. The patch is then finished, and only needs to be pressed with a warm iron.

When patching Hannel, the right and wrong sides of the material should be determined, the former being the more flutiy Each side should be cut straight enough to keep it to the same thread, and herringbone stitch is used for sewing the patch (Fig 2). Fig. 3 shows a good method for thick materials. Iay the patch on the garment, making it 1 in . larger all round than the hole. Turn in and tack a single hem, $\frac{1}{2}$ in. deep, all round the


Patching. Fig. 1. Right side of calico sheet, Fhowing hemming and arrangement of corners. Fig. 3. Overcasting edge to prevent fraying when Fig. 3. Overcastiog edge to prevent fraying when patching thick material
must fit right into the hole and the edges he darned together. See Darning : Mending.

PATCHOULI PLANT. This name is given to one of the varieties of the greenhouse foliage plant Colens, most of which are grown for their begonia-like leaves and their value as summer bedding-out plants. C. aromatica has a leaf, however, from which a one-time favourite perfume was obtained.

# Patchwork and its Decorative Uses <br> Ornamental Designs with Scraps of Silk, Leather, Lace and Paper 

The reader is referred to the articles on Applique and Embroidery for the sitches used in patch work. See also Cushion ; Lace ; Leather Work; Paste; Picture; Pouffe

Patchwork with a suitable assortment of colours and materials and a skilful method of assembling and joining the pieces can be raised to the level of an applied art if a good design is first originated, or copied, and the requisite patches are cut and joined to carry out the definite pattern or pictorial effect selected, The materials cost practically nothing, hut the results can be richly decorative.

Designs must have suitable relation to the objects to be made or partially covered with patchwork. They must also be chosen with regard to the materials that the worker wishes to utilize. It is a mistake to mix patches of heavy weight with thin fabrics: the pieces should be of average substance throughout the work. For instance, leather and stout cloth, velours or velvet, may be used together, and a simple geometrical design should be chosen for their patchwork; silks, satins and lightweight velvets should he assembled for more intricate designs in which fancy stitchery may play an important part; lace should be mixed only with net or openwork embroideries such as hroderie Anglaise; paper patchwork must be entirely of paper, though this may he tinselled or of any colour required by the design.

The completed piece of patchwork made from woven fabrics or leather usually requires to he hacked or lined with a suitably strong piece of material. As paste is employed to assemble paper patches on to cardbourl or strong cartridge or parchment paper, it is
necessary to provide a background when the design is completed

Leather and Velvet Patchwork. Ornamental and durable accessories for the home can be and durable accessories for the leathers or from mixing these with other suitable materials. Floor cushions and pouffes, sofa cushions for lounge or dining mom, and pyjama cases are among the hest articles on which to use leather patch work. Cuttings from leatherwork should he saved or can be purchased cheaply. A good effect is obtained by working light and dark brown leathers in parquetry patterns. Harlequin patterns of diamond-shapel pieces also look well in three or more shades. Netails about cutting leather, sewing and thonging are given in the article on Leather Work. Thonging can be employed for joining larger patches of stout leathers and for making an edging to a cushion or pouffe.

Two excellent cushion designs, which may be adapted to patchwork of leather, velvet and cloth piecea, are given in page 332, Figa 1, 2: whilat
and a similar one round the wrong side of the patch. Fit the patch into the hole and overcast
them together Over. cast the raw edges fraying. and then press the patch well on the right side. a darned-in patch is

Oman or


Patchwork. Fir. 1. Tatle mat of lace natchwork. Many gcraps ol lace are arranged round a central motif帾
the bolster-cushion design illustrated in Fig. 5) could be adapted to amaller scraps of velvet. by making the wide stripes narrower or by changing the colour half way round in each case. Care must be taken not to employ too many colours and to halance any change by a corresponding change in the other atripes
In this style of patchwork patterned materials are hardly ever successful in com bination with other scraps. The only exception would he in the case of some very boldly designed piece of velvet in which the patterin made a distinct motif which could be utilized as a central piece in the same way that a marquetry panel decorates inlay Linoleum, tiles and inlaid wood all may offer useful suggestions for geometrical patterns.

Whether leather alone or with fahrics is used, or velvets and cloths are combined, it is cssential when planning the pattern to have a definite colour scheme in mind. The larger the patches the more important it is that they should harmonize with the room in which the finished article will be used. When patches are intended to match each other they must be cut to exactly the same size. It is a good plan to make a template for each required shape out of cardboard to guide the scissors. The patches should be cut larger than the template to allow for turnings. Pieces of writing paper may then be cut to the exact size of the template and pasted lightly to the back of the leather or velvet patches in order to ensure even turnings.

Templates would be too laborious a method to adopt for patterns except in the case of simple designs requiring only a few shapes. It is advisahle at first to use straight-sided patches. Squares, oblongs, triangles, strijes, diamonds, and hexagons or stars need less skill in joining than curved figures Some excellent designs for suede-finished leather and velvet patchwork for cushions, telephone book covers and tops of floor pouffes can he evolved from stained glass window paper. The lines of the leading can be traced out with the aid of carion paper on an unbleached calico or linen foundation, the colours of the patches carefully selected and cut out from separate transfers of their reapective shapes made from the stained glass window pattern on to tracing paper. No allowance for turnings is needed, because the joins are covered by narrow gimp or a tinsel braid.

Patchwork of Thin Materials. For articlear such as handkerchief or nightdress sachets


Patchwork in lace. Fig. 2. Duchesse cover in preparation, showing bow the different pieces of lace are arranged on a brown paper pattern. The patchwork is finished by an edging of lace
triangular borders will form neat patchwork. poster. Floral designs can he built up from A piece of lloral silk or satin may be chosen scraps of cretomes, cutting out flowers and as a central motif and framed with scraps of ribhon which tone with material used for the rest of the article and with the motif. Fancy stitches may he introduced for joining pieces or for adding interest to designs. Buttonhole, ornamental blanket stitch and satin-stitch are useful: while fenther-stitch (q.v.) or faggoting (q.v.) are very suitable for linen patchwork.

Faggoting may be used to assemble scraps of linen, poplin or casement cloth for runners and mats. Patchwork in four colours such as grey, green, pink and rose, or brown, heige, yellow and orange, is effective for these. The scraps should be cut into squares or ohlongs and arranged so that the colours halance nicely. One shade should be chosen for the narrow horler to lie faggoted to the joined patches, and the embroidery cotton used for


Patchwork in paper. Fig. 3. Example of pictorial patchwork copied from an old Georgian chintz, the design being entirely made from small scraps of coloured paper
the faggoting should match this. A good effect is gained by cutting the central oblong or square also of this shade and larger than the rest of the patches Individual taste will ovolve many ideas on these lines. Borders may be of narrow lace if a remnant is forthcoming from the scrap bag, or edges may be scalloped

Pictorial designs can utilize a number of colours and fabrics. Really line work is done on pieces of canvas with contrasting inaterials and a variety of stitches to outline detail and supply shading. Such work requires very careful planning, and it is best to begin with a simple landscape scene copied from a small leaves to make a panel. Patchwork deaigns should always be conventional when used for large panels. When really well exccuted they form admirable wall decorations.
Lace Patchwork. Oddments of real lace or of good machine made pieces are often to be found in the housewife's scrap bag. These can he turned to excellent account for table mats and runners. A paper pattern of the de sired shape is cut out and the pieces of lace are planned out on it to form a pattern. For a set of table mats a num her of pieces are required. The store at home may be


Fig. 4. Primposes and violets in a bowl, cut out of coloured paper and pasted on a backrround, forma charming picture. Fif. 5. Paper patchwork picture suitable for wall decoration
paper is removed and the mat is carefully pressed. It may be lined with fine washing net to increase durability Directions for washing and further instructions for sewing lace are given in page 6ī. No. 40 white cotton should he used double, as the lace must be strongly sewn together.

Paper Patchwork. The 18th century craft of making patchwork pic tures from scraps of coloured papers has re cently been revived. An easy and far less artistic development of this work was the patchwork from coloured scraps, such as arestuck on the outside of

Christmas crackers and flowers from cards, etc., which were assembled, gummed on to acreens and other articles, and then varnished. Many Victorian screens and papier nâ̂ché boxes and brackets were decorated in this manner.
The exquisitely delicate picture illustrated in Fig. 4 of violets and primroses in a bowl is n return to the 18 th-century method. Nothing but coloured paper is used, each petal, leaf and llower centre is cut out separately and pasted on the hackground, and no drawing is done first on the paper either before or after it is cut. The most beautiful colours can he obtained from using gond coloured advertise inents and cutting out cach tiny section from these in the tint required. The effect is mosaic-like when finished, glazed and framed.
Bolder designs may be executed in foil papers. These are sometimes applied to glass, being pasted on to the reverse side, an idea which is utilized as a decoration for trays, which are afterwards backed and framed with wood The foils in which chocolates are wrapped are used, and any oddments of gold or silver paper to make up the designs.
Some of the most beautifully executed patch. work pictures are done by those who have no akill with the pencil. A sense of colour is necessary and accuracy with the scissors, which in this work are the artist's implement. Figs. 3 and 5 are examples of decorative designs done in this way and copied from 18th-century chintz patterns. Specially prepared coloured papers gummed at the hack can be bought for this work, but the better way is to store up a collection of scraps of every conceivable shade and kind of paper from cuttings of hrown and blue grocery bags to scarlet tea wrappings, and from silver paper to fragments of wallpapers.

PĀTÉ DE FOIE GRAS. The livers of yeese are prepared and sold ns a tahle delicacy under this name. To serve the foie gras on toast. niake croûtes of bread. Pound the foie gras and mix it with a little Worcester sauce and seasoning. Pile it lightly on the croûtes.
Another savoury dish prepared from foie gras is made by melting $2 \underset{2}{2}$ oz. hutter in a frying pan over the fire, putting in $i f$ or 8 water or milk biscuits, and heating them slowly. While they are heating. furn the biscuits frequently in order that they may aoak up as much of the butter as is possible. When they arc ready, lift them on to a dish, dust them with pepper, and place on each a small heap of foie gras, which should first be rubbed through a sieve with $\frac{1}{2}$ oz butter and a squeeze of lemon juice. Put the dish into the oven for a few minutes until the foie gras is thoroughly hot, then sprinkle each hiscuit with a little chopped parsley, and serve them nt once. A small tin of pâté de foie gras is required for this recipe.
Fuie gras may be used for sandwiches and is also served in aspic jelly. Rinse some small dariole moulds in cold water, and pour into them a little aspic jelly to coat the top of each mould to ahout the thiciness of half a crown. Allow this jelly to set, using ice if time is of importance : then decorate it with pretty shapes of cut truffle and chilli, forming a pleasing design in red and hlack. Set this with a little more jelly, and, when firm, place in each mould a small, hall-shaped piece of foie gras. Finally fill up the noulds with more jelly, then leave them to set, when they may be turned out on to a dish. Ahout $\frac{1}{2}$ pint aspic ielly, a small pot of foie gras, 1 or 2 picked chillies and a small truffle would be sufficient to make six savouries.
PATENT LEATHER. New ahoes of patent leather will wear much longer than usual if treated to a liheral application of vaseline and put aqide for a week so that the
grease may soak in. This not only softens the leather, but also prevents cracking.

In cold weather, hefore being placed on the feet, the surface of the leather should be warmed gently before a fire or with a warm hand. The fact that the patent leather will not stretch like ordinary leather should always be borne in mind. If the shoes are tight when bought, no amount of wearing will case then until they crack.

Glycerin and castor oil are good dressings for patent leather, hut only a very sinall smear ahould he used, and that rubhed well in and then rubhed off again. Special transparent dressings for patent leather, which can he ohtsined at most shoe retajlers, are also to be recommiended.

Old patent shoes anmetimes become lincd or covered with crow's-feet cracks. A rag dipped in turpentine and rubhed well over the surface will be found to anneal these cracks, and with a little patience the surface will he restored to its original gloss. See Boots.

PATENT MEDICINE. Proprietary remedies on which duty has been paid, represented by an official stamp affixed to the con-
taining bottle or packet, are patent medicines. In no sense dors the patent medicine stamp indicate an official guarantce of the composition or efficacy of the preparation. The stamp is merely a receipt for the payment of a tax. Patent medicines are generally advertised as a remedy for some form of disease. Some, in fact, are stated to contain, in the one preparation, a "cure" for many and varied diseascs
The danger in using patent medicines is that even although they may relieve some symptom, the patient may be suffering from a disease which requires urgent and thorough treatment, and which would be discovered if a doctor were consulted. It profits a man little to have his cough lessened when this is really due to consumption of the lungs

PATERA. A patera is a circular ornament used on furniture to give accent to rarious parts of the design. It is found on Adam and Hepplewhite furniture. On the carved friezes of hookeases, wardrobes, and secretaires it is separated by lengths of vertical Huting, and is a common ornament at the angles of the panels of cuphoard doors

## Paths and Their Arrangement

## Materials and Plans that Give the Best Results

The reader interested in this subiect is referred to the entries on the various materials used for paths, e.g. Asphalte: Brick; Concrete: Gravel; Tile; and to those on Dutch Gerden: Flower Garden; Lawn and the like. See also Border: Crazy Paving; Ejging: Paving
The constriction of a path depends largely order to give an air of seclusion and distance. upon the location and style of the house and In formal gardens, auch as Dutch gardens, the nature of the subsoil. The materials straight paths crossing each other at right with which it is made may be gravel, asphalt, tar paving, bricks, stone, cinders, tiles, mosaic, or concrete. The path to the entrance door, which will naturally take as direct and straight a course ns possible, should measure at least 4 ft . in width, and be very substantially made. The path to a tradesmen's entrance will generally be taken in as inconspicuous a manner as possible to the rear of the premises. Another form of path is the one that is often found entirely sur rounding a house, this kind heing generally made of concrete.

In the garden the lay-out of the paths is a matter of much importance, especially when space is restricted, as by the careful plan. ning of the paths and the correct disposition of the floral miasses it is possible angles are effective. These can be paved or laid with grass. Grass paths are also attractive in a rose garden or heside a herbaceous horder.

Brick and Tile Paths. The choice of materinls is a matter of individual selection. Gravel is pleasing in appearance, durable, and, if well laid, gives a good dry surface An entrance path will probably be best constructed in brick or tile. This can he done by excavating the top soil and building upa hard, solid berl of gravel, hard core, or rubhle. ramming this well down in the earth and grading it. with the coarsest at the bottom and the finest at the top, not forgetting to provide for drainage according to the sitc.
The bricks, which slould be laid to a fall to drain off eurface water may then be herlded on this foundation, either in sand (Fig. 1), or, if preferred, in cement or lime mortar. If the bricks are bedded in sand it will be best to grout them in with cement mortar (Fig. 2). A liquid mix. ture of cement and water is poured over the surface of the bricks and well hrushed into the cracks
to ohtain a sensation of distance which would otherwise be lacking.

If the garden is of considerable size, a good plan is to make a principal path going direct from the house to some conspicuous point, such as a summer-house or sundial, and from this to take other paths in different directions a nd turn these ahout in


Path. Fig. 1. Making a brick path. The coarser soil is Grst rammed down. and above this the bricks are bedded, either in and, as shown. or in morlar. Fig. 2. The flished path after grouting with cement
with a stiff bristled brusli. The surface is well washed over with water and scraped clean while the mortar is still green
Tiles can be dealt with in a similar manner, but the edge or lierb muat be made sufficiently strong to bear the weight of persons walking on the path, and may take the form of tiles, hull-nose bricks, or other material Concrete may be employed, either in slnbs and in different colours, or broken into pieces, using black coloured mortar in which to bed the concrete. Another variation is the usc of York stone paving, either in hown slabs or in random pieces, laid down like crazy paving.

Mosaic (q.v.) is expensive and more suitable for internal use, as in a courtyard or for the floor in a porch. Where quantities of broken stone are available, or small cules of granite, an excellent composition path is made by lining the sides with bricks and placing other bricks to form a simple pattern, connecting the two side courses of brickwork. The spaces between are filled with lime or cement mortar, the cubes of granite or the hroken pieces bedded into it, and the whole beaten down smoothly with the aid of a rammer and a hoard laid on the surface. After the cement is set, and while it is still green, the surface is well washed with water and scrubbed.
Cobbles. Another style is provided by cobble stones bedded in cement mortar, and usel with a brick or rough-hewn granite edging or kerb. In some districts it is possihle to obtain old granite blocks originally used for atreet paving, and these, if not too badly worn, inake an excellent path, and may be laid as if they were hricks.
A Substitute for Asphalte. Asphalte paths and courtyards are convenient, but difficult for the amateur to lny, unless the arca to be covered is large enough to swarrant the expense of obtaining use of the necessary heating oven and rammers. A convenient sub stitute is to use a mixture of 95 p.c. by weight of stone-dust-obtainable from a mason's yard-and 5 p.c. of tar. The proportion of 5 p.c. of tar should not be exceeded or the mixture will not set hard. In lnying this paving material, the earth must be well rammed or tramped to make it solid. Two inches of the mixture is then applicd, and thoroughly well rolled or tramped. The finished thickness should not be less than 2 in.

The pathways in the garden itself need not necessarily be built up with such hard and impervious materials ns the foregoing, but could he left in the form of natural grass paths, the borders being defined by floral plots. Where much traffic is expected on such a path, stepping stones made of


Fig. 3. Rough boaids set up parallel to each other to form the limitt of a narrow path


Path. Fig. 4. Diggrams showing various ways of laying concrete tiles : hese form a durable material for paths
of odd pieces of brick or stone, etc. The first thing to be done is to mark out $t^{2}: e$ position of the path with a garden line, a number of pegs being driven in as a further guide. The top surface of the marked out path should then be removed to a depth of 2 or 3 in . Into the shallow trench thus formed is put the foundation material, and the whole is firmly rammed in

On ground intended to be turfed the margins of the path may be defined by an elging of rough hoards, between which the path is laid, turf being brought up close to the edging outside (Fig. 3).

The cinders are graded acconding to size; they are placed with the coarser grade at the hotton, gradunlly working up to the finest grade, which should be on the surface. A better result will be obtsined if each layer of the cinders is firmly rammed or rolled dowi. Then give the completed path a good rolling and watering, so as to ensure its being firm, and to prevent it from picking up on to the hoots when walked upon.

Concrete Tiles. Concrete paving tiles in various colours are avail. able, and form a durable and comparatively inexpensive material for paths. A typical product is made in 9 in . square, 9 in. by $4 \frac{1}{2}$ in, and 12 in . by 12 in ., with a thickness of $1 \frac{1}{\mathrm{~g}}$ and $1 \frac{1}{3} \mathrm{in}$. Larger sizes ( 2 ft . 3 in . by 1 ft. 6 in., 1 ftt. 6 in. by 9 in. etc. ) are supplied in a thickness of 2 in.
The diagrams given in Fig. 4 show various ways of laying the abcre A apace of half an inch is left between tiles, which may be laid in mortar or cement. Another method is to spread a thin layer of sand or sifted earth over the prepared founda tions, and then to lay the tiles in position, pressing randoon pieces of Hagstone or granite, sunk them firmly in place The joints are afterin just below the surface of the grass so that the grass may he cut with a lawn mower, will take a goorl deal of wear, and at the same time will look very picturesque.

Cinder Paths. A simple path can be made with cinders removed from the grates and saved until the quantity is sufficient. Suitable material can often be obtained from the local gas-works for a little more than the cost of cartage. The foundation may be composed
wards filled in with earth or sand
A path should require little or nothing in the way of care and attention or repains, except at very infrequent intervals; hut generally all paths composed of rubble. cinclers, clinker. gravel, and the like may wear into grooves and hollows. In such acase breat up the surface, and relay with the old material and a top dressing of clean, fine material, well rolled and watered. and with a nicely cambered surface.

## Patience: Some Games Explained

## A Popular Pastime for Winter Evenings

For the purpose of this article a number of patience games have been selected and the way to play them explained. Those interested incards will And entriez on such card games as Bezique; Bridge; Cribhare; Nap; Piquet; Whist, ete.

The name patience is given to certain card Below these place the four aces as they appear. games which are usually played by a single The reat of the pack forms the stock. The person, although there are a few for two object of the game is to form on each of the people. They are played with one or two aces a sequence in suit up to the king. For packs of cards, but there are a certain number this purpose any tivo is transferred fro:n the for which three packs are necessary. There carpet to its position on the ace, and then a are a great number of these games, but the three, and so on. Vacant spaces in the carpet main principles are the same, to get the are filled from the stock and the game proceeds carda into a certain order. Some of the games are pure luck, but in others there is scope for a certain amount of foresight.

Carpet Patience. Patience games may be divided into those played with one pack and those played with two. Of the former, carpet patience, $\Omega$ very simple game, may be mentioned first. For this lay out, face upward, 20 cards in four rows of five to form the carpet
are filled from the stock and the game proceeds
as long as possible on these lines. When no further progress can be inade the player must deal the stock of cards, face upward, in a heap, known as the waste, and vacancies in the carpet must be filled from these. The top card of the waste can, if suitable, be played on to one of the sequences
Sultan Patience. To play this patience, take ont the four kings and the ace of hearts


Patience. Fig. 1. The nine foundation cards laid out to begin the game of Sultan Patience, with the king of hearts, or sultan, in the middie

Demon Patience. Demon patience requires only a single pack. Having shuflled and cut the cards, deal 13 of them, one on top of the other to a stock Then deal four others out in a row, and another nne to begin a row above them. This serves as a foundation card, and as they appear the other threo cards of the same value as this one are placed with it to form the four foundations. Thus, if an eight is the card first placed there, the other three will also be eights. On these foundations any suit. able exposed card, in ascending sequence of suit, can he played, the exposel cards being the top ones of the four packets on the lower row and the top one of the stock. The ascending sequence goes to thic king and then for loundations on which to build. After the to ace, two, and so on, until the 13 cards remaining cards have been shuffled and the are in place pack cut, four other cards are dealt out to be the foundations of four other piles. The actual building then begins on the nine foundation cards. On the king of hearts, who is the sultan, only a descending sequence of hearts can be built. On the three other kings an ascending sequence of the suit to which each belongs beginning with the ace, can be built. On the ace of hearts an ascending sequence of hearts can be built, and when this is in line with the dcscending sequence on the king, the cards are tra-sferred from the latter to the ace, leaving the king alone. On the four other cards a descending sequence of any suit can be built, and the exposed card can, if suitable, be transferred to one of the live piles of which four kings and an ace are the foundations. Thesc are seen in the illustration nbove.
'Ihe cards not wanted for any of theas nine piles are put, face upward, on a rubbiah heap, and the top one can he used whenever suit able. After the cards have heen dealt, those in the rubbish heap arc dealt out again. They may either, by being unsuitable, block the game, or may enable the five main foundations to work out. If this is done the sultan will be surrounded by four piles, on the top of each heing a queen.
Sir Tommy. Sir Tommy is another variety that is played with a single pack. Ite object is to build up four packs of carrla from the ace to the king, but it is not necessary to follow suit in so doing. The cards, having been well shuffled, are played out. Four of them are put down for the foundations. and there is no rubbish heap. As the aces appear they are placed below the four existing foundations, and the object of the game is to build on them at every opportunity.

If the cards dealt will not go on to an ace pack, they must be placed on one of the four others, and this usually presents a difficulty. It is not easy to decide, for instance, whether a six should go on a five or on a knave, and high carla must often be placed upon, low ones. If the kings and other bigh cards come out fairly late, the patience is almost impossible to accomplish. Some players keep one pack for the high cards, and this is desirable.

Exposed cards can he placed, not only on foundations in ascending sequence of suit, but on to four depots in descending sequence of alternate colour. A sequence of cards, or any portion of a sequence, can be transferred at any time from one depot to another, provided the proper sequence and alteration of colour are preserved. When 11 of the cards in stock have been taken, either of the remaining two may be played. A spacc occurs when all the cards in a depot have been played, and this must be filled by using the top card of the stock. After the stock has been exhausted it may be filled with any exposed card.

The cards remaining in hand after the initial deals are dealt in batches of three face upward to a rubbish heap, and the top card of each then becomes an ex. posed card. Such can be played either on foundations or depots, when the card immediately below it becomes exposed. When only two cards of the pack are left in hand they are dealt separately, and either or both can be played. When all are placed the rubbish heap should be picked up, turned face downward, and dealt out again, the cards from it being played until the patience comes out or is blocked.

Divorce Patience. Divorce patience is played with a single pack. Going through the cards, the player forms of them four


Patience. Fig. 2. The game of Divorce Patience in progress, with odd cards on aces, top row ; even cards on twos, middle row ; rubbish heaps, bottom row

Fous of these packets must have their faces downward and four upward Alter this, deal out eight cards and place this pile in the centre of the eight this centre pile must be placed lace upward. The remaining cards are dealt out, but belore this is done the player should examine the pilcs; il one of the top cards of a pile that lies face upward is an ace or a two, this can be taken out and employed for a foundation card.

The patience is built up on 16 cards, beginning with the aces and the twos, eight of each On the aces all uneven numbers to the king are placed; and on the twos are the even numbers to the queen Whenever an ace or a two appears it is placed as a loundation card. If any exposed card on the piles at the side becomes suitable, it can be taken away and used The top card of the rubbish heap can also be taken, whenever possible, in order to build up a sequence; but if there is a card on the pile and on the heap of the same value, the former must be taken.

At the end of the deal take the eight cards in the centre of the side piles, or as many of them as are left, and spread them out. If any are found suitable, place them in position on the 16 piles. Next turn up the top cards of the four piles that are placed face downward and, if thesc are suitable, use them When no further progress is possible, take up all the side piles and shuffe them with the cards of the rubbish heap. Then deal them out as before. Two of these deals are allowed, by which time the cards should all be in position

Legitimist Patience. Two packs are also required for legitimiat patience Having shuffled them well, take out a king and lay it on the table; then deal out the other cards, placing in a row quecn, knave, ten, nine, eight, seven, and six from nny suit and throwing the rest on to a rubbish heap These eight cards are the foundations, and as the remainder are dealt out they are built upon these in an ascending acale. The carila that cannot be placed go to the rubbish heap, which may be turned over once and suitable cards from it placed in position The object of the game is to get 13 cards on each pile.

Miss Milligan. Miss Milligan requires two packs of cards. Having been shuffled together and cut, eight of them should be dealt, lace upward, in a row to eight depots Any aces that come out at this time, or later, are taken to form eight loundations, which are placed below the depots. The object of the patience is to build on the foundations, eight suits in ascending scquence. Exposed cards, which are the top cards of the eight depota, are played in ascending sequence of suit to foundations, or in descending sequence of altetnating colour's to other depots. A complete sequence of any number of carda may be translerred bodily from one depot to another, provided the proper sequence and slterations of colour are maintained Portions of a sequence cannot, however, be transferred except the top card, which can be moved at any time A apace occurs when all the cards of a depot have been played. Such spaces can only be filled by a king or sequence to a king. If this is not possible, it must be left vacant for the time.
When all available carcla have been taken from the depots, a second eight cards should be dealt to them, and in this way any spaces which may have occurred will be filled The available exposed cards should then be played, after which another row should be dealt out, and this continues until all the cards have been played out. It should be noted that in each round carils must be dealt to all the depots before any one of them is played out.

Quadrilateral Patience. For quadrilateral patience two full packs of cards are also required. Having shuffed both together, deal
six packets out in a row, three cards being in each packet. They should be lace upward. Then lay out six more packets of three each, three on the right and three on the left, in such $\Omega$ lashion that with those already in position they make threc sides of a squarc. The space in the centre will be filled with the eight sequences, the building up of which is the player's aim
The sequences start with tho next card turned up Whatever this is, each sequence will start with one of the same value For instance, if it is a three each sequence will run in suit from the three to the two. The player should first note whether there is among the twelve exposed cards one or more that will serve as foundations, i.e. that correspond in number with the one just turned up. If so, that card is taken away and laid next the original loundation card. The player should next consult the exposed cards to scc if he can pack any of them in descending sequence of suit lor use later. He may be able to place a seven on an eight, or a qucen upon a king.

Having done all poraible in this direction, the player must deal out the remaining cards to a rubbiah heap, laying out any loundation cards as they appear, and whenever possible playing the other cards on to one of the 12 packets or one of the eight foundations. When any packet is exhausted, he can place there a card, either from the rubbish henp or from one of the other packets. The latter is better, as it gives greater opportunities for working off the cards. The cards are only dealt out once, but when this is over the player is allowed to take five cards from the bottom of the rubbish hesp and spread them out. This will help to place furthor cards, and may enable the game to be completed.

Khedive Patience. Khedive patience is not difficult to work out. Having shuffled the 2 packs, lay 25 cards out in 5 rows, 9 cards in the bottom one, then 7, then 5, then 3, and then 1 , the whole resembling a pyramid. From these cards the player chooses onc as the base card. This should be a two, if there is one, or, if not, another low card, say a three or a four This should be placed on one side, and as the other 7 cards of the same value appear they should be placed at one side or the other until there arc 8 altogether. On these 8 cards sequences in their own suit must be built up Any suitable card can be taken from the table and the vacancy made filled up from the pack When no more progress can be made in this way, the remaining cards ahould be dealt out and a rubbish heap, formed from which any vacancies are filled. If the patience works out, the pyramid of carls will totally disappear, as will the rubbish heap which feeds it.

PATINA. In furniture, this term is applied to the metallic appearance of the surfuce of old wood. It is regarded as a sign of age, and therefore is valued by collectors. Patina can not properly be produced by the application of varnish or polish. It comes after years of careful cleaning and rubbing, and as a rule the upper surlaces or those that catch the dust have the finest patina.

The term patina is applied also to the characteristic appcarance taken on by old bronze and copper articles, which is the result of chemical action It is simulated more or less successfully by treating new pieces with various chemical solutions, and can be imitated also by painting such articles with one or other of the special preparations sold for the purposc.

Artiflcial Patina on Metals. A patina can be imparted to bronze and copper in the manner herc described. A green patina is produced on bronze by brushing the article with a rolution made by dissolving 16 grm sal-ammoniac and 4 grin. sodium bicarbonatc
in 1 litre vinegar After this operation the bronze is placed for a time in a box, in which carbon dioxide will be evolved The process is repeated until the desired degree of colour is obtained
A bright green patina can be obtained on copper by preparing 10 per cent solutions of nitrate of copper, sal-smmoniac and calcium chloride A mixture made from 10 parts cach solution is brushed on to the article and nllowed to dry

Another method for copper, which results in an antique green patina, is to lay on the lollowing misture quickly and allow it to dry : $7 \frac{1}{2} \mathrm{grin}$ sal-ammoniac; $7 \frac{1}{2} \mathrm{grm}$. common salt 15 grm liquid ammonia Several applications are necessary. Some carc is necessary in using thesc proccsses, and the worker is recommended to test the solution on an odd pieco of metal before proceeding with a larger job

PATRINIA. This is a hardy biennial plant sometimes called eastern valerian. It bears graceful loliage and fragrant yellow Howers The chief species grown in gardens are palmata, villosa, and scabioscaefolia, which require a sunny position in ordinary soil. Patrinia is raised by seed sown outdoors in spring, or increased by division of roots in March or October

PATTERN : For Dressmaking. Generally a pattern is cut out in paper for one side of the garment only A whole pattern is unnecessary, because the balf can be set on doutile material and a whole shape cut out more casily and quickly. It is only when the two sides are different in shape that it is necessary to have a pattern of the whole garment They are designed to meet seasonal requirements and cut out in various stock sizes; that is to say, the models are made on perhaps 4 or 6 stands of varying average sizes, ranging from sniall to very large
If any alteration is made, whether it is merely a simple one for size, or a big adaptation, the pattern should always be 1ried on after the alteration is completed, so that the exact effect may be judged. One of the rulea of the home dressmaker should be to pin up and fit on a pattern before cutting the material. Only in this way can it be seen whether the desired size and style are there, and so perhaps save spoiling the material.
The best course to pursue when a pattern is to be altered in any wny is to take the parts to be altered and cut them in newspaper, and to carry out the alterations on these newspaper parts first of all, so that the original pattern is still a vailable.
Another essential is to note whether turnings are allowed on the pattern, and, if not, to take carc to leave enough on all the edges for fitting, seams, and hems. It is a good plan, after cutting the material. and before removing the pattern, to chalk or tack round the material close up to the pattern edges, fo as to see exactly what turnings must be taken up everywhere
As a rule, paper patterns can the obtained through pattern services in connexion with fashion or needlework journals and magarines. and through special pattern cutting agencics

Paper patterns of all kinds are supplied by some of the fashion papers published by the Amalgnmated Press, Ltd., especially Home Fashions, Fashions for All, Mabs Fashions, and Children's Dress. They can be obtained, either in person or through the post, from 291a, Oxford Street, London, W. 1

PATTERN: In Metal Work. Patterns are replicas of an object to be subsequently made in metal, and more particularly for the purpose of forming depressions in the moulding box. into which the molten metal is poured in the production of the castings See Casting.

## Pattern Printing on Woven \& Hard Fabrics

Simple Methods for Applying an Effective Ârt Craft

## The reader interested in art crafts will find information relared to this article In the entries on Dyeing; Glass Ware; Lampshade Painting on Textile Fabrics: Stencilling; Transfer

Pattern printing within the limita of simple seen in use and others required for the pattern designs is one of the easiest of the genuine art are on the table ready to hand) has been crafts, and can be used to decorate many objects in the home. Another excellent service which its study can render is the training of school children by cultivating their apprecia. tion of line and colour when forming patterna. Results are accomplished with comparative quickness and at $\Omega$ very small cost. The materials for the craft are simple to use, and obtainable through any artists' colourman.
Two of its advantages are that it can be successfully carried out almost from the first attempt, and that fabrics can be printed with washable and permanent colours. The most delicate georgette scarf can be patterned without injury, while pieces of silk or cotton which have lost colour can be renovated with pleasing results. This is particularly the case with unpatterned window curtains, bedsprends and cushion covers, the fabric of which is not worn out, but the original colours have heen laundered to a drab shade. Ro-dyed and bordered with pattern printing, articles which have been considered unsightly and practically worthless aro transformed into attractive furnishings.
In addition to the articles to be decorated, all that is required to print in almost any colour on woven fabrics, or on hard surfaced ones, such as glass, wood and pottery, are pattern printing liquid colours in bottles and tubes of oil colours; a set of $a$ dozen pattern printing sticks; a palette containing small square pads to hold the colour ; a saucer or white tile for oil colours; some rubber stamps (or these can be cut on ordinary pieces of rubber, as will be explained Inter in the article); pieces of lino; a bottle of copal and one of wood varnish. Bronze powders and gtencil medium can be utilized in this work when it is wished to gain a richly decorative effect.
The liquid colours in bottles are specially prepared for printing on soft materials and are of the exact consistency for immedinte use, while oil colours must be used for printing on glass, wool or potiery.

Oil colours may be used on woven fabrics when thinned with turpentine, but the results are not so satisfactory except for surfaces which remnin liat, such as lampshades or sachets. Soft fabrics tend to become stiff when printed with oil colours, and if the pattern is large the fabric thus trented may not hang or drape in good folds.
Printing on Textiles. Some soft materials are more absorbent after washing, and thus receive colour more easily; this applies to cotton and linen. Silks and other thin woven fabrics need not be washed before printing is done. A few experiments on scraps of material washed and unwashed can be made before starting to print any larger piece. Throughout the work it is advisable to have a small piece of the same material at hand on which to make $\Omega$ few trinls and to eee the effect of combinations of colour. The best way to become accustomed to tho printing process is to collect some scraps of differently textured and coloured materials and make experiments, rather than risk spoiling a piece of work.
The method of working is well illustrated in Fig. 1. An inexpensive tray cloth is being printed in chrome orange, chrome yellow and ivory black. The article is laid on a board which has been padded with sheets of newspaper and a sheet of white blotting paper on top of these. Drawing pins keep the work taut and straight. A little pattern printing colour (or oil colour if preferred) is spread on to the pads in the palette The pattern stick (one is
pressed on to the colour so that the end of the stick is evenly covered and is now being pressed on to the cloth to make the print. The actual process is simplicity itself.
The colours provided-red, orange, yellow, green, blue and violet-are brilliant and pure. Mixed with white or grey as well as with one another, handreds of distinct shades and hues can be obtained, ranging from deep full tones to delicate partel tints. As experiments are made with the printing sticks, and each separaie ahape appears on the fabric, patterns will be found with delightful ense. For those who wish to try experiments before attempting original designs, transfers printed full size on thin paper arc obtainable for scarves, table niats, cushion covers, etc. Possibilities of combinations of printing forms can be scen from the study of one or two transfers.
Although colour is a matter of taste, thero are certain rules which are useful to remember with reference to harmony of tints. Any pure colour will harmonize with black and white or grey, or with itself mixed with black or white to make deeper or paler tones. Two colours will harmonize if grey is mixed with both. Brilliant effects require marked contrasts, such as blue and orange, purplo and green: quiet restful effects can be workel with tones of the same colours, or with those which are closely related, such as blue and vioiet, or vellow and green

A trial border can be quickly printed on $n$ piece of nainsook. First take a pattern stick which prints a half-inch square and place it diagonally and join to it a quarter-inch square. Repeat the arrangenient along the border. This is such a simple pattern that it may seem unintercsting, but it is useful for experiment with oven pressures of the printing sticks, and also for colour coinbination, while it forms a good surround for more elaborato designs. With regard to colour it will soon be seen that the small squares look better in a diarker shade and the large squares in a lighter. With three or four printing sticks, printing different geometrical shapes, a number of simple borders can be worked, and the most interesting experiments can be made in colour.

In Fig. I the simple pattern would not be effective if orange or black had bren used for the large aquarea By keeping these in the palest of the three tones selected they do not overpower the tiny black squares set diagon ally, nor the orangc circles, and thus balance is preserved in the design. It is necessary from the beginning of learn ing this craft to consider not only which colours go well together, but how much of each colou is required, and on which part of the pattern it can most decoratively be em ployed. Most people will want to origi. nate designs after they have practised a few aimple borders and patterns and

Pattern Printing. Fig. 1. Printing a pattern on a white tray cloth by means
 of wooden printing sticks and washable printing cooours
used a transfer, ironed off oll to the object to be printed in the ordinary way. Pattern printing paper is obtainable, which is marked with quarter-inch squares, on which the designs can be worked out with gourche colours. In this way the effect of toncs and shapes can be judged and well ba!anced to suit the particular object.
When conipleted the original design may be transferred to the fabric in one of two ways. (1) If the material is very thin the deaign can be placed underneath and will show through sufficiently to guide the printer. (2) If the fabric is not semi-transparent, $\Omega$ sheet of transfer paper will be required. This transfer paper must not be confused with the pattern printing transfers. It is coated on one side with red, blue or black, and is used in the same way as carbon paper.
At the other end of some of the printing sticks are more fanciful shapes which greatly facilitate the production of elaborate deaigns, and give interest to the patterns, once the simple process has been mastered.

Printing on Hard Surfaces. Wood printing sticks are not suitable for printing on wood, pottery or metal. Such unyielding surfaces require n softer substance, and india-rubber is the ideal material for this purposc. Flower and other shaped stamps are obtainable, or pioces of soft india-rubber can be cut to correspond with the wooden printing sticks. Another way of turning rubber into intercsting shapes is to heat a knitting needle, and when red hot burn round holes with the end, and lines with the side of the neadle, on the pieces of rubber.

For all hard surfaces the oil colours in tubes are used. The colour is squeezed out on to a piece of thick glass or a white tile, a little varnish is used with it, and it is spread evenly so that a palette knife will just take it up when the printing rubber or stamp is pressed into it. When the colour is dry the whole work should receive a cont of vamish.

The application of pattern printing to pottery and wood is illustrated in the various diagrams shown in Fig. 2. Puttern transfers cannot be used for such pieces of work, as it would be impossible on $\pi$ hard and curved surface to keep a transfer in position. After the proposed patterm has bcen sketched out on a piece of paper, the worker will need to make dots with pencil or coloured crayon directly on to the article to be printed. For this type of work the simpler the designs the bettor. In Fiy. 2, $G$ to $N$ show $a$ variety of print forms that go to mako up patterns. In A nothing hut different sizes of squares are used
$D$ shows the formation of the print from the rubber used for printing all but the straight lines on the vase 13. The pattern on the candlestick $F$ was entirely evolved from repetition of print $G$. A collection of articles, including a silk scarf, wooden candlestick, pottery case and papier mâché bowl, are shown in Fig. 3, all of which have been decorated by the simplest of designs in pattern printing.

Printing from Linoleum Blocks. Another way of making printing shapes is cutting them from thiok linoleum This method can be practised on 8 mall pieces. Special cut ting tools are obtain able and comprise dividers, gouges and outline knives of assorted sizes Printing by hand from lino and wood blocks is a more advanced form of pattern printing. The design may be drawn directly on to the linoleum, but usually it is traced on to tissue paper. with Indian ink. The surface of the lino is covered with gum and then placed down on the tracing. The lino block is next turned face upward, and any bubbles on the paper are pressed out with a scrubber or rubleir covered roller.
After the gum is set the block may be cut. With the knife cut round the edge of the design. A clearing cut is then made, sloping towards the base of the first one, lenving a $V$-shaped trench round the design. The portions of the design not required to print are then cut away with a small gouge, or a wider one is used for larger waste picces. Very benutiful results can be obtained from these printing blocks, but such a development cennot be dealt with adequately here. Interesting shapes cut into lino can, however, be atilized to give
freer scope to original idens. These aro mounted with ghe on to pieces of wood and used in much the same way as the printing sticks, but as lino is rather unyielding it is not so suitable for hard surfaces, though good results have been obtained on wood and papier mâché.
PATTY: How to Make. A small pie or pastry case filled either with meat, fish, jam, or some savoury or sweet mixture is knowil as a patty. The cases may be open or coverod, and sometimes they are baked in small, round tins called patto pans. If the case is of puff


Pattern Printing. Fig. 3. Examples of pattern printing on silk, pottery, papier máché and wooden articles
or rough puff pastry it should be cut out of a sheet of pastry about $\frac{1}{1}$ ir. thick with a sharp, round cutter and baked on a steel baking sheet wetted with cold water. When properly prepared and baked in a hot oven, the rounds will rise to the correct height for oyster or any other variety of savoury patty.

The cutter should be rather larger than the size desired, as when the cases rise in the oven they diminish somewhat in circumference. When the rounds are laid on the baking shect, an inner circle should be marked on the surface with a smaller outter, leaving a margin round the cilge. 'This inner portion forms a lid for


Pattern Printing. Fig. 2. Diagrams showing potters and wooden articles decorated with pattern printing executed by ineans of rabber nribts and oil colours. See text
savoury or jam patties, and must be removed as soon as the case comes out of the oven The patty must now be cleared of all loose uncooked paste inside and then will be ready to fill.
Cold cooked chicken, gamo, meat, fish. mushrooms, oysters, shelfish ham, hardboiled eggs, eto., chopped finoly and mixed with a savoury white sauce are used to fill the patty cases, which are then given the name of their contents. The small round of pastry is placed on top of the filling. They can be served hot or cold. For jam patties any kind of jam can be used

Meat Patties. Meat patties inade with plain short or flaky pastry should be baked in patty pans. A round layer of pastry forms the base of the patty, a portion of prepared meat is heaped in the centre of the round, and a secend round of pastry moistened at the edge is placed over for a cover An incision is made in the top, and the patty after being glazed is ready to bake. Add also a little stock or water and bake about 15 min . in a good oven.

Patty Pans. A small round tin known as a patty pan, having a depression in the middle and varying in size is used for baking tartlets, etc. After use they should be wiped out with clean kitchen pajer and should not be washed unless they have become covered with jam, fruit syrup, or mcat gravy. See Prawn Patty.
PAULOWNIA. The hardy summer flowering tree Paulownia imperialis is highly ornamental having very large heart-shaped or lobed downy leaves and violet Howers of tubular shape
The Paulownia likes a deep, loamy soil in a sheltered but sunny position, and abundance of moisture. Propagation is by seeds sown in heat in spring, and by cuttings inserted in sandy soil under a bell-glass or handlight in sumner. This tree is suitable only for planting in comparatively mild districts.
PAVING : Method of Laying. As applied to domestic work, paving is a floor or path laid with large slabs of stone, but in a wiler scnse may include concrete, brick, tile, tar-macadam, asphalte, or any impervious material of a hard and durable nature. Examples are found in the paved courtyard, terrace, or paved entrance path, while in many country homes the foor of the kitchen dairy, and sometimes the living-rooms, are paved with stones. tiles, or brick

Should a stone paving have to be laid, it is customary to make a foundation of hard core, well rammed and consolidated, and then to lay a bed of finer stuff about 2 in. thick, top. ping this with cement mortar or linie mortar, embedding the stones in it, and completing the work by grouting with cement. Bricks or tiles may be laid in a similar manner. The joints should not be too narrow ; $\frac{1}{2} \mathrm{in}$. is not too wide, as wide joints improve the appcarance of such a flow. Smooth bricks specially intended for paving and burnt to the right degrec of hardness are obtainable, but ordinary hard stock bricks or rough bricks are quite serviceable for the purposc.

Care must be taken that the joints are properly broken, that is, that no two bricks stand exactly opposite one another, as if they do the joints will be in line with each other, and the parement would not be so durable. After all the bricks are set in position they are beaten down by laying a board on top of them and hammering it with a rammer or heavy mallet. The whole is then well grouted, thin cement brushed into all the joints, and the bricks cleansed with clean water after the mortar has set. See Concrete ; Crazy Paving ; Path, etc.

PAWL. A pivoted check, known as a pawl, is used in connexion with a ratchet, or similar mechanical device Its function is $t o$ permit rotation in one direction and not in another. A common form of pawl consists of a pear-shaped piece of metal, the broadened
end ol which is pivoted to the one member and the narrow end rounded off to some pointed shape, so that it can engage in the teeth of a ratchet wheel or other device.

A pawl is sometimes made reversible, or double ended, so that in the one position it will permit of rotation in a ripht-handed direction, and when in the other position in a left-handed direction. Common applications are found in machinery, and clocks and watches of all linds, where a pawl is used ns a check or detent to the main spring.

PAYING GUEST. Unlike the ordinary Iodger, a paying guest is a person who sliares the family life of the people with whom he or she boards. The usual arrangement is for an inclusive fec to be charged, and for the person to be treated exactly like a guest, to be given the best of which the household is capable.

Legally, the position of a paying guest is that of a hoarder; for in essence his contract is one for board and lodging. The only difficulty ever likely to arise is as to the length of notice to be giren on either side to terminate the contract; so that both host and guest should he careful to make an express stipulation on this point. There is also an implied undertaking on the part of the loost to provide food and accommodation reasonably adequate according to the sum paid by the guest ; and one by the guest to beliave in a proper manner in the house. Indeed, it would probably he held that these stipulations were conditions upon the breach of which by the one, the other party would have the right to terminate the contract. See Boarding House: Lodgings.

PEA. This is the name hoth of a certain plant (Pisum sativum) and of its seeds that are used, either green or dried, for culinary purposes. The plant is more usually spoken of in the plural, under which heading is appears in this work. Other members of the same family, for instance, the sweet pea, everlasting pea, and glory pen, are grown for their Howering qualities. See Everlasting Pea; Glory Pen; Peas: Sweet Pea.

PEA BEETLE. A little insect that is often very destructive to seed is the pen beetle. It lays eggs in immature pods, and these hatch into legless grubs, which eat their way into seeds and pupate in the cavities. Seed containing this pest usually fails to germinate, imported seed being more likely to be infested than home-grown samples. There is no reliable remedy, and all infested seed must be burnt. See Peas.

PEACH. The peach is one of the most delicions of fruits. In Great Britain it can be grown to perfection out of doors, but only on a sunny wall. One variety, named Breda, may succeed as a standard tree in the open garden in mild districts. Peach trees grown under glass, either in a heated or unheated glasshouse, vield exceptionally fine fruits. The cultivation of the peach tree requires care, otherwise


Peach. Two specimens of the downy-skinned and luscious dessert fruit
Courtesu al Amateur Gardeniny
disa ppointment is almost certain. Unless the soil is naturally loamy old turf soil and decayed manure must be arlded before the trees are put in. Planting should be done in autumm. When the trees are in bloom it may he necessary to protect the flowers from damage by frost.

Pruning is a detail of great importance in the management of peach trees. In spring fresh shoots will develop freely on the old branches, and if all are allowed to remain the tree will be spoilt. All except two shoots on each hranch of the past year's growth should be removed while they are small. One must be left at the top and another near the base: the remainder sliould be time, during a the final pruning takes place : it is done by cutting out the branches of the previous year's growth and tying in the new shoots to replace them. Thus a considerable part of a peach tree is renewed yearly. Shoots which grow one year bear froits the following year and are then cut out. Peach trees grown under glass need similar treatment: if early fruits are required their development may be hastened by maintaining a warm and moist atmosphere in the glasshouse when the fruits are about one third full size. Amateurs will achieve success by ventilating the glasshouse freely during the summer months. Some of the hest

This sum practice is termed disbudding. In late in syrup, then pour them into an earthen ammer, when all the fruits have been gathered, vessel and leave all night. The following mornvarieties are Royal George, Stirling a double variety
arsica. varieties are Royal George, Stirling Castle, Barrington, Early Rivers, and Grosse Mignonne.

Peach leaf curl, a disense which causes hlister-like patches on the leaves, is often troublesonie. It can he prevented bv spraying with Bordeaux nixture in February.

The Fruit. No preserved or foreign peach possesses the delicute Havour of the English fruit, but imported peaches of best quality also appear as dessert fruit. The second quality and preserved or canned peaches inay be converted into many sweets and are not expensive.

Imported or home grown peaches may be preserved as follows: Pare the fruit, which must not he quite ripe,


Outdoor Peach. Cultivation. 1. Planting in loamy soil : a, heavy loam and old mortar; b, original top spit joc, bottom soil opened with brick-bats. 2. Planting on wet soil : a, heavy loam: b. orikinal top spit: $c_{\text {, brick-bats }}$ replaced by good compost. 4. Shallow planting of a wall tree 5. How to distinguish huds : $a$ fruit huds : $b$, growth hads, 6 . Remove front and back distinces be $a$, hais branches. 7. Stopping laterals at base of fruits and keeping to one leas 8. Disbudding : growths at $a$ and $\iota$ to remain unchecked

Peach Gáteau. To make this trifle, a kernels, which should previously have been border ring of sponge cake, a large tin of peaches, cream and flavouring are requircd Put the sponge cake in a glass or silver dish,


Peach Gatean, a trife made with tinned peaches. sponge cake, cream and blanched almonils
soak it with gill sherry and a little of the peach syrup, and then stick into it 2 oz blanched and skinned almonds cut lengthways into thin slices. Round the base of the ring place 2 or 3 peaches cut into quarters; pile the remaining fruit and syrup in the centre, and over them shake pint atiffly whisked cream flavoured with vanilla and aweetened to taste. Garnish the top with a fow crystallized violets

Peach Jam. This is made by peeling and cutting into halves 6 lb . peaches These should be put into an enamel or steel preserving pan with $\mathrm{I} / \mathrm{lb}$. loaf sugar to each lb . of fruit Boil for about an hour, stirring frequently to prevent burning. When almost set add the
kernels, which aliould previously have been
removed from the stones and blanched. Put into jars and cover each witl paper dipped in brandy. See Nectarinc.

PEA-NUT. The pea-nut is valuable because of its oil, and forms the foundation of many nut butters. As well as being eaten as dessert, these nuts are sumetimes ground or flaked and then mixed with fresh mashed fruit, such as atrawherries or raspberries, or sprinkled over the surface of stewed fruit, sundaes or ices.

Pea-nuts lightly browned in hot butter and then seasoned with salt are quickly and simply prepared Shell and akin about a quart of nuts, and toss them gently in a pan containing 2 oz amoking hot butter. When they are of a pale brown colour lift them out, drain them, and coat them lightly with salt to which a little cayenne pepper has been added. Dry the nuts in a cool oven, shake off any loose salt, and, when they are cold, atore in tins till nceded, or eat them hot.

Pea-nut sandwiches are made trom finely ground or grated nuts from which the skins have been first removed. Mix these with hall their weight of fresh butter or whipped cream, season the mixture highly, and spread between thin slices of brown or white unbuttered bread. Pea-nuts are often added $w$ toffee in the same way as almonds. See Almond Toffee.

## Pears: In Garden and Household

## Directions for Growing and Preparing a Popular Table Fruit

This article is on the same lines as those that deal with the Apple, Cherry and Plum; the krowing and cooking of the fruit are described. and then follow the varlous dishes that ca.a be made from it. See further Diet; Fruit; Grafting: Grease: Pruning
The pear is one of the most delicious of all are again pruned, to within about three buds hardy fruits and is eapecially well suited to of the base of the past summer's growth cultivation in the milder parts of England and Wales: elsewhere the choice varieties should be grown on a sunny wall. When budded on the pear stock the tree will reach a height of 20 ft . or more and live to a great age; in this form it is suitable for orchard planting. Pear trees budded on the quince atock are more suitable for gardens, for they are of less vigorous growth and take up far less room: they may be set at 10 to 12 ft . apart. Trees on the pear atock are usually grown in the form of standards : those on the quince stock may be bushes, pyramids, cordons, fan-trained or horizontal espaliers. Those planted against a wall are cordon, fan-trained or horizontal espaliers.

Pear trecs prefer well.drained loamy soil, but they will thrive in ordinary garden ground that is not waterlogged, provided they are planted in a sunny position. In heavy soil it is wise to plant the trees at such a depth that the uppermost moots are covered only by 2 or 3 in . of soil: mortar rubble may be mixed in freely with advantage.

During the first few years pear trees usually make luxuriant growth but bear little fruit; to counteract this tendency it is a good plan to lift young trees (other than standarda) every autumn for the first two or three years after planting, shorten long, thick roots, and replant at once, taking care to keep the uppermost roots near the surface. If this procedure is followed there will be less need for severe branch pruning, with consequent advantage to the trees.

Pruning in summer and in winter is neces. sary. In summer the side shoots on the main branches should be shortened to within about six leaves of the base of the current year's growth : from the middle to the end of July is the best time for this work. Care must be taken not to prune natural fruit spurs-those short stunted shoots on which blossom buds form naturally.

At the winter pruning, which should be done in December or January, the side shoota

Branches which tend to block up the centre of the tree or to cause overcrowding should be out out i this thinning out is important, for fruit buds will not form unlcas the shouts are fully exposed to air and light.

It is necessary to make a careful selection of varieties, for some are more reliable in cropping than others. Some of the most suitable for general cultivation in the open garden are Conference (a very regular cropper), Fertility, Williams' Bon Chrétien, Souvenir dı Congrès, Durondeau, Emile d'Heyst, Louise Bonne of Jersey, Jargonelle, Fordante d'Automne and Charles Erneat. The most delicious pear of all, Doyenné du Comice, is


Pears: thelr coltivation and the insects that attack them. 1. Bow to plant a standard near tree. 2. Planting a dwart. 3. Pear trained as a maiden. 4. As a double cordon. 5. As a triple cordon. A. As an espalier. 7. Showing how a newly planted tree should be mulched. 8. Social samfly. 8 . Vapourer caterpillar. 10. Pear midge. 1-Grab of pear ma
Bu special arrangement wikn
A....uteur Gardenino and soft soap emulsion.
suitable for cultivation as a cordon or espalier on a trellis in the open garden, and as a trained tree or cordon on a sunny wall. Iate varieties of pears such as Winter Nelis, Glon Morceau, Passe Colmar and Olivier de Serres need a warm wall to enable them to ripen thoroughly

Pears auitable for planting as orchard standards are Jargonelle, Williama' Bon Chrétien, Fertility, Conference, Hessle, Lammas, Beurné d'Amanlis and Emile d'Heyst. Good cooking pears are Vicar of Winkfield, Uvedale's St. Germans and Catillac. The hest time to plant pear trees is in autumn as soon as the leaves have fallen, but the work may he carried out between then and the middle of March in mild weather.

Mature trees which are carrying full crops are benefited by manuring from the time the pears have fairly started swelling. Sowage is excellent, but it is wise to use a special phosphatic nianure also, becanse phosphoric acid is essential to fruit development. Mineral superphosphate is one of thie cheapest forms of phosphate fertilizer, and is soluble: 1 oz . to the gallon of water is a suitable quantity. Heavily laden trees are also benefited by a mulch of manure.

Pests of the Pear. The enemics of pears are in the main, those of the apple, with the difference, which is in favour of the pear, that it is on the whole the healthier trec.
Black spot is one of the worst fungus pests of pears. By this is meant the spotting, generally followed by eracking, which affects the fruit. It is worst in badly drained soil, but it may be serious in drained land if the soil is poor. Consideration should be given to the drainage and the condition of the soil. Spray with Bordeaux mixture in spring.

Caterpillars which attack pears in spring should be comlsated by autumn grease banding and spring spraying with arsenate of lead ${ }_{r}$ 1 if . to $2^{5}$ gallons of water. For oyster scale, lime, lime-salt and limesulphur sprays generally am effective, but in bad casea the branches should be scrubbed with a paraflin

Aphides arc often troublesome, especially in dry spells. Paraffin and soft soap, or $1!\frac{\mathrm{lb}}{}$ washing soda and $\frac{1}{2} \mathrm{lb}$. soft soap. in 20 gallons of water, or oz commercial nicotine and $\frac{1}{2} \mathrm{lb}$. soft soap in 10 gallons of water, will check aphides. The last remedy is the best, if applicd very hot where the leaves are badly curled. Pear slug is best fought with nicotine, a wineglaswful to 3 gallons of water.

Injury to fruit by birds and wasps has also to be thought of. Birds may start pecking the fruit before it is ripe. This can be combated with shares to some extent, but netting the trecs is the only sure remedy. If there is not a great deal of fruit to deal with, a strip of cotton wool may be tied loosely round the stalk, and it generally answers; but specially fine fruits may be enclosed in large gauze bags, which baffle both birds and wasps. If wasps are numerous, an endeavour should be made to find their nests and to destroy them at night with hot tar or by other means. Pear Midge. The presence of this pest, which is very detrimental to pear trees,


Pear. The variety called Charles Ernest, a desse
pear of fine fich favour that ripens late
especially the early tlowering varietics, usually first hecomes evident from the rapid falling of the young fruit when about the size of marbles. Upon examination the freshly fallen fruit will usually be found to be deformed and much distorted Upon cutting open an attacked fruitlet, a blackened mass of pulp and excreta with a number of the small, whitish yellow maggots will be found.
In small gardens where only bush fruits are grown the hest remedy is the handpicking and lestruction of all infested fruit, with repeated shallow cultivation of the ground beneath the trees in June and July. In large orchards great benefit has been derived from stocking heavily with poultry in April, May, and June, which is the time when the flies are appearing from the ground, and while the maggots are leaving the fruit.
On light soils an application of kainit, spread very evenly at the time the maggots are falling, is esid to give very good results. Other potash manures will prohably answer the purpose as well as kainit. Spraying the ground or grass beneath affected trees, when the midges are appearing in the spring, with soap and water, 1 lb . soft soap to 10 gallons of water, will kill the midges before they start egg-laying The spraying should be done on dull days or early in the morning. The information given here is taken from Leaflet 5:3 issued by the Ministry of Agriculture
Gathering Pears. Pears are ready for gat hering when the stalks part readily from the tree uniler gentle pressure, even if they are not ripeAs a niatter of fact, most pears should be gathered before they are quite ripe. Sone need to be eaten almost off the tree, but others, including the William and the Jargonelle, are best gathered a few days in advance of full ripeness and laid in a cool room. Gentle pres. sure with the finger near the stalk affords a very fair clue to ripeness. If the fruit is quite hard, and particularly if it has little smell, it is not ready for eating. If it yields a little and has a pronounced aroma it is ready.
lears that will keep till spring are best gathered in the latter part of October, before severe frost comes; a few degrees of frost will not hurt them. If thesc late pears are gathered much before mid.October they are apt to shrivel. The fruit keeps well in a dark, cool, sweet, frost-proof place. As a rule, it improves in flavour if it is kept for a few hours in a warm place before being placed on the table.
The amenable nature of pears, which makes them well adapted for formal training and restrictive pruning, renders them well suited for orchard house culture. They do well in large pots, in a compost mainly composed of
fibrous loam. With support in the form of liquid manure while the fruit is swelling they will furnish excellent crops of splendid fruit.
Uses of the Wood. The wood is hard and lieavy with a short and close grain As it cuts cleanly in all directions it is an excellent wond for carving, but it seasons badly, and without care in the cutting and drying is apt to warp and twist. It absorbs stain well, and as $n$ result most of the dyed stringing and banding material is prepared from it. Mathematical instruments such as rules, tee squares, and set squares are made from it.

Methods of Cooking. For many dishes ripe pears are most suitable, hut for baking or stewing, hard green pears are the hest

To bake pears, wipe 6 hard, green pears, hut do not pare them; lay them on a tin plate and bake them in a slow oven. They will take a long time to cook. When nearly soft flatten them with $a$ wooden spoon, and continue cooking until done. Serve as for baked apples. with sifted sugar sprinkled over.
Stewed pcars can he used as the foundation of many dinner sweets. Peel very evenly 4 large stewing pears, cut each in half and remove the core without taking away the piece of stalk. As they are divided plunge then into cold water to prevent them from turning black When all are finished, take them out of the water and put them into a stewing jar or block-tin saucepan with 5 oz granulated sugar and sufficient water to cover them Add the thinly pared rind of $\frac{1}{2}$ a lemon, 2 cloves, 2 allspice (bruised), and enough cochineal to colour the syrup a good pink. Cover them close and stew for 3 or 4 hours. When tender, which can be ascertained by running a straw through one of them, lift them out and strain the liquor over them. If the liquor is very thin, hoil it sharply for a few minutes.

Pears a la Ricardo. To make this pretty swcet put the stewed pears into a glass dish, pour the syrup over, and then make a small red jelly. Whip a gill of cream till it nearly hangs on the whisk, into it stir $\frac{1}{2} \mathrm{oz}$. preserved ginger cut into small dice, and then blend it lightly with the atiffly whipped white of an


Pears la Ricardo, made with stewed pears and
egg. Heap the mixture roughly over the pears, and decorate the top with lines of chopped jelly and $\frac{1}{2}$ oz. ratafias

Pear Conserve. To make this jelly conserve take 6 lb . ripe, juicy pears, pare them thin, core them and cut them into quarters. Cook them till quite soft, using a little water. Strain all the liquid out of the pulp through a cloth or fine hair sieve ns when making other fruit jellies (see page 647). Measure the liquid and add an equal proportion of sugar Boil the mixture until a jelly is obtained, then strain into glass jars.

Pear Dainty. Stewed pears also form the foundation of this sweet. T'o make it, cut a slice from the top of a round sponge-cake, scoop out the centre to form a case, and in the meantime atew 1 lb . peeled and sliced pears in sufficient sweetened water to cover them When they are tender, leave them to cool, and then add 6 oz ground almonds, putting the minture into the case. Replace the top of the cake and cover with halves of blanched almonds. Prepare some custard with 2 dessertspoon-
fuls custard powder, 3 dessertspoonfuls sugar, 1 pint milk, and some almond llavouring, and, when cold, pour it round the cake. Whisk the white of an egg to a stiff froth, stir into it 1 gill whipped cream, swecten and flavour the mixture with almond essence, and pile it high in the centre of the cake

Pear Mould. To make this, mix dessertspoonful custard powder to a smooth paste with a little milk taken fiom $\frac{1}{2}$ pint. Boil the remainder, add it to the paste, stirring all the time. and then llavour it with a little vanilla.


Pear Mould, the centre of which is olled with tinned pears and whipped cream
While it is cooling, rub a small tinful of peara through a sieve, then add the pulp, together with if dessertspoonfuls castor sugar, to the custard
Fold the stiffly whisked whites of 2 cggs into the pulp, etc., and lastly strain in $k$ oz. leaf gelatine dissolved in $\frac{1}{2}$ gill warm pear syrup. Mix all together, pour them into a horder mould, and leave until set. The centre may be filled with some more tinned pears and whipped cream

PEARL: Real and Artificial. Pearls can be divided into three classes. These are the natural pearls found in certain kinds of shellfish, cultivated pearls which are produced partly by natural and partly by artificial means, and the wholly artificial pearls. The first named are the only ones that may justly be described as genuine, but cultivated pearls are also valuable, and far more costly than the manufactured specimens. Various makes of initation pearls can be obtained, some of them being patented.

The value of real pearls is determined by their freedom from defects and also by their size, shape and colour. The round ones are the most precious, and next to these rank the button-shaped varieties Pear-shaped pearls are cheaper, though large and faultless specimens command high prices. Black pearls are rare and costly. They have two lustres, one being grey and the other green. Black hematite, which is used to imitate black learls, can always be detected by its considerably heavier weight.
Pink pearls are no less valuable than white ones, but they are often peculiarly shaped. Pearls of many other shades of colour can also be ohtained, and are seen in great variety in some famous necklaces.
The best deep sea pearls are liable to de teriorate unless they receive proper care. The brilliancy of colour and the lustre which makes a pearl so attractive soon disappears if it is allowed to come into frequent contact with rough surfaces, or to be dainped by perspiration which contains uric acid. When the outer surface only is damaged, however, it can sometimes be successfully removed. The underlying layers of nacre will be found still to contain the orient tints, though not with the same degree of lustre or brilliancy as the outer surface. The natural lustre of pearls is often lost through keeping these gems for long periods in jewel-cases. A sun hath generally improves them.

The irregular surfaces found on the inside of the oyster shell, mostly semicircular or oval in shape, are known as blister pearls. These are used largely in jewelry in combination with coloured or semi-precious stones, such as amethysts, aquamarines, topazes and tourmalines. The price commanded by seni-
circusar pearls is small compared with the amount that would be realized for a spherical pearl of corresponding size.

Cultivated Pearls. People in Japan cultivate pearls by performing a small operation on the oyster, which enables a bead to be introduced into the flesh, and in the course of time the oyster covers the bead with nacre. There is also another method of introducing a bead. This is by cementing it into the shell and leaving it for a year, or several years, until the oyster has covered it with one or several layers of nacre, thus giving the bead a covering which is the same as the exterior of a pearl that might otherwise have taken many years to produce.

These pearls are usually composed of a core of mother-of-pearl, and, except by expert examination, there is no means of detecting them from the naturally formed pearls. Those pearls which are cemented into the shells of molluscs only receive a covering on the upper side ; consequently, after they are removed from the oyster, they are cut into half-rounds. These are used for mounting into such articles as rinys, bronches and pendants. It has been laid down by Enylish law that these cultivated pearls must not be offered as genuine pearls, notwithstanding that the orient sheen thereon is actually the result of the work of the oyster.

Artificlal Pearis. Really good imitation pearls are artistic productions. These are made by covering a solid bead, either of glass or mother-of-pearl, with a series of layers of collodion: in colour, weight, and outward appearance they are exact reproductions of the best deep-sea pearls. Such pearls can be hardened off so as to give them increased durability and also to enable them to be cleaned by washing with soap and water.

Some artificial pearls are filled with matter obtained from fish scales, and bear an extraordinary resemblance to the real gems. They are made by blowing thin beads or bulbs of glass and then injecting into them a mixture obtained by soaking the scales in water and mixing the sediment that results with some liquid ammonia. It forms a coating inside the bead which gives the latter just the right shade. Melted white wax is afterwards poured in to increase the weight and durability of the bead, and the shiny exterior, in order to hide the fact that it is made of glass, is dulled by the application of chemicals. Such pearls are frequently blown to the irregular shape that distinguishes a great number of the large zenuine pearls.

Imitation pearls in necklaces can be detected by the following simple tests, which, of course, do not apply to cultivated pearla. Gently place the point of a needle on the exterior of the pearl immediately above the point where the hole has been drilled. If it makes a mark, or if by a slight movement of the point of the needle it scratches the pearl, then it is safe to assume that it is an imitation with a core of some solid material with a vellum-like covering.

If the needle makes no impression on the exterior, there is a possibility that it is an artificial pearl which has a glass exterior filled with a mixture of wax and fish-scales. A further test should then be applied by pushing the point of the needle gently into the hole of the pearl. If it is one of the filled varieties, the probing will disclose that the interior has a filling of soft material into which the needle point can be inserted. If the pearl is a real one, the needle will make no impression when pushed against any part of the wall of the hole.

Cleaning Pearls. Pearls may appear to lose their lustre and require cleaning. They can be washed in soapsuds and lukewarm water and then dried. It is important
thoroughly to dissolve the soap before putting a ring or other piece of jewelry. into the lather, and afterwards to rinse it in clean water. It is then dropped into a saucer filled with jeweller's sawdust, which is shaken up and absorbs the moisture on the pearls. The ring is taken from the sawdust and brushed with a camel hair brush or a dry tooth-brush so that no particles of sawdust adhere to the setting. See Jewelry; Necklace

## Peas: Growing and Cooking

## How Gardener and Cook can Secure Good Results

In connexion with this subiect the reader should consult our article Kitchen Garden. See those on other vegetables, e.g. Cabbage ; Carrot : Potato : Spinach; also Coral Spot.
Green peas are the most delicious of all summer vegetables, and by making successive sowings from March to June it is possible to produce excellent peas from June until September. Success depends chiefly on correct cultivation of the soil: this must be dug deeply, enriched with manure and not be deficient in lime. After the soil has been dug and manured a scattering of lime may be applied with advantage, especially on freshly cultivated ground, and on old garden land which has been well manured annually during a period of years. On poor or shallow soil peas are not a success: growth will be poor and the yield small.

The seeds should be sown thinly in a double row in a 12 in . wide shallow trench, 1 to 2 in . deep, taken out on land that has been prepared in the way advised. When the earliest rows are 2 or 3 in . high the soil should be drawn up to them with a hoe as a protection from cold winds and to some extent from birds; it may be necessary to protect the seedlings from birds by using the special pea guards, or fish netting. Tall varieties must be staked in good time, for once the seedlings are allowed to fall over they become bent and rarely do so well as others which were supported early.
The dwarf varieties of peas have been improved so much in recent years that many gardeners now grow them almost exclusively in preference to the tall varieties; the latter, however, still yield the largest crops, and if pea sticks can be obtained cheaply or free of cost it pays to grow the taller peas. If, however, pea sticks are expensive in the grower's locality the dwarf varieties of peas are to be recommended.
Some of the best of these are the following which reach a height of about 18 in .: Peter Pan, Laxtonian, Prince Arthur and Little Marvel. Others which reach a height of about 2 ft . are Daisy, Abundance, Stratagem and

Pearl Barley. The grain of barley stripped of its husk and rounded by grinding is known as pearl barley. See Barley

PEARMAIN: The Apple. This class of dessert and culinary apples is of very old standing. Varieties in cultivation include. Blue, Adams's, Hormead's, Claygate, Herefordshire, and the popular dessert variety Worcester. The latter is an early eating apple of high colour and free bearing. See Apple.

Giantatride. Excellent tall peas are Rent payer. Senator, of whiok an illustration is given in the next page, Prince of Wales and Eureka. Ho a late sowing in June, Autocrat or Gladstone are recommended. The distance between rows of tall peas should be equal to the height of the plants. Catch crops such as lettuce. spinach and radishes can be grown between the rows.

The way to maintain an unbroken succession of fresh green peas is to sow a row every fortnight or so from the middle of March to the middle of May, or even later if necessary. It is a mistake to make one large sowing if peas are wanted throughout as long a period as possible Quite Content and V.C. which produce immense pods, are favourite exhibition varieties.

Diseases of Peas. Peas are subject to a number of diseases. One of these is powdery mildew. The leaves of the peas show yellowishgreen blotches, which gradually increase in size until the whole of the foliage changes to a yellow colour, and soon wilts and dies When badly attacked a now of peas presents the appearance of having been whitewashed, leaves, stems, and pods being equally covered with the mildew.

To control this disease spraying is effective, provided it is begun early enougli. It should be carried out before mildew appears in June and July, using liver of sulphur, 1 oz . in 4 gallons of water

Pea mildew, although liable to be confused with powdery mildew, is really quite different from it and requires different treatment. In it the leaves first become covered with a delicate white mould, which soon changes to a pale pinkish-grey colour, and may pass unnoticed until its presence is indicated by the wilting and yellowing of the leaves. The powdery appearance of the mould, character7. are Dainy, in this case. When


How to grow Peas. 1. Ideal soil preparation. 2. Sowing drills: A, intercropping. 3. Bad method of sowing. 4 and 5. Two good methods of placing
seeds. 6 and 7 . How to sow in pots : a. fine soil ; $b$, good soil ; $c$ leaves
this disease is present the peas should be sprayed with Bordeaux mixture at half strength. This can be made from $1 \frac{1}{2} \mathrm{lb}$. of copper sul. phate or bluestone and lb . of quicklime to 25 gallons of water.
Pea Maggot. This is the name of the maggot that infeats pods of culinary peas. As soon as the maggots are hatched they gnaw their way through the skin and devour the seed When the larva is satisfied it leaves the pod and hides in the soil for its pupal stage, emerging as a moth in June. and immediately deposit. ing eggs in clusters.


Peas. 1. Sowing in old turves : $a$, sowing method ; $b$, seed closed in $c$, seedlings ready for permanent planting. 2. Same in position: $a$, picb soil: $b$, manure or vegetable refuse. 3. Seed sown in err-sbell. 4. Support for young seedlings. 5. Protectlon from birds. 6. Protection for early sowings a boards: b, Rlass. 7. Seedlings hoed up. 8. Good sticking: $a$, cross support. 9. Another method : $a$, support for wire : $b$, canes fred to same. 10. Pea thrip. 11. Pea maggot. 12 and 13. Pea weevil and its caterpillar

There is no real remedy for the pest, and all that can be done is to sprinkle soot over the foliage in early June evenings.

Pea Weevil. Weevils will attack peas, and if disturhed will instantly drop to the ground and appear dead. The weevila are about $\frac{1}{1}$ in. long. Seedlings should have sand and paraffin sprinkled round them, or be sprayed with an arsenate of lead wash.

How to Cook Peas. To boil green peas, first put on the fire a good-sized saucepan of water to boil, with sufficient salt, 3 or 4 sprigs of fresh green mint, and 3 lumps of sugar. While the water is boiling, shell the peas, then put them into the water and cook for 20 min ., or according to the age of the peas. Drain them, remove the mint, and dish them in a very hot dish in which 1 oz . butter has been allowed to melt. Stir them lightly in with the butter and scatter over the top, a little chopped mint.

Green peas are frequently served with fried or boiled ham, and makc an appetizing dish. The peas should be cooked as for plain loiled peas, except that the chopped mint is omitted on the top. They may be dished scparately and accompany boiled hain or gammon, or the bacon may be fried and laid on the top of the peas. Gammon rashers ahout $\frac{1}{2}$ in thick are hest for this dish. When boiled ham or bacon is to be served with peas they are sometimes hoiled in the same saucepan, the peas being added about $\frac{1}{2}$ an hour before the ham is done. This method improves the llavour of each. The liam used must not be too salt and no extra salt should be put into the saucepan.

Peas may be steamed by placing them in a jar with a little sugar, salt, mint, and 2 tablespoonfuls water, covering the jar tightly and then putting it into a saucepan of boiling water. Keep the water boiling rapidly for about $\frac{1}{2}$ hour, and add more if necessary.
Cold cooked peas can be used for salad making. Poach 2 or 3 eggs, cut the edges neatly, and leave them to get cold. In the meantime bind a small teacupful of cooked peas with a little mayonnaise sauce, and add seasoning to taste. Place each egg in the centre of a fresh lettuce leaf laid in a salad bowl, put some peas on top, and cover with a little more mayonnaise.

Green pea soup is made by putting 1 quart shelled green peas into a large saucepan with 2 oz raw bacon cut in dice, $1 \frac{1}{2}$ oz. butter,

## top of the soup before serving.

Bottled or tinned peas, when required should be turned into a colander, and washed thoroughly with boiling water. A little mint, butter, salt, and sugar should be added to the pan in which the peas are heated; actual cooking is unnecessary. Packet peas, with which directions for preparing are usually supplied, need to be soaked in hoiling water overnight before they are cooked.
PEASE PUDDING. To make this, soak 1 pint split peas overnight, and in the morning wash and pick them and tie them loosely in a large pudding cloth, giving them plenty of room to swell. Boil them for 4 hours, and when quite tender rub them through a coarse wire sieve or colander. Add to them 2 oz . butter or good beef dripping, and season them with salt and pepper. Mix all well together


Peas. Specimen pods of a popular green pea the variety known as Senator
and tie once more in a cloth, but this time draw it tight round the peas. Boil it again for from 20 to 30 min

Peasgood's Nonsuch. This is a favourite autumn cooking apple of large size and handsome appearance. See Apple.
PEAT : As Fuel. For use as fuel peat is cut in turves from a foot or two below the surface during the summer, stacked edgewisc to dry, and turned every day or two until the drying is complete; this takes 10 to 12 days It is then carted home and piled under cover in an outhouse, or erected into a rick and roughly thatched for winter use

The heating value of peat is a littlc more than half that of a similar weight of coal. It is therefore much bulkier in proportion to the time it burns, and large wooden peat vases, twice the size of the average coal scuttle, are placed in rooms where it is burnt to hold it, and refilled once or twice a day. P'eat makes very much less dirt than coal, and has a pleasant fragrance when alight, but owing to the rate at which it burns it requires more frequent attention than is given to a coal fire.

When lighting a peat fire it should be: remembered that it will not catch from paper. A good handful of thoroughly dry wood is needed to start it, and very little peat should be added until the wond is well alight. Large unbroken turves should never be put on to a newly lighted fire, or they will extinguish it. The proper plan is to break them up small hetween the lingers, and to feed the fire with then gradually, giving entirc attention to it for the first 10 minutes

When the firc has well started the hearth should be piled up with large sods of peat, using plenty of them. They will appear at first to kill the blaze, but it will soon shoot up again. If possible a proportion of coal should be used, starting the firc well with coal, and then piling the peat up high over it. Such a fire will last well, look very cheery, and throw out a great deal of heat. A pair of bellows should never be absent from a pent fireside: they put new life into the fire when it dwindles unexpectedly See Fire; Fuel.
PEAT : For Garden Use. A soil which is made up chiefly of decayed leaves and other vegetable natter is known in gardening as peat. It represents the early stages of the transition of wood into coal. It needs to be mixed with loam and sand for ordinary plant culture.
PEBBLE WARE. This is a term used by Josiah Wedgwood to describe earthenware products in which the effect of erystalline rocks was imitated by means of differently coloured clays. In these materials he turned out llower-pots, basins, plates, inkstands, and candlesticks, but especially vases, all simulat. ing natural crystalline stones.

Egyptian pebble was made of coloured clays, with veining; when spotted with blue it was called variegated pebble. Some of the specific imitations, such as verde antique, agate, porphyry, serpentine, and granite, always bore these names, although they are all varieties of pebble ware The carliest pieces, made by colouring cream bodies, can he distinguished by the light tint of the edges. Afterwards the veining was made to run through the substance by means of bands of clay incorporated in the paste. See Jasper Ware : Wedgwood

PECHE MELBA. A fancy name for ice cream made with peaches is pêche Melba. The peachics are divided in half, stoned, and steeped in liqueur, with a spinkling of sugar added. They are served nith a surround of rich ice cream, and garnished with whipped cream arranged in the centre. See Ice.

PECK. This measure of weight is used for potatcess and other vegetables; also for fruit. Ordinarily, a peck consists of 14 lb ., and four pecks make a bushel. Apples, however, are usually sold 10 lb . to the peck, and onions often 12 lb . See Dry Measure.

PECTIN. This is a substance allied to gum which is found in tipe iruits and causes jams and jellies to sct. Before cooking it exists as pectose, and is converted into pectin by the heat of the process. If too much licat is employed the pectin is changed in character and no longer gelatinizes the jam. On this account too much boiling should be avoided in the preparation of fruit jams.

Apples and gooseberries contain more pectose than soft fruits such as raspberries, strawberries, and plums, and this is why strawberry or other jam often contains a sinali proportion of apple or gooseberry pulp or juice. Unripe fruit contains very lit tle pectose, hence the necessity of employing only rire fruit in jam making. The setting properties of crabapple jelly are due to the largo proportion of pectose contained in crab-apples. A pectin preparation for adding to jams and jellies when making these can be obtained at grocery stores. See Jam; Jelly

PEDIMENT. This word meant originally the triangular finish placed over the cornice that rested on the column of a Greek temple. It thus resembles the gable in Gothic architecture. Its chief use to-day is in connexion with furniture, being scen on English furniture most usually in the form of a broken pediment. The tops of bookcases and cabinets have the sides of the triangle, that would otherwise reach an apex, stopped short of it. This form of pediment was used by Chippendale and is seen in Georgian style rooms over doors and fireplaces. Uccasionally the pediment takes another form; a semicircular one is on the mirror, Fig. 1, illustrated in page 797. Sce Door; Georgian Style.

Pedlar. See Hawker.
FEEL. Peel is a skin or rind, the word being cspecially applied to the skin of fruit. This skin should in most cases be removed before the fruit is eaten. Certain peela, e.g. that of the lemon, have many culinary uses. See Candied Peel; Lemon.

PEGAMODD. This is a substitute for leather, nnd is used for upholstery. It is easily cleaned with soap and water, and kept in condition with ordinary furniture polish. Like all leather surfaces, it becomes cracked with continual use; if treated with one of the specially prepared paints anld for the purpose, the surface can be rendered equal to new. See Upholstery.

PEKINESE DOG. The Pekinese is an affectionate little dog, purely domestic and of engaging manners. Its head is broad and ilat bet ween the long, drooping, heart-shaped ears ; the muzzle short, hroad and wrinkled, and with the broad nose black. The large dark


Pakinese Dor. Prize-winner of thls favourite breed of long-halred toy doks


Pelargoninm. Ivy-leaved variety in a terrace vase
eyes are round, bright and prominent. The hody, broader in front, has a denso undercoat covered with rather coarse though soft, long, Hat hair; the legs, feet and tail profusely


Pelargonium. Method of culture. 1. Sultable cutting. 2. Cuttings in a box 3. Cuttings in a pot. 4. Single cutting potted right. 5. Cntting potted wrong. joint where proned and soill-ball reduced. 11. Same repotted to provide coltings 12. How to hank old plants during the winter
$H_{u}$ special arranuement with Amaleur Gariening feathered. Any colour is allowable, self or shoots are then cut back, the plants repotted, patched, but the golden-tan, self-coloured and grown in a cold frame until autumn, dogs are the truest to type. The maximum when they should be placed in a slightly weight is 18 lb ., but the smaller dogs are the heated glasshouse. Cuttings made from more desirable. See log; Kennel.

PEIKOE. The fine variety of China tea known as Pekoe is very suitable for mixing with Indian, Ceylon, or other teas. The leaves are picked when the plant is young, and has the down upon it. From the pleasant aroma of this tea it is often called the flowery Pekoe. See Tea.

PELARGONIUM. The two most popular kinds are the ivy-leaved and the zonal pelargoniums, the latter being commonly but erroneously known as zonal geraniums. Both are valued for planting in summer beds, and the ivy-leaved varieties are well suited to filling vases in the flower garden or hanging baskets in a porch, veranda or window box.

They are propagated by cuttings taken from Howericss shoots in August, inserted in pots or boxes of very sandy soil and placed in a cold frame. During the winter the cuttings must be kept in a grcenhouse heated suffi-
ciently to beep out frost : a temperature of 45 to 50 degrees is high enough to ensure their anfety. In autumn or in spring the rooter cuttings are potted singly in 3 -in pots in a compost of sandy loam; they may be repotted in 5 -in. pots before being hardenerl ofl ready for planting out of doors early in June.
The old planta should be lifted early in October: if placed in pots or hoxes of soil and kept under glass safe from frost in winter and spring they may be planted out in June. Old plants are useful for garden vases and for filling the centres of Hower heds. I method sometimes employed by those who have no greenhouse is to shake the roots of zonal pelargoniums frec from soil in autumn and hang them, roots downwards, in a cellar or other frost-proof place for the winter ; it is however less satisfact ory than potting them and keeping them inside a room window.

1 few of the best varieties of zonal pelargonium arc Paul Crampel, red; King of Denmark, salmon; Henry Jacoby. crimson; Queen of the Belgians, white. There are innumerable others. Two favourite varieties of ivy-leaved pelargoniums are Madanic Crouse, salmon-pink: and Souvenir do Charles Turner, carmine-rose.

Certain pelargoniums are grown for the satio of their coloured leaves, but they are less popular than they were some vears ago. Flower of Spring, green and whitc leaves; Crustal Palace Gem, yellowish lenves; and Swanley Bronze, with bronzecoloured leaves, are some of them. Then there are the tricolorlenved pelargoniums, of which Mrs. Polloch is a great favourite.

The show and fancy pelargoniums are still favourite plants for cottage windows where, during the summer months, they may be seen in full beauty in almost any part ol the country. They are valuable for conservatory decoration. When the Howers are over the plants should be partially dried off by giving less water by giving less the fresh shoots will form roots il pots of sandy soil in a frame.
Scented-leaved pelargoniums are rarely seen nowadays, but they are worth adding to a
 collection of greenhouse plants, for they are easily grownina temperature of about 50 degrees if potted in sandy loamy soil.
Zonal pelargoniums will Hower -in winter in a greenhouse temperature of is to 60 degrees if they are
propagated by cuttings in March. During the summer months the plants must be grown in a cold sunny frame and all flower buds should be picked off. In Inte September they should be placed in the greenhouse. The final potting is in $5 \cdot \mathrm{in}$. or $6 \cdot \mathrm{in}$. pots, using a compost of turfy loam with a little sand and decayod manure. See Geranium.
PELMANISM. This game depends largely upon the memory. It is played with a pack of ordinary cards, which, instead of being dealt in the usual way, arc laid face downward on the table unsymmetrically, each card separate. The first player turns up a card, shows it to the others, and lays it down again in the same place, face downward. I second card is treated in the same way. Subsequent players turn up a card, and if a similar card has already been turned up they can pair it off, providing they can remember its position. If they succeed in pairing it the two cards are then removed from the game. This is done by each player in turn, and the one who has most pairs at the end of the game is the winner.
PELMET. This is the furnishing accessory which surmounts the curtains of a window and hides the pole or rod and rings. Woven fabric pelmets are usually of the same material as the curtains, but occasionally a contrasting treatment is omployed by making the pelmet to match an appliqué trimming or border. In such a case the pelmet is often trimmed with applique of the material used for the main body of the curtains. The difference between a textile pelmet and a valance is that the latter is pleated or gathered, while the former is shaped to fit. It may be trimmed with a fringe, scalloped, or stepped and braided, or curved at each end as shown in Fig. 1. It requires lining with the same material used for the curtsins or to tone with them, and often also to be interlined with canvas. The pelmet is fired on to a pelmet board, as illustrated in Fig. 2 below.
Many window treatments now incorporate a glass, wooden or
metal pelmet. Mirror glass is used divided into sections which are held in position with silver-headed nails or glass studs. Coloured glass which matches the colours of the curtains is effective for pelmets. Oak or painted wood moulded pelmets are also seen, while designs in plywood are suitable for bedrooms and modern bungalows. Aluminium and chromium plate are also used for this purpose. The advantage of hard surface fabrica for pelmets is that they do not require to be taken down when the curtains are changed, but are simply cleaned with a damp cloth and polished. Illustrated ideas for pelmets are secn in page 71 , and in the article on Curtain.

Pelmet Board. This name is given to the support which holds a pelmet or a pleated valance in position. It consists of a strip of wond that is sometimes provided with a wide moulding on the front colge and ends. The pelmet is attached either directly to the front edge or behind the moulding. In addition, the rods on which the curtains are hung are generally attached to the pelmet board. An illustration of a pelmet fitted to a board with a moulded front is shown in Fig. 1. The side view in Fig. 2 gives a section showing how the moulding may be attached to the board and the position of the silk pelmet and curtain rod, which is held in position with screw hooks. Small iron brackets are used to secure tho pelmet board in its proper position. See Bay Window: Curtain: Living Room; Mirror

PEMBROKE TABLE. This is a name given to an oblong table with two leares, which may either hang down or, supported by brackets, be raised to the level of the rest of the piece. The leaves may be cither oblong or semicircular, and the table is made in oak and mahogany, ns well as in the cheaper woods. Pembroke tables of the 18th century have fre. quently edgings of marquetry, and on some is the serpentine line favoured by Hepplewhite and his followers. See Table.

PENCIL PAINTING. Pencils specially prepared for this work are known as Aquarello and are obtainable in 24 colours. They may be used ilry, as ordinary coloured pencils, or with water and a brush when pencil painting can be accomplished on paper, textile fabrics, lenther and wood.

Therc are two methods of working the colours. Part of a design is filled in with the desired tint, as if using an ordinary crayon, and then apread and amoothed with a brush dipped in water. This results in beautiful clear wanh effects of non fading colour


Pencil Painting. Outining the design on a parchment spill nolder with a water colour pencil. The boxes have been decorated with pencil colours applied dry
The other method
of application is to damp the paper, or portion of a design on a piece of fabric, slightly with a clean, wet brush and then draw in with strokes of the pencil the colour required. Unless there is an excess of water the colour

will not run, but in this way sliades can be softly blended.

To make a strong outline the pencil itself is dipped in water and used, asshown in the illustration. The conrentional design on a parch-

Pelmet. Fig. 1. Fringed and braided silk pelmet fired to pelmet board with moulded fron!. Fig. 2. Sectional view of board with pelmet attached ant covered spili holder is being drawn before being tilled in
Colours may be superimposed and may be distributed over large surfaces by means of a piece of damped felt wrapped round the index finger.

The simplicity of the outfit will appeal to many people, and pencil painting is a delightful and clean metholl of colouring for childien to use. It is excellent for sketching or for map tinting, and may also be used for colocring photographs on either dull or glossy paper. For this last purpose the pencil is applied dry, and the markings are then gone over with a damped brush. If ton much colour is applied, or it is put in the wrong
white pencil was used over the colour. Leather is pencil painted in the same way as wood. For either work to ensure permanence against wear, spray with an ordinary solution of shellac and alcohol, or brush over with clear varnish, to protect the design. The application of pencil painting to woven fabrics is dealt with in the articlo Painting on Textile Fabrics. See Transfer; Writing Desk Set.

PENDANT. The most valuable of these ncck ornaments are made of gold and are set with diamonds, sapphires, and other precious stones, while platinum and pearls are also used for them. Pendants are also made in rolled gold and enamelled silver.

Yet another type of pendant is of carved or plain amber, jade or ivory. Such pendants often form part of a necklace composed of heads to match, with or without metal chainwork or filigiee connecting links. Other pendants are usually worn on chains which match the metal of which they are made. See Enamelling : Jewchry.

PENDULUM. A clock depends for its timekeeping upon the proper working and adjustment of the pendulum. The motion of a pendulum is controlled by the laws of gravity : if free from friction and atmospheric pressure, it would swing for an indelinite period at a uniform rate The time of vibration of a pendulum depends entirely on its length. It is the same for a given length whether the pendulum swings through a long are or a short one, the velocity being proportionate to the height the pendulum falls in its swing The length is the distance


Pendant. Eiguteenta century piece in rold set rith diamonds
from the point of support to the centre of gravity of the pendulum bob and rod; the shorter the rod the greater the number of the vibrations. Lengthening the rod reduces the speed of the clock, and shortening the rod increases the speed The length of a seconds pendulum is taken as the basis: in the latitude of London this is approximately $39 \cdot 14$ in., and a rod of this length will make 60 vibrations per minute, or. in other words, will take one second to swing from one side of its stroke to the other. Cheap clocks generally run at a speed of 120 or more, hence the pendulum must be shorter than 39 in . in length. The length varies as the square of the time of vibration, hence a pendulum to beat at 120 jer minute will only need to be 9.75 in . long.
The following table gives some of the lengths and corresponding vibration rates:

| Length of I'endulum <br> in. | Vibirution Rate <br> in. |
| :---: | :---: |
| 14.1 | 1190 |
| 11.3 | 110 |
| 6.75 | 1.20 |
| 8.3 | 130 |
| 7.2 | 140 |
| 6.25 | 150 |
| 5.5 | 160 |
| 4.0 | 185 |
| 2.5 | 240 |

The length of pendulum arranged for a clock is governed as a rule by the anount of room available in the clock.case. The clock, through its wheels and pinions geared up to suit the length of the pendulum, transmits the number of vibrations in the form of seconds, minutes and hours recorded on the dial by the hands.

Ordinary pendulums vary slightly with changes of temperature, which cause the metal rods of which most of them are made to expand or contract, thus lengthening or shortening the pendulum, with the result that the clock goes slower or faster Where very accurate time is required pendulums are made to compensate, and there are several ways of doing this.

Modern science has produced a metal known as Invar steel, which requires no compensation and has the lowest known coefficient of ex pansion. This is generally used where very accurate timekeeping is required. A wood rod, well french polished, with a lead bob, also makes a good pendulum, as wood is not much affected by temperature. The spring by which a pendulum is suspended should always be as thin as possible, just of sufficient strength to keep the pendulum from rolling or wobbling.
Regulating the Pendulum. The regulating of a clock consists in getting the pendulum to make the correct number of vibrations 80 as to record the right time. This is done by lengthening or shortening the pendulum In most clocks the bottom part of the rod is fitted with a screw, on which is a knurled nut. On this nut rests the bob which slides up or down on the rod, so that by turning the nut the bob is raised or lowered as required. In doing this, great care must be taken not to buckle the suspension spring, as a distorted spring will very often cause bad timekeeping. A good plan is to hold the bob with one hand and turn the nut with the other.
When a clock requires regulating it should first be noted how much it is out in a given time. The pendulum should be altered accordingly, shortening it to make the clock go faster. and lengthening it to make it go slower. The result should be watched to see what difference the alteration has made over the same period, and from this it will then be possible to gauge exactly what further alteration is required. A long pendulum will require moving a greater distance than a short one for the same error. Some clocks are provided with a means of regulation from the front of the dial.
French clocks use what is known as a Brocot regulator. Over the top of the figure 12 is a
small square, which is turned with a key that works a slide up and down the suspending spring of the pendulum. On account of backlash between the two toothed wheels employed, this device is often not very reliable, and the slide should be observed to see just how much it is moved by turning the key. English clocks use a different method, known as a rise and fall. This is a rocking bar across the top of the clock plates, the pendulum being hung on one end, the other end working on an cccentric snail at the back of the dial, with an arbor through the dial, to which is fixed a pointer or hand. By turning this the bar is moved up or down, by this means drawing the suspension spring between two brass jaws underneath the bar. See Clock: Grandfather Clock.

PENNISETUM. Of these ornamental grasses only one, Pennisetum longistylum, is usually grown in gardens. It is 18 in . high and bears spikes of purplish flowers in summer Seeds are sown out of doors in April where the plants are to bloom.
PENNYROYAL. This aromatic herb (Mentha pulegium) thrives in ordinary soil and is propagated by cuttings in spring. If these arc severed beneath the soil they will possess a few roots and soon become established.

PENNYWEIGRT. This measure is used in Troy weight, 24 grains going to a penny weight: 20 pennyweights make an ouncc. The usual abbreviation is dwt. See Troy Weight.

PENNYWORT. Sometimes called navelwort, and botanically known as Cotyledon umbilicus, pennywort is a succulent plant which may be found growing wild in crevices of rocks and ancient walls in the west and southwest of England and Wales. It has orbicular leaves and bears erect spikes of drooping cylindrical yellowish-green flowers during June. Its rounded fleshy leaves have depressed centres. It is useful for wall-gardening and for outdoor ferneries, but requires mild climatic conditions.

PEN PAINTING. This form of decora tion can be applied to cotton, silk, relvet, leather, papier mâché, wood, pottery, glass and metal. Oil colours are used with a special powder and medium, pens, palctte, palcttc knife, drawing pins, drawing board, and a sheet of clean white blotting paper are also required.
When used on textile fabrics care is neccs. sary to prevent spreading of the oil colour. This may be achieved by removing the work from the drawing board immediately the pen painting is finished and placing it on a sheet of clean blotting paper which has been dusted over with absorbent powder. The back of the silk or other fabric must touch the powder while the colours are drying and this prevents their tendency to spread.

Wooden articles to be decorated in this manner should be lacquered or enamelled first, the design being pounced on when the background is quite dry. Glass and pottery must be washed, rinsed in cold water, and


Pen Painting. Fig. 1. Two of a sot of densert doilies. each of which is decorated with a diferent flower
polished with methylated spirit. Colours will not adhere to a greasy surface Stencilled designs may be outlined in pen painting.

Floral and conventional designs are the most suitable for pen painting. The finished appearance of the work has some resemblance to embroidery as the strokes of the pen by means of which the oil colours are laid on take the form of stitches.
The first step is to trace the design on to the fabric in the case of textiles, to pounce it on for wood or to paste it on the reverse side for pen painting on glass (see page 540) Designs may also be placed under gauze, which is an admirable fabric for pen painting. Black gauze mounted afterwards on satin is effective when pen painted for central pieces on nightdress, glove or handkerchief sachets. In white it is used for des-


Fig. 2. Glags vase decorated D pen painting with design of mimosa in nataral colonrs sert doilies such as those illustrated in Fig. 1. Silk gauze is ob. tainable for the work by the yard or in pieces; also traced gauze doilies and table centres for pen painting.

Special oil colours are sold for this purpose. A convenient method of mixing is to squeezo a little white on to the palette and mix the powder with it till it is of the consistency of thick creant and no specks of free powder are left. The white is then tinted a very pale shade of the colour required and a third of it put aside. The remainder is tinted a deeper shade and hal! of this is put aside, while the part left over is coloured a still darker shade. This gives a medium tone for a flower, leaf or groundwork, a pale tone for high lights and a dark tone for shadows. The various colours may be prepared in this way, and a drop of medium should be added to each before starting work.

The three shades of a colour actually in use may be placed on the blade of an old table lknife. A long, thin piece of colour is then modelled on the knife and picked up with the pen and applied to the fabrio as if making a down stroke in writing, a slight but even pressure being maintained. This is followed by further strokes until the design is filled in; the darker and lighter tones of the colours being used for the high lights and shadows. Practice soon teaches the worker just how to gain good effects from the direc. tion of the strokes. A set of dessert doilies with a different flower on each one is an excellent piece of work to undertake after experiments have been made on a few scraps of silk or cotton to gain someskill with the strokes. English and French makes of pens are obtainable for a few pence a dozen. Bronze and lustre powders can be used to give a richly varied appearance to designs. The former are painted on finely with a No. 1 sable brush, using the quick-drying medium supplied for them. The latter are dusted over portions of the work, while still wet, to
give a raised effect. For instance, they were used to give a touch of realiam to the mimosa leaves and Howers on the glass vase in Fig. 2. The leaves were worked first in greens and while wet covered with green lustre powder. When this was dry enough for the surplus powder to be shaken off, the mimosa was painted in with the pen in chrome yellow and white This was covered with yellow lustre powder to give the fluffy look to the mimosa balls.

One advantage of pen painting is that it can be done rapidly. It takes some time to dry however, one week being the uaval time allowed in winter. Afterwards the work may be hrushed, washed, or rubhed without harm ful results. If the colours fade with time, they can be freshened by a second but light application of paint. See Painting on Textile Fahrics; Stencilling; Transfer.
PENSION. A penaion is rally an annual payment made to elderly or infirm persons in recognition of past services. Officers of the army and navy and civil servants enjoy pensions if they have served a certain period, and many businesses have pension schemes for their employees, among these being the banks and insurance companies. Many local authori ties, such as town and urban councils, have also pension schemes, and pensions are also provided by some trade unions.

Pensions are either contributory or noncontributory. Those given by the state to officers and civil servants are non contributory, i.e. no deduction is made from the salary on this account. Most other schemes are contributory, i.e. the employee pays from his salary a certain amount each week, month, or quarter towards his pension, usually something from 3 to 5 p.c. If he dies before he becomes entitled to a pension, his relatives, in most cascs, receive the amount he has paid in to the fund. In some schemes the firm pays a sum equal to the total contributions of the employees; in others it makes itself responsible for the whole except that part paid by the employee.

The amount given as pension varies, depend ing upon the salary received and the length of service. In the civil service the maximum pension is one-half the salary for 40 years service. In addition, however, a substantial sum is given to the retiring civil servant in the forin of a gratuity. The pension is calculated, morenver, on the salary received at the time of retirement, i.e. when it is highest. Other pensions are usually calculated according to the length of service with a maximum of twothirds of the annual salary. Some pension schemes, but not all. provide pensions for the widows of employees. These may be as much as one-third of the salary

State Schemes. In the United Kingdom of Great Britain and Northern Ireland, and also in other parts of the British Empire, there are state schemes for providing pensions. One of these is the non-contrihutory ocheme for oldage pensions, which, at the rate of 10 s n week. are paid to all persons whose means are below a certain figure on reaching the age of 70 . The other schence provides pensions at the age of 65 for persons who are insured under the national health insurance scheme. These are contributory, combined weekly payments being made for health and pension.
lersons who do not come into any pension scheme can provide a pension for themselves by insurance. They can also in the same wry secure pensions for their dependents. The insurance companies and friendly societies will give information about their terms. An annuity may be described as a pension. Firms wishing to establish a pension scheme should consult an actuary, as only an expert who is acquainted with the conditions of the business in question can eatimate its cost. For purposes of income tax pensions are treated as earned income. See Annuity; Income Tax: Insurance: Old Age Pensions.

PENTSTEMON. This is an invaluable From seeds sown in n heated glasshouse in hardy or half-hardy plant suitahle for the rock January or Fehruary the plants will bloom the garden and flower beds and horders. The same year. A summer sowing in a garden frame


Pentstemon, a showy plant for the rarden border
florists varieties of pentstemon are popular late summer flowers: new onesare raised annually and the sizeand colouring of the blooms have been greatly im. proved : they vary from wh ite through pink to scarlet and through rose to carmine and purple. The plants are abnut 2 ft . high and are very showy from July onwards. Catalogues give long lists of named varicties. The small-flowered section of pentstemon has become popular in recent


Peony: two beautiful varietles. Left, flower of the fragrant white berbaceous albifora; right, rose-shaped flower of a variety of tree peony will yield planta that will flower the following year. 'The florists' varieties of pentatemon are not thomughly hardy, therefore annual propa. gation is advisable. Plants in warm, sheltered places may live thmugh the winter; if they do they ought to be pruned in spring.

Among the species or wild types of pent stemon there are several beautiful fowers. The loveliest of all is the blue heterophyllus, which needs well-drained soil and is suitable for the rock garden. Barbatus, 3 ft., is a good border plant which benrs red flowers in late summer.
PEONY. There are two kinds of peony, one a hardy herbaceous perennial, the other a shruh commonly called tree peony. The former is of chief value in British gardens. There are innumerable varieties with single or double flowers in many charming colours, and well-eatablished planta provide a hrilliant dia play of hloom in May and June. These plants thrive hest in deeply cultivated soil which has been enriched with decayed manure: they must be watered freely in dry weather, and an annual mulch or soil covering of manure in spring is heneficial. The heat time to plant is in September-October. Peonies are often slow in becoming established: they should thereforc be left undisturhed as long as they continue to Hourish. When after some years hruhs soveral feet in arge, hnnclanme blooms in about 18 in . high and hloom freely; a few of early summer. Although these shrubs arc the hest are Newbury Gem, Southgate Gem and Myddieton Gem. The usual method of propagating the named varieties of pentstemon is by cuttings of flower less shoots inserted in a bed of anndy soil in a cold frame in Septen. ber; if the frame is kepte closed for a few weeks they will soon form roots. The plants may remain undis. turbed until April or early May, when they are planted out of doors. A hetter plan is to pot them singly in $3-\mathrm{in}$ pots in spring Pentatemons can be raised from sceds, and those who do not wish to possess certain named varieties will find this method satis. factory if reeds of a good strain are obtained.


Peony Culture. 1. Good soil preparation. 2. First year: planting with Lilies between. 3. Second year: middle plant removed; tulips and libes between 4. How to lift a plant. 5. How to divide. 6. Planting in grass: a, riob
hardy they start growing carly in the spring, and must therefore have a sheltered situation, preferably one facing south or west. They Hourish best in loamy soil. Paeonia lutea is a tree peony from China, and cross-breeding between this and the Japanese tree peony has produced new varietiea Pron. Pee-on-e.
PEPPER : The Plant. The pepper plant belongs to a family of hothouse and greenhouse shrubs of the genus Piper. In Grcat Britain they are cultivated chicfly for their foliage. They require stove culture in a mixture of loam, leaf-mould and sand, and need a temperature varying from $60^{\circ}$ to $80^{\circ}$, according to the period of the ycar Propagation is by cuttings in springtime. The flowers ure insignificant.
PPPPER : The Condiment. Both the white and black pepper are obtained from the seed of the $E$. Indian pepper plant. The white variety, which is less pungent than the other, and is produced by allowing the berrios to ripen more fully, is used as a condiment for the table. but the black gives the best tesults in cookery.

Cayenne and Other Peppers. Cayenne pepper is employed in sauces and for seasoning white made dishes; it is also served as a table condiment it is obtained from the chilli or capsicunt. and the preparation may


Pepper Grinder in painted poruolain and silver. The peppercorns groove at the top, and ground popper is aprintled trom the base in pepper. Long pepper from India, and Neilgherry epper is prepared from a yellow variety grown in the Neilgherry hills. It is usually mixed with cumin and other aromatic spices. Mignonette pepper is a coarse-ground rather whitish variety, mild in character.
Medical Uses. Pepper has various uses in medicine, either as a counter-irritant, a stimulant, or to prevent flatulence, but must be taken in small quantities, otherwise it will set up irritation of the stomach and other organs. It may be used instead of a mustard plaster by steeping black pepper in alcohol, then spreading it on brown paper, covering with muslin and applying it to the skin for $n$ lew minutes.

Where a stimulant is urgently needed, and no brandy, sal volatile, etc., is at hand, pepper will supply the want. Give about 15 gr . of gmund black pepper in milk : it will act as a powerful restorative.

Peppercorn. This is the seed of the pepper plant before being ground, and it is valuable for the adequate seasoning of stock and stews. In order to distinguish the quality, observe that the seeds or corns are not broken They should be whole, firm, and cleanlooking. (See Allspice ; Capsicum: Chilli).

Pepper Pots. Pepper [wts, or casturs, are made of various materials. Cut glass ones, with silver tops, are found in condiment sets, and there are aluminium ones for kitchen use. They are also madc in carthenware, generally as part of a set. For the dining room pepper pots are made of silver, Sheffield plate, and electro-platc, and are usually bought in pairs to match salt cellars and mustard pots.
lepper pots of silver were first produced about 1700. They were cylindrical in shape, with a curved or domed top, which was perforated. Later the vase design was used for them, and, known as castors, they were made to form part of a set of three, two being for pepper and one for sugar. Pots in Sheffield plate were at first made on the same lines as those in silver, but afterwards other features were introduced. Some of the pieces were pierced, and, like the salt cellars, were fitted with glass liners. Bead edging is found on many of the antique pepper pots, which are sometimes called dredgers or muffineers. See Muffineer: Sheffield Plate: Silver: Table Laying.

PEPPERMINT. This hardy perennial herb may be grown in any rich, moist soil, and is well suited for the rock garden, or in rockwork by the side of a sunken walk. The flowers and young foliage should be gathered for the purpose of distillation. Pcppermint should be freely and constantly watered in dry weather.

Essence of Peppermint. Extract of peppermint is used for Havouring certain kinds of swcet meats and digestive lozenges. while the essence is made into cordials. A favourite dessert sweet consists of mild peppermint creams made with fondant and coated with unswectened chocolate.

Medical Uses. The fragrance and stimulating properties of peppermint are due to an essential oil which gives it a value as a medicine in digestive troubles. It is given to infants in the form of peppermint water in doses of

## Perambulators and Push Cars

## Up-to-date Types and Some Notes on Repairing

## Reference should alao be made to the arricies Baby: Nursery; and others dealing with

The shape and design of baby carriages by leather straps, thus preventing any vibrahave changerl of late years, the older high- tion and shock to the baby. huilt type of pram having been superseded by cars having a much lower built body and amaller whecls. The deep, low-built body affords the infant more protection from draughts, and keeps the weight low down and minimises the risk of over-balancing.

The chief requirements for a baby carriage are safety, comfort, and strength. It is essential othee. the beading or othamentation sprung applied hiereto $n s$ in tho case of wiond


Perambalator. Piga. 1 and 2. Two models, both of which have deep, low-built, ateal bodies, and wheela with ball bearingi and ruatleas mporea and babs. The oar on the left in fitted with madguards and a foot brake Courtesu of Dwnkley Safety Prame and of J.ines Bros., Lid
perambulators The surface is finished with carriage dusted inside and out whencver with pliers and bending them until they are
nitso-cellulnse enamel. These prams are casily cleaned. and the surface is not liable to chip. All the bright parts of the chassis can be protected from rust by chromium plating, which is standaid on all good prams

Inatead of the ordinary waist strap, a patent safety strap is hetter ; this costs only a trille more and malice it innossible for the child to fall out of the pram. It. is important that the hood and apron are cflicient. fit well, and are stormproof. Extra tittings are mudguards to lit over the back wheels, a chain guards to lit over the back wheels, a chain perishes rubber cloth and
brake for attaching to tha rim of the wheel spoils painted surfaces. when the car is left atanding, and a holder for an umbrella. The brake should be procured, as it is not safe to leare the pram standing without one. Even on almost level ground, baby can rock or slanke the car and so cause it to start in motion. while on an


Incline the employment of a brake is impera tive if accidents are to be avoided.

The question of size is important in small houses, flats, and in the type of house where the hall consists of a narrow passage. The slorage space must be considered, and the overall length and width should be measured, as in some models the handles extend 1 ft . to $1 \frac{1}{2} \mathrm{ft}$. beyond the carriage body. Folding handles can be had on some models, the levers bcing hinged so as to fold across the top or down against the body.

For two children a well-proportioned double enrriage can be obtained It is wider in the bed, a little longer, and has two hoods, and a special-shaped apron to protect the inmates from rain.

Folding Baby Carriages. In some circumstances it may be difficult to house an ordinary pram, and one of the folding variety must be procured. Great care should be exercised in its selection, and the purchaser should not be induced to buy one of the ordinary lowbuilt folding push cars. This type of car, though it may have an extension and provide a suitable bed length, has not the comfort necessaly for $n$ baby's first carriage, and serious curvature of the spine may result from their use in the upright position in the case of infants. For an older child the push car has its uses, as it is portable and can be taken away on holidays. It is employed normally in the crect position, with thic child sitting up, and can be arranged at will to allow the occupant to rest in n re. clining posture. Good examples of both types of car are illustrated.

Care and Repair. Perambulators wear well and lost a long time if care is taken of them The hubs should be oiled regularly, and the

Perambulator. Fig. 3. Baby carriage witn 1010 lng movement. Fig. 4. The vehicle folded. It can be set un on end for storing. Fir. 5. Push car with body adjustable to three positions and bed extension Courlesil of Tan-Sad. R.1d.

Beeswax dissolved in turpentine or any good wax polish can be applied to keep the pram in good condition. It produces a brilliant polish, feeds the wood and protects the atcel part from rusting and the leather cloth from (racking.
The points that most usually call for attention лre the tircs, hubs, and hood. Pneumintic tires may be treated in the same way as cycle tires; when the ordinary solil tire breaks or wears it must he replaced by a new one. To do this, the lirst step is to remove the old tire. Sometines tircs are secured by cement, and in such cases will have to be warmed. For this purpose the wheel should be taken off from the pram, the dust cap on the end of the nale heing first removed by means of a spanner; when it lias licen taken off it revenls the end of the axie.

In many prams the wheel is held on by a split pin and a washer known as a D washer ; it lias a flat part formed on it which engages on a flat on the axle, the purpose being to prevent the washer rotating. The split pin is removed by pinching the two ends fogether warming the class of lire is fitted by warming the rim of the wheel, laying a little dire cement in the hottom of the rim, immediately inserting the tire in place and springing it over the rim. In the casc of the continuous tiring, the first atep is to measure the length nceded. This is done by coiling the tire round the rim and cutting it off about $1 \frac{1}{2}$ to 2 in shorter than the length round the rim. the amount varying with the dinmeter of the wheel and that of the tire. The next step is to saw the tire naunder with a hacksaw, supporting the tiring in one side of the vice and manipulating the hack-saw with one hand while supporting the other end of the tiring with the other hand Having cut it off, the ends of the wire are joined together hy screwing one end into the other To do this, it is necessary to twist up the length of tiring into three coils and place the two ends of the wire in register. On relcasing the tire, it will uncoil itself, the ends will be firmly screwed into each other, and the tire will be found to le complete.

The next step is to spring the tire on to the


Perambulator Repairs. Fig. 8. Replacing a solid tira: sa wing of length of tiring with hack-saw. Fig. 7. Tire twisted up in coil and wire ends joined. Fir. 8 . Renewing worn-out rivets of a folding perambulator; a heavg hammer is held arainst the head oi the rivet, and the riveting is done with a ball peine tammer
working it on with the thumbs. The fingers and the hands should grasp the rim of the wheel and the.tire firmly, so that it cannot possibly slip and spring off, while the thumbs are pressed over, gradually springing the tire into position on the rim. Before replacing the wheel the bearinga are overhnuled, hub and wheel cleaned up, and the axle oleaned and oiled with light machine oil. After this, the D washer, split pin and dust cap are replaced.

After the pram has been in service for some time it may well receive n thorough overhaul. It should be taken to pieces, commencing at the top and removing the hood, oushions, etc., and taking off the body from the ohassis. The axles, if bolted to it, can be unfastened from the framework or aprings and every part dismantled. The whole should be cleaned, and the metal parts wiped over with a rag saturnted in paraffin oil, which will remove the bulk oi the grease, then they may be finished off with a clean rag. Leather suspension strapa can receive a dressing of harnesa oil.

All metal parts that have been painted should be well rubbed down with coarse sandpaper and smoothed off with fine sandparer, taking care to remove all traces of rust. They may be painted with one or other of the special cycle enamels on the market, which give an excellent result if the maker's instructions are carefully carried out. It is seldom worth while to repaint the bodywork. Many prams now have pressed ateel bodies and are cellulose enamelled, a method giving a hard and durable aurface: Scratched paintwork can be touched up with a paint of the appropriate colour
The upholstery may be renovated with one of the leather revivers on the inarket. The axles and the underframe, or chassis, should then be put together, the wheels refixed, and the straps fixed in their positions. To refix the body will necessitate an assistant, one to hold up the body while the other fastens the atraps to the hangers. The lining of the hood may require renewing, and to do this the old lining may be used as a pattern by whioh to prepare the new one.

## Repairs to a Foldins Perambulator

Folding cars call for somewhat different treatment, as their construction is not the same as that of the ordinary type of pram. The folding car is largely constructed of strips of inetal joined by rivets. The wheels can be removed and re-tired in the same manner as already described. Sometimes the rivets wear and get slack, and the frame may not fold up properly. To remedy this, the rivet should be removed by filing off the shank where it has been burrea over and carefully punching it out. Obtain a new one of requisite size, place it in position and rivet it up, holding a heavy hammer against the head and riveting with a light ball peine or riveting hammer
The bodywork of this class of pram is constructed chiefly with waterproof material and suspended from wooden bars attached to the metal frame. To remove the body it is necessary to withdraw the nails and screws which secure it to these wooden bars. The front part of the boly is secured by rivets to a cross-bar of metal forming part of the franiework, and if this has to be removed the heads will have to be filed off and the rivets punched out. When the body has been removed it can be renovated with leather reviver, or may be re-covered with new material, using the old as a pattern. If the upholstery is sound, but the padding solidified, remove the covering. tease the flock or padding and re-cover as before. When replacing the body, be sure it is securely fixed to the wooden bars and atrongly riveted at the front.
The hood is removed by unfastening the screws which secure it to the wooden bars, as generally this type of hood is made up to give is kind of parallel motion arrangement, on
nickel-plnted metal strips, which allows the hood to fall forward or backwand as desited. When overhauling auch a pram, the hood and body should be removed, all the joints well oiled and all traces of oil wiped off the exterior. The whole of the metal work should be cleaned down and re-enamelled.

PERCH : The Fish. Perch is in season from the end of May till the heginning of the following February. The fish, which varies in size from 1 lb . to 3 lb ., should be cooked and eaten as soon as possible after being caught. It is difficult to scale, and sometimes the scaling is left till after it is cooked; but it is better to plunge the fish for a minute or two into boiling water and remove the scales hefore dressing it. The blanching will facilitate cleaning it

Perch can be fried according to the general instructions given for frying fish.
To stew perch. prepare a large fish and atuff it with a rich veal stuffing, tying it together Put into a stewpan $1 \frac{1}{2}$ pinta good stock, add an onion and carrot prepared and out small, also a bouquet garni. Lay the fish in the pan and pour over it a large wineglassful of port. Season it and stew it in the oven for 20 min . or longer, according to the size. Dish the fish, strain the liquor, reduce it till thick and add some matelotte sauce. See Fish: Matelotte.

PERCOLATOR. 'The apparatus known as a percolator is designed to enable liquid to pass alowly through a porous material, as in a coffee-pot or a filter. In the former a perforated metal or china plate dividea an upper compartment from a lower. In a filter the separator is often made of porous eart henware through which water drips from the upper vessel to the lower and is purified in the process. See Coffee

PERENNIAL. In gardening a perennial is a tree, shrub or plant which persists or lives on from year to year. Herbaceous perennials are those plants of which the stems and leaves die down in autumn but the rootstock lives and produces fresh growth in spring. Familiar hardy herbaccous perennials are lupin, delphinium, peony, and phlox. Hardy shrubby perennials, i.e. trees and ahrubs, are usually increased by cuttings in a frame in August or out of doors in autumn, or by layering in summer ; herbaceous perennials are increased by division in nutumn or spring. Perennials may also be raised from secds.

PERESKIA. A greenhouse succulent of perennial growth, pereskia is alan known as the Barbados gooseberry. Two species are cultivated in Great Britain, aculeata and bleo, and these are grown as stocks upon which to graft the epiphyllum or leaf-Howering cactus. Perfume. Sce Scent.

# Pergolas: In Wood and Brickwork 

## The Construction of a Decorative Garden Feature

> Gardening is represented by a great varicty of articles. These, in addition to those on the Hlowers and plants, will be found under such headings as Areh; Rustic Work; Trellis. See also Flower Garden; Garden; Path; Rambler, etc.

A charming addition to any garilen is a members are similarly mortised and tenoned pergola. It is not only an admirable device and notched to receive the cross-pieces. for displaying the colours of flowering olimbers, They are further notched on their upper side but is a means of providing a shady walk, as it to receive the lighter timbers, which are set is essentially intended for spanning a atraight on edge in the notches and laid longitudinally. walk or path. In its simplest form the Another method is to use rough poles, such as pergola is a skelcton structure, made up from larch, and simply build up the structure by prepared or rough timber, composed of uprights, spaced about 6 ft . to 8 ft . apart, connected together by longitudinal members, and oross-bars apanning the path. These should be at least 7 ft ., and preferably 8 ft ., in height, so that when they are covered with climbing plants there will be still sufficient room to walk beneath them

Oak is one of the beat materials, but any durable wood may be used. Iarch and chestnut are suitable.

Some excellent effects are obtained by the use of rough hewn timber, especially oak, which may be worked somewhat on the lines indicated in Fig. 1. The bascs of the posts ahould be charred or creosoted to preserve them from decay; they will last indefinitely if emberlded in concrete. The posts may be a bout 4 in. square, connected together by horizontal members about 2 ft . 6 in . from the ground, and roughly mortised and tenoned and pegged together The other longitudinal


Pergola. Fig. 1. Good effect obtained by the ase of rough-bewn oak, the uprights and rails being mortised and tenoned to each other
nailing suitable longitudinal and cross nembers to the uprights. This can be done with stout 4 in . wire nails.

A pergola nearly always spans one of the principal paths, the ground being marked out with lines, as in setting out the foundations of a building. Pega are placed on every spot where an upright is to be fixed, and the lines removed. If the poles are of any size, the holes should be dug to a depth of about 2 ft ., according to the nature of the soil, and the first post set up in position, plumbing it to ensure ita being upright. The earth is then filled in the hole around the butt of the post, and well rainmed and consolidated. The butts could be concreted in if desired

The next to erect is that on the opposite side of the path, adjacent to the first ; that is, assuming that the pergola is to be straight, otherwise the procedure will be slightly varied. This is set up in a similar manner, and then the two posts at the opposite ends of the pergola are similarly erected and plumbed. The height for the posts is then determined, a batten being tacked across them at the required height and tested for level, after wbich the tops are sawn off llush with the hatten

The other posts are erected in a similar manner, and as the first and last posts in the line have already heen plumbed and levelled, all that is necessary is to stretch a line tightly
betwcen the two end posts and adjust the remaining posts accordingly.
Having fixed all the uprights, the next atep is to fix the lower horizontal members, nailing these firmly to the uprights, as if this is done securely planks can be laid across them frmm side to side, to facilitate the fixing of the upper nembers, which may then be nailed in position. luring the progress of the work the posts should be sighted from end to end by looking along them to see if any of them are displaced when the error will be immedintely perceived and corrected. Hence when the horizontal and longitudinal members are fixed, and the cross members nailed into position, there will be little fear of the pergoln going out of shape.

Should the ground undulate, the top of the pergola may either be made level or can follow the curvature of the earth. In the former the post on the lowest point of the pergola should he the first to be erected When a pergola is to be erected over a curving path. regular spacing is determined by the use of two batons, one the length of the space between the poles, and the other the width between them

A permanent structure can be made with pillars of brickwork as in Fig. 2, and is often of architectural value to connect the house with some apecial feature of the garden. The brick pillars should be set up on a concrete foundation. Gaps should be left in the brickwork for the reception of the horizontal meinbers, which are slipped into place, or built in while the brickwork proceeds. The work is completed by an open roof of timber. which may be stained to a dark colour.

After a pergola has been erected it is a very: diflicult matter to paint or colour it at any subsequent time, as all the climbers will have to be removed, and re-trained after the paint is dry. Consequently it is most cconomical to use a naturally durable material such as oak or brick, and to treat the less durable ninterial with generous coats of wood preservative before attempting to train the plants around them.

PERIDOT. This deep yellowish-green stone is a species of olivine and is the month stone for September. It can he set in gold or dull silver, and harmonizes well with pink or white topaz, but needs diamonds to display its beauty to the best advantage.

PERILLA. The half-hardy annual perilln. which comes from China and has purplish ornamental foliage. is often used for summer


Pergola. Fig. 3. Charming arrangement at the entrance to a rose garden. The wooden uprights are connected by wires along whish are trained single and double varieties of climbing roses
bedding. It may be raised from seed sown the stomach and other abdominal organs; also in heat during March, the seedlings being infection may result through penetrating transplanted and hardened off for planting wounds, and other causes. out in June.

PERISTERIA. This stove evergreen orchid, Peristeria eluta, is sometimes known ая the dove Hower; the fragrant blooms, white marked with purple, n ppear in summer. It is best grown in well-drained pots or teak baskets, and needs little water during the resting period. See Orchid

PERITONITIS. Inflammation of the peritoneum, the serous membrane which lines the abdominal cavity and surrounds the greater parts of the contents, is called peritonitis. This lining membrane is liable to infec. tion from perforating wleers and ahscesses of

An acute attack generally begins with chilly sensations or violent shivering. The temperature rises quickly, and there is frequently an intense sickening pain in the abdomen Any inovement increases the pain, so thint the patient is even afraid to talk, breathe, or cough, and lies on his back with the legs drawn up and likes to have the shoulders raised to relax the abdominal muscles. The pulse rises to 120 beats or more per minute Vomiting sometimes begins early, and cruses great agony Great distension by gases occurs. Constipation omes on quickly.
To give the patient any chance of recovery an iminediate operation is necessary In the


Pergola. Fig. 2. Permanent structure made with pillara of brickwork and an open rool of timber, stained to a dark colour, over which rosea, clematis, etc., will climb
meantime, in relicve pain, apply hot linsced meal. poultices every 2 hours, covering them with cotton woal or flannels wrung out of hot water and frequently renewed.
PERIWINKLE : The Plant. This name is popularly given to the Vinca, a small family of hardy herbaccous perennial plants They like a shady position and may he planted at


Periwinkle. Star-like blue fowers of the low-growing glossy-leaved shrab that loves the shede
any time between autumn and spring. The flowers are blue or white, and propagation is by division of the roots in springtime The common kinds are major, 20 in high, and minor, 6 in . or so high. Both are suitable for planting heneath trees. There is a variety with green and white leaves. Vinca rosea, a tronical plant. is suitable only for cultivation under glass.
PERMANGANATE OF POTASH. This salt occurs in dark purple crystals, which give a deep violet-red colour to water in solution. Permanganate of potash is a very eflicient antisentio, disinfectant, and deodorizer, removing offensive smells and killing harmful bacterin.

The best way to keep it is in solution in distilled water, dissolving 1 oz in a pint of water. For use this must be further diluted as follows As a gargle, 1 oz . of the strong solution to a pint of water As a wash for ulcers and wounds, 2 or $2 \frac{1}{2}$ oz. to a pint of water.

Discoloration of the hanils or linen caused by potassium permanganate may be removed by a solution of oxalic acid. It may be used as an application for insect bites and stings, and the crystala are rubbed into incisions made over snake bites. In offensive swenting of the feet a weak solution should be used as a footbath once a day or oftencr.

PERNETTYA. This beautiful low growing hardy evergreen shrub, $12-30 \mathrm{in}$. high, is valued for the anke of its large, brightly coloured herries in autumn and early winter. The white flowers are borne in May. The species in cultivation is Pernettya mucronata, and there arc many varieties with berries of various colours-crimann, rose, mauve and purple, as well as white. These shrubs like peat soil, but will thrive in loam that is free from lime; they must be kept moist in dry weather. Propagation is by division in autumn or by cuttings and layers in July-August.

PERNICIOUS ANAEMIA. A very severe form of anaemia, which nearly always ends in death within 3 to 12 months, is termed
pernicious anacmia The disease is most common in people of midale age, and apjears to be associated with poisoning from septic stumps or other septic foci ahout the body. The pallor of the skin has a lemon-yellow tint. See Anaemin.

PEROWSKIA. This handsome shruhby hardy perennial is strongly scented with the perfume of the common sagc Its crect stems, bearing large terminal panicles of violet-blue llowers upon silver-grey growth, arc most attractive during September. There are four species, the chief being P. atriplicifolin, 4 ft . high, which must be planted in a well-drained position where it can get full sunshine. It is best propagated by cuttings planted in light soil, under a handlight, during carly sumimer.

PEROXIDE OF HYDROGEN. When diluted with an equal quantity of water, peroxide of hydrngen may be used as a lotion for wounds and ulcers of all corts. A teaspoonful made up to two tablespoonfuls with water makes a useful mouth wash or gargle for aeptic conditions in the mouth or throat ; and the same may be used for cleansing the nose or ear.

Hydrogen peroxide is a good application for insect bites and atings. A teaspoonful added to the water used for cleaning the teeth not only helps to preserve their whiteness, but alao prevents pyorrhoea. Teeth discoloured through smoking should he rubbed with a piece of cotton wool dipped in uncliluted peroxide. It bleaches the hair to a yellow colour, and is frequently used for this purpose. In the case of dark-haired people bleaching will diminish the disfigurement of superlluous hairs on the face. In speaking of hydrogen pieroxide the B.P. 10 -volume solution is usually meant.

PERRIER WATER. The natural mineral water known as Perrier water is derived from a spring at the village of Vergesc, near Nismes, in France. It contains a sinall quantity of alkaline carbonates and is an excellent table water. See Mineral Water.

PERRON. This is a term applied 10 almost any type of external staircase leading to a house, but it is generally presumed that the entrance door is ahove ground level.

PERRY. Perry is the fermented juice of the pear, just as cider is the fermented juice of the apple; the difference between them is slight, but perry as a rule is lighter in colour. It clocs not 1 aste strongly of the pear; on the contrary, a horoughly fermented pear-juice made from a vintage pear may give a liquor that is indistinguishable from a good dry cider. The pear required for perry making is a hald astringent fruit, that good for eating being unsuitable for perry. When gathered. the fruit should be sufficiently mature and should not be stored for longer than a fortnight before use.

Perry is made in the same way as cider. It ferments better if a proportion, say $\because 0$ per cent, of bitter-sweet apples, or even crabapples, is included among the pears at the timic of crushing. See Cider; Pcar.
PERSIAN CARPET. Peraian carpets and rugs normally have cotton warps and wefts. In some classes the design, made of dyed or undyed yarns, is always fastened to the warp with Selina or Peraian knot, in which the yarn is passed under the first warp, thread and over it and under the next beforc reappearing between them. The Ghiordes or 'Turkish knot, found in all Anatolians and Caucasians, whose warps and wefts are wool, as well as in some Persians and Turcomans, lays the garn over two warp threads, passes it under both, and then brings both ends through between them. The pile or nap is afterwards produced by severing the loops of the knots.
The Sehna knot may be right-handed or lefthanded, so that the nap points either to the
right or to the left top comer. With the symmetrical Ghiordes knot the nap always runs in a forward direction The lustrous sheen possessed by all Persian carpets and rugs is due to the wool being washed in soft running water, leaving the natural grease unaffected. Their durahility is aided by their harmless vegetable dyer. Silk is seldom used, except in some uncominon classes, notably the Kashans, not to apeak of the inodern commercial reproductions done in inferior dyes at Kaisariyeh. Undyed camel hair sometimes appears in field or horder in Hamadan rugs, but a good deal of so-called camel is goat. The gravest defect in modern fabrics is the substitution of the old vegetahle dyes by aniline products, which perish the yarns and cannot be mellowed. It is now the custom in the carjet trade to describe must Oriental carpets as Persian no matter from whence they coine.

Tahriz rugs almost always have florid medallion centres filling the whole ficld. This style they share with Kirmans, whose dyes are always good; but Kirman designs made al Tahriz to dealers' orders are not always guiltless of aniline. Mcdallions, with or without corner-pieces, also characterize the Ghorevan fahrice, which are almost always in carpet sizes only. Pole-medallions, which run in a series with the axes projecting. are a great feature of the Hamadan and Shiraz looms. Birds and animals, diagonal stripes, and other motives are also conimon Shiraz styles.

Very attractive is a diaper pattern of amall repeated objects, carried out in restrained and yet gleaming tones. This is much favoured for small rooms, because it does not dwarf their dimensions, and harmonizes with neutral furnishings and wall-hangings. Of these the most fainous are the Feraghans, which are highly eateemed in the East when made with the Herat design, a rosette between twolanceshaped, fish-like leaves. The field may be dark blue or rose-red and ivory, with ivory and greenish border tones; if there is much ycliow, and the Ghiordes knot is present, it should be noted that the piece cannot jossibly he antique. Saraband is usually diapered with the pear or cone design, arranged with the stems in opposite directions; in the style of Khorasan and Herat the pears all face the same way. The inost cliarming of Sarabands have borders of small conventionalized flowers linked up by a trailing vine, notahly rich rose or blue pieces with ivory horders.

Some clarsos have fields of large lloral designs without uny medallion suggestion, especially in the extensive output of the Sultanahad district. From bere come showy carpets with florid horlers of a type much affected for Ixminster squares. The mechanical sym. metry of these reproductions lacks the appeal of the unsjoiled native craftamanahip. Other better Persian designs are copied freely in the British factories, and such carpeta, whether Wilton or Axminster, are a good choice for dining room or living-room. See Carpet; Dining Room: Rug.

## Persian Cat. See Cat.

PERSLAN CYCLAMEN. This is the popular name for Cyclamen persicum, an attractive winter- and spring-llowering plant for the amateur's greenhouse some varieties of this cyclamen have prettily fringed petala, whilst others bear quaint huttertly-like flowers. See Cyclamen.

PERSIAN LAMB. A fur often confured with astrakhan, which it somewhat rescmbles, Persian lamb is a curly black skin of remarkable softness and durability. Kain does not affect it, and therefore, unlike most furs, it mak be worn with rafety in wet weather. Its natural colour is a rusty black, hut it is dyed to a much deejer shade.

PERSIAN LILAC. This is the popular name of Syringa persica, n graceful hardy shrub. It grows to a height of 4 ft ., and bears lilac-coloured fragrant blooms in May.

PERSIMMON Of the several kinds of persimmon the best known is Diospyros kaki This is a small leaf-losing tree which, if grown in large pots in a sunny, airv greenliouse, will vield its orange-vellow, plum-like fruits. In mild districts it may be grown on a sunny wall out of doors
PERSPIRATION. The sweat glands, the essential purpose of which is to extract water from the blood and pour it out on the surface of the skin, are scattered all over the body They are especially numerous on the soles of the feat and the palnis of the hands. Perspiration, although we are insensible of it, is continually flowing. The average amount of perspiration, sensible and insensible, in the - 4 hours is about 2 lb ., but exercise or heat increases the amount to an enormous extent.

The chief function of perspiration is to regu Iate the heat of the hody. People who do not swent easily are very liable to heat stroke if they find themselves under conditions which provoke this Perspiration, therefore, fulfils an exceedingly important function, and care should be taken, by keeping the skin clenn, to give it free cxit.

Excessive perspiration chiefly affects the armpits, groin, and feet, and is sometimes associated with an offensive odour. The parts should be washed once a dny at least with cold water and soap, dried thoroughly, and powdered freely with boric acid. In the case of the fect the powder should go well in hetween the toes, and the inside of the soclis should also be powdered. Shoes should he worn for the sake of coolness. The following powder could be used instend: Salicylic acid 15 gr . powder starch 50 gr , powdered talc to 1 oz For the armpits the following pouder may be dusted on several times a day after washing the parts and drying then thoroughly

l'owdered starch

| 1 |
| :--- |
| 3 |
| 3 |
| dran |

3 oz.
3
For the feet these lotions are useful, applied daily: 1 oz. formalin in 2 pints water, or water coloured red with permanganate of jotash, or a 2 per cent ointment of salicylic acid in vaseline may lic used. Those who perspire freely should always wear woollen underclothing

Perspiration stains on clothes should be treated promptly with fresh lemon juice and then washed in warm soapy water. If this treatment is not successful at first it nay be repeated, but the lemon juice should not be allowed to remain on for more than a few minutes, otherwise it may itself injure the colour of the material.

PERUVIAN BALSAM. Known some times as balsam of Peru, this is the exudation from the trunk of a Central American tree. Externally, it acts ins a disinfectant and as a stimulant when applied to a raw surface. Its chief use externally is as a parnsiticide in the treatment of scabies, nits in the hairp etc. It exerts a stimulant and antiseptic action on the lining of the bronchial tubes, and is therefore often included in expectorant mixtures in the treatment of chronic bronchitis.
When poured upon a fresh wound and covered with a bandage, Peruvian halsam has a healing and antiseptic action, and the balsam need not be changed for many days.

PERUVIAN LILY. This is the popular name of Alatrocmeria, hardy tubcrous-moted plants which grow from one to three feet high and bear showy, amaryllis-like Howers in summer. In some gardens, especially those having well-drained soil, they give no trouble, and in fact sometimes become rather a nuisance by spreading rapidly In others


Poruvian Lily. Bulbous plant of vivid hue well suited for growing in a sungy border or rockery

Courtesy of Amateur Garden'ul
where the soil is clayey it must be made suitable by adding leaf-mould and sand very freely The Peruvian lilics need a sumny place and appreciate such shelter as is provided by $\pi$ wall or fence. The roots should be planted 5 in. or $\mathbf{~} \mathbf{j}$ in. deep in spring. Some of the best kinds are aurantiaca, orange Hushed with. red. chilensis and its varieties in many rich colours, and psittacina, crimson marked with brown and green. Propagation is effected by lifting and dividing the roots in spring or by sowing seeds under glass in early spring
PETASITES. The winter heliotrope (petasites fragians) is useful for planting in the wild garden or woodland for the sake of its white fragrant flowers, which open in February, when few other plants are in bloom It grows 12 in . or so high and sprends so rapidly as to become a muisance in small gardens

Peter's Pence. In certnin Incalitjes this name is given to the honesty ( $q \cdot \nabla$ ).

PETROIL. This is the name given to a system of lubrication in internal combustion engines in which the lubricating oil is mixed with the petrol in the main tank of the machine. See Internal Combustion Engine ; Lubrication.

PETROL, or Gasoline. Thesc names are used for the lighter distillates obtained from crude oil. Petrol is highly inflam. mable, and its vapour, when mixed with air, is explosive. Special regulations govern the storage of the spirit in any considerable quantity. It must be kept in motal vessels of not more than 2 gallon capacity, pro vided with a screw stopper, so that leakage cannot take place. Not more than fio gallons may be stored in one place, or at any one time, exclusive of petrol actually in the tank of a motor car or motor cycle If the building used for storage is within 20 ft. of any other huilding notice must be given to the local authority in January of each year, and the authority may inspect the premises. Inflammable gords staclied in dumps, such as timber, are considered to be a building. The place of and intention to store must be notified to the local authority.

Apparatus or material for extinguishing fire must be provided in any place where pictrol is stored, and this applies to a privato garage if petrol is left in the tank of a motor vehicle housed therein The filling up of the petrol tank should never he done in the mesence
of a naked light. An electric light or some form of safety lamp only should be used One or two pails full of sand should be kept handy in case of fire, or a better plan would be to install one of the chemical fire extin. guishers. Small fires can usually he smothered with a damp cloth or sacking.

Water should not be used if petrol takes fire, as the petrol will floal on lop and thus be distributed over the floor of the building.
A point to remember is that insurance companies will not accept liability should it be proved that even as little as one tin of petrol is kept on the premises in which the car is garaged, unless the amount and incthod of storage are stated at the time the policy is effecterl. This does not apply to pietrol in the tank of the car or motor cycle at the time.

Cleaning Uses. As a cleaning agent for clothes, petrol has few equals. Sergc, silk. satin. felt, and velour garments of all kinds, provided that they are not of too light a colour, can be cleaned with it. It should be noted that the petrol vapour may travel a considerable distance and be ignited by a lire or lamp. Many fatalities have been cansed thus

This uork is best done in daylight, oul of doors, and the petrol in any case must be kepl a sulfe distance away from a fire or naked lighl. Niee Iry Cleaning.
Petroleum. See Parallin
Petrol Gas. See Air Gas
PETSAI. The Chinesc cabbage or petsai resembles a cos lettuce in appearance with pale green leaves and thick midribs The former are eaten like kale, and the latter. with sauce, like seakale Seed may he ohtained from specialist sccismen, and is best sown during July. See Scakale.

PETUNIA. This half-hardy llowering plant is suitable for cultivation in the greenhouse nod for planting in llower beds out of doors in summer. Though they are perennials and can he increaserl by cuttings under glass in spring, if it is wisherl to perpetuate named or spiccial varieties, it is usual nowadays to treat then as half-hardy annuals and raise them every year foms seeds sown in a heated glasshouse in February. Those which hear


Petunia Favourite greanhouse plant bearing fowers ranging from pink to crimsou and purple
double flowers must be propagated by cuttings: is finishod by polishing in these are more suitable for cultivation in pots under glass than out of doors. A compost of loam, leaf-mould, decayed manure and sand will ensure fine plants.

PEWTER: The Metal. A silvery-grey metal, very soft and ductile, pewter is oomposed of a similar group of metals to those known as Britannia metals, or alloys which contain a large amount of tin. Peuter is used in the form of sheet, and can be cast in a ladle or in a simple furnace In some typical compositions of pewter the percentages of the metals are as follows:

| Tin | Anti- <br> mony | Copper | Z.nc | 1ead |
| :---: | :---: | :---: | :---: | :---: |
| 91.5 | 6 | 1 | - | 1.5 |
| 88 | 8 | 2 | - | 2 |
| 88.5 | 7 | 3.5 | 3.5 | 1.5 |

If bismuth is added to the extent of 5 per cent the melting-point of the alloy is lowered Copper and antimony both tend to harden the
 alloy. With lead there is the danger of lead poison. ing. Pewter melta at about $400^{\circ}$ F., a temperature only one third of that necessary to melt aluminium or brass ; it can, therefore. be fused in a ladle over a gas.ring or fire. Articles to he made in pewter in the forin of enstings are Pewter. Fig.
pot. dating from $1740-50$ the lathe.
Suitablesolders for pewter are composed na follows: lparteach ol bismuth and tin, melts at. $286^{\circ}$ F.: 3 parts tin. 1 part lead, melts at $334^{\circ} \mathrm{F}$. 1 part bismuth, 2 parts tin melts at $336^{\circ}$ F.: I pari hismuth, 3 parts tin, meltr at $392^{\circ} \mathrm{F}$. A commonly used solder alloy consista of 1 part of bismuth, 1 part of tin, and 2 parts of lead The larger amount of lead may be aafely used on out. side work. Of the Huxes for pewter work Gallipoli oil, tallow, resin, and chloride of zinc are the most used. The oil is to be preforred, and can generally be purchnsed from firsi. class supply shops. This is aimply applied to the work and the solder run on in the usual way

To get a bright finish on peuter the piece should he first cleaned with benzoline to remove any fingermarks and then rubbed all over, both the worked and unworked parta, with ornot up and down

PEWTER COLLECTING The great dinary knife powder until the necessary polish attract whera. mould is prepared with moulding sand or will do well to study the collection in a good Jacohean Hagons are dignified and of aterling
plaster of Paris. The latter must be well museum, and make uphis mind to specialize quality as a rule. Georgian church plate is dried before the metnl is poured. The casting in one hranch of pewter, not necessarily to the henvy and rather dull Church plate is some.


Pewter tor the Collector. Fig. 3. Left to right : Frenct lidded measure, c. 1690-1710; Englisn porringer of Charles II period : \&cottish tappit hen, 1750 ; English bleeding bowl, Stuart period. French lidded measure of about 1710. At the back is an English dish, 1780-80 Courtesu of 11 \& A. Kimbell
ne necesary polish attract others. scribed then after cleaning as de-well-known maker are worth picking up if a snt the owner desines what is known as reasonable in price. Dishes fetch far more, satin finish to his pewter, he should obtain and a boar's head dish 24 in . in diameter is some very fine powder, such as is used by worth many pounds. Jugs are effective pieces dentiata, and use it on a flannel to polish the for diaplav, and so are chocolate and coffee pots piece. The flannel should be rubbed mund. Somo collectors may feel drawn to the collect charm of peuter is the pearly grey colour and Angons and patens may be follnd in the there is no other exactly like it. The beginner there is much faked church plate in the market. will do well to study the colleotion in a good Jacohean Hagons are dignified and of aterling


Pewter, Fig, 2. Pair of Flemish candle Fik. 2. Pair of Femish tinies made of Rritannia metal which the collector must avoid

A sinall collection of pewter may be diaplayed to advantage on a Welsh dresser or an antiquo style oak sidehnard or buffet. Tho plates will look well placed on edge, and the table portion will serve for a fow choice exhibits, such as tappit hens (see Fig. 3) or Inrge tankards A fow small cups may bc permitted on the shelves in front of the plates The drawers in the dresser, or the cuphoards at the sides, may be used for small exhibits, such as spoons,

For those who specialize in small articles such as snuff-boxes or sponns, the only satisfactory method of display is in a curio table with a glazed top.

It is no use to put pewter with brass tobacco-boxes, steel candlesnuffers, china and Sheffield plate, all mixed up together. Pewter also suffers from being placed in a room where decoration and furniture are of too ornate a description to make a gond setting. It looks hest with oak or plain mahogany furniture and in the rather old-world type of living-room, dining room or hall. To realize the effect of pewter properly displayed, a visit to the Victoria and llbert Museum may be recommended. If any specimens of pewter are imperfect through age, accident, or carelesaness. they may
be displayed in a cabinet just as specimens, or they may be restored by a careful reatorer. to render them capable of the ordinary handling to which they may be aubjected.

It is possible to lacquer the pewter, when it has once been jroperly cleaned, with an acctone varnish. which is transparent and not offensive in appearance. It is, however, far more satisfactory to clean the pewter to a certain point of brightness, not too silverlike. then smear it over with a rag which has some vaseline upon it. Rub it well with n clcan. soft velvet cloth, and afterwards at intervala, as the Japanese are asid to do to their wonderful metal work, polish with an old silk handkerchief

PHACELIA. The most beautiful flowering plant in this group or genus is Phacelin campanularia This annual should he sown out of


Phacelia. Bell-shaped flowers of the species known as campanularia of this American annual
doors in April where the plants are to bloom in summer; it grows 9 or 10 in high and bears bell-shaped flowers of rich blue colouring. It thrives heat in a sunny place and in well. drained soil.

PHATUS. This is a very old type of terrestrial orchid requiring cultivation in a stovehouse, and it is, therefore, beyond the scope of most amateurs. There are several species in cultivation, all of which grow some 2 ft . in height, and bear hlossoms of various colours See Orchid.

PHALAENOPSIS. This is a most graceful orchid with Howers on long arching stems It is grown in baskets or susjended pots in a warm greenhouse in a compost consisting of sphagnum moss and a little orchid fibre. A minimum winter temperature of about (io degrees is necessary. They need moist, shady conditions in summer and a good deal of water while growing freely, but drier conditions in winter. The flowers are white marked with various shades of colour Schilleriana and sanderiana are two well known ones, but the newer hybrids are now chiefly grown

PHARYNGITIS. Inflammation of the pharynx, the cavity behind the nose and mouth, is of three main varieties: acute simple pharyngitis, commonly called sore throat : chronic pharyngitis, frequently occurring in singers, speakers, street hawkers, and uthers who overtax their vocal organs; and acute phlegmonous, n serious but rare affection.
In acute simple pharyngitis, or sorc throat, the inflammation is superficial. The common cause is exposure and catching cold. The patient has a feeling of tenderness, dryness, and tickling in the throat. He sneezes, coughs, has a headache, and loses his appetite.

Usually the inflammation lasts only a few days or a week. The patient should remain in bed if he desires a speedy cure. To relieve the congestion and discomfort in the throat,
give ice to suck, and apply a llannel wrung out of hot water to the throat. Inhalations of steam give relief. A good application to the throat is glycerin of borax. When, the inflammation has subsided the patient should use a gargle of a $\frac{1}{2}$ teaspoonful either of glycerin of tannic acid or of alum, in a wine glass of water; or the glycerin may be painted on. He should keep to a liquid diet.

Chronic pharyngitis, or clergyman's sore throat, is cansed most frequently by over use of the voice. The patient should give his voice a long rest, and go to live in a warm, dry climate if possible. He must give up smoking and drinking alcohol if these habits are practised. The pharynx may he sprayed with a 1 per cent solution of carbolic acid once or twice a day. An excellent gargle is made of $l$ dram each of common salt, bicarbonate of sorla, and borax in a pint of tepid water. See Throat Pron. Far-in-ji-tis.

PHEASANT. Pheasants are in season from Oct 1 to Feb. 12, and should be hung for 12 to 15 days. Pheasants may be tested for age by examining the wing feathers and the spurs in the cock bird. The spurs in an old bird are Jong and sharp; in a young bird they are short or round and blunt.
In preparing a pheasant for cooking it is trussed like a chicken and stuffed and roasted as described under the heading Game I medium-sized bird takes $30-35 \mathrm{nmin}$. to roast, but the time varies according to the size of the bird and the heat of the oven.

Pheasant and Macaroni. Roast pheasant larded and served with macaroni affords a change from the ordinary method of dressing. Only young pheasants are suitable for this dish Lard closely the breasts of a brace of pheasants with small strips of larding bacon, using about 6 oz . ; cover with thickly huttercd paper, and roast for 25 min . in a inoderate oven. Then remove the paper and return the birds to the fire or oven for 10 min . longer.

While the birds are cooking prepare the inacaroni. Cook 1 lb . small niacaroni till tender in plenty of boiling salted water, strain it and return to the stewpan with 2 oz . butter and I teacupful tomato sauce and the saine of brown gravy. Mix well and let all become very hot, then season with white pepper and add 3 oz grated cheese. Do not stir the ingredients to mix them, but toss them over and over with a fork. Arrange the macaroni on $n$ dish, sprinkle over a little more cheese and pour over another teacupful of gravy, then serve the pheasant on the top of the inacaroni.

A Pheasant Entrée. An excellent inethod of cooking pheasant as an entrée is called the gipsy way. Truss the bird as for boiling and put it into a stewpan or casserole with 6 oz. bacon cut in dice; the bacon should not be too lean. Add 2 oz . butter and a tooth of garlic, and fry all together until the bird is brown. It must he turned over while frying, so that the breast may become as well coloured as the back. Now pour away the surplus fat and add 2 peeled and aliced Spanish onions, 4 peeled and sliced large tomatoes, and 2 wineglasses sherry. Season to taste. Put the lid on the stewpan, see that it fits well, and stew gently for $\frac{3}{2}$ hour, giving the pan every now and then a gentle ahake When cooked add a dust of pimento pepper, and dish up with


Pheasant. Roast pheasant. garnished with tail
feathers and served on a bed of watercress
the gravy and vegetables poured round it on the dish. The remains of cold pheasant may be used up in any of the methods described under the general heading of Game in this work. See Casserole; Chicken: Fowl: Game: Partridge.
PHEASANT'S EYE. This is the popular naine of adonis, a genus of spring-flowering hardy herbaceous perennials suitable for the rock garden. The best known is Adonis amurensis, which grows 12 in high, has deeply cut, almost fern-like leaves, and large yellow buttercup-like tlowers in March-April Vernalis, 9 in bears amaller yellow flowers in spring. Loamy soil $w$ ith which leaf-mould has been mixed suits these plants The annual kinds, autumnalis, bright red flowers in late summer, and aestivalis, red Howers in June, July, are raised from seeds sown out of doors in April in a sunny place in light soil.

PHLEBITIS. Inflammation of a vein, or phlebitis, may be of a septic or a simple character Septic phlebitis may be caused by organisms circulating in the blood, or by such organisms being introduced through a wound or making their way into the vein from septic tissues which surround it. It is a very dangerous condition, as clotting, or thrombosis, occurs in the vein, and the clot becomes infected
Simple phlebitis is more prone to occur in the gouty and in those who are anaemic. It is more likely also to occur in veins that have been in a varicose condition for a long time, or in veins in which the circulation has been sluggish for a long time

The occurrence of phlebitis is marked by pain and tenderncas in the line of the affected vein, which is felt to be firm and cord-like. If the vein is superficial the skin over it is reddened and somewhat swollen. If a large deep vein of a limb is involved, the limh below the site of the mischief becomes progressively swollen and brawny to the touch.
A person suffering from phlebitis should rest in bed, and if the affection is in one of the veins of a lower limb, as it inost commonly is, the limb should be swathed in cotton wool and elevated on a pillow. Pain may be relieved by smearing glycerin of belladonna along the line of tenderness. The weight of the bedclothes should be taken off the limb by using a bed-cradle. Large doses of sodium or potassium citrate are sometimes given in order to lessen the risk of thrombosis. See Varicose Veins
PHENACETIN. Phenacetin is a colourless, tasteless, crystalline substance which is only slightly soluble in water. Its chief use in medicine is in the relief of pain. In the treatment of severe neuralgic headache, migraine, dysmenorrhoea, the lightning pains of locomotor ataxia, phenacetin in 5 gr . doses every hour until 3 or 4 doses have been taken often gives great relief. Further, to safeguard against the possibility of heart depression following on the drug's action, phenacetin is often prescribed with caffeine, as in the following powder: caffeine citrate 2 gr., phenacetin 5 gr .

In poisoning by an overdose of phenacetin an irregular, Huttering pulse, slow breathing, blueness ahont the face, profuse perspiration, and a general condition of collapse, which may even lead to death, are the commonest symptoms. Treatment consists in applying warinth to the body by hot-water bottles, warm blankets, etc., and in administration of some stimulant, spirits or sal volatile. The patient should reinain in bed for a day or two after the symptoms of poisoning have passed off, to avoid all risk of heart failure.

Philately. See Stamp Collecting.
PHILODENDRON. The hothouse plant called philodendron has heart-shaped or arrowshaped leaves, usually of a very vivid green
in colour. The plants require a mean average temperature of $60^{\circ}$, in pots in a mixture in which leaf-mould and peat predominate. They are useful for training up pillars and onvering ugly walls, but their llowering properties are negligible. Propagation is by cuttings at any senson of the year. Wnter should be given freely daily.

PHLOMIS. This is a shrubby or partly shrubby plant of sage-like appearance which Hourishes in sunny places if ret in well drained soil. The most handsume of all is the Jerusalem sage (Phlomis fruticosa), a shrub $4-5 \mathrm{ft}$. high with grey lcaves and bearing yellow llowers in sumnier. It is increased by cuttings placed in sandy soil in a frame in July and Iugust.

PHLOX. The herbaceous perennial phloxes are invaluable border plants which are in full beauty in July and lugust. They Hourish remarkably in the cooler northern districts, and in southern gardens are best suited by heing planted in slight shade. They must have decply dug soil enriched by manure; they are not a success in poor, dry ground. If the plants are allowed to remain undisturbed for 2 or 3 years they form splendid clumps.

Propagation is by division in early autumn or by taking cuttings of the young shouts in spring and setting them in sandy soil in a slightly heated glasshouse. The finest heads of hloom are obtained by lifting a fow plants in autumn, placing them in boxes in a slightly heated glasshouse, and inserting the fresh shoots as cuttings early in spring. If put out in April-May each plant will bear one splendid head of bloom.

Many new varietics of phlox are introduced almost every year, and for them the nurserymen's catalogies should lie consulted. A few beautiful ones am Le Mahdi, Europa, Rijnstroom, F. A Buchner, and E. Danzanvilliers. The half-hardy annual phlox Drummondi, of which there are varieties bearing llowers of various colours, is an excellent summer bedding plant, for it blooms for many weeks. It is raised from seeds sown in n heated glasshouse in February-March, the seedlings being planted out of doors in May.

The dwarf trailing phloxes suitable for the rock garden are charming plants which sonn spread into wide masses if plantel in slight shade in a compost of loam, leaf-mould and sand. They are increased by cuttings inserted in sandly soil beneath a handlight as soon as the plants have finished llowering. The favourite is the moss pink (Phlox subulata), of whioh there aro several beantiful nanied varieties, e.g G. F. Wilson, mauve; the Bride, white; and Vivid, rose. Phlox amoenn hears large rose-coloured llowers III these dwarf phloxes bloon in spring


Phlox. Flowers of the herbaceous phlox, a splendid border plant which blooms in Joly-Auguat

PHOENIX. Of this palm, which is not hardy in Great Britain, the chief specics is the date palm (Phoenix dactylifera). It is less decorative as $n$ pot or tub plant when grown under glass in this country than Phoenix canariensis, a tall graceful palnı for large conservatorics. Phoenix rupicola is another attractive kind and Rocbelini, a less vigorous palm, is particularly useful. These palms thrive in a compost of half lonm and half peat with sand added freely. They need moist shady conditions and a minimum winter temperature of 50-55 degrees. Propagation is by mearis of seeds sown in pots of soil plunged in libre in $n$ case in the hot house.

## Phormium. See New Zealand Flax.

PHOSPHATE: In Medicine. The salts formed by the union of phosphoric acid and bases arc called phosphates. They are used in medicine as tonic remedies, in the syrup of iron phosphates, the compound syrup of iron phospliates, B.P.C., or chemical food, Enston's syrup and similar preparations. Sudium phosphate and effervescing sodium phosphate are used as aperients.

## PHOSPHATE: In Gardening.

The fertilizers known as phosphates are essential in the garden for the well-being of plants, as their action directly affects fruiting and llowering. These phosphates consist of various jiroportions of phosphoric acid combined with bases of organic mineral sulastances such as potash and lime.

One of the most valuable combinations is superphosplate of lime, which, in good commercial samples, contains about 25 per cent of soluble ploosphates. This phosphatic manure is best applied during spring, lightly forking it in 2 or 3 weeks before sowing or planting. It is most suitable for land with tendency towards lightness. On heavy, clayey soil another phosphoric manure, basic slag, is to be jreferred.

Bones are valuable for the phosphates they contain, and arc commercialized in a substance
known as steamed hone Hour, which is a great acquisition wherever phosphatio food is required. Other phosphatic manures are phosphate of ammonia and phosphate of potash, hoth purticularly valuable as liquid stimulant for pot plants, and used in the proportion of $\frac{1}{2} \mathrm{oz}$. to a gallon of water. See Fertilizer; Gardening, Manure

PHOSPHORUS. Ordinary phosphorus is n peculiar waxy solid substance "hich, when exposed to the air, rapidly oxidizes and readily bursts into llame. It therefore must be kept under "ater, in which fluid it is insoluble Phosphorus has the characteristic of being luminous or glowing in the dark. There aro several kinds; the white or yellow is virulently poisonous, and the red or amorphous is not poisonous. Poisonous phosphorus is present in some matehes and inamany rat poisons.
Poisoning by Phosphorus. One of the first symptoms of acute phosphorus poisoning is a burning sensation, or a taste something resembling that of garlic, in the mouth Then a burning pain may be felt in the thmat and stomach. The patient vomita, and if the matter brought up is examined in the dark it may be seen to glow. Purging occurs in some cases.
The doctor must be sent for without delay. Meanwhile, give a very weak solution of permanganate of potassium, or oil of turpentine. the Fiench variety for choice It may be given in closes of thirty minims every halfhour. The patient should be given soothing drinks, such ns barley-water, linseed ten, and gum-water. He must not be given castor oil. or any other oil, butter, fat, milk, or eggs, for three or four days.
PHOTINIA. Of this genus of shrubs the moat valuable in gardens in this country is the Chinese hawthom, photinia serrulata, an evergreen which will reach a height of 10 feet or more : it hears white Howers in June and the reddish-tinted young leaves ane attractive. This shrub is not very hardy and except in mild districts alould be planted against a sunny wall.

## Photography: How to Get Good Results

## Hints and Suggestions for Snapshots and Advanced Work

## For advice about the choice of a camera and the details of photographic processes the reader is referred to the specific headings Camera; Developing: Ennarging; Fixing: Negative ; Printing: Washing, etc. Ses also Landscapc Photography ; Lens: Panchromatic

Amateur photographers may, roughly, be divided into two classes-those who regard. consciously or unconsciously, the camern as a machine in which all that has to be done is to press the button, while the camera and the chemist do the rest: and those who regard photography as a hobby without limit in interest and knowledge.

For those in the class first mentioned the principal considerations are the methods of obtaining the resulta they want with a minimum of trouble, and the complete exclusion of the chemienl side of photography. So limited, photography can nevertheless he made an interesting and valuable hobly if the limitations are frankly acceptel, and a fow rules atudied and intelligently applierl. Photography of this kind is generally spoken of as snapshot pliotography.

Plotographers of the second type develop out of the lirst, hecause they find that the hest way of learning how to improve their resulta is to make somie study of each hranch of photographic work, and, in particular, to develop their own negatives and to make their own prints and enlargements Waeh of the scparate operations is dealt with in detail in other parts of this Encyclopedia Here will he given an outline of the subject in two sections, one for the taker of snapshots and the other for the amateur with wider aims

For the heginner the simplest, and in many ways the nost satisfactory. type of camera
is the lwox-form or other type of fixed-focus roll-film camera provided he accepts its limitations and does not expect a camera which is designed for smapalota in strong outdoor light to produce indoor portraits.
It is still a comnon delusion that a really good photograph can only he ohtained by the use of a first-class camera with a very explensive lens. It is far more probable that the lieginner will produce good photographs with the simple hox-form camera than with a more elaborate camera possessing an expensive lens It is simply a question of knowing what the camera and its lens can do

The Camera. Two things which the heginner should bear in mind from the first time he uses his camera are, first, that it is not a jress-the-lutton machinc, but a tool which requires practice for its proper use ; second, that $n \mathrm{~s}$ it is $n$ snapahot camera to be held in the hand. successful snapahots can only be obtained in stmong light out of doors. Although the simplest box camera can be used on a stand or stendied on a wall or a chnir while a time exposure is given, which means any exposure lasting longer than its to $\frac{1}{2} \frac{\text { sec., the beginner }}{}$ will generally wish to snap everything.

Whether he has a cheap camera or an expensive and clahorate une, it is imporsible to overconie the difficulty that a large number of subjects are not sulficiently well lighted to permit successful snapshots. This does not mean of course, that no results at all will
be obtained, but that the photograph will subject. The ordinary view not be a good one; it will cither give a finder is too small to show grey, flat pint with poor detail or where detail, and the only way to shadows are included, harsh and unnatural contrasts will appear

Roughly, it may be said that with a fairly cheap hand camern. having a lens working at about 1:12 (Kodak 1), sunshine, or sunlight reflected off large white clouds in a blue sky is necessary for a successful snapshot, and this only in summer time. This applies to cameras with shutters marked ns working at a speed of ${ }_{2}^{2}$ 's sec., which usually means between of and ${ }_{3}^{10}$ sec. With better lenses wo:king at $f / 8$, as found on the slightly more expensive types of roll film camera, successful resulta may be obtained in slightly dull summer light and midday winter sunshine. It is clear, therefore. that the leginner is limited in his snapshots almost entirely by the question of light.

Light is very deceptive, and when it appears bright to the eyes it may be weak from the point of view of the camera, as, for instance, sunlight under trees. The only thing that will show definitely the strength of the light is an exposure meter (q.v.), and the heginner is atrongly advised to make use of one.

The lind of camera referred to is known as the lixed-focus type, i.e. there is no trouble with focussing; so long as the camera is held more than a mininum distance away from the object to be photographed everything will be in fucus and shown sharply in the resulting photograph. This distance may he taken


Photography. Fig. 1. The optipod, a substitute for a frinod, holding a camera to a fence, walking-stick, or other object to permit time exposures Courtesy of Kodali. Lid
normally as about 4 yd It is only necessary to ree that no object nt a shorter diatance comics in the picture as seen in the viewlinder. If it d!oes it will appear hlurred and disproportionate in size in the photograph. spoiling it accordingly.

Securing Good Snapshots. The following simple rules, if carefully attended to, will do much towards securing successful snapshot photographs
See that the object to he photographerl is included completely in the view-finder. Photographs in which the top of a person's hat. or the feet, or the top of a building or other object is cut off are bad. All that is necessary is to get farther away front the object. A little practice at judging listances, experimenting on a friend or an inanimate ohject at distances from 4 to 12 or 15 yd ., will be very helpful.

Hold the camera firmly with both hands and perfectly level. If it is pointed upward, persons and buildings will look as if they were falling backward: pointed downward they will appear to be falling forward.

Look at the object squarely. Practise looking in the view-finder before exposing: but when exposing, fix the eyes on the be cetail, and the only way to be certain of snapping at
the right moment is tolook at the object.

Take a breath before snap ping, and hold it as the shutter release is pressed: this prevents movement of the camern during the instant of exposure. Exposure should be made by a firm and deliberate movement and not sharply, which may mean jerkily. Do not take a snapshot with the sun shining on the lens. With the box-form camera the lens is set inside the box, and is fairly well shielded. but with the folding camera the lens mount is shallow nnd affords little shale for the lens. Sunlight shining into the lens will lie found to give flat, misty results.

While perfectly clear photoyraphs are olitained picture, which will improve it.

Do not attempt to take distant views and wide Inndscapes with a snapshot camera They are beyond its scope. directly into the camera. The hest sna pahots are obtained when the subject is not aware that he is being photographed. This hint applics particularly to groups and strect scenes by the ses. At least (M) per cent of amateurs' failures are due to under-exposure, though it may not alvags be recognized. Use an exposure meter occasionally.

When the tilms or plates have been developerl and prints minde there is usually a chance of im proving the photograph by trimming it. With a small camera not possessing a focussing screen it is not possihle to ensure that nothing but the picture required will appear on the print, particularly in the case of snapshots. In fact. the small view-linder usually provided with roll-film cancras makes it dangerous to attempt to give the whole lilm to the subject or person smapped, for if this is done there is a prob. ahility that something will he missing in the photopraph. See, therefore, that sufficient matgin is given, hut cut it off when the print is made. Many photographs are greatly iniproved hy trimming off unnecessary sliy or fore. ground, or cutting out in. truding objects. Examples are given in Figs. 3 and 5.

These photographs, taken more or less by chance fiom an amateur's collection of snapshots containing many succesaful pictures. show several faults common to a large proportion of snapshots One is insulticient care in choosing the view-point. getting too far from or too near to the obiect of the picture Often a movement of a few feet to one side or forwards will obviate dilliculties and prevent


Fig. 3. Improvemant by trimming print. Building is falling backmard
because camera was tiffed upward
foreground objects bulking too - largely or getting ton much foreground. Another fault is not holding the camern straight
If the printing of the suapshots is left to the chemist or photographic dealer he can be relied upon to make the prints on paper hest suited to the particular negatives. A matt or semimaft surface paper gives softer and more pleasing results than glossy paper (unless the sharpeat rletail is requircd, is when thic photograph is to le reproduced ill a newspaper or hook), and the amateur will do well to ask for his prints to lic made on these mntt papers.

Do not hlame the chemist if the photographs turn out badly Grey and flat prints are almost invariably duc to badly exposed negatives. The modern husiness of devetop. results will sun shining from hehind, lictter ing and printing amateurs negatives is so whed with well orgalized and cartied out on the scientific one side or a little towards the front, principles of time and temperature develonfor then some shadows will be included in the ment that properly exposed negatives will

As far as possible, prevent people staring

Do not he afraid of over-exposure, except


Photorraphy. Faults in amateur snapshots. Fig. 2. Camera ot beld straight, too much foreground, unwanted piece
development until the correct methody seiniautomatically obtained by the tank have familiarized him with the appearance of good negatives. Even if he uses plates or flat films he should employ a developing tank in the same way hefore he attempta dish development by the dark room lamp

No written deacription can convoy a olear idea of the appearance of a correctly exposed and developed negative. and the amatcur without this knowledge who attempta development hy the aid of the dark room lamp is almost certain to go wrong With some films and plates and developers the image flashes up quickly in the developing bath and there is the consequent temptation to take the negative out lest it be over-developed. whereas the truth is that after the ininge has a ppenred time is required to build it up in the negative. A negative which looks bright and full of detail under the red lamp will! give fat and grey prints after fixing, herause it has been removed from the develojer before development is complete. With other films, plates. and developers the reverse is the case, and the imange appeara slowly. The safest rule is to folluw the scientific methods of development by time and tempernture accorrling to the tables giren with most developers.
Do not make any attompt to correct either over- or under-exposure ly varving the time of development of "dodges" lor correcting faults in exposure, hut modern scientifio working has proved them to be uselces. at leagt as far as the nmateur is concerned.

While still using his camera largely as a hand cainernthe amateur can en large its scope greatly by pro. viding a stand or tripod for it, so that time exposures may be kiven under the many conditions when smapshots are bound to be failures Even without a tripod a little ingenuity will find support by pressing the camera firmly against a post, tree, fence, or wall, or placing it on top of a wall or post packed level with small stones. A simple device for fixing the carnera is the Kodak Optipod, shown in Fig. 1, by means of which any convenient tree, fence, or even a walkingstick may be used. With the latter it is quite possible to hold the camera suff. ciently steady to give $t$ or $\frac{1}{8} \mathrm{sec}$ exposure.


Next, the use of different shutter speeds marks At the same time, if he is properly bas to be studied. If the camera has only ambitious he will consider the elementary one apeed, usually marked $\frac{1}{2}$ sec, but actually somewhat slower, this can be overcome to, some extent by olosing or opening the dia phragm By closing the diaphragm, i.e using a smaller stop, as explained under $\mathbf{F} /$ numbers the exposure is ahortened, and vice versa.

The beat way of increasing the range of photographic possibilities is to invest in a camera with a fairly good lens with an aperturo of about $1 / 6.8$ and, perhapseven more im portant, a really good shutter giving accurate speeds of from 1 sec to $\frac{1}{6} \mathrm{sec}$. It is the lack of a slow shutter speed that is the greatest a slow shiter speasure. The camern sces all and records fault in cheap hand cameras With the all with a fidelity that may have a disastrous slower speeds, say $\frac{1}{3}$ or $\frac{1}{2}$ sec., good photographs can often he obtained, the camera heing steadied, when a snapshot would mean bad under exposure

The amateur must practise the technique of his hobby until he can obtain negatives fully exposed and fully, but not over, developed. sharply focussed, clean and without stains, clean nd without stains, holes, raph in artistic arrangement of his photo graphs in the posing of the original subject, whether personal or natural, and in the production of his pirints.

Pointing the comera at a beautiful scene and pressing the button will not necessarily produce a beautiful photograph. The camera does not see as the eye. Its range is linited and it is far leas selective Looking at a scene that impresses one, the unimportant and perhapa unpleasant items are passed over and hardly noticed in the general impression result. Some selectivity result. Some selectivity
is therefore essential. A lamp pust can be avoided by moving the camera a foot or two to one side Similarly, obtrusive objecta which would fill the foreground of the photograph are often reduced in inpmortance by moving back.

Some Useful Hints. Following are a fow hints which will help in the pmduction of satisfactory photographic pictures even of the simplest and most unambitious lind.
Do not get ohjects of different or opposing interest in the picture In other words, concentrate on the subject to be photographed, and let the hackgmund be no nore than background. In most cases it is the foreground that makes the photograph.

Do not have the most intereating object in the middle of the picture. The centre is the weakest point. Keep the principal sulijert alightly to one side, or alightly aloove or slightly below the middle. On the other hand, do not arrange the picture so that the eye is led out of it towards the side. A river. for instance, should come out of the picture at the buttom right or left corner, not at the side.
Avoid bare expanses of sky or flat foreground. Trim oñ the print at top and bottom to reduce these defecta. Plain white skics do not exist in nature, and if panchromatic plates or films are not used, so that sky and clouds are inoluded on the negative, either print in clouds from a special cloud negative, taken at the same time as the particular landscape, or trim the print down so that the minimum amount of sky is shown.
In phetographing buildinga, nuch better and more interesting pictures will be oblained if parta, details such as doors, windows, glimpses down aisles or thmugh arches, are taken, rather than if the whole, inside or outside, is attempted. This rule frequently applies to landscape subjects, particularly wooded scones, as explained under Landscape Photography.

PHOTOGRAVURE. Photogravures that have been damaged by expusurc, dirt or greane can he cleaned by immersion for several hours in benzine in a Hat, shallow photographic dish. The dish mist be kept covered and no naked lights permitted in the ronm, owing to evaporation of highly inHammahle vapour Afterwards dry and brush over with clean, soft linen. This removes grense and dirt held by it. Other discolorations can tie got rid of by hathing in hydrogen peroxide, 10 vols strength diluted with 1 part of water, in a photugraphic dish. the photugravure being exposed to strong daylight while in process of immersiun.

An alternative method is to follon the henzine bath with a prolonged immersion in
sodium carbonate solution, 2 oz . of washing soda to 8 oz . of water, finishing by thorough washing in running water to remove all soda. See Carbro Process : Printing.

## Phthisis. See Consumption.

PHYLLOCACTUS. The phyllocactus has large flat stems, no leaves, and red, white, or pink flowers borne chiefly in summer. It is one of the favourite cacti for cultivation in pots under glass. It should be potted in well-drained pots in a compost of sandy loam with which hroken brick or mortar rubble has heen mixed. A sunny, airy greenhouse suits this plant best ; it must be safe from frost in winter. Propagation is by means of cuttings. During summer the phyllocactus needs a good deal of water, but little in winter. There are numerous named varieties with large showy flowers.

PHYLLOSTACHYS. Of this hardy bamboo several species are of considerable ornamental value. A position sheltered from cold winds is most suitable, and deep loany soil that does not dry out in hot weather is required. Bamboos do not flourish in poor, dry soil. Some of the most decorative species are aurea, which has yellow stems, fastuosa, Hexuosa, henonis and the blackstemmed nigra. All are of tall and graceful growth. The whangee cane for walking purposes is furnished by these bamboos. The old canes or stems ought to be cut out in April. Propagation is by lifting and dividing the clumps in September or May.

PHYLLOXERA. Also known as the vine louse, this small insect is very injurious to vines, and although more prevalent in America and upon the continent of Europe than in Great Britain, it is scheduled by the Ministry of Agriculture as a notifiable pest. An attack may be recognized by the warty or knotty appearance of both foliage and roots. As a rule the remedy is complete destruction of infected vines, thorough cleansing of the vinery, and the introduction of new border soil. The Ministry of Agriculture must he notified at once of the appearance of the pest, failing which a heavy penalty may be imposed.
PHYSALIS. This is the botanical name of a hardy herbaceous perennial known as Chinese lantern or winter cherry. It is grown for the sake of the enlarged, orange-coloured lantern-like calyces which enclose the true fruits: they are in full beauty in late summer and early autumn and are cut for decorative use indoors in winter. The leafy stems die down in autumn, and at that season the plants may be increased by lifting and dividing the clumps. The sorts with the finest "Ianterns" are Franchetti and Bunyardi. Physalis edulis is the Cape gooseberry.

PHYSIANTHUS. The evergreen green. house flowering, climbing plant Physianthus alhens attains a height of from 10 to 15 ft . It has red and white flowers, borne in ear!y summer. It should be planted in a large pot or tub. in the ordinary potting mixture, and placed in such a position that it can be trained up walls. rafters, or pillars Propagation is by seeds or cuttings in spring. In some parts of the country it is known as the white bladder flower, on account of the downy and bladder-like appearance of its

## blossoms.

PHYSICAL TRAINING. Systematic training for the promotion of health and the development of the body can take many forms. One of the most convenient, because it is practised without apparatus, is the Swedish system, often referred to as free movements. It was an important part of the training of the British soldier during the Great War. and forms the basis of the syllabus of physical exercises for puhlic elementary schools issued by the Board of Education. It is divided into groups, each concentrating
on a certain part of the body. and in this way muscles are brought into play which have hitherto been dormant, or nearly so.

One result of the system is to develop the chest and increase its measurement. To do this the gymnast takes deeper and more complete inspirations, filling the lungs with fresh air to their maximum capacity. This habit of adequate respiration, which is one of the main features of the system, tends to
improve the general health and fitness It cannot be too strongly emphasized that correct breathing is a vitally important factor in all branches of physical training. Much benefit may be derived by taking 10 to 15 ninutes' Swedish drill night and morning. If performed indoors a window should always be opened to permit of good air heing breathed. See Breathing ; Drill ; Dumb Bells; Exercise ; Gymnastics: Indian Club.

## Pianos: Mechanism, Choice and Care <br> With Instructions about Doing a Few Elementary Repairs

Owing to the presence of a Piano in almost every home this article is one of the most important of those dealing with musical matecrs. Others are Flutc: Harp; Player Piano: Violin. See further Gramophone etc.

A piano is $\Omega$ percussion instrument having steel strings struck by felted hammers which are set in motion by the depression of keys. The keyboard consists of a recurring series of long (white) and short (black) levers or keys, scven of the former and five of the latter in each octave. No pianos are now made of less compass than seven octaves $A$ to $A$, while most modern instruments have this compass extended to C .

Parts of the Instrument. To each note there are three strings (trichord), except in the lower part of the compass, where spun copper covered strings are userl, two to each note as a rule, but in the lowest octave of all only one. All these strings of varying thick. ness and length are stretched from the wrest pins over upper and lower bridges to other pins on the frame. and are subjected to a very high tension, the pull of which in a concert grand amounts to some tons, to withstand which there is a frame of iron or steel.

In most modern pianos the strings are made to cross one another so that the greater length thus obtainable in a smaller case may produce more sonority This is called overstringing. Behind or under the strings lies the soundboard, usually of Swiss pine or fir, joined up and varnished. The action consists of several independent but co-ordinated parts, which move on a key being struck and impel the hammer against its string, at the same time providing that it recoils instantly. An inıportant plart of the action consista of the dampers, which are small pads of felt lying upon the strings to prevent them vibrating. They are lifted off in the process of playing, and remain off so long as the key or keys are held down. Upon the latter being released, the


Piano. Diagram showing the mechanism of a treble note. A. Kes. B. Jack. C. Notch. D. Hammer butt. button button. J. Jack or hopper spring. K. Spoon. L. Carriage
centre. M. Check tail. N. Tape. 0 . Hammer butt centre. M. Check tail. N. Tape. O. Hammer but Courtesy of John Broadwood is Sons. Letd.
damper falls upon its string and stops or dampa its vibrations. In the very highest part of the compass they are not necessary, as the extreme shortness of the strings renders the sound very evanescent. The whole of this action is contained within a wooden frame. enabling it to be removed bodily.

Lastly, there are the pedals, of which there are usually two. The right or sustaining pedal, when depressed, suspends the whole of the damper action, irrespective of the fingers. In a grand piano the left pedal shifts the action, so that the hammer escapes striking one string of the three The unstruck one, however, vibrates sympathetically, thus producing a different quality of tone. But in most uprights, either the hammers are shifted nearcr to the strings so as to lessen the force of impact. or else a strip of felt is interposed between the ham. mer and the strings. This last is called the celeste pedal. In both instances the very characteristic una corda effect is lost.

When the strings are horizontal the instrument is either a grand or a square. the latter being very rare in Great Britain The mote usual form of instrument is that in which the stringsare stretched from top to bottom, known as an upright; if of larger make, an upright grand; if of smaller, a cottage piano ; or smaller still, a pianette. Naturally, the larger the instrument the fuller and stronger the tone, because more sonorous strings can be used. As regards the case, this is sometimes of solid oak, mahogany, or American walnut, but as a general rule it is either stained in imitation of ebony or rosewood, or else it is veneered in walnut.

There are other terms connected with the case which need explanation. The lid is the top of the instrument. It is usually divided
into two halves, the front half working on a long hinge The front panel is immediately below this, and upon it are fixed the music rest and the sconces. The bottom panel is just above the pedals The fall covers the lieyboard, and is joined to the hollow by a long hinge. In some pianos there is a nome board bearing the maker's name, though this is generally placed upon the fall. The 1 russes are the nore or less ornamental supports under the keyboard on the right and left

Choosing a Piano. In choosing a riano the purchaser should be prepared to spend as much as he can athord, as cheap pianos are seldon good investments. To the uninitiated eye the instrument may appear as highly finished as a inore expensive one, and its tone may even seem as good, but it is unlikely to wear well. It is thercfore advisable to go to a maker or dealer of reputation, and to avoid places where pianos are n mere side line to other articles. It is best to pay cash down if possible, as most firms are then ready to niake a substantial concession. If this be not possible, there is the instalment system It is usual to liave an agreement, and it is well in make sure that it is not one-sided and wholly against the purchaser if he should, by any chance, fall behind in any of his payments.
The first test of a piano is that of the tone Everybody has his own personal preferences, but, in general terms. the tone should be full, mellow, and powerful, without any trace of hardness or harshness. A good tone has depth and richness, whereas a poor one, despite apparent brightness, seems shallow and all on the surface, lacking singing quality. Avoid a brittle high register, like playing on glass, and what is called a tubby bass, i.e. weight of tone without richness. If the buyer is also a player, he can judge for himself, but otherwise he shonld onlist the help of a friend. The tone should exhibit perfect evenness throughout the compass, without a single break. This evenness can casily be tested by playing scales in single notes at various speeds up and down the piano.

The repetition should be perfect. Try several different noter, high, medium, and low, by playing each as rapidly as the fingers can move. Test the damper by playing passages and staccato chords-without pedal, of course -and listen for the insiant cessation of vibra tion. What is termed an underdamper action will be found to give the best results, as the damping is quicker and more effective. 'l'ry the peda!s and see that they are doing their work well. Pay particular attention to the touch, which should respond to the wishes of the player as expressed through his fingers. Persons nccustomed to an old. well-worn piano rometimes think that the touch of a new one is stiff, wherens it really is better regulated and more calculated to produce all shades of tone Notice whether the white lieys are ivory or celluloid. The latter substance is more generally used to-day. Ivory is greatly to be preferred, but it adds to the cost. As to the case, the best makes are distinguished by good taste rather than by assertive ornamentation, which in a wellfurnished room is apt to prove an eyesore.
It is quite possible to pick up a bargain in the shape of a second-hand piano, especially when one hears of it privately; also, most makers and dealers have such instruments either returned from hire or taken in part payment for new ones. But the purchaser should be wary of pianos included in cntalogues of after-season sales, especially if they are by obscure makers. A second-hand piano should be tested in the same way as a new one, but it is ndvisable to see, at the same time, if the hammers arc much cut by use, and whether moth has attacked the felt, bushes, etc.

A piano is very susceptible to changes in the atmospherc and temperature. It is best placed
against an inside wall, at a fair distance (rom it; if possible, a cross position is preferable. In no case should it be near the fire, close to a window, or next a door through which there is a strong current of air ; all these will cause it to go out of tune

It is not ndvisable to place objects such as books, ornaments. or vases of flowers on the lid of the piano. They lend to disngreeable jarring or buzzing. and if water is spilt more damage may be done in a minute than can be remedied in a month. Open the lid frequently ro as to ventilate the interior Condensation of moisture on cool surfaces is common in every roons, and this can as easily happen inside the piano as outside it. So-called ominmental covers should also be taboo. The use of insulators or glass cups, though sometimes neccessary to proteot the instrument from damp, may not only cause inconvenience to the player hut also putundue strain on the pedals through raising the piano too high. A foot rest should therefore be uscd in such cases.
It is the custom for the firm which sells the piano to tune it for 6 months free of charge, after which it is the duty of the purchaser to see that he gets a competent tuner. It is false economy to rave a few shillings a year by employing an inferior man. The piano should be tuned at least four times a year, or oftener if it is much in use. Sometimes little defects will develop which should be left to the tuner to remedy.

Cleaning the Plano. Once a year the piano should have a spring clean, for dust and Huff will find their way into the best-cared-for instrument, and cannot but affect the tone. First open the lid back, and then remove both top and bottom panels by undoing the hooks, buttons or stavs by which they are kept in place. Next take of the fall and hollow, which will be quite easily done. To take out the action, turn back the catches on each side, firmly grasp the frame at the sides, give it a alight pull forward, and the whole can be lifted out. It should then be placed upright on the floor in some position where it will be in no danger of falling
Now remove the keys in regular order from the bottom to the top, and place them on a table. They are all numbered, but it will he convenient to preserve the proper sequence. In removing them, ease them gently off their pins. With a light brush of soft hair, or of feathers, dust down the strings, and then remove all dirt from the bed underneath the keyboard and from the base of the instrument, bring carcful not to damage any of the baize bushes. On no account use a duster unless it is perfectly dry. When the cleaning is over, replace all the parts in the inverse order to which they were taken out.
Ivory has a natural tendency to turn yellow with age, but this discoloration may be retarded, even if it cannot be wholly prevented, by cleaning the keys frequently from the dirt and perspiration which fingers are bound to deposit. They can be well rubbed with a chamois leather wrung almost dry; the rubbing is done with the tip of the finger, so as to avoid any damp coming into contact with the wood at the side of the key, each key being immediatcly dried with a soft cloth.
Very occasionally the ivory may be rubbed over with a little uncoloured methylated spirit; this will help to keep it white Another recipe which has been recommended is to use lemon juice instend of spirit. If the keys are very discoloured it is best to seek expert advice. The case should be dusted lightly with a soft cloth; hard dusting with harsh material rubs the dirt into the polish, thus destroying its lustre. Never use furniture cream; use, instead, a soft cloth, very slightly damp. sprinkle a few drops of paraffin uloon it; a nd apply it lightly. To prevent any damage f́rom moths, camphor balls may be employed.

Simple Repairs. While the services of п competent tuner should be utilized regularls to keep the piano in playable condition. small breakages sometimes occur in the interva! between his calls and cause considerable annoyance by putting the instrument out of use for the time leing. Although interference with the mechaniasm of a piano by an inexperiencel person is to be deprecated, there are certain minor repairs that can be undertaken by the handyman. The following hints are intended more particularly for the bencfit of those in remote districts who cannot call in the expert at a moment's notice

Broken Strings. One of the most frequent troubles is the hreaking of a string. In the case of a steel string this may affect either one note or two aljacent notes. The portions of the wire that has suapped should be cut off as close as possible to the tuning pins in the wreat-plank and the loose portions carcfully drawn out. This prevents any jangling noisc in playing the instrument. but it reduces either one note to a monochord or two adjacent notes to bichords, and conserpuently decreases their volume

This procedure should be followed in regard to the covered strings. except that the bottom portion need only he eased off the hitch pin and drawn out. In the case of a bichord there will still be one string playable. but a single string note will be dumb. In the latter case care should be exercised, when playing, either to miss the corresponding key or to touch it as lightly as possihle to avoid breaking the section of the action. Since there is nothing now to stop the travel of the hammer, breakage of the tape or of one of the flanges of the action may result. The liroken pieces of wire or string must be retained to scrve as』 pattern for replacement.

Broken Hammer Shank. Another occa sional mishap is the breaking of a hammer shank. If the tracture is a finirly long one, the two pieces can he jointed together with seccotine and hound round with strong silk or linen thread. If. owing to shoit grain in the wood, the breali gives insufficient glucing surface, it can be apliced temporarily by means of a thin piece of light wood glued on immediately in front of the shank, so as to resist the force of the blow, and this splint should be atrengthened as before with si!k or thread wrapping. Care should be taken, however, not to increase the weight of the shank more than can be avoided since this, in turn, will affect the weight of the touch.

Where a permanent repair is desired. the procedure is to remove the broken pieces of shank from the hammer head and butt. This is done loy melting the glue in both joints by means of a small blow lamp. or, failing this, a petrol filled cigarette lig! iter which does not give off smoke. Whatever form of heat is applied, care must be taken not to scorch the wood. When the glue is sufficiently softened. the pieces of shank can be twisted or pulled out. Where the application of heat is ineffective, the shank nust be cut off at the point where it enters the head or butt and the remaining piece drilled out. Care must be taken not to enlarge the diameter of the original holcs, and the drill must follow the original direction of the looles This is particularly necessary in regard to the head, and the need for this caution will be appreciated by noting the angle at which the head is fixed on the shank

Making a New Shank. Before cxtracting the broken shank it is better to shape the new one 'This should preferably be minde of the same wood as the rest of the set-mahogany. cedar maple, etc.-but if this is not readily obtainable a shank can be made from a piece of thin dowelling. The grain shou!d run in the direction of its length to lessen the risk of
the shank snapping under the force of the blow. A piece onger than will be necesanry should be cut from the dowelling and glass papered down to the thickness of the original ahank It should then be slightly filed at one end to fit into the hole in the hammer head When filing, the shank must he kept turning in the hand to ensure its being perfectly round An alternative method is to use two long files. One file is laid on a bench or other flat surface and the tip of the shank to be inserted in the heal is placed on it. With a stroke o the other file the tip is made to travel under pressure between the two and the fibres of the wool are thus compressed until the diameter is sufficiently reduced to allow the shank to enter the hole and fit tightly but without having to be forced in.
When'a satisfactory fit has been obtained a small groove is made with a marking gauge along the tip to allow the surplus glue to escape. To fix the shank to the head a blob of seccotine is dropped into the hole and the shank is turned in the fingers as it is preased home so as to form a ring of seccotine at the dge of the hole. The other end of the shank is prepared and fitted into the butt in the same wry, but the shank must first be cut to the correct length. It is essential that the ength aliould be exact, otherwise the hammer will not hit the strings at the correct nodal point and impurity of tone will result.

To arrive at the correct length, the measurement of one of the adjacent hammors is taken from the small centre pin in the flange (to which the butt is hinged) to the centre of the wooden portion of the hammer head. This measurement is usually about $5 \frac{1}{8} \mathrm{in}$. but it may be slightly more. The new hammer shank is then roughly tipped to allow it to enter right down to the bottom of the hole in the butt 'The measurement of the new shank s then taken from centre pin to centre of head, and the difference between this and the first measurement cut of the new shank. The latter is then re-tipped and fixed in the butt as alrendy deocribed. To allow the liammer to be turned to form the ring of seccotine the tape should first be carefully laken off the check wire
Replacing the Hammer. In replacing, care must he taken to sce that all the parts of the rection are in their correct position. When forming the ring, the hammer head must be lelt in correct position, and to ensure this the hammer is carried forwarl to its note and the nose of the hammer placed in contact with all the strings forming that note
In many pianos, especially overstrungs, the hammera are on the slant, and the new haminier must be in line with its neighhours to prevent fouling. To olstain this slant the tip of the shank that enters the butt, after being prepared, is filed slightly on the side opposite to that to which it inclines. Should the hammer nfter fixing not be quite in correct alinement it has to be "cast." This is done by henting the shank-the petrol lighter will serve for this purpose-and bending it either with the finger or pliers in the required direction The hammer should be held in position till the shank has cooled and set This operation must be performed gradually and repented till the required position is attained. The butt whould be held firmly while casting, to prevent strain or breakage, and the casting should not be done til! the seccotine has thoroughly iardened. Should $\Omega$ hammer head becone ooqe this can be easily refixed with seccotine, care being taken that the head is in correct position in regard to its neighhours and its note as already mentioned. A broken tanc can be temporarily repaired by fixing the broken ends with seccotine to a hacking of narrow tape
Repairs to Keys. In regard to the keys, n soraping or creaking noise is sometimes caused
by a chip or shaving on one key rubbing against another. This should be renoved with a chisel working the wry of the grain. Should two keys rub together at the front the piano has to be opened out and the faulty key taken off the pins. Underneath the front of the key will be found an oval-shaped pin This should he very slightly turned with the pliers. so that its flattened side inclines to the front only just sufficient to give clearance If turned too far, or if the pin is roughened with the pliers, the key will stick. If clearance hetween two keys cannot be obtained in this way it means the key has warped and requires the tuner's attention

Where an ivory or celluloid front or head has come off a key these can be readily refixed with seccotine after the old glue has been care fully removed from both surfaces. Ordinary glue should not be used for fixing celluloid, as it is apt to cause discoloration.

The Pedals. In regard to pedal troubles, an annoying squeak sometimes occurs. This may siniply mean that the pedal hinge requires oiling, but it may also arise from two rockers rubbing together or the front rocker fouling the inside of the bottom door. Where this occurs sufficient wood can he removed with a chisel from the offending rocker to give clearance. The replacement of a broken pedal is better left to the tuner.
PICKLE. Foods stceped in'a preservative, auch as salt, ןrepared brine, vinegar, or some similar acid, are known as pickled or pickles. Vegetables such as onions; beetroot, red cabbage, and cuoumber are either pickled separately or together. Fish or meat may be pickled, as, for example, salmon, herrings, pork, or beef. Walnuts or tomatoes also may be pickled, the former alone, and the latter usually as an ingredient in a mixed pickle.

An excellent pickle is made with celery and tomatoes boiled with vinegar, sugar, and spices in the proportion of 2 heads of celery broken small to 9 tomatoes, 1 brcakfastcupful sugar, $\mathcal{l}$ breakfastcupful vinegar, 1 tableapoonful salt, and $\frac{1}{2}$ teaspoonful each cloves, allspice, cinnamon, and mustard All the ingredients should be brought slowly to boiling point in a preserving pan and simmered for it hours. While hot the pickle should be poured into jars or bottles and sealed up.

Some vegetables require a more highly spiced vinegar than others. Cauliflowers pickled separately should be cut into sprays, sonked for 9 daya in brine, blanched for 10 min., dried and put into jars with spiced vinegar poured over them. To make this allow $\frac{1}{2}$ oz. mixed pickling spice to 1 pint malt vinegar, boil, add 1 teaspoonful salt, boil again for 5 min . Strain over the cauliHower and allow to grow cold before putting into jars. Ilways tie pickles down very closely, and after a week or two, if the vinegar has been absorbed, fill up the jars with a further supply. For French beans, lay in brine as for cauliflowers, then hoil them in the liquor, adding a tableapoonful of vinegar until they acquire a good green colour. Usc the pickle vinegar hot.

For cucumber pickle use very small cucumbers. Rub them all over with salt. then cover them and lave them for 9 days, turning them each day. Drain and cut them into oubes, and lay them in a basin lined with well. washed and dried cabbage leavea Pour over them enough boiling vinegar to cover them; lay over the top more leaves, and leave them n a warm place all night. Next day strain off the vinegar and drain the cubes. Preparc the basin again, using fresh leaves; arrange the pieces in it and pour the vinegar over them again, after boiling it up. Cover as before with leaves and set to stcep. This process must be repeated for 2 more days, when the colour of the cubes should be much improved. Now put the cuoumber into jars, boil up the
vinegar with pickling spice, let it go cold, and fill up the jars

Onions should not be used for about a month after pickling. Peel a pint of the pickling variety, sprinkle with salt and leave overnight: then put them into some boiling apice-flavoured vinegar. The latter may be prepared from 1 pint white wine vinegar, oz. allspice, $\frac{1}{2}$ oz. white peppercorns, 1 or cloves, and 1 teaspoonful salt. Let them boil, and then simmer for a few minutes and skim the top before putting in the onions. The whole should cook for about 5 min . bcfore being poured into a jar and tied down

Piccalilli. This mixed piokle is composed of various vegetables cut into portions and favoured with hot spices. It is made as follows: Prepare a small cauliflower and cut the flower part into neat pieces, peel $\frac{1}{2}$ pint button pickling onions, string 18 French beans, peel 12 small shallots, then cut into cubes 4 oz. vegetable marrow, also prepared, and wipe 12 gherkins.

Sonk these vegetables in brine with 3 or 4 capsicums for 9 days, but dry them well before pouring on them the following pickle ; also add 3 cloves of garlic. For the pickle, to 1 quart white wine vinegar add oz. salt, $\$$ oz. sliced ginger, $\&$ oz cloves, 1 dram each mace, black pepper, and white pepper, and $\frac{1}{d}$ dram cayenne pepper

Steep the spices in the vinegar, letting it remain in a warm place for 3 days, then boil it up alowly. Mix 2 oz. dry mustard and $\frac{1}{2}$ oz. turmeric to a thin paste with a little cold vinegar and add to the boiling spiced vinegar. Now add the vegetables and boil all together for 5 min , then set to cool, and when quite cold put into jars. If very hot pickle is not desired, lessen the amount of cayenne pepper.

If all these vegetables are not obtainable at one time, make up the pickle with those which can bo had, and add the missing in gredients as soon as available. This pickle improves with keeping, so that a little delay in finishing it will not harm it.

Pickled Herrings. Soused or pickled herrings can be bought in a prepared form and are then ready to eat immediately, or may be soused at home (see page 593). Dutch pickled herrings are imported in flat tubs To prepare these wash thoroughly and suali for 2-3 hours in milk. Cut off the heads and tails and divide the fish into fillets about 1 in . thick. Pour vinegar over them, or a sauce composed of 3 tablespoonfuls salad oil, 2 tablespoonfuls mixed vinegars, such as chilli, tarragon, herb, or tomatoes, and I teaspoonful each chopped parsley and shallot, and a seasoning of pepper
The herrings may be garnished with.slices of hard-boiled egg, but root chicory, or sonie suitable salad herb, or a well-mixed plain salad, may be served with them Salt should be sprinkled to taste. Salted herrings make a good luncheon dish.

Pickle Fork. These forks are usually made of silver or electro-plate with bone, ivory or mother-of-pearl handles, or entirely of the metal. A variation is a telescopic pickle fork. This fork lengthens so that when piciles are low in the containers they can he easily reached. A substitute for a pickle fork, and one which is useful for such varieties of pickles as walnuts, which might split it pierced with a fork, has spoon-shaped ends. Thesc open and close by manipulation of the spring top. See Beef; Herring: Marinade : Pork; Red Cabbage; Walnut.

PICK-UP. This is a device for reproducing gramophone records electrically, and is used in conjunction with a wireless receiving apparatus. The pick-up is the clectrical equivalent of the sound box used in the ordinary gramophone, and in its elementary form may comprise a permanent magnet having an
armature arranged so as to pivot freely bet ween the magnet pole pieces．The armature may have a chuck for holding the gramophone needle，or alternatively the needle itself may form the armature．A winding of silk or enamel covered copper wire surrounds the magnet pole pieces or the armature．

In operation the needle and therefore the armature vibrates in sympathy with the undulations of the sound channels on the record，thus causing changes in the magnetic field produced by the permanent magnet These changes are communicated to the coil winding and voltages arc set up across its ends．These voltages are then applied by way of the pick－up leads to the grid and nega－ tive filament，or grid bias negative，of a low frequency amplifying valve，and magnified up to a strength sufficient to work a loud speaker

A pick－up requires careful and skilled design in order to avoid unpleasant resonances and undue wear of the record．A good pick－up employed in conjunction with a properly designed low－frequency magnifier and a cone or moving coil loud speaker will give excellent reproduction over the range of musical frequencies covered by the record．

The average pick－up is highly sensitive，and in many cases two low－frequency amplifying stages will give ample volume for domestic purposes．In the case of the less sensitive piok－ups the detector valve of a wireless receiver employing two low－frequency stages may be arranged so as to act as an additional amplifying valve，the pick－up being switched directly into the grid circuit of this valve．

## Switching in the pick－up

A single pole change－over switch is required， the connexions being as follows：The lead joining the grid condenser and one side of the grid leak to the grid of the detector valve is disconnected from the grid terminal on the detector valve－holder and transferred to one side of the change－over switch．The centre or common terminal of the switch is connected to the grid of the detector valve，and the remaining terminal on the switch is joined to one side of the pick－up．The remaining side of the pick－up is connected to the $1 \frac{1}{2}$ or 3 －volt grid bias negative socket on the grid battery

Thus in one position of the f⿴囗十介itch the set functions as a wireless receiver in the normal manner，whilat in the other position of the switch the piok－up is connected in oircuit with the low－frequency magnifier，the high－ frequency side of the receiver being discon nected．This switching scheme may also be employed in sets which incorpornte only one low－frequency stage

If a volume control is not already included in the low－frequency circuit of the receiver， it is advisable to connect a potentiometer having a suitable reaistance value dircetly across the pick－up itself．This method，in addition to providing an efficient control of volume，also prevents overloading of the first amplifying valve．
The pick－up leads should not be permitted to trail across the set or to become entangled with the loud speaker leads，since this is liable to cause instability．It is frequently heneficial to earth the pick－up tone arm．See Gramonlunle．

## Picnics：Suitable Fare and Accessories

## How to Plan，Pack，and Serve in Appetizing Fashion

Suggestions for menus and special pienle ware are given in this article．See also the entrles Luncheon：Salad；Sandurich

Whether $n$ picnic is at the bottom of the garden，in a hut on the beach，or in some far－ diatant heauty－spot．its essential character－ istio is lack of formality．In summer，when sunny days permit，tea，luncheon or supper out of doors can be a delightful form of entertaining guests，or of varying the monotony of home meals for the family，eapecinlly during holiday times．Succesa in all cases though mainly dependent on a factor outaide the control of the organizer or hostess，namely， the weather，is also subject to good planning， good fare，and a suitable location
The meal selected is a matter of choice， though tea－picnics are the most usual．largely hecause they are the easiest to arrange．When the entertainment is simply and solely a pienic for children，where ten is served and games played nfterwards，woods are popular for the actual meal，but there should be an open space near for the games．Rounders is often part of the programine，and sporta with prizes are sometimes organized．The ideal place may be some distance away，and means of locomotion have to be studied．A small party may pack into a car ：a larger one may have the use of cars which are loared ry friends；but where a number of children are being enter－ tained，hrakes or a private omnibus may be hired，a method which usually gives great enjoyment to the guests

The food need not be elnh orate for such a picnic：but there must be plenty of it． It is astonishing how hungry people get in the open air This does not mean that any thing is good enough to offer the guests．The breand used for the fish－paste，egg and cress，mustard and cress，and cucumber sandwiches should be both brown and white and as freah as is consistent with neat making．Crusta are better left on，both for reasons of economy and also because the sandwiches keep a better shape．Bridge rolls，alightly sweetened brioches，and cur－ rant bread are all excellent for children＇s tes picnics， whether only buttered of sandwiched with jam，honey and sliced banana，walnuts and raisins or lemon curd Butter ahould be creamed before apreading， and fillings should be generous enough to prevent any reproaches of dry or du！l fare， but not so generous that they ooze out uncomfortably at the first bite．Bought sandwichea are seldion the success that nicely home－made ones are．To keep the bread freah wrap） them in waxed grease－ proof paper first，and then fold up in wet butter－muslin．

Very rich caker are not only too expensive，but out of place nt such a pienic．All the sponge inixtures are liked including jam sponge sandwiches．Swiss rolls， simple layer cakes and sponge fingers．Rock cakes，dough－nuts and the various plain and


Picnic．F／R．1．Luncheon and tea outht for lour persons．The gaily－coloured ware is non－fragile，very light，and easily packed Courtesy of Messrs．Beall

Picnic Luncheons．The same type of fare can be taken for the fanily lunclieon on the beach．or when 1 laskberrying some distance from home，if the sandwiches have more substantial fillings or home－nade Cornish pasties，veal and ham pie or patties（these last are convenient because they do not necessitate knives and forks）are added to the menu．Anchovy or any other sa voury hard－ boiled egg dish and individual salads packed in cardboard cases with a box of amall gruyère or other cheeses to be eaten with buttered bread．rolls，or biscuits are also simple to prepare．Home－made potato and onion salad with ham and tongue or beef sandwiches make a favourite meat course．Creams and jellies may be taken in their moulda Tomatoes and soft fruit can be carried in punnets． Jaspberries or strawberries should be well covered with cabbage leaves and placel so that they will not be crushed in transit．

When a picnic is given with a view to entertaining gueats in an informal manner．

a slightly more elaboiate equipnient and menu may be required and prepared. Where practical, it is a good plan for the hostess to name in the invitations an hour when she will ring up the various guests to contime arrangements. This obviates the had weather uncertainty. Often if all preparations for food have bcen made and the ensuing day proves wet, the party can be given in the house, and the guests will enjoy a helpyourself cold luncheon almost as much as the proposed pienic. A good menu would be either anchovy eggs or prawns in aspic, chicken and ham (in portions), or veal and ham pie or chicken sandwiches, salad, fruit-jelly and cheese biscuit sandwiches or cheese straws and a variety of small genoese pastries. If fruit salad is taken it may be packed in a container with a screw lid, and cream is better whipped before starting, and taken in a glass jar with a screw top. Mayonnaise dressing for the salad can be packed in the same way: Coffee may be carried in a vacuum flask either hot or iced. A jar of pickles may be added and condiments must not be forgotten.

For a grown-up party a cocktail is sometimes necded. This is best carried in a shaker containing a vacuum for freezing mixture. A pleasant non-alcoholic drink to vary lemonade is jinger ale punch, made from 3 oranges, 3 lemons, 2 grape fruit, 1 pint ginger ale, 4 oz. castor sugar and 1 pint water. The juice is squeezed from the fruit and the ginger ale, water and sugar added and allowed to stand. Some prople take a large jug, squeezer and ingredients and make this punch on the spot Menus for picnic suppers are exactly the same as for luncheons. For moonlight parties hot soup and hot coffee are generally appreciated.


Fir. 4. Inespensive accessories in aluminium
include a billy-can and rlass-lined jars and foodinclude a billy-can and rlass-lined jars and loodcarrier with screw lids

Picnic Accessqries. A 'The soufflé dishes to hold individual portions ground-sheet of mackintosh of creams or jellies (these may be poured in hot covered with a rug makes and left to set), the spoons and straws, cardgood seating accommodation for children. A fcw cushions can be carried if the picnic is by car and add to the comfort, while a folding table and chairs which stow away into a suitcase are other useful pieces of equipment. Pienic bags for holding vacuum flasks upright and cases of picnic ware in place of the more old-fashioned board tumblers, salad trays, neat and cheese plates also shown are convenient items, none of which cost more than 8 d . a dozen. The willow pattern papier mâché plates seen in Fig. 3 are a change from white ones. Picnic Hasks and jars, wicker-covered with screw stoppers, are very inexpensive, while cane spoons, knives and forks cost a few pence the set. Checkered paper cloths and napkins provide a pleasing note of colour.
Aluminium accersories include those shown

Picnic. Fir. 2. A jug-shaped vacuum Hask is convenient for hot coflee. Cardboard plates covered with wared paper, salad trays, and cases to hold boticial portions of jelly are useiul items. Fir. 3. Wicker-encasad bottie and jar, cane spoon, fork and knife set, willow-pattern plates a
baskets are made to suit all reyuirements. embroidery cotton or in silk.
The case illustrated in Fig. 1 contains a One effective type of picot edging is shown complete outfit for luncheon and tea for in Fig. 1. It consists of a series of small four people, and is very light in weight. loops of embroidery thread, between each The plates, tumblers and cups are of non- two loops a simple oversewing or buttonhole fragile ware in brilliant colours, and food. stitch being made in the material, to ensure containers, flasks, spoons and knives are all that if one loop is accidentally dragged, it packed into a conveniently small space will not pucker up the rest of the loops. 'lumblers in the same ware are obtainable in a Although this cdging is easy to work, care has separate leather case, and plates. cups and to be taken to make the loops of an even length, saucers may also be purchased singly as otherwise the effect will be spoiled. It should required. A useful accessory is a combined also be noted that the edge to be trimmed must corkscrew and stopper opener.

Tea if carried in vacuum flasks should have milk and sugar packed separately. An excellent ideat invented for use with a thermos flask is a tea-infuser. This simple but ingenious device provides a method for brewing tea when required. The flask is filled with hoiling water, tightly corked until tea is wanted. when the requisite number of spoonfuls are placed in the infuser, which is provided with a hook for attachment to the rim. When put into the flask the beverage is quickly ready to serve freshly mede. Should ice cream le a part of the menu, a general-purpose thermos jar is obtainable with wide opening to permit easy filling, emptying and cleaning. Separate containers can be stowed inside such a jar when it is wished to take several iced or hot dishes, the food being retained hot or cold for several hours. Another method for providing ice cream at a picnic is to take a half-minute freezer (see page 488).

The vacuum jug shown in Fig. 2 is particularly useful for carrying hot coffee


Picot. Fig. 1, How to make an ornamental looped edge. Fig. 2. Buttonholed picot used in openwork embroidery Fig. 3. Substitute for picot formed by a cut line of hem-stitching
first be neatly faced in or hemmed. Com. mence at the left-hand end of the edge by pushing the needle through the material from the back to front. Carry the needle a little farther along towards the right, and ngain push it through the edge in the same way, and draw through the cotton or silk until a loop of the size desired is made ; then make a tiny buttonhole stitch in the material inmediately to the right of the loop. Continue in this way along the edge, and fasten off on the wrong sidc.

Another type of picot is shown in Fig. 2. 'This is a buttonholed picot, and is much used in Richelieu work to decorate the many buttonholed hass or strands which form the open-work part of thís embroidery. A trimming for collars, cuffs, or house linen can be made by buttonholing the material cdge and working these picots at frequent intervals. The edge that is to be decorated in this way need not be proviously neatened, hecause the buttonholing will itself make it quite neat.

Commence by buttonholing along the edge of the material, beginning at the right-hand end; then when the position at which the first picot is to be made is reached, work 3 more buttonhole stitches. Carry the needle back to the right, and slip it through the head of the first of these 3 stitches, and draw through to leave a tiny loop of the cotton or silk. Buttonhole stitch along this loop in the same way as a loop is made for fastening purposes, and when the left-hand side of the loop is reacherl, procced to buttonhole the edge ns before, until ready to make the next loop.

If desired, the loop can be made thicker by earrying the needle back to the left side before buttonholing it, slipping it through the
last stitch, and then carrying it back to the right-hand side, as before. In this way there will be 3 strands of cotton in the loop over which to buttonhole. If the loops are set fairly closely together, the edging is a pretty finish for table mats.
Imitation picot edging is formed of $\Omega$ line of hemstitching which is worked by machine, and afterwards has the outer coril cut away, to leave the out bars of the hemstitching forming a serics of cut ends, as in Fig. 3. To obtain this picot, simply run a coloured tacking along the edge that is to be trimmed, anci take the fabric to $n$ sewing-machine shop to be hemstitehed along this ine: then cut the outer cord of the hemstitching away. With this edging there is no nced to hem or face in the edige of the material.

There are many other picot edgings. length of crochet chain, for instance, sewn along the edge of a tray cloth or runner in a series of loops is very effective, or it may be worked directly on to an open-meshed material, passing the crochet-hook through the edge after each loop of chain is made, and making it secure by means of $\pi$ double crochet. Picots in crochet arc chiefly used to form a background or filling for Irish crochet and to make a picot edge on narrow edgings and Inces. See Crochet ; Embroidery ; Richelieu Work.

PICOTEE. This old type of border carnation has a narrow band of colour at the edges of the petals. There are two types of picotecs, the white ground and yellow ground, the edge being of various coloursrose, red, purple, or scarlet. Picotecs need the same cultivation as border carnations.

## Pictures and Picture Frames <br> How to Hang and Frame Prints and Paintings

This article is one of those that deal with decorative accessories for the home; others being Curtain: Mirror; Rug. See also Cornice: Drawing Room; Living.Room; Panelling; Passe Parlout: Queen Anne Style; Vic:orinn Style

A picture is onc of two things, either sinuply a decoration upon the wall, or else the illusion of a landscape or figure subject seen through a hole in the wall Frames for the first type of pictures should be nieraly borders or part of the whole acheme of the picture: for the second type they should linve some solidity or depth which gives them power to divide the pictures front their surroundings
The earliest frames were architectural in design Most pictures being painted for churches, altarpiece frames were in the asmo character as the arches of Gothic huildinga. The Italian frames of the Renaissance period were made exactly like doorways and windows enclosing painted portraits and clnssical figures with an illusion of reality. The frames had the same upright columns, lintels, sloping hase lines and pediments of the windows and doors of the period.

With the introduction of landscape painting pictures became popular and enclosure for protection was necesaary. Metal frames finely decorated with leaves and festoons were produced in France Gilded and carved wood and geaso decoration followed, and many beautiful frames were designed in England. At the beginning of the nineteenth century it became the fashion to frame everything from a miniaturc to a huge landscape in gilt frames to match, irrespective of style of picture. Later in the century the walls of living. rooms were completely covered with pictures, the gilded frames of which were usually of more importance than the paintings.

To-day framing varies from the strip mouldings, cut in lengths and mitred at the corners to the specially designed carved frames taking into consideration light and shade effects and period of pictures. The art of framing and hanging pictures is governed by three things -place, picture and period. With regard to
place, there should he general ngreement with surroundinga. In modern ronnis a fow prints and pictures of the decorative typo look well when framed or re-frumed to suit the furnishing schemes relected. Flat frames of harmonious colour are the hest choice. Old f́mies do not mix happily with inodern ornamental nccessorics.
lictures of the recond type of interest, historical, port raite, landscapes or figure pieces, nust be considered on their own claims. Sometimes they are too heavy for the living. roons, hut may look well in the hall or on the staircase. Oil paintings require well recessed and not flat frames. Carving is added so that light and shade shall play on the surface of the frame. In this atyle of picture such framing does not detract from the interest, but adds to it. 'The frames should alan possers such fentures in their designs as connect them with the school to which the painting belongs in style and period These features may be studied at big picture galleries with representative collections. Another intereating thing to note is that inould. ings and ormaments will correspond with those in use on furniture, etc., of the period and the influence of Chippendale, Robert Adanı, and other grent designers can be scen.
Generally speaking. a better effect is gained by hanging pictures, with the exception of one over the mantelshelf, at the eame level all round than by arranging them at different levels. An example of such good placing is seen in the illustration of a living-room in page 734, Fig. 4. On panclled walla such as are there shown, any haphazard hanging or mixture of frames would spoil the decorative scheme of the roon. The tendency is to hang them too high; the lower edge of the picture itself, not of the frame, should in most eases be on the eye-level of the beholder when
standing. By inclining the frames slightly forward the reflection of the glass is avoideal and also the ascumulation of duat
Care of Pictures. Old frames should never be regilded without discrimination, especially as much modern gilding is far from being durable. The brass hooks uscd on picture rails tend to disintegrate where gna is used, and may cause pictures to fall. Heavy frames should be supported by three vertical wires or chains, hecause this minimizes the risk attending the slipping of one of them. When the glass is being cleaned pads may be placed behind the upper edge of the frame, to keep the pioture rigid; otherwise the supports may become dislodged. Fly-marka may be removed by a damp cloth or brush, the spot being dried immeliately after. Nildew will usually hrush off. If for any reason a canvas is unglazed, it may be kept in condition by means of a dry feather and a silk handkerchief

The task of cleaning or restoring pictures is best entrusted to an experienced person. If they arc antique canvases, covered with the grime of generations, they mny without much risk be sponged over with warm water. Soap should not be applied without experience, and acid and alkaline fluids are risky. The darkened condition of inany pictures is due pither to the cxcessive use by the artist of siccatives, or to the action of time. Such pictures cannot be properly renovated, and when they are retouched or repainted the monlern pigments may not age in the same way as the original ones, so that the picture conies to look pratchy and unplensing. Sometimes thic original can vas has been so weakened that it nerds rebacking. All these vicissitudes demand nuch skill in their treatnient.
Hanging Pictures. Pictures should be suitably framed and liung against a barkground that will enhance their beauty. A picture rail is a convenience where large pictures are to be placed, except in a panelled or period roon, when, unless the pictures can be themselves trented es panels, they must be placed with great discretion and hung so that neither wires nor supports show.
It is not a difficult matter to fix a picture rail. The succeeding article on this subject should be referred to. Brass hooks for the picture rail can be obtained with a stamped decoration (Fig. 1), or plain.
The beat way of hanging pictures on walla not providel with rail or rods is by means of onc of the picture suspenders which can be obtained from the ironmonger. That shown in Fig. 2 is attached with long fine steel pins driven into the wall at a slight inclination, and will hold a picture up to 50 lb . in weight. Another form of hook shown in Fig. 3 is fixed with a single pin, and is made in sizes to hold weights of $30,40,70$, and 100 lb ; the method of fixing is shown on the right. These pins are intended for plaster walls; for brick-faced wills the beat method is to use an ordinary stout brasshended nail, but the wall should be plugged first. This may be done by using n manall cold chisel and then filling the hole with a wooden peg, or by the fibre plug method.
Ordinary cord is convenient for hanging small pictures, but it is not advised for heavy ones. Stranded picture wire is much more


Pictnre Hanging. Fig. 1. Brass hook for picture rail. Fig. 2. Banger for wall with no rall. Fip. 3. Hanger fred ithasingle steel pin. Fi
Brass dicture cbaln
suitable for general use. Brass picture chain as shown in Fig. 4 is known as patent chain, but ordinary brass jack chain with plain round double links can be used. Stout brass screw eyes should be fastened in the back of the frame about half-way down the width of the top piece. Pictures that require a tilt ahould have the screw eyes about a quarter of the way down the sides of the frame.

In hanging a picture, sufficient wire or chain should be provided to support it at the approximate height ; the final adjustment is made by shortening or lengthening the wire at one of the screw eyes at the back of the frame. Although a single length of wire attached to two screw eyes and supported on one hook will be sufficient for pictures of ordinary size, it will be necessary to use two separate lengths for heavy oil paintings or large engravings. Stout screw eyes should be driven in the frame, and the chain carried vertically to nails or hooks on the rail.

Picture Framing. Although the maiority of picture frames are put together with the mitre joint, one which is usually regarded as troublesome to deal with, there is nothing specially difficult about it if proper tools are used. A fine backsaw is the first requirement. It is almost useless to attempt to use a coarse one, as it is sure to splinter out the grain, and will probably ruin the mitre block on which the mitres are cut. The mitre block is a device for cutting mitres accurately without elaborate marking out. The important point about it is that on no account must the saw be forced in it. It is purely a guide for the saw, so that the latter must run frecly in it.
A useful appliance, though it is not an absolute necessity, is a mitre cramp. This holds the parts of the joint firmly together whilst the nails are being driven in. A hammer and punch are also needed. The Warrington type hammer is the most convenient, but practically any kind of carpenter's hammer can be used.

Materlals. It is usual to buy picture frame moulding ready made, as it is so cheap and cleanly finished that it does not pay to attempt to make it. All sorts of patterns are obtainable. Some are in plain wood, oak or some other hardwood, and may be just moulded or te partly embellished with an embossed design. The latter type looks attractive, but calls for extra care in mitreing because the pattern must be balanced.

Another type of moulding has a highly polished surface of composition. Here, again, care is needed in order to avoid chipping. A
Fig. 1
Rebate
third kind of moulding is gilt. This usually has a fine, smooth finish and
gives a different effect from those frames in which gold paint is applied after the frame has been put together. All picture mouldings have one point in common in that they liave a rebate at the back in which to accommodate the picture and glass.

Other materials include cheap thin wood backing. Practically any thin wood can be used. Plywood is excellent for the purpose.


A good quality glass should be used, one of a good clear transparency, which will not give the picture a distorted appearance due to inequalities in thickness. Some brown paper to back the whole, screw eycs to hold the cord. and a few picture sprigs are the only other requirements.

As the picture has to fit in the rebate of the moulding, the size of the frame must be based on the rebate size. Fig. 1 is a section through a pictur moulding and shows the rebate clearly. As a practical example, assume that a picture measuring 10 in . by 7 in . has to be framed. Whilst the rebate size is all-important it is necessary to ascertain the overali size because, when the moulding is placed on the mitre block, the back edge touches the kerf in the block. This back edge necessarily represents the overall size.

Fig. 2 shows how the calculation is made. The moulding should be measured on the under side from the rebato to the back edge, not the complete width. In this case it measures 1 in . Consequently, the overall length is 10 in . (the picture length) plus 1 in . at each end (the moulding), giving a total measurement of 12 in . To this it is advisable to add, say, it in. to allow clearance for the picture. Similarly, the height bocomes 9 in. full. The rebate causes a margin of the picture to be hidden all round. If this is to be avoided the picture must be stuck on to a slightly larger sheet of paper so that only the projecting part of the paper is hidden.

Cutting the Mitres. Place a piece of moulding on the mitre block and, holding it firmly against the back, cut one mitre as shown in Fig. 3. Notice that back of the moulding touches the kerfs in the mitre block, not the rebate side. The reason for this is that the saw is not so liable to split out the grain as would be the case if the
moulding were reversed If cut carefully no trimming is necessary.

From the point of the mitre mark the overall length along the back of the moulding. Place it again on the mitre block with the mark slightly to one side of the kerf in the block. In this way the mark is just left in when the second mitre is cut. If this were not done the frame would te a trifle under size.

Proceed similarly with the opposite side. but take the length from the piece already cut, this is because the opposite pieces must be exactly the aaine length When the two remaining sides have been cut the four pieces can be tried together on a flat board. Somc workers prefer to trim the mitres on a nitre shooting hoard, but this should not be nccessary if the work has been done carefully.

Assembling the Frame. There are various ways of doing this. Those who have a mitre cramp will find this a qreat advantage. The mitres of two adjacent pieces are glued and placed quickly in the cramp. When the members of the moukling coincide exactly the tightening screws are turned, and two nails are driven in, one in each direction Fig. 4 shows the r.rocedure. In the case of extra tough wool it is $\Omega$ good plan to first drill fine holes.

Next the two opposite pieces are put together in the same way, so that the work at this stage is in the form of two letters L. The moulding can be taken out of the cramp immediately after the
in and punched honc. nails have been driven in and punched honc.
It is now merely a matter of joining together the two parts, and this is done in exactly the same way.
If a mitre cramp is not available the bench vice can be used to hold the one fiece whilat the nails are being knocked in. In this case it is essential to drill a hole in the upper piece and drive in a nail so that it just projects at the mitre. Otherwise the blows of the hammer simply cause the upper piece to slip, down. In any case a small amount of slipping is to be expected, and for this reason it is necessary to placethe upper piece a trifle lugh, as shown in Fig. 5. The hammering soon brings it to the correct position. Fig. 6 shows the work in the vice.
A point always to be remembered is that nearly all picture mouldings are


Fig. 5. Upper plooe of moulding is placed slighty high to coanteract downward alip thinner to. wards the rebato. Consequently the nails must be so placed that they go into solid wood. Nothing looks worse than for a nail to emerge at the surface of the moulding. If this should happen the nail should be tapped back and withdrawn, and another nail driven into a more solid part of the moulding.

When assembling the snitres in the vice the left hand should alwavs hold the upper picce
ol mouldingapartly to steady it and partly to prevent it from turning on the nail. It may be found g.fter all four sides have been put together that the frame "winds" slightly, that is, the four pieces are not in a true plane. 'This is easily ascertained by laying the frame on aflat hoard If it is not true.


Picture Frame. the two diagonally opposite corners will stand To hold it in position a few picture sprigs are up a trific. This is casily corrected by placing the frame face downwards and tapping the corners lightly with the hanmmer, care being taken not to break the joints.

A third method of putting together a frame is shown in Fig. 7 It has the advantage that no nails are driven in until after the glue has set There is thus no danger of the joints


Picture Frame. Fig. 8. Back ol picture, showing sprigs and paper backing
slipping. All the mitres are glued and the four parts are laid in position on a flat board. To squeeze out any surplus glue the parts of ench mitre should be rubbed together. A piece of strong string is then tied around the whole, thus binding the sides together. T'o force the joints tightly together eight small pieces of wood are cut out, and two are passed between the string and the moulding at each side near the centre. By sliding the pieces towards the corncrs the string is tightened. At least twelve hours must elapse before the string can be taken off and the nails driven in.
No matter which method of assembling is adopted, it is important that any surplus glue is cleaned of before it hardens. It is difficult to remove hard gluc cleanly, and it looks most unsightly in a joint. If the glue is used carefully and sparingly it will not be squeezed out on the surface of the moulding. If it should ooze out it can be wiped off with a swab damped with hot water.
Putting in the Glass. If the worker has a glass cutter he can easily cut his own glass.


Probably the majority, however, will prefer to take the frame to a glazicr, who will cut a piece of glass to size After the glass has been thoroughly cleaned and polished it should be laid in the rebate, care being taken not to finger-mark theinner side. The picture is laid over this and a piece of backing prepared. If thin wood is not available a piece of stout cardboard can be substituted. It should be of such a thickness that the back is level with the back of the frame.
driven in all round as shown in Fir 8 These are headless and can be tapped down so that they scarcely project. A piece of brown paper is pasted down over the whole. This gives a neat finish and excludes all dust Small screw cyes can be put in at the sides to hold the cord.
To hide the nail holes plastic wood or was should be pressed in. If the latter is used it should be heated and dropped in from a pointed match stick. When it has cooled it can be levelled down with glass paper. If the frame is to be stainel or painted this should be done before the glass and picture are inserted.
PICTURE RAIL. As a rule the wooden moulding or rail incorporated into a wall surface to support pictures and other omaments should be at a height equal to the architraves on the door, but space may require this to be raised or lowered. Several typical sections are illustrated.

In new work the picture rails are generally fixed to rough grounds embedded in the plaster, oval brads being used which are punched helow the surface, the holes being made good with putty or hard stopping. In a room devoid of a rail the picture rail inay be fixed by the use of wall plugs and screws, the holes for the latter being carefully stopped

Occasionally the picture rail may have to be cut and removed to permit a wardrobe or other article of furniture to stand Hat against the wall. This is accomplished by sawing the moulding across with a fine-toothed tenon saw, placing a piece of card above and below the moulding so that the saw will not damage the plaster. To repair such a moulding will require a new piece of the same section, which is cut to fit between the existing ends of the picture rail and painted or stained to match the existing work.

Metal picture hangers are used which are curved in such a way that they fit sccurely over the edge of the moulding, thus doing anay with the necessity for nails, and allowing the position of the pictures to be changed at will, without any disfigurement of the walls.

PIE. In some parts of the country the words pie and tart are interchangeable, but usually there is a distinction het ween them, a tart being open and baked in a shallow tin, while a pie, with few exceptions, is deeper and has a covering of pastry. See Apple Pie; Fish; Game; Pastry, etc.

PIECRUST : On Furniture. In furniture design this term is used for a certain kind of edging sometimes found on small tables. It is waved or scalloped and is raised above the flat centre because the latter has


Picture Rail. Fig. 1. Typical examples of simple picture rail mouldings shown in section
been worked down with the tool. It is chietly scen on mahogany tables of the time of Chippendale style.

PIER : In Building. As used in domestic building construction a pier is a stone or brick pillar, or a projection built out from the face of $n$ wall to strengthen it or to carry any excess of local weight. A small portable building is often arranged to rest on a number of low brick piers. Timber plates are

supported by the piers, and the Hour of the to build the four corner piers first and then building rests on these plates (see Garage). level them, if necessary laying one or two The piers will be proportioned to the size and weight of the building, but for most erections in connaxion with the home the piers will suffice if built in 9 in . brickwark

The first step is to excavate the soil until a sufficiently firm bottom is reached; a bed of concrete about 18 in square and 6 in. to 9 in . thick should be laid at the bottom and as soon as the concrete is set the brick piens can be crected upon it. The simplest plan is level them, if necessary laying one or two
courses of tilcs, but getting the heights uniform The intermediate piers may then be built. levelling them by stretching a line tightly between the corner piers and resting upon the tops. The remaining piers can then be built up, and the line will serve to keep, them uniform both as regards direction and height. After the mortar has set hard the timbers may be bedded on the top of the piors and the building completed. See Bric:k; House.

## Piercing in Metal Work

## Directions About a Graceful Form of Ornamentation

Th.is contribution is one of those dealing with the decorative working of metals. See also Bent
Iron Work: Meral W'ork; Napkin Ring; Repousse
For the $h$ me craftaman, pierced metal carbon paper and is transferred to the metal work offers a very attractive occupation. and many of the articles which the amateur metal worker producos can be ornamented by piercing. It does not cost a great deal for the apparatus, neither does it require a work bench. the only real essentials being a good, firm table and a stendy light. The tonls are few and inexpensive, the most important being a metal.


Piercing. Fir. 1. Design 10 pierced metal napkin ring laid fiat. and ghowink the measurements of the piece of metal necessary for the work
piercing salw, a work tahle known as a sawing table, and a cramp to affix it to the table.

The table can be made from a piece of 1 in. deal with a $V$-shaped piece cut from the front part. This open portion is th allow the saw to move while the jaws or side pieces support the meta!. The width and shape of the opening can be modified to suit the work in hand. The material used for pierced metal work is thin shect metal, either brass, copper, zinc, or pewter, and genernlly No. 24 gauge. The thickeat metal that can be cut by hand is a bout No. 16 in copper or brass.

As a task for the beginner the napkin ring shown in Fig. 2 can be cut in copper, brass, or pewter, about No. 20 gauge in thickness. It is a 1)-shaped ring ornamented with a monogram The
file or cleared away unless this is done projertion catching sawing table and breaking the salw blade. It will save trouble to make all the holes at the start. so that the sawing can continue with. out interruption.
The piercing-saw is clearly shown in Fig. 4. The saw clamp nearest the handie is fixed to the latter, and the one at the end of the frame is free to slide in and out of a square hole in the frame. This clamp is adjustable by means of a smal thumb nut ; its pur. pose is to tighten the blade when it has been fixed in the clamps.
The effective length of the frame can be altered by sliding the back of the frame in or out after loosen ing the locking serew. To fix a saw blade in the frame, first see that the teeth are pointing downward. that is, towards the wooden handle. For exterior work, fasten the raw into the top clamp, then press the
end of the frame against the edge of the table, thus cansing the frame to spring a little; keep the frame in this position and fix the blade in to the lower clamp. and screw the thumb nut tightly. The spring of the frame will tighten the blade, and further pressure can be brought on it by tightening the thumb nut at the end of the frame, thins drawing the clamp and the saw very tight. When the saw is twanged like a harp string, it should give out a decided musical note. It is very important that the blade be tight, or it will not cut properly and will specdily break

On internal work the saw has to be passed through the hole in the metal, as shown in Fig. 3 when it can be tightened as described, although some workers prefer to fasten and unfasten the top clamp, as then the work can rest on the left hand while the right is employed in clamping the blade

The next stage in the work is to fasten the saw tahle to the work bench with screws or with the clamp, and rest the work on the top, of the saw table with the part to be pierced over the hole therein, and with the edge of the part to be cut as near to the sides of the table as is possible. Then with the left hand hold the metal lirmly to the table, and with the right conimence the sniving.

The whole of the cutting is done on the down stroke, and on the up stmke the saw blade should pass as easily through the saw cut as possible. Keep the saw perfcctly upright. ns in Fig. 4, and make about 2 strokes per second. Maintain this rate of progress, and continue the cutting steadily with an even pressure throughout the whole of the time the blade is at work When the blade is working on a straight line there is not so much risk of it breaking; when cutting curved parts the blade must be kept going steadily all the while, as if it is twisted in the hole it will be almost certain to break. Should the blada show the slightest tendency to stick, it can be lubricated with $a$ little oil or tallow.

When the first hole has been cut the others can be dealt with in the same way. The
expanded design is ${ }^{\mathrm{givec}}$ Fig in leading dimensions being indicated. In cutting the desired monograin it is essential that the letters be

Fif. 2. Napkin ring, tue making of which is described here

formed by removing the metal around them, and that they have sufficient support from the framework The articles on Initial, Lettering, and Monogram will form a guide in making the design.

A full-size design should be prepared on thin paper, and the sheet of metal is cut with a pair of tinman's snips to a rectangular shape with overall dimensions a little larger than the design. The metal is then flattened and cleaned up on the surface with fine emery paper. The design is placed over a piece of
going over it with a blunt pencil.
The next step is to cut the nutside of the metal to shape, doing this with a pair of snips or sawing it with the piercing saw if the outline is at all intricate. A pair of cutting snipa with bent jaws would be a useful addition to the tool kit, and is employed for cutting curved outlines. A small hole must be made through the metal just inside one of the lines that define the outline of one of the larger holes. This may be done either with a small drill in a handdrilling machine, or, in the case of thin materials, with an awl. The rough enges of the metal on the under side of the hole should be filed flat with the end of a small with a countersink, as there is a risk of a on the surface of the spoiling the cut or


Fig. 3. Threading the gaw for Internal work. Fig. 4. How the saw and work Cable are used. Fir. 5. Filing the edges true with a jowelier's needie file Fig. 6. Shaplng the ring on a wooden block, after which the joint is brazed or silver soldered, and the ring finished by polishịng. plating, or lacquering
saws are made in various grades, or numbers of tecth to the inch, and as $n$ general guide it oan be taken that the harder the metal the greater the number of teeth per inch will be needed
After the pattern has been cut out in this way, the edges may be a little rough, and it will be advisable to clean them up with fine fics The work can be held in the hand, as in Fig 5 , or the metal can be grasped in the vice between two pieces of hoard. When filing, watch the progress carefully, as a few careless al rokes with a file will destroy the appearance of the whole design. The metal is fashioned to the desired curvature by bending it over a shaped worren block with the hands, finishing hy gentle hammering with a repoussé or other llat-faced hammer, as in Fig. 6. The joint is afterwaids brazed or silver soldered, and the work is then cleaned up. Finally it is polished, laequered, or plated, whichever is found to be most suitable to it.

PIER GLASS. Strictly speaking a pier glasy is a mirror of such shape and size that it can be fixed between two windows, the name bring due to the fact that the word pier in one of jts senses means the wall space between two openings. l'ier glasses were seen in the great houses of the 18th century, and often pier tables were made to match them. Their principal features were their size and the richness and elaboration of their carving and gilding. The phrase, however, is now used somewhat loosely for a looking-glass suitable for the dining room, drawing room, or one of the other irception rooms of the housc. See Cheval Glass: Dressing Table; Mirmer

PIERIS. This is an evergreen llowering shrub belonging to the heather family. It liears panicles of white blooms in the spring


Pieris, a bardy evergreen shrub with beather-like flowers in apring and early summer
and early summer months. It likes peaty soil, but will flourish in lonmy soil which is free from lime. Planting should be done in September or in April-May. The hardiest kinds are floribunda and japonica, which grow 3-4 ft. high and Hower in April-May. A more vigorous and less hardy kind is Pieris formosa, which is chiefly suitable for planting in mild districts Little pruning is needed, but the shrubs should be clipped lightly when the period of llowering is over. Propagation is by sceds and layers

PIER TABLE. This is one of the several forms of the occasional or side table. The name was first given to a table designed to stand against a wall between windows, the reason heing that the wall space there is sometimes called a pier. Seen in the inore affluent houses of the 18th century, many of them had marble tops and were designed in the Louia style, although they were


Pier Table. Antique example veneered with satinwood and other woods. English, about $1770-80$ R"l special permiasion of the Director, Victoria
a pier table is a light table, the marble top having given way to a wooden one, made to stand at the side of a room. Its usual form is a reproduction of the antique example illustrated See Table
PIETRA-DURA.
This is a form of Italian inlaid work in which marbles, agates, or other liard atones are inlaid in wood or inarble and known as pietra-dura Used in the decoration of隹 glass benesth which they were placed. To-day proper, which is embedded in cement.

## Pigs and Pigkeeping

## The Feeding and Housing of These Profitable Animals

Country readers, in addition to this contribulion, may consult with advantage such articles
as Duck: Goat; Poultry. Sec also Bacon; Ham; Pork
It is essential that before entering upon same time. Water should be added, or prepig keeping persons ahall make themselves ferably a little skim milk, to give the whole acquainted with the regulations of the local the consistency of gruel A newly weaned sanitary authority These vary from place pig will usually require about 2 lb of food to place, being more stringent in urban arens per day, irrespective of added water, and, in than in rural ones.

Making a Start. When this matter has been atisfactorily settled, the next point to consider is the type of pig that should be kept Before making a choice the pig keeper should decide whether he intends to breed from it or to keep it as a store or a fat pig; in the latter cise he should decide whether he intends to convert it into pork or bacon. Whichever his intention may de, he is advised to select the breed or type of pig that is most popular in his district for the purpose for which he requires it Whatever breed or cross is selected. it is advisable to choose the offspring of a well-bred dam of good conformation. It is also important that the sire should be purebred and that the sire and dam should not be too closely related.

It is advisable to start pig lieeping with a newly weaned pig, about eight weeks old, care being taken to secure as good a specimen as possible. An extra shilling or two spent on a good pig will be amply repaid. At the same time, the buyer should not devote too much attention to fancy points. Above all. he must have an animal with a vigorous constitution ; a greedy, lusty fellow, active on his legs, lengthy and round in shape, with a clean and plinble akin, covered with a fine coat of soft, glossy hair.

Feeding the Pig. For several weeks after weaning the pig should receive its fool in $n$ moderately sloppy condition, slightly warm if the weather is cold. The food should be easily digeatible and may consist of potatoce, turnips, and other vegetables, together with table scraps and grease from the kitchen and a little middlings or sharps. The roots and vegetable matter should be boiled together and afterwards well mashed nnd mixed, the mea! being incorporated at the


Pig. Berksbire plg, a proftable breed, producing fine hams


Sow of the Middle White breed, a prolific variety that matures early
objects to black porkers."

If carefully fed from the start a pig should weigh from 170 lb to $180^{\circ}$ ib live weight when about 5 or 6 months old. It is then reanly for killing. The dressed carcasa should then weigh from 130 lb to 140 lb . The nmount of food re. quired at this stage will be from 5 lb to 6 lb of meals or their equivalent each day If kept alive beyond this stage the rute of increase gradually slackens, while the amount of food neces-
could well be spared for this highly nutritious forage plant. Rape, vetches, and rye supply highly nutritious green food at times when such material is scarce. For the supply of the necessary succulent food in the dead of winter recoursc must be had to potatoes, furnips, mangolds, sugar heet, artichokes, paranips, etc. Of these, potatoes and sugar beet are the most valuable, 4 lb . of each being considered equiva. lent to 1 lb . of cereal meal.

For the first month or two the pig should be allowed a moderate amount of exercise. An occasional run outside its sty will tend to promote a healthy uppetite and will also encourage growth. When the pig reaches about 100 lh . in live weight this should be curtailed, and feeding should be rather more forced. Wheat offals, accompanied by a little rice meal, maize meal, or harley meal. may be given more frecly, and the supply of the more bulky vegetaile food should be reduced.

The pigkeeper should note that the method of iceding pigs is most important, if the best quality meat is to be obtained In a good carcass the flesh should be solid, of uniform consistency, and fine texture evenly streaked with fat and lean, of a bright fresh colour, and not watery. The fat should be firm and white and remain hard at ordinary temperatures, while a thin, smooth and mellowskin is desirable.
'lo obtain the above qualities a proper food ration is necessary; anyone situated near milk. butter and cheese factories, who can obtain the waste by-products and use them with meal, has the ideal ration for producing good quality pork and bacon. An unbalanced ration consisting chiefly of oily foods, with maize and rice meal, produces dark coarse Hesh and soft spongy fat. A suitable carcasa for the fresh pork trade has the following characteristics:
Head, Inght and medlum size. Shouldera light and tine Back, frim and level; ribs well sprung. Helly, straight underline, nicely lined with Hair. llanis, plump, deep and well let down. Flank. thick and at reaky. Bone, Hoc

The Ministry of Agriculture give the following conformation which the Wiltshire bacon trade requires:

Buck, long and level, with ribs well sprung. sides, level and inoderately dee $\mu$ Hams, hroad. WIde, and deep to hock; tail set high Belly and lank, thick w/th straight underilne. Shoulders, light, and on a line with forelegg below, and with wides laterally, free from wrinklea and coarscness. Flank, alined with the gides. Head, neck and jowl ight. Legs, aliort and set apart ; the pip alould tand well up on the tips of the toes. Bone, fine
The pork section of the National Federation of Meat 'raders' Associations states, in sumInarising points to be borne in mind by pig hreeders, that "Iarge and middle white and Welsh breeds, or pigs produced by crossing large black or Berkshire sows with these breeds, are suitable for the pork market. The loar should not be black, as the trade stronglv
sary to produce each additional lb. of pig becomes greater. Fat bacon and fat pork, however, are more useful as food than are their lean equiralenta, especially in winter, and the person who only fattens one pig for his own use will be well advised to keep this factor in mind He may prefer to feed his pigs to a heavier weight than 180 ll . In the absence of straw, dried bracken, grass and leaves make a thoroughly satis factory bedding for pigs Every effort should be made to provide an abund ant supply, especially in cold weather, when the pig prefers to curl up in bed, and is content with the minimum of exercise When it is remembered that food is more expensive in winter than


Fig. 2. Pigsty shown below, giving details of door, brick floor, surrounding wall, etc
promotes the general health of the animals, prevents chills and rheumatiom, and minimizes the risk of discase.

The foundation must be dry and, if condi. tions permit, it should face south Access to a small paddock is a distinct advantage Openings in the wall and roof, through which the passage of air can be easily regulated, should oe provided in order that the temperature may be kept as even as possible throughout the year. A close, stuffy atmosphere destroys the appetite and is as harmiful as a cold sty. Provision for suitable lighting may be made either in the walls or in the roof

A simple type of sty is illustrated in Fig. 1, which indicates the general arrangement of the structure The total area occupied by the double structure is 15 ft . by 18 ft . The covered portion is 6 ft from front to back, leaving an open space of 9 sq. ft. for each enclosure. Details of the outer walls and door as well as the brick floor to the pen are shown in Fig. 2. Such an ercction provides accommodation for two sows and their litter In this case the sty is located in the angle of a wall and the roof plate resta on the wall of the adjoining building. The same lines of treatment may be followed if the pigheeper prefers to build an independent structure, when. of course, four walls will be needed.

The first step in construction is to mark out the ground with pegs and lines and excavate the top soil, digging a shallow trench, which is filled in with concrete and the top surface levelled off. The whole surfaceshould be covered with concrete at least 9 in. thick. A fall is preferably arranged to the front of the pen and an outlet provided to any convenient drain: that it takes more food in winter to produce in its absence $\Omega$ sump should be built a lb. of pork, the supreme importance of and drain pipes taken to a cesspool, or some comfort during the coldest season of the other sanitary arrangements made for dealing year is apparent.

Building a piggery The mun easention of a pigsty are comfortalle and clean condi- prefer sufficiently, the walls may be put up, of a pigsty are comfortahe and clean condi- preferably in 9 in work, hut in the case of
tions. A dry bed, combined with suit. sinall pens it may he possible to utilize $\frac{1}{d}$-brick able ventilation and the absence of draughts. thickness, that is, walls only $4 \frac{1}{2}$ in thick,


Pigsty. Fig. 1. An easily constructed pigsty in brickwork with a felt-covered timber roof. It is situated in the angle formed by two walls, and will provide accommodation for two sows and their littera
using strong cement mortar made of I part head in two, removing the bones Season it to

Portland cement and 2 parts sand The brickwork should be continued to plate height and the roof furnished with stout rafters or other roofing material.

The floor should be floated off with at least 1 in. thickness of strong cement mortar, unless it is finishod with regulation stable tiles. The surface should be brushed over with in stiff-bristled broom as soon as the cement is steady, or partly set, to roughen it, so that the pigs can maintain a sure footing on it. A stout wooden rail raised on posts 9 in . high and 9 in. from the wall will prevent the sow crushing the young ones when she lies down. The walls are rendered with cement and finished with limewash as desired. A strong door of substantial pattern must be provided for at some part of the pen, and is needed for the covered part or house as well. Provision should be made for light and air in the way of small windows, which can be merely openings, or else they may be partially closcd with wood shutters or with perforated inetal. Pigs must not be liept in such a manner that they constitute a nuisance, and in most places there are by-laws which must be complicd with by those who kcep them

Cooking Hints. When pickled, dried and cured, pig's check is known as bath chap, but it is also sold simnly pickied Bath chap needs to be soaked before being cooked, but pickled check usually requires a thorough washing. Both are cooked in the same way.

Pig's Feet There are various ways of cooking pig's feet, but broiling and frying are perhaps the best. 'To do this, wash two feet thoroughly, scraping the skin with a knife, then cut them in two and let them soak for about an hour in salted water. Wash them again in fresh water, tie them together and put then into a pan containing I pint water and $\downarrow$ gill vinegar which have been previously heated over the fire.
Boil up the whole, and after removing the scum from the top put in a small onion, a bunch of herbe, and salt to taste. Cover the pan and cook its contenta very slowly until they are tender, then take out the feet, hone them and season them to taste. 'Hev can be eaten hot or cold. If they are to be fried spread a little pork sausage ment over the cut sides of the flesh, and fit the pieces together again to form their original shape. Roll then lightly in Ilour, coat them with egg and breadcrumbs, and fry them in a pan of hot fat.
'To broil, cook and hone them, brush them over with melted butter, coat with breaulcrumbs, and cook over a clear tire. Apple sauce (q.v.) makes a good accompaniment
Pig's Head. The most usual method of cooking this is to steep it in a salt pickle comprising 1 lb . salt and $1 \frac{1}{2}$ or saltpetre and then to boil it, and serve it hot with cabbage or beans; or to boil it in a clotlo, press it between two weights, and serve cold'

For pickling, scald the head in boiling water for a few minutes, scraping off the hinirs with a knife, then cut it open and remove the brains, eyes, and snout Wash it thorough!y, leave it overnight in a pan of atrongly salted water, and then rinse it in fresh water. Rub it all over with the salt mixture and leave it thus for a bout 6 days, turning and basting it daily. Before boiling, wash the head again to remove the surplus brine, then put it into a pan containing just enough water to cover it. Boil this up, removing any scum from the top, and then cook the head slowly until it is tender. Serve it garnished with the cooked tongue, skinned and neatly sliced.
To prepare the cold dish boil up a salted pig's head in a pan containing sufficient warm water to covel it, take the scum from the top, and then let the whole simmer for about 2 hours. When tender, take it out of the pan to cool, skin and slice the tongue, and split the
head in two, removing the bones Season it to
taste, and on one half of the head place the slices of tongue putting the other half on top to form a sandwich. Tie the whole in a pud ding-cloth, cook it again for the same length of time as before, and then press it between two weights, leaving it to get cold. It should then be served thinly sliced

PIGEON. Anyonc wishing to keep pigeons should think carefully before securing stock The climate and the available accommodation must be considered. If one is living in a town many of the most beautiful and picturesque pigeons cannot he licpt. Birds such as FanTnils, Jacobins 'I'runipeters, Fairy Swallows, Muffed-legged Tumblers are sorrv-looking objects when they are forced to live in the atmosphere of an industrial district like Manchester or Leeds, but in the open country they will do well.

Birds of delicate-coloured plumage and markings are also unsuitable for town life Dragoons, Antwerps. Snow Homers, Carriers, Scandaroons, and English Owls thrive liest in the country. Of those which thrive in almost any climate may be mentioned dreh. angels, Tipplers, Flying Homers, Magpies. Nuns, Short and Long faced Tumb!ers. Borbs, 'Turbits, African Owls, Poutera, Pigniy Pouters, Norwich and Holle Croppers, lỉrummers, Swifts and Modenas. The best breeds for a beginner to choose from are the short, hardfeathered birds such as Archangels, Long faced Tumblers, Exhibition Flying Homers, Mag. pies, Nuns and Modenas.

Before deciding upon any particular breed the novice should visit one of the shows which are held in all parts of the country from September till Fehruary and select one which is the best adapted to the environment in which the birds will have to be kept.

Feeding the Birds. As to food, maple peas, tarea, dari and wheat in equal proportions make good feeding for the smaller breeds. The larger ones may be given beans, and amall maize in addition Green food in the form of lettuce, cabbage, or some of the succulent


Pigeon: lour breeds that are general lavourites. 1. The nun, an attractive loy pigeon. 2. Norwich cropper, a pouter pigeon. 3. Homer or homing

甘" courlestl of Piyeons and Plie Placon World
weeds found in the garden, chopped up tine and given in a bowl twice or thrice a week will be muchappreciatel. A handful of mixed small seeds and rice may be given ns a tit-bit once a week.

The hreeding scason extends Irom February till July. It is unwise to prolong it, as it interferes with the proper casting of the feathers in the moulting season. Unless a bind noults freely its health will be impairel.

Young pigeons are cared for by their parenta for the first month. After that the old birds leave them to themselves, and set about raising another family. A hen pigeon when she goes to nest lays her first egg at night. and the second about noon on the second day nfter. The period of incubation is 18 days

The Pigeon House. Before purchasing any birds a house in which to keep them is needed. The papers devoted to pigeons contain advertisements of many such. The majority of pigeon keepers use home mide erections. chiefly because they can adapt the house to its surroundings. The best form of building for the purpose is a strongly mule wooden whel built of 1 -in. tongued and grooved boards. The roof should be covered, on top of the boards, with either galvanized iron slieets or asphalte felt. The outaide walls may be covered with either tar or paint. The ?ormer is more lasting, the latter morc pleasing to the eya Dark-green paint with the window and door frames in white is attractive. The insidr should lie painted light blue or whitewashed.

Each house should possess a wiredl-in aviary. or llight, extending the whole width of the front. and about 10 ft or 12 ft . long. Stout 3 -in. wire netting should lie used, which if tarred every summer will last many ycars

If success is to be attained and a race of strong, healthy birds built up they nust never be overcrowded A shed 8 ft. by 6 ft . with a span roof 6 ft . 6 in . at the eaves will give accommodation for eight pairs of the smaller breeds or six of the larger. The floor of the house should be covered to the depth of 3 in . with coarse sn wdust, which should be renewed frequently. It will last much longer if the droppings are removed from the top every weel: The floor of the aviary should be dug out to a depth ol 2 ft ., and filled with broken bricks, or clinkers, to within 4 in. of the top. This should be covered with conrse sand, which should be rolled hard, the top swept or scraped every week, and the whole of the and rencwed every six months.
Ordinary hracket perches fixed to the wall will suit any of the breeds recommended to tha beginner. Good nest boxes may he made from the ordinary sugar boxes which are sold by grocers. These should he laid on the floor. Glazed earthenware nest pans should be used. The hox should contain sawdust to the depth of 1 in., and the nest pan also ; short pieces of soft straw 4 to 6 in. long may be given to the birds for nesting material. Large open pans of earthen. ware or zinc are best for
baths, and fountains for drinking water. Never let the birda drink the bathing water if it can be avoided. Drinking water should be given fresh daily. The bath water should lee rencwed twice a week. See Dove

How to Cook. Wild or wood pigeons should always be roasted, but the house pigeon may be served in a variety of ways. When buying these birds, select those with comparatively small eyes soft red and tender feet, and necks covered with bright, neat-looking feathers of much the same colour as those on the rest of the body The spurs of the male bird should be short and round
'l'o roast pigeons, pluck, draw and singe then, then wash and truss then. Ierve the feet on, but scald and scrape them. Iay a shallot inside each bird, dust with pepper and salt then tic over the breast a rasher of fat bacon Roast for 20 to 25 min ., and baste frequently using clear beef dripping or butter Just before dishing, dredge the birds with flour, then baste and return to the fire or oven to finish cooking. Bread saluce and a good brown gravy should be served with them, and the stock with which the gravy is made should be finvourel with the giblets If liked, roast pigcon may be stuffed with pigcon forcemeat
'lo broil pigeons, split the birds down the back, spread them open, rul) them with butter season and broil them over a clear fire or under a gas griller before dishing. rub then once more with butter, sprinkle over them some chopped parsley and a few grains of cayenne pepper

Pigeon Forcemeat. A good stulting for pigeons can be made from the livers of these birds Parboil 2 of these, chop and mix them with $\frac{1}{2}$ dessertspoonful chopped shallot, ( 6 dessertspoonfuls breadcrumbs and こ oz. chopped fat bacon Scason the mixture with pepper and salt and a little grated nutmeg, and bind it with the yolk of an egg and, if needed, a little milk

Pigeon Pie. 'T'ake 4 young pigcons and 3 lb . rump steak 4 oz . prepared and chopped mushrooms 4 shallots, also peeled and chopped, I dessertspoonful chopped parsley 2 hard-hoiled eggs, and seasoning. Cut each bird in halves and fry the pieces sharply for 2 or 3 min . to colour them. Cut the steak into slices, roll them and dip them in pepper, salt. and thour. Lay then at the botton of a piedish, then sprinkle over half the mushroom, parsley, and shallot. Arrange the pieces of pigeon over the steak, sprinkle on them the remainder of the mushroom, etc., and senson.
'l'he egge must be cut in quarters and fitted in among the portions of pigcon: moisten with d pint good stock. Cover with rough puif pastry (see Past ry) in the usual way, decorate the centre with pastry leaves, egg the top ol the pic. and batic about is hours. Before serving, fill up the pe with gravy and replace the pastry ornament with the fect in the opening on tho top of the !id The feet of the birds should be senlded, scraped. Blanched. and glazed with meat glaze

Pigeon Ragoût. 'l'o nake this ragoût, bone and stuif 4 pigeons with veal stufting (see Forcemeat), but ald to this 2 oz. chopper fat bacon and the chopped livers of the birds Flour the pugeons and fry them a good brown in hacon fat Then put them into a casserole cover them with stock, aulding 4 oz. preparal mushrooms cut in strips. I carsot cut in dice, and a sliced onion. Pour in a wineglassful port and a tablespoonful orange juicc. Season to taste, boil up and stew gently about 1 hour. Garnish with crouttes of fried bread or of puff pastry.
Pigeon Soup. Nake 2 quarts stock well llavoured with vegetable. and add the giblets of the birds to be used. Truss 4 old pigcons hrown them in a frying-pan, using butter to fry them, and turning them in order to brown
then allover Drain them from the fat and add them to the stock, which must be ready hoiling on the firc. Cook all gently for one hour, then remove them from the soup, shim it free from fat after straining it, and thicken it with brown roux. Serve with dice of fried bread. Fillets cut from the birds may be served in this soup, or tho pigeons may be laid aside whole and used up for some made dish. If the soup ia too pale, colour it with a little browning.
PIGEON BREAST. The serious de formity of the human chest, in which the ribs are llattened so as to throw forward the breast-bone, is known as pigeon breast. It occurs in rickety children who suffer from some bronchial affection, which prevents the free entrance of air into the chest, and is then due to the clfect of atnospheric pressure on the softened ribs. See Rickets
PIKE: The Fish. This large fresh-water fish requires careful cleansing or it is apt to retain its muddy flavour

When the pilie does not cxcecd 4 or 5 lb . in weight it is known as a luce or jack. Large pike are considered better than small ones. The flesh when cooked should look white and firm, but it will improve by keeping for about two days in a cool lasler before it is dressel The roe of the pike should be thrown away. When scaling the fish lay it on a dish in the sink and pour hoiling water over it
To bake a pike whole, choose a tish weighing about 8 lb Wash, scale, and draw out the gills, trim off the fins, and then wash the fish again before wiping it dry Fill it with a well-scasoned veal stufling (ser Forcemeat) and sew it up, then truss it in the slonpe of an $S$; score the fish each side in several places and lay it in a rather deep baking tin. Add not less than 6 oz butter or clear beef dripping, 3 pecled and chopped shallots, 2 oz prepared and chopied mushrooms, 1 small onion stuffed with 4 cloves, a honquel garni, and pint good stock to which has been udded a wineglassful of sherry. Cover the fish with a well-buttered paper and bake it for an hour in a good oven, basting frequently.
As soon ns it is ready dish it, removing the trussing strings. Pour olf from the pan all surphis fat and stir in $\frac{1}{2}$ pint stock. Have ready $\frac{1}{2}$ pint well-flavoured brown sauce, add it to the stock, mix all together and cum the whole into a stewpan, boiling it till it is reduced to the right consistency Skim it free from fat or scum, add 1 oz. butter, a little anchovy casence, the juice of $\frac{1}{2}$ a lemon, 2 wineglasses sherry, and scasoning of cayenne pepper Strain this sauce over and round the pike

Cold Pike. Prepare the fish and truss it as in the preceding recipe, and then make the following broth: Fry for 10 min . in $\frac{1}{2}$ gill salad oil 2 onions and a carrot, both prepared and sliced, 2 rashers bacon cut in strips, a bouquet garni, 3 allspice, and 4 cloves, and when the vegetables are ready pour into the pan 2 quarts white atock, add some white wine if liked and 1 dessertspoonful salt Simmer for an hour, and strain. Boil the fish in this until tender-about hour for an average sized fish. Let it lay in the broth overnight. Then drain it, remove the trussing strings, and dish it. Coat it with mayonnaise sauce. A pike of 9 lb is sufficient for from 10 to 12 persons. The fish may be reheated in the broth and served hot with tartare sauce. Like all fresh-water fish, pike is better boiled in prepared liquor than in water The liquor need not be thrown awny, as it can be used up for making fish soup or sauces. If liept more than three days boil it up ngain. See Fish.
PIKELET. These are sometimes known as Lancashire girdle cakes. The ingredients arc $\frac{1}{2} \mathrm{lb}$ flour. $\frac{1}{2}$ teaspoonful salt, $\frac{1}{2}$ teaspoonful
bicarbonate of soda, l teaspoonful creain of tartar, 2 teaspoonfuls castor sugar, one egg, $\&$ pint water and $\&$ pint milk. Mix flour and all dry ingredients, beat in yolk of egg, milk and water. Beat well, then fold in the stiffly beaten white of egg. Pour in tablespoonfuls on a hot greased girdle. Cook until brown underneath, then turn with a knife and brown on reverse side. Butter and serve very hot. If left to go cold before using toast then on both sides before a clear fire. See Girdle.

PILASTER. This term is used in archi tecture to describe a form of pillar paitly embedded in a wall. It is a fcature of many buildings, and examples are also found in shop fronts and as decorative features of chimney pieces and furniture. In panelled rooms symmetry is often attnined by the use of a pilaster to balance some other feature; the face is panclled or moulded and carved to harmonize with the other decoration. See Panelling.

PILCHARD. The small salt-water lish known as pilchard somewhat resembles the herring in appenrance and taste. but it is more oily and it has a tin in the centre of the back and not near the tail. Pilchards are caught in large quantities off the coast of Cornwall, and are in scason from the middle of July till the end of November. They deteriorate rapidly after being caught, and usually are at once salted and kept in harrels or tinned in oil.

Pilchards may be cooked according to most of the methods employed for herrings, and in some parts of Britain they are made into pies They must he soaked overnight nad then placed in a pie dish with alternate layers of lecks and covered with short pastry 13ake about 30-40 min. See Herring ; P'astry

PILE : In Textile Fabrics. Velvet and velveteen are eloths with comparatively short pile, whereas plush has a longer pile. Other pile fabics are in common use, one of them being Turkish towelling, in which the pile consists of loops. The imitation fur fabrics, such as astrakhan, are piled, and so are many carpets. In Genoa velpet, as used in furnishings, there are two heights, and often colours, of pile forming a decorative pattern. Pile fabrica are generally warmer than cloths macle without pile The wear conses not on the sides but on the ends of the tibres, and for this reason properly made pile goods are durable A beauty, depth, and richness are obtained for carpets, furniture and hangings in velvet piles which cannot be obtained in non-piled materials Pile surfaces have their disadvantages, for sometimes their surface is a clinging one, and they harbour dust The pile can be pulled out of new carpets by careless use of carpet-sweepers. The longer the pile in fabrics of any kind the greater is its tendency to beconie laid. See Carpet; Velvet

PILES. Congested and varicose conditions of the veins at the lower ends of the bowel are the cause of piles. Thero aro two varietics, external and internal, but hoth miny be present.

Anything which produces an obstruction in the circulation of the blood in the abdomen is a predisposing factor. Constipation is one of the most frequent causes. Congestion of the liver acts in the same way, and piles are common in beer and spirit drinkers, and also in those who eat largely, or live a sedentary life. Sitting on the grass, a stone or a cold seat may bring on an attack by chilling.

External piles form dark brown folds of skin running out from the anus. They are soft, but when filled with blood large and hard. Friction and want of cleanliness may cause them to inllame. With internal piles the first symptoins may be a little blseding As a rule, they give no pain, but cause
a sensation of fullness in the bowel. and they may cnuse straining at stool.
Constipation must be preventerl. Eat wholemeal bread, stewed pruncs, apples, and other fruits, and plenty of vegetables. Violent purgatives of any kind are bad, while nloes are particularly to be avoided Regular, modernte exercise should be taken, the hest form being a brisk walk of two miles a day. The sufferer should take great pains to avoid much standing about and cold feet; he should never sit on the ground or on a cold scat; lie should take little or no nlcoliol, strong tea or coffee. Another important rule is to lieep the affected parts perfectly clean by washing and aponging. When piles become inflamed the patient slould keep his bed and send for the doctor.
When the acute atage of the inflammation has passed off, the official ointment of gall and opium may be used applied on lint, or witch hazel ointment. When internal piles come down or prolapse at stonl, they should be gently pushed back with the fingers. Should bleeding occur thoroughly smear a small plug of cotton wool with witch hazel ointment and gently push it into the bowel.
PILLAR. In architecture a pillar is a rigid upright support capable of stnnding alone and siupporting an object or part of a building. liilars may be employed for a portico or entrance porch, for a pergola, or as part of the structure of a house. Pillars have a definite decorative value, and the architect rmploys them in this way as well as to perform some useful purpose. Unlike a column, a pillar does not of necessity conform to any defined rules of proportion or period, but the claracteristics of the recognized periods of architecture are generally talien as the basis in preparing a deeign. See Porch.
PILLAR ROSE. This term is used to distinguish varietics of climbing or rambling roses which are suitable for training on polea or pillars from 6 to 8 ft . in height. For the taller pillars some of the rambler roses are suitablc, e.g. Fraicheur, Hiawatha, Lady Gay, Sander's White, Lady Godiva, Blush Ramililer and Dr. Van Flect. Some of the best climbing roses for pillars 6 ft. or more high are Scarlet Climber, Mme. A. Carric̈re, Lemon Pillar, Climbing Ophelia, Climbing Lady Hillingdon and Iady Waterlow. See Rose.
PILLION SEAT: On Motor Cycle. This is an auxiliary seat attached to the carrier at the rear of a motor cycle or side rar combination. Two types are here illustrated. It is against the law to carry mome than one passenger on the pillion seat of a motor cycle, and the person carried nuist sit astride on a properly secuied seat. This law does not apply to a motor cycle with side car. Side saddles may be used only when a motor cycle is attached to a side car.
An extra premium is generally charged by insurance companies if a pillion passenger is to be carried, and an ordinary policy not having this extra cover may be invalidated if such a passenger is carried. See Motor Cycle.

PILLOW. The ordinary pillow is made of goose teathers or of down, enclosed in a corer or tick of white fustian, which must be firmly and strongly sewn, so that no feathers can escape. A pillow requires to be unmade. stoved, picked over, and remade from time to time; but this need not he done so often if it is sewn into a plain linen underslip, and kept thoroughly well shaken and heaten.

Down pillows are nearly twice as expensive as gond fentlier pillows, but they have the disadvantage that they nre very hot. and many penple like them to bc replaced in suminer by feather pillows. The ordinary English pillow is oblong in shape, a bout 27 in. by 18 in. But the square pillow, which may be as large as 27 in . by 27 in ., is most comfortable if it is used with what is known as a wedge bolster. This is like a tiny mattress, about 5 in. deep at the back and sloping down to $a$ bout $\frac{1}{\frac{1}{2}} \mathrm{in}$. in front.
Children must have pillows thinly filled, so that the head is only very alightity raised. Low pillows are better for adults, too, and the modern tendency to do away with the bolster is a recognition of this.

Pillow Case. Pillow cases, or, as they arc sometimes called, pillow slipa, are obtainable in cotton and linen. Linen is much the best, for it not only wears and washes extremely well, but is smoother and cooler, and therefore more comfortable than cotton. The cases vary in size, so that hefore buying a pillow case the pillow it is to cover should be mensured. If a pillow case is too small the pillow will be hard and unyiclding; if it is too large the pillow will be untidy.

Frequently the alip is a plain bag, fastened at one end with linen buttons or tapes. It may be decorated with a hemstitched barder or a frill. or with lace and rows of hemstitching. Unless for fancy pillows for day time use or ornament, embroidery should be nbsent or kept to the corners of the case only. When making a pillow case, it is best not to fasten the buttons directly to the end, but to make a flap of double material, about $2 \frac{1}{2} \mathrm{in}$. wide, that will fold down over the end of the other side of the pillow. The buttons are then sewn inside the flap, so that they are invisible when the case is fastened. See Linen; Quilt.

PILLOW LACE. Lace made with many threads on a cushion or pillow is popularly known as pillow lace. This term is somewhat mislcading and such handmade lace is more correctly termed bobbin lace, as many needlepoint laces, in which a single needle and thread are used, are made on pillows. See Lace

PILOCEREUS.
This is a genus of greenhouse cacti, without leaves, and with fleshy, spiny stems. A familiar example is old man cactus. The genus properly is classified under the name cereus. See Cactus.

## PILOT CLOTH.

Other colours can be had, but pilot cloths are commonly blue. They are heavy woollens intended
originally for pea-jackets, such as ship pilots wear as a protection from wind and rain.
The cheaper kinds are thick but hard, and in looking at them carcfully the blue colour is seen to be cloudy and lighiter on the surface of the short nnp than in the hody of the material.

PIMENTA. This evergreen shrub necils grcenhouse treatment as far as Great Britnin is conecrned. [sfaring white nnd red flowers in early summer, Pimenta acris is vigorous nnd needs a lot of space. It should be pruned in the spring, and propagation is by cuttings.
Pimento Pepper. This is an alternative name for Jamaica pepper, better known as allspice (q v.).
PIMPERNEL. One of the prettiest of British wild flowers is the scarlet pimpencl (Anagallis arvensis), a common weed in gardens. Of others grown for their decorative effect in flower beds and borders the prettiest are Anagallis linifolia, of which the varietiea Parksii, red: and Phillipsii, blue, are the best. They grow only about 6 in . high and are useful edging plants. Seeds are sown under glass in April and the seedlings are planted nut of doors in May. The bng pimpernel (Anagallis tenella) is a pretty pink-flowered trailing plant suitable for moist places in the rock garden or bog gardon

PIMPLE. Papules, which are small, solid prominences of the skin, are popularly called pimples. They vary in shape, and may be pointed, round, or llat on the top. Common examples are the eruptions of chicken-pox, acne, and boils in their earliest stages. They should not be ruhbed. In many caser a little boric ointment removes pimples, but more energetic treatment

## may be necessary:

PINCERS. An indispensable tool in the home is a pair of pincers for pulling out nails and other purposes. The ordinary type has a pair of broad jaws and two handles, one with $\pi$ knob and the other with a fork or claw end. This is inserted under the head of the nail and used to prize it up sufficiently to enable the jaws to get a firm liold under the head, after which the pincers arc closed together and pressed over sideways, thus withdrawing the nail, which may subsequently be pulled out. The cost of a good tool is so little that it is worth while to get a really serviceable and well made pair of pincers.
Shoomakers' pincers have grooved and serrated jaws, with an upstanding block formed on one of them They arc employed for pulling leather into shape, and the block is used to got a good pull, being rested ngainst some firm part to obtain a good purchase.

PINCHBECK. From its resemblance 10 the precious metal, pinchbeck has been popularly termed Brummagem gold. It was to the mien and women of the 18th and early 19th centuries what rolled gold and gold! filled articlea are to those of to day, with this difference, that the supply was much moro limited. Consequently, it has a distinct value to the collector of antique jewelry.

Modern inventions, such as gold-filled pro ducts, have superseded pinchbeck in Great Britain, but a variety of it is in use in Switzerland and other continental countries, for cheap jewelry and articles made to imitate gold.

The collector should beware of the modern imitations of old pinchbeck, many of which are difficult to distinguish from the genuine
article, but, as a rule, are not so carefully made and are distinctly inferior in artistic quality. Examples of old pinchbeck that are worth acquiring include snuff-boxes and patch-boxes, with slips of onyx or agate forming the top and bottom : vinaigrettes, various kinds of buckles, bracelets, and other articles of jewelry set with tortoiseshell, mother-ofpcarl, amethysts or topazes. Ring and jewel caskets can occasionally be picked up which are a valuable addition to any colloction; these are beautifully ornamented with agate, onyx, cairngorm, or lapis lazul. See Jewelry.
PINC:INNG. This is a gardening term which means cutting off or pinching off the tips of shoots or branches to force the development of others and thus ensure well-branched trees or planta. See Pruning.
PINCUSEION. The simplest form is a littlo bag stuffed with bran and sewn up at the end. Bran is the best material to use, as it is much lighter than sawdust and has not its tendency to absorb damp. The covering material should be strong and closely woven, so that the pinheads cannot pass through and the bran cannot come out through the pinholes For this reason it is always best to make a bag for the bran, then to cover it with another material such as silk or velvet and edge with a narrow cord. The daintiest dressing table pincushinns have detachable, washable covers of embroidered muslin, the cushion being covered with pink, blue, or mauve satin.

PINCUSBION FLOWBR. This is the old name for scabious, a plant much in demand for cutting purposes. There are annual, biennial, and perennial kinds. The finest of all is the Caucasian scabious, which is popular not alono for garden decoration, but as an exceedingly beautiful florists' flower. See Scabious.

PINE. The word is often ased loosely to describe various cone-bearing trees, but correctly it is the popular name of those contained in the genus Pinus. Some of the pines are of great value as a windscreen for the protection of choicer trees and plants: they are particularly useful for planting in exposed soacoast gardens. They are evergreen and rather slow growing.

It is wise to plant small trees about 2 ft . high, for they become established more quickly than larger ones. The Austrian pine (Pinus laricio nigricans) is a most valuable wind break tree. Pinus insignis, which is chifly suitable for mild districts, is also a gond shelter tree. The most familiar of all is the Scots pine, Pinus sylvestris, a tall handsome tree which reaches a height of 80 ft . or more and will thrive in very exposed places. It furnishes the timber known as deal

Some of the pincs are suitable for planting as ornamental lawn trees in large gardens One of the most distinct is the umbrella pine (Pinus pinea), a flat-topped tree of distinctive growth which can be recommended for gardens in the milder counties. Others are the blue pinc (excelsa), with grey-green lenves, and the Corsican pinc (laricio), which flourisies in poor soil The pines are propagated by seeds sown out of doors as soon as they are mature

Uses of the Wood. The name pine is applied to several varieties of timber, the produce of trees which grow extensively in Europe and N. America. The Scots fir, which is common all over the north of Europe, is called northern pine, or red, yellow, or white deal, according to its character. It is the wood commonly used in carpentry, in housc-building, for outdoor work. and rough work generally It is cheap, not heavy or difficult to work, and durable, varying in character according to locality and conditions of growth.

Other varietics of pine come from North America; an important one being yellow pine It is a pale honos-yellow in colour, light, soft.
straight-grained and uniform in texture, easy to work, has very few knots, and shrinks and warps very little. For these reasons it is the wood preferred by pattern-makers. It is not employed for outdoor work, but in joinery and cabinet-work it is the best kind of softwond, and in furniture it often forms a ground for veneer. Mouldings, panels, and frames are made of it.

Another Amorican wood is pitch pine, highly resinous, strong, and heavy, and is therofore much used for piles, struts, and the like. Reddish-yellow in colour, it has strongly marked annual rings that show as alternating light and dark streaks in the grain, sometimes with a wavy figure, and is rather difficult to work owing to its resinous character. Being clean and attractive when varnished, it is sometimes used for bedroom furniture and also for flooring purposes. In general, however, it is unsuitable for indoor work, especially when close joints aro needed, as it shrinks badly. Pitch pine takes varnish much better than it dnes paint. See Deal ; Wood.
PINEAPPLE: How to Grow. Mainly owing to the great quantities of this fruit which are imported the pineapple is now rarely cultivated in Great Britain, although for delicaoy of Havour the home-grown pine is unsurpassed. The best method of cultivation is to prepare a bed 3 ft . in depth of fresh leaves in a deep garden frame or pit, which is heated, cover the leaves with a 12 -in. layer of loamy soil, and plant the pines in this at about $2 \frac{1}{2} \mathrm{ft}$. apart. Considerable artificial warmth is required: the winter temperature should be about 65 degrees. If only a few plants are grown thoy should be potted in large flower pots 10 in . or 12 in . in diameter. Pmpagation is easily effected by suckers or offshoots, which, if potted and kept in a moist hothouse, will form roots. The leafy top of a ripe fruit may be made to form roots in the same way.

The botanical name of the pineapple is Ananassa sativa. A variety named The Qucen is best for cultivation under glass in Great Britain (See Greenhouse)

Serving the Frult. To prepare the fresh fruit for the table, dut it into slices with a silver or stainless knife and cut off the rind, taking care to remove all the woody part. When canned, pineapple retains much of its flavour, and can be served alone with the syrup poured round it, mixed with other fruits to form a compote or fruit salad, or cut up to mako pineapple flans, fritters, ctc. Crystallized or glace pineapple may also be bought in rings or chunks.
Pineapple jelly is made as other table jellies. described in page 648. For fritters this fruit is used either fresh or tinned, and the batter is the same as that given in the recipe for Apple Fritters (q.v.) Tinned pineapple is used for a flan, which is made as described in page 464. It can also be used as a filling for turnovers and tartlets and to decorato small cakes or layer cakes though glacé pineapple is more often used for cakes.
Pineapple Cup. Peel a small pincapple and cut it in thin slices. Sprinkle it well with castor sugar and let it stand 6 hours. Put the trimmings of the fruit into a bright stewpan. cover them with cold water, and then boil up, skim, and simmer them till the flavour is extracted. Strain this cssence over the fruit. add the juice of 2 oranges, 6 oz . castor sugar, and 11 pints white burgundy. Stir and then cover over, and keep in a cold place. When required add a syphon of soda or seltzer water
Pineapple Mould. Mix a dessertspoonful chocolate powder to a smooth paste with a little milk taken from $\frac{1}{2}$ pint; boil up the remainder of the latter and stir it into the chocolate. When it has cooled slightly, add it to a beaten egg, strain the whole into a jug
placed in a saucepan of cold water over the fire and cook it until the custard thickens. Then take it from the pan, add 3 dessertspoonfuls castor sugar, and leave it to get cold

Rub the contents of a small tin of pineapple through a sieve, and mix the pulp with the chocolate custard. Put $\frac{1}{2} \mathrm{oz}$. leaf gelatine in a saucopan with $\frac{1}{2}$ gill pineapple syrup, let it dissolve slowly, and then strain it intn the whole. Pour the mixture into a wct border mould, leave it to set, and after turning it out fill up the centre with a gill of stiffly whisked cream sweetened and flavoured to taste.

Pineapple Pudding. To make pineapple pudding, 3 oz . crystallized pincapple should be used, but the fresh or tinned fruit will do quite well if the juice is drained away. Put intu a stewpan $\frac{1}{2}$ pint milk with 3 oz . sugar, and as soon as it comes to the boil draw it back from the fire and stir in quickly 4 oz . fine sifted flour. then return it to the heat and beat it well. As soon as the paste ceases to adhere to the saucepan it is done. Let it cool slightly and mix in the well-beaten yolks of 3 eggs, add also the pineapple, chopped, and then fold in the whipped whites of the egga. Pour it into a buttered mould and steam for $1 t$ hours Serve it with sweet sauce. If crystallized pineapple is used, flavour the sauce with a few drops of pineapple essence. If fresh or tinned fruit, make the sauce with the juice or liquor in the tin. See Fruit Snlad: Marmalade ; Salarl.
PINEAPPLE FLOWER. Alternatirely known as Eucomis, the pineapple flower, which belongs to the order Liliaceac, is $n$ half-hardy bulb, succeeding in sandy loam in a cool house. As a rule it is grown only in pots in the greenhouse, but in mild districts and in


Pizeapple Flower, bulb suitable for pot onltivation sheltered positions it will sometimes do well out of doors. It reaches a height of about 2 ft., and flowers in August. Pro. pagation is by offsets in spring. The species punctata, green and rose, is usually grown.

PINE WEEVIL. Sometinces known as the conifer beetle, this is a pest which de vours the bark of such trees as pinc, firs and spruce Eggs hatch out into fleshy white larvae, about $\frac{1}{2}$ in. long, pupating in autumn, and emerging as wecvils in June. All old stumps of the trees mentioned should be cleared away and all branches of infested trees well shaken to cause the pests to fall upon sheets of paper spread beneath; they are then collected and burnt. See Inscc. ticide.

PING PONG. This game is an indoor form of lawn tennis. Rules were drawn up and an association
formed, but after a time the game began to le called table tennis. The ping pong association was therefore dissolved and the game is now governed by rules drawn up by the Table Tennis Association. See Table Tennis.

PINGUICULA. Butterwort is the common name of this group of low-growing hardy


Pinguicula alpina, a hards pezennial bearing yollow-
tipped, white fowers, suitable for the bog garden plants. They form rosettes of leaves, bear violet-like llowers on slender stalks in May and are suitable for planting in the bog garden or moist spots in the rock garden. One of the pretticst of these flowers is srandiflora, with violet-bluc flowers; the bloonis of alpina are white marked with ycllow. The plants can be propagnted by division preferably in the autuinn.
PINHOLE PHOTOGRAPHY. A minute hole in a light-tight box forms a substitute for a icns. The apparatus is simple, and no focussing is requircd. It may easily be improvised for testing purposes from any rectangular light-tight box at one end of which is fitted a very thin metal plate, such as a piece of copper foil, and at the other a photographic plate kept in place by a clip. A small hole is made in the copper foil with the point of a needle, and kept covered until exposure is made.

Mr. Alfred Watkins, of Hereford, has prepared a table for sizes of pinholes based upon the use of sewing-needles which are standard in size: metal disks piorced with standardsize holes for pinhole camoras can be obtained from him which can also be fitted into the ordinary camera in place of the lens. While the distance between the hole and the plate does not affect focussing, it does affect the size of the image thrown on the plate, the greater the distance between hole and plate the larger the image.

The sizes of holes to give the best definition for any particular distance between hole and plate, and a means for calculating the approxiinate exposure, are given in Mr. Watkins' table as follows :

| Neerle | Diameter | Best Dlatance Hole to Plate | Calculate Exposure as for |
| :---: | :---: | :---: | :---: |
| No. | In. | In. |  |
| 1 | 2 | 40 | 1/80 $\times$ cu |
| 4 | 4 | 910 | 1/80 $\times 1 / 5 \times$ |
| 7 | \%11 | 10 | 1/60 $\times \ldots$ |
| 8 | ! | 8 | 1/56 $\times$ \% |
| 10 | ${ }^{1 / 4}$ |  | 5/30 $/ 35 \times$ |
| 12 | 1 | 34 | f/35 $\times$ " |

Thus, if the pinhole is to be used in an ordinary camera with a total extension of 8 in., the hole should not be made with a needle larger than No. 8. The actual exposure is then calculated by referring to an exposure meter or table. Having calculated the exposure according to the speed of the plate and actual lighting conditions at the aperture or $f /$ No. given in the table for thesize of pinhole in use, it is multiplicd by 00 , the resulting exposure being in seconds.

Alternatively the figure obtained may be reckoned as minutes. Thus, for instance, on a bright summer day, using No. 8 pinhole, the meter may give $\frac{1}{8} \mathrm{sec}$. for $\mathrm{f} / 50$ : this is reckoned as $\frac{1}{f}$ min., or 20 sec . The hole made by the needle must be perfectly clean, and any burr marle in piercing the foil carefully rubbed down with emery paper or file. Only in a very bright light can the image be seen on a focussing screen. Therefore a good view finder is cssen-
tial. The larger the plate used in a pinhole camera the larger the angle of vicw, and this property makes the pinhole very valunble in crampéd places, such as buildings in narrow streets or interiors where it is impossible to get sufficiently far away with an ordinary camera to include the whole subject. For landscape purposes with an ordinary lens the angle of view may vary from $20^{\circ}$ to $50^{\circ}$. With a pinholc it may be anything up to $100^{\prime}$.

Another useful property of the pinhole camera is that its image is mathematically correct, and may be used for calculating heights and distancos. The size of the image depends upon (1) the size of the object ; (2) distance from object to pinhole ; and (3) distance between plate and pinhole. It is directly proportional to (1) and (3) and inversely proportional to (2), so that if two qualities are known the third is casily calculated. Thus, to find the size of an object, the distance (2) being known, multiply the size of the image on the photograph produced by the camern by (2) and


Pink: two beantiful varieties. Loft, fine flowers of Dianthus Herbertii : right, blooms of the variety known as Queen Mary
profusion of fragrant flowers in spring. There are two chicf classes, the border and the alpine or rock garden pinks. The border pinks Hourish best in well-drained rather light soil; clayey soil can be made suitable by adding leaf-mould, sand and grit. Planting may be done in autumn or spring.
Propagation is by cuttings taken in June or July and inserted in sandy soil out of doors and covered with a bell glass or handlight. In four or live weeks the cuttings will be rooted and the covering can be removed : they may be planted out in autumn. Two kinds of cuttings are used-the piping, which is the top of a shoot pulled out, and the ordinary cutting, 3 in. or so long, made by severing the shoot just beneath a joint and renoving the lowest leaves. Pinks can also be increased by layering. The double whitc, named Mrs. Sinkins, is still the favourite border variety. but others are listed in catalogues. There are some beautiful flowers in the Herbertii strain of pinks. The old laced pinks are seldom grown now, but varicties may be obtained from specialista

In recent years the perpetual floworing or Allwoodii pinks have been raised and have become very populas. There are many named varicties in rich and varied colours. They are increased by cuttings or by layering in sunsmer. Border pinks are very easily raised from seens sown in boxes of light soil in a frame in May : the seedlings will be large enough to plant out of doors in autumn
The alpinc pinks are exquisite rock garden flowers suitable for planting in gritty soil in divide by (3). If the size be known and the sunny places. The most popular of all is distance required, divide (1) by the size of the the Cheddar pink (Dianthus caesius), which image and multiply by (3). See Exposure : forms a wide low tuft of leaves and bears small F/Numbers: Lens.
PINION. A small cog wheel that engages with another cog wheel usually of a greater dianteter is termed a pinion, and is constructed of either stecl, cast iron, brass, phosphor bronze, or even vulcanized fibre
Apart from its use in transinitting rotary motion the pinion is cxtensively used in conjunction with a rack, as for example in the focussing arrangement of a microscope. Very small pinions, such as are used in clock and watch making, are generally machined from pinion wire, which is manufac. tured in lengths, diameter, tooth sections, and numbers of teeth according to require. ments. See Gear.

PINK. The pink is one of the most delightful of all the old-fashioned garden Howers and unsurpassed as an edging plant for beds and borders. Its grey leaves arc attractive all the year round, and it yields a


How to grow Pinks. 1. Layering an old plant : a, fine soil over lagers. 2. Rooted layer. 3. Same transplanted to shallow drill with sand at base 4. Cutting or piping. 5. 8ame propared with lea! tips romoved (b) and properly clanted : $a$, very sandy compost. 6. Propagation nader handlight: a, fae sandy soil ; $b$, sand ; $c$, soil ; $d$, crocks ; $e$, handlight: $f$, boz
soil containing lime These two, together with glacialis, should be tried in the moraine. See Border; Carnation
PINKING. Pinking is a good method of finishing the cdges of material that is not suitable for the usual double turning. The edge is acalloped in small triangles or half. diamond shapes. This is done to prevent the material from ravelling along the raw cdge, and to nenten the appearance.
To pink an edging, ordinary sharp scissors may be used. A line of tacking should be run along the edge where the head of the acallops is to lie, or a sealloped transfer can be ironed on to the material to act as a guide. The material should then be folded between each scallop, and a slanting cut made to the depth required or to the line of tacking. If the pinking is to be carried out on oilcloth or leather, the points can be faintly drawn in with chalk or pencil.
PINS AND NEEDLES. The prickling sensation, popularly termed pins and needles. is one form of paraesthesia, or a disturbance of sensation. which may be experienced on parts of the body in nervous and other discases. These may be due simply to debility, and an iron tonic may cause their disappearance.
Pint. This measure is used for milk, beer, and other liquids. It consists of 4 gills, and 2 pints make a quart.
PINTAII: The Duck. A pintail is a type of wild duck that derives its name from its long, pointed tail. It is almost invariably roasted, and, except for the fact that the feet are usually left $n n$, it should be prepared and trussed in the same way as an ordinary duck Abnut 20 min is the time required for ronsting, and because the flesh of the pintail is rather dry it should be basted frequently. Serve it with some sharp sauce and garnish it with watercress and cut lemon. See Duck

PIP. The kernel or seed of fruit, $a s$ of an apple, pear, or cherry, is known as the pip Although plants and trees may bc raised from pips the process is not advocated for practical purposes, because most of the scedlings would be worthless, and the trees are slow in reach. ing the fruit-bearing stage unless budded on other stocks. For those who nevertheless desire to experiment in the propagation of fruit from pips the following information will be useful

For apples and pears the pips may be sown when fully ripe, in pots of sandy lnam, and placed in a cold frame. Watering must be very moderate until the seedlings have grown 3 or 4 in ., and then they are transplanted to open ground. Further periodical transplantings will be required as the trees incrense in size, and they will probably bear fruit in 6 to 10 years after the original sowing. Apricots, cherries, damsons, and plums, as well as apples, pears, peaches and nectarines, may be raised in a similar manner. Amongat other fruits likely to give results from pips are raspberries and atrawberries. See Apricot: Cherry: Pear

PIPE : For Smoking. Wood of various kinds is used in the manufacture of pipes. Briar is the favourite, but Australian myallwood, ebony, cherry, and other kinds of wood are alm employed. A good pipe is made from thoroughly seasoned wood, and the harder it is the hetter. It should have a nice straight grain, without knots or flaws of any kind. The colour varies from rich shades of chestnut or walnut, with a tinge of red, to the glossy black, which many smokers prefer.

For the mouthpiece vulcanite, made or finished by hand, is the material chiefly used. A silver band or mount at the end of the stem is a customary ornament.

Regular sminkers usually keep one or tivo good briars for everyday use, reserving the
meerschaum, should they possess one, for occasional enjoyment together witli such varieties as the cherrywood or the corn-cob. The two latter are amongst the cheapest and simplest types, consisting of the hollowedout bowl of cherrywood or cob, into which the stem is thrust. Patent varieties are on the market, the object of which is to collect or get rid of liquid accumulations of nicotine.

When smoking a pipe for the first time, shred some tobacco well and pack about a third of a charge smoothly and evenly in the bowl, heing careful not to ram it right down to the bottom of ${ }^{*}$ the pipe. Light the tobacco carefully, making sure that the whole top of the surface is aglow, and smoke it indoors, very slowly. If the tobacco burns down one side, as a result of bad packing or a strong draught, the new wood is bound to suffer from the unequal distribution of the heat. It will suffer equally from excessive heat developed by too rapid drawing at the pipc. A new pipe should be cleared gently of all unconsumed tobacco each time it is smoked. Never refill and relight it; nor, indeed, any pipe while it is still hot from a previous smoke.

A pipe should not be knocked against the heel or the hob or mantelpiece, or, when out of doors, on a wall or post or railing, to get rid of the unconsumed residue of tohacco, as this very often results in cracking the pipe. All such remaining tobacco should be removed by scraping it out gently with the blade of a pocket-knife. See Tobacco.
PIPE : For Gas, Water, Steam. Pipes of all kinds play an important part in the home. Water is brought into the house through a lead pipe and taken to a cistern or receptacle in the roof. When it is intencled to fit a hot-water supply the pipe is generally of iron and may be plain or galvanized, tho latter resisting the attack of rust. In some cases the water is supplied through $n$ copper pipe, especially in connexion with hot-water supply in districts where the water has a corroding action on iron. Gas is conducted through a rough iron pipe known as gasbarrel, which is made of wrought iron and is measured by the nominal bore of the pipe Thus a $\frac{1}{2}$ in. gas pipe means that the pipe measures $\frac{1}{2}$ in. internal dianeter, while the nutside is about $? \mathrm{in}$. diameter. Hot water barrel and steam pipe or barrel, stronger varieties, are measured in the same manner

In contradistinction to gas-barrel, brass and copper pipes are measured by the outside diameter and are purchasable in various thicknesses or gauge sizes. The higher the number the thinner the tube; a normal thickness for gas fittings is No. 16 gauge, nominally $\frac{1}{18}$ in. thick This class of
 Pipe Joints. Pig. 1. Remonng plug from T-piece. Pig. 2. Cutting pipe to correct length by means of a hack-saw. Fig. 3. The end of the pipe must be gled up before screwing is begun
pipe is made in two grades. The one most generally used is made with a seamed or brazed joint; a superior tube is known as seamless and is made from the solid. The latter, or triblet drawn, as it is sometimes called, is usually more accurate to size and forms a stronger tube than the seamed Larger diameters such as 2 in and upward are made in thin gauges

Pipes are jointed in various ways, according to their nature and purpose; for example, gas and hot water pipes are connected by means of fittings with screw threads cut on or in thens. and screwing to corresponding threads cut on the pipe. Lead and compn pipes are joined by a soldering process, and the joint is known as a wiped joint. Brasa and copper pipes are joined with screwed fittings, and also by brazing and soldering to suita ble fittings.
Joints in Gas or Hot Water Barrel. In. atructions for manipulating lead piping are given in the article on Plumbing. The amateur shou!d be verv chary of doing anything to the gas service pipes, as there are many snags for the inexperienced Gas barrel, however, has many other uses than its most common one, and can be employed in conjunction with certain stock fittings to make atanchions, handrails, etc.
The home worker may at some time or other wish to alter his hot water supply system, or, for example, talie a branch from the existing water pipe to a fresh point. This may be accomplished by unfastening one of the joints of the existing pipe, after having turned off the water, or isolated that part of the pipe so that the water cannot escapa.
 in a convenient position and the outlet from the T.piece hss been plugged, the best plan is to commence the new work from it. In Fig. I such a pipe is shown, the plug being removed with a spanner or pipe wrench.

A piece of pipe has to be cut to length, as in Fig. 2, the ends of the pipe rounded off with a file, and the scale, or hard
outer surface, removed by filing, as in Fig. 3. The pipe is set vertically in a strong vice, or horizontally in a proper pipe vice, and a thread cut upon it with stocks and dies, as in Hig. 4. To test the thread, a socket or other standard screwed fitting should be tried in place, to ensure that a perfect fit results : if necessary the die is adjusted and run over the pipe again, so that the fitting screws on evenly and firmly. Both ends of the pipe should be treated in the same way. The next step is to screw the pipe into the $T$ and to make the joint water or gas tight with a mixture of red lead and gold size or a good thick paint.

This is smeared on with a brush, a few fibres of hemp twisted into the screw thread, and the pipe screwed into the T.piece (Fig. 5). To prevent the pipe sagging it inay be supported temporarily with a nail, pipe hook, or a strut of wood. If it is desired to terminate the branch at one end of the length of pipe, this can be effected by screwing an elbow on the end of the pipe and screwing a plug into it, but if it is necessary to carry the pipe upward or downward, a sufficient length of it must be screwed into the elbow and $T$ or branch fitting.

A great point is to make the screw threads a good fit, to make them tight with the aid of red lead. and to cut the lengths correctly at

they have rooted, when they may be planted out. Pipings may be taken at any time during July and August. See Carnation: Garden : Layering: Pink.

PIPING: In Needlework. A length of piping cord encased in a tube of material is employed in dressmaking and in making covers, cushions, curtains, etc., to finish off


Piping in Neodiework. How the cord is onclosed in a tube of material
the edges, in an ornamental manner. If these edges are curved, the piping is made separately, and applied afterwards.

To make it, take a crossway strip of material $1 \frac{1}{2} \mathrm{in}$. wide or more, according to the thickness of the piping cord, which may be had in many different sizes. Fold one of the longer edges over nearly duwn to the other, and slip the cord up into the fold; then tack along close up to the cord to keep it in position. Lay the piping over the right side of the article to be piped so thot the narrower of the two strip edges faces this, and the cord lies in. ward; then stitch the strip down to the article close up to the cord. Roll the cord upward so that it lies along the top of the article, and hem down the wider of the two raw edges. If the edge that is to be piped is
the start. Another point to bear in inind is to work progressively from one end upward, otherwise it will be necessary to use connectors. These are long sockets, and to usc them one of the ends of the pipes to be jointed must be screwed for a sufficient length to allow the socket to screw right on to it. The ends of the pipe are then drawn as close to one another as possible, the socket unscrewed from one and partly on to the other. both of them being secured with locknuts tightened up on the ends of the socket, as in Fig. 6. The nuts have to be fitted before the socket is screwed on. A sound joint is made with twists of hemp soaked in a mixture of red lead and gold size.

When an iron pipe is to be joined to a lead pipe it is necessary to use a brass union fitting and to solder the lead pipe to the tail of the union; otherwise the fitting work may proceed as described. See Overflow.

PIPE CLAY. White clay resembling potter's clay is used for making tobacco pipes and other purposes. The peculiarity of this variety of clay is that it is soft and greasy to the touch and very tenacious. When used for whitening leather parts of military accoutrements its adhesiveness is increased by adding white of egg to a thick cream made by rubbing pipe clay with water.

PIPING : In Gardening. This is the name given to a special kind of cutting used in propagating pinks; it consists of the top of a shoot pulled out instead of being severed with a knife. To take a piping, the top end of a shoot is held in the right hand, while the leit hand grasps the stem. The right hand gently but firmly pulls the stem apart, showing a hollow pipe, like a quill or tube.

These pipings, when taken, are planted in a mixture of silver sand and finely-sifted soil, watered and covered with a handlight until

quite straight, it is just sufficient to turn the edge of the material itself in over the cord. and to run alorig close up to it; but this cannot be done if the piping is to be of a contrasting colour, as often happens. Piping can be used in rows as an ornamental trimming, by taking up a tuck in the material and setting the cord at the back of the fabric, so that this may be picked up inside the tuck, which is then stitched. Sometimes the material is pushed along the piping, to give a rucked effect. This style is used in making cushions.

PIPPIN. A popular type of apple is known by this name, well known examples being Cox's Orange pippin, Allington, Kerry, King of the Pippins, King's Acre, Sturmer, Normandy and Summer Golden pippin. The first named is the finest dessert apple known.

Normandy Pipplns. Dried apple rings are sold as Normandy pippins, although they
are sometimes known as biffins. They mny be used for winter fruit salads and puddings, but require to be washed thoroughly before use and to be steeped in cold water for 24 hours. See Apple; Dried Fruit.

PIQUÉ. A material often used for making detachable coat-slips, collars and cuffs, pique is generally white or light-coloured. The surface is ribbed into cords, and in true piqué these run crossways on the cloth, although lengthwise cords are often sold under the same name. The cloth is a strong cotton one which wears and washes well. A silk material ribbed to look like this cotton cord is known as silk piqué.

Piqué cinbroidery is a form of white stitchery upon a strong foundation. The outlines are traced by a cord made in crochet chains or overcast, while the fillings are in different stitches to imitate a figured material, such as linen damask.

PIQUET : How to Play. Piquet is a card game for two players, and is played with a pack of cards from which all from the six to the two have been thrown out. The 32 cards rank as in whist, and the ace is high in cutting and play. There are no trumps.

The dealer deals 12 cards, 2 or 3 at a time, to his opponent and himself, face downward. The remaining 8 cards are placed on the table face downward in a pack of 5 laid across a pack of 3 . The object of the game is to score for certain combinations held in the hand, and afterwards by the winning of tricks. First of all each player examines his 12 cards, and begins to declare, beginning with the dealer's opponent. If the latter finds that he has no king, queen or jack in his hand, he calls out carte blanche, and scores 10 points. If the dealer also has carte blanche, he does not announce it until his opponent has discarded.

The dealer's opponent may discard any number of cards from 1 to 5 . and at least one. Whatever number he discards he takes a corresponding number from the top of the pack. If he does not take 5 , he may look at those he leaves. If he takes 3 , for example, he may look at the next 2. The dealer then discards and draws a corresponding number of cards from the pack. He is bound to discard one card, and may take all the cards which remain, if he wishes. He may look at any of the cards he leaves behind, but if he does so his opponent has the right to look at them as well, either after playing his first card or naming the suit that he intends to play.

The hands being made up, the dealer's opponent begins to declare his hand. He first calls the point. This is the suit which has the greatest pip value. The player first of all announces how many cards of his longest suit he has. If he has more cards than the dealer, the latter says Good, and his opponent scores the point. If he has less, the dealer says Not good, and scores the point. If the number of cards is equal the pips are counted, aces counting as 11, court cards as 10 , and the other cards at their face value. If the pips are cqual, ncither player scores the point. The point cards must be shown to a player's opponent when demanded.

Each card in a point scores one. A point of six counts 0, for example

The second call is sequence, three or more cards of a suit in order. The plaper with the longest sequence counts it. If the number of cards in the sequences are equal, the highest sequence scores. The player with the best sequence also counts all other sequences he may hold, his opponent counting none. If the best sequences are equal, neither side scores. A sequence of 3 cards counts 3 points; of 4 cards, 5 points; and of any greater number, 10 points plus the number of oards in the sequence.

Thus a sequence of 0 counts 10 points As with the point, sequence must be shown when demanded. The third call is triplets or fours. These are 3 or 4 cards alike, as 3 kings or $\mathbf{4}$ aces, and the hest scores. Three of a kind counts 3 points; 4 of a kind, 14 pmints. The player with all higheat triplet or 4 counts all others in his hand, his opponent counting nonc. The hands must be called in the regular order : point, sequence, triplets or fours
How to Score. Each card led counta one point, and as each point in declaring and afterwards is made, the players announce their total score. If the ilealer's opponent scones 30 points by declaring his combinations and by the cards he leads before the dealer scores, he scores an additional 30 points. known as pique. If either player reaches 30 before playing a card and before his opponent scorea, he acores an additional fiO points for repique The dealor's opponent leads and adds one point as he does so, and the dealer must follow suit. If the winner of a tick also led, he counts one for his next lead. but if the other player wins the trick he counts one for winning it, as well as one in the usual way for his next lead. The winner of the last trick always scores one extra point, no matter which player led.

If each player wins 6 tricks it is a tic; the player who wins more than (i tricks scores 10 points for cards, and the player who wins every trick scores 40 points for capot. This acore includes the point for the last trick. The game is 100 or 101 points up, and scoring is in the following order, since each player may actually he able to make sufficient points to score the 100 or 101 , and so the order of scoring becomes important. Carte blanche is scored first, and then point, sequences, fours and triplets, points made in play, and finally the cards.
In Ruhicon piquet there is no definite scone Fach game consists of $\mathbf{i}$ deals, and the player making the highest aggregate wins. The winner deducts the loser's score from his own and adds 100 points If the loser fails to reach 100 points the winner adds the loser's score and 100 points to his own. Pron. Pik.et.
PISE-DE-TERRE. This is the name given to the building of walls and structures with earth. Shuttering is erected to the thickness of the wall, and the earth is fillod in and rammed thoroughly. Sometimes the base is marle of several courses of brick or stone, to protect the piséde-terre from dampness.
PISTACHIO. The small green kernel of the pistachio nut is used in cookery as a decoration for either meat or siweet dishes In galantine these nuts are often introduced into the forcemeat stuffing, forming a contrast in colour to the red tint of the tongue or ham or the black of the truffle. Pistachios enter into the composition of various dinner sweets much in the same manner as almonds. Pounded or chopped pistachios may be made into sauces for puildings by employing any method adapted to almonds.
Pistachio Cream. To make this cream, blanch and peel 2 oz. pistachio liemels and pound them in a mortar with a few drops of rose water. Make a ich custard, using $\$$ pint
milk, the yolks of 3 eggs, and $2 \frac{1}{2}$ oz. castor sugar. Cool the custand slightly, then mix in by degrece the pounded nuts and, in order to heighten the colour, add, if neceseary, a little spinach-green or sap-green colouring.

Dissolve 1 oz. leaf gelatine in 2 tablespoonfuls water; and after the custard and the nuts have been passed through a sieve add the gelatine. Last of all fold in lightly ${ }^{3}$ pint whipped double cream, and pour at once into a mould rinsed out with melted jelly and decorated suitably. Set it on ice and turn it out of the mould when the crenm is to be served. The custard must not be quite cold when the gelatine is added, or it will begin to set before the cream can be mixed with it.

PISTON. In an engine the piston is a mov ing part that has a free reciprocating movement in the cylinder and takes 1 he pressure of the


Piston. Fig. 1. Diagram showing types al piston used in internal combustion engine design: $A$, cast iron : B, alumlniam : $O$, aluminium and bronze

Piston rings are always made of close grained cast iron, machined all over, and ground to a fine limit so as to ensure a perfect fit in the groove. There are several methods by which a perfectly uniform expansion of the ring is assured, so that it oxerts an equal piressure on the cylinder wall over the whole of its diameter. By the first method the inside diameter of the ring is machined lightly eccentric to the outside diameter, and slotted or cut through at the thinnest part: by this means the beuding moment will be equal from any point, thus allowing the ring to keep a perfect circle when closed to the diameter of the cylinder.

By the second method the rings are turned a little larger in diameter than the cylinder, slotted to leave a gap, and sprung into the cylinder. The gap must be laige enough, when the piston is in place, to allow for proper expansion of the ring.

In anothermethod, the inside diameter of the ring is machined from the same centre as the outside diameter, and slotted. It is then pertianently expanderd. so as to give tho necessary tension when closed to the diameter of the cy!inder. by means of hammer blows at close intervals
oxpanding gas, thus transforming it into round the inside diameter mechanical motion, via the connecting rod and the crankshaft.

The piston of an internal comibustion engine as used on motor vehicles is of the type known ns trunk piston, being long ns compared with that of a steam engine. It serves as a guide for the small end of the connecting rod to which it is connected by a gudgcon pin.

Pistons for petrol engines are constructed of cast iron, machined as light as possible, of aluminium alloy, and of aluminium and bronze (Fig. 1). Generally the top, or piston head, is llat, and bevelled at the edge. although sometimes a slightly domed head is eniployed. In the majority of 2 -stroke engines the piston is provided with a specially shaped deflector on the head. The purpose of this is to direct the path of the burnt gases, as well as to retard the moment at which the fresh gases will unavoidably come in contact with the tail-end of the burnt gases
The fitting of piston in a cylinder is not sufficient in it self to prevent leakage of compression bet ween the two surfaces, and forthis reason what are known as piston rings are fitted in grooves machined round the piston, which by expanding against the cylinder wall prevent a leak age at this point.

The rings are arranged so that the gaps do not fall in line. In order to obtain as perfect a compression as possible, some makers fit two thin rings in one groove, placing the slots on opposite sides; by this arrangement loss of compression via the slots is greatly reduced. This has led to the introduction of the donble twist piston ring shown in Fig. 2, which presents an unbroken surface to the cylinder wall over the whole of its diameter.
Methods of shaping the slots so that as little compression as possible shal! get away at this point are shown in Fif 2. Scraper rings of various constructions are fitted to remove surplus oil from the wall of the cylinder, one being located usually at the lowest of the groovem, just nbove the gurlgeon pin. Small holes in the pis. ton wall carry the oil thus removed to the inside. The ring is grooved, chamfered or stopped, and has a sliarp edge for scraping off the oil (Fi.g 3)

The removal of the cast iron ringe from the piston is a job thateallsfor con-
Fir. 4. Removing piston rinks by meaus of string of tio inserted and worked round
siderable care, and is best carried out as follows : Obtain 3 or 4 strips of sheet till about in. wide, and insert them all side by side at one point hetween the ring and the piston. Next work them round to the positions shown in Fig. 4. By so doing it will he an easy matter to remove the rings without fear of breakage. Never attempt to remove more than one ring at a time. To replace the rings, it is a good plan to use the strips as a means of keeping the middle ling, where three
nre used, from contering cither the top or bottom groove.

On examining the ringe one or more may be found to have extensive brown marks on the face. This will mean that the ring so marked is a bad fit to the cylinder wall Theonlycure is to fit a new ring. In the case of one ring only being so marked, a varying degree of porosity of the cast iron, causing unequal heat distortion, will be the most likely reason; but where all the rings are affected, then a badly worn cylinder is responsible After a considerable mileage the ringa may be found to be slack in the grooves The only remedy is to have the grooves turned true, and a new set of rings fitted

It is essential to the proper functioning of piston rings that all carbon deposit is removed from the bottom of the grooves, and a blunt instrument only that will not damage the rvalls of the grooves should be used for Internal Combustion Engine; Notor Car.

PIT : A Card Game. Pit is a card game plaved by 3 to 7 people with a special pack of cards, and is so called from the slang name for American corn exchanges, which are known as pits. The cards numiber 63 , and contain 7 suits of 9 cards each. The number of suite used must correspond with the number of players. The cards are named after the cercals wheat, corn, oats, barley, ctc., and the object of each player is to obtain a complete set or corner in one cereal before any other player.

The cards are shuffled and clealt one at $n$ tine in the usual way. The suits are of varying values, which are indicated on the cards. Thus, wheat may be 100 , corm 75 , and an on. The game is won by the plaver who first succeeds in scoring 500 points by the corners he makes in any cercal. A minuite is allowed players to sort their cards and the pit is then opened. Each player tries to exchange cards he does not want for an equal number of cards he does, but without naming the actual suits he wants. Every player shouts out the number of cards he wants, and tries to shout down the opposing players. "Trade two," shouts one player: "three," cries another; "four," yells a third, and so on. The cards traded must be all of the same suit. Immediately a suit is complete the player shouts out "Corner in wheat," or whatever cereal it may be. After each corner the player is credited with its value, and the cards are shuffled and denit afresh.

PITCH. Pitch is the black residue in the distillation of tar. Vegetable pitch is produced in Sweden, and mineral pitch is obtained in large quantities from gas-tar. Damp walls are effectively treated by painting them with melted pitch. Another method is to paper the walls with paper impregnated with soft pitch. Other uses to which pitch is applied are as a component of briquettes, for making black varnish, as a waterproof coating for roads, and as a protective paint for iron.
Yellow Burgundy pitch is used in making plasters whieh are applied to the chest in affections of the lungs. The pitch is melted and spread on thin leather by means of a hot ircn The plasters are also applied to the loins in lumbago and for relieving rheumatic pains.

PITCHER PLANT. The peculiarity from which the pitcher plant obtains its name is the fact that the mid-ribs of the leaves extend beyond the ends, and each forms a sort of jug or pitcher, with a lid When a Hy or other insect happens to fall into the pitcher, its slippery mouth, which is also furnished with stiff hairs or bristles, prevents the escape of the insect. The leaves are green, sometimes with brown or red blotehes, and the plants should be grown in a hothouse, in baskets of peat and sphagnum moss, suspended from the roof of the house. They require plenty of moisture, and should be shaded from the sun
The botanical name of the pitcher plant is Nepenthes, but there is another genus with the same English name and of similar habit. This is Sarracenia, the side saddle plant, or Ainerican pitcher plant. It flourishes in peat and moss, and will thrive in a cool house. There are
th Howers of various colours. cally as Nepenthe several sorts, with Howers of various colours.
The Sarracenia requires very little water in the winter-time. The pitchers are richly marked, and possess the same insect-entrapping qualitics as Nepenthes. One kind, S. purpurea, is hardy, and may be grown in the bog garden, or in a moist comier of the rock garden, in a peaty soil. The surface of the soil should be kept covered with moss. All kinds are increascd by division in early spring.
PITCHFORK. The sharp-pronged instrument known as a pitchfork is chielly used in farmwork, for forking hay or manure and for other purposes. The common type has two slightly curved steel prongs about 1 ft . in length and spaced from ( 5 to ! in. apart. At the back end of the prongs two lugs are formed, and to the inside of them is attached a long handle, usually of ash or hickory. The length of the handle is about 5 ft ., with a diameter of $1 \frac{1}{2} \mathrm{in}$. to 2 in . The ends of the prongs are often turned out slightly at the ends to enable the fork to retain the load it has picked up.

A common use of the pitchfork is in the construction of hayricks, the tool being used to toss the sheaves from the hay cart to the top of the rick. Another application is in the distribution of manure over a field. The pitchfork is almost exclusively used for farm and small. holder's work

## Pitch Pine. See Pine.

PITTOSPORUM. This group of evergrcen shrubs or small trees is hardy only in the milder parts of the country. They thrive in sandy, loamy soil to which a little peat may he added with advantage. In other districts they should be planted against a sunny wall, or in tubs, and kept under glass safe from frost in winter. Tobira and undulatum, with white sweet-scented Howers, and eugenioides, with pale fragrant blooms, are some of the best. Propagation is by cuttings placed in sandy soil in a frame in August.
PLACKET. The slit or opening in the side of a skirt is usually known as a placket. It should be just large enough to enable the skirt to be put on and taken off with ease, and is prepared by opening the seam from the waist downward. 'Two pieces of material, each about $\frac{1}{2} \mathrm{in}$. longer than the opening and 4 in . and 2 in . wide respectively, are then required. The uider piece serves as an underlap, being doubled over and sewn to the left side of the
skirt, while the remaining piece is faced to the right side. Press studs arc generally used o fasten.
PLAGUE. The acutc infectious disease known as plague, bubonic plague, or black denth, has spread over the world at various periods, causing a heavy mortality. It is endemic in E. Asia It is due to infection with the bacillus pestis, which may gain access to the body in food, by inhalation, or by the bites of fleas or other wounds. Rats are mainly responsible for its spread Preventive measures include isolation and disinfection the destruc tion of rats and other vermin. Curative measures include various sera.

PLAICE. The treshness of plaice can be determined by the orange-coloured spots with which the fish is covered. These should br. bright, any tendency to dullness being an indication that the fish is stale. To prepare stuffed plaice, wash, olean, and dry the fish, remove the fins and head, and slit the fish down the centre to the bone, making the incision on the side covered with black skin. Lift the Hesl, with the knife on both sides of the bone, and fill as full as possible with forcement, and then lay the plaice in a tin containing a little inelted butter or margarine. Brush some of the fat over the top of the fisl, sprinkle the latter with brown breadcrumbs, and bake it in a warm oven for a bout $\frac{1}{2}$ hour, basting it occa sionally with the fat. Sprigs of parsley and alices of lemon may be used as a garnish. A suitable sauce such as maitre d'hôtel or tomato sauce should be served in a sauce-boat Com plete instructions for filleting and frying plaice are given under the heading Fish (q.v.) on page 462.

Plaice au gratin may be prepared by wash. ing a plaice, trimming the tail, and removing the fins, eyes, and dark skin. Put it in a gratin dish, place over it 1 oz. butter cut into small pieces, and add also $\frac{1}{2}$ gill milk and salt and pepper to taste. Put the fish in a moderately hot oven, cover it with a plate, and bake it for about 20 min . Pour what remains from $\frac{1}{2}$ pint of milk into a saucepan, heat it up with 1 oz . butter and seasoning to taste, and when it is warm pour it over 1 oz. Hour previously mixed to a smootl, thick paste with a little water. Put the whole back into the saucepan, stir it well until it boils, continue boiling for 6 min., and then stir in 1 dessertspoonful grated cheese. Take the fish from the oven, pour the hoiling sauce over it, and on top sprinkle another dessertspoonful grated cheese Return to the oven or place under the grill until the cheese melts and browns.

Fillets of plaice may also be served thus: Mix together 3 tablespoonfuls white breadcrumbs, 1 dessertapoonful grated cheese, a finely ohopped shallot, and a skinned and mashed tomato. Season them with pepper and salt, add sullicient egg to bind thein, and spread the mixture over the fillets. Roll them up, stand thein in a buttered tin or pie-dish, and put any of the mixture that remains on top. Cover the lish with a buttered paper, bake it in the oven for 15 min , and when cooked lift it on to a dish, pouring some hot tomato sauce and sprinkling a fow browned crumbs over each fillet. See Fish; Food: Force. meat ; Frying; Maitre d'Hotel

PLAN: Of a Building. A drawing giving details of construction and arrangement of the parts of some object or piece of work is known as a plan, and refers more particularly to architectural drawings of buildings. Plans of machinery are senerally termed working drawings, and similar drawings of boats are called the lines. Plans of buildings are prepared to a uniform scale of $\frac{1}{\frac{1}{2}}$ in to 1 ft . for the general arrangement drawings, the elevation of the exterior and the disposition of the rooms. Urawings on a larger acale of $\frac{1}{2} \mathrm{in}$. to 1 ft . are employed for the purpose of constructional details. See -Irchitecture: House

## Planes: Varieties and Their Uses

## The Care and Manipulation of these Important Tools

The amateur woodworker may te reminded that this Encyclopedia is full of articles giving detailed directions about making various items of furniture, for many of which a knowledge of planing is essential. In addition there are articles on the varlous types of plane, e.g. Jack Plane: Ovolo; Plough; Rebate Planc; Router; Smoothing Plane. See further Amatcur Carpentry; Tools

The carpenter's plane is used for producing the sole, or bottom of the plane. If sloort a smooth flat surface on wood. In its simplest whitish lines are visible, known as medullary form it consists of a steel blade which is rays, thesc should be as nearly as possible at passed through a wood or motal block, the right angles to the sole of the plane, as such a cutting edge projecting slightly below the tool will wear better than one in which these botton. The blade, which is inclined at an lines are at another angle. If the plane angle, is secured in its place with a wedge or has been made by a reputable maker, it can sone other device, and in the larger varieties a handle is fitted to the tool. In some planes the blade, or plane iron, is single; in others it is composed of two separate portions, the cutting iron and the back or covering iron.
The bottom of the hole where the blade protrudes is known as the mouth, and the upper portion as the throat, and it is important that the mouth should be just wide enough to allow the shavings to cone away freely and pass through it; if too wide this will not press down the fibres of the wood in front of the plane iron, which consequently will have a tendency to tear the work badly. The principle on which any plane works is that the cutting iron is so ground and sharpened that the shavings are chiselled off with $n$ regular and uniform motion working with the grain and not against it. The function of the plane is to guide the direction or course of the plane iron and to regulate the depth of the cut. In inetal-bodied planes with screw adjustments, etc., the principle is the same.
The amateur should possess n jack plane, trying plane, and
 reasonably be expected to be true and free from warp or twist; but this can generally be told by holding the plane horizontally on a level with the eyes, and looking along the level of the sole. The body of a new wooden plane the first time iron, that is, the side that is not ground

The blade is replaced and held as if taking the plane apart, while the wedge is tapped lightly in position with a hammer sufficiently to hold the iron. The plane is tilted at an angle, and the edge of the iron will be seen to protrude slightly. If it does not, it may be tapped out gently by tapping the opposite end with the hammer, or be adjusted by the screw device on an iron plane. The iron should project slightly less than $\frac{1}{10}$ in from the sole of the plane, and should project evenly over the whole brendth of the blade. except the comers, whicl will be slightly rounded off in the grinding process. The wedge should be secured tightly, and the plane is ready for use.
A smoothing plane is adjusted in the same way, except that to loosen the plane iron, the back of the plane is struck with the hammer
should be soaked in raw linseed oil before using it for

To remove the iron of a jack plane, or trying plane, grasp the plane in the left hand, the thumb pressing upon the iron, and the fingers grasping the bottom or sole of the plane. With the aid of a hammer strike a sharp blow near the end of the plane, as in Fig. 1. This will loosen the wedge, which can be with. drawn and the blade lifted out. The two irons aresepar. ated by laying them on the bench, holding them firmly in the left hand, and manipulitting a scrowdriver, as in Fig. 2. The plane iron should rest on or be firmly held by some support such as the hench. When the screw is loose the back iron is slid along the slot cut in the plane iron until the screw is opposite a large diameter hole, when it can he lifted out of its place. The iron is sharpened in the manner described in the articles on Grinding and Oilstone. The cover iron is then replaced; the edge should be about $\frac{1}{n}$ in. or less from the cutting edge of the plane iron. The cover rests upon the front of the plane
(Fig. 3) In the case of motal planes the various adjusting devices are opcrated. Fig 4 shows a metal trying plane with the location and purpose of the various adjustments indicated.

Manipulation of the Tool. Most planes are held and used with both hands; in general, the right hand grasps the handle of the plane, such as a jxck plane, or the back part of a smaller plane, such as a smoothing plane Some very small planes may be held in the right hand only; they arc used for chamfering the edge or cleaning up any little roughness on the end of a piecc of wool, or for work on curved surfaces, but are seldom of usc in making a really flat surface. The correct method of using a smoothing plane is illustrated in Fig. 5 , which shows the disposition of the hands and the style of shaving that should be produced. Rebate planes and similar planes used for making mouldings are held in the manner indicated in Fig. 6, which shows a fillister plane employed making a rebate.

Figs. 7 and 8 show the heginning and ending of a planing movement with $\Omega$ jack plane The top front of the plane is grasped hetween thi lingers and thumb of the left hand, and the handle held in the right. The object should be to thrist the plane forward in a straight line, keeping it level. A ten. dency to roll the plane may he detected by the tool inclining to lift at one corner, and this may be
 smoothing plane
checked by control with the hands and arm
If the edge of a board is to be planed, the tool is grasped in a different manner. It may be held as in Fig. 9, the first finger of the right hand being extended as shown, and the left hand reating on the top of the planc. With this grip it is possible to judge whether the plane is being held level or not.

Planing to thicknessos and widths is simply a question of gauging The principle is to establich a flat surface, or face side, then one edge. These are inarked off and gauged to the desired thickness, for which purpose special hardwool gauges can he preparel, or, as in gauging the thickness of a panel, grooves can be ploughed into a small piece of wood, and this is applied to the edge of the panel to correct the planing.

When planing curved surfnces, always work downhill; never attempt to plane uphill against the grain of the wool When rlaning


Fig. 4. Typical iron plane with principal parts named

Plane Fir 5. Tsing grain, hut work from each side across the end grain to the middle; or slightly bevel one corner of the board and plane across the end grain to this bevel ; or clamp it to an odd piece of wood on the far side of the hoard, and plane right across. If theae precautions are not ohserved, the wood will split Another

aid is to hold the plane diagonally, or slanting, neross the board, but to push the plane bodily in a straight line.

Before attempting to plane woord it is essential that the plane iron is very sharp, and it must be rubbed up on an oilatone when this becomes necessary For rough work the planc iron should project considerably; for smoothing, a less amount, and for a fine finish the least a mount it is possible to set it at. When the plane is cutting properly, the slinving sliould come away with a clear. decided sound.

PLANE: The Tree. The hardy summerleafing plane tree, ranging in height from 60 ft. to 80 ft ., will thrive in the gardens of smokeladen towns and oities when all other trees fail as the bark is slied annually. Many fine examples are to be seen in London and other cities in Great Britain. Acerifolin (London plane) and orientalis are two of the chief kinds: they llourish in ordinary soil and may. if it is necessary to keep them within bounds, be pruned hard every few years. They are not, however, suitable for small gardens. The planes can be increased by cuttings set out of doors in late autumn.

PLANK. This is the name given to sawn timber 11 in . or more widc, and from $2 \frac{1}{2} \mathrm{in}$. to 6 in.thick, but the word is commonly applied to all sorts of hoards. Examiples are seen in planks of a platform, in planks used in scaffold. ing and general building purposes, and in bont building.

For cabinct nıaking it is very often cheapor to purchase a plank and have it sawn into boards, the charge for the saw cuts being a few pence. An objection, however, is that the boards may wind or $t w i s t$ after sawing from the plank, so that a period of seasoning is


Fig. 6. Using a fillister plane to form a rebate
end grain, do not plane straight across the desirable before using the stuff for anything important. Care should be taken in selecting
a plank for conversion, and an end grain showing the heart should be avoided unless several thin boards of narrow width are required. In planning the number of boards due allowance must bo made for the thickness of the saw cuts. For example, a 6 in . plank can be sawn into four lin. and two $\frac{1}{2} \mathrm{in}$. boards, each leing full in thickness.

PLANT. Some authorities define a plant as a living organisın, diversified in structure and possessing organs of nutrition and reproduction. The former comprise root, stem, and leaves, functioning for purposes of respiration, circulation and growth The latter include the flower, with its calyx and corolla, and stamens and anthers, the malc organs: pistil, stigma, and ovary, the female organs. Male and female organs may be contained in one llower, or they may be borne on different
important. Care should be taken in selecting


Plane. Fig. 7. Start of the stroke with a jack plane. Fig. 8. How the plane is held at the finish of the stroke.
Fig. . Shooting the edge of a board with a jack plane
plants; some examples carry male and female llowers separately on the same plant.
PLANTAIN: The Fruit. The plantain is a fruit belonging to the banana family, of which the scientifio name is Musa. The very Iarge outsize fruits, often attaining n curved length of 8 or ! in ., which are sold in Great Britain as bannnas, are really plantains. They may also be distinguished by their thick, tongh skins Real hananas are much smaller, softer, and have thinner, velvety slins. The culture of plantains is as for bananas ( $\mathrm{q} . \mathrm{\nabla}$.).
PLANTAIN: A Garden Weed. Two plantains (Plantago major and $P$. Innceolata) compel the attention of the gardencr because
they are common weeds of the lawn. They spread rapidly by means of self-sown seeds and should be uprooted with a bent-pronged weeding fork while small. A little sulphato of ammonia or lawn sand, if placed on the plantains in settled dry weather, will destroy them. Or they can be killed by means of a special weed eradicator which liberates a supply of weed killer when thrust into the plantains.

PLANTANN LILY. This group of hardy herbaceous percnnials, 2 ft. or so high, is valued for its largo ornamental leaves and spikes of small white or lavender colourcd lily-like flowers in summer. They flourish cither in sunny or partially shaded places in well drained loamy soil and are increased by division in spring. Snails are very fond of the leaves, and if not deatroyed often apoil the beauty of the plants. Thie plantain liliea are first-rate for cultivation in tubs and develop into large handsome plants in n few years; the varieties with coloured leaves are particularly well suited to this purpose. The chief kinds are Fortunei, glauca, which has grey-blue lenves, Sieboldina, and subcordata. Two low-growing kinds suitable for edging or for cultivation in pots are lancifolia and tnrdiflora.

PLANT HOUSE. A glasshouse built for the cultivation of plants and fruits which are not sulliciently hardy to be grown out of doors or are improved by the shelter thus afforded. The stove or hothouse is for tropical plants; its ininimum winter temperature is a bout 65 degrees. The greenliouse or conservatory artificially warmed to maintain a minimum temperature of a bout 50 degrees is for the cultivation of half-hardy and subtropical plants. In the cold or unlieated greenhouse many hardy rock and border plants can be grown in pots, ns well as grapes, peaches and tomatoes, either in pots or planted in a border of soil. During the spring and summer months half-hardy flowering plants, e.g. fuchsia, tuberous begonia, zonal geranium and gloxinia, may be grown.

There are two chief types of glasslıouses, the span roof and the lean-to, the latter being built ngainst a wall. A garden frame is indispensable to the possessor of a glasshouse; there the plants are propagated and kept until well developed. A pit is a frame or small glasshouse the Hoor of which is below the ground level; it is often uscd for the oultivation of melons and cucumbers Special glasshouses are constructed for the various classes of stove, intermediate and coolhouse orchids. See Greenhousc.

PLANTING. The best times to plant are autumn and spring, the former period being preferable for hardy perennials and lenf-losing i rees and shrubs. Evergreens may be planted in September-October, or in April and May. Farly planting, either in spring or autumn, is sound practice, when preceded by thorough preparation of soil.

The method of making holes just sufficiently large to accommodate cramped roots should be avoided: they must be opened enongh to provide ample space, with a little to spare, when roots are spread out horizontally. The value of trenching land before planting is great. See Digging; Mulching; Trenching.

PLANT LICE. The name is applied to the various types of aphis, such as the grcen tly, which do great harm to all kinds of plants by sucking sap Infested plants out of doors should be syringed, during a dry evening, with an insecticide, or with a homely remedy made of soft soap and quassia chips in solution. In the greenhouse fumigation with a suitable fumigating compound, such as $n$ nicotine preparation, miny be found to be necessary.

The best treatment for apple, plum, and other trees infested with lice is to spray the lower leaf
surface rrequently with an insecticide. Certain garden insects, including the ladybird, ichneumon fly, etc., are voracious devourers of plant lice. See Insecticide.

PrAQUE. Ornamental tablets of metal, porcelain, majolica ware, ivory, plaster, marble, etc., usually carved or decorated in some manner, are known as plaques.

With the exception of polychrome enamels, such as the lith century masterpieces of Limoges, metal plaques aro usually wrought in low relief. They may be hammered out in repoussé, or cast and chased, ns in the case of ormolu or gilt bronze, being sometimes oval portraits in the manner of large medallions, sometimes round or oblong scenes of classical or local interest. If they are of actual value,
as examples of antique work, they should be protected by appropriate glazing.
Ceramic plaques of value usually take the form of old delft, either Dutch or English, of majolica, or the jasper-ware plaques introduced by Josiah Wedgwood.
PLASHING. This is a method of repairing or confining a liedge by bending shoots tnwards the roots and cutting the stems half through. In this way the sap is still allowed to circulate, the stcms remain alive, and unruly ones bccome pliable enough to twist a mong others. Care must be taken that the plashed stems, or branches, are not cut more than half through, ol herwise they will die. Proper trimming and attention to hedges in season will generally e, obviate any necessity for plashing. See Hedgc.

## Plaster and Plastering Methods

## The Effective Treatment of Walls and Ceilings

For further details ahout work of this kind the reader should turn to the article House Sce also Ceiling; Cornice; Float: Frieze; Hawk; Lath; Mortar; Partition, ctc.
Plaster is the name given to calcareous here is prepared from pure chalk lime compounds with a base of calcium sulphate. In the general use of the word, as applied to building operations, it refers to a mixture of lime, sand, and water, gencrally with the addition of plaster of Paris, or some other material to accelerate its setting. The genera! use for plaster, as far as the amateur is concerncd, will be in the plastering and repair of wall surfaces.

The plaster for a wall is applied in 2 or 3 separate conts. The first, or pricking up coat, is applied with coarse stuff coniposed of a good chalk limo, coarse, clean, sharp sand, and clean ox hair. For the mix-up the sand is arranged in the form of a hollow basin, preferably rested on boards (Fig. 1); but if the ground is impervious, such as a concreted floor, it can be set direct upon it. The lime should previously bave been thoroughly slaked, and is used in the form of a putty with a consistency not unlike that of thick cream.

This is sifted through a sieve, which may be rested upon a couple of poles or hoards upon the surface, and water is run through it, if necessary, to ensure that no lumps of the lime are prevented from being inixed with the sand, which should previously have heen sifted for a similar reason. The hair, when purchased, is in a clotted state and all lumpy. It is separated by placing some of it on a bonrd and beating it with two sticks, one held in each hand, so as to separate the hairs without breaking them. The hair when heaten is disposed over the slaked lime, and the whole of the sand and lime turned over and thoroughly well mixed with larry and shovel. The mixture should be just wet enough to mix evenly. The larry is a broad bladed tool resembling a hoe. In the blade is a large hole, which aids the mixing of the plaster.
The mass that is thus prepared should be is left to temper, the nore satis. factory the plas. ter. The usual proportions are 1 of lime, 3 of sand, and 1 jb . of hair for every cubic font of coarise stuff. The object of mixing the hair is to bind the plaster together and make it more tenacious.
The plasterer's putty or lime. putty referred to
heaped up and left to temper for as long as possible before using. Coarse stuff made in this way can be used at once, but the longer it


Plaster. Fig. 1. Preparing tho llme plaster in the centre of a crater of sand
measuring aloout 14 in . across, with a small round handle underneath. Stuff that is being applied to the wall or ceiling is conveyed from the mortar hoard to the hawk and laid on with a trowel. The latter is an oblong tonl made of steel, having a handle attached, and is used for applying the first coat of material, known as the coarse stuff The hand float, similar in shape, but made of wood, is em. ployed for applying the linal or setting coats. The scratch consisty of 3 or 4 laths nailed together in the form of a fan, the ends being pointed. It is used for scratching over the surface of the accond coat, so as to form a key for the succeeding coat.
The pauging trowel resembles the ordinary thowel used by bricklayers, except that it is tapered, and does not terminate with a sharp point, but is slightly rounded off. Its use is for mixing small quantities of material, such as putty and plaster. The margin trowel is for work where it would not be possible to use a float. In shape it rescmbles a small shovel with the sides turned up ahout $\frac{1}{2} \mathrm{in} .$. and is made of steel. The stock brush is for sprink. ling small quantities of water on to the work to keep it to working consistency.

Thore are other tools used by the plasterer which require professional skill and much practice to handle ; they arc used principally in the formation of mouldings and cornices. For example, the running horse is a tool cut to a particular shape to form a certain section moulding. These tools are generally specially made for the particular job, in conjunction with small moulding tools of different shapes. Another tool is the joint rule (Fig. 3) for working in the angles on cornice work. All thesc implements may he obtained from any good tool store.
Plastering a Brick Wall. Supposing that a rough brick wall is to be plastered, then the work will he carried out in the following manner: First, with a garden syringe or a bucket and brush, thoroughly wet the bricks Having placed several buckets fill of the coarse stuff on a mortar board in a convenient position, as, for example, on a box adjacent to the wall to he plastered, take a hawk in the left hand and the laying on trowel in the right hand, and, with a swinging, circular movement apply the plaster to the brick. work, pressing it firmly into contact and making it about $\frac{1}{2} \mathrm{in}$. thick. Fig. 4 illustrates the method of application. Only sufficient of the wall should be covered at a time to permit of convenient working.
The next stage is to tako a derby float, and work over the whole surface to Hatten and even it. If, however, tho wall surface is to he got up in any style, a screed lvill be necessary. This, in the case of 1 room having a picture rail and skirting board, may be wooden strips about 2 in. wide and $\frac{1}{2}$ in. thick, securely nailed to the wall, and backed up when necessary with rough grounds, so that their surfaces are in line and repiesent a level surface. A traversing rule or long batten is worked up and down, levelling off the plaster and making its surface uniform with the level of the grounds.

When the plaster begins to set, a wide, flat, mugh wood float, having a nail driven through it, the point of which projects through the face, is applied to the surface of the plaster, producing a series of scratches ; this provides a key or hold for the second coat. For all ordinary partitions a second coat may be applied the next day; it may be composed of fine stuff, gauged with a proportion of Keene's cement, or some similar hard, quicksetting material. It is applied with a wooden float, this coat not being so thick as the former.
Fig. 5 shows the mortar hoard in position in the centre of the room and the second coat in course of application. It is brought to a
true and that surface by the aid of a traverwing rule, with a metal float and a liheral application of water. The great point is to prevent the plaster from setting ton quickly, and this can generally be accomplished by moistelling the work, and keeping it damp as the job proceeds, both with the first and second couts All small blemishes are carefully worked out with a laging-on trowel, or hand tloat. as illustrated in Fig. 6 , and the corners linished off. They may

Which tutie the form in general of cnst plaster enrichnents, the plaster of which they are composed heing reinforced with fibrous material, such as hair, coconut fibre, and the like. In many cases canvas is used as a backing, and

ling it Hat, true and level with the surface. To ensure a good joint the edges of the old work must be kept saturated with water. On all angles or corners liable to sustain extra wear, the first coating of plaster should be composed of Portland cement and sand in equal proportions. Sometimes in a lath and plaster partition or ceiling the laths are broken, or they fail through age or some defect, in which case all the affected laths should be cut out and replaced by new. The process is descrihed and illustrated under the heading Ceilings.
PLASTER: In Medicine. The value ol
be finished aquare with the aid of a special thin strips of wood are employed as a reintmwel virtually having two faces, which work forcement These are siniply cemented in place simultaneously at the juncture. A different with plaster of J'aris. treatment, and one that is very effective and hygienic, is to cove the corners, that is, mund them off, using a wooden float more or leas triangular in section, with one of the angles rounded off to the desirel curvature. The appearance of such a corncr, in course of completion, is illustrated in Fig. 7
Great care must be taken in reducing the linishing coats to a sinooth and level surface in every part. It is important in this connexion to work the lirst layer as evenly as possible. Equal care should be taken in linishing the arrises, or edges, of projecting corners, particularly the edges of chimney breasts.

Ceilings. Similar methods are employed in the case of ceilings. These are often decorated with applied fibrous plaster ornamentations.

If the cornice is large and consequently too heavy to he made solid, it is usunlly cast in pieces and then fixed into position. An alternative method is to fix blocks of wood, either triangular in form or of a shape ap. proaching nore nearly to the outline of the comice, so that strips of wood or laths may be nailed on and thus provide a strong foundation for the first layer of coarse work Full instructions for repairing a damaged ceiling are given in the article on Ceilings (q.v.). Plaster work on walls is liable to surtain damage, in which case any dents or bruises can he lilled in with neat plaster or a mixture of lime-putty and plaster of Paris. The general procedure is to hack out the plaster over the damaged area, thoroughly wet it and work
in the new plaster with a small trowel, trowel- plasters applied to the skin may depend on the support and pmetection they give, or on the Jrugs they contain.

A plaster should not be used indiscriminately for closing akin cuts and slight wounds, as there is always a risk of microbes thus being enclosed in the wound. The wound should first be protected by a thin layer or pad of antiseptic gauze. Strips of plaster should be used with spaces between to allow of the escape of discharges. Plastery are usunally so made that the heat of the borly melts them suflicient.ly to allow of them clinging to the skin. Sce Adhesive Plaster: Corn ; Mustard.

PLASTER OF PARIS. Calcium sulphate, known as plaster of Paris, is used for the production of casts of many varieties of small atatues and ornaments, for mouldings and interior decorations. It is employed in making


Fig. 4. Using the layingion troweí io appiy urst coat ol plaster. Fig. 5. Applying the finishing coat. Fig. B. Hand Hoat finishing the coat. Fig. 7. Rounding off a corner with a wooden float which is triangular in section with one of ita angles suitably curved
numerous applications in surgery. It is finely ground and is obtainable in several grades, and should invariably be kept in a dry place.

Plaster of Paris has the property of setting into a hard white subatance when it is mixed with water. The best proportion to use is water I pint to plaster 2 lb . When the plaster sets, it expands slightly.
Plaster figures are made by pouring mixed plaster into moulds. The figures are generally hollow, the residue of plaster from the centre being poured out before it has had time to set. If a small proportion of Portland cement is added to the plaster the time of setting is delayed. The hardness of the plaster is increased by using alum solution instcad of water in the mixing prucess Plaster of Paris is useful in the household for mending broken tiles and for filling up crevices in walls.

If only a small quantity is wanted, a good plan is to fill a bowl about of with cold water and pour in the plaster with a circular motion, distributing it evenly over the water and nt the same time stirring with a circular motion using a wooden spoon or smooth stick. The surface of the water will exhibit air bubbles, and the plaster should be stirred until these bubbles no longer appear The stirring should be steady, and the water should on no account be riolently disturbed, as the air bubbles will be imprisoned and the work will be imperfect The mixture speedily gets thicker, and it required to be poured into a mould to make a cast, this should be done just as the plaster is in the thickening stage, approaching the consistency of thick cream. If required for moulded work, pour the plaster in steadily so that the air in the mould can escape. See Casting ; Modelling.

PLASTIC WOOD. This is the name given to a preparation of word in paste form. It is used as a filler in woodwork and for a variety of other purposes. It can be moulded by hand or modelled, dries and hardens in a short time, and takes stain or polish readily. When using plastic wond to fill nail holes, knot holes, or shakes, the stopping should be left a little above the surface level and the surplus chiselled off when dry. Any moisture or grease on the surface to be treated will provent the filler from adhering properly, and i a considerable area is to be dealt with it is as well first to apply a little of a special softening preparation, which can be had from the maker of the plastic wood.

PLATE: The Utensil. As used in the household a plate is a tlat, shallow dish used for holding food at the table and elsowhera Plates are made in cvery possible kind of china and earthenware, in enamel ware, aluminium and pewter. In dozens or half dozens they form an essential part of break. fast, dinner, dessert and tea services. Plates of four sizes are usually part of a dinner service, those for the soup having deeper bowls than the others. With breakfast and tea services there are larger plates for bread and butter, cakea, etc. Plates are also sold singly or in odd numbers, and plates of metal are used for cooking and other purposes.

Plate Rack. Usually of wood in the larger sizes, smaller plate racks are often in metal. Teak wood plate racks with accommodation also for cups and saucers are convenient fittings for the scullery or kitchen sink when there is a good deal of washing up to be done for the household.

When fixing a wooden plate rack, stout ear plates (or mirror plates) are screwed to the back, and plugs are fixed in the wall at suitable places to coincide. If fibre plugs are used (see Plug), screws must be employed which are threaded close up to the head, so that the screw can be driven right home into the plug and properly grip the countersunk portion of the ear plate. When attaching the plates sce that the countersunk side of
the bole in projecting top portion faces the proper way (i.e. outwards into the room).
Plate Warmer. Any apparatus that is used for heating plates or dishes may be described as a plate warmer. A type used mainly in large establishments somewhat resembles a miniature oven. and has separate shelves for plates, vegetable and meat dishes.
In the home, the iron rack nbove the stove is often used as a substitute for a warming plate, the dishes being left there while the meal is being prepared. A small metal standard plate rack is useful for this purpose, and it accommodates a number of plates. Electric warming plates can be obtained in various sizes, fitted with flexible cable and wall plug.
A less modern kind of plato wariner still used consists of a deep dish which contains a trough for holding hot water. The plate is placed on top of this trough, and the water as it becomes cold is poured away, fresh hot water being put in to replace it. See China; Dinner ; Sink: Tea; Washing (T).
PLATE : In Photography. A plate is a piece of thin glass of standard size coated with light-sensitive emulsion for exposure to light in a camera. After exposure and development plates are called negat-ivcs. When the sensitive cmulsion is coated on a celluloid support the combination is known as a film.

There is a somewhat greater variety of glass plates than of films, both in the matter of speed or degree of sensitivity to light, and of the kinds of emulsion used. For this reason many amateur and professional photographers prefer glass plates to films, in spite of their greater weight and bulk. Nevertheless the use of flat films in addition to roll films has so increased that one company, the Kodak Co., has abandoned the manufacture ol glass plates.

Varieties of Plates. The varieties of plates which are of use to the amateur are stated in the following paragraphs.
Ordinary plates made uncler this title by most plate manufacturers are coated with plain emulsion and moderate in speed, and are very suitable for all-round amateur work if sufficient exposure can be given. They have a finer grain than faster plates, and therefore give good contrast and make excellent enlargements and lantern slides. They are not fast enough for snapshot work. Orthochromatic or panchromatic emulsions include dyes that give more accurate response to colour values than the plain cmulsions.
The plate sold as ordinary has generally a speed of about 70 H . and D. (Hunter and Driffield system). Other ordinary plates, i.e. with plain emulsion, but of higher speeds, are sold under such names as Rapid, Special Rapid, Ultra Rapid, Speedy, etc., and have H. and D. speeds of about $100,125,170,250$, 300, 400, 500, and 600. Even higher speed emulsions are now gvailable. Unfortunately not only are there different systems of calcula. ting plate speeds, but there is great difficulty in obtaining results which are scientifically consistent. Thus a batch of plates marked 200 H . and D. by one maker is not necessarily of the same speed as another maker's plates also marked 200 H . and D. This is the principal reason why the amateur is always advised to keep to the brand of plate whose qualities in working he knows by experience.

A speed number is not a reliable indication of the quality of a plate. As a general rule medium speed plates are more likely to be of high quality than very fast ones, although some of the most rapid plates give very good results. Experience can be the only guide in the choice of a plate, but for general use an extremely fast plate should be avoided. The slower plates have thicker emulsions than the faster, and are therefore freer from liability to fog, give better contrasts, and a wider range of tones. The faster plates have much thinner emulsions, and there is consequently greater
difficulty in manufacture to ensure freedom from fog, and to avoid lialation owing to the surface of the glass support being nearer the surface of the film. Fog is due to scattering of light over the sensitive surface of the plate with the result that a general greyness is observed in the negative which consequently gives a somewhat flat, grey print.

Many plates are now available designed to overcome halation troubles. One method is to coat the back of a plate with a black nonreflecting substance, such as caramel. Thesc plates are sold as backed plates. Another is to coat the plate with a matt emulsion. When developed, the negative has the appearance of being coated upon finely ground glass. For interiors with window-lighting, light coming through tree foliage, polished metal articles. and similar subjects which cannot be satisfactorily reproduced on ordinary plates on account of halation. thesc plates are very useful. Other anti-halation plates are available in which a special light-absorbing coating is placed between the emulsion and the glass plate.

For amateur purposes the sizes of plates best suited are the $3 \frac{1}{2} \mathrm{in}$. by $2 \frac{1}{2} \mathrm{in}$., the $\ddagger$ plate, and the $\frac{1}{2}$ plate, the favourite being the $\&$ plate. A better-shaped plate for general use, particularly for landscape work, is the standard continental plate, 9 cm . by 12 cm ., or a bout $3 \frac{1}{\frac{1}{2} \mathrm{in}}$. by $4 \% \mathrm{in}$. The following are standard Iritish, and continental sizes.

STANDARD SIKES OF PLATES

| Name | Size | Diggomal |
| :---: | :---: | :---: |
| - |  | 3 ln . |
| - |  | $41 \mathrm{ln} .$ |
| I.antern plate | 3 In. $\times 31 \mathrm{ln}$. | 41 in . |
| f-plate | $41 \mathrm{ln} . \times 3 \mathrm{l}$ | 53 ln . |
| Conitinental erini- valent of -plate | $9 \mathrm{cmin} \times 10 \mathrm{cms}$. |  |
| vaient ol d-plate |  | 6s in. |
| Poatcard | 6, In. $\times 34 \mathrm{in}$. | (1) in . |
| - - | ofiln. $\times 4 i \mathrm{ln}$. | \%if. |
| 1-plate | $01 \mathrm{in} \times 48 \mathrm{in}$. | 8 f in. |
| Stercoscopic | cîl $\mathrm{In} . \times$ till ln . | 71 ll . |
| Whole plate | 8 l in. $\times 01 \mathrm{in}$. | 101: ill. |
| - | $11 \mathrm{in} . \times 8 \mathrm{in}$. | - |
| - | $12 \mathrm{Im} . \times 10 \mathrm{ln}$. | - |
| - | $15 \mathrm{in} . \times 12 \mathrm{in}$. | - |
| - | $18 \mathrm{in} . \times 12 \mathrm{ln}$. | - |

The diagonals given in the above table serve as a guide to the size of condenser required if the plates are to be used in an enlarging lantern. All the sizes given are also standard sizes for bromide and gaslight papera and the sizes up to whole plate for P.O.P. See Developing; Film; Negative ; Panchromatic.

PLATE GLASS. In the processes of its manufacture plate glass is finished with a flat and true surfacc, and, being transparent and free from irregularities or surface niarkings, it is used for good-class windows. In the home plate glass is also used as a protective covering for washstands and the tops of tables. The surface is easily kept clean, and docorative material can be placed beneath the glass to add colour to the room. In the same way a well-polished piece of furniture or tray can be protected, and the grain and colour of the wood revealed.

Another application of plate glass in the home is as shelves in the bathroom, or for pastry making in the kitchen. Nhelves should have rounded and polished edges, and they aro generally supported by clectro-plated wail brackets.

Plate glass can be purchased from builders' merchants or first-class ironmongers, and has to be cut to size by the manufacturers. In ordering it is well to give the exact dimensions, or a full-size pattern of the piece required. The thinnest plate glass measures $\frac{2}{18}$ in thick. A usoful thickness is $f \mathrm{in}$., and this will generally be supplied if no thickness is mentioned at the time of ordering. Sec Glass.

PLATE MARR. Articles of gold and silver plate are marked with a set of symbols by certain recognized guilds or assay offices in the

United Kingdom, as a guaranten that the metal is of stinndard purity, and also to indicate the date. Thesc hall-marks on plate are a greater saleguard than pottors' marlis on chisa, and are always taken into account by rollectors Thry have no relation to the artistio inerits of the plate.

From 1784 to 1890 in Great Britain, and from 1807 to 1890 in Ireland, the sovereign's head was punched on all plate to denote that duty had been paid The duty marks of the three kings faced to the right, Qucen Victoria's to the left Duty-free pieces, intended for export, were identified by a figure of Britannia to prevent their being sent out of the country duty free and then inmediately brought bacl ngain. In $187 \%$ all imported plate marked at an English office wins required to bear the letter F, to indiente its foreign origin. In 1900 distinctive symbols for imported plate were prescribed, such as the constellation Leo for London, of Libra for Sheffield, and a triangle for Birmingham. See Silver.
PLATINOTYPE. In this process of printing pictures from photographic negatives tho final picture is composed of platinum, and is therefore of the highest degree of permanence.
When exposed behind the negative in a printing frame the picture gradually appenis as a la int brownish image on the yellow paper. Alter some practice it is ensy to judge when the paper has been sufficiently exposed; the detnil of the picture requires to be visible everywherc except in the highest lights, suclı as the sk.y. The paper is much more rapid than P.O.P., so that in bright daylight only $\longrightarrow$ or 3 min . are required for exposure.
The paper must be kept perfectly dry both before and after exposure and during printing. It is sent out by the makers in sealed tins containing calcium chloride, which keeps it absolutely dry. Unless the prints are to be finisherl off as soon as they have been made, they sloould be put in one of thesecentainers until the time arrives for development. The paper should be backed up in the printing frame with a sheet of thin rubber or oileloth or a piece of celluloid, in order to prevent moisture getting in.
Several varieties of platinotype paper are made, some for prints of black colour and others for sepia; different surfaces are also available. The former are developed in a cold solution, but for the sepia papers a warm developer is necessary.

The handling of the paper after exposure is exceedingly quick and simple. The print bearing the finint picturo is floated face down on a developing solution, which immediately causes the picture to flash up to its full depth. The print is laken off the developer for an instant and a picce of glass rod run over the surface, so as to ensure that every spot is covered by the developer. It is then allowed to remain floating on thic developer for a further half minute or longer. The developer consists of a saturated solution of oxalate of potaah, and it is important that this cliemical should the pure A specinl form of it is supplied by the Platinotype Company in packets requiring ouly to be dissolved in hot water.

## Washing the Print.

$\qquad$ As soun as develop. ment is complete the print is transferred, without washing, into the lirst of three baths of weak acid made by mixing 1 part of pure hydrodhloric acid in tio parts of water. Three lots of this solution are put in white porcelain dishes, and the print is nllowed to remain in each of the threc for about 5 min . The object of these baths is to remove the yellow iron sensitizing salts from the paper; unless this is done the prints will retnin a certain yellow stain. The teat for complete removal of the iron salts is that bath No. 3 remains perfectly water-white alter the print has bern
in it for 5 min If at the end of this time any yellow tint can be seen, bath No. I should be thrown away and its place taken by No. 2 . The latter is in turn replaced by No. 3, and a fresh lot of acid poured out for the third bath.
In working off a considerable number of prints it is best to allow them to remain for longer than is min., say 15 or 20 min., in bath No. 1 This will do no harm so long as there is plenty of the solution, a nd it will a void the necessity of replacing the third bath by fresh. Even in their weak state these acil baths render the paper somewhat tender, and care must be taken not to trar the prints nor to rub onc over another.
From the last bath the prints are translerred to running water and aro washed for about $1 \overline{\mathrm{~J}} \mathrm{~min}$. They are then laid out or hung up to dry, or can be pressed dry between blotting paper, or even dried quiokly hefore the fire, since there is no golatine coating on the paper.
With sepia papers the developer must be heated to a temperature of from $160^{\circ}$ to $170^{\circ} \mathrm{F}$., by putting it in a porcelain developing dish placed over a small gas ring. Sepia papers must be treated separately from those for black prints in the acid baths, otherwise the pure black colour of the latter will acquire a sepia tinge. For the sance reason black and sepin papers should never be kept together in the same container, nor should a dish used for sepia developer be afterwards used for the black papers. See Photography: Printing.
Platinum : The Metal. Of whitish. grey colour, platimum is generally to be found in tho native state, although it inay be alloyed with other platinum minerals It is used extensively for the manufacture of jewelry and objects of art, for various dental and medical appliances, and for several forms of clienical crucibles. Owing to the fact that platinum has nearly the same expansion rate as glass, it is employed in making many forms of electrical contact points and connexions for lamps and other fittings, especially wherc the conductor has to pass through the glass.
Platinum is used in jewelry chietly as a setting for diamonds. On account of the high cost of this metal, such a setting is usually backied with gold. Platinum needles, or points, as they are called, forin a part of every pokerwork outfit, and their uses in this connexion are described under the heading Polierwork.
PLATYCERIUM. This plant, which is commonly linown as the elk's-horn fern, is epiphytal in form and practically provides its own nourish mient. Its horn-shaped fronds are


Platycerium, or elk's-horn fern, a greenhouse fern with curioasly shaped fronds
fertile, but in addition to these it throws up tlat, broad, barren fronds, which spread upon thic surface; these decay, and provide substance upon which the plant survives.
Plants are best arranged upon blocks of wood, covering their roots with pent and inoss, and binding the whole firmly with copper wire. Thus prepared they may be suspended from the roof or other parts of a warm, shaded greenhouse, keeping them moist at all times, and top-dressing every year with peat and fresh moss Propagation is by offsets, with rootlets, thrown off at the base of the plant. and planted during March.
PLATYSTEMON. The common name of Californian poppy ( $\mathrm{q} \cdot \mathrm{v}$ ) is applied to the hardy annual, Platystemon californicus, and to various other tlowers The platystemon, which is raised from sceds sown out of doors in April where the plants are to bloon in summer, grows from 10 to 12 in . high, has grey-green leaves and bears pale yellow poppy-like tlowers.
PLAYER PIANO. The terms player piano and piano player are often used as if they were synonymous, which is not the casc. When the idea of playing the piano by means of a mechanical adjunct first became practicable, it took the form of a cabinet containing the mechanisin, which was moved to and from the piano as required This was the piano player. It had drawbacks in the way of adjustment, which inventors overcame by finding room for the mechanism in the hody of the piano, thus making the adjustment invariable. This is the player piano. Apart from certain differences connected with the altered positions, the principles of construction and management are the same.

The Mechanism. The principle of the player is pneumatic. The motive power is supplicd by a pair of treadles like those of the harmonium, whioh fill the bellows, the action being made to operate on the keys of the pianoforte. The notation for the player piano consists of a roll of paper having perforations in it. This roll is attached to the spool, and when the treadles are worked, it unwinds and passes over a tracker bar picrced with $8 \overline{0}$ or 88 holes corresponding to the notes of the ordinary or the extra compass pianoforte. When a hole in the roll coincides with a hole in the tracker bar, the note on the piano corresponding to it is made to sound.

Below the keys are if or more levers, or sometimes buttons, for various purposesrolling and re-rolling the music ; controlling the tempo: kassening the tone on either or both balves of the compass; and working the pedals of the piano; to which may be added one for controlling the melocly.
The player piano is an ingenious device for rendering pianoforte music without the aid of fingers (in a pianistic sense), but there is, however, not only ainple scope, but an absolute necessity, for individuality on the part of the operator if the elfect is to be musically satisfactory. The player piano has to be studied just the same as any ot lier instrument, and the first thing to be learned is how to use the treadles, for on this depends the various degrees of tone from pianissimo to fortissimo.
The possessor of a player piano should always buy good rolls, not only ns to the music cut on then, but also as to the quality of paper, for if this be poor and soft it will take up moisture from the air, swelling to such an extent that exact tracking and accurate playing will be out of the question. The roll can be dried. but it is hetter to buy the best only. It is cheapest in the long run, as with careful use a roll should last a long time. In buying a second-hand instrument it is best to get someone who unclerstands players to test it thoroughly before clinching the bargain. See P'iano.

PLAY PEN : How to Construct. Suitable either for in or out of doors, a play pen is useful for assisting a baby to walk. For convenience in carrying it about, the pen should fold up in a small space, and, although it should be strong and rigid, the method of construction must allow of the use of comparatively thin material.
The play pen illustrated in Fig. I has 2 long and 2 shorter sides, the latter being hinged together in the centre and nlso linged at each end to the long sides, so that they fold inwards and allow the sides to closo up. First prepare four 48 in . lengths of birch or whitewood to $1 \frac{7}{8}$ in. by $1 \frac{1}{8}$ in., and, if the materin is purchnsed especially for the purpose from a timber yard, order some 2 in. by 1 i in . mnterial to be machine-planed on all sides, which will bring it to the approximate size. In addition, nbout 53 lengths of 8 in. birch dowels, 24 in. long, and another 12 ft . of the $1 \frac{1}{8}$ in. by $1 \frac{1}{8}$ in. wood will be sufficient.
Place 2 of the 48 in . lengths together, and, beginning at the centre, set off $1 \frac{1}{2} \mathrm{in}$. each side, and follow with 3 in. marks across the edges, making 16 marks in all and leaving a 1 d in. space $n$ t each end. Draw a line along the centre of the whole length and bore centre or twist bit holes to a depth of $\frac{3}{3}$ in., but first make sure, by testing, that the hole is a tight fit for the dowels. The total height of the pen is to be 24 in . over all, so that the depth of holes and length of rods must be carefully gauged throughout the job. On the remaining 2 lengths draw a line along the ventre. Place them together, and this time commence marking 3 in . spaces $7 \frac{1}{2} \mathrm{in}$. from the centre, which will give 12 centre marks for the holes. In one length, which will be the bottom one, set out 2 minks 4 in . from the centre; the corresponding space in the top piece is left plain. Bore holes as before Then plane off the corners of top lengths and at top of bottum lengths, round the ends and finish quite smooth. The 2 lengths with the 16 holes nre now glued up, the dowels being cut off to 218 inches.
The section at Fig. 2 shows the shape of the top pieces with the dowels in position. When the round rods of the other long side are in position, there will be a space of 15 in between the 2 inner ones, this is to allow for the bead frame. The method of making this part is to trim the ends of a $15 \frac{\mathrm{~g}}{\mathrm{~g}} \mathrm{in}$. length of dowel for the horizontal piece, A, as in the section at Fig. 3, and three 11 ? in . lengths for the vertical rods at B. Holes of $\ddagger$ in. diameter and $z_{8} \mathrm{in}$. deep are bored in the 2 up. rights ilt in. up, and others corresponding to those at the bottom in the horizontal length, and the trimmed ends of rods fitted in.
Three 158 in. lengths of $\frac{3}{16} \mathrm{in}$. brass rod are next fitted in the upper part of the inner uprights ns at C Fig. 3 and 18 coloured glass or wooden lends threaded on, 8 on the top. 6 on the centre. and 4 on the lower rod. The side can now be glued up, provided all corners have been rounded and smoothed with glass paper.
An alternative method of securing the short lengths of dowel is to file $n$ hollow on the ends and screw them together as in Fig. 4. Instead of using round wood for the uprights and centre bar. $1 \frac{1}{8}$ in. square wood can be mortised and tenoned together.
For the ends, cut off 8 lengths of $16 \frac{7}{8} \mathrm{in}$. by $1 \frac{7}{7} \mathrm{in}$. by $1 \frac{1}{8} \mathrm{in}$. wood,
place them together, and set off 3 in . marks from one end; these will fit next
the side. Draw centrc lines and bore the holes for the dowels as before, ench length having five holes. Round the top lengths to match those of the sides as shown in the scetion at Fig. 2, nnd take the corners off the underside and on top of the bottom lengths. Dowels can then be fitterl and glued to give a total height of 24 in ., as with the sides.
Before the corners are hinged together, ns at Fig. 5 , with $1 \frac{1}{2}$ in. by 1 in. back flap hinges, the 2 halves of the ends are hinged with similar hinges on the outside, ns shown in Fig. 6. In addition to the hinges, it is necessary to fit locking plates on the top bars; these are made from shect iron or brass 5 in. by 1 in . by $\frac{1}{d}$ or $\frac{3}{8}$ in.
The screw holes are drillell at one end, and a $\frac{1}{4} \mathrm{in}$. bolt soldered to the other through a hole drilled $\frac{1}{2}$ in. from the end, the end of the plate being rounded as in Fig. 7. The plate is screwed to one half of the rail, and the bolt fits in a hole in the opposite half, being held by a wing nut as in Fig. 8. The centre for the hole should be accurately marked from the plate and bored right through the top rail; but to allow the bolt to enter, the wood is cut away with a chisel at a slant on the inner edge of the hole, as shown in Fig. 9.
In order to prevent the loss of the wing bolts, a groove should be filell round each, and a length of brass wire with an attached loop fitted on, the ends being soldered, so that it will move but not slip off. A length of chain is attached to the is attached to the
loop, as in Fig. 10,
and fastened to the top rnil. The woodworls if quite smootl should be sized and varnished, or it may be enamelled white. The metal fittings, with the exception of the rods in the bead frame, should bo conted with black enamel, but care must be taken that the rough edges of the hinges and locking plates are taken off with a file and smoothed up with emery cloth. See Baby : Nursery.
PLEATING. One or more folds of material pressed flat and held in usually at the upper end only, allowing the lower one to open and give extra fullnes 3 when required, is called pleating. The arrangement of folds to form pleating is used extensively in dressmaking.
Different kinds of pleating arc suited to heavy or light materials. Kilting and boxpleating are gencrally employed for the former, while a finely woven material should be chosen for accordion pleating, as otherwise it is diffcult to keep the pleats in place.
Inverted pleats or box pleats are made as shown in Fig 1, quite close together. In the case of plealing for a skirt a piece of binding or taps is usually placed at intervals of about 6 in. ncross the inner side of the pleats, nnd tacked to each one to prevent them opening and coming out of shape. Crêpe-de-Chine, georgette, or any light woollen fabrie can be accordion or knife pleated with success. Accordion pleats are rather difficult to keen in place. Knife pleats (Fig. 2) may be tacked into position and pressed flat.
Pressing the Pleats. When pleats become creased or lose their shape, the garment should


Fiǵ 8
Fig. 10


Play Pen. Fig. 1. Folding play pen with two long and two short sides. Fig. 2. Shape of top with uprights in position. Fig. 3. Section showing bead rods and method oi securing uprights and rail. Fig. 4. A.lternative mothod of fastening uprights and rail. Fik. Top 8 and 8 . Method of making and fiting locking plate. Fig. 10. Wing nut with wire chain fastening


Pleating Fig. 1. Inverted and bor pleating. Fig. 2. Knite pleating
painted with a mix. ture of equal parts of the tincture and the liquor of iodine. Drugs such as potas. sium iodide, the salicylates, etc., are usually given. Aspiration, or removal of Huid through a hollow needle inserted by the physician into the pleural sac, is a common remedy in this disease, notably in the chronic form. Exercises to expand the lungs ahould be practised. Iron tonics and cod liver oil are useful, and a few months' residence
tacked into place, and the whole covered with a clean, damp cloih. Press this heavily and evenly with a hot iron unt 1 it is dry and the steam ceases to rise, and the pleata will then be found neatly pressed. If the pleats are many, the process should be done in stages, two or three pleata being pressed at a time. The jron should not be too hot, otherwise the covering cloth may be dried before the pressing is finished, or the garment beneath may be badly singed. If the result is not satisfactory, the cloth may be damped again and the process repented. Box pleats are the easiest to press, but the finer kinds and sunray pleating, in which the pleating widens towards the base of the garment, need to be arranged skilfully, and in a great number of cases are best sent away for professional treatment.
Pleated frilling in net, ninon, and voile becomes $\operatorname{limp}$ and shapeless when washed, and requires special skill in ironing to restore the original pleats. Some of the laundries specialize in dealing with pleated and frilled garments and return them in an almost new sondition. See Accordion Pleating; Box Pleat.
PLEIONE. To-day classified as Coelogyne by botanists, this genus of orchids includes some very pretty species. One of the best for cultivation in a cool greenhouse is maculata ; its flowers are fairly large, with attractive markings of yellow and orimson upon white, and these are borne in autumn, appearing while the plants are leafless. See Orchid
PLEURISY. Pleurisy, or inflammation of the pleurae, the membranes which line the chest cavity and cover the lungs, often follows a chill, but this is only a predisposing cause. The active agent is the germ of such diseases as diphtheria, typhoid fever, pneumonia, and especially tuberculosis. The attack may be of the dry type, or fluid may accumulate in the pleural cavity.

In dry pleurisy a severe cutting, stabbing stitch is felt under the armpit or around the nipple, but it may be above the collar bone or on the abdomen. Any movement of the chest greatly increases the pain. Vibration may be felt wherp the hand is laid on the chest. The patient lics on his back, or very often on the healthy side, because pressure on the affected side causes pain; when the pleura becomes filled with fluid he usually lies on the affected side so as to have full use of the healthy side.

Pleurisy with effusion, being commonly caused by the tubercle bacillus, is often fol lowed by consumption of the lungs. much fluid fills the pleural sac, it may causc bulging of the spaces between the ribs, and the heart and the abdominal organs may be displaced.
In the dry stage the chief aim of treatment is to relieve pain. For this purpose apply linsced meal poultices, hot fomentations, turpentine stupes, or a mustard poultice. In the effusion stage the affected side is often
at a mountain resort is very beneficial in most cases. See Lung.

PLEURO - PNEUMONIA. This term means, with reference to human beings, a combination of pneumonia and pleurisy. The term is more properly applied to a disease which is very fatal to cattle but does not affect human beings. See Pneumonia

PLIERS. Of the many patterns of this tool there are 3 that should be found in every amateur's tool kit, and these are: side cutting, gas and round-nosed pliers. The first, generally made with Hat jaws and with cutting edges at the sides, are used for snipping of wire. Gas plicrs, made with serrated, circular, internal jaws, are for gripping pipes and rods. Round-nosed pliers with tapered jaws are indispensable for forming eyes at the end of wire and for other purposes, such as bending wire and thin sheet metal.

Electricians' pliers are made with heavily insulated handles to protect the worker from electric shock. Small flat-nosed pliers are bandy for bending thin metal. Cone pliers, which resemble gas pliers, are used for tightening cones on a bicycle. See Leather Work.

Plimsolls. This word is sometimes used for the rubber-soled shoes worn by children and known also as sandshoes.
PLINTH. As employed in architecture a plinth is the base or alab on which a column rests. The term is also applied to the same part of the construction of a base for a statue or pedestal. In another application the word is used to describe the upper projecting course, or cornice, of a wall The word is also used in a similar sense by the woodworker. See Chest of Drawers: Cupboard.
PLOUGH: The Plane. A plough is a woodworking plane designed to make a groove on the face of a board parallel to an edge. The bardwoorl body of the plane is furnished with a stcel sheet, or blade, projecting down-


Plougb Plone. Simple type used for making a groove to tate isid in. plywood Inset, right, sectional view of the plane Courlesy of Handicrafls, Lid. cress and cut lemon.
ward, which is divided so that the cutter, or iron, can pass through : the blade is thinner than the width of the narrowest iron to be used. Two bars pass transversely through the body of the plane, and carry a hardwood block, or fence, adapted to bear against the edge of the board.

In use the bars are pushed through the planc body and locked by wedges, so that the distance from the centre of the iron to the face of the fence is equal to the required distance from the centre of the groove to the edge of the board. The width of groove depends on the size of the iron chosen. The amount cut at each stroke is regulated by the amount that the edge of the cutter projects below the bottom of the blade: the iron is locked by a wedge aftes being adjusted as required. The total depth to which the groove is ploughed out is regulated by an adjustable stop below the plane body.

The tool is pushed along the work repeatedly till it reaches the required depth. when it


ceases to cut owing to the operntion of the stop. While cutting is in progress the fence is kept up against the edge of the work so that the groove comes in the right place. The tool must be so held during the cutting process that it is kept level laterally. Two useful types are illustrated. Ses Planc.

PLOVER. Plovers arc almost invariably roasted, the directions being the same as those given for rousting game. While cooking, they must be kept well basted, ot herwise they will he found too dry. They may be drawn or left undrawn, but whatever the method adopted, the livers must be left inside. The time required for cooking is about 20 min ., and the bird should be served on small rounds of fried bread Garnish with water-

Plovers' Eggs. The eggs are of a rich flavour, and are regarded as a delicacy. Though sometimes eaten hot, they are better cold, and, ufter being hard boiled, should be left in cold water until they are to be served. They may be served on small ovals of bread and butter, and garnished with cress or salad and maitre d'hotal butter. If the egga are preferred hot, they should be reheatel in some suitable sauce and served in it. See Game.

PLUG: In the Wall. Before any fitment can be attached to a brick, breeze block, or plaster wall, holes must be made to take plugs in which the naila or screws can be driven home. For many of the jobs about the home the patent. fibrous plugs offer the most convenient means of doing this. The plug consists of a short piece of specially prepared fibrous material, through the centre of which is a
small hole. In the material in which the scmiv is to be inserted a suitably sized hole is made with a drill or jumper, the plug pushed into it, and the screw driven into the plug. The effect is to cause the fibre to open and expand, therehy firmly grippinge the walls of the hole in the walls, etc The plug can be applied to brickwork. atone, or plastet, and is a practical means of fixing a great number of articles in the home. Some care is needed in miaking the hole. A jumper of the proper size for the plug should be employed, and the latter must be the one intended to be used for the particular gauge of screw employed. Do not attempt to drive the tool straight into the wall, or the outside edges of the wall will probably be cracked and break off, leaving an unsightly mark. Hold the jumper lightly in the left hand and strike the tool a series of sharp, light taps, slightly turning the tool in the hole after each tap. In this way a perfectly round hole can he formed in the wall without damage. The tool should not be forced, and it should he held straight out from the wall, or perpendicular to it, as in Fig. 1.

Having prepared the hole to a depth suited to the screw, a plug of the required length is inserted in the hole, so that the end is flush with the wall surface. The length of the hole, and consequently the plug, will vary with the article to be fixed. Suppose, for instance, the fitting is $f$ in. thick. If the article were not very henvy, a $1 \frac{1}{2}$ in. acrew would probably he sufficient, leaving 1 in . of the screw to fit into the hole in the wall. In this casc a plug 1 in . long, fitted into a hole about the same depth, or alightly more, would be needed. The next step is to insert the screw through a suitable hole dilled through the article, and into the hollow centre of the plug fitted into the hole in the wall. The screw should then be screwed up tightly with the aid of a suitable screwdriver

The holes for a rail or other like article should be bored in the wood and the positions of the holes carefully inarked on the wall. The plug holes must coincide exactly with these, and the screws must enter the plugs accurately, centre to centre, or the plug may split. The screw must be of wuch a length that it can be driven home, and thus hold the


Fig. 4. Rough bole chipped out with cold chisel Fig. 5. Driving wooden plug into hole


Plug. Fig. 1. Making bole for flbre plug with borer. Fig. 2. Inserting f bre plug in bole made in plastered wall. Fig. 3. 8howing bow screw enters the bollow centre of the plag
ahorter in length than the screw, and to drive the plug in so that it is below the surface of the wall. This preventa the unthreaded portion of the screw from entering the hollow of the plug, and thus facilitates the screwing-up operation. An alternative is to use screws which are threaded right up to the head, when the plug can be fitted flush to the surface of the wall as usmal. This type of screw is required in fixing thin metal fittings, such as brackets, mirror plates, and hangers.

It is often necessary to plug a brick wall to provide a fixing for rough grounds, henvy shclves, etc Where the joints between the
bricks are visible it is generally possible to cut out the mortar Prepare a hardwood plug equal in width to that of the hole and about 3 in long, and drive it into the joint along the way of the grain, so that the end grain is facing out of the hole. The wood should be tapered, and is driven in tightly with a hammer. The joint may then be made with neat cement.
If it is necessary to place the plug in the brick itself, or in a plastered brick wall when the joints of the bricks are not visible, the hole must firat be ohipped out with a cold chisel, or brick boner, as illustrated in Fig. 4. The rough hole thus formed is drilled out smooth, and a softwood plug driven into the brickwork, as in Fig 5. If the plug is niade to proper length, which is slightly less than the depth of the hole, it will only have to be driven in flush with the wall, otherwise the protruding end may be sawn off with a hand saw, interposing a piece of zinc between the aide of the saw and the wall to prevent scratching the latter

In plugging a concrete wall it is necessary to chip out a hole in the concrete, making the hole wider at the bottom than at the mouth. The plug should be split at the top and provided with a wooden wedge, which is first placed in the hole; the plug is then introduced so that the wedge goes into the slit, and the whole is driven into place. The wedge will expand the wood plug at the back and cause it to grip the concrete. As an extra precaution, the hole may be loaded with plaster, or, priferably, cement, hefore driving the plug in, so that every crevice is filled with cement.

When making holes in walls for plugs, care must be taken to avoid gas and water pipes, or the casings of electric light cables that may be embedded in the plaster work. When plugging into brickwork, especially near the fireplace, the hole must not go too near a Hue, or the plug may takefire. See Gas.

## Plums: The Garden Varieties

## The Growing and Cooking of a Delicious and Serviceable Fruit

Thls article deals firstly with the growing of plums and with keeping the freces frec from insect pests. This is followed by entries that describe the making of various plum dishes. Sec furiher Fruit; Grafting: Pruning: the articles on other popular fruits, e.p. Apple; Cherry: Pear; also Bottling ; Bullace; Cordon: Espalicr; Grcengage ; Jam ; Silyer Leaf; Spraying, etc.

The plum is one of the most useful of late summer and early autumn fruita, and if correctly managed will yield satisfactory crops unless climatic conditions are very unfavourable when the trees are in blossom in spring. Many of the dessert plums are self-sterile, and unless other varieties are planted near them they will not bear fruita freely. A mixed plantation is indispensable to success

Plum trees may be grown in the open garden in the form of hushes or standaids, or as trained trees on walls; they are also grown as cordons, but are not an suitable for this method of training as apples and pears.
During the first few years after planting plum treos usually grow very vigorously but hear little fruit. Orchard standards, which eventually form large trees, must be allowed to grow freely and much fruit cannot be expected from them for several years. But by correct manageroent bush and trained trees can be made to yield in their early years

Plum trices thrive hest in well drained loamy soil, especially that which overlice chalk. In preparing sites on clayey land the sub soil should be broken up to provide drainage, moitar rubble should be added very
frecly, and lime ahould be applied Manure
ought not to he mixed in and the trees must be planted with their uppermost roots 2 or 3 in . below the surface. Every autumn for the first three or four years it is a good plan to lift young plum tiees. shorten the thick roots, and replant at once. On light land, loamy (turfy) soil should be placed about the roots at planting time.

The following are some of the best cooking plums Although all are sclf-fertile varieties it is, nevertheless, safcr to have a mixed plantation than to rely on onc or two varietiea only Czar, blue-black, August; Gisborne's, greenish yellow, August; Monarch, large, dark purple, Sept. Oct : Pershore (yellow egg plum), vellow. August: Victoria, rose-red, Septeinber Other cooking plums to bc recommended for a mixed plantation are Pond's Seedling, a large reddish fruit ripe in September, and River's Early Prolific, small purple, late July.

There arc some delicious fruits among the desnert plums, but as a rule they do not bear so frecly as the cooking varicties and ought always to he interplanted with the latter. Some of the most reliable are Coe's Golden Drop, vellow, September, which does best on a wall facing weat ; Comte d'Althan's Gage,


Plom. The variety $\begin{gathered}\text { Victoria, as a a } \\ \text { bearlog large pink frult }\end{gathered}$ reddish, Sepicmber; Denniston's Suplerh Gage, greenish, Auguat ; Early Transparent, Gage, yellow and crimson, August; Jeffereon, yellow and red, September: Ou'lin's Golden Gage, yellow, August : and Stint, small, yellow and red, August.

Pruning the Trees. Plum trecs need very little pruning; indeed, they are usually worse for much cutting. One reason is that they are addicted to gumming, and nothing is more likely to bring a bad attack of this, particularly in a mature trained tree, than severc pruning. The pruning necessary for the training of the tree should therefore be done at a very early stage, and nifter they have become established they should be pruned as little as possible. Repeated bard shortening should never be practised with open-healed trees, whether dwarfs or standards, as auch pruning is apt to result in the production of a large number of soft, whippy shoots, none of which will be found suitable for an extension branch.
Summer pruning may be applied to the new lateral shoots of plums. Matured trees
need little pruning, an ve the occasional removal of $n$ branch here and there if the head threatens to become too thick Trained trees, whether cordons, fans, or horizontals, will produce a certain ainount of breastwnod from the main hranclies, and the course of pruning in this case is the asme as with similar trees of applos and pears, namely, summer pruning and winter spurring
Pests and Diseases. The plum, in conmmon with other fruits, has numerous enemies. It escapes the canker which is often so deadly in apples, but falls a victim to the still more destructive silver leaf, which attacks trees at all ages, but is most dangerous in old trees There is no relinble remedy. The trees should he grown in well.drained, substantial soil containing lime, proned little, and maintained in as healthy a state as possible, according to the circumatances and the means at disposal. Beyond that, prompt burning of badly affected trees is desirnhle. Everỳ bit of deail wood should he burned, as it carries the spores which spread the disense.

Caterpillars are sometimes injurious, and in the presence of an attack the trecs should be promptly sprayed-but not while the trees are in bloom in case of injury to the treeswith a solution of arsennte of lead, 1 lb . in 25 gallons of water.

Gumming is liable to cause trouble in plums. as in other stone fruits, esplecially if the soil is undrnined and very loose and rich, or if much winter pruning is done. But trees grown in well-drained, fertile soil, and pruned by summer pruning or branch thinning in summer, instead of winter pruning when there is very little sap moving, ecldom gum. Grcen and blue flies (aphides) sometimes chock plums severely. especially in dry aprells, and curl the lenves One of the general winter sprays, such as lime, limesalt, and lime-sulphur. tends to keep down aphides; but if an attack has to be fought directly, a paraffin and soft soap emulsion is excellent, and the lest remedy of all is $1 f$ oz. of commercial nicotine and $i \mathrm{lb}$. of soft roap in 20 gallons of water. To be efficacious this mixture must be used very hot.

How to Cook. To stew plums, remove the stalks and wipe the fruit : then put them in a stewpan with $6-8$ oz sugar and $\frac{1}{2}$ pint water to 111 . plums The amount of sugar varies with the kind of plum employed and the degree of ripeness. Let them simmer until soft.
Another way of preparing nlums is to bake them in $n$ jar. First skin the plums. If they are ripe, the skin will peel off; if not. they will first require scalding. A fruit knife should be used to draw off the skin. Put them in a stone jam jar or crock, with the sugnr on the top and just a little water, and bake until tender

Except that plums are used instead of spples, the method of making plum charlotte is exactly the same as for apple charlotte (q.v.). For pie, flan or tart pluins should be ripe or partly stewerl first with sugar and allowed to get cold Otherwise the pro. cedure is the same as for other fruits when making these dishes.

## Plum Jam. To every

 lb. of plums used in jam-making, 3 lh. sugar is required. Wipe andstalk the fruit, put it into a precerving pan with the sugar, nnd cook slowly until the Inatter has dissolved. Kcep the jam well stirred so that it will not burn, and when the sugnr has melted bring it to the boil, boiling it for 3 hour or moro. In the course of cooking most of the stones will leave the plums; these should be taken out as soon as they appear. and if they arc cracked, the lierncla hlanched and then put back, the jam will be improved

To make plum and apple jam peel nad core 4 lb apples. cut them into rough pieces, add $7 \frac{1}{2} \mathrm{lb}$. sugar, and bring them to the boil in a preserving pan. [ut in 6 lb . plums. Boil fast, removing the scum, until the syrup jellics when coolod on a plate. This should take about an hour. Pour the jam into jars and tic down the jars when the contents are cold.

Plum Solid. This sweet can be made with any kind of ripe plum. For it take 4 oz . granulated sugar. a lemon. I oz gelatine. and 8 fint water


Plum Two specimens of Orpington Prolitic purple dessert plum of delicious flavour
to ench lb. plums. A glass of claret and a stick of cinnamon an inch long may be added, or instend of the cinret almond essence many be used for flavouring.

Having wasled and stalked the plums, put them into a pan with the water, the sugar, the cinnamon and the rind of the lemon thinly peeled. Simmer them until tender, strain off the liquid and rub them throughasieve Melt the gelatine in the plum liquor, straill this into the puree, ndd the clarct or essence, and reheat the mixture. It should then be poured into a basin and stirred frequently until cool.
When cold turn the mixture into a mould that has been rinseal out in cold water, and Icave it until it is sct. Then turn it out into a dish and decorate it with chopped almonds or pistachio nuts and some Devonshire cream.
PLUMBAGO. This group of climbing half-hardy shrubs is suitable for cultivation under glass and of herbaceous perennials for the garden. For the former purpose the chief favourite is the Cape leadwort. Plumbago capensia n lenf-losing climbing shruh for the


Ylumbago sarpentae, a cuarming blue-Howered plant for a sunny place in the rock garden


Plumb Bob and Line in pase simply a smooth piece of string or cord, fairly thin and of aven texture, to the lower end of which is attached a plumb bob. It is used by surpending it and allowing it to hang down freely. It will then naturally assume a perfectly vertical position as soon as it has come to rest.

It is used for comparing upright parts of a structure, udjusting them to the line so that they thenselves will be upright or plumb. All such operations as setting up doorposts, comer posts of buildings, nnd so forth, should be checked by the plumb ling to make sure the vertical members are perfectly upright. When not in use, the line should be coiled up on a reel, wound on to a spool, or wound around a stick, and preserved in the tool chest or other convenient place.

There are various patterns of the bob, rang. ing from simple ones which are merely plain lead costings to instruments made of brass and filled with lead, accurately machinel and finished. The illustration shows a typical pattern in use and indicates the method of handling it.

A plumb line is easily extemporised from a piece of smooth string to the lower end of which is attached any weighty object of nymmetrical form. A henvy lead sinker, as used by anglers, could be employed, or a large hexagonal nut with the string passed through the hole in its centre.

A plumb level comprises a combined plumb rule and spirit level It has a vertical bubble tube for plumbing upright work, in addition to the usual tube in horizontal position. Another type can be used with a plumb hob for vertical work. See Brick; Plumb Rule.
slightly hented greenhouse: it bears bunches of lovely pale blue flowers in summer. It is usually planted in a border of lonmy soil. but may be grown in a fub or large flower pot; it should be pruned in February. Cuttinus can be made from the fresh shoots in spring. Plumbngo rowen, which bears rosc-coloured Howers in winter, needs the temperatuie of a hothouse
Of the herbacenus perennials the best is Plumbango larpentae. n beantiful plant 12 in. or more high, suitable for a sunny spot in the rock garden or at the foot of a low wall ; it needs sandy, loamy soil The rich blue lowers open in August-September, and the leaves colour well. It is increased by division in spring.

## PLUMBAGO: The

 Mineral. This is another name for graphite, a form of cartion. It has many applications as a lubricant Plumbago is a conductor of electricity, and in electro-plating work it is used as n preliminary conting on non-conducting materinls, such as india. rubber, which have subsequently to be electroplated. Crucibles are made of plumbago. as they stand the hent of the furnace, and are extensively used for the melting of metals.PLUMB BOB AND LINE. 'l'he plumb line is piece of string or cord,
2
lin line are used for measuring and setting chall work I wrench hammer and gas pliers are required for dealing with nuts and collars, cspecially those found on hrass or iron pipes.


Plumbing. Fig. 1. Plumber's tools. A, dresser. B, gas tongs. C, wood blocks. D, saips. E, wrench.



 branch pipe to main pipe. Fig. 8. Building up solder around joint. Fig. 9. Finished wiped joint
pipe is to form a round hole in the pipe wall. After filing, the hole is scraped into a funnel shape. Fig. 7 shows the branch pipe fitted into the main pipe. The meeting and joint faces of the pipes are acraped clean with the shave hook, and subsequently the solder is melted around them, as in Fig. 8, and allowed to run on tho joint. About 1 lb . of solder is required, nnd when it is being applied the final shape of the joint is borne in mind.
The main pipe is secured by a nail and a piece of string to a temporary block of wond, so as to raisc the pipe from the wall or other backing. The main pipe should be bent or closed up ao as to grip the branch pipe. Fig. 9 illuatrates the saddle joint complete. The inain pipe has been straightened; but at least 20 min . must be allowed hefore straightening to permit of the joint cooling uufficiently. The pipe is straightened by careful bending with the hands and lightly atriking it with a wooden mallet.

This class of joint is employed when it is required to run an additional branch, as for exainple for the supply of water to a tap over a copper, or some other position. Where it is necessary to make several bends in the branch pipe thesc should be worked beforc it is attached to the main pipe. Fig. 10 shows the
firmly in the groove,
plumber's dresser, which is resting on top of a trestle to allow free movoment and space in any direction. Care must be exercised not to distort the section of the pipe to any extent. This is avoided by careful manipulation of the pipo, gently hammering the sides wherever it exhibits any tendency to flatten. The hammering is done in order to drive the pipe back from an oval section to the proper circular shape.

When a sharp) bend is to bo made, the amateur may get good results by the method illustrated in Fig. 11, where a sharp bend in a pipe is made for a square corner of $n$ rough piece of wood, in which a groove has been cut to the width of the pipe. The walls of the groove should be upright and exactly the diameter of the pipe, so that the latter is gripped and this tends to


Plumbing. Fig. 10. Bending a pipe over the dresser. Fig. 11. Showing how a sharp bend is made in a pipe
cad as the work proceeds, rendering a lurther heating of the joint unnecessary.

There are one or two pointa that the amateur plumber should bear in mind. The water supply companies have stringent regula tions governing piping ard fittings connected to their mains, and only materials and fittinga of an approved specification may be employed. Local authorities also have regulations which must he complied with, especially as regards any work connected with the sanitation system. Some require that the work shall be done by a registered plumher The advice or assistance of a competent person should be obtained before undertaking any task other than that dictated by cunditions of emergency.

Plumb Level. See Plumb Bob.
PLUMB RULE. The plumb rule is employed for testing the uprightness of a structure. It comprises a piece of board with a pear-shaped hole at the botton of it A line is scribed down the centre of the board, and near the topa nail or peg is fixed, to which is attached a strong, smooth, and tine string, the lower end of which is weighted with a pearshaped piece of lead, which ewings clear in the pear-shaped hole cut in the boaril. To prevent the string of the plumb from dangling about, a strap of leather or some other material is fixed acrass the board just above the opening, and is so arranged that the string can swing clear, hut not to too great an extent

The illnstration shows the method of use. which is in hold the board against the object to be tested, and to judge its uprightness. or otherwise, by the line of the string in


Plumb Rule in use to test uprightness of door lining relation to the line scribed on the board. If the structure is out of plumb, that is, not vertical, the upper end of the bonrd will lean outward. or in. ward, and the hoh will tend to swing over, and the string will not coincide with the scribed line. In testing a curner of brick. work, or when orecting a corner post, a timber structure, or a door pust, it is neccssary to test in two directions, npplying the pluinb rule to hoth faces of the work, as it may he up,tight in one direction but not in another. Adfustmentsarc made to the work until the string hangs exactly in register with the sctibed line on the board

A plumb rule can be made up by any amateur from a piece of board about 4 ft . long, 6 in. wide and $\frac{1}{2}$ in. thick The line must be ecribed in the centre of the board, exaotly parallel to hoth


Plumbing: repairing a gutter. Fig. 12. Cracked gutter beforo repair. Fig. 13. Gutter cut across and raised, and groove cut in gutter board. Fig. 14. Melting lead solder iuto groove and joint. Fig. 15 Surface of molten metal being levelled flush with the lead
the outside edges. The hole is cut out with summer. They thrive in ordinary soil in a sunny a pad saw or keybole saw, and the edges place and nre increased by division in autumn. smonthed off with a gouge or sandpaper The favourite kind is Bocconia cordata.
The line is twisted into three saw cuts made in the topi end of the rule, one central and the others at convergent angles. as shown. See Plumb Bob.

Plum Cake. Cakes containing raisins are often sjoken of as Plum Cakes See Calie.

PLUM DUFF. Tomake this plain hoiled pudding, which is also known as spotted dog, chop up very finely $\ddagger \mathrm{lb}$. suet and mix it thoroughly with $\frac{1}{2} \mathrm{lb}$ flour to which $\frac{1}{2}$ tenspoonful baking-powder has been added Add also $4-0 \mathrm{oz}$. well-cleaned currants, 1 oz . sugar, and a pinch of salt. Mix together with a well-beaten egg, adding a little milk if neccseary. Scald and tlour a puclding cloth, put the mix. ture into the centre of it, andeither roll it and tie it at either end, or tie it on top. In cither case leave plenty of room for the pudding to swell Drop the pudding into boiling water and boil for 2-3 hours.
PLUME POPPY.
This is the popular name of bocconia, a group of vigorous hardy herbaccous pereminials, 6 ft. or more high, with decorativegreygreen leaves and plumes of small pale tlowers in late


Plymouth China coflee pot, dating from 1763-70 Brltish Museum

Plum Pudding. See Christmas P'udding
PLUSH. A longer pile distinguishes plush from velvet. Mohair plush is cheaper than silk plush and is sometimes used for covering large pieces of furniture. Teddy-bear plush is obtrinable a hout 50 in wide.
Linen plushes can be had for making curtains, but their pile is more easily flattened down than that of silk or hair plushes Hatter's plush, made with a laid pile instend of an erect pile, and intended for covering silk hats, is a distinct variety. See Upholstery.
PLYMOUTH CHINA. The interest of Plymonth china for the collector lics in the fact that it was the carliest true or hardpaste porcelain to be produced in England of English materials. As it was being made for a few years only before 1770, when its inventor, W Cookworthy, trans. ferred his activities to Bristol, it is not easy to come by, and is also sometimes difficult to distinguish from Bristol ware. The sides of the vessels from both factorics frequently show n spiral ridge, due to a defect in the throwing. But Plymouth ware can often he identified
by a characteristic amoky atain in the glaze, comparatively free from risk of warping as well as by its high polish, and also by the cold, grey tint of the underglaze blue.

The pieces to look for arc cups with folinge reliefs, statuettes, shell-shaperl salt-cellsra, and oyster and pickle stands. These are cither plain whito or with blue decoration, which was alan done on mugs, arucers, sauceboats. and full services Ennmelled designs were painted on plates, teapots, vascs, and ligures, those comprising birds and llowers having been done sometines by a French nrtist from Sevres.

The usual mark, in underglaze blue or cnamel colours, resembles a combination of 2 and 4 , being the alchemists' symbol for tin This appears in gold on some of the finest pieces, which perhaps belong to tho Bristol perind of Cookworthy's work. Sce. China.

PLYMOUTH ROCK. One of the most popular breeds of poultry is the Plymouth Rock, which is generally spoken of ns tho farmer's fowl. This bird has a large frame which carries plenty of meat. It is $n$ good, especially a good winter, layer. The hena are most excellent mothers, and the chicks am hardy and quick in maturing.

The Plymouth Rock is bred in 6 coloursbarred, white, black, blue, buff, and golden barred, the latter being tho lateat to appear The barred has a greyish, bluish-white ground colour with glosay steel-blue bars running across. These bars must be distinct, even, and narrow. The chicks are greenish grey with pnle cream under parts, or very dark, almost black, top colour, with a small apot of a light colour on the head

Whites are pure white right through, the chicks creamy white. Blacks are a rich lustrous beetle-green black, the chicks black and white. Buffis are a sound even shade of soft lemon buff, the chicks buff. Blues are of an even slaty blue throughout, the chicks bluc and hlue and white The golden barred are as the barred, except that the ground colour is two shades of golden buff, the chicks buff. See Fowl; Poultry.

PLYWOOD. Made of thin layers of wood glued together at right angles or diagonally and then placed under considerable pressure and then placed under con in large sheets or panels, and in thicknesses from $\frac{1}{\frac{1}{2}} \mathrm{in}$., increasing by $\frac{1}{\text { or }}$ in to $\frac{1}{1}$ in. These thicknesses are generally of 3-ply, but additional layers of wood are commonly used up to 5.ply to a thickness of

Various kinds of wood are used. Birch, whitewood, satin walnut, and pine are softwoods and suitable for backing or staining. Of the com monly used hardwonds. oak, mahogany, teak, black walnut, and bird's eye maple are obtainable in plywood. The more expensive woods are made with $n$ core of cheaper wood.

The main feature of plywood is the strength it affords in a thin board. It is estimated that a piece of plywood is four times atronger than solid wond of similar thickness The method of manufacture, which places the grain of the layers at right angles to one another, prevents aplitting and renders the miaterial

cause lowers the vitality and enables the germs to multiply. One of the most powerful predisposing causes is intemperance. No other factor assists "recovery so much as plenty of freah air. The pationt should have a large well-ventilated ronm.

High temperature is one of the greatest dangers as it may lead to failure of the heart If necessary, sponge the patient with cold or tepid water, uncovering only a small part ol the body at one time, and drying it hefore sponging another part

Pneumonia In Dogs. Pneubionia is a com mon sequel to distemper, or it may follow bronchitis or a severe chill. There is a high temperature, breathing is quick and difficult, and a characteristic symptom is blowing at the lips The patient should be kept in a tempera ture of about $60^{\circ}$, with plenty of fresh air.

Envelop the chest in gamgee wool with a flannel coat over it. Apply compresses to the side as hot as can be tolerated. Place a piece of flannel in a length of linen and insert it in hoiling water onntaining $n$ little methylated spirit. It can then be wrung dry without hurting the hands. Place it well at the sides, at the hack of the elbows, and under the chest Cover with flannel, and then tho gamgee wool Do this severnl times a day. Feed little and often with strengthening foods See Dog

POCRET BOOK. A pocket book, in one meaning of the term, is not, strictly speaking, n book at all, but a wallet, usually of leather, provided with compartments for holding letters, papers, notes, stamps, etc. It usually folds down the middle and is of a convenient size to carry in a man's pocket In another sense a pocket book is an ordinary printed book made in a small size. Pocket editions are obtainable of most of the classics and a greal number of other well known works.

A third meaning of the term is almost synonymous with note brok, except that the latter has n wider significance, embracing books of almost any size, while the size of a pocket book usually varics between about that of a post card and that of a playing card.

POCKET KNIFE. Strictly speaking, the blades of n pocket knife are placed side by side at one end of the case while those of a pen-
knife are at upposite ends, but for practical chiefly to poas, beans and uther members of purposes the distinction is no longer marle, and the term pocket knife is applied to both.

The ordinary pockot knife is usually about 3 in to 4 in. long. Blades are mounted between two plates, usually of brass, a brass rivet fitting a hole in the shank of the blare holding them in place. The rivets embrace the covering of horn. bone or other material, as well as the brass plates. A steel spring riveter in the centre presses against the shank ands of the blades, causing them to open and shut with a snap. A shoulder on the back of the knife blade fits the top of the spring and takes the strain of the blade when in use. Each blade is provided with a thumb-nail groove in order to lacilitate its extraction from the casa.
A well-made pocket knife is a long-wearing tonl, and it is only rarely that it needs attention. The most easily worn parts are the brass rivets. Constant opening and shutting the blades in time wears away theso parts until the rivet either snaps or wears 80 thin that the apring loses its effect. While the parts are separatod to put in new rivets the knife can be thoroughly oleaned and reconditioned

The method is as follows : The blades, or blado if the knife has only one, are opencd and clamped between two pieces of wond held in a vice. Using a very small drill about the size of a rivet head and a hand brace the burrs of the rivets on one side only are drilled avay. This process is shown in Fig. 1. The knife is then removed from the vice, into which is tightly clamped a small hexagon nut. A small rivet punch is improvised from a piece of stcel knitting needle of rather smaller diameter than the rivet itself. The knife is placed on the nut so that the ivet comes over the hole in the nut, and the rivet is then punched out. (Fig. 2.)

The parts should be cleaned by dipping them in petrol and rubbing them with a rag. A short length of stout brass wire is obtained of a diameter to fit the rivet holes, and the blades and apring are reassembled as shown in Fig. 3. The coverings are also fitted and the brass wire cut off to within $\frac{1}{10} \mathrm{in}$. of the cover ing plates. A Hat hammer head is fastened in the vice to form an anvil for riveting. The rivet is held against the hammer head while a series of gentle taps are given to the other end in order to spread it.

Fig. 4 shows the burring over of the new rivet, which should be struck on its edge in order to create as large a burr as possible. When a substantial burr has been obtained on one side, the knife is turned over and a munded burr knocked on the other side. All the rivets are treated in this way. The next step is to file off the rivet ends flush with the covering plates, taking care not to remove too much of the rivet head in the process or the rivet will not hold.

It occasionally happens that one side of the scale or covering of a knife cracks across. A suitable material is chosen, and a new scale cut and filed to shape to replace the broken one. Rivet holes are drilled to correspond, and reassembly is proceeded with as above. The life of the rivets is considerably lengthened by a drop of oil on the moving parts from time to time.
POD. The botanical definition of a pod is a dry fruit (possessing several seeds) which is dehiscent, i.e. which when ripe opens to let the seeds fall. It is popularly used in reference

## the Laguminosse family.

PODOPEYLLUM. This hardy herbaceous perennial posscsses largo, deeply lobed leaves and bears chicfly white flowers in sunimer. They should be planted in damp leafy soil. Propagation is by division in spring. Two of the chief kinds are peltatum. 12 in. high, with pale flowers and small green fruits (hence its popular name May apple), and emodi, 12 in . high, with bronze-green leaves and white flowers followed by red fruits.

The dried root of the May apple is used in medicine as a purgative and stimulant for the liver, preparations in common use being podophyllin, dose to to gr. : tincture of podophyllin, 5 to 15 minims. It is usually taken in the form of a pill, which inay be made up from 3 gr . of podophyllin resin and 21 gr . of extract of hyoscyamus. This is divided into 12 pills.

POET'S NARCISSUS. This is the common name of Narcissus poeticus, of which See Narcissus. with a free nddition of sand. During the summer months a cool, airy greenhouse or frame nuits them, but in September they must again be placed in warmth.


POINTER: The Dog. Besides having a good nose to find the game, a pointer must have endurance and pace, and he should be built on lines which indicate the two latter. His forelcgs should be straight and strong, the thighs long and musculsr, the shoulders long and sloping, chest deep and not ton wide bodv well ileveloned
there aro many beautiful varieties. The perianth is white and the crown or centre is of various rioh colours.

POINSEMIA.
This
hothouse plant is grown for the sake of its scarlet bracts, which are in full beauty in winter, the true flowers being 8 mall and inconspicuous. When the plantg have finished flowering they should be pruned and kept rather dry at the root for a few weeks. Then if kept moist and warm they will atart into fresh growth, and the young shoots are taken off and inserted as cuttings in pots of sandy. soil in a propagating case Subsequently they must be potted in small pots and finally in those 5 or 6 in . wide, in a compost of loam two thirds, decayed manure one third, the pointing material is still wet a grooving tool is pressed into it and, when set, there is a recess to receive mure jointing material, usually of a contrasting colour.

In repointing an old building the joints have to be raked out to about 1 in . in depth and in the procces the


Pointer. Champlon of this broed of sporting dos
and powerful, loin slightly arched, broad ard muscular. In fact, he should be symmetrical all through, giving the impression of being able to gallop and stay. White usually predominates in the colour, and the markings may bo lemon, orange, or liver. Wholecoloured black or liver are occasionally scen. See Dog.
POLNTING: In Building. Pointing is the process of finishing the face of joints in brickwork or stonework. giving it a better appearance and offering resistance to rain at the joints. It may be done as the building work proceeds, which is the strongest form of pointing, or it may be done at the completion. working from the top downward and striking the scaffold as the work is finished. The lattel method gives the better and cleaner appearance, but it is not as strong as the other and it is more costly, becausc the joints have to be raked out to at least $\frac{1}{1} \mathrm{in}$. deep so as to receive the material that is used for pointing.

The struck joint is the best and strongest kind of pointing. It consists in pressing the mortar tightly into the joint with the tmwel. forming a smooth face splayed back at the top edge so as to weather the joint, or in other words so as not to hold the rain that might drive on to the wall.

Flat pointing or flush pointing is carried out on the interior of walls that are not to be finished in any way other than limewashed: it consists in flushing the wet mortar off with the trowel, so as not to encourage the lodg. ment of dust. Flat pointing is sometimes used on external work, but it is then what is terned jointed, that is, while


Pointing: four lypes. Fig. 1. Straok joint the top edse bolaz splajed back Pointiag: four lypes. Fig. 1 . straok joint, the top odge boing spiaged back
to weather the joint. Fig. 2 Eeyod pointing, in whioh the mortar is grooval Fig. 3. Flat or finsh pointing. Fig. 4. Tuor pointing, a more orammenta form, bat jess. easy for the amatear
edges of the bricks often become very dam aged. They are first flush pointed so as to make sound the damaged edges, then a grooving iron or jointer is drawn along the wet pointing, forming a recess, into whioh is put usually a white pointing. The flush pointing is first coloured, however, to match the brickwork.

In keyed pointing the pointing material is pressed into the joints with the trowel in the usual way, then a gronving iron is placed into the joint and drawn along, thus forming a semicircular recess. The grooving tool is made generally from a pieco of $s$ in. round iron. set up so as to form the handle at one end. There are other forms of kicyed pointing, but thesc need professinnal skill and are used principally where rendering of the walls is to follow

The tonls required for pointing consist of a pointing trowel-i.c. onc having $n$ blade a hout 4 in. long and a straight-edge-a piece of wood about 3 ft . long, $2 \frac{f}{\mathrm{f}} \mathrm{in}$. wide, and $\frac{3}{3} \mathrm{in}$. thick An old table-knife ground off to a point is used for trimming the edge of the joint that has heen pointed, so as to cut olf any surplus inaterial there may be.
The material used is, as a rule, cement mortar, made up of equal proportions of Port. Ind cement and clean, sharp pit sand The materials are mixed together dry. then aufficient clean water is added to make them plastic On!y as much of the material is mixed as can he used. The inortar is pressed into the joints, and brought in a smooth face by drawing the Irowel along it, cutting the edges straight with the knife and straight-edge

If old brickwork is being pointed, or new work at the completion of the ordinary bricklaying, then, in addition to raking and cleaning out the joints. water must be copiously employed. On no account should pointing he done during very frosty weather, becauso the material will ultimately fall out of the joints

POISON. Certain substances are statutory poisons. They are enumerated in the Schedule to the Poison Act. Any preparation which contains a statutory poison must he labelled as "poison." A medicine prescribed for internal use may be thus inbelled. but this fact need not alarm the patient : care must be taken, however, to adhere to the instructions.

Poisonous substances nust be dispensed in containers which are ensily distinguishable by colour and shanpe, and on no secount should they be transferred to plain containers in the home. All poisons should be kept under lock and key. It is illegal to send poisonous substances by post, except such as arc contained in medicines prescribed by a registcied dnctor and dispensed by a registered chemist and druggist. Opium, its alkaloids and cocaine are classed as dangerous drugs, and dealings in them, by preseription or nther!vise, are suliject to strict regulations.

POISONING. In few emergencies can angacious first aid be of such service as in that of pisoning. The nerd may arise in a variety of circumstances. It may be definitely known that pmison has heen swallowed or otherwise may have got into the body, and the nature of the poison may even be known. Without this knowledge, however, the probability of poisoning would be recognized when a person becomes ill shortly after taking food, drink or a dose of medicinc.

Some poisons destroy tisaues with which they come into contact, and are known as corrosives. There is evidence of destruction of the lining of the mouth. and possibly marks oil the face and clothing. Such poisons cause an immediate burning pain in the mouth, throat and stomach, also vomiting, and perhaps purging There may he difficulty in breathing. The patient is collapsed.

Amongst the corrosive poisons are the strong mineral acids, such as ail of vitriol : the caustic allialics, such as strong ammonia,
corrosive sublimate, formalin oxalic acid certain metallic salts, etc Carbolic acid and crensote also cause a burning pain, but vomit. ing is uncominon, and there is a sense of giddincss and intoxication, followed by un conscionsucss

Irritant poisons may or may not occasion a hot fecling during swallowing, but they causc nausea, vomiting, abdominal pain, purging, and more or less collapac Some cause diffi culty in breathing, and some cramps in the legs. They include antimony, arsenio, copper, lead: mercury, zinc, croton oil and other strong purgatives, arum, cantharides, etc.
Narcotic poisons may, like opium, cause immediate somnolence, decpening into slcep and coma: or, like belladonna, there may be pronounced delirium and then coma: or, liki alcohol and nitro-benzenc, they may cause signs of intoxication, followed by coma
Some poisons, including aconite, diluted oxnlic acid, prussic acid, elc., cause great dopression of the heart, while others. such na

TARLE OF COMMON POISONS GROUPEI ACCORDING TO
TIIEIR ANTIDOTES

## Polson

Oxalic acid (salt of sorrel or lemon)

Sulphuric acid (oil oi vitriol)
Hudrochloric acid (spirit of sult)
Nlerle acid (arjua fortis)
Strong acetic acld
Washing sodn, caustle soda
Caustic notnah
Strong ammonla (epirit of hartahorn).
Carlolic acid
Crensote
Corrosive subllmate (perchloride o
mercury)
Armenic (white nrsenic, rat poison, weed
killer)
Antimony (tartar ensetic, antimonial , wime)
Phosphorus (match hicads, rat poison).

## lodine (tincture of iodine)

Sugar of lend (lead lotion, white lead) Copper (blıestone, verdigris)
Silver nitrate (lunar caustic)
Cantharides (Spanish fly. b!istering
fluid)
Poisonous fungl
Zinc salts (zinc sulplinte, zinc lotion) Oll of turpentine
Dlyitalis (foxglove)
Upinm (laudanum, morphila, morphine,
parcgoric, chlorndyne, Battles's solu
tion, llover's powder, soothing
syrups)
Belladonna (deadly nightshade, atro-
liniment, eve dropa to dilate the pupil) I yoscyamils (henbane)
bliack nightshade
Woody nightshade (Vitfcrsivect)
Alcohol (apirits, liqucurs, wines. lieer rectiliel spirit, HethyInted spirits)
Gocaine
Cilloroform
Ether
Chloral
Chloralamide
Nitrobenzene (nitro-benzol, oil of milirbanc)
Prossic acid (hydrocyanic ncid, cherry
laurcl-leaves and water-bitter almonds, cyanides)
Strychnine (nus vomica, "Enston'
syrup, tonic tribeta)
tconitc (monk's hood)
Wolifsbinte
Tolnacco (nicotine, fruit-tree spray)
Antipyrine (plien:azone)
Phenaceti
Axalgin
Antlfehrin (ncetanilidu).
Cilliphor (camphoratell oil)
Sulphonial
Ceronal
Laburnun
ime waler or tablespoonful doses of chalk, whiting, mignesia, or p!aster taken fromithe walls and nowdored Castor oil.
Lime plister, magnesin, cha!k, whitinu, washing sodn, or bicarbonate of soda, in water. Weak solution of ammonia sal volatile In water.
()live oil.
rwo or three tablespoonfuls of lemon or lime juice, or vinegar, ill water.
Weak solution of citric or thrtaric acid crystals
Olive oil.
lipsom salts, 02 . in warm water 1 pint or more.
White of an ega in water.
Tublespoonful doses of dialysed iron magnesia frecly, in water
Strong warm ten frecly.
Weak solution of permanganate o potash. Old oil of turientine, tab!cspononful, if doctor advises
Weak solution of washing soda
Starch in water
t.panim salts, oz. in water.

## White of egg.

White of egg. No fat.
Weak solution of permangnonate of potash, brandy, sal volatile.
Atropine, to be adminlatered liy doctor White of cha, milk, olive oil
Epsom salts, toz. in water.
Strong warm tea.
Weak solution of permanganate of potash, strong warm tea, strong of warm strong coffec by the bowel

Sirong waril tea

Strong warin colfee, sal volatile
Ammonium chloride, large doses, given
lis a doctor.
Alcoholic stimulnnts, strong warm ten.
Warm strong colfec, sal volatile.
For chloroform, large doses of bicarbonate oi soda also.

Presh air, inlulation of ammonia, snl volatile.

Strong warin tca
Strong warmi tea, spirits, sлl volatile, strong warm coffee.

Sill volatilo, atrong warm colfee, whisky or btand $y$

## Strony warm colfee.

Sal volntile, spirits, atrong colfeo, freely
hemlock, calabar bean and curare. cause mus. cular paralysis Nux vomica and its alkaloids trychnine and brucine. cause convulsions without impairing consciousness or producing igns of irritation of the alimentary tract
In the event of poisoning $n$ doctor should be sent for at once, and should be told what poison his heen taken, if this faet be known In the meantime, first aid should be rendercel promptly If the nature of the poison is known, instructions as to its trcatinent will be found under the appropriate heading in this book, but, if not, treatment should be along the !ines to be now laid down:

If the poison be a corrosive, on no accoun: should an cmelic be given, as vomiling might cause perforation of the stomach, bul in all other cases, if the putient can suallow, an effort should bc mule to empty the stomach
To this end a tablespoonful of mustard or two tablespoonfuls of common salt may br arm water Vomiting may he hastened by tickling the back of the throat with a feather or a paper spill, and when it begins the patient should drink large draughts of tepid water in order to washout the stomach

In the next place, or in the first, when dealing with a cor rosive poison, something should fe given to neutralise the activitics of any drug remaining in the stomach: a list of the appropriate antidotes to use for each poison is given hace A strouk infusion, or decoc tion, of tea is usually a good thing to Live as not only does it stimulate, but the tannic acid which it contains is an anti dote for nllinloids. the active principle of most veretable poisons, and for some metals

The irritation caused by a corrosive or irritant poison may be less cned by hiving demulcent drinks such as nilk, thin gruel, thin cornflour or arrowroot, olive oil, or white of ege in water Oil should not be giren, how ever, in poisoning by cantharides or phos phorus and as littlc water as possible in poisoning by oxalic acid or lysol When poison has been itl the stomach for some tinue sornc ol it may hare passed into the howel, in which case one ol t wo tablespoonfuls of castor oil, or a tablespoonful ol Epsom salts in s
tumbler of warm water, should be given For difficulty of breathing caused by corrosive poisons, hot cloths sliould be put on the neck, and the air may be noistened with steam by means of a bronchitis kettle (q.v.), which can be improvised, if necessary. Pieces. of ice should be given to the patient to suck.

Faintness and collapse are treated by keeping the patient lying down in bed and promoting warmth by blankets and by putting hot-water bottles, covered with llannel, at the feet and by the sides. Stimulants should be given in the shape of sal volatile, a teaspoonful in a wineglass of water, whisky or brandy, a teaspoonful or more, according to age, cto., well diluted, or strong tea or coffee. No alcoliol should be given in poisoning by aniline, nitro-benzene, or related poisons Pain or cramps are treated by placing large hot fomentations over the affected parts.

Any bottles found near the patient, or any vomited matter, should always be kept for the doctor's inspection. See Artificial Respiration; Emetic ; Fainting; Food, Poisoning by ; Ptomaine Poisoning; Shock; and under the headings of all the principal poisons

POKER. Pokers are made of iron, steel, brass, copper, oxidized silver, and other metals. The cheapest are little more than iron bars, but more expensive ones are made with a certain amount of ornament, and are usually part of a set of fire irons. Omamenta tion is confined to the handle and upper part.

Poker Gas Burner. This is a burner used for igniting a coke or coal fire. It is connected to a plug point at the fireplace, the gas lighted, and the burner thrust into the firc amongst the coke or coal. When the tire is well alight the burner is withdrawn and disconnected. See Fire Irons; Gas
POKER : The Card Game. Poker is a card game for any number of players less than seven. There are several varietics of the game, the commonest being draw poker, and the rules differ greatly in minor details. This game is played with an ordinary pack of 52 cards, and the cards rank as at whist ; the ace can count high or low as required, but not botli at once.
One player usually acts as banker, and sclls counters to the othiers, redeeming them as required. A limit usually is set to the amount that any player may raisc a bet In one general variation eacli player begins with the same number of counters, and when he loses all or is frozen out, he drops out of the game. Any player may quit the game when he wishes, receiving from the banker their value for any counters he may still hold. No hand may be shown until betting has ceased. The players cut for denl, the lowest dealing, and aces count low. In some forms of deciding the opening, player cards are dealt round, and the first to receive a jack deals.
The Hands. Five cards are dealt to each player, one at a time, and these five cards constitute a hand. There are 10 varieties of hands, as follows: The hands are given in the order of their importance, beginning with the highest possible hand that can be held. A Hush is 5 cards of a suit. Royal flush consists of the ace to the 10 of any suit. Straight flush is any $j$ cards of a suit in sequence, excluding royal flushes. Four of a kind consists of 4 aces, 4 kings, etc., and one ordinary card. A full house consists of 3 cards of a kind, as 3 tens, and a pair. Three of a kind is 3 cards of the same denomination, as 3 tens, 3 fours, etc., and 2 ordinary cards. Two pairs are selfexplanatory. One pair and 3 ordinary cards s the lowest hand but one. The lowest hand contains none of the above, and consists of all ordinary cards.
The royal flushes tie, since the suits do not rank at poker. Some players, however, rank the suits as at bridge, so that a royal flush in
hearts beats one in diamonds, etc. If 2 plavers hold hands of the same class the highest denomination wins, e.g. 3 kings beat 3 fours. If 2 hands tie, except royal flushes, the highest card wins. In a sequence a top card, for example, decides, as does the top card in a flush, though in some forms of poker flushes are always equal. If each player has equal pairs the highest ordinary card settles the winner. If a hand has no scoring cards the highest card wins. If the highest cards tie, the second highest wins and so on. If hands tie throughout, the pot is divided. The player to the dealer's left is known as the age, and before the deal he places a counter or counters in the pool. This stake is known as the blind or ante, but must not exceed one-half the limit. Since this stake is a compulsory one on an unknown hand, it is invariably made as low as possible, usually a single counter.

How to Play. Each player is dealt 5 cands each in turn, and after looking at his hand he may do one of three things. He may pass, in which case he throws his cards face downward on the table, and takes no further part in that particular hand. He may go in, that is, decide to play, in which case he puts in the pool double the amount of the ante. He may put in the pool double the ante and then raise the stake to the limit, or any less he chooses.

Any player who wishes to go on then must put in the amount of the raise. One player may raise the contributions one counter, the next by 2 or 3 counters: and so on; but every player who decides to play must contribute the full amount of the highest raise plus double the ante. Any player who has already contributed before a player who raises, may decide to throw in his hand and lose the counters he already has in the pool rather than risk losing more on a bad opening hand.

When all players have decided to go in or pass, each player may discard any number of carla from his hand up to 5 , and receive an equal number from the dealer. The discarded cards are thrown face downward on the table, and must not be looked at by any player. This drawing of cards is known as filling the hands, and the object of each player is to improve any hand he may have. A player may have a pair, for example, and he discards 3 cands and draws a fresh 3 in the hope he may get another card to pair, or otherwise increase the value of his hand. A player who draws no cards is said to stand pat
The drawing is all important; for by it each player tries to decoive the others as to the cards in his hand. A player may hold 4 fours and an ordinary card, for example, when the pot is opened. If he stands pat the other players may suspect the cards he holds, or assume he has in any case a flush or full hand. If he discards one card, however, and draws another,
though the latter in any case cannot help him, his opponents are not sure whether he is drawing to 2 pairs, trying to complete a Hush or a sequence, or even trying to make a full house when holding 3 of a kind and 2 odd cards. In the same way a player may hold 3 of a kind, and throw out only one card.

A player on the other hand may hold 4 cards of a suit and draw one card to try and get the fifth for a flush. If he fails, it does not necessarily follow that he throws his hand down at once. For all his opponents know he may have obtained his flush, or he may have been drawing to ? pairs to try to get a full house, and so on. He may decide to bluff and boldly raise the stakes, frightening other players into the belief that he has a good hand. and inducing them to throw their bands in. If players throw in their hands the winner is not bound to show his cards, and it is therefore not known whether lie was bluffing or not It is this' fact which is important in the game, for if a player is a good one, it is never a certainty whether he is bluffing or not.

The players having filled their hands bet in turn or pass out. Any player may raise tho bet of the last player or decide to see him, and all cards are exposed in the last case, unless a player still to bet decides to raise. But when the players decide to see tho highest bet, the cands are exposed, and the best hand takes the pool.

Other Games of Poker. In straight poker the hands are not filled as in draw poker already described, each player retaining the 5 cards originally dealt him. Each puts in the pool the same amount as ante or blind, and players pass or come in as at draw poker. If all pass the pool is added to afresh, as for a new deal, the deal passing to the left. In atud poker one card only of each hand is dealt face downward, the remaining four being dealt face upward. The betting is as in draw poker.

Jack pots is a well-known variation of poker. In this form of the game each player puts an agreed stake into the pool, which cannot be opened, that is, played for, unless some player holds either a pair of jacks in his original 5 cards, or some combination which is better than a pair of jacks. Such a player may or may not open the jack pot as he pleases. If he does so he may open it for any stake ho pleases up to the limit, and each player must stake a similar amount or throw in his cards. The stake may he raised up to the limit by any players. If no player comes in except the opener of the pot, the latter takes the pool, and shows the necessary cards which are equivalent to or will heat the pair of jacks required for opening. If no player opens there is a fresh deal, each player once more contributing to the pot, and so on until the pot is opened

## Pokerwork in Various Forms

Appliances, Tools, and Methods for this Decorative Handicraft
This contribution explains the methods for decorating suitable materials by means of pokerwork. Other artistic crafts treated on similar lines include Enamelling; Gesso; Lacquer: Leather:
'Ihe ornamentation of wood, leather, and velvet by tracing the pattern with a hot platinum point or needle is known as pokerwork or pyrography There are various appliances for this purpose. One of these, an electrical apparatue contained in a box, is illustrated in Figs. 1 (left) and 3. A small plate screwed on to the front panel merely needs reversing to change the voltage. The machine can be fitted with either an adapter or plug-piece, and used on any ordinary fitting.

A simple appliance is shown in Figs. 1 (right) and 2. Instcad of an ordinary union, a pyro top is fitted into the neck of a bottle which is charged to two-thirds of its capacity with benzoline. It is adrisable to leave the ben-
zoline in the bottle for half an hour, if possible, before putting in the top. There is a small tap on the pyro top. When first heating the point, this should be vertical. Press the bellows slightly and light the little jet at the top of the union. Hold the platinum point in this until red hot. Then turn the tap horizontally and continue pumping to force the gas generated from the benzoline through the tube on to the point. Care must be taken never to touch any metal with the point when hot, as this will greatly damnage it.

When burning wood, the point should be kept hot, so that as it burns along the outline it produces a tiny flame whioh will consume the smoke. There is a small attachnent sold
which can be fitted to the cork handle. This makes an excellent whicalle man is called $n$ smoke diffuser. When working on workbox, powder or leather or velvet, the point must only be a dull red, as the method is to acorch a line and not actually to hurn it. In velvet the pile only should be touched, and it is advisable to use a small, light point. For general use where only one point is available, an ordinary flat point is best, תs the outlining can be done by holding the point almost upright and sideways. For the broader work, the point may be used as a modelling tool. A horn noint is useful for outlining, and burna n good clear line, cutting deeper than the flat point. Shading is done by means of a shading point, or the flat point held over the wood to scorch it.

Pokerwork on Wood. The surface of the wood ahould he carefully prepared by rubbing over with a piece of sandpaper, and then the rleaign is traced on it or transferred by placing the pencil side of the tracing next to the wood and going over the back with a hard pencil Pokerwork tranafers are obtainahle in variety, but an original design is to be preferred where possible or one that is adapted to the shape of the purticular piece to he decorated. The worker next pokers the outlines. He must use the point as $n$ pencil and draw with it, avoiding any uneven pressure, which menns a hal line. As soon as the point touches the surface the work must be continued or a hole will be burnt. It is wise to practise on a piece of wood, making lines, curves, etc., and in this way to determine the correct heat for the point. When the end of a line is reached, take up the point. Avoid pressing ton heavily on the wood, as $n$ line can always be deepened if necessary. The point of the needle must not be too hot if the wood is soft. If it is intended to colour the work, the outline and main sharing only should be pokered.

The cabinet illustrated in Fig. 5 is an example of surface work. The denign is first traced on the wood, previously prepared, then the whole of the outline is posered, using a horn point. For the fine lines a small horn point is used. The work is then lightly rublied over with an old piece of sand papar to remove any charred wood or grease, and atained with water atains. The doga and the clothes of the figures are coloured in liquid ensmels. (Se Enamel: Flower Designs on Wood, n. 424.) An tique gold bironze colour s employed for the archer of the cabinet. a round box decora.


Pokerwork. Fir. 1. Two forms of apparatus used. In that abown on the left the point is heated by electricity. The right-hand one consists of a bottle of benzoline surmoanted by a pyro top. Fig. 2. Showing the platinum point being heated in the benzoline flame. Fig. 3. The electrically heated point in use. Fig. 4. Tools nsed in 10 me forms of this handicraft. Reading downward amall rouge, Guter, and bent-knite point for relief work


Paint it in oil colours, using megilpas a medium Make all the colours as bright as possible and outline some of the flowers in gold. Stain the edge and the reat of the box walnut colour using two coats of stain, and was polish.
Velvet and Leather. Silvel pokerwork on velvet, Fig. 6: produces a good effect. Thi silver sheen is olitained by means of a sheath which is fixed over the point. Heat the point in the ordinary way and then try the sheath on a piece of the velvet. Most velvet pokers hest going with the pile: but there are exceptions. The whole of the outline should first be silveled and the design then coloured in with spirit atains or pastels. Spray with silvel fixative to make the work brighter.
Pokerwork may he used on heavy cloth to outline stencilling, and forms a decoration for the tops of floor cushions. The stencilling should be done with a strong brush to ensure n clear outline.
To use pokerwork on leather the worker should select a suitable design, and when working, the point should be kept a dull heat. as only surface burning is required The whole of the design should be pokered and the necessary colouring then done. To make important parta of the deaign atand out use lacquer and bronze colours. The reat of the leather should be stained a dark colour to tone, and the whole should be wax polished.

Relief Poker Work. Relief-burning, which is an advanced form of pyrography, has the appearance of carving when tinished and can be used to decorate furniture A different point is needed, called a bent-knife (Fig. 4). The work aliould he cramped to a tahle.
The point must he made very hot, and after the design hins been traced it should be out. lined as at A. Fig. 8. The line should be burnt to about 1 in deep, holding the bentknife almost parallel to the surface of the wool. It should not he allowed to lean to either side, and is held more upright in going round a curve. It is essential to have a cleancut outline, and it is best to cut the outline outside the design. A little methylated spirit rubbed lightly over the surface to be burnt will prevent the wood from charring too much. Should there be an angle in the design, begin each line from the corner.

The next thing is to sink the background This can be hurnt out with the point, but it uses the points a great deal and causes exces. sive smoking It is much quicker and easier to use a small gouge, as in Wig. 4. For large spaces a larger gouge can be eniployed. Carve out the wood across the grairr as far as possible to prevent tearing it, and do not cut too deeply at first. Be careful not to damage the design. It is most important to keep the tool well sharpened. Fig. 8, B shows the background ourved out.

Before attempting the modelling study a similar subject, and determine which portions of the design require to be sunk. The elges are left and the portions of a leaf on


Pokerwork. Fig 5 Cabinet in surface poker, the finer lines of the design being worked with a born point, and the whole falsbed in stalas, gold bronze colour and enamels. Fig. 8. Sllver work on black velvet coloured with spirit stalng
breakfast dish To prepare it, boil up 4 teacupfuls milk and water mixed in any proportions, adding salt to taste; sprinkle in 1\} teacupfuls maize meal, and stir the whole over the fire for about 10 min . Then draw the pan to the side of the fire and cook its contents slowly for about 1 hour, stirring them occasionally.

When cooked, spread the mixture on a plate, allow it to get cold, and then cut it into squares. Fry the latter in a pan of fat or bake them in the oven until they are crisp Serve the cakes with a slice of liver and bacon on each, and some good grary.
either side of the centre vein It is a good The plant will grow in any ordinary soil, but plan to start from the centre of the leaf, can only be recommended for the eflect whioh using the flat side of the bent-knife, and is produced by its berries. The roots of the gradually to work almost to the edge, pressing a little heavier to make a depression. This is often done by means of the gouge in order to save the point (Fig 8, C).

A fluter, another carving tool, shown in Fig. 4, is used to make a groove for the centre vein The point is used to smooth a way any irregularities and put in the finishing touches. The veins must be put in, using the edge of the point, and the background burnt even It is necessary from time to time to brush over the work with a wire brush to remove the charred wood; and if the work is not sharp enough after this operation, touch it up again with the point. An uncoloured leal is shown at D, Fig. 8. The colouring should be as soft as possible, merely to enhance the value of the carving, not to supersede it. The background should be stained to match the other furniture Marquetry stains are best.

When polishing a large surface or an elaborate piece of work, coat it all over with liquid wax polish, using a soft brush. Allow this to become dry. Then smenr a little wax polish on a piece of wood. Take a soft brush and brush this over the wood, up and down, until the polish is spread evenly over the yuriace of the brush. Then brush over the work, following the direction of the grain of the wood Do this several times, leaving the work a few hours between each rubbing

POKEWEED. The hardy perennial pokeweed (Phytolacea decandra), sometimes called the red ink plant, is suitable chiefly for the shrubbery or wild garden. It forms a large bush 5 ft or more high, with white Howers, allcceerded by purple berries during autumn.

## plant are poisonous.

Pole : The Measure. See Rod.
Polemonium. See Jacob's Ladder (q. $\nabla$.).
POLENTA. Served with liver and bacon, polenta makes a good supper, luncheon, or

POLISH. Any preparation that is used to produce a glossy surface on wood, leather, plate, linoleum, etc., is known as a polish. It is sold in liquid and paste form, and is usually applied on a rag or brush. Various kinds of polishes, such as those used for cleaning boots, brass, and furniture, are employed regularly in the home. See l3oot Polish; Floor Polish ; Furniture Cream and Polish; Metal Polish.

## Polishing: Finishes for Various Surfaces

## Effective Methods of Treating Wood and Metal

Reference may be made to the article on Furniture and to those on the various pieces of furniture
that can be treated in this way, e.g. Tuble. See also French Pollshing; Labour Saving Staln
The process of french polishing is described left in ridges. This may be avoided by using in a separate article under that heading. a wide eamel-hair brush, but practice will As a substitute for french polishing the process enable the largest surfaces to be succesafully known as glazing will be found useful. Glaze treated with the rubber, which is by far the can be purchased realy made, but is easily better method prepared by dissolving 3 oz of gum henzoin in f pint of methylated spirit. The mixture should be allowed to stand for several days before use, as it improves by keeping. The surface of the wood should firat be filled and rendered perfectly smooth with fine glass paper. A body of ordinary polish is then applied, as described in the article on french polishing

The glaze can be applied with a brush, but it is customary to use a rubber and paint it on, applying it in the direction of the grain The method is to dip the rubber in the glaze, which should, be placed in a saucer, and wipe it over the work quiokly, lightly, and evenly, taking care not to go over the surface twice until the first application is dry. With wide surfaces some experience is necessary, and unless great care is used the surface will be

Eggshell finish can be obtained with a glaze finish by adding about one-third of sandarac to the mixture of benzoin and apirita; the finest finish is obtained by rubbing down the finished polished surface with pumice powder, applied with a piece of felt slightly lubricated with raw linseed oil. Dip the felt into the oil, place on it some pumice powder, and rub well over the work with an even, circular motion The nreasure applied although not light must not be heavy; the rubber must be kept supplied with powder and enough, but not too much, oil. Wien the surface has been dulled evenly all over it should be rubbed down with a clean rag and wiped over with benzoin Small mouldinga or carvings can be rubbed with a brush

Oil Polish. Oil nolishing has several advan tages over other forms of eurface finishing,


Pokerwask. Fig. 7. Lid of bor with simple flower design in colours. Fig. 8. Panel In relief burning, whiob gives the offeot of carving. A. traced design outlined. B, background sunk by means of a rouge. $C$ modelling of the leaf begun. $D$, the finished leaf belore colouring
and is particularly effective on oak. It doee not crack or blister, neither does it show marks made with water, but it requires time and a considerable amount of friction. Prepare linseed oil by placing a quantity into a vessel, surround it with water, and allow it to simmer on a gas stove for about $\frac{1}{2}$ hour. Pour it into a bottle, and add one-eighth the quantity of turpentine. Apply the oil with a felt or flannel rubber and rub it thoroughly into the wood. It is possible to apply too much oil, but the amount of rubbing cannot be overdone. The work should be carricd on over a period of 2 or 3 weeks at least; a little oil and plenty of rubbing every day or every other day. When a suitable polish has been obtained and the work shows signs of sweating, a little methylated spirits can be rubbed over the surface, as this will dry it without spoiling the polish Further applications of oil can be applied if required, and the spirit finishing will not affect it in any way.

Floors can be polished with oil polish applied with a pad made by wrapping some flannel round an old brush; by applying the oil polish to a stained floor and thoroughly rubbing it in, a lasting polish will result.

Wax Pollsh. Wax polishing may be used on any kind of wood and gives an eggshell gloss which is most effective on oak, mahogany and walnut. Either white or yellow wax should be shredded, placed in turpentine, and left to dissolve. The consistency of the mixture should be that of cream. It is applied with brush or rubber, and must be evenly distributed and thoroughly well rubbed in. A dry rag should be used for finishing, but a good body of polish must be applied if the finish is to last. The finest effects of wax rolishing are obtained by giving the surface a body of french polish, rubbing the surface down with pumice powder, and then applying the wax polish; but if ordinary wood is properly filled and thoroughly cleaned down with fine glass paper a satisfactory polish can as a general rule be quite easily obtained.

Carved and Pierced Work. The treatment of carved work depends mainly on its surroundings, and generally a high polish is not desirable. The most suitable method is to cover the work with raw linseed oil, allow it to stand for a few hours, and wipe it off with a soft rag. After 2 or 3 applications, followed by vigorous rubbing, the groundwork will remain dull, nut a soft polish will appear on the raised parts. Although a body of french polish can be applied to carved work, and some portions brought to a high polish, the better medium for woods like oak, walnut and


Polishing. Fig. 1. Rabber for waz or oil polishing. Fig. 2. Pounce bag of maslin for holding pamice. Fig. 3. Rubber made of rag for ase in suriace alling. Fig. 4. Method of using rabber by meat. Fig. $\delta$. How the rabber is held
mahogany is a creamy mixture of beeswax, a rag, or brushed and rubbed down.

Fretwork and pierced woodwork are more difficult to polish owing to the broken surface With wax or oil, it is mainly a matter of working into the crevices, but with french polish, a particularly light touch is required. The edges of large pierceal surfaces, especially the end grain, should be filled with size or a prepared filler, and well smoothed down. The polish can then be applied on a small pad made by wrapping a little cotton wool round a thin stick and covering it with soft rag.

Treatment of Stains and Cracks. The repolishing of surfaces which have become stained usually means the removal of the old polish, in many cases right down to the surface of the wood. If the surface is dented, it may mean planing, or, at least, filling the surface to bring it up smooth and level. Special preparations for removing old polish can be obtained, but the usual method is to soak the surface with methylated spirit to soften the shellac, and rub it with a coarse rag. Glass paper will then be sufficient to take the top surface off. Unless the work is dented or cracked, or the stains go too far down, it is better to leave the original body so that a fresh surface of polish can be applied. With veneered surfaces, the greatest care must be taken. If the veneer is damaged, repairs can often be effected by the application of a hard filler, or by the use of wax.
Defects in polished surfaces do not always show at once, but when they do, they should be remedied as soon as possible. The commonest defect in french polishing is known as sweating, and is caused by the excessive use of oil, which breaks through the hardened surface It is difficult to treat, as any further hardening of the surface will be affected in the same way. Continual application of furniture crean will keep the surface bright, but until the surplus oil embodied in the polish has worked out, further french polishing will do no good. Cracks which may have occurred on a french. polished surface can only be removed by rubbing the whole of the surface down with pumice powder, and then repolishing in the ordinary way.
White marks on a french-polished surface may be caused by defective inaterials, or by water or spirit stains on a glazed or poorly finished surface. The best way to remove them is to take off the top surface and repolish; to put a new coat of polish on the old one, without removing the stains, is not advisable. Jight stains can be taken out by wiping the surface with lin. seed oil and then rubbing it lightly with a rag dipped in methylated spirit. If the stains are caused by hot plates, the only thing to do is torubthe surface down and repolish.

Polishing Metal. The polishing of metal surfaces can be done in many cases by purcly mechanical means or alternatively by hand. Polishing wheels of various kinds can be fitted to the lathe or arranged separately on a special bench fitted with a polishing head
and a fly-wheel. A useful polishing head with a drill chuck, etc, can be bought for a few shillings. Hand polishing. essential for some work, is done with rifflers, emery cloth and buffing sticks.

In machine-polishing, turned work is first rubbed down with emery cloth, finishing with the finest grade. The surface should be left free from scratches, for all subsequent work depends on the quality of the emery finish. As a rule, the emery cloth is used in conjunction with a piece of wood.

The next process is to apply pumice powder by means of a buffing stick, made by glueing strips of basil leather to wood strips of convenient size. For iron and steel it will generally be sufficient to complete the polish. ing with pumice powder, but a high finish can be obtained by using flour of emery and oil. 'lo obtain a good surface on turned brass in the lathe, first use emery cloth, then pumice powder, and finish with powdered rotten-stone and oil.

By the use of a polishing head, with wire scratch brushes and polishing mops-and these can also be attached to a lathe-much more rapid results are obtained The scratch brush is made of hard brass wire and used with vinegar and water or stale beer to produce a lather so that a scouring effect results.

For further finishing, brushes made of bristles, leather, calico and swansdown are suitable for applying pumice, rotten-stone and other polishing powders. As a rule the brush is revolved towards the article and the workel, and the highest speed is used for the final polish. The highest possible finish for brass and copper articles is obtained by the use of crocus powder applied with a calico mop Silver can be scoured with a scratch brush, then treated with rotten-stone and oil and finished with rouge and water, the higheat gloss being obtained by burnishing.

POLRA. The polka is danced to 2.4 time, and consists of light, springing, semicircular movements of three steps each. The original movement was to start off with a little spring, so that counting in teaching is spring $1,2,3$, and not 1, 2, 3, spring. See Dance; Dancing.
POLLACE. Known in Scotland as lythe, the pollack is a large fish of the cod tribe with protruding jaws, and is rich in oil. It is cooked by the same methods employed for cod. Plain boilcd or steamed is perhaps the best way to cook it, but it requires a well-flavoured sauce. Large fish of this description can be baked with advantage. They should be out into slices or steaks, laid in a deep dish well lined with butter, sprinkled with seasoning and lemonjuice, covered with buttered or greased paper, and baked until cooked through to the bone. Pollack should be served accompanied by piquant or shrimp sauce.
Occasionally the name of pollack is applied to the coal fish, also to some descriptions of fresh-water fish; but these are of a different species. A small fish of delicate flavour found in some of the Scottish lakes is called a pollack, but has, however, no relation to the other varieties of fresh-water pollack. See Cod; Fish; Sauce.
POLHINATION. In gardening pollination is the process of self or cross fertilization. It means the placing of pollen on the stigma of the same or a different flower whence it was taken There are three natural methoda and one artificial, the first being effected by insects, self-agency, or wind ; the latter by the hybridist, with the object of securing fresh varieties of flowers, fruit, or vegetables.

When the pollen is placed on the same Hower, or another upon the same plant, it is termed self-pollination; but if transferred by insects, wind, or hybridizer to the Hower of another variety, it is called cross-fertilization.

POLONY. A description of dry sausage known as polony, and first made at Bologna.
js a sausage which has been either boiled or smoked, and is fit for consumption without further cooking. The polony is a mixture of finely minced meat, highly seasoned and spiced. In the best varieties lean beef, ham or pork is used as a foundation, with portions of fat bacon interspersing the lean. The sausage is Havoured with chives or onions, spiced with mace or nutmeg and scasoned with salt and black pepper. A large clean sansage akin is then filled with the mixture, and it is bciled for 2 or 3 hours, or smoked for several weeks. If boiled the skin must be frequently pricked with a needle to keep it from bursting In some parts of the country the skins are dyed a bright red This skin is not edible. Sometimes strings of dricd or smoked sausages are called polonies

POLYANTTHA ROSE. The dwari poly. antha, or baby rambler roses, as they are popularly called, vary in height from 12 to 36 in . and bear bunches of single, semi-double or donble flowers in summer and autumn. They are useful for planting in Hower beds or as an edging to large horders and for cultivation in pots under glass. They need the same treatment as ot her low growing roses. Piruning, done in early April. is severe or light according to whether small or large bushes are wanted.

The older type of dwarf polyanthin rose is of low growth, 12-18 in., with bunches of small Howers. Some of the newer varicties are taller and more vigorous and hear larger blooms. I few of the best are Alice Amos, rose and white, Eblouissant. bright crimson, Ellen Poulsen, rose, Elsc Poulsen, light pink, Gloria Mundi, orange salnion, Katherine Zeimet, white, Kcrsbergen, dark red and Mrs Cutbush, pink.

POLYANTHUS. The bunch-flowered primrose callod polyant hus is one of the loveliest of spring llowers. The modern strains are


PQlyanthus. $\begin{gathered}\text { Blassom beads of this many-coloured } \\ \text { smring flowering primula }\end{gathered}$
distinguished by vigorous growth and large clusters of bloom of rich and varied colouring -crimison, orange, yellow, and cream. They are invaluable for spring berlding. Seeds are sown in boxes of fine soil or on a prepared seed bed out of doors in May. The seedlings are grown on a reserve border during the summer and in October are planted where they are to bloom in April-May. Another method of propagation is to lift the plants after they have finished llowering, separate them into pieces cach with a few roots attachel and re:
plant them on a reserve border for the summer A slightly shady place suits them best at that season. The old gold-laced polyantlus is now little grown excejt for exhibition purposes.

## POLYANTHUS NARCISSUS.

The buncli-flowered or polyanthus narcissus (tazetta) is valuable for cultivation in pots under glass, in bowls of fibre indoors and in beds and borders out of doors. They need the same treatment as other forms of narcissus. The old sulll-flowered varieties have been superseded by others raised by cross-breeding between them and the poets' narcisans (poeticus); they are called poetae narcissi. These are more vigorous and altogether finer plants with large bunches of
fragrant show'y flowers: they are also hardier than the old type. Some of the best of them are Aspasia, Elvira, Jaune a Merveille, Klondyke, and Orange Cup: they have white, creamwhite, or yellow perianth, with cup or centre of yellow, orange, or orange-red See Narcissus.

POLYGALA. These are hardy or half hardy shrubs with small leaves and pealike tlowers in various colours in sumıner: the popular name is milkwort. The favourite hardy species is polygaln chamaebuxus, which is of low growth and suitable for the rock garden : it needs sandy peaty soil and bears pale yellow blooms in spring. Polygaln myrtifolia, which will reach a height of 8 ft . or more, can he grown out of doors in mild districts and elsewhere in pots in the cool greenhouse; the flowers are reddish-purple $J$ compost of loam, peat, and sand is suitable Pruning is done after the flowers have faded, and propagation is by cuttinge at that season
Polygonatum. This is the botanical name of Solomon's Seal (q.v.).

POLYGONUM. Knotwend is the common name of this group of hardy plants, some of which are valuable for the rock garden or border. Others spread very rapidly and may soon prove a nuisance in gardens of moderate size. The most familiar is a rampant climbing plant, Polygonum baldschnanicum, which is uscful for covering a trellis or arbour, while it looks well if allowed to clamber over all evergreen. It bears bunches of small white Howers in early and late summer

Two pretty little planis for the rock garden or front of the border are altine, is in., and Bistorta, 24 in., both bear mse-coloured flowers in late summer. Cuspidatum ani sacchalinense, which grow 8 or 10 ft high and bear white Howers in late summer, spread quickly, and it is difficult to get rid of them. They look well in the wild garden or shrubleery. A half hardy silvery-leaved plant, Polygonum lanigerum, is often used for summer bedding

POLYPODY. This is the popular name of a genus of ferns, called botanically polypodium. The common polypody (vulgare) is a hardy evergreen fern, 12 in or more high, which fikes a shady place and soil with shich leaf-mould or peat and sand have been mixed. There are many attractive named varietics of this fern. The beech fern (Polypodium phegopteris) and the oak fern (Polypodium dryopteris) are other popular kinds. Many polypodiums need to be grown in a warm, moist atmosphere under glass and must be shaded from sunshinc. A suitable compost is made by mixing loam, leaf-mould and peat
in equal proportions. and adding sand frecly. Some of them are Knightac, nigrescens, Smithinnum, Mayi and schneitlerianum
POLYSTICHUM. The preenhouse and hardy evergreen fern polystichum is known as shield fern from the curious shape of its leaves. Culture is not difficult if protection from the rays of the sun is afforded, whether in the heated house or open garden. See Fern.

POMEGRANATE. This is a flowering. and fruiting shrub (Punica Granatum) which is suitable only for planting in a well drained border of loamy soil at the foot of a sunny wall in comparatively mild districts Only in exceptionally favourable seasons arc fruits



ears. The neck and body are short and compact, the body rounded and deep chested ; legs straight, fine boncd, and well feathered; feet small. There are two coats, the under soft and fluffy, the upper long and rather harsh, standing out straight like a frill around the neck, shoulders, and chest. The tail, too, which is carried flat over the back, is profusely covered with long stiff hair. All colours are admissible, either selfs or parti-coloured in patches ; but the selfs are preferable. Except white selfs, no pon should have white feet. Most poms were pure white until pure blacks became fashionable. See Dog: Kennel: Mange; Rabies, etc.
POMPON : In Dress. This soft, fluffy ball is used for fancy dress, especially for pierrot costumes, and also for finishing the ends of a girdle for a dressing-gown.
To make pompons of wool or knitting silk, cut two rounds of cardboard a little harger than the required pompon. In the centre of each cut a round hole, about a third of the diameter of the whole round. Plate the two card board rings together, and wind the wool, which can be all one colour or many different ones, mund them, passing it through the hole in the centre. If the pompon is to be a small one, the wool must be threaded through a necdlo; and even if it is to be large, a needle will be required when the hole is nearly filled.
Only when the hole is completely full has enough wool been ased. Then thread a bodkin with several strands of wool, and slip it all round the circumference, under the edge of the wool, so that the two ends of wool come out in the same place. Pull them carefully but tightly, so that the strands passing round the circumference slip between the two cardboard circles. Then put the point of a pair of scissors just between the cards, and cut the wool all round. 1raw the strands as tightly as possible and tie them firmly, leaving the two long ends for attaching the pompon. Then cut the cardboard away, and the pompon is finished. A woolly ball for a child can be made in the same way.
POMPON: In the Garden. This name is given to certain varicties of chrysanthemum and dahlia which bear small, round blooms. Sce Chrysanthemum ; Flower Garden.
POND. A pond is a pool of standing water. Ornainental ponds are found in a number of gardens, in which they form a picturesque feature. The pond should always be made in the open clear away from trees. Board fences close to the pond are also objectionable. becauso they hinder the continuous circula. tion of warm and cold air. The exact top of a hill is always chosen in preference to other sites, as it affords ideal conditions for the downward How of constantly fresh supplies of air. The pond should be quite shallow; in shape it should resemble a saucer rather than a bowl.
The Soll. If the soil is well drained and of a dry nature, such as the Sussex chalk or tho Surrey gravel, all that is needed is to select a site on level ground to preclude the possibility of disaster being caused by small surface rivulets in time of heavy rain. Given such a site the pond can be dug out, thickly lined with strav or reeds, covered with a gond crust of carefully puddled clay, extending well out over the nargin of the straw to keep it dry. and the clav protected by a thick layer of stones or pebbles.
If the soil is lowland clay or loann, a pond sunk below ground level is doomed to fail, and it is better to have the whole of the prond above ground. This may be arranged by building a low skirting wall with drainage holes through it at intervals round the base, forming the surface of the ground inside to a slight rise in the centre, paving the bottom with concrete or otherwise to prevent interference by earthworns, and then putting in the
lagging, puddle, and stones. - Dew ponds do not require artificial flooding when constructed, as they commence work from the dry of their own accord.

A Dew Pond. This is an artificial basin with a layer of material that is a good nonconductor of heat below. It has the remark. able property that dew forms on it in greater quantity than on surrounding objects, and that it will also collect dew on nights when tho country in general gets none. The supply of dew at night during a dry summer is adequate not only to compensate for evaporation by day, but also to afford a valuable supply of water; for instance, in the otherwise waterless parts of the down country of the south of England, all stock are watered at dew ponds.
The reason why a dew pond supplies itself with water is really very simple when it is properly understood. On a calm and cloud. less night the air which has been warmed during the day tends to conl rapidly by radiation of heat out into space, while at the same time the warm earth radiates heat up into the air; the result is that the air, which is losing heat above, but receiving some compensation from below, cools slowly, so that dew is likely to be dcposited on the ground in small quantity towards the end of the night when the air temperature has dropped low enough to cause condensation of the water vapour in it.
Now a dew pond, with such water as it contains already, may be considered as a patch of land over which a shallow surface layer is cut off from all heat communication with the decper-seated levels of the soil; hence the dew pond gets quite cold by radiation quite early in the night, after which it ceases to keep the air above it warm by further supplies of radiant heat. The consequence is that the air above the pond becomes so cold, by itself radiating its heat upward, especially at the bottom where it is in contact with the cold pond, that it deposits dew in the pond basin. Again, the coldnoss of the column of air above the water causes it to descend on to the pond surface, deposit its dew, and flow away horizontally. See Dutch Garden ; Lily Pool.

PONGEE. Unbleached, brownish, handmade silk fron N. China is the original pongee. It is plain, but has irregularities in the thickness of its threads. The material has a crispness which softens a little after repeated washings.

PONY: How to Keep. In many country houses a pony is kept either for the children to ride, for pulling a lawn mower, or for light road work in a governess cart. Being smaller than a horse, it costs less to feed: it is also much hardier, and can therefore be run at grass in a small paddock during the greater part of the year. There are several distinct breeds in Great Britain, the main varietics being the Shetland, Welsh, New Forest, 1)artmoor, Exmoor, and the Hackney. Next to the Hackney the Welsh is probably the best, but for real hardiness the Shetland cannot be surpassed.

A good pony should have short legs and sound fcet. Too many have narrow feet, contracted at the heels. It must be surefooted and free from tricks. If required for saddle work it must have an oblique, not upright, shoulder.

As for colour, the best ponies are light and dark bay, blue roan, red roan, brown, and grey. There are good chestnuts, but cliestnut is not a hard colour, not is black. A pony may be kept in a shed if left unclipped, but a stable is preferable. A pony stable may be built cheaply out of wood, with a galvanized iron roof, but whatever the material it is cssential the floor should be sound and well drained.

Feeding the Animals. As a rule, ponies are less dainty than horses, and therefore less difficult to feed. A pony at regular work will require 6 to 8 lb . of oats or similar food daily, but if not required for work may be run out nt grass. It is we!! to bring the animal in at night and give it $n$ small amount of hay If turned to pasture for some considerable time, it is a good practice to remove the shoes, but tips should be fixed to the forcfeet in order to prevent the horn from becoming broken. A good supply of fresh water must be arranged for. In summer a pony will require some 5 gallons a day.
In the matter of feeding, $n$ mixed diet is best. It can consist of oats, beans, maize, bran, and chaff In buying oats it is necessary to avoid those which are broken or dusty. Good oats should be plump, not too dark coloured, and quite free from any musty smell. Some horses and ponies do better on crushed or braised than on whole oats. Maize is useful for a pony in poor condition, because of its fattening qualities. Beans form $n$ strong and stimu lating food, but should be at least a year old before being used. Barley is inferior to oats as a food for horses or ponies. If a ration of lentils is given it should not exceed $\frac{1}{2} \mathrm{lb}$. daily A little bran is useful for an animal that is not getting green food.
As a rule, a mixture of oats with chopped hay is the stnple food for nll ponies kept in stables. Condiments may be given at times, but any excess of treacly or sugary natter is not good. A little linseed is bencficial to the animnl's coat, and a bran mash should be given 2 or 3 times a week. The best hay is that from upland pastures. Hay that is burned or mowheated is always a poor investment. Good hay can be told by its unmistakable fragrance. All ponies are fond of carrots, $n$ few of which should be given at intervals. Swedes form a good substitute if carrots are unobtninable. Under no circumstances should $n$ pony be fed while hot from exercise. A good driver, how. ever, does not bring in his animal in a state of perspiration, but allows it to go quietly for the last mile of the jonrney, and so to come in cool.

Grooming and Bedding. In the matter of grooming it is essential to remove mud as soon as possible from $n$ pony's fect and legs. The feet of an animal standing in the stable must be cleaned with a hoof pick at least twice a day. Shocing must be done with care. Many smiths are prone to cut away too inuch of the horn in shocing, with the result that the animal soon goes lame. A pony that is kept clipped will require to be covered by a blanket while standing in the stable.

Good bedding is essential, but for a pony it is not necessary to go to the expense of straw. In most country districts bracken is obtainable, and forms a uscful substitute; it is cut usually in September, and can be drial casily and stacked. Bracken is distinctly preferable to saivdust or pine needles. The bedding must be forked over daily, and, if possible, tumed out in the air to dry. If a pony is allowed to stand on wet and fermenting bedding its health and feet alike are certnin to suffer. See Horse ; Stables.

POODLE. This dog is not so well fitted to be a home companion as most other domestic breeds, as he is neither so affectionate nor so reliable in temper. Moreover, to keep him in good companionablo condition may involve considerable work. His coat is the chief trouble ; though the very long hairs are hard, they are much disposed to tangle, and the daily use of the comb and brush is a necessity. This is the reason why most poodles have a great part of the coat clipped closely or even shaved, leaving tufts at certain points, which give the animal a grotesque appearance.

Without constant grooming the hair twines up into long cords which trail along the
ground and require oiling. which soon renders the dog unpleasant company indoors Regular combing, by getting rid of the shed hairs, reduces the length of the eoat, and this curls instead of cording. Even so, the Poodle Club recommends that a third of the hody should be clipped or shaved. The colour of a good poodle should be unmixed, that is to say, all black, all white. all red. or all blue. See Dog; Kennel;

## lange, ete.

POOL. This ball game is played on a billiard table by a number of persons. For it special balls are provided, each of these heing a different colour, white, rd, yellow, green, brown, blue, pink, and then, if necessary, the same colours in the same order, spotted. Each player has his own ball, and they play in turn, the sequence of the colours being set out on the scoring board in the order mentioned above. The game is for each player to play at the hall of the previous player in order to pocket it.
Method of Play. The players must first determine by lot, or by some other convenient method, the choice of the balls. Each player starts with three lives. The owner of the white ball places it on the spot, the owner of the red ball plays at it, and at the end of his breal: the next in order follows. The st riker's ball must hit the one at whieh he is playing. If the latter ball is lawfolly pockeled its owner pays a forfeit, loses a life, and his ball remains in hand until his turn arrives again. The one who pockets a ball continues to play, aiming at the ball nearest to where his own rests. If he can continue to play until all the balls on the tahle are pocketed, he piaces his ball on the spont, and the next player plays from hand if the striker fails to score or makes a foul, the next in thrn plays.

In pools of less than four players, the game continues until all the players but one have lost their lives. The surviving player then takes the whole pool. In pools of four or more players, when only two players are left in with an equal number of lives, they divide the pool. If they have an unequal number of lives, the game is continued until the number becomes equal, when they divide, or until one loses all his lives, when the survivor takes the whole pool. It is provided, however, in all cases that a striker who has lawfully pocketed a ball has the option of either continuing his theak or dividing.
Starring. The first player who loses his three lipes is entitled to purchise a star by luying into the pool the value of three lives, for which he receives as many lives as therc remain to the player or players with the lowest number. The player, however, must decide whether he will star or not before the next stroke is played. If the lirst player who is out refuses to atar, the second may do so ; if the second refuses, the third may do so, and so on until two only are left in the pool, in which case the priviloge ceases.

If before a star two or more balls are pocketed by the same stioke, including the ball plaved at, each having one life, the owner of the ball first struck has the option of starring. If he refuses, and more than one remains, the jersons to whom they belolig must draw lots

for the star. If the balls pocketed do not inclucle the ball played at, thoir owners must draw lots for the star.
Only one star is allowed in a pool of six players, hut two stars are allowed in a pool of seven or more players. The player taking a second star pays double the amount of the first star. Thesame player may take both stars.
No convenient method of handi. capping at pool has becn devised. The handicap of starting with two lives in. stead of thice is a very severe one. The best, player, however, may arrange to divide, in the proportion of their remaining lives, at the reguest of the player who survives with him to the end of the prol. The best plaver may alsn agree not to star. This information is token from the rules of the Billinirls Association See Billiards: Russian Pool: Snooker
P.O.P.: In Photography. Printing-out paper, or P.() P., is used for the printing of pictures fiom photographic negatives. It is so called from the fact that when the paper is exposed to daylight behind $n$ negative, the picture gradually prints out until it attains its full depth. It is one of the ensiest photohraphic papers, but is less popular since a still simpile variety, namely self-toning paper, has largely taken its place. P.O.1. prints require to be toned in order to give them a pleasing colour; prints on self-toning paper, however, have only to be fixed, since gold contained in the coating produces the toning action when the prints are placed in the fixing bath.
P.O.P. is made by almost every manufacturer of photographic papers in several varieties, differing chictly in surface. There are trice desciptions of the paper, matt, semi-matt, and glossy, the last-named being chielly used, as it gives the utmost detail in the pictures Sensitive P.O.P. postcarls are made for the production of photographs of this size. P.O I'. is used almost exclusively for printing from small negatives on account of its rendering of detail. It cannot be used for enlargements or for printing by artiticial light, since the low sensitiveness of the paper makes it necessary to use daylight in printing.

When exposing the paper behind the negative, it is necessary to allow the light to act until the picture is very much darker than it is required to be when finished. The print is, thercfore, examined from time to time by turning back one half of the printing frame. The correct degree of printing is reached when the shadows of the picture have a choked-up, appearance, and when the highlights (the sky) are perceptibly of rleeper tone than a pure white. In ordinary good daylight, printing will he completed in from 5 to 15 min ., according to the density of the negative. Some practice is needed in hitting the cxact degiee of over-printing correctly ; more over-printing is neerled when a negative rrints quickly, say, in 5 min., than when printing occupies a longer time.

A number of prints having heen made, they require to be toned and fixed in orler to change the reddish colour of the prints to an agrecable purple or purplish brown. The most satisfactory method for the beginner is to tone and fix at the same time, in a single salution which
contains gold chloride for the toning and hypo for the fixing, with other chemicals necessary for the process This combined bath, as it is called, is hest purchased in liquid form, or as a powder requiring to he dissolved in the requisite quantity of water.

The prints, without any previous washing, are placed one by one face down in the combined hath. and kept on the move. When the prints have taken on all agrecable purplish tone, transfer them to a dish of water and give them a thorongh washing by allowing the water from a tap to run into the dish for a bout one hour. During this time the prints must not be allowed to clot together, otherwise the water docs not obtain free access and the chemicals are not removed

As a safcguard and particularly if prints tone quick!y, e.g. in less than 5 min ., it is advisable to use an additional solution for extra fixing. This is made by dissolving 3 oz of hypo in 20 oz . of water. Prints are trans. ferred clirect to it from the combined toning bath, and kejp moving in it for ahout 10 min . After the washing process the prints are laid face up on blotting paper, or clipped up on a line to dry. On no account must they be put face down on anything, or heated, as the sticky gelatine surface will be spoilt. See Printing: Self-Toning Paper
POPCORN. This is an American dish made with maize or Indian corn. The unripe grains are parched over the fire until the heat bursts them open and the centre of the grain is exposed. In this condition it is caten and considered a great delicacy. The best inaize to use for popcorn is that with a smallish grain

Poprorn is also sold as a sweetment. The grains are poppel, and coated with cither piik or white sugar very much in the same manner as is n sugar plum.

POPE JOAN. This card game is played with a special hoard, which consists of a circhtlar tray or hoard revolving on a central post or stand. The tray is divided by lines running from the centre to the circumference into 8 compartments, each of which will hold 100 or 150 counters. Each division has n name, these being pope, king, matrimony. queen, intrigue, knave, ace, and game. Popic is the nine of diamonds, matrimony is king and queen in the same hand; intrigue is queen and knave. The ace counts the lowest.

The game is played with a full pack, save that the eight of diamonds is withdrawn. This card, and also the four kings, are stops, i.c. a sequence stops when one of them is reached. The cards are dealt round to the players, and the last is turned up for trumps. An extra hand is dealt to the centre of the table, and the cards thercin are stops, as are those just before the ones that have heen already led in play. Wach player contributes an agred number of counters for the stake, and these are distributed among the several compartments of the tray.

The elder hand, i.e. the player on the dealer's left, leads any card lie likes, at the same time naming it. The next to play is the person who holds the next highest card in that suit, who also names it. This continues until no one can play a higher card, when the one who played last leads again, and the process is repeatcil. When the sequence is thus stopped, the cards previously played are turned face downward.

During the game a player who plays king, qucen, ace, or knave of the trump suit or pope takes the counter or counters in the corresponding compartment of the board. If he plays both king and queen of trumps, he takes those from the matrimony compiart. ment ; if he takes queen and linave of trumps. those in intrigue. If the card turned up for trumps is ace, king, queen, knave, or pope, the dealer takes the counters in the comprimment
concerned The aim of each player is to get rid or all his cards, and the onc who doen this is the winner $H e$ is entitled to the counters from the game compartment, and adso to one counter from each of the other players. The holder of the pope, if the carl is still in his hand, dnes not pay this counter If, however, he has played it, he docs.

If, as is usually the cusc, counters remain in some of the compartments, when the game is over, the cards are lealt round face upward in order to see who shall take the spoil. Those who obtain ace, king, quoen, and knave of diamonds take the counters in those divisions, if there are any: pope entitles its receiver to the counters in that division. The counters in matrimony, if any, are divided between the holders of the king and queen of diamonds, and those in intrigue between the holders of qucen and knave.

POPLAR: The Tree. Few treen grow more quickly than the poplar and it will flourish in damp low-lying land unsuitable for many other kinds. The best known is the Lombardy poplar (Populue nigra pyramidalis), a tall tree of columinar form : it makes a good windbreak or acreen if pollarded to make it spread when the desired height is reached The white poplar (Populus alba) and the aspen (Populus tremula), which is distinguished by the possession of leaves which quiver in the alighteat hreeze, are other kinds Mnat of the poplars are easily increased by cuttings set out of doors in autumn The aspen is usually propagated by suckers.

Uses of the Wood. Poplar, although not a wood of much cominercial value, nor nlways obtainable from timlicr dealers, is useful for numerous purposes. It is used for sugar and herring barrels, packing cases, inatches, clothes pegs, ehurns, pails, clogs, and wood wool or shavings for packing; also for brake blocks, the bottoms and sides of carts, wagons and barmu's, and sometimes for field hurdles. It is soft. light and porous, casily dented, but does not aplinter so easily as most woods and does not burn readily. It shrinks a great deal and is not very strong or durable, but is casy to work and seldom split by nails, though it holds nails well In colour it is light grey or pale yellowish brown. See Wood
POPLIN. Irish poplin is a combination of silk and wool, slightly ribbed, firm and warm without being atiff and heavy.
Cotton poplina, plain-coloured or striped, are the chief poplins in use for ourtains and light upholstery fabrics. They are obtainable in a wide range of coloura and guaranteed fadelcss.
POPPY: The Flower. Three kinds of poppy are invalunble hardy garden llowers the oriental, which is perennial, the Iceland, which is biennial, and various types of annual poppies. The oriental poppy (Papaver orientale) thrives in ordinary well-tilled soil and bears large handsome blooms in orimson, scarlet, rose, salmon and other colours in May and June. It dislikes being disturbed and should not be transplanted unneccssarily : it is increased by rowing seeds in May or by taking root cuttings in autumn There are many named varieties.
The Iceland poppy (Papaver nudicaule) is grown in gardens ns a biennial, seeds being sown in bores of tine snil or out of doors on a prepared seed bed in May to producc flowering plants the following year. The seedlings must be transplanted before they become crowded and put out in autumn or spring where they arc to bloom. The Coonarn is an improved type of lceland poppy. The chief favourite among the annual poppies is the Shirley; but the Jarge double varieties of the grey-leaved opium popply are very handsone. All these are raised from seeds sown out of doors in March-April where they are to bloom in summer. The flowers of


Poppy Flowers and buds of the Ryeburgh poppy
poppies are very fleeting, but if cut before the buds liave expanded they last well in water indoors. See Iceland Poppy; Nepaul Poppy; Opium Poppy.
POPPY ANEMONE. This is onc of the most brilliant of garden llowers : its botanical name is nnemone coronarin. There are many strains or types, the St. Brigid being the favourite: the fowera are large and of brilliant and varied colour-scarlet, crimson, purple, nose, etc. The roots ahould be planted on a sumny sheltered border in September to provicle blossoms in spring: they are set 3 inches deep and 4 or 5 inches apart in well drained friable soil of loam, leaf-mould and sand. Planting in February will ensure a later display of bloom

PORCELAIN. Porcelatn is a fine, thin transparent ware, practically the same as china. See Chelsca China: Dresden; Plymouth; Sèvres, etc
PORCR. A porch is n covered entrance to a house, either built on to it in fmnt of the door or part of the house itself. Whether it is a successful adjunct or not depends on its harmony with the architectural style of the house. Porches are sometimes added to exiating dwellings with bad reaults because they completely spoil the frontages deaigned by architects in planning the main buildings. A porch inust be an important feature; it is therefore essential that it should be an attractive one.

For our first illuatration a quaint brich porch with a tiled and pointed roof is selected. Both brickwork and tiling accord with the style of the little liouse, the walls of which have been partially whitewnshed with so thin a coating that the outlines and colour of the bricks show through it. The porch is ceiled and has an electric light fitting which illuminates the entrance and the naine on the door

Very different in oharacter is the other small porch illustrated in Fig. 2. This some what formal entrance belongs to $n$ house in a town strcet. The classical character is sug geated by the pilanter effect at each side and by the projecting roof. The paintwork of porch and doorway gives distinction to the front of the house. Glazed bricks nre used for the step, and there is an electric light fitting:

Half-timbered houses and country cottages are often designed with picturesque porches. A combination of herringboned brickwork and oak for the timbers and side balustrades is employed to construct the porches of some modern houses with excellent old-world effect. For a whitewashed cottage the simple roomy porch illustrated in Fig. 3 is a charming architectural feature. The door and timbers are of old onk, and the tiles of the porch ronf match those of the house. The side windows are glazed to aforl better protection from the weather. The rafters are exposed, as a ceiling would be out of place in such an entrance.

A dignified porch is illustrated in Fig. 4, with its semicircular formation, domed


Porch. Fig. 1. Quaint bick parch with pointed tiled root which sults this modern type of country cottage. Fig. 2. 'Shis tormal porch for a small town hous? is painted to harmonize with the door

Humplirell \& Dera Joel


Porch. Fir. 3. An attractive porch made from old oak beams rooted with tiles, set outside a whitewashed cottage. Fig. 4. Domed and pillared entrance in the angle of two walls of a brick-built house No. 4 bu courtesy of Our Homes and Gardens
roof and pillars. It is an attractive feature for the "angle house" designed with two wings to catch as much sun as possible. In such a porch there is room for a white painted seat at either side of the door, or for green tubs containing hydrangeas or other suitable flowering piants. The ronf is ceiled and finished off as a part of the interior of the house. It has a central enclosed electric light fitting.

An attractive porch for a bungalow can be constructed entirely from light timber. The uprights, 3 in. square, are connected by short cross-pieces of timber. 2 in. deep and 1 in . thick, mortised or dowelled into place. At the top the uprights are framed into place with timber 4 in . in hreadth and 3 in . in thickness, finishing flush with the tops of the posts The roof rafters are brought down on to this plate and the roof tiled The eaves are finished with aoffit and fascia board, faced with O.G. cast-imon guttering, the down pipe for the rain water being provided in the most convenient position adjacent to the rainwater Irainage aystem. Such a porch should be made in prepared timber, and looks well if oak stained to contrast with whitewash or rough cast and brick. See Lnggia : Lych Gate ; Name Plate; Path.

PORK. The season for pork should he confined to the winter months, or from the end of September to the beginning of April. When salted, especially in the form of bacon, pork is more wholesome than the fresh meat. This is the only salted meat which is superior in point of digestibility.

Particular attention should be paid to the condition of the meat, and to sce that not only is it free from taint, but that the fat is devoid of kernels. The best joints for roasting are the leg, loin, and fore-loin ; the spare rib, also, may be roasted, but it is not so thrifty. Roasted joints should be stuffed with sage and onion stuffing, served with thickened brown gravy and accompanied by cither onion or apple sauce If it is not desired to atuff the joint the stuffing may be formed into balls and cooked in the tin along with the meat.
To prepare the leg for roasting, saw off the shank bone and make an incision between the rind and the fleah just bclow the knuckle.

Fill the cavity with the stuffing and sew it in securely, or it will ooze out and be partially lost in the pan. Then, with a sharp-pointed linife, score the surface on the rind in even lines about $t$ in. apart. Cut well into the rind, but not deeper than the outer skin. Pork should always be well basted with plenty of good dripping, and be exposed to a good solid heat, especially at first ; but on no account must the crackling be scorched. Allow 20 $\min$ to the lb . for masting the leg, and 20 $\min$. over.
All solid joints require longer to cook than thinner pieces, and the time for cooking meat should be measured rather by the compactness of the flesh than the actual weight, after considering the average. The crackling of pork is improved if, when nearly cooked, it is rubbed over the surface with butter, drerlged slightly with flour, and then basted before being returned to finish. The directions given apply to all joints of pork, but for loin and fore-loin saw off the chine For loins or spare rib make the incision where convenient well under the skin. Before roasting these, and after the chine bone is removed, just separate the rib hones. but be sure that the joint is left whole.

The gravy should be served in a gravyboat. Any trimmings should be added to the stock from which the gravy is made : also the dregs remaining in the pan in which the joint has been roasted should be addled, after the dripping has been poured off. Pork dripping should never be mixed with that from other ments. It is always rather highly flavoured and will have absorbed the taste of the stuffing. Pork dripping can be used for basting poultry or game.

To boil a leg or hand of pork, saw off the shank bone and put the leg into a saucepan with a large onion stuck with 3 cloves, 1 lb . carmots, and the same of paranips. Cover it with cold water, boil up, skim, and continue boiling very gently for about 3 hours, or a little over or under according to the size of the leg; 20 min to the lb . is usually allowed for thick joints, but pork must invariably be cooked right through to the bone. For pork and beans add $\frac{1}{2} \mathrm{lb}$ soaked haricot
beans 30 min before the pork is cooked. Drain the beans and serve separately with parsley sauce. The spring or belly of pork is usually salted and boiled, but if not too thin it can he roasted Care must be taken not to over cook it. Make up some sage and onion stuffing into balls, fry these, and dish with the pork
The ears and feet can be cooked together Purchase them ready cleaned, and soak them for 12 hours. then rinse and boil them til tender. Let them get cold, and then soak again for 1 hour in a little vinegar, 2 cloves, 1 bay eaf (bruised), and seasoning. When ready to cook, dry them and cut the ears in slices and bone the feet, cutting the flesh in neat pieces Fry the slices and pieces in butter after egging and crumbing them ; or they may he dipped in batter hefore they are fried
Pork chops should not be cut more than in. thick. They should be neatly trimmed beaten with $n$ cutlet bat, and fried in hot butter. To dish, sprinkle with a little chopped onion and powdered sage Pork cutleta are cut from the neck bones, and should not be more than $\frac{1}{3} \mathrm{in}$. thick. They should be egged and crumbed, and a little minced shallot and powdered sage may be mixed with the egg. The cutlets are fried on both sides in hot butter until thomughly cooked.
Pickled Pork. To pickle pork, cut the meat into joints of $n$ convenient size and, after wiping it and removing all kernels and pipes, rub it well with common salt. Let it stand for 12 hours, then drain off the brine, and the following day steep it in a pickle prepared from $1 \frac{1}{2} \mathrm{lb}$. common salt, $\frac{1}{2} \mathrm{lb}$. bmown sugar oz. raltpetre, and a gallon of water. Boi these ingredients together for about $\ddagger$ hour, remore the scum from the top, and then strain them. The pickle should be allowed to cool hefore being poured over the meat, and the latter should remain completely immersed in it for about 12 days.

Pork Pie. To make a raised pork pie, weigh out 1 lb . neck of pork, freed from skin and hone, cut it up finely, season it to taste, and then add $\{$ tablespoonful chopped onion and I teaspoonful powdered sage. Make 6 oz .
hot water crust (see Pastry), turn it out hot on to a floured board, and knead it until it is perfectly smooth Cut offthree quarters of it and roll it out to acircle about $\frac{1}{4}$ in. thiok, keeping theedges even and the strip itself of uni form thickness. The remaining picce of pastry should be wrapped in paper and kept hot over
 raised pie monld like the one illustrated should be used for baking a pork pie. Line the mould evenly with the large piece of pastry. If no mould is available
the pastry may be shaped over the hottom of a round cake tin Stand the tin in the centre of the circle of pastry. nnd press pastry evenly up the sides, kceping the top edge level Remove tin and tie a bnnd of grenseproof paper round paatry case

Put in the pork mixture, moistening it with a little stock or water, and press it well in, leaving a narrow rim of pastry standing above it all mound Roll out thinly the smaller piece of pastry, cut from it a sound for the top, hrush the edges of it with cold water and then lay it on top of the pie pressing the edges together. A ridge of pastry standing about of higher than the pie should be left all round, and this should be trimmed and decorated with a pair of scissors. A hole must be left for steam to escape. Any scraps of pastry may be used to decorate top of pie.

Brush some beaten egg over the whole pie, und bake it in a moderately hot oven for 1!-2 hours, or until the pastry is lightly hrowned and the meat tender. When the pie is cooked. pour through the hole in the top a little warm stock in which a sheet of gelatine has been disalved, and then allow it to get cold. See Apple Sance; Bacon; Pastry; Sage.

PORRIDGE. The preparation known as porridge is made by stirring oatmenl, whentmeal. Quaker Onts, or some similar patent food into boiling water or milk, or a mixture of both. It is eaten for breakfast either with sugar and hot milk, with cream, or with salt, and is hoth heating and nourishing.

To make oatmeal porridge boil up 1 pint water, then sprinkle in 3 oz . ontmeal, stirring all the time to prevent burning. Continue stirring until the mixture is smooth and creamy, then add salt to taste and let the porridge cook slowly at the side of the fire for about 45 min . Stir occasionally to prevent sticking, and add more boiling water if necessary. Serve in porridgo plates or soup plates. Porridge made with whenten meal requires about $1 \frac{1}{2}$ handfuls to each cup of water. The meal is sprinkled into boiling water, salt leeing added to taste. Stir until smooth, then allow to cook gently 40 to 50 min . Porridge is also made with harley meal and ontineal. The method is similar, the oatmeal being aprinkled into boiling water, allowed to boil for 10 min ., then the barley is sprinkled in finely thmugh the fingers and tuble salt added. This form of porridge is hest taken with cream. As it helps to purify the blood, it is said to be good for the complexion.

PORRINGER. A porringer wiss originally a vessel used for holding porridge. Though it is sometimes known as a caudle cup, strictly apenking a caudle cup has a lid and is bellied,
or rather squat, in slinpe. A porringer proper is lidless, with fairly straight sides. Porringers were made in silver, pewter, and Sheflield plate, and good examples are much sought by collectors. They are known to have existed in the 16 th century, nnd the lion and unicorn pattern appeared after the Restoration

The hest porringers were made from 1660 to the time of Annc. Examiples are freely decorated with acanthus and roses Repoussé is used for decoration with, in some eases, a little chasing by way of relief. 17th century specimens are found with fanciful devices of animals, birds, and Howers therenn; hut with the accession of William III, Dutch influence was exercised in the direction of simplicity, and the flute and tho gadroon appeared. See 「ewier; Silver.

PORTABLE WIRELESS SET. This is a self-contained receiver. It is usually built into

a cahinet of the suit-casc type and is designed for use with an enclosed frame acrial

Four or tive valves are normally employed and the low sensitivity of it frame acrial renders high-frequency amplification essential. A well-tried circuit should be chosen owing to the restricted layout of the components in a portable set. The use of more than one stage of tuned high-frequency amplification calls for skilled design. otherwise stable opera. tion may be impossible It is therefore common practice to employ either one tuned screen-grid high. fiequency stage or one luned and onc chokecoupled stage.
Careful screening is necessary in order to avoid interaction between the frame aerial windings and the high-frequency coupling coils. In the casc of choke-coupling the
high-frequency chokes should have a high inductance value and a low self-capacity. l'oorly designed chokes will result in a loss of amplification, and may possibly cause instahility. It is advisable to decouple the screening grids of the screen-grid valves with resistances having a value of (i)0 or 1,000 olims and 1 mfd . by-pass condensers to lowtension negative.

The low frequency stages may comprise either one stage of resistance capacity amplification followed by a trancformer or two transformer coupled stages Tho transformers should have low ratios

The risk of instability may he minimized by inserting a $\mathbf{2 5 , 0 0 0}$ ohm decoupling resistance in series with the detector high tension positive lead, and a 2 or 4 mfd by-jass condenser to low tension nogative.

The limited space available prohibits the use of large-capacity high-tension hatteries, and therefore it is highly important to apply negative grid bias to the high-frequency valve or valves, and also to adjust the grid hias on the low-frequency side with care Failure to apply the correct grid bias will considerably shorten the life of the high-tension


Portable Wireless Set. Lett. Reneral lagout of receiver, showing valves and batteries. Above. typical erample of a q-valve portable set, showing loud speaker and controls
battery. The low-tension accumulator should be of the unspillable type.
In the case of portable sets which are only intencled to be moved from room to room the lighting ninins can be employed, and the high tension can be ohtained from an eliminator, a suitable unit being one which has also a switch for trickle charging. Such eliminators as these are readily ohtainable, and are designed to till the space normally occupied by the high-tension battery. In use the eliminator mains plug is inserted into the socket of a lamp holder in the room in which the set is to bo worked.
The toud speaker usually comprises a balanced armature cone unit, and is inserted in the lid of the cabinet The frame aerial winding for the long and medium wave bands may be wound around the framework supporting the lid, and in a home constructed receiver the most at raight forward scheme is to employ two separate windings for the medium and long wave bands respectively. Wavechanging can be carried out with the aid of a double-pole change over switch, a second switch of the anme type being utilized for wave-changing the high-frequency coupling coils. See Frame Aerial.

PORTER: The Drink. This name is given to the dark-coloured malt liquor similar to but thinner than stout, and not so fre quently used. Sep Stout.

PORTLAND CEMENT. Poitland cement is so named hecause of its resemblance in colour to Portland stone. It is made by the intinate mixing of calcareous and argillaccous innterials such as limestone and clay, in certain definite proportions. Portland cement should always he of the British standard specification. See Brick; Cement; Concrote; Rendering

PORTRAIT ATTACHMENT. A small lens known as $n$ portrait attachment, or magnifier, is attached by screwing to the lens
mount of a Kodali or other foiding cainera to increase the focal length, for taking portraits. With the ordinary lens alone nothing nearer than about 15 ft to 20 ft is in focus, so that portraits of sufficient size on the film or plate cannot be obtained The portrait attachment, by lengthening the focus of the lens, allows the camern to be hrought within 8 ft . or 10 ft (not nearer) of the person to he photographed.
Another use for the portrait attachment is to get photograplis of huildings and ohjects in confined spaces where it is impossible to get the whole of a building within the limits of the focussing screen without tilting the camera, and so producing distortion See Lens: Swing back

## Portraiture: In Photography

## Simple Rules for Good Results in Amateur Work

Continuing the sequence of our photographic articles, our contributor dcals here with the taking of
portralis. Other entries that hear upan this subiect include Orthochromatic: Panchromatic. See portralis. Other entries that hesr upon this subiect include Orthochromatic: Panchromatic. See also Camera: Enlarging: Lens: Pholography: Spot-liphe
Of all branches of amateur photography consisting of two separate lenses, nne of which portraiture is probably the most difficult. Much can be done with the ordinary snapshot camera, particularly if it be clearly recognized that it is not designed for portrait work, and its use is mainly confined to out-of-doors portraits taken with the subject some distance from the camera. For indoor work a stand camera is cssential. To get sntisfactory results with a fixed-focus camera an extra lens, called a portrait attachment (q.v.) or magnifier. should lie used

With the ordinary lens the figure will he too small on the plate or film, even for enlargement, since if the sitter is brought near to the camera he will be out of focus and the perspective will he distorted. Even with a portrait attachment the sitter should not be less than 8 ft . or 12 ft . from the cannera This will give a somewhat small image on the plate, which. however, can be enlarged antisfactorily

To obtain a large image on the plate, such as is seen in professional portrnits. a lens with n long focus is necessary. For a $t$-plate camera an 8 in. or 10 in. lens will give gond results. Its definition miny not be perfectly sharp, and its deptlı of focus will be sinall if, as should he the case, it is of fairly large aperture. These qualities, however, are advantages in portrait

| xs |
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| 日C | work, giving soft, rouniled pictures. Thus an old single landseape lens will serve excellently. If the lens of the camers in use is what is known as a doublet,

can be screwed out, it will he found that using the back lens only will give the extrn focal length required, i.e enlargement of the image. although it will have the effect of reducing the aperture, and therefore increasing the exposure.

The next consideration is ahortness of exposure. Naturalistic portraits cannot be obtained if the sitter has to keep $\Omega$ rigid position for inore than a fraction of a second. This is one of the reasons why the aninteur snapshot portrait is often more pleasing than some professional portraits. Short exposure is obtained by using a fast lens, i.e. working at an aperture of $f / 6$ or less, fast plates or films (such films as the Kodak 'Verichrome' used with a pale filter can be made to give good resulta), and strong light. Outdoor light is the strongest, and therefore hest for minateur portraits, although it has the disadvantage that it cannot be controlled.

For outdoor work avoid full front lighting, and place the sitter ao that the light is stronger on one side than the other. With the sitter facing the st rongest light squarely. all model ling in the face will be lost and the portrait consequently untrue and uninteresting. For similar reasons full sunlight is nsually un satisfactory, rpart from the fact that it makes

the subject screw up his eyes and wrinkle the forehead. A tree, wall, fence, or other object on one side of the sitter will help to give the necessary side lighting and greatly improve the modelling. Lighting from above also needs consideration, for if it is too strong the eyes will he shadowed by the forehead and hair and give a scowling effect.

If the top lighting is too harsh a screen can be rigged up with an old sheet stretched horizontally 2 or 3 ft . above the subject's hcad A camern with $\Omega$ focussing screen enables all these effects to he studied. Much can be learned if a good-sized sculptured bust or plaster cast is used for experiments and for trial exposures.
Great care is necessary in the choice of a background. It must not be full of detail sharply rendered, or the interest will be divided A neutral background should le chosen it possible If it is in deep shadow without high lights, the portrait will be thrown up well A simple and effective background is provided by a sheet stretched on a clothes horse Whatever its nature it should be well out of focus

Another foint is to see that there is no incongruous object, such as a bush or tree trunk, immediately behind the sitter.

Whenever porsible use orthochromatic or panchromatic plates or films. Apart from questions of colour in the dress, freckles or slight rednesses or other hlemishes in the skin, hardly noticed by the eye, are greatly exag. gerated by ordinary plates on account of their insensitiveness to red. With colour sensitive plates these characteristics are reduced to their proper proportion, and retouching, n matter hardly within the capacity of the nverage nmateur, is avoided
The pose of the sitter should he attended to carcfully, but without making him adopt unnatural or uneasy positions which will give the effect of strain. Do not let him sit in a slovenly attitude, but reasonably upright, with the chin held up $a$ little and the cyes looking very slightly to one side for a full-face portrait. The camera should he so arranged that the lens is about level with the chin. The face should he studied to ascertain whether full face, side face, or profile gives the most characteristic and pleasing likencss.

Indoor portraiture ©s somewhat more diflicult 1 han outdoor work. Much more careful control of the lighting is both necessary and possible, and


Portraiture. Fig. 1. Result obtalned with lighting from one window. Fig. 2. Reflecting screen added, wlth improved lighting ot iead and iace moieiting. Fig. 3. Picturesque lighting effects obtained with background screen and arrangement, of reflector and camera. Fig. 4. Good effect with lighting from t windows and reflector. The diagram above each photograph shows the arrangement of camer
Specially pholographed by $E$. Hoppe


Portugal Laneel. Evergreen flowering tree attrac tive for the garden shrubbery
effects can be obtained which are impossible outdoors. Longer exposures are required, but this difficulty can be partly overcome by the use of very fast plates, or of panchromatic plates without light filters.
The tendency with indoor anateur portraits is towards harshness of lighting. This is a acoided by using a room with a good-sized north window, or, better, with two windows, the lower part or the whole lightly screened with lace or muslin ourtains, or other white translucent material, to soften and diffuse the light. The subject should be placed near, but not too close, to the window, and a reflector on the other side (Figs. 2 and 3). This lights up the portions of the face and figure otherwise in shadow. A reflector can be contrived with a large sheet or white paper hung on a clothes horse or a line that can be moved about. The positions of screen und camera are best found by experiment. Suggestions are given in Fig. 1-3, which show three possible arrangements in a room with one window. and in Fig. 4 for a room with two windows. Very interesting effects can be obtained with the reflector placed in front of the sitter, the camera lens pointing through a bole cut in the reflector.

If the top light is too strong, it can be regulated by short curtains on rods hung at the top of the window.

The background in an ordinary room should be carefully considered. It is usually best to contrive a simple background out of some un. patterned material not too light in colour hung on a line stretched across the corner of the room and kept out of focus. If the ordinary room furniture constitutes the background take care that no prominent lines of furniture, picture frames, etc., pass directly lehind the sitter's head, and also that the glass of piotures, or other bright objects, do not eatch the light, thereby making a glaring white blob in the photograph

The head should not be central in the plate unless a full-face front-figure portrait is being made. With side face, or profile, much more
pleasing results are obtained with the head on either side of the middle line of the plate.

Exposure should always be cherked with an exposure meter, except when artificial light is used, when actual experiment alone can decide, according to light, lens, and plate used Development should be deliberately on the thin side, either using the ordinary developer diluted with one-third the amount of water extra to the ordinary amount, or by shortening the time of development. Over-development will entail loss of modelling and harshness without any gain in detail. For most portraits rather broad effects are best, and these are given by thin negatives, which are printed or enlarged on matt or rough papers.

PORTUGAL LAUREL. This vigorous evergreen (Prunus lusitanica) forms an attrac tive tree if allowed to grow naturally and bears white flowers in summer. The best time to plant is in September or early May, and it is wise to put in small trees as large ones can rarely be transplanted successfully.

PORTULACA. The dwarl-growing portu laca is a S . American annual flowering plant of low growth. It is raised from seed sown in pans in $a$ cold frame in carly spring and planted out in June. Sowing may be made in the open grmund in May. The flowers are crimson, pink, white. and yellow. They need light anil and a sunny place.

PORT WINE. There are three classifica tions of port : vintage, ruby, and tawny, of which particulars are here given.

Vintage Port. Vintage port is wine of a particular vear, shipped, as a rule. from 2 to 4 years after it is made, bottled in Great Britain, and allowed to mature in cellars. It matures slowly and improves with age. Only those years in which conditions have been favourable to the perfect ripening of the grapcs are known as vintage years.

The purchaser of vintage port should take care that the wine has been shipped by a reliable shipper in the first instance, and bottled by a good wine merchant. The pur chaser should always assure himself of the bottling date before taking delivery. The most economical plan is to buy vintage port carly, as soon as the wine merchant has bottled it. The wine should then be laid down in the cellar for keeping purposes. Ten ycars in bottle is a fair age, although the wine may improve up to 20 years or more.
Vintage port is hnown by its character, full, fruity Havour, colour, and fine bouquet. In the process of maturing in bottle a crust is formed, and the wine should be carefully decanted, the white splash on the end of the bottle being kept uppermost. The decanter should be perfectly dry and clean. The bottle must not be shaken, nor the sediment allowed to pass into the decanter: If the cork breaks. the wine should be poured into the decanter through a strainer or piece of muslin.

Port bought for immediate use from wine merchants should be stood upright for 24 hours in the dining room to enable the crust to settle, and so that the winc acquires the temperature of the room. Port should be decanted at least 2 or 3 hours before drinking, as the wine develops in bouquet and Havour.

Other Ports. Tawny port is not a wine made from any one apecial year's grapes, but a blend of wines of a number of years. It is matured at Oporto in wood instead of in bottle, and conscquently loses its deep red colour. It is a lighter wine, both in colour and body, than vintage port.

Ruby port is a compromise between vintage and tawny. It may be a wine of a particular vintage kept in wood for some time before being bottled so that it has lost some of its depth of colour and strength ; or it may be a blend of wines of different years blended at Oporto or in Great Britain by wine merchants.

The percentage of alcohol in port wine is from 15 to 20 per cent. When more than 15 or 16 per cent. of alcohol is present. the wine has bcen fortified, that is to say, spirit has been added to it. Much cheap wine sold under this name may be nothing but a mixture of potato or grain spirit coloured and fla voured with dycs and essences. Natural port is a wholesome beverage, but the artificial compounds may be extremely injurious. Port wine is combined with malt or malt extract in some tonic preparations. See Alcohol: Wine

Port Wine Mark. See Birthmark.
POSITIVE. In photography a positive is the reverse of a negative, and may be made, as is most usual, on paper or on glasw, when it is seen by transmitted light instead of by reflected light, as in the case of n print. A glass positive is generally known as a trans parency It may be for use as a lantern slide or a colour transparency
Ordinary transparenciea are made for the purpose of copying negatives by contact A alow plate is best. See Colour Photography; Negative.
POST. A post is a picce of timber, metal, or other material usually lixed in a vertical position and used as a means of support or attachment.
The majority of fences are constructed of posta made in wood. cast or wrought iron, or concrete, set at a distance apart, the intervening space being filled with rails, palings of wood, chains, stout galvanized iron wire, or barbed wire. In the latter two cases a stouter post, called a atraining post, is often placed at certain distances, incorporating a drun with a ratchet device for tightening the wire. An example of a concrete atraining post braced with a atrut is illustrated in the article on Fence, at page 451.

A gate post has to carry a heary weight, and often needs a support on the opposite side to the gate. Since a gate sinks if the post falls even slightly out of the vertical, it


Post. How a corner post is erected in the course al constructing any small building
is advisable when erecting the post to ensure a perfectly sound foundation. Where the gate post is of wood, it should be well creosoted or treated with some other form of wood pre servative, to prevent rotting. See Clothes Line; Fence; Gate.

## Postage: Rules and Regulations

## A Concise Guide to Matters of Everyday Concern

This article contains information about the dispatch of letters and postal packets of all kinds Branches of the subject are dealt with under the headings Money Order: Parcel Post: Post card. See also Letter; Parcel: Telegram

The cost of sending letters, papers, cards, for the first year after removal is done without newspapers, etc., through the prost is met by charge. For redirectionduring the second and purchasing stamps and fastening them to the letter, card, or wтapper. Parcels, not exceeding a certain weight, can be sent in the rame way. The postal rules and charges are divided into three main classes, which refer respectively to inland postage, i.e within the British Isles: to postage to British possessions and the U.S.A and to postage to other foreign countries.

The communications that are sent through the post may be divided into four classes: letters proper, this including letter cards: postcards; newspapers: printed papers of other kinds.

Letter Rates. A letter may be sent to any part of the British Isles, including the Irish Free State, for $1 \frac{1}{2} \mathrm{~d}$. provided it does not exceed 2 oz . in weight. If it does exceed 2 oz . in weight, it will cost an extra $\frac{1}{d}$. for every 2 oz or portion of 2 oz . Thus a letter weighing 3 oz . will cost 2 d , and one weighing 5 oz . will cost $2 \frac{1}{2} \mathrm{~d}$

The prepaid rate of postage on letters from the United Kingdom to other parts of the British Empire generally, mandated territories, except Iray and Transjordan, the United States of America, Egypt and the British Post Office at Tangier is $1 \frac{1}{2} \mathrm{~d}$. for the first ounce, and 1d. for each additional ounce or fraction thereof. The rate to all other places abroad. including Iraq and Trans jordan, is $2 \frac{1}{2} \mathrm{~d}$. for the first ounce and $1 \frac{1}{2} \mathrm{~d}$. for each additional ounce or fraction thereof.

A letter if posted unpaid is charged on delivery with double postage : if posted underpaid, with double the amount of the deficiency. No letter may exceed two feet in length, one foot in width, or one foot in depth ; or, if inade up in the form of a roll, 30 inches in length and four inches in diameter. There is no limit of weight.

Postage stamps can be bought from any post office. They are sold in the following values: $\frac{1}{2}$ d., $1 d ., 1 \frac{1}{2} d ., 2 d ., 2 \frac{1}{2} d ., 3 d ., 4 d ., 5 d .$, $6 \mathrm{~d} ., 9 \mathrm{~d} ., 10 \mathrm{~d}$. 1s., 2s. 6d., 5 s ., and 10 s . A took containing $181 \frac{1}{2}$ d. stamps, 6 penny ones and six halfpenny ones can be bought for 3 s Letter cards, stanped with a $1 \frac{1}{2} d$ stamp, can he bought. The charge is 2 d . for one, and goes up to 1 s . $6 d$. for a packet of 10 .
Envelopes embossed with $1 \frac{1}{2} d$. and $\frac{1}{2} d$ stamps, envelopes for registered letters and newspaper wrappers, are also sold at the post offices. These embossed envelopes are in two sizes, $4 \frac{3}{2} \mathrm{in}$. by $3 \frac{1}{16} \mathrm{in}$., and $5 \frac{5}{18} \mathrm{in}$. by $3 \frac{1}{8}$ in. Of the former a packet of 11 bearing $1 \frac{1}{d} d$. stamps costs 1 s . 6 d ., and of the latter a packet of 15 costs 2 s .

Newspaper wrappers bearing 1d. stamps cost 2s. for 22. Registered letter envelopes with stamps for 4 d . embossed thereon are sold in four sizes, $5 \frac{1}{2} \mathrm{in}$ by $3 f \mathrm{in}$. 6 in. by
 These can he used for foreign postage, pro vided the extra stamps are affixed. In rural districts stamps for $\frac{1 d}{}$., 1d., and $1 \frac{1}{2}$ d., and also envelopes with a $1 \frac{1}{2} d$. stamp, can be bought from a postman.

Redirecting Letters. Any kind of postal packet can be redirected to the same person at another address under certain conditions. This privilege is necessary when persons remove from one house to another. It is also very useful when families go away for the summer holidays, and during other absences from home. It can be done either by someone authorized by the person to whom the letter is aldressed, such as a relative or caretaker, or by an official of the post office. The redirection of letters
thind years a fee of 1s a year is charged After that 5 s. a year is charged.
The postal authorities only undertake to re direct letters, postcards, etc., when such cannot be redirected at the place of addrcss. They do not, for instance, redirect postal packets addressed to a person who has temporarily left his house, unless the house is left unin habited; or those addressed to clubs, hotels hoarding houses, or lodgings.

Notices of removal and applications for redirection must be signed by all the persons to whom any packets to be redirected are to be addressed. Thus, in case of a removal, all the members of a family who have any reason to expect letters must sign, not the head of the house only. Printed forms for this purpose can be obtained from the local post office or from a postman, and when filled up and signed should be sent to the postmaster or handed to the postman.
Registered Letters. Letters which contain money or artioles of value should be regis tered, and if this is done compensation will be paid by the Post Office in the event of loss. Any letter, parcel, or other postal packet can be registered. Anything intended for registra tion must be handed to an official of the post office, and a certificate of registration, bearing an acknowledgment that the necessary fee has heen paid, must be obtained. Nothing intended for registration should be dropped into a letter hox
The fee for registration is 3 d . exclusive of postage This insures the-packet up to $£ 5$, so if it is worth more than that sum a higher registration fee should be paid. The fees and limits of compensation are as follows, this applying obviously to inland postage only. No compensation in excess of $£ 400$ is paid.


A packet intended for registration must he made up in a reasonably strong cover appropriate to its contents and must be fastened with wax, gum, or other adhesive matter. It is not sufficient neerely to tie a packet with string, but if it is tied with string in addition to the fastening, the string need not be sealed.

If it is desired to secure compensation in the event of damage to a packet not sent in a parcel, the packet must bear the words fragile, with care. These words should appear on the face of the cover, above the address. Any official to whom a packet is tendered for regis. tration is instructed to refuse to register it if the packing is, in his opinion, obviously inadequate. Compensation will nevertheless be refused if, though acoepted, the packet is afterwards found to have been imperfectly packed. When several packets are sent for registration by the same person it is desirable for a list of the addresses in duplicate to be sent with them; one copy is kept by the post office and the other is signed and returned to the sender. The sender of any registered postal packet may arrange at the office of posting, either at the time of posting or subsequently, for an advice of its delivery to be sent to
him The fee is 3 d , payable by means of stamps affixed by the sender to a form provided for that purpose.

Packeta that contain coin or jewelry, and also all packets for inland postage bearing the word Registered or any other word, phrase, or mark to the like effect, written or printed on the cover, are, if posted otherwise than in accordance with the regulations, subject to compulsory registration and are charged on delivery with a registration fee of 6 d . less any mount prepaid in excess of the postage.
Any packet which is found open in the post or cannot be delivered, and which is found to contain an uncrossed postal order in which the name of the payee has not been inserted, a cheque or dividend warrant not crossed or made payable to order, a banknote, currency note, postage stamps, or any article, other than coin or jewelry, of a value in each case of 10 s . in coin, will be subject to registration and be charged with a registration fec of 3 d . No compensation will he given for any postal packet that has been compulsorily registered.

Compensation in respect of money of any kind, coin, banknotes, money, postal orders. cheques, stamps, etc., will be paid only in those cases in which the money is enclosed in one of the registered letter envelopes sold by the post office, and the packet is tendered for transmission by registered letter post. The compensation paid in respect of coin, which must be packed so that it cannot movo about, will in no oase exceed $£ 5$. . Compensation for damage to a packet sent by registered letter post will be paid only in cases where the packet is marked with the words fragile, with care
Printed Papers For printed papers the prepaid rate of postage is d d . and an additional dd. for every 2 oz . or fraction thereof up to a maximum of 2 lb . Printed paper includes all documents that fall into the following six classes. Such documents must consist of a printed form and any writing on it must refer solely to its subject matter or must consist of formulas of courtesy or of a conventional character, not exceeding five words or initials.
(1) Commercial or business papery of a lormal character, namely, invoicea, orlers for gomds or for work, confirmations of orders, advice notes of the dispatch or receipt of letters, documents, goods, or money, wnybills, bills of lading, receipts for ronds or money, statenients of account, price lists, prices current. market reports, delivery and shipping notes, tenders for zooxds or for advertisementa, quotations or gonds, estimates for work, inyluiriew for quotations, outract noter, conffimations of contracts, share transfer notices and applications for employnient. Notices oi assessments and applications for payment of mites, notices relating to the registration of votera, notices, certificates, reports, and returna aiven or made to or by public bocdiea. lista nuld bular statements.
(2) Proposals and policies of insumnce, powers of attorney, proxy papiers, llcences, voting papers,

## (3) Circuliss thut is printe

4) Printed Christmas, printed notices and letters. picture, greeting and visiting cards. (including information for insertion in printed proofs and sinilar publications) with corrections and enstructions.
(f) Educational exercises and examination papers ith comments, corrections and instructions.
As overy printed paper is subject to examination, it must be posted in a cover that can be easily removed for the purpose of examination without breaking any seal, tearing any paper, separating any adhering sulsstance, or cutting any string No printed paper may contain or bear any communica. tion in the nature of a letter.

No paper money may be posted or conveyed or delivered by post in a printed paper. A stamperl proxy paper or a stamped and addressed card, wrapper, label, or envelope forwarded in order that such card, wrapper, label, or envelope may be returned through the post is, however, permitted. A packet prepaid as printed paper, but which contains
an enclosure of any kind, is not admissible at printell paper rate.
Newspapers. Newspapers can be sent through the post at special rates provided such newspapers have been registered at the general post office. If this has been done, the words Registered for transmission through the post will usually be found thereon. The rate of postage on publications registered in this way is ld for every copy not exceeding 6 oz., with a further charge of $\frac{1}{2} \mathrm{~d}$. for every additional 6 oz . or fraction of $6 \mathbf{~ o z}$.

The rate is per copy; so if two or more copies are sent in a single packet each is liable to the same postage as if posted separately. But in no case will a copy or a packet of such copies be chargeable with a higher rate than that chargenble on a printed paper of the same weight. A copy or a packet of copies posted unpaid or underpaid is chargeable on delivery with double the deficiency at the newspaper rate or printed paper rate, whichever involves the lower charge. No copy or packet of copies may weigh more than 2 lib or exceed 2 ft . in length or 1 ft . in width or depth, or, if made up in a roll, 30 in . in length and 4 in . in diameter.

Every newspaper sent through the post should he so folded and covered, if a cover is used, as to admit of the ready inspection of the title. Every copy or packet of copies must he posted either without a cover or in a cover open at hoth ends, which can be easily re. moved for the purpose of examination. No copy of a newspaper sent by post at news. paper rate may hear on the paper itself or on the wrapper any writing except the name, address, and description of the person to whom it is sent, the name of the sender, the words With compliments, and a request for its return in case of non-delivery.

No unregistered publication and no article that is not part of a publication registered as a newspaper or a supplement thereto may be enclosed in any packet sent at newspaper rate. No supplement to a publication registered as a newspaper is admissible at the newspaper rate unless it is sent through the post with the publication to which it is a supplement. If any of these regulations are infringed, the packet will be charged, either as an underpaid printed paper or an underpaid letter, or is transferred to the parcel post and charged with a fee of Id. in addition to any deficient parcel postage, whichever involves the lower charge.

Other Points. If a letter, postcard, or newspaper cannot for some reason be delivered at the place to which it is addressed, it is returned direct and unopened to the sender, provided it hears on the outside his or her name and address. If this is not thereon, the packet is opened by an official of the post office, and if it contains the sender's address it is returned thereto. An undelivered postal packet which cannot he returned to the sender and contains no enclosure of importance is destroyed.

Any person who desires proof that a letter, letter card, postcard, printed paper, or news. paper has been posted to a particular person, should hand in the letter or card at a post office and ask for a certificate of posting. The fee for this is $\frac{1}{2} d$., payable by means of a stamp, which must be affixed by the sender to the certificate. A letter which contains anything of a fragile nature should be lahelled fragile.

In towns, where post offices or pillar hoxes are found in almost every street, the postmen are not allowed to accept anything for the post, hut in country districts it is different. There, subject to certain conditions as to weight, etc., a postman must accept any letter, parcel, or other postal packet handed to him on his round, whether intended for registration or not.

Railway Letters. In Great Britain the rail. way companies will accept and convey letters, both on weekdays and Sundays, by the next
available train or ship, either to be calsed for at the station of address or to be transferred to the nearest letter box. Such letters are called railway letters.

A railway letter must not exceed 2 oz . in weight and must be taken to a passenger station of the railway company over whose line it is to be sent, and tendered, during such hours as the station is open to the public, to a servant of the company. Postage at the inland rate must be prepaid by putting stamps on the cover in the ordinary way. In addition, a railway fee of 4 d . is charged, which must be paid in cash to the railway company's servant. Nothing further is payable on delivery.

Mails by Air. Any kind of letter packet may be sent by air mail, that is, letters, postcards, printed papers and commercial papers. and samples. The limits of size and weight are the same as for similar correspondence sent by ordinary post. Air mail letters can be accepted for registration, hut insurance is limited to letters and boxes for Holland and Switzerland. A special hlue air mail label anust he affixed to the top left-hand corner of every air mail packet. These labels may be obtained free of charge at any post oflice.

Stamps to the full value of the cambined postage and air fee must be affixed at the top right-hand corner of the address side of the envelope. If the proper fees are not piepaid, the packet cannot he sent by air mail. The combined postage and air fees for correspondence for countries outside Europe are for a weight of half an ounce.

POSTAL ORDER. Those who wish to send small sums of money through the post may do so by purchasing one or more postal orders from any post office where this kind of husiness is transacted.
Postal orders are issued for various amounts between 6d. and $£ 1$ ls. The charge is 1d each for those of 2 s .6 d . and less, $1 \frac{1}{\mathrm{~d}} \mathrm{~d}$. for those between 3 s . and 15 s .; and 2 d . for those above that amount. If odd sums of money are required stamps can be fastened on to the order, if they do not exceed 5 d . in value.
To obtain the money for one of these orders the recipient must take it to a post office and sign his name thereon, or pay it into a bank where he has an account. If, however, it is crossed, it can only be paid through a bank. Persons wishing to send larger sums of money through the post can do so by means of money orders. See Money Order.

POSTCARD. A postcard is a card on which a message is written and which is sent through the post. Postcards are sold ready atamped at all post offices for a little more than the cost of the stamps, while unstamped cards suitable for posteards can be bought and stamped by the sender.
In Great Britain and Ireland the rate of postage is a penny for every card. A postcard, if posted unpaid, is charged double postage on delivery ; if posted underpaid it is charged double the amount of the deficiency. The prepaid rate of postage on every reply post. card is 2 d . As regards size, a postcard may not exceed $5 \frac{1}{2} \mathrm{in}$. in length, by $3 \frac{1}{2} \mathrm{in}$. in width, or
 If private carcls are used as postcards, their material must be ordinary cardhoard or paper not thinner than that sold at the post offices for use as postcards. Picture postcards, il containing not more than five words, will go for $\frac{1}{2} \mathrm{~d}$. as printed papers. (See Postage.)

Nothing may be attached to a postcard except the stamps: a completely adherent gummed label or slip that folds back, hearing the name and address of the person to whom the card is sent; a similar label, not exceeding 2 in . long and $\frac{3}{3} \mathrm{in}$. in width, bearing the name and address of the sender of the card; and engravings, drawings, photographs, and printed matter on very thin paper and com-
pletely adherent to the card These additions may be affixed either to the back of the card or to the left-hand half of the front. The right-hand half of the front must be reserved exclusively for the address and the postage stamps. If these rules, which are intended mainly to allow picture postcards to go through the post, are not observed, the postal authorities may refuse to deliver the card, as they are officially entitled to do.

A postcard may not be folded, nor may it be hent or altered in such a way as to reduce its size below 4 in . by 23 in . It must not be fastened against inspection in any way, nor enclosed in a cover of any kind. If these rules are brolien the card will be treated as is letter and will be charged accordingly.

Postcards can also be sent to destinations outside Great Britain. Gencrally speaking the rules are the same for these as they are for inland postcards. The rate of postage for one of these foreign cards is $1 \frac{1}{d}$., and for a reply posteard is 3 d . A postcard from a place abroad, if unpaid, is charged with a postage of 3 d . If it is partially paid it is charged with double the deficiency, with a minimum charge of $1 \frac{1}{2} d$. Any card can be stamped and used as a postcard for the foreign and colonial post provided it is of cardhoard similar to, but not thinner than, that used for the cards sold at the post oflices for use as postcards. They may not excced $5 \frac{1}{2} \mathrm{in}$. in length by $3 \frac{1}{2} \mathrm{in}$. in width, or he less than 4 in in length by 23 in. in width.

Postcards for abroad must bear on the face the heading Carte postale, or the equivalent of the heading in another language. Thia heading, however, is not obligatory for single postcards that have been manufactured privately. Reply paid postcards must bear on the face in French, as a heading on the first half, the words Carte postale avec réponse payee; on the second half, Carte postale réponse. Each of the two halves must, moreorer, comply with the other conditions laid down for single postcards. One half should be folded over the other, and they must not be closed in any way.
Official postcards sold for inland postage may be used for destinations outside the United Kingdom if they bear a postage stamp for the additional postage required. This concession does not apply to reply paid cards. A postcaril must be sent unenclosed, that is to say, without wrapper or envelope.
Although it is forbidden to join or attach to postcards samples of merchandise or similar articles, yet illustrations, photographs, stamps of any kind, address labels, and cuttings of any kind may be affixed to them, provided that these articles are not of such a nature ns to alter the character of the postcard ; that they consist of paper or other very thin aubstance, and that they adhere completely to the card. With the exception of address labels or slips, these articles may only be affixed to the hack, or to the left-hand half of the address side. These details are sufficient for ordinary purposes, but fuller ones will be found in the Post Office Gıide

POSTE RESTANTE. This name is given to a post oflice where postal packets of all kinds may be addressed and left until called for.

When letters, etc., are addressed to a person at a poste restante, the words, To be called for, or Poste restante, should appear in the address. The post restante is intended solely for the accominodation of strangers and travellers, who, however, must not use it for more than three months consecutively. Postal packets addressed to initials or to fictitious names, or to a Christian name without a surname, are not taken in at a post restante.

Postal packets may not be re-directed from one poste restante to another in the same
town, or from it private address to a poste restante in the same town For the purpose of this rule the various postal districts of London are considered as different towns. All persons applying for letters at a poste restante must furnish sufficient particulars to prevent mistakes and to ensure delivery to the proper person.

Postal packets from abroad will he kept at a poste restante for a period of two months, and those from within the United Kingdom for a fortnight. Letters addressed to a post office at a seaport town for a persun on board ship expected to arrive at that port are kept for two months. At the expiration of these periods postal packets will be treated as undelivered If, however, one bears a request for its return within a specified time, not exceeding the official period of retention, it will, if not delivered, be dealt with in accordance with such request. See Postage.

POT. A pot is a general term for a vessel for holding foorl, both when cooking and at other times. The word, however, has been superscded largely by the special names given to the various utensils, although it remains in mustard pot, pepper pot, and stock pot, and in the words pot-hook, potherb, and pottery. Another pot is the Hower pot, and potting is a familiar tern among gardeners. (See Flower Pot; Mustard; Pcpper; Potting ; Stock Pot.)
Pot Plants. Plants grown in flower pots arc chiefly relied on for the decoration of the conservatory and greenhouse, and by making a selection of suitable kinds a succession of bloom can be assured all the year round
Those of chief value for summer and autumn flowering in the amateur's greenhouse are tuberous begonia, yellow arum lily, fuchsia, zonal geranium, begonia semperflorens, campanula isophylla, herbaceous calceolaria, petunia, chrysanthemum, hydrangea, mar guerite, heliotrope, lilies, nerine, Scarborough ily or vallota and various annuals.
For winter and spring Howers reliance must be placed on daffodil, hyacinth, paper white narcissus, tulip, Chinese and other primulas, Persian oyclamen, stoclis, azalca, nrum lily, cineraria and perpetual Howering carnation, together with various shrubs which may be forced into bloom. Suitable foliage plants are ferns, palms, indiarubber plant (ficus elastica), aralia sieboldii, araucaria excelsa, hlue gum (eucalyptus), grevillea robusta, isolepis gracilis (a grass-like plant for edging), ophiopogon variegata, panicum (also suitable for edging) tradescantia, aspıaragus Sprengeri, and smilax.
Seeds of hardy and half-hardy annuals should be sown in pots in September for spring and early summer bloom and in March to provide a succession. Several secds are sown in $5-\mathrm{in}$. or $6-\mathrm{in}$ pots and the seedlings are thinned out, not transplanted. The buttertly flower (schizanthus) is one of the best for sowing in September, but many annuals can be grown in pots.
Watering is one of the most important details in the management of pot plants : most failures are due to incorrect watering. The secret of success is not to moisten the soil until it is moderately dry, and then to fill the pot to the rim. Water should not be given again until the soil is fairly dry.

POTASH : In Medicine. Applied externally in concentrated form, potash acts as an irritant and caustic. In medicinal doses internally the action of potassium salts resembles practically that of the corresponding salts of sodium.

The sulphate, tartrate, and acid tartrate of potassium are all commonly used as saline purgatives or "salts," and may be employed in habitual costiveness. The best way to take these salts in this ailment is dissolved in half a glass or more of warm water, slowly sipied,
hefore breakfast. The acid tartrate is one of impurities that sometimes harm active roote the ingredients of Imperial drink (q.v.), often prescribed as a cooling beverage in slight feverish states.

Potassium chlorate is commonly uscd as a mouth.wash or gargle, the drug exhibiting an antiseptic, curative action in all kinds of sore throats, tonsillitis, and similar conditions. It should be discontinued, however, after a few days' use. An aerated water containing hicarbonate of potash makes a palatablc diluent of other drinks, and is feebly antacid.

As a Fertilizer. l'otash is an essential element of plant food, producing quality and Havour in fruit, tubers, and roots. The form used is kainit, an easily soluble salt containing about 15 per cent potash, but embodying

## Potatoes: Cultivation and Cooking

## Successive Steps in Preparing this Vegetable for the Table

Other articles that contain something usefulabout potatoes include Black Scah; Cutworm; Digging: Division: Forcing: Kitchen Garden; Manure; Trenching. See also Burgundy Mixture; and for the cooking, Chips: Frying; Hot Pot; Irish Stew; Salad; Shepherd's Pie, etc.
For garden purposes the most suitable soil kinds. A space of 12 to 15 in should be left in which to grow potatues is a rich loam, a between the sets, and the rows should be from trille on the sandy or chalky side, well drained, 2 ft to 2 ft .6 in . apart. If plenty of ground is and in a sunny situation. If the soil is heavy available. the potatoes may be inserted at it should he thoroughly dug over during the 3 ft ., and catch crops grown in between the autumn and winter. Couch grass, docks, rows. They may be planted either whole or nettles, and uther perennial weeds should he in pieces, according to the number and quality forked out; if there is any reason to suspect of the eyes or shoots that leather jackets, wire worms, or millipeles are present, the eriil should he turned over.

When the soil is sandy or open in texture it can he improved, as far as potato growing is concemed, by adding dead leaves of decaying vegetable matter. Impoverished land should be enriched with stable manure, which may he dug in during the antumn or winter or before planting in spring. Lime, say 7 lb . to the rod, is beneticial to rich garden soils.

The selection of the beat varieties of potatoes for planting purposes is a matter of great importance. Some which do well in one district prove disappointing in others, and an actual trial is often the only means of proving whether a new variety is worth planting.

Planting, Early potatoes can lie planted early in Narch. Affer the surface of the ground has been levelled, the sets should be put in about !) in. apart, at a depth of 6 in There should be a span of 18 in . between the rows If the soil is heavy, the potatoes should not he huried so deeply.

The end of March or the beginning of April is the hest time for planting the ordinary.


Potato. Method of preparation for planting. 1. Large tuber divided. 2 and 3. Divisions ready for liming. 4. Well-sprouted tuber with supertluous eyes removed. 5. An ill-sprouted tuber with weak useless shoots. 6. How the tubers are arranged in a baz for sprouting

When the potatoes are about 9 in . high they should be earthed up. Sufficient soil is hanked up to cover any young tubers that may be growing near the surface.
Growing Under Glass. Iotatoes may be grown under glass where hottom heat is available. A frame or pit should be prepared early in January, with a $\leq$ ood hed of manure or leaves. This is covered with ahout 1 ft . of soil, and the potatoes planted about 6 in . deep Plenty of fresh air should he given in mild weather, and tepid water. No earthing up is required. The potatoes will he ready early in May. A few radishes may he forced in hel ween the rows, if desired, in which case the turnip-rooted sorts are the best to employ.

Digging. As regards the digging or lifting of potatues, growers are prone to lift early ones too early and late ones too late. The bulk of the earlies ought not to be lifted until the tubers have got at least to the size of a hen's egg and the tops have changed colour. If they are lifted too early the crop will suffer from loss of weight or of starch, the sub. stance which gives the tuber its nourishing value. Exposure on the ground for a few hours is desirable, as it allows for setting the skins. There are few cases in which potatoes lose by being lifted before Michaelmas, and there are many in which they gain. It is well, if jossible, to lift them when the soil is comparatively dry, as they will then come up fairly clean. Late potatoes lifted in September may, as a rule, lie on the ground for 20 hours, provided the weather is not too wet.

Potatoes for Seed. For seed, potatoes of a suitable size can be bought, or they can he saved from a previous crop, provided it is a hoorl one. It is not desirable to plant the
very small potatoes known as chats, or the largest tubers, except in the case of first early varieties, when cutting should be avoided As potatoes lose their vitality if grown continuously in the saine locality, frequent change of seed is recommended; experience has shown that it is desirable to obtain seed tubers from a district farther north than that in which they are to he planted. Some growers ohtain new seed tubers every second year from Scotland. In the warmest and driest districts of the country a change of seed is advisable every year.

Growers who wish to provide their own seed tuhers should set aside a portion of the crop for this purpose, lifting it before the tubers are fully ripe, as immature tuhers make the best seed. They should then be selected Clean tubers, having been selected, should be allowed to lie on sacking or on the ground for a few days, and should be turned occasionally so that they become greened. This will improve their keeping quality. In winter they sbould be placed with the crown uppermost in shallow trays or boxes, or on shelves one layer deep. These should be laid in a cool, frost proof place where they will get as much light and air as possible. Tubers boxed in this fashion develop 2 or 3 strong green sprouts instead of a large of doing this is to scatter litter lightly but number of weakly shoots, which they pro thickly over the heap.
duce if they are pitted or kept in the dark.
Manuring. A good system of manuring consists in the application just hefore the time of planting of a mixture of superphosphate of lime, 5 parts, and sulphate of ammonia, 3 parts, at the rate 3-4 oz. to the sq. yd. If sulphate of ammonia is applied after the shoots have come above the ground, it should he mixed with soil so that the growing plant does not come in contact with it. The addition of a small quantity, $l \mathrm{oz}$. to the yd. run, of wood ashes as a dressing to the soil before the sets are planted is also to he recommended. If potatoes are cut into sections before being planted, the wounded parts should be dipped into alaked lime.







Storing. For potatoes stored on a large scale a clamp or pit is almost a necessity, but other methods are possible with small quantities. A dry, frost-proof shed makes an excellent store. In this the potatoes ahould be spread in layers on the floor, either directly or on straw, bracken, or sacking. The rlepth of the Inyer must not he more than 21 ft . or the tubers may become heated and liegin to sprout. They should be covered with straw, litter, or sacking to keep out the light, unless they are intended for seed.

They should be inspected 10 days after they have heen put in store. and diseased potatoes removed. The shed should be ventilated whenever possible or desirahle. A watch must he kept for rats and mice. and every care taken against frost. One effective method


Potatoes in various stages of growth, illustrating bow the tuberation is effected Courtesil of Amateur Gardening

Where there is no shed suitable for storing, and the quantity is not too great, the tubers may be placed in thick baga and left in a larder. Quicklime or lime and llower of sulphur sprinkled lightly among them will help to keep down the disease. During the late autumn season they should, if possible, be looked over once a fortnight, and diseased tuhers removed. In winter old sacking thrown over the sacks will protect the potatoes from frost. In very severe weather extra covering should he put on at night and removed in the morning.

If no suitable place is available, potatoes may be atored in a cellar, careful attention being paid to ventilation, particularly during
the first months of storuge.

For growers who are in a prosition to store their potatoes in a clamp or pit, the following hints may be helpful. The condition of the potatoes at the time of clamping is most important They should he putaway in a dry state, and as free from soil as possible.

Irge clamps are lin ble to develop more heat than small ones. As a general rule it is unsafe and inadvis. able for the base to exceed 7 ft., while smaller clamps are often seen. The site should bedry and well drained, and the base, if anything, should be alightly above the generalle vel of thesoil.
Having been placed in a heap, shaped like
a pyramid, the potatocs must next be covered First cover them with a layer of straw ahout 6 in thick A plank about 1 ft . broad and from 8 to 10 ft . long should be placed along the top or ridge of the heap, and the sides, to the edge of the plank, covered with an inch or two of soil. The plank is then moved along. and another length covered with soil. In this way the top of the clamp is kept free from soil. thus providing for the necessary ventilation.
The covering soil should not be put on at once. If the weather is fine and severe frost is not threatened, $\Omega$ full fortnight should elapse between putting on the straw and closing in with the first covering of soil. as this allows much of the hent that is produced by respiration to escape. In very wet weather the soil may be put on sooner, as it is inadvisable to close in when the straw is sodlden It may be neccasary to add more soil to the sides later in the year

Adequate top ventilation must be given. The straw should be left exposed along the ridge and not closed in completcly

Potato Diseases. Potntoes are subject to n number of diseases. The chief one is known sometimes as potato blight and sometimes as potato disease The first sign of the disease visible to the naked oye is the appearance on the leaves of dark brown or blackish spots of irregular size and shinpe, on the under surface of which $\Omega$ delicate white mould may be secn, esperially round the margin of the diseased areas. If weather conditions favour the fungus the dark-coloured patches spread rapidly, and the whole of the foliage, and sometimes the stems also. soon become blackened Potato plants badly attacked by blight give off a very distinct and disagreeable smell.

If the weather is wet after the haulm has heen attacked, the tubers soon begin to be affected. Infection of the tuhers is brought about by spores which, liberated from the surface of the lenf, are washed into the soil.

By the use of Bordenux or Burgundy mixture in June and July the spores of the fungus are prevented from germinating and producing threads which grow into the tissues of the leaf, and hence the haulm, instead of withering, as it does when attacked by blight, remains healthy and green. Spraying must be done in good time, and if heavy rains have washed the spraying material from the leaves, the operation of spraying must be repeated.

Potatoes in store are liable to diseases. One of these is dry rot, which uqually develops from December onward, becoming more severo as the spring advances.

Potato Leaf Curl. Probably no diseare is more directly responsible for weakly potato plant and light crops than that termed potato lesf curl. In the lighter soils in the southern and drier part of Great Britain it is very pro valent and is particularly abundant where the practice of using locally grown seed is followed. A marked symptom is curling of the leaves.

As the disease is perpetuated by means of the seed tubers it is of the utmost importance that they should not he saved from affected plants. Not only should tubers from dwarfed or distinctly curled plants le rejected for seed purposes, but also those from all plants showing curling of the lower leaves and, at all events in the south, those in immediate proximity to diseased plants.

Potato Scab. Common potato scah or brown scal, is one of the most widespread disenses affecting the potato. It is particularly pre valent on light gravelly soils poor in hunius, and on other soils where ashes, lime, and other alkaline substances have been used freely. The diserse is also caused by a minute fungus which attacks the surfaces of the tubers and gives rise to the production of dark scnttered scabs, or large eroded patches. The scabs increase in size with the growth of the tubers, and they may in bad cases cover almost tha


Potato. Doufle row dug up showing number of tubers produced Courtcsu of Amateur Gardening entire surface of them. For eating. the and serub the required number of potatoes put sound part of a scabbed tuber is not injured. The nost important preventive, according to Leaflet 137 of the Ministry of Agriculture, is suitable trentment of the soil. To sandy or gravelly soil organic matter of a vegetable nature should be applied. In gardens ancl amiall holdinga, decaved lenves, spent hops and grass mowings may be used.

The application of lime, ashes and soot should be temporarily suspended on alkaline soils, and their alkalinity counteracted by the use of superphosphate of lime and sulphate of ammonia in apring. Scabled potatoess and peclings from nffected potntocs must not be thrown on the manure heap, neither should they be given to piga unless they liave previously been boiled.
Sclerotinia and Sprain. Potatoes are also subject to a number of other diseases, although these are neither so widespread nor ao frequent as those already mentioned. The aclerotinia disease is most destructive in the northern and damper parts of the country, and is eapecially virulent in the west of Ireland. To eradicate it the most important step is promptly and syatematically to collect and burn all diseased portions of the plant in order to prevent the disease from spreading and the sclerotin from reaching the soil. The sterilization of the soil by ateam is also recommended. Unless this has been done, potatoes and other plants liable to this discase should not be grown in infected soil until at least three years have passed.
them into a pan containing enough hoiling wate to cover them, adding a dossertspoonful of anlt to every quart. Bring them to the hoil. then ainmer them gently until they nre soft but not broken. Drain off the water, peel the potatoes, and then put them back into the pan, covering them with n clean cloth and placing the lid so that it half covers the top Put the pan over gentle heat for a few minutes, shake it occasionally, and then turn the potatoes into $n$ hot vegctalile diah. If preGerred, the potatnes may be served in their skins, water being drained off and the potstoes left to dry thoroughly in the covered pan. The time required for cooking is 20 to 30 min .

To boil potatoes with out the skins. they are washed and peeled thinly, the eyes and any damnged or discoloured Mortions being removed. Potatoes of large aize are cut into halves or quarters of uniform proportions. They are then put into a pan of asalted boil. ing water and conked in the amme way as potatoea boiled in their skins. Some varieties of potatoes conk better if placed in cold water, so should

The disease known ля eprain is not gen erally distributed, but it in troubleanome in certain localities where the soil conditions nppear to favour its development. It may be recognized by the appearance of dark brown blotches or streaks on the flesh of the tubers. The disease known as pink rot is common in parts of Ireland, capecially in the west, and has slso appeared in Great Britain. The fungus causes a wet rot the tubers, and the disease owes its name to the fact that the cut surfaces of infected tubers turn pink when exposed to the air. It commences when the potatoes are still in the ground.

Cooking Potatoes The potato is alinost pntirely a starchy food. It contains ureful sults, but these nre mostly ost unless it is cooked in its jacket. To support life it must be combined with fats, gravy, for exnmple, improving its fond value: and proteins, meat, fish, milk, or chcese. New potatoes are less starchythan old ones.
To hoil potatoes in their akins, wash
resulte not be successful by the method \%iven try this. Potatoes need careful watching to prevent them hoiling into the water. Some do this quicker than others, therefore it is impossible to give a definite time for cooking Stenmed potatoes cooked in their skins ahould first be waslied and then placed in a covered steamer over a saucepan of boiling water. Cook them until the skins begin to crack and the potatoes themselves feel soft when tested with a fork; then take the lid olf the steamer, move the pan to the side of the fire and let its contents dry. Peeled potritoes may be atenmed in the asme way. This method of cooking takes about $\frac{1}{2}$ hour

Potatoes baked or roasted with a joint should first be parhoiled, drained nad sprinkled with aalt. Lay them in the pan under the meat, basting them frequently, and when they are brown on one side turn them and brown the other. They mav be served on the dish with the joint or placed in a hot vegetnble dish. 'These require sbout 1 hour's cooking.

Gloves for acraping new potatoes are y useful invention. Those illustrated have a metal attachment for removing eyes The potato skins are rubled off by means of the wired surface on the fronts of the gloves.
Now potatocs, aiter being washed and acraped, are put into a pan of boiling aalted water with a sprig of mint, and simmered gently until they are tender. The water is poured off. the pan returned to the side of the firc, the top half covered with the lid, and the potatoes left to dry. A small lump of butter or mar garine is placed in a hot vegetable diah, and the potatoes served in it, with the mint re moved and a little chopped parsley sprinkled on top : $20-30 \mathrm{~min}$. is the time required
Fried Potatoes. Fried or chip potatoes are served with grilled chops and steaks, fish, etc. Old potatoce are more successful than new ones. The starch cells in new potatoes are undeveloped, so they do not fry a good brown They can be used, but care must be taken not to over-cook them in the effort to get them as brown as old ones. Slice some washed and peeled potstoes into finger-shaped pieces with a knife or potato cutter, or cut them into straws, cubes or thin oval-shaped slices. Put them into a bowl of cold water until they are required, and in the meantime heat rome fat in a a aucepan until a faint hlue smoke rises from it. Drain the potatoes in a clean cloth, and put them into a frying basket, placing the latter in the fat. Shake the bnsket occasionally so that the potatoes may cook on hoth sides, nnd when they are brown and crisp lift out the braket. let the fat drain from it into the pan, and then empty them into a dish lined with crushed tisaue paper. Stand in a warm place until potatoca are drained thoroughly, then serve in a hot vegetable dish with salt sprinkled over them.
Fried potatoes that can be enten hot or cold, known as potato crisps, are prepared by


Potato. Gloves for scraping new potatoes. The fronts are made of fine wire and the potatoes are rubbed between them. Note the attachment on the right-hand plove for removing eyes, etc.
slicing the potatoes as finely as possible with the special cutter illustratel in this page or with a very sharp knife. Put the pieces in cold water and let them stand as long sa possible. Heat a pan of derp fat until it is past the blue-smoke stage: it must be perfertly still and no sign of smoke arising. Dry the potatoes well, and put them into a finemeshed frying hasket. Reduce the heat under the frying fat. and lower the basket in carefully. The fat will bubble up in the pann. and must be withdrawn from the heat if it shows signs of boiling over. Allow the potatoes to cook for about two minutes-until they are transparent looking but not browned at all.
Then take them up, and let them drain in the basket in a warm place while the fat is rehented to the same degres as before Then put in the basket of potatocs again They will lecome crisp and brown almost immediately, and muat then be taken up and drained well on tisaue paper. Sprinkle with salt and serve, or if required cold they should be stored in an airtight package The two fryings take every scrap of moisture from the potato slices so they remain crisp indefinitely
Other Methods. For sauté potatoes, cold hoiled potatoes are required. Chit 1 lb . of these into slices $\frac{1}{2}$ in thick, and fry them in a pan containing 1 oz smoking hot fat When they are pale brown on one side turn them over and cook them on the other Serve them hot. sprinkled with salt and fincly chopped parsley.

Boiled potatoes may also be served au gratin. To do this, cut fi large cooked potatoes into sliccs, place these in layers in a fireproof dish with a little grated cheese and salt and pepper sprinklal hetween each layer. Ahout 3 oz . cheese will be requised for this. Pour $\frac{1}{2}$ pint white sauce over the whole, sprinkle a littlo moro cheese on top, and hent the mixture in a morlerate oven or under ia griller. Serve the potatoes in the dish in which they were cooked

Potatoes that are to be mashed should first he boiled or steamed, and then put through a sieve, beaten up with n fork, or pounded with a potato masher. The potatoes are placed in this and are forced through a wire mesh by pressing down a handle Add \&oz. butter or margarine nod a tablespoonful of milk to each lb of potatocs, season to taste. and then put them into a hot vegetahle dish Mark tho top with a fork and then place the dish under a griller or in the oven so that the potatoes mny become lightly browned on top

For notatoes in la Jucherse, melt 2 oz . butter in a saucepan, and when hot add 2 oz . grated checse. and the yolk of one egg. Mix all well together over gentle heat, and season to taste with salt and popper and a dust of nutmeg. Turn out on to a floured board, and spread out until $\frac{1}{}$ in. thick. If the mixture seenss too soft, add a little flour. Cut out into rounds with a pastry cutter or make into 3 -in. squares. Mark the tops in a lattice pattern with the back of a knife. Brush over with beaten egg, nut the pieces on a greased baking sheet, and hake in n molerate oven until a delicate brown. The samp misture as the foregoing may be shaped into potato balls, egg and breadcrumbed, and fried in deeps smoking fat.

Potato scallops are also made with this mixture put into buttered scallop shells. the tops sprinkled with grated cheese and baked in a hot oven till slightly brown.

Cold cooked potatoes may be used to make potato fritters. Nelt a lump of butter a little lews than twice the size of a hen's egg in a saucepan, stir in ? lb . cooked potatoes rubled through $n$ sieve, the yolks of 1 or 2 eggs, $\Omega$ dust of nutmeg and seasoning to taste. Mix in also 2 stiflly whisked whites of rgg, and in the meantime heat up a deep panful of fat When the latter hoils, drop in the misture a teaspoonful at a time, snil cook the fritters until thev are a golden brown. Then drain them and serve them garnished with parsley.

Potato Cake. Cold hoiled potatoes may tre on a Houred baking sheet to prove. Bakic employed to make these cakes Prepare them them in a hot oven. They should be eaten
by rntibing 2 oz . butter into $\& \mathrm{lb}$ flour, adding 2 oz. castor sugar, $\frac{1}{2} \mathrm{lb}$. mashed colll potatoes and 2 oz sultanas. and mixing the whole with a beaten rgg lioll the mixture out to a thickness of about $t$ in., cut it into round cakes. and bake these in a hot oven for about 20 min . When they are cooked, slice them through the midule butter them and

serve them hot $1 f$ swect notato cakes are not liked the sultanas and castor sugar may be omitted

Potato Croustade. Snvoury croustales can be made from 2 lb cooked potatoes, 1 egg and 3 extra yolks, some bread crumbs and seasoning. Rub the potatocs th:ough a sieve. then mix them with the 3 yo!ks and salt and pepper to taste, and shape the mixture into flat round cakes. ahout if in high and the same in diameter.

Brush these over carefully with beaten egg and coat them with fine breulcrumbs: repeat the operation, and then with a small cutter mark a small circle in the centre of each cake Fry the croustades in hot fat, drain them on kitchen paper, and with a sharp-pointed knife take out the centre pieces. Scoop out as much as possible of the potato without damaging the sides and fill the hollow with minced poultry, ganie, or fish, seasoned and mised with thick sauce.

Potato Dumpling. Potato dumplings for serving in soup can be male in the following way: Boil 6 dry mealy potatoes in their akins and, after removing the latter. rub them through a fine sicve. Beat I oz. butter to a cream, add to it the yollis of 2 or 3 egge, and then mis in the sieved potato. $t$ oz Hour, and seasoning to tuste. When the mixture is firm, divide it into small, even-sized pieces, shape these into dumplings and cook them for about 5 min . in a pan of boiling stock
Potato Rolls. Stearn two good sized potatoes, and while still hot pass them through n wirc sieve into a basin and mix with them $1 \frac{1}{2}$. sifted tine Hour and 1 traspoonful salt Cream oz. veast with sugar and add to it $2 \downarrow$ gills of warm water. Make a well in the centre of the Hour and potatoes and pour in the yeast and water. Sprinkle a little Hour from the sides over the top, cover it over with a thick cloth, and set it to rise in a warm place.
When t is quite light knead in 2 oz . butter and the well-heaten yolks of 2 egga , and work up into a dough as for bread (q.v.), adding with the eggs $\frac{1}{4}$ teaspoonful carbonate of soda dissolved in 1 tablespoonful warm water. Divide the dough into equal parts and make each into long-shaped rolls. Place these hot after being pulled apart with two forks and buttered.

POTATO CUTTER. There are various kinds of potato cutter on the marliet, one of them being a cylinder-shaped tin with a perforated top. The potato is forced through these holes with the hand and comes out in long linger-shaped pieces. This cutter is


Potato Cutter which outs fancy shapes, mainly for purposes of garnisbing. Above, left, device for slicing potatoes finely and quickly for notato crisps
specially designed for chip making. The cutter illustrated on the left is used for slicing potatoes finely for crisps. The other is for cutting fancy shapes.

POTATO PEELER. There are various kinds of patent potato peelers, differing both in size and design. The most effective type consists of $n$ straight piece of wood about 4 in . long, into which is fitted a convexahaped projection of cast iron. The latter, in turn, is fittel with $n$ blade which reaches just below the edge of the iron
The blade is drawn sharply over the potato, with the result that the peel is drawn up) ward and outward through a slit in the iron. This pecler can also be used for peeling ot ber vegetables as well as fruits. Its chief recommendations are that it can he used without danger of cutting the hands and it jeels the skin off without waste.

POTATO RING. In silver and Sheffield plate the potato ring is now chielly a curiosity valued by collectors. It was first made in Ireland early in the 18th century, and Irish specimens fetch high prices. The rings were used as stands for the wooden bowls in which the potatces were brought to the table.
The conventional shape is a band of metal about $2 \frac{1}{2}$ in. deep, bent to form a circle something like a large napkin ring. This was swaged to present a concave surface, and was decorated by piercing or embossing; sometimes by chasing or engraving. Most rings were larger on one side than on the other, the reason being that they could be used for bowis of different sizes.

Potato rings are occasionally found fitted with glass bowls. Several beautiful examples are in existence. One in Sheffield plate is ornamented with foliage, and has Hat chasing rith ogee mounts round base and rim. See Sheflielil Plate ; Silver.

POTENTIAL DIVIDER : In Wireless. that illustrated is from walnut, 1 in . thick. This is a tapped resistance, which, when connected across a source of potential, enables voltages to be obtained which are a known fraction of the total voltage across the ends of the resistance. Thus a potential divider joined across a 6 -volt battery might have tappings at one third, one lialf and two thirds of the total resistance. The voltages between each tapping and the negative end of the resistance would be four, three and two volts respectively.
Potenti:, dividers may he employed in mains eliminators when it is desired to tap off voltages lower than the maximuni available value. The resistances used in this case should preferably be wire wound and capahle of carrying the anode current consumed by the valve or valves
Potentioneters, i.e potential dividers having continuously variable tappings, are used in wirelcss receivers for controlling volume or for adjusting the potential applied to the grid of the detcctor valve.
Volume control potentiometers, when incorporated on the low frequency side of a set, should have a value of not less than 500,000 ohms, and may take the place of the grid leak in a resistance capacity coupled stage or be connected across the secondary winding of a low frequency transformier.
Detector grid potentiometers may have a value of 400 ohms and are joined directly across the positive and negative low tension leads. The end of the detector grid leak which usually goes to low tension positive is transferred to the slider or moving arm of the potentiometer. The use of a detector grid potentiometer frequently results in an improved control of reaction, and is often beneficial in sets designed for short wave reception. The most suitable position for the moving arm of the potentionieter is determined by experiment.

POTENTILLA. The cinquefoil or poten tilla is an old hardy herbaceous perennial of which there are several improved varieties with large showy flowers. The plants reach a leeight of $18-36 \mathrm{in}$. and hear single or semidouble strawberry-like llowers in summer. They can be increased by division in autumn or by sowing seeds out of loors in May. The varietics Gibsun's Scarlet, Yellow Queen and William Rollinaon, red and orange yellow, are a few of the best Potentilla nitida is a beautiful little rock garden plant with grey leaves and pink flowers: it needs gritty soil and should be protected by a raised piece of glass in winter.

POTHERE. This name is used for any plant the leaves and atalk of which are used for food, more especially for such herbs as thyme, marjoram, etc., used fur flavouring. Vegetables that are served in stews, such as carrots, turnips, parsnipa, onions, etc., arc often known as potherbs. See Asparagus; Balm ; Masil; Cabbage; Spinach, etc.
POTLID. Owners of picture potlids, which were sold in such large numbers between 1848 and 1859, and are now valuable, often complain of there being no really satisfactory method of displaying them. Thic pictures require no covering of glass, being upon carthenware, glazed, and absolntely permanent. The illustrations show the system of framing.

To make the rim, it should be turned about 1 in . in width all round, and of an inside measurement ahout $\frac{1}{3} \mathrm{in}$. less than the potlid in dinmeter. The front may be moulded, but the outside circular edge and the back are kept Hat. No rehate to take the lid, as an ordinary frame takes glas8, is necessary, but one may be turned out of the back if desired. Any convenient wood may be used, one of thic hardwoods being desirable:

The rim is shown in section at $A$.
The backing consists of a ring of common wood-soft white deal is suitable. The ring is turned of an outside diameter like that of the irame ring, or, if preferred, a tritle smaller, but in any case, not larger, than the frame. The inner circular a perture in the backing ring is of a size to fit tightly over the outside rimı of the potlid. This backing ring is shown at $B$.

The potlid, C, is adjusted in the frame, $A$, the convex or picture side of the lid being outward, and thus visible through the frame. The ring, $B$, is then slipped over the rim at the hack, and the ring screwed, with not less than 2 and not morc than 3 screws, to the frame. One screw is shown at D. The potlid is thus held most securely in the circular frame, and
both the front with its picture, and the inner por-
Potlid. Sectional tion of the lid with jerhaps its makers marks, are visible as desired. A picture ring, E, permits of the framed lid being exhibited upon a wall. The best plan is to arrange them along the top of a set of shelves, or an oak dresser

POT POURRI. There are various recijes for making pot pourri from mixtures uf sweet-scented flowers, herbs and leaves, preserved with salt and spices. It is necessary to gather the flowers or leaves to be used on a dry day as any danipness on them causes mould. The stalks should be removed and the flowers, etc, dried for at least two days in the run The old-fashioned roses with strong perfume are the best to use.

A simple recipe is made from rose petals and a powder composed of equal quantities of musk, storax, cloves, orris root, Jamaica pepper and dried lemon peel. A layer of rose leaves is put into the jar, then bay salt and next a layer of the pounded and powdered apices. Repent these layers till the jar is full. Cover closely and leave for a month. After that the contents may be mixed and stirred and placed in ornamental jars or muslin hags. Jars are better for preserving the scent of pot pouri. They should be provided with well fitting lids, which may be removed to allow the fragrance to escape into lie room hs required.
Another recipe requires a linndful each of lavender llowers, rose petals, sweet briar leaves, jasmine, rosemary and half a handful each of sweet geranium leaves, mint, thyme and lemon verbena. Put layers of these in a wide mouthed glass jar with bay or rock salt hetwcen each layer Cover for a month and


Potlid. Front and back view of the lid with frame completed
after turning out tho mixture add 1 oz. pow dercd orris root. a few dmps each oil of neroli, oil of musk, oil of cloves and oil of cinnamon. The bay salt which is ohtainable in lumps is roughly pounded. It may be mixed with an equal quantity of common salt.
POTTED FISH. Almost every kind of fish may be potted, but those usually preserved in this way are salmon, shrimp, and lobster. They may be bought in small glass jars or tins, but can also be prepared at home according to the following directions.
Potted salmon is hest made from cold boiled fish. Remove all skin and bnne from the latter and pound it well in a mortar with enough hutter to malie a smonth paste. Add seasoning to taste, then turn the mixture into clean, dry jars, and cover it with melted butter bcoore tying it down.

To make potted shrimp, remove the heads and tails from a pint of shrimps, and then pound the latter in a mortar with a little butter. The shells also should be pounded with butter and then pressed through a finc hair sieve before they are added to the fish Season to taste

Melt a lump of hutter about the size of a hen's egg in a pan, and stir the shrimp mixture into it. When the butter has been absorbed, move the pan to the side of the fire and add a little powdered mace. Let the mixture cool before joiting it as deacribed in the previous recipe. Prawns may be potted in the sanie way, and so nay the remains of any conked white fish. The latter, however, should be favoured with anchovy and well scasoned.

POTTED MEAT. Almost any cold cooked ment may he potted First free the meat from skin and gristle, then mince it finely and put it into a nortar with seasoning to tastc. To every $\& \mathrm{lb}$. meat allow a little more than 3 oz. melted butter, adding it gradually and reserving a little to cover the meat when it is potterl. A little tomato sauce or Worcester sauce added to cold mutton or heef is an improvement. Pound the mixture well then ruh it through a wire sieve and put it into pots, pouring the remainder of the butter over it to kecp out the air.

Two different kinds of meat, such as veal and ham or chicken and tongue, may be used together. Ham. from its salt nature, makes a good addition to most fresh meats, but should not be used in too large a proportion.

Potted chicken is especially tasty when mixed with ham or tongue. To prepare it, take $\frac{1}{2} \mathrm{~b}$. cooked chicken and $\} \mathrm{lb}$. cooked han or tonguc, mince thesc thoroughly by putting them through a machinc 2 or 3 times, and then pound then in a mortar with a little more than : 3 oz . butter, previously melted. Scason the mixture to taste, rub it through a tine wirc sieve. and then put it into small glass pots, putting a little more melted butter on the top of each.

Rnw meat inay also bo potted, but should be as lean as possible. Boke 1 lb . of this in a jar to which is alded a tablespoonful of butter. the same quantity of water, a lew cloves, a pinch of allgpice, and some aalt and pepper. Cover the jar well with buttered paper and a close-fitting lid, and place it in a tin of boiling water in the oven. or in a saucepan of hoiling water on the stove. Cook the whole gently for 2 or 3 hours, then take the meat out of the jar and make into a paste by pounding it in a mortar. Finally, aub it through n sieve and put into jars covercd with clarifind fat.

## Pottery and Pottery Collecting

## How to Recognize Typical Pieces of Many Periods

This contribution is concerned with decorative carthenware pleces, and the reader is especially referred to the article on China. Other branches of ceramics are deale with under Faience; Terra Cotta; Tiles. See also the separate entries on kinds of Pottery, e.g. Saısuma Warc; W'edgwood: Whicldon Ware
used on Bristol 18th-century ware While Chinesc, Persian and Indian styles of deroration werc copied in the Staffordshire potteries, several firma apecialised in views of cathedrals, cast lcs and country houses. These were mostly on dishes and plates; figures also received much attention from the designers.

In cottage homes, apart from lustred ware. the taste for chimney-piece ornaments was catered for by the Staffordshire factories with the so-called china toys. These earthenware figures were in part based upon the Chelsen tradition, in part upon the uninstructerl work of local modellers. Their figures were art less, but they carried on the 18 th-century work of the Woor family. Fig. 6 illustrates a statuette of a girl modelled by Ralph Wood about 1760
The productions of John Walton, ncarly all in ensmel colours, such as his shepherdesses with a foliage background, and his scriptural groups, mark a degeneration of type which Iltimately led to the spotted dogs and woolly sheep of Ralph Salt. The figures of these and a score of other potters, who turned out farmynrd incidents and portraita of celebritics. are to he found, genuine or forged, on many $s$ farmhouse mantel. Most of this class of image-work is unmarked, and indeed a marked piece should be suspecterl. With these may be ranked the jugs and mugs portraying historical events, with other memorial ware.

Leeda ware includes Egyptian basalt (matt black), glossy black, white ware which is blue printed, and lustre printed pottery.
Like the willow pattern at Canghley, lustre ware was introduced, at Spode's, in the later years of the 18 th century. The large output of Newcastlo and Sunderland lustre wase of a less interesting and artiatic character covered with scenes, rhymes and texts in black transfer work and enlivened by patches of pink or purple lustre fell within the earlier years of the lath century. When the design itself was lustred the effect was less crude, hut this north-country ware at its best seldom John Dwight. and the delft, which wa wrought at Iambeth, Bristol and Livel pool. Astbury ware also included pottery statuettes an example of which. dated 1740. is shown in Fig. 5.
For about eighty years of the 18th century the Frank family ware producing pottery of a refined delft type at Bristol. This earthenware hal a clear greenish-blue glaze, and many of the designs were tranaferred by printing. Some of the pieces had grounds of bluc or purple dots surrounding a printed or painted panel. Characteristio also of Bristol ware was white ornament over the ename! glaze The initials of the painter, sometimes the word Bristol, the date or occesionally two strokes crossed diagonally with two others were marks


Pottery. Fig. 3. Example of Palissy Ware, a 16th-century dieb with cupids set between the sunk portions Brilish Muxeum


Pottery. Fig. 4. Quaint salt glaze group, dating from about 1730 British Museum
reached the level of that made in Lecds, Swansea and Staffordshire. As it was mostly unmarked, its origin is usually determined on the dubious evidence of the potting.
Some of the best Staffordshire lustre was made by Wedgwood's, whose founder himself did some good work in this method. After 1831, a silver lustre made with platinum was introduced at Longton by Charles Allerton, and for 40 years his products attained such distinction that they were in constant demand by collectors. In contradistinction to the Sunderland lustred mugs are the salt-glazed brown wares produced at Brampton and Chesterfield, inaccurately called Nottingham ware. This inclutes complimentary tankards, jugs with hunting scenes, and animal figures for the mantelpiece

Victorian Pottery. With the Great Exhibition of 18.51 there was insugurated a revival, which profoundly influenced the pottery crafts. Many of these pieces have an old. fashioned rather than an antique air. Victorian pottery should be chosen for its decorative merit, whether it seeks to simulate ancient styles or is the outcome of the creative thought of its own age.
The task of emulating the gleaming hues of the medieval majolica was approached in the mid century at Minton's, and afterwards at Wedgwood's. The two methods of reproduction were quite distinctive, the former using dark clays with opaque enamela, the latter white bodies with coloured glazes. Later on the accomplished work of William de Morgan, who successfully rivalled the glories of the old Gubbio as well as the Persian lustre, remains quite unsurpassed.

A profound influence has been exerted upon the ceramic industry by the faience and other art fabrics for which the Doulton works at Lambeth are famed. Dating from the Great Exhibition, they present distinct qualities of make and design, and as moulds are but sparingly if ever used each piece possesses its own individuality. Even when the work is deliberately reminiscent of early pottery, as in the case of Miss Crawley's studies in the old Persian and Rhodian manner, the same observation applies.

Another great development of this period was the invention of Parian ware (q.v.), whose ivory-white body, unglazed or slightly glazed, ensbled statuettes to be moulded which
reaemb.led marhle Mesides Copeland's, Minton's, and Wedg. wood's, there are other works, such as Bootes' in Burslem and the Irish factory at Relleck, which did admirable Parian figures. A polychrome effect was also secured by majolica pigments ait Stoke especially by Poole, Stanway and Wood. The smaller examples are often desirable and, like other Victorian products, will assuredly attract in due time the attention of collectors. 'The larger figures and groups are often of poor design and pretentious.
Demanding at their hest no less care in modelling, are the terra-cotta figures and groups of the same period. Notablo among these are the clasaical statuettes turned out at the

This was founded by
Dale Hall pottery. a potter of another name in 1790 , and a mark embodying this date was adopted late in the 19th century. It is one of several instances of a mark with an errly date actually attesting not the antiquity but the modernity of the ware.

Modern Pottery. Much rustic pottery is turned out to-day in Sussex, Devonshire and other districts. Some of it is made of common brick clays with blended glazes, others have a fireclay hody. Specimens of the best work of the Ashtead Potterios are most desirable acquisitions. Their table ware is excellent in shape and design. In the productions of the Wedgwood, Minton, Copeland, Cauldon and other Staffordshire potteries, besides the Doulton in London, there is great variety Individuality is a vital clasacteristic and the pottery of to day has attained a standard of popularity on its own merits. In some of the designs there is a note of the bizarre in brilliant colour and geometrical forms. In others rich soft tones are finely blended, as in the modern versions of pehble ware (q.v.) and of "Peach bloom." Whito ware is perhaps the most beautiful, and two examples of fine design and glaze are illustrated in Figs. 7 and 8.


Modern Pottery. Fig. 7. Duck and drake in highly


This white ware is sometimes faintly tinged with colour where the pottery shows through the paste surface. Very benutiful book-ends are modelled in it, while candlesticks made of white Poole pottery show fine designs. A lovely branched pair for the mantelpiece or for the dining table have a conventionalised bunch of grapes on each stand. Book-ends in creamy crackle, which serves to mellow the appearance of the pottery, show genmetrical designs, and are a change from the animal and cherub figures so often seen. Other decorative book-ends are made in polychrome pottery, in a great variety of shapes, designs and colours.
The modern vases shown in Figs. 9 and 10 rcly on shape for their simple beauty and for


Fig. 5. Grenadier in Astbury ware, c. 1740. Fig. 6. Statuette of a girl, modelled by Ralin Wood, c. 1760
their usefulness, as they are both entirely charming and adequate for flower arrange ment. Fig. 9 is in brown earthenware of the classical amphora shape. while Fig. 10 is of rose-pink lustre shading to deep wine red. Ashtead and Poole pottery vases showing multi-coloured designs on white grounds provide many examples of decorative modern English ware, while French pottery is well represented by pieces which have excellent designs of sporting character, the development of sport having greatly increased of late years in France. Modern deaigns, whether



Pottery. Fig. 8. Brown earthenware amphora, a graceful and useful pottery onse for tall flowers or foliare. Fig. 10. Example of modern !ustre marestading from rose pink to wine red

Holiday makers oftell bring home תง souvenirs of continental travel individual pieces of local pottery which have attracted their attention. Favourite objects of this kind are initutions of Cologne atonevare tankirds, Dutch delft-often not delft at all in the sense of being tin-enamelledItalian majolica, and Spanish luatre. The homely wares of North Africa with their brilliant and strikingly orienta designs are gry in certain rooms Modern Italian pottery also is much favoured on account of its wealth of colour and plessing shapes

The nost popular rival of British pottery that is procurable without foreigntravel comes from Japin. Of its earthen. ware fabrics, not to he confused with the true English or French, arc characterized by sug. porcelains, the most famous are those of gestion: the amount which is left out being Satanna 'Jhe tawcliy platters and vascs as important as that which is detailed. There are most certsinly outstanding potters to day whose collected work will increase in value
which are turned out mechanically in Japanese factories for the purposes of export trade should lie avoided

## Pottery: Making Simple Pieces

## An Outline of a Pleasing and Useful Handicraft

This contribution explains how simple articles can be modelled, fired and glazed, at home, and concludes with a brief description of methods for vecorating pottery

There are two methods of forming the Before being used, the clav must be worked shapes in pottery; one is by building up the clay by liand on n potter's wheel, the other by casting and pressing Apart from the potter's wheel and $n$ muffle furnace, the tools are simple and inexpensive. The clay used for making bricks or Hower pots can be used if properly sieved and evaporated down, but for good work it is advisable to employ common C.C., or cane-coloured earthenware. China clay forms the main hody of porcelain; blue clay, known also as hall clay and hlack clay, is very strong and plastic. Felspar, flint which flock clay and driven in with a mallet or has heen calcined and ground, and bone ash flat hoard (rig. 3). The result is seen in the are mixed with clay to bind the material cut edge, small holes being formed by the air together and render it translucent.
How to Mix the Clay. Ordinary clay can be refined hy mixing it with water to form a thin crenm, passing it through a No. 40 sieve. The mixture is placed in a shallow pan and alowly evaporated. The dried clay is mixed with fine sand and powdered flint- 8 parts of clay, 2 of fint, and 1 of sand. This body, ulthough not so safe in use as the properly prepared C.C. Lody, is quite suitable for such objects as candle. sticks, small trays, or thick bowls for bulbe, but it wolild not do for circular forms on the wheel, or for casting.
The clay being hard at first is moistened with water; the lumps should be reduced to powder by pounding, water being then added until the clay is soft enough. It is of the right consistency when the fingers easily make an impression in it without picking any of it up. It can be kept in this condition for a long time if placed in a tin or zinc-lined tox: small quantities will remain plastic if kept in a tin biscuit box and covered with $n$ damp cloth.


Pottery. Useful articles which can be modelled in clay, and fired and glazed at home. The photograph shows, amongst other pieces, a candlestick, an ash tray, and a vase ornamented with a conventional flowaph pattern

the mould; and when sufficiently thick, the slip should be poured out and the mould left in n warm place for about $\frac{1}{2}$ hour. The mould should now be taken apart, using every possible care; there should be no difliculty in removing the vase, as the clay shrinks on drying. The lines and the waste at tho top should be trimmed off with a sharp knife : then leave the shape to hecome quite hard

To complete the work, rub the base on glase paper to level it, rub the sides down with tine ginss paper, mund off the edges at the top, and finish by riping over the whole of the shape with a damp sponge. Throughout these linishing operations the clay shape must be handled very carefully, as it is very fragile, and will continue to be until it is fired. The 1 -piece mould is done in the same way, but as only those objects that can slide out of the mould, after the casting has set, are suitable, all that is necessary to take the casting from the mould is to place it upside down. The same methods of cleaning up apply

Pressed Shapes. These are easier, but it is not so easy to make the ware thin Proceed by flattening a lump of clay, using if desired a hatter as in Fig 14. this being a thick disk of plaster with a stout handle. The clay is placed on a piece of linen or calico and pressed out llat with a rolling pin to a thickness of $\frac{1}{4} \mathrm{in}$. or 80 . Sponge the surface of the mould, place the thin slab of clay on it, and press carefully to the shape.

When hoth sides of the mould have been done in this way, smooth the edges, coat the joins with slip, place a thin layer of clay along the join, and then place the parts together. The joins are pressad to the sides of the mould from contrasts in form To make one, first set out on the pattern a line that will divide it into 2 equal parts. Place it on the board and build up a bed of c!ay to the halfway line, extending $\frac{1}{2} \mathrm{in}$. at the topand $f \mathrm{in}$. at the bottom. Shape the sides of the clay and attach a border of cardboard, as in Fig. 10 : then fill up the space with plaster, allowing at least $1 /$ in. of plaster noove the pattern. When set, carefully remove the walls and the clay and work out semicircular depressions at each corner of the half mould, as shown in Fig. 11. These recesses, which should be quite smooth, are necessary in order that the two halies of the mould may be accurately keyed together.

Coat the surface of the plaster with olive oil, replace the walls, the half mould heing at the hottom, as in Fig. 11, and fill up, with plaster again. When set, the walls should be removed. Then smooth the bottom of the mould and cut the recesses in each half at right angles to the join, as shown in Fig. 12. Oil this surface, place walls round the mould and fill up with plaster to give a thickness of about $1 \frac{1}{2}$ in., thus casting the third member or hottom piece of the mould. When set, the two halves of the mould should be prized apart, the pattern removed and the mould placel together again to dry, the final drying taking place with the parts separated

Casting a Vase. The methorl of casting allows considerably thinner pottery to be made. First prepare a large howl or small pail, which should be perfectly clean. Place a few lumps of clay in it, and pour water in to more than cover the clay. Next squeeze the clay between the fingers, and thoroughly mix the clay with the water until it forms a creamy

liquid. The liquid, termed "slip," is passed through a No. 40 phosphor bronze sieve, a stiff bristle bruah being used to assist it. The mould is sponged lightly with water and tied together with string, onc or two wooden wedges being used to tighten up tho parts, as in Fig. 13.
The mould is now tilted, and the slip should be very carefully poured into it so that no bubbles are formet, as these mean holes on the surface of the finished casting. The liquid or slip should he watched, and it will be seen that the level gradually falls. Keep refilling it, and give the mould a revolving movement from time to time to prevent the clay settling at the hotton. As the sides absorl, the water from the slip, the clay becomes deposited on


Pottery-Making. Fig. 1. Preliminary working of clay into a brick shape. Fig. 2. Wedge cut fromi corner with a piece of string. Fig. 3. Wedge placed in centre and driven in. Fig. 4. Easily made tray. Figs. 5 and 6. Small curved trays and bowls in section. Fig. 7. Candlestick suitabie for a piece of wheelmade pottery. Fig. 8. Section showing proportion ol parts. Fig. 9. Form for a vase which can be cast in a 3-piece mould. Figs. 10 and 11. How to cas the vase. Fig. 12. Recesses cut in each mould at right angles to the j
Fig. 13. Mould tied together with string tightened with wedges
the inside and wiped over with a damp We illustrate a special gas muffle turnace sponge fitted to the end of a piece of stick If for pottery It is made in a number of sizes. the mould is placed in a warm room for an but the amateur potter will need n muffle size hour the shape inside will have shrunk of at least 14 in . wide, 8 in . high, and 18 in sufficiently for the mould to be taken apart. deep, if vases and similar ohjects are to be when it can be treated like a casting.
Much pottery can he made without moulds by building the shape or throwing on the wheel, but in inaking spouts and handles, either pressing or casting should be followed Âny additions can be made to a piece of pottery while in the clay atage by scratching the parts to be joined, coating them with slip, and holding in position until set Handles or projections is obtainable in


Pottery-Making. Fig. 14. Disk of plaster with handle attached, used for flattening a lump of clay
applied in this way should not be touched before firing, and must he carefully fixed, or they will come apart When making pottery, it must not be allowed to dry out, and if the piece cannot he finished at one sitting it must be kept covered with moistened cloths.
There are many ways of decorating pottery. Line incision is the earliest and the easiest; it is done with a modelling tool, and for smali work there is considerable oppmrtunity for artistic treatment. Another method suitable for the pre-fired stage is to use slip formed from different coloureal clays: n number of

plensing effects can he worked in this way by applying the slip with suitable brushes.

Firing the Clay. Before poittery can be glazed or painted it is necessary to subject it to great heat and to tranaforn it into what is known as biscuit. This is the most critical part of the work. If a small furnace is used, the work must be placed in a muffle, supporterl on slabs of fireclay or sand. The shapes are conveniently arranged, the air inlet almost closed, and the dampers $\ddagger$ open. Light up gradually if using a gas muffle furnace, close the lower door, and after the muffle has got sufficiently hot-in ahout half hour-the lower door should he pushicd in close and the interstices covered over with clay
When the work has finished steaming turn on more gas, leave for ahout an hour, plaster up the top door, and give full heat until the interior, judged from the spy hole, is white hot : this will take ahout an hour. The work can now be allowed to cool. To make quite sure, the placing of suitable trial pieces so that they can be removed during firing will help; if the trial piece can be scratched on the surface it is a proof that the firing is not complete. Small piecea of clay, known as Seger cones, can he placed inside; these will bend over when the correct temperature is reached Common C.C. requires a tempcrature of $1,100^{\circ} \mathrm{C}$. and ahout four houra in the furnace.
he filled up with a cement made of 3 parts fired clay, 1 part damp clay. and $t$ part of No. 8 flux, ground to a powder, sieved, and mixerl with gum. Biscuit pottery can be coloured without firing by applying colour diluted with gum arabic, dextrine, and water to the moist surface of the clay. A fine surface can be applied to unglazed pottery by using ordinary wax polish.

Cloisonné Decoration. Another method is to apply cloisonné enamels.
is obtainable in various colours, and may be applied with a diffuser or a brush. A glaze firing at ahout $800^{\circ} \mathrm{C}$. will be found most convenient, and if the article is to hold water it will he necessary to glaze the interior as well Coloura can be added to a plain glaze by mixing them with boiling water, passing through a 200 sieve, and mixing with the glaze; only a small amount of colour is required. Before the underglaze paint is applied the surface of the pot must he stoppal by coating it with a solution composed of gum arabic and water. The paints employed for the work are metallic oxides or oxy-salts, and give their true colours when combined with the glaze
Shapes that are not quite perfect need not generally he thrown a way, for small defects on the hiscuit pottery can be removed with glass paper, and amall holes, cracks or nhips in the article can


Fig. 1b. Muttle furnace tor tring pottery Fletcher. Russell \& Co.. Led., Warrinoton

A simple outfit of these contains 6 enamels. gold and silver powder, medium, varnish, 1 flat brush and 4 camel-hair brushes. The design is incised on the plastic surface of the pottery with a modelling tool before the clay is fired. Fig. 17 shows the pleasing and simple type of design which lends itself admirably to this kind of decoration. Pieces of pottery can he painted in sets to harnonize with any colour scheme. This style of decoration is particularly suited to pottery book-ends of simple or geometrical shapes. For those who are unable to make their own pieces, a variety of articles can be olitained with designs already incised. The procedure is very simple. First coat the whole of the article with the special varnish, which dries in about half an hour. Then a coat of gold or silver enamel is applied, taking care that this flows into the incised lines of the design; this, again, is allowed to dry for ahout an hour and the decoration


Pottery Making. Fig. 16. Painting on unglazed pottery with cloisonné enamels alter the design has been incised, as shown on the plate. The Fig. 17 been gilded but not coloured, while the jar is ball comped Fig. 17. The finished pieces. Fig. 18. Jar with lid decorated in
in colours is proceeded with. Fig. 16 shows rammed firm, but not articles in three stages of decoration. The plate is merely incised with the design, the vase has been gilded, and the small jar has been half coloured. The design is pioked out in various tints, using $a$ separate fine brush for each tint employed on the piece Figs 17 and 18 show the pieces finished
Care should be taken not to let the colours run intu the incised lines, or the effect will be spoilt. Therc is no need for subsequent varnishing, as the enamels are durable and have a brilliant finish They can be thinned if desired with a special thinning medium.

The larger brush used for the varnish should be cleaned with methylated spirit, while the brushes for the gold, silver and coloured enamels should be cleaned with turpentine.
POTTING: In the Garden. Success i the potting of plants is acquired only by practice and experience: ignorance of its elementary principles is the cause of ninetenths of the sickly anaemic-looking plants seen in many greenhouses and in moms. For successful potting attention must be paid to the cleanliness of the crocks and pots, the drainage, the ingredients for composts and correct planting.

Pots and crocks sliould be well soaked and cleansed with water, even if quite new. Proper drainage is essential Take a fairly large piece of curved crock, and place this, hollow side downward, over the pot hole. Incidentally, an oyster shell is admirable for the purpose. The next layer of crocks must be determined by the clasa of plant being potted If this is a hard-wooded suliject, crocks should be broken up quite sinall. but if the plant is softrooded, as, for example, the geranium, then larger pieces will be required.

The larger the pots the larger the crocks, allowing deeper drainage to plants remaining in pots for a considerable time, and leas to those having a shorter stay. Indeed, for foreing stuff, such as spirens, one large curved crock is often sufficient. On top of the drainage place a little rough of leaves, moss, or fibre, to prevent loose compost dmpping amongst the crocks and choking drainage
The chief ingredient in potting composts is lonm with plenty of fibre, such as is obtained from old pastures, where the roots of grass are several inches deep. Cut turres in autumn, atacking them grass downward, and placing light facings of well-rotted manure and a sprinkling of lime between layers. In twelve months this will become n stack of loam in suitable condition to form a base for most potting composts.

Other indispensable materials for the potting shed are leaf-soil, pent, silver sand, charcoal, wood ashes, mortar rubble, and bnnemeal These are not all required at one time; but with supplies to draw upon, practically any combination for many different kinds of planta may he made up at vill. Whatever combination is in preparation, this should be well mixed and turned with the spade, damping it when necessary, until a gripped handful will hang together, yet separate at slight touch.
A good general compost is formed of 3 parts loan, 2 parts leaf-soil, and 1 part sand. For seeds and cuttings only use equal parts of loam, leaf-soil, and sand, finely sieved and mixed.
The placing of the plant is no less important than the contents of its pot. Do not drag, or lift by the stem, any young plant fiom its early receptacle, but spread it upside down upon the fingers of one hand and gently rap the rim of the pot on the potting bench, so that the pot itself may be lifted clear. Carefully remove any old crocks with as little root disturbance as possible.

A few inches of soil, made firm with a potting stick, should be placed in the larger pot, and the new plant artanged upright in its centre. Suitable compost should be worked round and filled within in of its rim, a necessary apace for watering. When ramming, be carelul not to touch the old ball of soil. but only the filling of new compost. Various plants and hulbs require potting at different depths

A potting bench or table is desirable for the amateur gar dener, the construc. tion of which may be on the lines sug. gested in the sketch Labels, too. should not be ignored if choice plants are to be duly identified. A potting stick is easily constructed from an old broom handle. rounded at one end and cut chisel-shaped consisting of 4 pints. culosis. old-fashioned footstool. radius, or half the diameter.
at the other. Different sizes of pots should he stuckerl and boxes of graded crocks ready to hand. A mistalie is to use pots that 3 in. from its lower end, is called Pott's fracture are too large. A safe rule is to take a size it is produced by twisting the foot outward, which allows 1 in between its sides and the as for example, in slipping off the kerb or old root ball. See Aspidistra; Chrysan- intu a hole in the ground
themum; Flower Pot; Hydrangea; Palm The slighter onses may be mistakien by the
Pottle. A pottle, originally a little pot, patient for a sprain of the ankle. It is therehas come to mean a measure of liquid, one fore desirable to consult a doctor when a sprain

Pott's Disease. See Curvature; Tuher-

## Pouffe Ottomans or Humpties

## Materials and Methods for Making Attractive Floor Cushions

The reader of thls article should turn for furtner information to the entries on Box Ottoman; Cushion: Leather Work: Patchwork: Upholstery

A pouffe or humpty is the name given to a length to the circumference of the circle, and variety of Hoor cushions varying considerably in size and shape, from small circular pouffes to large square or oblong box humpties which possess well sprung and upholstered lids.

Pouffes are suitable for use in small rooms as they take up little floor space, and when not required as seats they can be placed out of the way in a corner or under a table. The box type is a useful addition to bedroom or sitting room, as it can be used either as a slipper, hat or work box. 'The rofter type of solid pouffe floor cushion is a cony accessory for the nursery, while invalids and elderly people find them more comfortable than the

Solid Poufles. The solid pouffe is the simpleat kind to make. It can either be circular or aquare in shape, and is made by stuffing a calico cover with sone suitahle filling. Decide a pproximately the size required, then cut out a pattern in strong paper. This can be pinned up, and gives a good ider of what the size will be when the floor cushion is completed: 16 in . diameter each for top and bottom, as in Fig. 1, makes a mediunsized circular one with a band of 16 in . deep between, as in Fig. 2. It is import. ant to get a true circle, or the finished shape will not be good. A circular tray can be used; or if this is not available, take a piece of fine string, tic a small loop in one end, and fasten the other end to the centre of the piece of paper with a drawing-pin. Place a pencil in the loop, stretch it tautly, inoving it in a circle: the lenkth of the string gives the

To make the case, cout a strip of unhleached calico, preferably selvedge way, equal in
length to the circumference of the circle, and
allowing $1 \frac{1}{2}$ in. for turnings. Tack the top of the band to one circle and the hottom of the hand to the other circle; the case then resembles a short bolster, as in Fig. 3. Machine on the wrong side, leaving about 6 in . open on one side

As a quantity of filling material is required when making large floor cushions, the centre can be filled with cuttings of woollen or cotton materisks. For the new filling necessary, imitation hair, filbre, flocks or brown rugging wool, with wood wool right in the centre, is the most suitable. For a medium size pouffe about 10 lb . of wool is necesary
As the filling is a dusty process, it sliould be done in a roon with little furniture, and preferably in one with a linolenm floor covering. Each handful of filling should be Huffed out before it is put into the case. Use a wonden spoon or stick for forcing the wool into tl edges. When as much as possible has bet.l forced into the case, take a piecc of flat wool and beat it evenly all over.

Unless the cushion is well stulfed, after it has been in use a short time it becomes flat and loses its shape. When it is impossible to add any more wool, the seans can be sewn up securely. Take some atrong string and, using a slip-knot, cord the waist as tightly as possible, Fig. 4. Place a piece of flat wadding cut to size over the top of the case before covering with the upholstery fabrio.

For a pattern of a square-shape poutfo cut two pieces of paper about 30 in . by 30 in , as in Fig. 5, for a medium-sized nouffe. Fold each piese in half lengthways, and then width-wrys-this gives a small square of 4 thick. nesses. as in Fir $\mathbf{6}$; curve of the top left-hand


Attractive round pouffe floor cushions can
comer (Fig. 7) and the shnpe will resemble lig. 8. These two pieces form the top and hottom of the pouffe.

Having out out the unbleached calico for the case, sew the curves at each corner together as in Fig. 9, and when all the curves are joinal the cap-shaped pieces are formed which make the top and bottom of the pouffe. Place one ahove the other and join then together, leaving one of the four scams open for filling (Figs. 10 and 11 ).

There are two ways of making the outer covering for pouffes : either by making the material into a bag-shaped case, leaving one side open into which the cushion is dropped, or by stretching the material and scwing it securely along each waist-line. The former is less trouble, but the latter allows the covering material to be stretched more tightly. Place the weft edge, with a 1 in . turn, aiong one side of the waist, and stitch securely with strong thread. Then pull the finbric tightly round the cushion, atitch it firmly along the opposite waist-line, again along the first side, and attach the material to the two remnining sides of the waist, cutting off any surplus. Gather the comers of the niaterial to form ears, and neaten the waist with cord to match the cover ; if the cord is thick the ears can be sccured by being slipped through the twisted cord. A pouffe of the above description is illustrated in Fig. 12. he inade by using velveteen for the sides and bottom and introducing patchwork of leather and velvet for the top. Such a pouffe can be finished without the corded waist if made 20 in . in diameter, the outer covering being cut in the shapes shown in Figs. 1-3, and the top and bottom finished with a piping or fancy cord. The side strip (Fig. 2) may lee cut 10 in. deep (less turnings). Fancy stripsd material inay be used for the top and bottom of such pouffes with a plain fabric for the sides; or terry cloth with an appliqué design in a contrasting colour will make a good cover for a nurserv floor cushion
A two colour schome may be devised for a square floor cushion by mounting a square piece of brozade oi damask cornerwise on upholstery satin which matches the groundwork of the figured material, and finishing off the edges with narrow gold braid or coloured gimp.

Pouffe Ottoman. The pouffe ottoman shown in Fig. 13, makes an attractive piece of furniture, as well as a convenient receptacle for music, needlework, or newspapers. A strong woolen box should he procured, if possible with dovetailed sides. No lid is necessary. A box 18 in . long, 12 in . wide, and 12 in . deep is a convenient size : one of smaller dimensions, when upholstered, would not have a very roomy interior. Divide the


Pouffe. Fig. 12. Solid pouffe upholstered in small patteraed brocade. Fig. 13. Pouffe ottoman, which can be made from a wooden bor, with sprung and upholstered top
bos in two pieces, cutting off a section 4 in . deep; but if the box is too shallow to allow of this, a narrow box having the same length and width can be utilized by knocking out the bottom, or a wooden frame can lie made by using four 4 in . battens; this should be atrengthened at the corners. The bottom part of the hox will form the container or ottoman, and the 4 in . frame, when fitted with springs, will make the lid and seat of the pouffe
The two parts must be upholstered separately, the fixing of the hinges being the linst step. First upholster the bottom part: if nccessary, acrub) and dry the hox, preferably out of doors. When dry, rub the inside first with coarse and then fine glass paper. Cover the sides with any suitable faloric, such as casement cloth or hessian. Messure the distance round the box and the depth; allow $\underline{\imath}$ in. for turnings. Tack the hessian firmly along the top edge and the bottom, keeping it as tant as possible. The reason for covering the wooden sides is that it is impossible to fix hair or wool filling on to wood.
Stitch 3 or 4 rows of strong twine loops into the hessian, using a sacking needle and lenving about 2 in. hetween each row. Each loop should measure about $2 \frac{1}{\mathrm{in}}$, and a back stitch is necessary between the loops, otherwise the filling, when forced under, causes them to slip. Fig. 11 shows the lower part of the box covered with hessian, and the rows of twinc loops ready for the stuffing.

Wond wool is a very cheap tirst stuffing end rugging wool, fibre, or imitation hair are all suitable for the top layer. Arrange the stuffing as evenly as possible under the string loops, giving the corners extra pacding, so that when finished they will be well rounded, as in Fig. 13. Cut off a length of unbleached calico, allowing for the padding and for mitred corners, and tack it in position along the bottom of the box; standing over it, pull the cover up tightly over the padded sides, as in Fig. 15, rearranging and adding more stuting if needed. Tack the covejust inside the box. Line the inside first with lavere of cotton
wool and then with casement cloth. A straight piece of material about 2 in . deeper than the sides of the box and long enough to go round it is necessary. Use small brass tacks to fix the lining along the inside of the top edge. Cut a piece of stiff cardboard to fit the bottom of the inside tightly ; cover it with the anme material, and place it in position. A piecc of plain American clotly to match the upholstery fabric in colours should be tacked over the hottom of the box that comes next to the lloor, to prevent the edges of the material fraying and to neaten. The bottom of the pouffe should be fitted with castors or glides. If the latter are used, 4 small stained blocks of wood should be screwed in position nt ench corner. in which the prongs of the glides ahould be fixed! : this raises the pouffe off the ground and improves ita gencral прpearance.

To upholster the licl, first st retch the frame with good quality webbing bands length. ways as in Fig. 13, and then interlace them at right angles in basket fashion. A webling strainer or small piece of wood used as shown enables the bands to he stretched vory tightly. Procure five or six 8 in. copper springs, arrange them in position on the web-
bing, and stitch them firmly, using twine and a packing needle. When all the springs are fixed nt the bottom, tack the outside ones tightly to the frame, and tie euch one to the adjacent springs. When all are lashed down, cover the springs and sides of the frame with hessian, make twine loops and pad in exactly the same way as the lower part. Extra padding must be piled on to the top of the springs or the sent will become flat after being in uec a short time. Keep the stufling in position with a cover of umbleached calico, tacked to the lower edge of the frame.

Tapsestry, rep, velveteen or phish miay be used to cover the humpty; with a patterned material a more professione! appearance is given if an oblong panel 10 in . by 14 in . is piped on to a length of fabric. The panel must he arranged so that it comes in the centre of the lid, and the piping sliould be of one of the colours incorporated in the pattern. Nitre the comers ncatiy, maling any surplus material into small rosettes, Make a small tab of covering materinl about 2 in. long, and tack it to the middle of the front edge of lid, to facilitnte owening. Linc the inside of the lid with casement cloth over cotton wool, tacking it on to the wooden rin. Attach the bottom of the pouffe to the lid by two sminll brass hinges. Two chains screwed inside to the sides of the bux nnd to the rim of the lid may be added to keep the id from falling back:

POULTICE : How to Make. As a means of applying moist heat to any part of the body one may make use of a poultice. Poultices increase the flow of blood to the part which they cover, withdrawing it from deeper, congested areas: hence they are useful in deep-sented pain, as in cheat affections, inflammatory pain in the abdomen, or in the painful swelling of joints. In the case of boils, poultices relieve the tension and bring the boils to a head more quickly. The unaterials used are crushed linseed, brend, vatmen!. starch, etc. Crushed linsecd is


Pouffe. Fis. 14. Lower part of ottoman covered with bessian, also four rows of string loops and some of the wool in position. The last plece of webbing of lid
better than linseed meal, becanse it contains more oil, and therefore does not so readily stick to the slin. Mustard and various antiseptics can be combined in the poultice. Bread, linseed and mustard poultices are described under their own headings, while directions for making one of starch ure given in the niticle on Eczema.

Poultices large enough to cover both the back and chest of the patient arc sometimes
ordered. For children, these can usually be made in one piece, the poulticc being wrapped right round the body and escured with snfety pins; but for arfults it is generally necessary to make two separate poultices, large enough to meet at the sides. These cannot be pinned satisfactory and are there. fore held in place with a special binder or a wide strip of matevial that will serve the same. purpose. I warm, close-litting jacket, such as that sometimes worn by pneumonia patients, is also useful for confining these poultices.
l.inseed and other poultices, to be effective, must be smooth, soft, and as moist as possi ble, without being sloppy. They should be thicli enough to retain heat and moisture for some time, but not so thick as to be uncomfortably heavy. As their value lies principally in the warmth they supply, it is necessary to make them quickly, and to apply them at once before they have time to cool. For this reason everything that is required should be got ready before commencing to make the poultice, and the patient should nlso be prepared. Poultices on any part should be removed hefore they becomc cold. The skin should then be dried with n soft cloth, smeared with vaseline, and covered with a piece of flannel. Sce Bread Poultice; Liczema; Fornentation ; Linseed ; Mustard, etc.

## Poultry and Poultry Houses

## How to Rear the Birds Successfully in Town and Country

[^8]The facilities for those who wish to keep the run should be about from 20 to 24 fect a few fowls are much grenter than they were long and as widc as the houso. If the house a few yeurs since, ns stock is so much more can be placell on grass the larger portion of easily obtained. Many now buy pullets of the run shuuld he open. and the house and run various ages from three to six inonths. This should he moved from one spot to another each menns that the small poulty kecper avoids the tiouble and time spent in brceding and rearing and therefore needs less nccommodation.
These young pullets may be hought, kept until they have completed their first reason of laying and then sold to a dealer, or clac fattel and killed for the table. Tt pinys hetter to buy what is known as gunranteed stock, that is biris bred from stock which has heen tiap-nested, and whose production is known. Tu-day poultry farmers are catering for such buyers as they never did before. Many are breeding cross-bred birds, known ns sexlinked, that is the union of two pure hreeds which hare progeny of such colour and marking that the sexes are dissimilar as soon as the chicks are hatched. This method of brecding reluces the breeder's costs, as he is saved the expensc of rearing his cockerels.

The Poultry House. For suhurhan or town poultry kecping, a bouse with a covered run is best. The spnce given in the house to each bird should bo three to four spuare feot. and
year. If grass is not possilile, the run shoukl he well brushed and scraped each w'cek, also dug over about once a month, and giveu a gond covering of lime.
The floor of all poultry houses should he boardel and covered with peat moss or chaff. Such a lloor is more sanitary and there is less trouble from tats and mice. As soon as the litter on the floor shows signy of lecoming damp, or there is a musty smell it should be swept cut and a fresh lot put in The perches should be fixed from 18 in to 2 ft . fiom the lloor so as to avoid injury to the legs and feet when the birds fly down from the perches, and so as to miss the draughts which are a fiequent cause of colds when the perches are lival too high.

If the houses are kept clean, the perches and their holdery brushed over with paraffin or turpentine every fortnight (except in the height of summer), when once $n$ week is to he preferred, there will lec little trouble from red mites, or lice. 'The best aspect for a houso


Poultry House. Fig. 1. Combination house and scratching sined, which will accommodate six or eight birds Courtess of Boulton \& Paul. Ltd
is southeast. The birds then get the early house with a span roof The building is morning sun, and avoid its heat during the mounted oll stming cast-iron wheels. In adlatter part of the day in the summer months.

The manufacture of poultry houses has now become a great business, and the poultry appliance builders can supply any sized house that may be required from one suitable for 5 or (f) birds to one for several hundred Strongly built, well lighted, efficiently ventilated. yet draught proof, are the points of a good serviceable house. The ready made houses are sent out in sections and are quickly and easily holted together. They are fitted with all the necessary locks and bolts, and windows.

Three common types of poultry house are illustrated. Fig. I shows a combination house and scratching shed for six or eight birds. The simplest type of house consists of four walls of timber covered with a timber or felt roof and possibly provided with a hoarded floor. Half of the finnt is usually devoted to a door, of which the one part may be hoarded up or the upper part can be made with wire netting. The other half of the front may take the form of a window covered with wire netting and provided with some kind of adjustable screen or shutter, as shown in Fig. 2.

A development of the same type of building is illustrated in Fig 3, and comprisea a small


Poultry House. Fig. 2. Strongly built bouse, small enough and light enough in weight to be easily portable Courtess of T. Ball d Co.. Ltd
dition. perches, dmpping hoard, and outside nest boxes are providerl, and so arranged that the birds can enter them from within and the attendant can remove the eggs from the exterior. This type of honse is suitable for birds that are kept on open range, as the building can be moverl about from one place to a nother and the birds enabled to run on fresh pasture

Larger and more pretentious huildings used for mosting and scratching sheds arc often used. By another method, an extension of the main building consisting of a long run with a back and side wall and open front is enclosed with wire netting. and is used for scratching purposes, the main building being reserved for roosting and laying. One jortion inay he utilized for breeding and incubation purposes. Another plan is to use the main building for egg production and to have separate buildinga for incuhators, rearing. and the storage of foodstuffs. Provision should be made for keeping the grain and other foodstuffs in a dry location and free from attack by rats and sparrows.

For the benefit of the poultry kecper who wishes to build his houses and runs we give at the end of this article constructional details of two or threc useful types

Feeding the Birds. In feeding a sinall flock the table scraps mixed with equal parts of brall and middlings will give them good feeding, in fact all they need, except for grain and green food. The latter may be the refuse of the vegetables used in the house, such as the outer leaves of lettuce. cabbage and broccoli, the tope of carrots, parsnips, beetroot. and turnips. The rinds of vegetable inarrows and melons may lie boiled and mixed with the household scraps. The grain feed, wheat and onts, should be given at night, a good hig handful for each hen It is advisable that the
house scraps and neal mash should he given warm in the early morning.
By way of a change harley meal, or Sussex ground oats, may be used occasionally instead of the middlings Fresh clean water should he provided every morning, and in the summer time at midday as well. Flint grit and oyster shell is also neederl. If the run jo not very large the birds may be exercised by lianging the green food in a net bag and suspending it just out of their reach, thue compelling then to jump for it.

Kcep the nest boxes very clean, supply them with fresh hay, and dust them once a week with a good insect powder. The houses should he whitewashed inside twice or thrice a year. This not only liceps the house sweet, but alan makes it lighter than when it is creosoted. A lew drops of carbolic may be added to the whitewash when it is mixed. The outside may be painted, tarred, or creosoted as desired.

The Breeds. The hest breeds for a small household llock are the non-broody or light hreeds such as Leghorns, Anconns. Anda. lugians, Minorcas, and Campines. The Leg. horns and Anconas lay egge about 2 oz . to $2 \ddagger \mathrm{oz}$. in weight. The Andalusian and Minorca eggs are generally from $2 \downarrow \mathrm{oz}$ to 23 oz ., and sometimes a bit more. The Campines eggs ate from 1/ oz. to $20 \%$ The Hanlourgh family are also non-sitters and prolific layers, whilst they are among the most beautiful of all fowls, hut their eggs are sinall. All these mentioned lay white eggs

For town and suburban lovers of poultry. whose accommodation is limited in character and who only need the birds as a hobby,


Fig. 3. Useful poultry house, with outside nest boxes, the whole set on wheels for easy transport

Bantams are useful. The hreeds to be recominended are the Sebrights (gold and silver), Black Rosecombs, Minorcas, Leghorns Old English Game, and all the Wyandottea, except the whites and Columbians which are not suitable for town rums. The feather legged breeds like Pekins and Brahmas are suited for the show man only, and the same may be said of mudern game bantams.

Those who have a field, or paddlock, in which to keep their birds, may indulge in breeding with consequent pleasure and profit. They have a much larger field from which to select their birds. Among the hirds they may choose fiom are all the sitting breeds such as Wyandottes (Whiten, Blacks, Blucs, Buffs, Columbians, Gold and Silver laced, Paitridge, and Silver-pencilled); Australorps; Orping. tons, Dorkings; Plymouth Rocks (Barred Butf, White, Columbian, nud Partridge) ;

Barnwelders, Suscex (Light, Red, Speckled, Buff, Brown, and White); Croad Langshans Rhode Island Reds; Indian Game: Old English Game (Black.reds, spangles, Brown reds, Birchens and Piles) ; Houdans; Faverolles; also any of the light non-sitting breeds. The non-sitting breeds lay white-shelled eggs ; the sitting breeds tinted or brown, except the Dorking. which is white Breeds like the English modern game, modern Langshans, each very long in leg, Brahmas and Cochins with their heavy body and leg fenthers are not to be recommended to the ordinary amatcur. They are fancy breeds entirely and require special care and treatment.

One breed which is most useful and at the same time handsome is the latest comer from Holland-the Welsummer It is the only light breed which lays a brown egg, but is is not safe to stylc it a non-sitter becanse many of the hens do go broody.

Of the heavy breeds the best layers are the White Wyandottes; Rhode Ialand Reds, Australorps; Barred and Buff Plymouth Rocks and Light Sussex. None of the light breeds are good table birds. The best breeds for table poultry are Dorkings, Sussex, Orpingtons, Croad Langshans, Houdans, Faverolles, Indian and Old English Game. The best of the general purposes breeds, that is fairly good egg proflucers and table poultry, are the Wyandottes, Plymouth Rocks, Rhode Island Reds, Barnwelders and Croad Lang. shans.

Crossing is not advisable when egg production is the ohief thing to be considered because it induces broodiness and loss of production, but for table purposes crosses between Indian Game on the one side and Dorking, Sussex, Buff or White Orpington, or Faverolles, on the other are to he recommended, eapecially Indian Game and Faverolles, the progeny of which are very quick growing, Crosses between the Old English Game and any of the birds mentioned as suitable to the Indian Game. are good, but generally not quite so large when matured as those from the Indian Gaine.

Fattening for the Table. In fattening poultry the following procedure is adopted. The birds that are to he fatted for the table should be penned in a small place for about a fortnight hefore being killed. During this period they are fed upon mashes maile of Sussex ground oats and barley meal in which about two ounces of mut!on fat is mixed per bird daily. This fat may be ohopped fine, or it may be melted


Poultry. Fig. 4 Portable poultry run and roosting house, made to accommodate eight or nine birds Bu arrangement with Evans Bros, Lid.. L.onion

milk can be used the flesh will be whiter and more succulent. No grain or grit should be given during the fattening period. When the time for killing comes the birds should be starved for 24 hours. as the flesh keeps better.

Killing the Birds. The most simple and humane method of killing is to bold the bird with the shanks closely gripped together in the left hand. place the bird across the knce, head down wards, grasp the head with your right hand, and give the neck a swift jerk and twist at the same moment The bird should then be hung hend downwards to allow the blood to drain down into the nock. If this is not done the blood will remain in the body and cause the flesh to be discoloured. The feathers should be removed whist the body is still warm, they will then come away quickly and easily. Always draw the feathers in the direction they lie with a downward movement and so avoid breaking the skin.

Final Hints. The chief things neerled to ensure success in the keeping of poultry is to purchase sound bealthy stock, house it in buildinge which are waterproof, light, and well ventilated. Everything about the house and run should be kept scrupulously clean so as
Fig. 5. Method of joining framing in making poultry house shown below

to avoid disease and attacks from vermin. such as red mites and lice. The food should be sound and fresh and given regularly. Regularity in feeding has much to do with good health and egg production. A bird that is unhealthy is not a good layer. Crushed oyster shell and sharp flint grit are as necessary to the bircls' welfare as is food. Water pots


Poultry. Figs 6 and 7. Interior and exterior views of a bygienic poultry hoose, showing the covered run, with food honpers, nest boxes, perches, ete clean. Never let the water which the birda are to drink stand in the sun. Sun-warmed water is a frequent cause of diarrhoea.
Making a Poultry House. A portable run and roosting house suitable for 8 or 9 birds is shown in Fig. 4. The whole of the timher consists of white deal framing weather hoarding, and tongued and grooved flooring boards. A method of framing is shown in Fig. 5. Here the cross-rails are halved and nailed to the uprights, and by using corrugated fasteners mortise and tenon and bridle joints are avoided. The cent:c upright rails of the run (F, Fig. 4) may he nailed on the inside of the top and bottom rails, as shown. The small feeding.door (G) is made by nailing tongued and grooved flooring boards on two battens, and hinging it with a pair of stamper steel butt hinges costing a few pence.
The top part ( E ) is boarded so a.s to provide a shelter to the stock at times when it may not be desirable to nllow them access to the interior of the pen. The shelter, on account of expense, may be omitted if desired, and it is left to the discretion of the builder as to covering it with tarred roofing felt. The out side and the top of the run is covered with wire netting, which is secured to the framing by small galvanized wire staples.

The pen is made by constructing two end frames, the joints of which are constructed similarly to Fig. 5. These frames are connected together by nailing weatherboarding ( $C$ and $D$ ) on the back and front; and in matchtolrding (lettered H) on the end. For the opposite end ( B$)$ a battened door is male and hinged to the upright rail (R). This door will allow easy access to the interior of the pen and permit the removal of the egga. An arrangement such as this is essential to a good poultry run The nesting arrangements are shown by the shelf ( $N$ ), the upright partitions ( $\mathrm{P}, \mathrm{P}$ ) and
the 2 in . by 1 in. rail which is provided to keep the nesting material in it place. The exit and entrance ( $M$ ) at the front of the pen is


Poaltry. Fisa. 8-10. Constractional dotails of the arse wire ran shown in Fis. 7

The bottom of the pen (A) is an important part. It is self-contained and should be made by nailing 1 in . tongued and grooved flooring boards upon the four battens (K), which are 5 in wide and 11 in . thick. This floor portion should be tarred, and whilst the tar is soft it should be liberally sprinkled with sand and fine grit. The floor is not fastened to the pen, and it is therefore casily removable for cleaning purposes, etc. For the perches three langths of timber, $2 \downarrow \mathrm{in}$. wide by $1 \frac{1}{2}$. thick, should have their corners rounded off so as to give an octagonal section. Holes 18 in . in diameter should be bored across the front board just under the roof for ventilation.
A wire run suitable for 50 laying birds should measure about 75 ft . long by 40 ft . wide. The poultry house could be of the type illustrated in Figs. 6 and 7, and being located at the north end, always faces the sun. The run is built up by mak. ing holes in the ground with a crowbar or a jumper and erecting 2 in . by 2 in. deal posts, 7 ft. 6 in. long and 10 ft apart, the corner posts strutted with aimilar material. They are preferably coated with creosote or some other preservative prior to their erection. Some galvanized iron wire, 16 gauge, is then strained through holes drilled at the top and near the ground.
level of the uprights, and drawn up tight with an eyebolt or strainer, as in the method adopted when erecting a wire fence.

For this run 10 lb . of the wire will be required. The object is to provide support for the poles, which it does in an economical and effective manner. The run is completed by fastening galvanized iron wire netting to the poles, using staples for this purpose and further securing the netting by wiring it to the straining wires. This netting must be at least 6 ft . high, and may be all 3 in . mesh lf young birds are to be allowed to run. the better plan is to begin at the bottom with a length of 1 in . mesh wire 2 ft . high, and complete the work with 3 in. mesh wire. The wire netting is fixed to the ground with wooden pegs cut as shown in detail in Figs. 8 and 8. A panel of the run is shown in Fig. 10. Alter natively the bottom can be boarded up to a height of 2 ft . with rough wooden planks. This latter method is necessary if the run is used as a breeding-pen.
The Semi-Intensive System. 'Fig. 11 is a block plan showing the lay-out for a poultry farm handling 200 laying birds on the semi-intensive system. The houses have been designed with a view to economy in material, ease of construction and erection, combined with greater comfort and durability than is generally the case in the housing of poultry. The houses are made in sections, each of which is 10 ft . in length and provides accommodation for 25 laying hens, and includes nest boxes and a covered scratohing-shed or run all under one roof. Any number of birds in multiples of 25
can be accommodated by constructing the requisite number of back, front. and end sections. Each two sections have a separate outdoor run 75 ft . long and 40 ft . wide.

The following is the method adopted in constructing the houses. The necessary details are given in the diagrams at Fig. 12. In the first place the ground was inspected, and the best position for the house determined, having regand to the contour of the land, which falls away from the house on the south. The house faces due south-west, receiving the full benefit of the sun, morning and evening The ground was then marked out and trenches 9 in . Wide and 2 ft . deep dug out and filled in with concrete and brickbats as a protection against rats
The top surface of the concrete was then levelled to receive the building. The building consists of a framework of 2 in . square deal, covered with in. tongued and grooved matchboards, those with a damaged bead being set aside for use as dropping boards or elsewhere than on the external ualls, as the latter must be weatherproof. The joints at corners are mortised and tenoned, and the door parts are similarly jointed, all the others boing halved and screwed or nailed. The accompanying working drawing give all dimensions and details. All material was first cut to length, then the joints prepared, the matchboarding nailed on, and the whole creosoted inside and out. As soon as this is dry, the work of erection proceeds.

A start is made at one corner, setting up the end section, and holding it in place with


Poultry. Fig, 11. Block plan ol the lay-oat ol a chicken ran on a poaltry farm, saitable for two hundred laging bipds. Pig. 12. Diagrame giving dimentions and details for making a seotional hoase to accommodate 25 laying hens. Fig. 13. Sectional diagram of a nest bor


POULTRY: A SELECTION OF THE MOST POPULAK ANI) PROFITABLE BREEDS 1. Silver-spangled Hamburgh. 2. Black Leghorn. 3. Ancona. 4 and 5. Spang!ed Old English Game Bantams. 6. Buff Plymouth Rock. 7. Sing!e-comb Rhode Island Red. 8. Silver Sebright Bantam. 9. Silver Campine ro. Houdans. it and i2. Black Red Modern Game Bantams. I3. Black Sumatra Came. I4 and 18. Brown Leghorns I5. Biack Minorcas. 16. Australorp. I7. Light Brahma. 19. Croad Langshan

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battens fixed to the top and secured at the bottom to pegs driven into the ground. The front section is then put up in place and similarly supported. Every care must be taken to get this corner square and perfectly upright, otherwise the house will always be lopsided and insecure. A plumb rule proves the latter, while a stout cord, 10 ft . long, attached to hooks fixed exactly 6 ft . from the corner in the end section, and 8 ft . from the corner on the front section, ensures the squareness of these two sections. The corner is bolted together with 5 in by $\frac{3}{3} \mathrm{in}$. coach bolts and nuts, with a washer beneath the nut. Then the back section is crected and bolted in place. The remaining front, brek, and end sections are tlien erected and bolted together, temporary cross pieces heing nailed from side to sside, while the internal stretcher section and the ridge pole and struts are nailed in place.

The roof is covered with 3 in. mesh gal. vanized imn wire netting stretched very lightly, and a covering of tarred felt securely nailed to the top of the section with clout nails. The roof is completed by laying the 6 ft . lengths of galvanized corrugated iron, completing the work with a standard galvanized iron ridge capping securely nailed into the ridge pole. This ruof costs very little more than an ordinary hoarded and felted roof, and is much more durable. The tarred felt lining is essential, as otherwise the condensation would make the interior of the house very damp and uncomfortable. The fonts are enclosed with 2 in mesh galvanized wire netting, and portable screens made of waterprooferl canvas in a wooden framework are provided for use in very wet and cold weather.

Nest Boxes. The nest boxes (Fig. 13) are made to project on the back of the house, and constructed with a weatherboarded hinged top providing easy access for egg collecting. Perches made from 2 in by $1 \frac{1}{2}$ in. deal with rounded edges are carried in thearers, and can be lifted out for cleaning. Dropping bnards, supported on bearers and legs, are provided with cross hattens and lift-out for cleaning. A sliding hen door is fitted at each outside end of the section, and the intermediate section has double folding doors normally closed and bolted. Exterior doors are ledged and braced, hung on 18 in . cross-garnet hinges and fitted with a lock and key, and also a turn-button on the inside to enable the attendant to close the door while working inside the house. The floor is left in its natural state and covered with a deep hed of litter wherein the hens can scratch for grain This is good for the birds and keeps them healthy and contented.
A large "aler vesse!, feeding t.rough and hopper, and a dust bath huilt in one corner complete the house. Access to the runs is obtained by framed doors covered with 2 in. mesh galvanized iron wire netting, hung on simple hinges and provided with a hook and eye fastener. The combination of run, sciatch-ing-shed, and roosting house has always pioved satisfactory. In fine weather the hirds can be outdonss in the run: in wet weather they are conlined in the seratching-shed. On extremely cold and wet days the screens are put up, and the birds are warm and comfortahle, and ahle to seek their food in daylight and also in the dry. with satisfactory results in egg production.

POUNCE POT. Also known as n sand botle, the pounce pot in silver and Sheftield plate is sought by collectors. It was made for holding sand, which was used hefore the general employment of blotting paper to sprinkle over writing in order to dry the ink

POUNCING. Patterns may be pounced On to metal, glass, or pottery by means of a Jinen bag containing blue chalk. By ponneing is meant that the bag will be dabbed all over the surface of a stencil and will thereby
transfer to the surface of the article itself the outline of the design cut in the stencil paper. See Stencilling

POUND. This standard English mensure of weight is divided into 16 ounces, and consists, strictly speaking, of 7,(100) grains; 14 pounds go to the stonc, 28 to the quarter, and 112 to the hundredweight. There are $2,2 f()$ pounds to a ton. The usual abbreviation for pound is lb ., which is used throughout this work. See Avoirduprois Weight.

Pound Cake. This is n rich sultana calic usually baked in a spuuare or oblong, fairly shallow, cake tin. See Calie.
POUT: The Fish. The pout possesses a membrane covering the head and eyes, and which it has the power of intlating. The best known is the whiting pout. $n$ member of the haddock tribe. It makes excellent eating, bul must be consumed very shortly after being caught to be in good condition. Largo specimens attain the weight of 5 lb ., but the smaller fish have the best llavour. They can be cooked by the same methods ns are used for haddock.

POWDER. A powder may be described as any substance reluced to fine particles. Powders used in the home may be divided into those used for the toilet, e.g. face and tooth powders. those used for various cleansing purposes, and those takell as merlicines.

For the complexion, ponders can be had in white, cream, pink, and tlesh tints, variously perfumed, and either in solid or loase form. They should be carefully sclected hoth for texture and colour. Many women hlend their own by mixing two or three shades until the desired tint is ohtained Other hinds of toilet powders include rice. pearl. violet. nud talcum powders.

Cleansing powders include those for cleaning silverware and cutlery; there are also sanitary powders and vermin destroving powders. Powrered soaps are used in washing clolhes. while another jowder used in the houschold is baking pouder.
The powders uged in medicine are reluced to very small particles by a mill, or with pestle and mortar. To give bulk where a small quantity of the drug is to be taken, sugar of milk is frequently included. Powders may be taken by sprinkling on the tongre or in jam or syrup.
Powder Puff. Puffs for applying porder to the skin are made chiefly of swansiown, lambs' wool, and beaver fur: for hygienic reasons no puff should be used too long.
To make a powder puff, cut out a circular piece of swansdown or fur, turn in the edges to the wrong side, and then cover the hack with a circular piece of white or coloured silk. If a bone button and ring or some other type of handle, are altached to the centre back, the puff will be found easier to use. Large puffs intended for powdering the neck, shoulders, and back are fitted with long handles of wood, bone, or tortuiscshell, and are backed with ruched satin narrow ribbon, or lloral trimming.

A usual kind of powder puff is a handlierchief puff. Small pieces of coloured swansdown can be purchased and neatly sewn on to the middle of a creppede. Chine or georgette handkerchicf. This may be decorated by painting or pattern printing (q.v.).

On large powder puffs the usual hone button and ring may be substituted by a handle made from a lonk of satin ribbon or a small bunch of parlded silk-covered flowers and fruit. See l3abv; Baking Powder; Beauty; Emery Powder : Make-up; Scent: Talcum : Terth, elc

## Power Grid Detection. See Detector.

PRAIRIE SUNFLOWER. The fine species of perennial suntlower, Helianthus rigidus, is a good plant for the garden or for vielding cut Howers. Inproved varieties of this prairie


Prairie Suntlower, a tavourite species, with Howers ranging through all shades of yellow
sunflower, as it is called, include Miss Mellish, Miss Willmott. Daniel Dewar, and Rev. Wollev Dod All are !n varying shades of ye!low, the tlowers being borne on slender crect stems, 6 f1. or more high.
PRATIA. licing a dwarf plant of trailing habit. pratia is suitable as a creper for a slightly shady place in the rockery. It belongs to the harebell family. The chief kind is Pratia angulata, which grows up only 3 in. high, and during summer hears white llowers; repens has white flowers followed by red berries. It is hest plantclin March, and may be increased by division during the same month. See Ruck Garden.
PRAWN. In appearance resembling the shrimp, the prawn is la giger and more delicate in Havour Like the shrimp, it is hought ready boiled, and if fresh it should he firm and a good pink in colour. P'rawns can also he oblained preserved in tins, in which case they are not only cooked hut also shelled

Preparing Prawns. To shell prawns, take the head and tail in the two hands and pult tho prawn straight, giving it a little twist at tho same time. In this way practically all the shell will come off with the head and tail: the piece hat remains can quite casily be removed
Cut some large tomntoes in slices, and on each slice place a thin slice of cl:cumber and then 2 prawns. Prepare some thin bread and butter, spread it over with anchovy pasle, mixed if liked with tomato sauce. Cut the bread and hutter into strips, roll them up, and place them on the dish hetween the tomato slices. Another way is to place the prawns on a thin slice of lemon, and garnish them with parsley or sprigs of watercress.
'To prepare prawns in aspic, line some sinall dariole moulds with aspic jelly, and leave them until the jelly is nearly set, when some finely chopped olives, or pickled gherkins, and some chopped lobster coral is sprinkled over it. Then put 2 large prawns or 3 small ones into each mould, fill them up with more aspic. and


Prawns in aspic served on croûtes of fried breal spread with green butter
put in a cool place or on ice to set. Meanwhile inatie as many croutes of fried bread as there are dariole moulds, and spread them with green butter. This is made by placing it oz inixed and wished herbs, comprising parsley, tarragon, chervil, and chives in a saucepan of cold water and boiling them; dry thonoughly with a clean cloth and pound in a mortar with 3 oz butter a little anchovy essence and seasoning, afterwards rubbing the mixture through a sieve.

When the prawne are to be served, a mould is turnerl out upon each prepared croutte. and one is served to each person

To preserve prawns whole in butter, shell 1 pint of prawns and pack them closely in shallow china pots Crush the shells roughly. and put them, with $t \mathrm{lb}$. frosh butter, into a stone jam-jar in a pot of bniling water When the buiter is thoroughly melted strain it free of shell, Havour it with cayenne, nutmeg, and a little salt, and pour it over the prawns. Mure inclted butter should te added when this is cold, if the pots are not full. Tie them down, and store them in a cool, dry place.

Prawn Patties. While the puff partry (sce page 812) for these patties is cooking. the filling may be prepared Make a plain


Prawn Patties, consisting of pof pastry cases, with a filling made frow whlte sauce, small pleces of prawn and some grated cheesa Dinner Party ; Etiquctte. months, and disappears.
their elder brothers and before their younger brothers' wives Daughters of peers marrying peers of lower degree take the snme order of precedency as their hushands; thus the daughter of a duke marrying a baron degrades to the rank of baroness, while her sisters married to commoners retain thioir rank. Mere official rank on the husband's part does not give similar precedence to the wifc. See

PREGNANCY. The fact of conception may be shown, or at any rate suggested, almost at once by nausea, sickncas, or an ill-defined sensation of some sart, but much more commonly it is not suspected till the failure of a menstrual period. Morning sickness may appear very early in pregnancy, but as a general rule it appenrs towards the end of the first month, lasts two or threc

As soon as a woman finds herself pregnant she can generally, by consulting a doctor, find out within a week or two the probable date of her confinement. She is thus ablo to engage a doctor and a nurse. The duration of pregnancy is about 40 weeks, that is to say, 10 lunar months or 9 calendar months. Thicre are various methods of calculating the 10 days. white sauce, and add to it $\frac{1}{2}$ gill shelled there is prolonged standing. prawns cut into small pieces Nake tho mixture thoroughly hot in a pan over the fire, then stir in 4 tablesponnfuls grated cheese and salt and pepper to taste. When the cheese has melted, fill the pastry cases with the mixture, and garnish the top of each patty with a prawn's head.
Prawn Sauce. This sauce can be served with any white fish. To make it, prepare 1 pint melted butter sauce, season it to taste, and add $\frac{1}{2}$ a teaspoonful lemon juice and a few drops anchovy essence. Then drop in $\frac{1}{2}$ pint shelled prawns, and the sauce is ready. See Aspic: Curry; Hors d'Oeuvres; Patty ; Silad.

PRECEDENCE. Precedence is the order in which individunls follow one another at state and other public ceremonies. There is also an order of precedence for private gatherings, nlthough this is not so rigid. There precedence is usually given to the guests in order of their rank and social standing.

For state ceremonies there is a regular order of precedence for peers and officials. The king comes first, then the prince of Wales, and the other male members of the royal family. Next come the archbishop of Canterbury, the lord Chancellor, the archbishop of York, and the prime minister. in the order named. Other high officials follow and then come the peers, rank after rank. After the peers come a number of other persons, sons of peers, baronets, knights, and other members of the various orders.
Women take the same rank as their husbands or as their eldest hrothers. Daughters of peers rank immediately after the wives of

She should take open-air exercise every day, and should live in well-ventilated rooms. She should have a sufficiency of rest at night, and as her pregnancy advances whe will, as a rule, find it desirable to lie down for a little several times during the day. It may be a comfort to her and make exerciac more easy if she wears a properly fitted obstetric belt. Her dress should be loose. She should have plenty of plain food. In most cases she is better without alcohol. It may be well to sup. plement the ordinary diet with a frec allowance of milk.
Constipation is apt to be troublesome, and an attempt should be made to obviate it by including porridge, brown bread, vegetables, and fruit in the diet. Shnuld an aperient be required a teaspoonful or more of castor oil at bedtime may be sufficient, and may be taken every night if necessary ; or liquorice powder or cascara may equally serve the purpose. The use of strong purgatives is dangerous.
The drawbacks of morning sickness may be avoided by having a light breakfast in bed and an hour's reat before getting up A woman
date of a confinement.
One is count back 3 months from the beginning of the last period, and to add

Pregnancy does not, and ns a rule need not, interfere witl the ordinary routine of a woman's life and duties. She should be careful to avoid physical strain or shock, such as is in. volved in lifting weights, in journeying in jolting vehicles or in occupations in which


Preserving and sterilizing outnt, comprising
combined bolder and stand, and glass jars
should keep in touch with her doctor throughout her pregnancy. See Baby; Childbirth.
PRESERVATIVE: In Food. The use of chemical preservatives for food can hardly be dispensed with, as so much food is importeil and hoth this and home-produced food require to be stoied, sometimes for considerable periods Some chemicals used for preserving are harmful if taken in the amounts which might well be ingested in the course of ordinary diets containing a fair proportion of preserved food Boracic acid, once used extensively, is an example.

In Great Britain the Public Health (Pre. servatires, etc., in Food) Regulations, 192?., prescribe the articles which may contain chemical preservatives, the approprinte preservative and nmount in each. The onlv preservatives allowed are sulphurous acid and benzoic acid. See Adulteration; Food.

PRESERVING: Of Food. Fruit, legetables, meat or fish may be prescrved and sterilized by a simple method and the use of the outfit illustrated. This is an economy to the house wife, as foods may be purchused when pirces are low, or home-grown vegetahles and fruits may be preserved during the plentiful season. The shelves of the lariler may be stocked with jars of chicken, fish, game, soups. fruit or vegetables which, have been preserved, and will keep for years owing to efficient sterilization without the use of chemicals.
The Process Described. Tho process is simple and fuel saving. The jars are first filled. placed on the combined holder and atand as shown in the illustration, and then put into the sterilizer. When the water at the bottom of the sterilizer reaches the correct temperature the jars are bernetically sealed. No screwing covers are needed, the glasa covers are self-sealing and the contents can be preserved for years. The natural juices and vitamins are retained, and the food kept pure and wholesome. With the combined holder and stand all the jars can be placed into the sterilizer or taken out with one operntion. The stand is supplied with six clips for holding jars securely in position. Shallow jars can be placed one on top of the other. The thermonieter is protected by a steel sheath and is clearly charted to show the cormet temperature for sterilizing various foods, milk, etc. The special jars can be obtained in several sizes and are guarantecd against breakage by heat.

Preserving Pan. This shallow pan for making jam or inarmalade is usually made of brass, copper, or aluminium, but cheaper kinds can
be obtained in tin, iron, and enamelled ware. The iron ones are not to be recommended as they often discolour their contents, while the tin and enamel pans quickly become overheated and so cause the jam to burn unless the latter is kept well stirred. Enamel pans are also liable to chip.

PRESSED BEEF. To prepare this procure n picce of brisket of beef weighing from 5 to if lb. ; see that it is well covered with fat and nent-looking, also perfectly frec from the slighteat taint. Wipe it and lay it on one side whilc preparing the brine. Nix well in an carthenware pan 2 lb . common salt, 1 oz . saltpetre, $3 \frac{1}{2}$ oz. raw sugar, 1 bay-leal bruised, 1 small teaspoonful mixed sweet herbs, which have been sifted, 1 blade mace, and 4 cloves.

Bonc the meat, immerse it in the pickle in the pan, and rub it well with this mixture all over, doing this for about 5 min. Kecp it in a conl place, and every day for 5 days turn the meat and rub it as on the first day, taking care that it is left on the side which has been turned over. The joint must remain in the salt for from 12 to 15 days, but after the first five days it need not be rubbed, only turned each day. The saltpetre gives the red tint.

To cook the meat, wash it free from salt in cold water, then lay it in a saucepan large enough to give it plenty of room. Cover it with cold water and boil it up, skimming it very carefully. Add 20 peppercorns, 3 carrots, 2 onions, ench stuck with 2 cloves, 1 head of celery, and 2 turnips. All the vegetables should be prepared and cut into pieces of convenient size. Simmer the whole gently for 4 or 5 bours, or until it is very tender, akimming occasionally. When cooked, take up the meat, drain it and lay it on a deep dish, quite flat. Corer it over with a second dish and arrange on the top sufficient weight to pross the brisket into an oblong shape.

When cold, remove the weight and covering dish, and trim the neat ; then glaze it and dish it, garnished with parsley. The bones removed from the briskct can be added to the contents of the stock-pot, or boiled down separately with a little vegetable and converted into glaze The stock left over from cooking the meat may either be served as a hroth, with the addition of suct dumplings, or it may he used as the foundation of a brown soup. Brisket is too fat for some tastes, and a piece of silverside or round of becf may be sub. stituted.

ISrisket can be bought ready salted and cooked in the same wry. See Beef.

## PRESSING

 Of Clothes. Pressing is one of the most inl. portant items in the care of clothes, as it prevents them from losing their shape. When pressing is done systeinatically by means of at clothes press, it is seldom necessary to resort to othier treatment ; but with garments where this method is not practioablc, steam pressing is usually effective.

Pressing. Suord iron, heated by electricity. for pressing

Steam pressing can be done at home with the aid of a hot iron and a damp cloth. The latter should be of linen or calico or some similarly thin material.

Press heavily on the iron so as to remove any creases, and continue pressing until the cloth is dry, taking care that it does not become singed. If the garment itself is wet when pressed, the cloth that covers it should not be damped. The iron must not touch the garment itself, otherwise a shiny appearance may quite likely develop.

Any cleaning that is required should be donc before pressing. A special iron for pressing men's ties is shown in the illustration. The "sword" is hented by electricity in the ordinary way and the tie is atretched on to it after the silk has been slightly damped. See Clothes; Ironing.

PRESSURE COOKER. Fond cooked by steam pressurc in a pressure cooker requires only a very short time owing to the high concentration of the steam inside the cooker.


Pressure Cooker consisting of a casserole with lood contalners. The food is cooked by steam pressure, which is rerulated by a special device Courtesn of Ilarrods, Lld

There are scveral makes of pressure cookers on the market, but the principle is identical in all cascs. The cooker is really a strongly made casacrole with food containers and a lid which fits internally into the cooker. This is held in position witls a locking bar. When the lid is in position no steam can escape: the greater the steam pressure the more securely the lid is held in position, and the lid cannot be removed while the stean pressure remains The lid is fitted with n whistle device, the function of which is to ragulate the cooking of the food, and when sufficient pressure lins been generated this whistle blows and warns the user to remove the cooker from the gas or other heat. The whistle is marked with numbers on the movable top half and with a red line at the base, and one of these numbers is set to the red line according to the kind of food which is being cooked. There is also a safety valve on the lid.

Inside the cooker are basket containers for vegetables, also a combined lifter grid and strainer. It is possible to cook a complete meal in a pressurc cooker, as ench fond kceps its own flavour, and locs not affect that of others. Gteens retain their colour, and dried vegetables can be coo'ved in a few minutes without soaking. There is very little shrink age or loss in cooking, and all the natural juices and valuable salts are retained. For stewing or boiling, cold water is put into the cooker to the depth of 1 in . to $1 \frac{1}{2} \mathrm{in}$. ; for roasting, boiling fat is put in.

Below are a few exainples of the time taken for various foods to cook in a pressure cooker. Ronst chicken, 6-10 minutes instead of $40-60$ minutes. Roast joint, 12-15 minutes instead of 2 hours or longer. Stewed meats, 12
minutes instead of 2-3 hours. Potatoes, 8 minutes instead of $20-25$ minutes. Green vegetables, 7-10 minutes instead of 25 minutes. Dried vegetables, 20 minutes instead of 2-3 hours. See Digester.
PRICRING-OUT : Of Plants. The process of transplanting the seedlings as soon as possible after they have made their first tirie leaf in addition to the seed lcaves is termed pricking-out. It requires care, and where the seedlings are very small a thin, Hat stick notehed V-shape at one end, should be used to lift thein from the sced-pan or box.
Tender seedlings raised under glass should be pricked out into pots or pans, at distances apart according to their hahit of growth: they will require careful shading and wateringo for some time after pricking-out, and must be kept under glass until establiahed Outdoor plants raised in heat must be hardened ofl before permanent planting.
Seedlings raised directly in the open may be thinned out instead of pricked out, and, where necessary, transplanted when 3 or 4 true leaves have formed
PRICKLY HEAT. In the tropics Europeans frequently suffer from the skin disorder known as prickly heat. It produces intolerable tingling, pricking, and itching, and is due to obstruction of the sweat ducts. Small red pimples, no larger than it pin's head, cover the arms, breast, neck, shoulders, and thighs.

Rest in a cool, slindy place, if practicable, is one of the best measures Iced and hot drinks, spirits and wine, are to be avoided So are hot baths, especially with the "ise of soap. Many remedics are recommended, of which the best appears to he a mixture of 8 parts of olive oil and 1 part of lanolin rubbed into the skin night and morning.
I tepid alkalinc bath has sometimes a very soothing effect. It is made by ndding 1 oz . of bicarbonate of sodn to each gnllon of water Or a tepid bath of plain water may be taken. the skin bcing afterwards rubbed with lemonjuice, or carbolic lotion (1 part carbolic to 60 parts water), or calaıninc ointment ; or dusted with a powder made of equal parts of oxide of zinc, boric ncid, and starch.

PRICKLY PEAR. This is the common name of opuntiu, one of the cacti It is usually cultivated in pots under glass in a collection of cacti, but a few, notably monacantha and vulgaris, can be grown on a sunny, welldrained rockery at the foot of a wall.

PRICKLY THRIFT. This is the popular name of a rock garden plant, acantholimon, which forins a low civergreen tuft of spiny


Prickly Thrift. Rose-coloured flowers of a rockery olant which requires a sunny position
leaves and bears rose-coloured Howers in soil therc are some summer It needs well drained sandy loam remarkable plants and a sunny position, and is increased by cuttings in a frame in Alrgust Acantholimon glumaceum and venustum are the chief hinda: both have rose coloured tlowers

PRIMING: For Painting. As applied to house painting and similar work, priming is $n n$ undercoating or groundworli for sub.


Priming paint applied as a groundwork to raw timber sofuent conts of paint or onanicl Pio. nrietary brands are made up spe. cially for woodwork metal. or stone The amateur can make his own by mixing red lcad in paste or powder form with white lead and linseed oil thinned with turpentine, and a little driers added This is brusherl well into the word. work imme. diately it has heen pre pared. The adrantage of a priming coat is that it
works well into the wood and acts as a durable busc lor the paint that follows, which would otherwise neel off after exposure to wind and weather Sec Paint

PRIMROSE. This is the popular name of the spring-llowering I'rimula vulgaris and its varieties Primroses arc natives of hodgerows, banks. woods, and the sides of streams, and when found wild they may be dug up and hrought into cultivation 'Tley are increased by division after flowering or by sceds sown in spring in a frame The blue priniruses are great favourites and the double varicties urc charming llowers Primruses like slight shade in moist. loamy soil. See Auricula Evoning Primiuse Himalayan Primrasc.

PRIMULA. This groupl of bardy and greenhouse plants is of the utnost importance to the gardener, for many of the specics and varieties are invaluable for spring and summer hlooming out of doors or for provid. ing a show of thowers under glass in winter and spring

There are two chicl t vjes of hardy primula, those which lluurish best in partial shade in deep, invist soi!, and others which thrive when planted in erevices of the ruck garden Among those which need deep, moist


Primula. Lelt, tult-llke Hower beads of the species denticulata, whica needs a moist situation. Rigbt, P. varlabilis, a rock-rarden flower


Primula. 1. How to sow: $a$, crocks; b chopped old turl; $c$, fine soil : $d_{\text {, }}$ seed sown on top ; $e$, Rlass. 2. Seedings ready for pricking out. 3. Seedings pricsed out in box. 4. First notting. 5. Second potting. 6. Plants placed in coldrame. propastion by shoots slit at greenhouse: $a_{\text {, moist shingie. 8. Method of }}$ beaped with mosi to make roots firm. 10 Rooted sboot potted separately

Bu specia: arrangement with Amatcur Cardening
As regards planting, this should be carried out in early autumn or in spring.
Several of the primulas are charming winter and spring-flowering grecnhouse planta which can be grown to perfection in a minimum temperature of 50 degrees The Cbinese primulas (sinensis and stellata), of which there are numerous varicties in rose, crimson, salmon and other colours, aro the most valuable The yellow-flowered Kewensis and flaribunda, the pale yellow verticillata and the fairy primrose (malacoides) in blac. mauve and rose are others to be recommended. Primula obconica is a showy kind with blush. ruse or crimson Howers Gloves should be worn when handling the plants or the hairs on the leaves may cause irritation of the sk in.

Seeds of primulas sinensis and stellata should be sown in pans of fine soil in a frame in May. During summer the plants must be grown in a cool, shady frame, and in September they should be placed in the greenhouse. A suitable potting compost consists of loam two-thirds and leat-muuld one-third, with wand alded freely l'ots 5 to $\mathrm{B}_{\mathrm{in}} \mathrm{in}$. wide are large enough for the final potting.
Seeds of primulas iloribunda, Kewensis and verticillata should be sown in April; thuse of malacoides in April and June to maintain n succession of tloom P'rimula obconica should be sown in March in order to provide plants in hlowm in winter. These need the same treatment as the Chinese primulas. See Flower Garden: Potting : Pricking Out: Rock Garden.

PRINCE'S FEATHER. This is the common name of a half-hardy annual (Amiaantus hypochondriacus), which bears spikes of crimson Howers on stems 3 ft . or more high in summer. It is raised from seeds sown in a heated glasshouse in Jlarch, the seedlings being planted out in May. Other favourite allied plants are love-lies-bleeding (Amarantus caudatus), and Josepli's Cont (Amarantus tricolor).

PRINT : The Material. Many kinds of cloth are printed with designs, but the name print is most often given to simple cottons, usoful for aprons, working overalls and dresses, or for dust shects. Print enn be pasted down as a lining to wooden boxes or cupboards, and it can be omployed as a backing to curtains made of washing niaterial Old print dresses can be cut up to make capital dusters, and when these are worn out they are still use. ful for wiping grease from machinery or for polishers for floors furniture, or boots.

PRINT : How to Choose. Print collect in colour or finish. Some of them bear the $n$ m ing is still a hobby open to people of moderate means. Most old print shops have hundreds of prints put away in portfolios through which the would-be collector may look and find treasures, ranging from a few pence to a few shillings apiece.
The collector's first business is to learn to identify the different processes of engraving and cutting by which the print is evolved. The broad distinction between an etching and a mezzotint or a lithograph is fairly evident at sight. But it is not so easy to tell the differ ence between an engraving on steel and one on copper, or to know at a glance the mixed processes employed to produce a certain kind of etching. Only by watching an operator at work on a plate through all its stages can absolute certainty be gained as to the way it is done.
Londoners have access to some of the finest prints in the world at the British Museum, at South Kensington, and the Guildhall; but all over the country there are plenty of good prints to be seen. Yet the most valuable experience is that gained in the shop For prints of all descriptions the inexperienced collector's safest guide is an intelligent and honest printseller.

It should be remembered that prints of views, topical events and sports, if good in themselves, are bound to increase in value. Anyone who specialises in prints of one town or district, of naval and military subjects, yachting, motoring, or aviation, may probably form an interesting and valuable collection.

While etchings by great masters, such as Rembrandt, Albrecht Dürer, and Whistler, and colour prints after Morland, Wheatley, and other artists are beyond the reach of the ordinary collector, there are many decorative prints in colour or monochrome which can be picked up for comparatively small sums.
The collector's Japanese prints form a class in themselves and are nearly always pleasing and those by the less known names may often be bought cheap. One should, however, remember that the Japanese produce a large class of prints solely for export, and they are not of the best quality.

Plate Marks. Fivery collestor is warned against the purchase of prints lacking the slight indentation that shows where the plate has been pressed on the paper; yet a print without a plate mark is not necessarily a fake. Absence of the mark may simply be the result of printing from a plate larger than the paper. The illustrations, for instance, to Scott's novels and Rogers' poems were printed from plates larger than the pages of the book, and there are hundreds of similar cases where the plate mark has disappeared for this reason.

False margins can generally be detected by holding the print up to the light, just as the most cleverly exccuted repair of a hole or tear in the specimen betrays itself if the light is strong enough. Touch can often determine the age of a print by revealing the texture of the paper. Modern paper is hard and harsh compared with 18 th century and older paper. This test, however. is not infallible.

A finger passed lightly over the surface of a print should show whether it is genuins or a clever photographic reproduction.

Baxter Prints. Genuine Baxter prints, the work of George Baxter, are valued by collectors. Baxter illustrated a large number of books, producing frontispieces and vignettes in addition to separate pictures. Many of these were used to illustrate pieces of music, and valuable Baxter prints have been discovered in this way, especially portraits about $4 \frac{1}{2}$ in. long, into which he put some of his best work. Some printing firms were afterwards licensed to use the Baxter process, which consisted in building up beautifully coloured prints by the use of many blocks; but the work of these licensees never equalled the originals either
in colour or finish. Some of them bear the name
of Baxter, and collectors are very liable to be misled by theso. Genuine examples bear the name of the artist and one or other of his various addresses in London; they have good mounts and are generally clean and unfaded, Baxter's brilliant and lasting colours being one of the principal secrets of his remarkable success.
There was no 3-colour process in Baxter's day: each colour in a picture had to be applied separately. and in this Baxter excclled. He started with an engraving, originally on wood, later copper, and then steel, printing in black, brown, or purple. This was the

Photographic printing processes are divided into two classes. The first and oldest, and apparently simplest, is the printing-out method in which daylight is allowed to act on sensitive paper behind a negative, the action continuing until all details of the image are visible. The paper which is used in this process is called printing-out paper or P.O.P. (q.v.).

In the second method, called the develop ment method, artificial light is used, and the exposure of the sensitive paper is very much shorter, no visible image being produced unti the paper is treated with a chemical developer
In both P.O.P. and development papers the negative is held in a printing frame for exposure. since it is essential that the sensitive paper should be closely and evenly in contact with negative and also that light should not leak in through the edges of a glass negative. Printing frames can be bought cheaply; if a number are required, they can be made a describel later.
When printing films it is necersary to place a piece of clean glass in the frame first, then the film, followed by the paper, the sensitive side of the film being in contact with the paper or the image will not be quite so sharp and will also be reversed. A waste negative glase of the right size for the frame, carefully cleaned, will serve best for the film support. keeping it flat and in close contact with the printing paper. If glass negatives are being printed see that the glass sicle is thoroughly cleaned and without smears or finger marks. for any marks will appear in the print, particu larly if it is on gaslight paper. Care must also be taken to see that the ncgative is thoroughly dry, or it will adhere to the sensitive paper, spoiling the negative and causing silver stains on it, which are extremcly difficult to remove. Take great care to see that the paper itself is not handled with moist or dirty fingers.

When printing in daylight on P.O.P. the frame should be filled in dull light or shadow and the printing should be carried out in diffused light, never in direct sunlight, except perhaps in weak sunlight from November to February. Too strong a light reduces the contrasts even in a good negative, and gives flat, dull prints. Weaker light, well diffused, increases contrasts and brightens the prints Place the frame on the window-sill out of the sun, but with an uninterrupted view of the sky. After a short time the print is examined in a dull light by opening one half of the hinged back of the frame.

See that the paper is not pulled or disturbed in any way, or a double and blurred image will appear on the finished print. Depth of printing varies somewhat according to the paper and toning bath used, but as a general rule it should be carried on until the whites of the picture are well coloured and the
foundation. After that he applied his colours with a series of wood blocks. letting one impression dry and then adding another

The variety of colours is always a striking feature of his work, from 8 to 20 different colours or tints being found in a single print. The register is always perfect ; that is to say each colour is fitted exactly into its place. This is one of the characteristics of a Baxter print ; another is the beauty of the colouring Baxter ground and mixed his own colours, and was very particular in his choice of paper He engraved the plates himself, and personally superintended every stage in the production of his prints. See Picture

## Printing and Printing Frames

## The Best Methods for the Amateur Photographic Worker

For the photographer who carries out the technical processes of his hobby clear instructloas are given under this and the relative headings, Developing; Enlarging: Flxing; Negative

Washing. See also Gaslight Paper; P.O.P.: Self-roning Paper
shadows begin to appear solid. Fixing and toning should be carried out as soon as possible after printing, as P.O.P. tends to discolour if kept after printing and will not tone so well

All prints, whether on P O.P., gaslight, or bromide paper, are much more effective if a white margin appears round the photograph proper. This is obtained by the use of a mask, best cut to fit the particular photo graph from opaque paper. flat and uncrumpled, such as the black paper used for wrapping sensitive plates. A sharp knife or a mounted razor blade must be used to cut the mask, since clean, straight enges are essential. Sets of masks may be bought, but those of oval shape or with rounded corners should not be used, for their effect is most inartistic.
To get clouds visible in a negative to print properly on P.O.P. paper it is necessary to shield the ground portion of the negative for part of the time during printing by placing a card over the frame, and so allowing the sky portion extra time for printing. The card should not touch the glass, but should be about $\frac{1}{2} \mathrm{in}$. to 1 in . away from it, and moved occasionally, or a sharp line will appear in the print In a similar way, when there arc no clouds in the negative, the sky portion being opaque, the print will be improved if, insteal of appearing a blank white, it shows some tone of varying density.
To do this, expose the paper first in the frame through plain glass, covering all but the topmost (sky) portion of the negative with a card as before, gradually moving the card downward so that the top of the print has the iongest exposure and shows a decided tint. The finished picture will show a graduated sky of much more natural appearance than if left blank. This process is called sunning-down. When printed P.O.P. papers are toned and fixed together with self-toning papers the two operations of toning and fixing are combined in onc.

Printing Frame. Several kinds of frames for making photographic prints and suitablc for all sizes in negatives, are obtainable. Although generally made in wood, some are made of metal, two kinds of the former being shown in Figs. 1 and 7. The framework of the first is shown in detail in Fig. 2, and for sizes up to whole plate the material can be the same size in section.

Taking the dimensions of a 1 -plate frame as a guide, the two sides $A$ should be 6 in . by 1 in . by $\frac{3}{} \mathrm{in}$,, and the ends 5 in . by 1 in . by $\frac{1}{2} \mathrm{in}$. In order to reduce the thickness of material close to the negative, the top edge of the wood should be planed to a chamfer, as in Fig. 3, and the mortise and tenon joint cut as in Fig. 4. The thickness of the tenon is 1 in., but, before cutting, allowance must be madc for the chamfer and also the rebate, this being $t$ in. deep and $t$ in. inward. The


Printing Prame. Fig. 1. Prame with mortise and tenon corners. Fig. 2. View showing joint and rebate. Pig. 3. section of side. Pig. 4. Detail ol joint. Pis. 5. Alternative joint. Fig. 6. 8pring. Fig. 7. Another methoj ol mating trame. Fis. 8. Soction showing apring and ataple. Fig. 9. Binged beviz
rebate is cut in order to leave a projection at the ends; Fig. 2.
'The simplest way oi making the frante is to chamier the two lengths ${ }^{-} A$, cut out the recess to leave $f$ in. at each end and to cut the mortise to a depth of 1 in The ends B are first notched on the side so that the bottom of the inclined shoulder is I in. from the end. After glueing up, the corners can be rounded as shown. An alternative method of forming the joint is shown in Fig. 5, the top chamfer being made after the joints are cut. The spring should be of hard rolled brass, hammered to form a curve, as in lig. 6, a suitable width being in., the length for a $d$-plate being 40 in Staples as at $S$ should lo mate from $\frac{1}{8}$ in. hard brans wire and driven in the wood.

For the plywood frame in Fig. 7 the bottom piece C should be for a frame of the same size as Fig. 1, 6 in. by 5 in., the tol pieces 15 in . by 1 in . by $\frac{1}{1} \mathrm{in}$, and the end pieces $E$ it in. by 1 in. by $\frac{1}{1}$ in. Cut the sloping recesses in the sides 1 to a length of about 2 in . and a clepth of $\frac{t}{} \mathrm{in}$., and then glue on, with end pieces $E$ butted against then.

The springe are now prepared and screwed on as in the section in Fig. 8, and a staple fitted to each spring. The hinged back for the first frame is made from $\ddagger \mathrm{in}$. wood, each portion being $3 \frac{t}{t}$ in. by $2 \frac{1}{8}$ in., hinged together with small brass butts The bach for the second, shown in Fig. 9, is made from two pieces, one to fit in the recessed portion and the other beyond it. Brass hinges can be used, or a strip of linen cloth glued on.

PRISONER'S BASE. This game can be played in a garden or playground by any number up to about 40 players. The ground should be markel into two equal portions, and at each end a base established. If played in a yard these can be marked with chalk, the base being $5-0 \mathrm{ft}$. each way.

When tho players have been divided intu two equal parties the game begins. At first they risk capture by venturing into the enemy's ground, or remain on the watch for those who onter their uwn. Those who are caught by being tagged are placed as prisoners in the lase, but can be relcased if touched by a free member of their own side. Buth prisoner and rescuer can be tagged anil brought back to
prison before reaching their uwn ground. A gane is won when one side has made prisuners of all its upponents, or when a free inan enters his upponent's prisun when it is empty
PRIVET: The Shrub. Thin is the commonest of all hedge shrubs and it is scarcely surpassed for forming a close liedge quickly. but it needs to be clipped frequently during the summer inonths and impuverishes the ground near by. The plants should be set in autumn at $1 \overline{\bar{j}} \mathrm{iu}$. apart; a thick hedge is assured most quickly by planting a double row. the plants in one row alternating with thuse in the other. In the following spring they should be prunol to within 12 in . or so of the base to make them branch out. The common privet is Ligustrum vulgare, but the oval. leaved privet (Ligustrum ovalifolium) is a better shrub with mraer leavion which arealnume

privet. Spraye of Ligustram valgare, the common privet
evergreen. The golden leaved privet is a favourite hedge shrub: it varies a good deal in colour and it is wise to chouse the plante in a nursery.
Several of the privets are worth cultivation as decurative shrubs: two of the best are japonicum, t-5 ft., and lucidum, ij $\mathrm{ft}_{\mathrm{t}}$; both bear white flowers in summer. Privet is easily increased by cuttings inserted out of doors in October or in a frame in August. See Hedge: Quick.

PROBATE: Of a Will. When a man diek leaving a will his executors cannut liandle his eatate until they have proved, or taken out pmbate of, his will. This is accomplisbed by takind the will either to a local registry or to Sumerset House, lugether with a copy : leaving the original there, and receiving frum the officials a copy written on parchment and sealod with the seal of the probate division of the high court. This is called a prolate colly, armed with which the executor can collect. the eatate and deal with it.

Any person who wisher to dispute a will must enter a careat on a form provided by Somerset House in London or a probate registry (fee $2 /(3)$. 'This form is to the effect that no will of X Y deceased is to be admitted to probate without notice to the objectur or his solicitor. The cavcat remains in force for six months and may be renewed. Anyone who wishes to prove a will of X Y deceased must first search and see if there is a caveat If he finds one, he must give nutice to the objector called a 'warning summons ' (foe 2/6). Unless the objector enters an appearance to the warning summons the caveat cxpires. If an appearance is entered by the ubjector it will be necessary to prove the will in solemn form by litigation.

The action is heard in the probate division of the high court, when the witncesses to the will come and give their evidence on nath : the objector is allowed to call evidence to show cither that the will was not executed according (1) law or that the testator was of unsound mind or subject to undue influence or the like. If the will is pronounced valid, it is then said to be proved in solenin form.
The ordinary probate of a will is called proof in common furin. The fullowing documents are required: (1) un affidavit according to the form which can be obtained from Sumerset House or the lical registry containing all particulars of the leceased's estate: (2) an oath of executors proving the cleath, will, dtc. . (3) renunciation by any exccutor where necessary ; (4) engrossment of the will and any rudicils on official engrossment sheets of special paper: (5) where neccssary an affidavit of due execution of the will; (6) a certificate of reasun of delay where the application is made after a lapse of 3 ycars from the testator's leath in order to enable the eatate duty to be assensed. If the deceased left a will but either named no executor or the executor whom he named is dead, then the person who would be entitled to administration if he had died intestate is also entitled to be administısto with the will annexed. As a rule, administra. tion is granted to the residuary legatee, because it is clearly wh his interest that the deceased's estate should be properly administered, he being entitled to what is left after paying debts and the various legacies devised under the will. See Executor; Legacy ; Will.

PROGRESSIVE PARTY. A pmgressive party may be held in one's own house, or, if it is desired to invite a large number of people, it may be oqually well held in a hall hired for the occasion. Whist is the must suitablo game, as bridge is too scientific to admit of the casual play and constant change of partners and talks which occur during the evening's entertainment. It is impurtant that the tables should not ise too cluse tuget her, and that circulation should be easy. Also that une or two people should be in rescrve in case
some player disappoints. Each table should have its number clearly marked
The best time-table is as follows: Allow $\frac{1}{2}$ hour for the questa to arrive, to serve coffee or any light refreshments, to hand out acoring cards. and for the arrangement of partners play mav last for $1!$ hours ; and another hour will serre to circulate refreshments and present the prizes It is a great mistake in allow the play to last too long, as after a certain time things may begin to drag.
It is heat to lcave the arrangement of partners to chance, and to let them find each other by one of the ordinary methods, such as the pairing of words. Ench man's card should have the table number written on it, and there should be two men for each table.

Ilay must start with the ringing of a bell : it should continue from 5 to 10 min .. and cease when the liell rings again. The winning couple, when the scorcs liave been tilled in, then move to other tables. Usually the woman moves to the next highest numbei and the man to the lower one. This ensures that the majority of perple shall meet ench wther in the course of the evening. The losing couple remain at the same tables as before. hut when the new arrivals come they ohange partners. When pliny ceases the scoring cards should he handed in to host or hustess, and the plavers go into another room for refresh. ments while the results are checked and graded. These will then be announced and the prizes presented. There should be at least one prize for the first woman and one for the first man leyond that, the matler is left to the means and digeretion of the host and hostess See Evening l'arty; Whist.

PROHIBITED DEGREE : In Marriage. In the Book of Conimon Prayer of the Church of Enyland there is printed a table of kindred and aflinity showing whom a man or a woman may not lawfully marry.

It is now permissible to marry the sister of a lecensed wife, but it is not lawful to marry the sister of a divorced wife who is still liring. A clergyman is not $t_{0}$ be subject to noy penalty for refusing to marry a man to his decensed wife's sister, because this sorl of marriage is still contiary to the law of the Church of England.

One of the prohibited degrees was removed, us far ds the civil law is concerned, when an Act was passed in 193! allowing a man to marry his nicce by marriage. See Marriage.
PROMISSORY NOTE. I y y the Rills of Exchange Act, 1882, a pmmissory nute is defined as an unconditional promise in writing made by one person to another. signed by the maker, engaging to pay on demand or at a lixed or determinable future time a sum certain in money to or to the order of a specitied person or besrer. The form of a promissory note is as follows

August 11931
Thiree months after date I promise to piy to Mr Arthur Smith or or :er the simm of One Hundred pounds with interest at, 0 "\% (Six per cent) for valuc recelved
£ 100 .
£100 (Signed) Jobn Jones
In this note John Jones is called the matier and Arthur Smith the payce. The payce of the note can negotiate it, i.e. by endarsing it on the back with his signature lie can transfer it to anybody he pleases, with or without consideration. It may he negotiated in the same way by the holder as often as he chooses. In this way the note can pass through any number of hands and the holder at the end of the 3 monthe has the right to present it for payment to John Jones.

If John Jones ducs not pay it, the holder can call upon any of the persons or all of them whose names are on the back of the note ns endorsers to pay. Any of such endarsers who dnes pay can in turn call upon anyone whose name was upon the note before his own to pay
him until it gets hack to. John Jones, the maker. It is no lefence to John Jones or any of the other people, it sued, that they received no consideration. If anybody in the whole series of transaotions has given any value at all, eithel in money or moner's worth, the note hecompa one fur valuable consideration in his hands, and also in the hands of anvone who rakes it after him
The value of a promissory note is that it is negotiable, i.e the holder of it has a good title to the money quite independently of the title of anyone from whon he took it.

As between the original partics, i.e. the original maker and payee of the note, the maker may have a good defence on the ground either that there iras no consideration given for the note or that it was obtained from him by fraud or for some illegal consideration. But if the note gets into the hands of someone who is a holder in due course, i c a holder who received the note atter consideration has been given for it by somebody and who talies it without receiving notice of any fraud or illegality at its inception, the holder call sue upon it.

If in the note set out John doner receiverd no value from Arthur Smith, that is a gond defence of John Jones if Arthur Smitl sues him upon it. But if Arthur Smith sells the note to William Brown for £is, William Brown can sue John Jones for the Llos. He can, of course, also sue Arthur Smith. Again, suppose John Jones was induced to sign the note by some frand on the part of Arthur Smith, Johnl Jones can set this up as a defence against Arthur Smith, but if Arthur Smith sells the note to William Brown, who had no notice of fraud, then John Jonesi inust pay William Brown if he is naked.

A note is only fully negotiablesolong as it is current, i e. until it hecomes overilue. The note is ovcrdue after the time when it is stated on the face of it to be parable. Thus, the note alove is overdue after the expiration of the three months. It can still be transferred osen after that date, but anyone who takes the transfer takes the risk of the note having been had at its inception. In other worls, it becomes like an ordinary contract or debt, and the maker may set up any defence or fraud against any holder, and it will then lie upon the holder who took the note after it was overdue to show aflirmatively that he had no knowledge of such fraud See l)ebt. : I.O.U.

PROPAGATION: Of Plants. The chiel methocls of propagating plants are by sceds: outtings : division; layering . bulhils; offerts: grafting; inarching leaves, as in gloxinia runners, as in straw herries: stein-ronting, as in the castur oil plant, eyes as in vincs ; and by pipings Most of these are dealt with under separate headings.
Aide to propagation are pota, pana, and boxes, a fine sieve, some pance of glass, 2 or 3 cloches, a finerosed watering pot, a good syringe, a keen budding hinife, and a few minor appliances, such as bust; clean crocks, etc. To these may be added a propagator and a garden frame. A propagator can be made from an ordinary box, with sheets of glass from old picture frames, or fronl a pot with char conl and fibre. and
covered with glass. Suitable soil is required and, generally any good light soil opened with a little sand will suffice, but certnin othor combinations will often be called for, including rich loan, anally peat well rubbied down. decayed leat-mould, silver sand and charcoal.

A few hints on preparation for sowing may be of value Pats, boxes, or pans must be well crucked with clean potsherds. over which a thin layer of moss or fibre is placed. This is followed with compont to within \} in of the top, the whole then being made moderatcly firm tiy pressure, and gently watered. Fixcess water should he allowed to drain well away, then the secols are sown thinly and covered with mil put through a fine mesh sieve.

After sowing, sced reccptacles should be covered with a sheet of glass to conserve moisture. Should the soil show signs of dryness, immerse the pot gently in tepid water and moisten the plunging niaterial. It can be sliaded from sunshine with sheets of beorn paper when the tirst rough leaf is formed it should he removed to a naturally shady place until ready for transplanting, every precaution heing taheil to avoid clamping off.
There are varions kinds of cuttings Shoot cultinge should always he takell with a hee or cut at the base of a joint, the lower pair of leaves being removed. Other types are root cutting and leaf-cutting. Receptacles with soil should he prepared in the mannel already devised, hut instead of the fine top covering of soil, well-waslied sand ahould he used. Tlif cuttings are inserted with a dihber, and thri bottoms must touch soil at the lase of thein holes. the soil is pressed firmly round them, and they are removed to a propagator.

Most hardy herbacous perennials are casily increased by division, i.e by liftiny the clumps in autumn or spring, separating them into pieces and replanting the latter Only the young outer pieces should be chosen. Border carnations, various shruhs and straw. herries are propagnted by layering in sumimer: The shoots or stems are slit and the slit por tion is pegged into the soil and kepit inoist Budding is practised in July-August, chielly for the purpose of raising a stock of fruit trees and inses. Grafting is carried out in spring buth out of doors and under glass Raspherries, chrysanthemuins. and some shrubs are propagated by suclioes, i.e shoots which grow through the unil from the parent rootstock See Bedding: Cuttings: 1)ivision: Edging

## Grafting; Pruning.

PROPELLER SHAFT. Tnis (also known as cardan shaft) is the driving shaft placed between the grar box and the back axle in a

Propagation : the various methods employed. 1. Budding. 2. Grafting. 3. Inarching. 4. Multiple layering. 5. Stem rooting. 6 . Rootlet of monks8. Crinam ofiset
10. Root propagation. 11. Hardwood cutting

motor vehicle, and may be classified under two heads-open and enclosed. With the open type a universal joint is employed at each end, one of which is capable of longitudinal as well as universal movement. The reason for this is that the radius of the axle movement is governed either by the point of the spring anchorage to the frame or, where fitted, by the point of anchorage of the torque stay. The object of the torque stay is to relieve the springs of the twisting tendency of the axle, which is created by the driving and braking stresses.

Unless the centre of the universal joint next the gear box is the same distance from the axle as the other centres that govern the axle's movement (e.g. the spring or torque st-ay anchorage), the up and down movements of the axle will cause the length of the propeller shaft to alter slightly, and this sliding movement must be provided for. Thercfore one of the universal joints is made to permit longitudinal movement. The open shaft is usually constructed of large diameter steel tubing, which affords rigidity and strength.

With the enclosed shaft, the difficulties of centres do not exist to the same extent, because the casing for the shaft is also a rigid part of the back axle, and acts as the torque stay with its forward end anchored close up to the gear box by a ball and socket joint.

Apart from the attention to lubrication which all universal joints require, there is one other point which may be mentioned in connexion with the propeller shaft, namely faulty alinement. This may be detected by a regular rhythmic whining noise when the car is running quietly. The trouble can be put right by any service garage, and is not an expensive job. See Brake ; Motor Car.
PROPGRTY TAX. This name is given to that part of the income tax which is derived from property. This is paid by the occupier of the house or premises, and if he has a landlord he is entitled to deduct the amount from the rent. See Income Tax.

PROTEIN: As a Food. In animal and vegetable tissues there are found complex organic compounds of carbon, hydrogen, nitrogen, oxygen, and sulphur, which are known as proteins. Food must contain a certain proportion of these nitrogenous substances, because they are absolutely necessary for the building and repair of the tissues. White of egg, serum albumin, fibrinogen, peptone haemoglobin, and casein are examples of proteins.

The patent food sold as protein food is used largely in vegetarian cookery, but may also be served as a breakfast or supper drink. To prepare this, put 3 tablespoonfuls of the food in a jug, mix it slowly with half pint of hot water, milk, cocoa, tea, or coffee. Grated nutmeg, cinnamon, or ginger Havouring may be added to taste. See Diet; Food; Vitamin.

PROTRACTOR : For Measmring, Used for measuring angles, the protractor is generally made in brass or celluloid, the commonly used pattern having a base of 4 in . The method of using the protractor is here illustrated. The two ends $A$ and $B$ are placed on a line with the centre. point $C$ exactly at the place where the required angle is to start from. If a mark is made at the point 60.as indicated at D and the point $D$ joined to the centre point $C$. the angle made by the lines A C D contains (: $6^{\circ}$. In the same way an angle of $25^{\circ}$ can be set Jff from the point E, and the angle con. tained by the lines FCB is $45^{\circ}$. Other
angles are $55^{\circ}$ at $\mathrm{G}, 77^{\circ}$ at H ; the right angle is at K and an angle of $115^{\circ}$ is contained by the lines LCA. See Drawing.

PROUD FLESE. The flabby, unhealthy tissue that sometimes projects from the edges of a wound or ulcer is popularly termed proud Hesh. It may result from an excessive use of poultices and ointments. The remedy is the application by the surgeon of an astringent, such as a solution of sulphate of copper or nitrate of silver
PROVENCE ROSE. One of the oldest garden roses, this is commonly called the cabbage rose because of the shape of the blooms, which lack the graceful contour which is characteristic of many modern varieties The Provence rose, which was derived from Rosa centifolia, beara rose-pink fragrant blooms It forms a fair-sized bush, flowers in summer only, and should be pruned in March by cutting out old worn-out branches and shortening the previous year's shoots slightly.
PROVERBS: The Game. There are various games of this name. One of the best known is as follows: One person is sent out of the room. The others select some proverb which contains as nearly as possible the same number of words as there are people present. The words are then given out in order and the person outside is summoned in. He proceeds to ask a question of each player in turn, and the answer must contain the word of the proverb which has been given to that player. When all have been questioned the newcomet must guess the proverb
Should there be insufficient words to go round, the people for whom there is no word must keep silence. If there are more words than players some of the playera must be responsible for two. Obviously the proverb chosen must have as few distinctive words as possible if it is to present difficulties in guessing. "It is never too late to mend " is an example of an easy one to disguise, while " a rolling stone gathers no moss "' is remarkably difficult. There are few ordinary questions an answer to which would naturally contain "rolling" or " moss" ; the latter word alone would identify it.

A Variant. In another form of the game a list is made of as many proverbs as are considered necessary, the number being regulated by the number of guests expected. Fach is then written out in separate words on separate pieces of paper. The key word of each is kept out, and the others, having been well shuffled, are pinned up in different places all over the house. This must be done before the guests arrive. It is advisable to keep the original list as a reference in case of questions.
The guesta are each given a key word and are set to complete the proverb which it suggests to them. They must be shown which rooms may be included in the search, and must all start at the same moment. Each proverb when completed nust be brought to the hostess, who will then issue


Protractor. Instrament used by the draughtaman for measaring angles
the largest number in the time given receives a prize.

This is an excellent game for an afternoon or evening party and the less formal type of at humc. At least three proverbs should be allowed for each player, but the larger the num ber the more difficult they are to find and the keener will be the interest. See Children's Party.

PRUNE. The dried fruit of the many varieties of plum is known as prune. Prunes form a health giving addition to the diet because of their content of carbohydrate, and alan because they increase the palatability of cornflour and other starchy dishes. They have a mild laxative effect, and are taken with advantage by those who have a marked tendency to constipation.

Before stewing, wash the fruit thoroughly and suak it for 12 hours or more in a covered basin containing sugar and water. To 1 lb . prunes, $\ddagger \mathrm{lb}$. or a little more sugar and enough cold water to cover them should be allowed. After soaking, put the fruit and syrup into a pan with a little lemon rind and juice. Stew these slowly until the prunes are tender, and serve them with the syrup.

Prune Fritter. Cold stewed prunes may be used to make frittors Take out the atones, and in their place put some blanched almonds Then coat the prunes with frying batter and fry them to a golden brown colour in a pan of boiling fat. Serve the fritters sprinkled either with castor sugar and grated chocolate or with sugar alone.
Prune Mould. This sweet is made by washing lb . prunes, covering them with cold water, and letting them soak for 12 hours


Prune Mould, a jelly awee! which can be made richer
by the accompanjment of thickly whiaked cream
Dissolve a $\frac{1}{\text { p }}$ pint packet of lemon jelly in hot water, and pour about 2 tablespoonfuls of it into the bottom of a mould previously rinsed with cold water. Put the prunes, together with their liquor, into a saucepan, add 3 dessertspoonfuls sugar, 1 oz . candied peel cut into small pieces, and the grated rind of a lemon, and cook all gently until the fruit is tender. Take ont the prunes and stone them; boil up the syrup for a few minutes until it thickens, and then set it aside to cool.

In $\frac{1}{2}$ gill of it dissolve $\frac{1}{\frac{1}{2}} \mathrm{oz}$. leaf gelatine, put the prunes back into the remainder of the syrup, and add the atrained juice of a lemon, \% oz. blanched almonds cut up roughly, gill sherry, and the rest of the jelly. Strain in the gelatine, atir all tugether until they thicken, then colour the mixture with a few drops of cochineal and pour it into the mould. When it has set, turn it on to a dish, and with an icing bag force round its base 1 gill thickly whisked cream. sweetened and Havoured to taste. Sprinkle the cream with some pistachio nuts which have been blanched and chopped.

A prune and rice mould can be made by soaking \& lb . prunes as already described, and then putting them into a saucepan with the water in which they have been soaking. Add also a dessertspounful Demerara sugar and 1 oz . candied peel cut into small pieces, and cook them until the fruit is soft. Then take out the prunes, stone them, and boil the syrup rapidly for about 5 min . The candied peel may be left in the syrup or strained out. W'as', 3 nz . rice, put it in a saucepan with
$1 \frac{1}{2}$ pints milk and 2 dessertspoonfuls sugar, and conk it slowly until it has absorbed the milk. Then stir the prunes into it, turn the mixture into a wet mould, and leave it to set.
Prune Pie. A pie can be made from pruncs by preparing 1 lb as already deacribed and putting them in a deep pie-dish. Cover with a lid of short pastry and balie in a hot oven half an hour. Six oz pastry will be required.

Prune Pudding. To make a pudding with prunes they should tee stewed and then rubbed with a little of the syrup tlirough a fine sieve. Mix together $\& \mathrm{lb}$. Hour, the same quantity of breadcrumbs, a little less than 1 lb sugar, 4 oz. suet, a teaspoonful baking-powder, and a little salt. Form a well in the centre, and into this put a well-beaten egg, a brealifastcupful of the fruit pulp, and a little milk.
Mix these gradually, adding more milk if necessary, and then turn the whole into a greased basin. Cover it with a piece of greased paper, and steam the pudding for


Prune Pudding, a wholesome steamed pudding which might be served with hot custard
about 3 hours. Hot custard makes a good acoompuniment. See Batter; Custard; Pastry. PRUNELLA. This dwarf growing perennial, commonly known as self-heal, is suitable for carpeting bare ground. The hest form. Webbiana, has crimison-purple flowers.

## Pruning of Trees and Bushes

## Directions for an Essential Gardening Operation

The gardening reader may be referred to such headings as Apple: Gooseberry : Pear: Plum : Rose. Sec also Disbudding: Grafting: Kitchen Garden : ctc.

Pruning is the process of cutting trees and with small, fairly wide tecth. A pruning hook bushes in such ways and at such times as will is useful for cutting high branches. help their productive qualitics. Pruning is chiefly enployed for trees and bushes that bear fruit and Howers.
Dealing with fruit trees, the objects of pruning are scveral. One is to form the tree, as trees are grown to certain forms for certain reasons, and these forma are secured by piuning. Another is to secure for all parts of the tree their due share of air and sunlight, so that they will perform their functions properly. Pruning is also necessary to induce fruiting and to improve the quality and quantity of the fruit ; to facilitate cultural functions, such as tillage, spraying, and finally gathering; and to remove dead and diseased fruit.

Knife and Other Tools. The pruner needa several tools. The first is a good knife, which he should keep thoroughly sharp, particularly towards the tip, of the blade. The reason for this is that long, slicing cuts, finished well through to the tip, are the sufest and best. Such cuts can be drawn boldly on to the thumb with the kcencst of edges on the knife without the slightest risk of injury, whereas short, jerky cuts are unsale. The knife is the best tool for use on small trees, hut for larger trees secateurs or pruning shears nay be used. especially if the pruner is working on a ladder, because he can steady and cut the shoot with one motion. For heavy pruning a saw is necessary. The beat is a tiny one with a blade not more than 5 in . long and an inch wide,


Pruning : some of the necessary tools. Top, strong folding knife for the amateur gardener. Centre, pruning shears. Bottom, pruning saw, which has a row of teath on each edge

Saw cuts and large wounds should be trimmed to smonthness with the knife and sealed over with whitc lead, oil paint, or carpenters' knotting.
Two Groups of Trees. To enable pruning to le done correctly some knowledge of the way in which trees and whrubs bear their flowers or fruits is essential Fruit trees and bushes fall naturally into two groups so far as their proning is concerned: those of one type produce fruits chiefly on spurs-short, sturily shoots which bear blosson buds; those of the other type yield the beat fruits on shoots or branches of the previous year's growth. The fruita of the spur-fraiting type are apple, pear. plum. sweet cherry, apricot, gooseherry, red and white currant and vino.
Briefly, the way to prune these fruit trees is to shorten the side shoots of the current season's growth in July or early August, and to cut them back still further in winter. At the latter season weakly and crowded branches must also be cut nut. Plum, gooseberry and apricot are most fruitful under is modified form of this treatment ; in the management of apricot and plum trees care should be taken to preserve pronising young shoots and to cut out parts of old branches to make room for them. The pruning of gooseberry bushes is done principally by thinning out the branches to such an extent that the hand can be passed between them, though the side shonts may he pruned in the orthodox way. luring the summer vine sinoots must he pruned; if this is not done it will liecome overcrowded and weakened.

Fruit tiees which bear chiefly on the branches of the previous year's growth are peach, nectarine, black currant, raspberry, loganberry, blackberry, and other allied berried fruits,


Pruning. 1. Comparison of \&ruit (a) and wood (b) bads. 2. Pruning cuts : $a$, correct, $b$, incorrect: snag left above eye : $c$, altogether wrong: $d$, cul too deep. 5. Principle of pruning busb apple. f. Pruanag a rose busb black parts to be cut away. 7. Pruning side shoots to encouraqe iruit spurs
-those which have still to develop-which will yield the flowers Familiar kinds which need this treatment are the rose, mauve bud dleia all varicties of clematis of the Jackman type, hydrangea paniculata (not the common hydrangea hortensis), hypericum or St. John's wort, late summer spiraeas and hardy fuchsia

There is atill another type of ornamental tree or shrub-that which needs no regular or systematic pruning. They inust be looked over oncasionally for the purpose of thinning out crowded branches or shortening straggling ones which spoil the symmetry of the hush These include flowering cherry, crab and plum, magnolia, rhorlolendron, azalen, viburnum or guelder rose, orange ball tree (Buddleia glohosa!. hawthorn and lahurnum

PRUNUS. This is the botanical name of one of the most important gmups of hardy flowering and fruiting trees It includes the almond, peach, nectarine, damson, aprical and plum. The common and Portugal laurels are also classed by the botanist as Prunus.

PRUSSIC ACID. Hydrucyanic or prussic acid is found in oil of bitter almonds, peach kernels, apple pips, cherry laurel leaves, and other vegetable products. When separated or prepared it occurs as a colourless liguid with a characteristic odour. Potassium and sodiun cyanide are used in the extraction of gald from ores and in photography

Prussic acid and the cyanides are extremely poisonous In poisoning by prussic acid there is rapid unconsciousness, but if there be time an cmetic of mustard and water should be given. An attempt should be made to rouse the patient by dashing cold water on the face and cheat, or cold and hut water alternately. Ammonia smelling salts shnuld be held to the nose, and warmth promoted by lont Hannels, hot-water bottles, and chafing the limbs. If breathing fails, artificial reapiration ahould be at once begun Stimulanta should be given when swallowing is possible See Artiticial Respiration: Poisoning.

PSITTACOSIS. Disease of parrots. is due to a filtrable virus and may be communicated to man. Even healthy birds may serve as carriers After a serious outbreak of the disease in 1929, in 1930 the import of parrots into Great Britain was forbidden

PSORIASIS. The skin disease known as panriasis is characterized by Hattish, dry patches of varying size covered with white or silvery-grey scales. The backs of the elbnws, the fronts of the knees, and the scalp are the favourite sites. but the trunk and other portions of the body ane not uncommonly involved as well. As a general rule the patient does not complain of symptoms beyond itching, and the patches can generally be made to disappear under treatment. Relapses are common, and the disease is subject to sudden increases in its rate of speed, If untreated this skin discase may last for many years.

The drugs used include arsenic, potassium iodide, thyroid extract, ctc. The first step in lucal trcalsnent is to scrub the patches with hot water and soff soap, or bathe them in warm olive oil. An ointment consisting of tar ointment, $2 \frac{1}{2}$ drams, and lanolin, enough to make I oz., is applied night and morning after the patches have been thoroughly clearod of scales. Another useful drug is resorcin, which may be used in an ointment composed of resorcin. 15 gr . ; lard, 1 oz . Pron. So-ri-as-is,

PSYCHO-ANAIYSIS. A method of investigating the subconacious part of the mind, which has proved of great value in the treatment of certain forms of neurotic disurders, is known as psycho-aralysis. The method was devised by the Viennese physician Prof. Sigmund Freud, and, with its applica. tions, has led to the development of a schnol of thought which recognizes the influence of
the aubconscious in a large number of menta prooesses

Speaking broadly, the paycho-analyat regards the mind as composed of two parta, the conscious, which appeara to control our thoughte and actions, and the aubennacious, which, without our heing aware of it, does in fact exercise a powerful intluence upnn our motives and conduct. The aubeonscious becomes the repository of painful memories and primitive tendencies which are described as being suppressed or repressed. and often date from early childhond

The exigencies of civilization and ancial life clearly demand a very considerable deцrec of inhibition of the primitivn instincts and impulses. Abnorinal tendencies present in infancy and childhond are by painful experience and education (in the bmadest senac) gradually eliminated from, or prevented from ever entering, the conacious part of the mind no normal growth and development procead

It is clear that very often the impulses to action of the conscious and subeonscious must be in direct opposition to each other. In the norinal individual these two parts are so adjusted that no conflict of which he is aurare arises. In the hysterical individual, however, the adjustment between the two parts of the mind has not been satisfactorily effected, and the result is the appearance of the various symploms which are characteristic of hysteria

The ultimate object of treatinent by prychoanalysis is to effect an adjustment between the conscious and subconscious, and thus bring about a resolution of the conflict which is responsible for the symptoms For thin purpose, by means of a special technique, the patient's immediate and free assnciations with eventa in his life which have had an ennotional cffect, slips of the tnngue, prrors in writing. etc., are nbtained, and furnish a clue to the underlying cause of the tmuble. In particular, dreams provide material of great value for investignting the subconscious

Litule by little under this treatment the patient comes to understand the warring mental processes which are going on within him : the aymptoms gradually disappear, and in favourable cases a complete cure can be effected. The patient who seeks relief by this method is advised to place himself only in the hande of a akilled physician

PTARMIGAN. A amall specien ot grouse tound in mountainous regions, the ptarmigan is alao known as the white grouse, because of the colour of its plumage in winter it needs to be well hung, and is cooked in the same way as ordinary grouse. Ptarmigan is best eaten young, otherwise it may be found to have rather a bitter flavour These birda make an excellent salmi and game pie See Game Pron. Tar-mi-gan.

PTERIS: The Fern. The bracken (Pteris aquilina) is the commoneat of all Rritish ferns and a familiar feature of the landscape in many parts of Great Britain, especially in wondland districts. It is acarcely suitable for planting in gardens of moderate cxtent. Bracken fronds provide useful material in winter for the protection of roses and tender shrubs. Several of the pteris ferns are admirable plants for the alightly heated greenhouse and room window : they are easily grown in pots in a compost of loam, leaf mould, and sand. Tremula, serrulata, serrulata cristata, cretica and cretica albo-lineata are some of the most attractive. They need a good deal of water in suminer hut inuch less in winter. They arc propagated by sowing apnres in pots of soil covercd with glass in the greenhouso.

PTOMAINE POISONING. By their action on animal and vegetable matter,
called ptomaincs, some of which are poisonous It would appear, however, that in the great majority of cases of food poisoning this is not duc to ptomaines, or to the producte of putrefactive organisms generally, but to discrse-producing bacteria and their toxins. A poisonous ptomaine may nccur in cheese pork. ice cream, and other commodities

Almost any kind of food may give rise to poianning. but some kinds are more dangerous than others. and should be eaten with caution in hot weather. These are veal and pork pies made from salale neat or kept some time after cooking. cold veal, pork, and badly cured ham, sausnges, mussels and othce shell-fish, mackerel, crab, canned fish, and contaminated ice cream To these may he added goose and veniaon kept ton long

Buth the liviny inicrobea and the chemica! aubatances they pruduce in the food may be puisnnous. The microhes are killed by thorough cooking, hut the poisonous substances within them may not be affected. Consequently conking is not always a protection

It should be remembered that cooked food is as liable to infection by microbes as raw food. Meal may be quite wholesome when first used and then, when put away in a dirly or ill-ventilated larder, it may become conlaminated. This very oflen occurs, poisoning being frequently caused by cold or re-heated meat that has been kepl some lime after cooking.
One of the great dangers arisea from the fact Chat the meat or fish may contain a fatal dose of prison without having any apperance o! odour or decay.

The symptoma may set in soon after a meal or be delayed for twelve hours, or even longer. The patient suffers from violent pains in the abdonnen, with nausea, vomiting, and purging. His pulse beata quickly; he has a severe headache, is very weak, and in a state of extreme nervous depression. There may be cramp in the calves of the legs, alcepiness. dizriness dimness of sight, difficulty in breathing, and finally collapse and death.

At the outset give an emetic of a tableapnon ful of mustard in $\frac{1}{2}$ pint of warm water. Follow this with a quickly acting purge, anch as a large dose of salts, 1 oz . of castor oil, or 5 gr . of calnmel For weakness give stimulants, and keep the patient warm with blankets and hot. water buttles. Any of the following stimulants may be used : whisky or brandy, in doses of 2 th 4 teaspuonfuls fre:puently repeated; sal volatile, a terspoonful in a little warm water: or hot, strong tea Pain may be relieved by hot prultices or flannely wrung out of loot water to the abdomen. When the patient recovers sufficiently to take food, it should consist at first of boiled milk only See Food: Poisoning.

PUBERTY. The critical age when the sexual functions become active is usually ic. ferred to as puberty. In Great Britain it occura in girls betweon the ages of thirteen and fifteen, but may be a year or two carlier or later in exceptional instances. In boys the average age of puberty is between fourteen

## and sixteen

Profound changes take place at this periud, and parents should exercise great care and watchfulness over their children's health. bodily, mental, anil moral. The physical and mental change is very sudden, and there is a great expenditure of energy on the quick development. It is not uncommon, therefore, to have signs of nervous diaturbance and exhaustion showing themselves at this. time There is a great increase in glandular activity, and the effect of this on the skin glands is a reason for the onset of acne at puberty. The whole outlook of life becomes altered, the feeling of sexual difference asserts itself, emotion deepens, and the bny or girl may
become very impressionable, selt conscious and perhaps shy and awkward in manner
Plenty of nourishing food and outfloot exercise and abundant time for sleep are essential. The following shows the minimum of sleep required as a rule :

13 ycars old
$10!$ hourn
Do not let a boy or girl be overworked in hody or mind If schonl-work seenis too much it should be cut down. With regard particn larly to girls, their management at the a ppear ance of menstruation (q. $\nabla$.) will influence their henlth for life
PUDDING. Puddings may be boiled. steamed, or baked, according to their in gredients. These made of suet are bniled or steamed, being wrapped in a scalded and lloured cloth, or turned into a greased basin and covered with a cluth or a piece of gronsed proper. Batter and custard puddinge, as well as those made with a covering of pastry, are baked in a deep dish. Ice puddings come into a different catcgory, as they are made by a freezing process

Pudding Cloth. The calicn cloths in whioh boiled puddings are cooked should be sprinkled with llour hefore use They need to be kept scmupulously clean, and after use any of the mixture adhering to the cloth should be scraped oif, the cloth washed in hot water to which a little soda has Lcen ndded, and, if ncopssary, boiled. Rinse it well to remove the sorda, and dry the cloth in the open air. No soap should be used either in washing or boil. ing. Cloths used for tying over the tops of puddinge cooked in basing are treated in the same way. See Apple, Batter: Beef Stenk Pudding; Cherry; Chestnut: Chocolato: (lhristmas Pudding; Cuconut: 1)ried Fruit: Gonseberry: Ice; Jam; Lemon; Macatoni: Dlarmalade ; Pastry ; Pineupple, etc

PUERPERAL FEVER. Quite shortly after labour a woman mily liecome feverish for a few hours, from some slight cause, or she may become seriously ill from septio infection of the womb or other neighbouring part. The name puerperal fever is popularly given to this condition.

Symptoms of infection may appent a few hours after the birth of the child, but most frequently the first symptoms manifest themselves about the third day. Fever is usually the first sign to attract attention ; it may be accompanied by a chill and headache Puer peral fever is a notifin ble disease and immediate inedical treatment is required.

PUFF PASTRY. The most delicate of all baked pastries is puff pastry. It is made with equal quantities of butier and Hour, a little lemon juice, water, salt. The method of mak. ing puff pastry is given in the article on Pastry sometimes an egg is ndded to the other ingredients to enrich the colour of the pastry, which requires a steady but brisk oven. See ['astry.
PUG: The Dog. The pug is a quiet ${ }_{1}$ clean, and affectionate dog. His strong attachment and faithfulness to his master or mistress, his docility and good behaviour, make him a very attractive homo companion, eapecially when it is not desirable to spend so much time over the dog's toilet as is requiwite for pets with long, silky coats. Short, thick, and rounded in body, with a smooth, short coat, the pug has well-developed hindquarters, straight, short logs, and a tightly curled tail. The head is rather large, with square, wrinkled face and a short black muzzle. The eyes are large and black; the small, silliy cars hang close to the head. Pugs were formerly all fawn-coluured, with a hlack line down the middle of the back,


Pug, a favourite variety oi short-haired toy dog
a black siot in the centre of the forchead and one on each check: the toenails were black. Thesc points are no longer insisted upon. There is now an entirely black race, and the fawns vary from silver grey to apricot colour The weight should be from 13 lb . to 17 lb . See Dog; Kennol.

PULLET. From the time when she enierges from chickenhoud until she becomes an adult the female fowl is known as a pullet. In the past a forl was considered a pullet from the day she was hatched until Jan. 1 in the vear following. lhut with the advance of egglaying properties, nud the institution of egg. laying competitions in which the birds are entered as pullets, it has become customaiy to speak of the number of egge a bird laid in her pullet year. To avoid confusion, a bird is con-
sidered a pullet until she has comipleted her first laying year, which is termed her pullet vear, though strictly speaking she became a hen on the previous Jan. 1. For exhibition purposes the old detinition remains, and a pullet becomes a hen on Jan 1 following her birth See Chicken; Fowl: Incubator; Poultry.

PULMONARIA. These hardy herbaccous plants of the borage family are suitable for the rock garden or border. The flowers of inost wf them are blue on opening and change to ruse colvur as thicy fade, and the leaves have white markings The common name is lungwort. The best suits are angustifolia, 12 in , arver nensis, 10 in ., and rubra, 12 in ., roddish. The Howers open in spring and early summer Propagation is by dividing the plants in autumn See Border: Rock Garden.

PUMICE. There are a number of uses for pumice It is employed in the form of a powdet in soaps and cleansing mixtures of many linds, and is also present in a number of polishing compositions. Pumice is chielly employed in the hoone lor clenning purposes. A small lump is rubbed on the fingers to remove stains and paint markings. The prowder. wrapped in a linen or muslin bag, ean be employed for rubbing down a painterl surface. especially if worked with a little water to act as a lubricant. In addition pumioe is employed as an ingredient in a certain liind of soap known as pumice soap.

Pumice stone is usually greyish white in colour, but can also be ubtained in gellow, brown and black. It is eapecially effectivo in removing obstinate ink stains from the lingers. and is also used to produce a gloss on un. polished marble, and for rubbing down-papier mâché articles bcfore painting them See Lubrication , Marble

## PUMPS FOR THE SUPPLY OF WATER

## A Household Necessity in Country Districts

This article is one of those that desl with the important subject of the water supply. Sce that entry: also Frost: Pipe: Rainwater: Ram: Well
In country districts, and also to some extent harrel, lifting the font valve that divides the in towns, households are dependent for their two. Then cones the down struke caused by supply of water, or at least for some part of the upward movement of the handle. the water it, upon a pump, which may be situated either below the bucket being trapped by the closing inside or outside the dwelling. Such pumps of the foot valve. This, therefore, forces are of two main kinds. The one more fre quently seen is known as a reciprocating pump; but the otlier, the chain pump, is also used. There are three main kinils of reciprocating pumps: bucket or lift pumps, piston or force pumps, and combined bucket and plunger pumps.
The principles of the buokot or lift pump are fairly simple. A buckot works in a barrel, being raised or lowered by the movement of a bandle. When the bucket is first raised a partial vacuum is creatod in that part of the barrel that is below it, and water rushes in through the suction pipe which is bensath the open a valve nearer the top of the barrel, or one in the bucket itself, and the water gets above the bucket. The bucket then rises again and carries with it the water above the upper valve, which is discharged through the mouth of the pump. Simultaneously, more water is sucked into the barrel through the lower valve Tho sequence s illustrated in Fig. 1. In Fig. 2 a typical lift pump is seen, the valves heing shown separatoly. The latter may valy in type, but the working principle is as above describerl.

The lift pump is useful for raising water from a well to the surface. and is recominended



Pump. Fir. 2. Bucket or lift pump. with valves shown separately. A, plunger, showing mushroom shown separately. A. plunker, showink mushroom
for suction liftes up to about 25 ft . Trouble associated with this pump is usually restricted to incorrect valve seating owing to the material used being perished or worn, or to a badly fitting plunger, also due to wear. New leathers can be had quite cheaply, so that it is not worth while to continue using defoctive ones. Where considerable pumping is required before water is drawn, indicative of faulty valves, the operation may be considerably quickened if a quantity of water is poured into the top of the pump before pumping is commenced.
Lift and Force Pumps. When, in addition to lifting water from a well, it is desired to force water into an elevated tank a combined lift and force
 puinp is used The pnttern illus. trated in Fig. 4 has an air chamber on the delivery side, and
is provided with a draw-off cock, permitting water to be obtained at the pump if desired. A hose may be attached to the nose of the cock. The principle of Pump. Fir. 3. Mechanism of the force pump is common type of lorce pump shown in Fig. 3, which illustrates what is known as a ram type, used for working agninst considerable pressurc.

An excellent pattern of force puinp is that known as a semi-rotary, illustrated in Fig. 5. The internal construction comprises a rocker or movable plate, which oscillates within a circular cast-iron casing. The water enters at the bottom, is forced to the upper side of the rocker through a simple flat valve, and then through the upper chamber into the delivery pipe, other valves serving to check the return of the water.
This type of pump is very ensy to work, n nd will lift water from a depth of 10 or 12 ft .
without the need of a holding-up valve. It will lift from greater depths if such a valve is fitted to the suction pipe. but no pump will lift more than ahout 27 ft. It can force water to a great height, depending largely upon the energy with which the handle is operated and the amount of friction in the pipes

Another good pump for domestic purposes, quite inexpensive, is the diaphragm pump shown in Fig. 6, which at 60 strokes per inin will deliver $4 \frac{1}{\text { gal, water per minute. With }}$ the addition of a foot valve and atrainer it will lift from 25 ft . and force water to a vertical height of 50 ft . In this class of pump a flexible diaphragm of leather or rubber replaces the piston or plunger.
Chain Pumps. The chain pump (illustrated in Fig. 7) consists of an endless chain, passing over a pulles which is driven by a crankshaft mounted in suitable bearings in a framework or casing situated over the well head The lower end of the chain should reach well below the surface of the water, which is raised when the crank is turned. The water clings to the rising chain and is flung off into the casing by centrifugal force as the chain passes over the pulley
The turn of the chain must be at least 2 ft . below the surface of the water in the well The spout should deliver the water over a barrel or into a shute or pipe, whence it can flow to any desired point. The only attention necessary is an occasional cleaning of the chain and irequent lubrication of the crankshaft bearings. This type of pump is specially adapted for lifting thick fluids, such as liquid manure, sewage, etc. Normally it is arranged for a depth of 12 ft helow the spout, but can be made for any depth not exceeding 25 ft . At 45 revs. per minute a 2 - in . pump will raise 650 gal per hour with a depth below spout of 12 ft .

Deep Well Pumps. In these the working barrel is located at or near the normal water level. The suction pipe projects down into the water, and terminates in a foot valve with a strainer to exclude dirt and other foreign mntter. The de ivery pipe extends to the well. head and thence to a cistern or storage tank. The pump is actuated by a well-rod made of wrought iron, or sometimes of wooa, which is guided by rollers in metal brackets fixed to the well.side, as in Fig. 8, or mounted on a central staging.



Fig. 7. Endless chain pump for thick liquids
Joscph Evans \& Sons. Led

Power Pumps.
The well.rod in the pump illustrated is worked by a whee and crank type of pump motion.

A deep well pump of a simpler kind is shown in Fig. 9 A branch for the delivery pipe is pro. vided 18 in helow ground level, and a draw off cock 3 ft ahove surface level This type is adnp. ted for wells up to 80 ft . dcep, and for delivery to an ele. vated tank about 20 ft . above the well top Asmaller pump has the lever inotion worl attached to a plank (Fig. 10), the working barrel-not illustrated - being fixed helow near water level and connected by iron rods with the motion

As a mule a pump for the domeatic supply is not required to wark continuously, and therefore a hand-operated apparatus which is employed for an hour or lesa per day usually suffices to fill the overhead cistern However, we give hrief particulars of a horizontal double acting power pump which can be driven by an oil engine.

The Petter pump shown in Fig. 11 is coupled to a paraffin-petrol engine of the type illustrated on page 633 , one rated at $1 \frac{1}{2}$ B.H.P. being used. Such an equipment will deliver ahout $3 \overline{5} 0 \mathrm{gal}$. water per hour under a total head (including friction) of 150 ft . Suction must not exceed 25 ft . A foot valve and strainer are supplied with the pump.

A mininture pumping plant is sometimes employed to operate a small fountain in the garden. An underground rain-water tank can be arranged as the snurce of aupply, the water from the fountain falling into an ornamental pool, whence the overflow drains back to the rainwater tank. A suitable plant might consist of a small centri. fugal pump operated by means of a $\ddagger$ horse power electric motor.

Useful Data. A pump in theory should lift water from a depth of about : 33 ft ., but owing to various causes the average pump will not work with a vertical suction of more than 27 ft ., reduced in the case of decp wells to about 20 ft .

In the case of some rotary and semi-rotary pumps the suction depth is much less. Factors governing the output of the reciprocating pump are the length of stroke and the inside diameter of the working barrel. Taking, for example, a single. acting pump with a 2 in.


Pump. $\underset{\text { wik. }}{\text { well }} \begin{aligned} & \text { 8. Saction of a deep } \\ & \text { force pump }\end{aligned}$
barrel and a 6 in stroke, operated by hand at 30 strokes per minute the apparatus should deliver about 120 gal water per hour This is the theoretical quantity from whichan allowance of from 10 p.c. must be made for slip. etc If the number of strokes per minute is in orensed or diminished theoutput will be correspondingly affected When the source of sup ply is at ground level, as in the case of a spring or stream, and a fall can be arranged, it is often possible to use a ranl (q.v.) to raise the water.

PUMP: For the Motor Car. Pumps of various types arc used in motor cars and motor cycles to inflate the tires and to circulate the oil in the engine and the water in the cooling system. The cylinder, piston connecting mod and crank of any internal combustion engine form a pump: the piston will draw air into the cylinder vin a valve on the down stroke and following this the air will be expelled on the up atroke
This is the principle adopted in the case of most mechanical pumps such as are used in garages, but the ondinary hand-operated tire inflator carried on the car consiats of a plunger on a rod working in a tubular cylinder. A thind type of pump consists of one or more vanes working in a disk eccentrically disposed in a


Fig. 8. Deep well pump, showing standard (left) and working barrel. Fir. 10. Smaller pump with lever motlon atfached to a plank Courtesy of Joseph Evans \& Sons, Led
circular chamber of a slightly larger diameter. so that as the disk and the vanes revolve in the chamber the space betwcen the vanes is constantly increasing and decreasing.

Oil Pumps. For circulating lubricant in an engine various applications of these principles are adopted. The plunger pump comprises a cam which is rotated by the engine and depresses a plunger (returned by a spring). oil being drawn in on the up stroke through a amall ball valve and delivered on the down stmke through a similar valve. In the gear pump two small gear wheels arc arranged within a casing which fits them fairly closely One gear wheel is on the end of a shaft usually driven from the camshaft by skew gears, and the other whec meshes with it. As the engine mtates, therefore, both the gear wheels turn also A hole in the pump casing admits oil, which fills up the spaces between the teeth on the gear wheels and is carried round by the he gourd an teeth to the other side of the casing There as larcely grown in Great Britain as in $\mathbf{N}$.

America Culture is the same
definite supply of oil only a little in excess of the actual amount required by the engine, as motor cycle engincs-except on some of the most modern types-do not carry a supply of oil in a sump. Those motor oycle engines, however, which have been designed to earry oil in the sump employ methods resembling those used in a car engina

Pumps for Water Circulation. Engines with water circulation on the thermo-siphon aystem do not require a pump, but in large and mediuns. sized cars $n$ centrifugal pump is used Con water from the bnttom of the radiator flows into the centre of the casing, and the vanes of the rotating member carry the water round with them so that the water is caused to flow thmugh the outlet pipe on the periphery of the casing to the cylinder jackets

PUMPKIN. The pumpkin is $\mathrm{a}_{\text {f }}$ fruiting plant of the Curcurbita fanily. to which the pourd and the marrow also becong it is not
as for narmws

Pumpkins, like marmws, have their uses in cookery. and can be made into soups. pies, and other dishes. They may also be served ns a vegetable, when they should be prepared according to the directions given for cooking marrow For soup making. old pumpkinsmay be used, but for all other purposes they should be young and tender.

Pumpkin Pie. This pie is made by cooking some thin slices of pumpkin in hoiling salted water and when tender, rubbing them through a sieve, Measure out 3 pint of the pulp. and to it add 3 well-beaten eggs, $\frac{8}{4}$ pint milk, $1 \frac{1}{2}$ terspoonfuls lemon-juice, and sugar and spice to taste

Mix these well, then turn a pipe is provided along which it is forced at them into a pie-dish lined with short-crust considerable pressure.

In the vane pump the shaft is eccentric to a circular casing. In a slot in the end of the shaft there slides $n$ vane consisting of two flat pieces of metal with small springs between them. As the shaft motates it forces the vane to turn within the casing, and accordingly the spaces betwcen the shaft, vane and casing alternately increase and decrease in size. A hole admits oil to the space which is increasing in size, and $n$ pipe conducts oil from the space that is decreasing in size. In most cars the oil pump is attached inside the crankease, projecting downwards into the sump. The pump is then sub. merged in oil, and there is no clance of its failing to begin work as soon as the engine is started When the pump is attached to the outside of the crankcase above the oil level it is usual to arrange the suction and delivery pipes en that when the engine stops the pump remains full of oil and is ready to start again. If a pump fails to work it may require priming, ie. filling with oil

On motor cycle engines similar principles are employed, but the oil-circulating pumps are usually run at a slower speed and are smaller. They are called upon to deliver a


Pump. Fig. 11. Self-contained power pump driven by a 1 : B B.P paraffin-petrol engine pastry, and bake the pie for about 40 min or until the pastry is golden-brown in colour and the filling of a firm appearance Serve it either hot or cold, and sprinkled witlı cnator sugar
Pumpkin Pudding. To make this dish take a pumpkin, 2 oz butter, $\frac{1}{2}$ pint milk, 2 or 3 eggs,


Pump for motor vehicles. Fig. 1. Centrifugal pump for circulating cooling water. Fig. 2. Plunger oil pump. operated by a cam. Fig. 3. cooling water. Fig. 2. Plunger ail Eumper oil pump. Fig. A. Eccentric vane type of oil pump

Courlesy of tha Autoeal

3 oz moist augar, $\downarrow$ teaspoonful powdered mace and a little grated nutmeg. Peel the pumpkin, remuve the seeds, and steam or boil it until it is soft. Drain the pulp well, pass it through a sicve and measure it. One pint is required for the quantities mentioned; if more or less is used they must be varied accordingly.

Beat in the butter and apices: add the sugar and the inilk, which should be made hot : beat (1) the jolks of the eggs and stir them in. Mix these all together, put them into a greased pie-diah and bake the mixture in a moderate oven for an hour or until it is firm when touched. Whip the whites of the egga to a stiff meringue, sweeten this to taste, favour it with vanilla and pour it over the pudding, which should then be put back in the oven to get brown and set. It can be served cither hot or cold See Gourd ; Marrow ; Pastry.

PUNCE : The Tool. In the domestic sense a puncli may be considered as any small wood or metal bar used for intervention between the hammer and the object to. be amitten The nail punch is a piece of mild steel bar. either hollow or flat at the small end, and slightly rounded at the upper end. This is applied to the head of the nail, and the upper end is struck with the hammer to drive the head of the nail below the surface of the wood, or in order to prevent the wood being bruised.

Punchics of various kinds are used for the perforation of leather The wad or saddler's punch has a hollow, tube-like cutting end, with the hollow carried upwards and increased in diameter at its mouth. A smart bluw with a hammer drives the punch through the material, leaving a clean, round hole. The part cut out is driven up into the hollow portion of the punch, succer ding cuts gradually forcing the dinks out at the mouth. Other small, hollow punches are used lur making reund holcs in leather. A hand-tool can be had with several punches of various sizes, and is used like a pair of pliers. Matting punches are made of ateel, and are used by wood and inctal workers for working up a diaper pattern. One end is shaped to produce the pattern, the other slightly rounded off. Soft punches are used by metal workers for many purposes.

A centre punch is for making an indentation on a metal surface (e.g. when starting to drill a hole). A similarly shaped punch with a sharp point is used for picring holes in corrugated iron. A bell centre punch has a conical shroud surrounding the point and is used for centreing the ends of cylindrical rods. Sjring actuated punches are made which need only a gentle prewure to operate the marking point. spacing punch has an ad. ditional or quide point which can be set at varying distances from the marking point.

Name or Ietter punches are employed for punching names or inonograms. Buttonhole punches are used by dressmakcrs and tailors for cutting cloth. Eyclet punches are used cyelets on sails and the sails and the
like. Pinking


Punch. Uuing a nail punob to drive the nail head below the surtace of the wood
punches are about 1 in in diameter and are employed for cutting soft malerial with a semated edge. Automatic, incchanically actuated minchea are made for cutting cardboard and paper for filing purposes Leather W'ork; Nail, Repoussé Work.
PUNCE: The Liquor. Five ingredients, lemon, sugar, apices, spirits, and water, are usually employed in brewing a bow! of punch. which was originally an Indian drink.

In making punch the juice of several lemons, together with one lemon cut into slices, is put with sugar intu boiling water, allowed to stand for half an hour then atrained into the bowl, and the spirits added, rum. biandy, gin, or whisky. with some grated nutmeg. The recipes vary, the quantities of cach ingredient required being more or les a matter of taste: the proportion of water to apitits may be 2 to 1 , or less. Rum and brandy may be mixedisometinen milk takea the place of water, or champagne is used instead of spirits. Elg punch is mnde by adding 4 eggs 10 each pint of whisky, brandy, and rum in equal proportions
Punch Jelly. Rum, sherry, and kirsch an used to Havaur this jelly. Put the thinly peeled rind of 2 lemons into a pan with $\frac{1}{2} \mathrm{lb}$ loaf augar and 1 pint water; boil the whole to a syrup, and then add It oz. leal gelatine, the atrained juice of the lemona, a wineglassful each of rum, sherry, and kirsch. and an inch atick of cinnamon. Iet the gelatine inelt slowly, then boil up the whole and add a cruslicd eggahell, toget her with the stiffly whisked white of an egg. Whisk the contents of the pan over a fire till they boil up, let them settle for a few minutes, and then atrain thein through a cloth until they arr clear Pour the jelly into a mould to set, and serve it in small glasses, with a teaspoonful of whipped, sweetened cream on top of each. decoratu:d with half a glacé cherry and atripa of angelica. See Mill: L’unch: Rum.

Punch Bowl. Very capacious punch buwls were at one time a recognizad art icle of house hold equipment. To-day when one is possersed it is sometimes used on Now Year'm Eve and other special occasions when punch is brewed. The briwla were usually of polished oak or other wood, plain or with ailver mountings. The bowls were also made of silver, and soine fine pieces date from the latter part of the 17th century, when they were introduced into England. A few existing specimens are of Sheffield platc, but this metal was not much used for them. They are sometimes provided with a ladle, inade of whalebone or wood, in the bowl of which a coin was inserted. The monteith, sometimes classed as a punch bowl, differs from the latter in that it is notched at the rim so that the glasses may hang by the foot down into the bowl. The rim could be removed when the glasses wore required for use.
lorcelnin was employed in making lighter and more delicate forms of punch bowl, and decorated vensels of this kind are atill made in Japan for ornamental purposes, and form an article of export. There are some annual cuatoma and ceremoniea at which a punch bowfilled with spiced ale is passed round.

PUNCTURE : Row to Mend. When a leakage occurs in a cycle or notor lire, it is well to make sure the valve is not at fault. A glass of water held up to the valve will reveal a leakage by the presence of air bubbles. If the valve passes the test, take out the inner
tube, attach the valve, and pinmp up again. If the leak is a bad one, it will be sufficient to run the hands over the tube to detect the atream of eacaping air If the leak is a mmall one, the inHated tube should be inmersed by 13 to 8 in. lengths in a bucket of water. Air bubblea will locate the puncture, and its position can be marked with an indelible pencil.
The patch had better be a prepared one, as sold with the puncture outfit. The surface ol the tube near the puncture shonuld be thor oughly cleancd with glass paper and a little petrol. The solution should be rubbed well into the surface of the tube on and round the place of puncture and on the patch until the two surfaces are tacky. The prepared surface of the patch is protected by linen, and shoulis] not be touched with the fingers after the linen han been removed. The patch sloulal be held firmly on to the tube until it is dry. In dealing with a large putcil care must be taken that air is not inl. prisoned between tube surface and


Punch Bowla in antique ailver. 1. Engraved bowl originally need an montelth; period of Jamea II. 2. Oneen Anne panch bawl with ombassed shield mank handlet and cantellated loose rim: maker
the patch. 'Jhis cun be avoided by first pressing the middle portion into contact and then slowly working down the remainder.

Plenty of time should be given to let the patch dry thoroughly, and it should be dusted with french chalk to dry the sticky edges. If the inner tube has punctured on the lim side and not on the tread side, the wheel sim should be carefully examined while the patch is drying. The puncture may have been caused by the nipping of the tube between the cdge of the cover and the rim, or by chafing on the spoke heads, which may not have been filed down properly, or the tape which protecis the tube from direct contact with the heads has slipped or worn through. Perhaps the tube is not the correct size for the cover, or it has not been propeily intated. The cover may be a bail fit on the rim, or the rubber may have perished

A common cause of punctures is nipping of tl.e inner tube, owing to lack of care in replacing it. The detlated tube should be placed inside the cover on the wheel, the cover having one free edge. Fit the valve and pump up the tube just sufficient to make it round. The cover can then le levered on the rim with little danger of the tulse being pinched. In any case, when the ec ver has teen finally placed on, the rim should br examined
all round, to make sure, before the tube is finally hlown up
Before replacing the tube, the inside of the cover should be carefully examined to locate the nail, scrap of flint, or other object that causell the puncture This may he hardly visible, but unless removed will caus trouble again Any conaiderable fash in the cover should te sealed up with one ol the patent compounds sold for the purposer See Motor Car Mntor Cycle. Tire: Valve
Purgative. See Aperi ent; Cathartic.

## PURLIN : Of a Roof

 The purlin is the horizontal member of the runf that supports the common rafters between the idgr and the wall plate The purlin is supported by the principal rafters, u hich nre the tol members of the truss of the ronf; the ends are supported by the "alls at the end of the huilding, or, in thin case of a hipped roof, they are framed to the hip limbers See House : Luft : Rouf.PURPLE CONE FLOWER. This is the popular name of a hardy herbaceous perennial, Echinacen purpuren, which grows $2-3 \mathrm{ft}$. high and benrs large reddish-purple finwers with a raised cone-like centre The newer varicties should the grown in preference to the old one; two of the beat are Taplow Crimson and The King, which have reddiah tlowers. Propagation is by division in autumn

PURSE. leather is the material princi pally employed in purse-making, pigskin in particular being favoured for men's purses hecause of its hard-wearing qualities Suelle purses, though attractive in appearance, are less durable Venetian lenther furses, orna mented with medieval designs in colours, are sometimes carried by women inside large purse bags Velvet. silk, and satin, elahotately beaded and embinidered, are also farourite materials for small parses to be used with inrious even ing dresses.

To make a brocade puise, as illustrated, cut out a circle of brocade 7 in. in diameter. and a circle of sill: or ot her lining of the saine size. Sew the two together neally around the cdge with a running Parse. Brocade pursa the gilk a running
being gashered to an ivory top stitch, then up and attach them to a bone or ivory pursetop Trim the inside, where the materin mects the frame, with a little rose-trinming or ribbon ruching. Bone, meta', and tortoise. shell purae-tops can he bought at drapery stores Sec Bag: Beads; leather.
PURSLANE. Puralane is an annual plant (Portulaca oleracea) grown for the value of its leaves as a summer salad. Seed must be sown early in April, the scedlings being thinned to 6 in apart. As soon as the shoots are about 3 in . in length they should be cut off close to the ground. If desired, a succession may be had until the late autumn See Calandrinin.

PUSH-PULL: In Wireless. This is a system of low-frequency magnification in

Which two similar output valves are coupled to a specia centre tapped secondary low-frequen oj transfor mer. The grids of the two valves are connected one to rach end of the second. ary winding and the centre puint
s juined to grid-hias negative. The anorle circuit crimprises an output tiansformer laving a centio-tapped primary winding This centretapping is connceted to ligh tension positive, and the two ends of the primary winding are joined respectively to the ro output valves The secondary winding of the out put translormer is connected to a loud speaker in the usua! way

In operation one valve deals with the positive half cycles of alteannting current, and the other valve with the negative half cjeles Thus two valver in push pull will handle ap proximately twice the grid swing of one similar value having the aame high tenaion voltage applied to its anode and connected in circuit in the normal manner. The method is advantagenus in cases where it is desired to deal with relatively large grid inputs on comparatively low high-tension voltages

PUSS MOTH. Thic arva of this moth is one of the most peculiar lound in the garden, the caterpillar bearing a curious resamblance to a kitten, whilst the parent moth ib covered with soft down The caterpillars hatch out from eggs de ןresited on the leaven of such trees as jop. lars and willows, feeding


Puss Moth upon them and gnawing the shoots. In duc course they form a cocoon, under cover of which the chrysalis stage is rached, from which they emerge as motlis during Juno The caterpillars shonld be picked off by hand and destroyed, or the trees sprayed with l'aris green was!
PUTLOG. On a builder's acafiold putlogs carry the boards that form the floor. They are filaced at right angles to the wall lint is being built, with one end resting on the ledger of the scaffold; the ollier end is let into a hole specially left in the wall to receive them

Putloga are about 5 ft . long and 3 in . square They are made usually of birch, and they are split and not cut, in order to obviate injuring the fibres of the wood, thus affording greater strength. The putlogs are as a rule placed about 4 ft . apart along the ledger See Scaffolding.

PUTTEES. Worn at times by men round the lega, puttees consist of long, narrow bands of material usually cut from woollen cloth, hut they may be specially woven fabric bands. They are warmer and more comfortable than leggings, and in addition they have the advantage of giving substantial support to the legs, thus acting as n preventive of varicose veins leing spirally wound from the ankle to just
below the knee, the leg is protected by at lenat a double, and mostly by a treble, thick. ness of the materinl, so that there is little danger of ecratches and othet iniuries heing auffered by the wearer They are. therefore, very suitable for farmers and others engaged on the land, and for thase who go out shooting and walking Thev are usually made in khaki molour, but navy blue ones are occasionally seen Great care and some skill are necespary in winding them round the leg, as, if lindly wound, they will look untidy.
To obtain a smart offect putices should be lirmly and closely wound, but this must not interfere with the circulation The method is that of ordinary bandnging, a reverse being made in the puitee whenever necessary sn that it may be llat to the shape of the leg. The uanal procedure is to begin at the inside of the ankle and wind upivard but the artillery method is to start below the kneecap and wind downward to the ankle

PUTTING: On the Lawn. Putting ean be practised on a lawn too small for croquet nr lawn tennia Apart from the land. the only requirements are a few balls and two or three putters

Putting resolyes itself into the playing ol two kinds of putte, a long appronch putt and a short putt, which drops the ball into the tin with a definite click. The approach putt involves two ideas : first, the imagination of the line to the hole, and the ability whit the ball alning the imagined line : and, secundly, judgement or instinot, horn of habit. of the strength necessary to make the ball traval firmity to a spot close to the hole The hall lies, say, 10 yd . or so away a putter is taken, and the linc of the putt inspected. It is vall not to muve either head or body until the putter is still and the stioke is quite finished.

The short putt is of a diflecent eharacter, and is apparently a simple businces which requires little more than confidence Many players see the ball and the hole, and, holding themscives quito stendy, tup the hall firmly yet smartly towards the back of the hole. and are successful

Making a Green. A golfer can obtain putting practice anif also a good deal of quiet reoreation on an ordinary lawn. One way of doing this is to make the hawn into a mininture golf course, say. one of nine holes. although any other number can be substituted Suitable holes can be minde in the ground and a small Hower-pot put in each, or, if preferred, a metnl cup can lie bought for the purpose
The holes should be dispused so na to give the greatest possible variely in the leneth and dircction of the atrokes One will he made as long as the ground will allow, and the otbers arranged to give putts. each shorter than the other. 'Jhe diagram offers a suggeation as to


Putting Green. Diagram showing how to lay out a lawn as a miniature roll course of nine holes
the laying out of the ground A simpler way of obtaining practico is to make a single hole in the lawn and to aim at this from various distances See Clock Golf: Golf, Midget.

PUTTY. As generally uscd in the liousehold, putty is the material known as glazier's putty, and is composed of whiting and linseed
 is The word plastering to rlescribe the fine stulf consisting of lime and water; it is also the name of a powder used in pulishing
glass and steel $S m a l l$ quantitics of glazier's putty can boob. tained from any oil shop or from an ironmonger :
but if a quanity is re quired, it is inore cono. mical to purchase a 7 lb keg; when not in use, the lid sbould bokept on tightly. It is sometimes advocated that the top be covered with a small quantity of linseed oil to provent the putty hardening.

Should putty when purchased be very soft and sticky, a very amall quantity of wbiting inay be added, by taking a lump of the putty in the left hand, sprinkling it with powdered whiting from the right hand, then ralling and knending the putty This process should be continued until the putty is an evon paste, perfectly fiee from lumps.

Whon putty is tho dry, the same operation is performed with linseed oil, which softens the material. Should it be ahort, or tend to crumble, it is an indication that it requires linseed oil, and the process can bo hastened by slightly warming the putty. In soine cases the putty may te prepared by placing a quantity on a clean board and beating it with heavy pieces of wood, one in cach hand, much as if heating up butter. Usually, however, the beat method is to knead the putty between the hands, as by this means its consistency can be judged When exposed to the air, putty gradually gets hard, until finally it becomes alinost as hard as soft stone.

A putty knife is a thin, broad bladerl knife with a word handle, the blade somewhat pointed at the end and more or losa jear shaped It isanindispensable thol for applying putty, stopping up small holes in wood. work prior to paint. ing, and for other purpuses. See Enainel: Glass: Line.
PUZZLE JUG. This name is given to a type of jug which has some unusual and unexpected feature. For instance some


Puzzle Jug. Quaintly fashioned jug in Wrotham slip ware British Mluseum
have a serics of hollow tuhes running round the ritn of the jug and through the handle The tubes contain the liquid, and the spouts, which project from the rim, are so arranged that the drinker will be drenched unless ho knows exactly which of the spouts to cover with his firgers and thumb.
These jugs have always a suggestion of rough humour about them, and many waro made for the use of ale houses Today they ale sought by collecturs. A few puzzle jugs were made in England in the 1 fith century Later they werc made in large numbers. especially by the Staffordshiro putters, but also at Leeds, Liverpual and Bristol. Some were imported from Holland They are often found with humorous inscriptions upon them

## Pyaemia. See lloond Poisoning

PYORRHOEA. Pyorrhoea is a discase commencing at the margin of the gum where this encircles the neck of the tooth. In the carly stages it may be recognized by a redness of the gum margin, and a tendency to bleed when rubbod, eg. with a toothbrush It is caused by stagnation of secretions, which barbour multitudes of microbes.
The natural method of preventing the discase is to eat or masticate the foods which neccasitate or stimulate mastication, and which rub, cleanse, and promote movement in the secretions surrounding the necks of the tenth. The foods which do this most effectually arc senerally of a somewhat fibrous nature, such as meat, fish, and particularly uncooked vegetablcs. The mastication of fresh fruit alan is very suitable for preventing the stagnation of matter around the necks of the teeth, and the type of fruit which is most useful is such as is of a firm consistency, and sumewhat acid or tart, such as apples.

Artilicial incthods follow the same principles. A toothbrush is generally used to supply the friction necessary to keep the necks of the tecth clean, and should be used with an up and down motion, rather than across the tecth. As the toothbrush cannot be forced between the tecth very far without injury to the gum, a mouth wash of a slightly acid nature should be used to rinse the inouth, and this should be done fairly vigorously. A pinch of cream of tartar to ahout a wineglassful of water may be used. The importance of preventive mcasures may further be emphasized by recognizing that as ago relvances the predisposition to the disease increases See Tecth.

PYRACANTHA, This is a favourite evergreen shrub which bears white hawthorn-like flowers in spring and red or yellow fruits in autumn. It will thrive in the open, but is more commonly planted against house walls, whore it forms a decorative covering in spring and autumn, and is pleasant to look upon al the year round: the common kind is Pyracantha coccinea ithe firethorn), which beare red fruita: the variety Lalandii has orange red fruits, while those of angustifolia and rogersiana are orange yellor.

Pruning, which should be done in winter or early spring, takes the form of thinning out crowded or weakly branches, or if the shrub is on a wall of keeping it within bounds. Propagation is by sowing seeds out of doors is soon as they are ripe.

PYRAMIDS: The Game. The gamo called pyramids is played on a tilliard table with 15 coloured balle, usually red, and the white ball which is used as the striking ball The coloured balls are arranged in the form of an equilateral trianglo, and the object of the players is to atrike one of them with the white ball in such a manner as to pocket a coloured ball, points being seored accurdingly. The balls ued in pyramida are slightly smaller than ordinary billiard balls

Pyramids is usually played by two persons, but it can be played by four, or by any other convenient number forming sides. It is a game of winning hazards exclusively, cannons being ignored

When the 15 red balls are placed on the table, practically everything, between players of appuoximately equal skill, who strike a good winning liazard, depends on getting an opening for a break. Safety play is so greatly the deciding factor that first-class plavers often


Pyrethrum, the variety B. Roblngon. See below.
make stroke after stroke without the least intention of pucketing a ball. But when at last the desired opportunity does present itnelf, 4 or 5 balls are almost sure to vanish, and it is by no nean unusual to see a break of 8 balla made, which ends the game at once.

Shell-Out. It is different when playing shell-out, a game often confused with pyramids. because it is played with the same number of balls and points are scored in the same way. But there is the important difference that sliell-out is a round game for a number of players, whereas pyramids is a game between two players. When playing shell-out, a man draws a stake fiom each of the other players for evory red ball he can pocket, and it is consequently the game to concentrate on every possible chance of taking a ball. The trouble is that while safety may close the game up for the next player, it is lung odds againat a bout of safety lasting until a man has another chance at the balls, a circumatance which makes sufety the exception rather than the rule when playing shell out. See Billiards.

PYRETHRUM. The most valuable planta in this group are the Horist's varieties of Pyrethrum ruseum, which grow from 18 to 24 in . high and bear single and double long. stemmed flowers in rose, crimson, blush and other colours in May and Junc. They are hardy herbaceous perennials which thrive best in well-drained soil. The way to propagate the plants is by lifting and dividing the clumpsas soon as they have finished flowering.

Seeds may also be sown under glass in oz of developer. Forunderspring, the seedlings being grown on a re- expusures take 1 part of serve border in summer and planted finally in $\mathrm{A}, 1 \frac{1}{2}-2$ parts of B , and add autumn. There are numerous named varieties. The noon daisy (pyrethrum or chrysanthe. mum) uliginosum grows 5 ft . high and bears largo white daisy-like flowers in late summer. It flourishes in ordinary soil, even on a shady border, and is increased by division in antumn. Pyrcthrum aureum is the well known golden feather sometimes used as an edging to flower beds ; it is raised from seeds sown in a heated glasshouse in spring. See Border: Carpet Bedding: also illus. p. 1022.

PYRIDINE. It is believed that the benefits derived in asthma from burning various fumigatory powders are due to pyridine. For use in asthma pour a dram on a plate and allow it to evaporate in a small room in which the patient remains for half an hour.
Pyridine is used with soap as an insecticida. Leaflet No. 330 of the Ministry of Agriculture gives the following formula for the treatment of apple aphis:

Pyrldine
Soap (soft)
402.
116.

10 cma.
See Asthma : Insecticide: Nicotine
PYRO or PYROGALLOL. Often, but wrongly. known as pyrogallic acid, pyro, as it is known to photographers, is more widely used than any other devcloper. Mixed with an alkaline substance or another developing agent, it produces negatives of fine quality, showing the characteristic yellow stain of pyro, which, however, often improves the printing value, especially of thin negatives.
Dissolved in water, pyro quickly oxidizes the solution, turning dark brown and losing activity as a developer accordingly. It is best kept in strong solutions containing an acidifying agent, potassium or sodium metabisulphite being added, when it will keep for several months. Pyro is sold in two forms, compact crystals and light feathery crystals, easily soluble in water. It is very poisonous, and must bo kept in well. corked bottles.
Pyro is never used alone, but combined with an alkali, sodiu $m$ carbonate or caustic soda, or another developing agent. In making up any formula the quantity of pyro in grains per ounce of developer mixed ready for use gives a useful indication of the strength of the developer. When weak, pyro brings out the first details in a negative quickly, but requires a comparatively long time to build up proper density: when strong, the image appears slowly, but density is rapidly gained, so that development is complete soon after the image appears.
Following are formulae for standard pyro combinations :


For normal use lake 10 minims $A$, 10 minims $B, 5$ minims $C$, and 1 oz . water.
A. Pyro .. Pyro-Caubtic Soda

Sodium sulphitc, 1 oz. (or $1 \frac{0}{1} 07$. .) Water
.110 gr. io 10 ör B. Caustic boda .. .. .. .. .. .. 35 gr . Water io 10 oz .
For use take 1 oz. of $A$ and $B$ and 102 of water. This is a quick acting and very economical developer.
A. Pyro

Metol
Potassium metabisulphite
Potasslum bromide
Water
B. Sodlum carbonate, crystal. Water
and B. This will contain 2 gr . of pyrs, to the

A, $1 \frac{1}{2}-2$ parts of $B$, and add
2 parts of water. T'his developer combines the characteristics of strong pyro and metol, and gives hoth detail and density quickly, the negatives being slightly greenish black. It is a good and reliable developer for the snapshot photographer.

The Watkins' develop. ment factor for pyro varies with the number of grains per o7. For the pyro-metol formula given above it is 9 . See Developing: Photo. graphy ; Pyro-Soda.

## PYRO-SODA. The

 must commonly employed of pyro developers, and perhaps the most economical of all photographic developers, is pyro-soda. this decorative shrab When used without potassium bromide re. strainer, which is quite unnecessary, it gives brownish or greenish black negatives of very good printing value, without the risk of fogging.

Pyro-soda is so called because the alkali which it contains is carbonate of soda, though ordinary washing soda is liable to contain impurities, and the photographic quality should be obtained. There are many pyro-soda formulae differing principally in the proportions of the preservative and alkali, but that which follows will mect the amatcur's requirements. The developer is always made up as two stock solutions, which are mixed and diluted when required for use. One contains the pyro with preservative, and the socond the alkali. First make up the following : Ten per Cent Pyro Stock Solution

> Pyro iü inetabisulphite Potassium

10 Oz
Water .. inetablsulphite .. .. $\quad$ io.$_{0} 20$ gr.
A half-pint stoppered bottle is required. The water is boiled briskly to get rid of dissolved air, which would cause oxidization of the pyro, and allowed to stand until cool without being disturbed. Crush the metabisulphite, the preservative, and dissolve it in the water. Pour it carefully into the $\frac{1}{2}$ pint bottle, add the pyro, and leave it to dissulve, the bottle being kept atoppered. Do not shake the bottle, or oxygen will be reabsorbed. This solution will contain almost exactly 10 per cent by weight of solid pyro. That is, every 10 minims of solution will contain 1 gr . of pyro. Made up exactly as described, it should keep for two years or more.

No. 2 Alkali Stock Solution
Sodium carbonato
802.

Sodlum sulphite
8
to 40
The carbonate and sulphite are dissolved in about 1 pint of hot water, which has boiled for some time, and the total made up to 40 oz . Keep it in a large corked bottle; a glass stopper is liable to stick on account of crystallization in the neck. It should keep for about a year. For use make up in the following proportions: Pyro-Soda Developer
10 p.c. stock pyro solution, 20 minims (or dropes) No. 2 soluthon
(or Uropes)
$\cdots \quad 102$.
Water
to 1 "
This developer will then contain 2 gr . of pyro per tluid oz., and will be suitable for practically any plate or film. For tank development 20 ninims of the 10 per cent solution and 1 oz . of No 2 may be used for each 4 oz . of developer, then containing $\frac{1}{8} \mathrm{gr}$. of pyro per oz. When pyro is used for tank development it is essential to pour off the whole developer from the tank and return it once or twice to avoid uneven development. Merely shaking or tilting the tank is not sufficient.

The Watkins' development factor for pyrosalmon, red and bluish.

(D)behind for the cighth returning. repeat this figure. however, it may be planted. The way to induce it to blossom freely is to prune the side shoots in summer and again in winter. There are several named varieties. In a favourable summer Pyrus japonica bears large quince-like fruits which do not ripen, but may be used to make an excellent jelly. In recent years a new race of Japanese quinces, called Cydonia Maulei, has become popular: there are many varioties with flowers in UADRILLE: The Dance. In quadrilles the set is composed of 4 couples, who form a square, each couple facing the centre, the men standing on the left of their partners. In the first figure, the leading couple and their vis-a-vis start by crossing over and returning. In each case 7 walking steps are used and the left foot is brought up

This movement is called half right and left. because each dancer passes on the right-hand side of the first person met in crossing and the left-hand side of his own partner. They cross and return to the first 8 bars : setting to partners in the next 8 bars. This is passing on the right-hand-side, using 3 steps forward and the left forst brought behind and 3 steps back, bringing the right foot up to the left to finish, giving the right hand to partner and

Then comes the ladies' chain, in which the women cross giving the right hand to each other and the left hand to the opposite men and the same back to place, while the men move round behind their partners giving the opposite woman the left hand and repeating the same movement to meet their own partners when they promenade holding hands, over to the place of their vis-d-vis, then return and perform half right and left to finish. There are 16 bars of music. The side couples now

In the second figure, the woman of the leading couple, and the man of the vis-a-vis, advance and retire, using 3 steps and the forst brought behind, and then move to right and left, cross to each other's place, advance and retire. This is danced in 16 bars. Then all return to place, set to partners, and turn in 8 bars. This movement is repoated by the other couple, each woman dancing with the partner of the opposite woman.

The woman of the leading couplo and the opposite man change places in the third figure, giving the right hand, and return, giving the left to each other and then tho right to their partners, so that the 4 dancers form a chain. They take a step forward together and one back, do this twice, then cross over to the

गpposite couplea' place The two people who started the figure advance and retire twice giving the nearest hund to their respective partners. All 4 advance and retire and then icft and right tu places. This is danced in 32 bars The figure is repeated in the same order 38 the preceding one.
In the fourth figure, alao 32 bara, the leading couple advance and retire again advanion and thewoman remaina on the left of the man of the op prsite couple. while hes bartner re. turns tu place The 3 advance from the other sideand retire, then cross over, give hands round, cross to their original places and half right and left to inish. The side couples then repeat the figure.
The fifth figure starts withell 4 couples join-
 ing hands.

Quaman. Bulb of the lily fa mily with blue or white flowera
and huttom couples pimmenade to each other's places and turn. These two movements are performed in 16 bars Then the ladies' chain follows for 8 bara and final promenade th places and turn for another 8. This figure is irpeated, being started by each of the four couples in turn and sometimes again by cach of the couples.

Another form of this danco is known an the Caledonian quadrille. In this the set is $;$ iom. posed in exactly the same way as in the ordinary quadrille and there are 5 figures. The chief difference between the two is that reel time is used throughout the Caledonian quadrille. The finst figure is danced in the asme way as in the quadrille, but there are slight differences as regards the others. The finale of the dance is a promenade all mund. See Lancers: Reel.


Quaigh. Shallow Righland drinling oug in wood with two handlea
QUAIGR. The Highland drinking cup known as a quaigh or quaich was rarely seen south of the Grampians until towards the close of the 17th century. It is in the form of a shallow bowl of oak or other wood, with two small oars or handles, and usually without ornamentation, being one of the simpleat of drinking vessels and probably of very ancient origin. It was alsu made in pewter and horn, and some were of silver, but the earlier quaighs were all carved from blocks of wond and made with ataver and houps.

In the 18th century the quaigh found its way to the lowland houses, and was embellished with silver mountings. Other uses werw found for it, and quaighs were utilized as alms dishes and served in some Scottish churches as communion cups.

Quail. These hiris may be cooked in the same ways as pigerons See Pigeon

QUARING GRASS. This is allorllamontal Howering grass about a forst in heoght. It is quile harly and is casily raised from seed sown in the eppring in orlinary garilen suil. It may be cut and dried for the purpinse of indionrlecoration. The commonest is briza maxima; "hera are merlia and ininor.
See Grass.
QUAMASE. This is A hardy bulb belonging tos the lily family. It gmiva fmen 12 t.1 24 in . high and bear apikes of white or blue Howers in May and June. They thrive in urdinary well tilled suil and shiuble be planted in :utumn about $\overline{\mathrm{z}} \mathrm{in}$. deep. The bolanical natne of fllamash is Camastin. The chiel species ane esculenta, bluc and its white valisty leitchlinii, Cusickii, pisle blue and Fruseri, palc blue. I'ropagation is by offsets taken off in autumn or in carly apring or by sce-ts sown as soon as ripe in boxes of soil in a frame.

QUARANTINE. The period during which a ship on which an infectious discase has occurred is kept out of port, or, at any
rate, from free personal communication with the ahore, is callel the quarantine periol. The word quarantine has, however, also come to menn the period of isolation of persons suffering or convaleacing from an infectious disease, and of others who have been in contact with such perauns wherever they may be.
'I'he question of quarantine. in the general experience, mostly arises in comnexion with the attendance of children at school. In the table herewith the dates at which a convalea cent or contact may return to sehoos are duly set out, but children who have actually been ill will probably require a little holiday beforr going back to school.

The date from which the quarantine of eontarts is to be calculated is that of the last expmasure to infection. A rertificate of litness (w) attend school should be got from a donetor. both for patients and contacts. Mort of the above particulars do not apply to adulte. See Infectious Disease.

Quarantine for Dogs. Nudog can he landed in Creat Britain without a licence, which muat be obtained from the Ministry of Agriculture, 4 Whitehall Ilace, Iondon. S.iV. When landed, the dog must go into quarantinc, that is, it must be detained and isolated for $n$ perind of six months from the date of landing on the premises of a veterinary surgenn.

Thi following premises, which can accommodate large numbers of doga, have been approved by the Ministry for the reception of all classes of imported dogs :

1. J. Braln, M.R.C.V.S., 5, St. Licurge's 'Turpace Cheltenham.
F. Brodley, M.R.C.V.S., Keka Dum, Hesald Hull. . S. Brooksliznka, M.R.C.C.S., 18, ('ouper stmet Buington, Manchestir.
W. Burt, M.R.C.V.s., 2, Eilward strent, Brluhtom Potton, Berls.
Ferricr, M.R.C.V.s.. Fantir ('leplugton House, I) undee.
illard \& Wacher, M.IR.C'I's., liaprow HIII House: Asliford, hent.
C. Giolden, M.R.C.N.S., Woo.lland» Farın Lyininge, Ken
Hancock \& Andermon M.R.C.I.s.. (cowley Rinal, -xbrilge, Mild legex.
P. Malc, M.R.C.V.S., 50, Frar Strect. Reading Berka.

| 1)iserse | Quarantine Purlod (Berionl of Exclusinn from School) |  |
| :---: | :---: | :---: |
|  | I'atient | Contacta |
| ('rribro-gpinal meninglits | Thren innntha at leant from nnact of direnan | Three wecks |
| ilisken-pox . . . | lintil all sculas havi gone : usually thriv wenk: | For those who liave not had the dlacare three wecky |
| Uiphtherin | Deprinds on lacterio. logical tests | An for patient |
| Encephalitla Iellunr alcy | lintll removery (at least alx weekg) | Fhree wceks |
| iifysipolas. . | Untll rash and peeling honc | May attend if Joctor certifica |
| (ierman moasloa | Not leas than a wock from appearaner of rash | F'or thoar whn have not had the diseame. threr wecks |
| Intluenza.. | lintll recovery .. |  |
| Mensics | l'util morlild digchapara lave rcaged (thrive wecks at lesat) | for thase who bitwe not had the dispase. thren weeks frim onset of last case in the house |
| Мıוиן | A week after the authaldener of awelling (at least thire weeks) | Three wrooks |
| I'olinmyelitls | (intil pronnounced frer by a doctor | Three woeks |
| Scarlet Ficver | rwo weeks after releame imon Isolation or from hospltal | Ten days; geven daya after patient la removed to hospltal or relcased from imula. tion allowed by some authorltien |
| simall nox | lintll free froln asslis (at least six weeks) | II not recently vac. cinated, slxtecn day's |
| Typhold Fever. . | bepenta on bacteriological testa | May aftend |
| Whooning Cough | Untll six weeks frum momniencement of whoop | For Infanta only, three weeks from last cx. posure |
|  | ITntll cured | $\left\{\begin{array}{l} \text { If free on Inapectinn. } \\ \text { may attend } \end{array}\right.$ |

quarantine periodi lor various infectious diseases C. Masson, M R.C'.V.S., 31, Abbey Road, Torfuay S. Jevon.
W. S. McMurtich, M.R.C.V.S., 77. East Clyde street. IIclonaburuh Inumiartun. A. E. Paviw, F.R.C.S.S. Hanger Hill, Weylirldga. K. F. Ouln, M.k.i.V.S, 1ist. Lancaster Koad. K Kenalnxton. Scott. M.R.S.S. Wulıner View. Whitelill, Bordon, Hanta.
H. G. Thhutrail-Hortick, II.R.C.V.S., Flect Hoa. pltal for Ings, flecot, Hants.
Major W. N. Wrikht. M.K. $\because . \dot{V} . S .$. Hlghgate Lodge Torquay, s. Devon.

- Stow Younk. M.R.C'.V.s. The Dogn Home. Huckliridge surrey.
F. W. ('hamierlain, M.R.('.V.S., Firatta Quaran. tine Kouncle, Beiddinetoll Inac. Mitcham, Surrey. I'apit. J. Facer, M.IR.C.V.S. Bitterne Manor F'arin. Bitterne, Southampton.
A. Spier r, F.R.S.V.S., Crabwuorl. Now Oxted.
M. G. Byerley, M.K.C.V.S. Blue Cross C'lariton Kennela, Shooter's Hill, S.f.ls.
The owner or importer of the dog at the time of inportation muat pruville the manager of the quarantinc atation at which the dog is detained with a permanent address at which any neceasury commonications will at all times reach hirn

Severe penaltiea are inflictel upon persons who bring dngg into the country, by aeroplane or otherwise, in urler to avoid sending them to a quarantine atation. See I)ug.

QUARRY. This name is given to a square or lozenge-shaped piece of glass sometimes set in leaded lights. Quarries are painted with figures or patterns and inserted in otherwise plain lights. They are also seen as plain squares set diagonally in 15 th-century church windows to divide panels or roundels painted with pictorial subjects. See Staineđ Glass.

Quart. This measure is used for milk, beer, and other liquids. It consists of two pints ; and four quarts make n gallon.

QUARTER : The Measure. This measure or weight is the fourth part or quarter of a hundredwcight, containing therefore 28 lb or 2 stone. As a measure of capacity, used for grain, etc., the quarter contains is bushcls. From it has aprung the words quart and quartern, used in measuring food and drink. See Avoindupois Weight.

QUARTER : Of Meat. This word is used for the parta of a beast when it is cut up for luman ford the idea being that it is quartered or divided into four. The parts are known from their position on the animal as the fore quarters and the hindquarters. Sce Beef Carving ; Joint; Lamb: Mutton.

QUARTER DAY، Quarter days are clays on which are due the rents of houses taken by the quarter and certain other payments. In Eingland, Wales and Ireland they are March 25 (Lady Day) June 2.1 (Midsummer Day), September 29 (Michaelmiss Day), and Decem her 25 (Christmas Day). In Scotland they are l'eb. 2, May 15, Aug. 1, and Nov. 11. Sec Rent

QUARTERING: In Woodwork. Quar. tering as a furm of decoration in woodwork consists of the division of a surface into 4 parts, the grain of each portion running in a dircction contrary to that ne.rt to it. Its most general use is in furniture, as a decuration for panels. table topy and other llat surfaces See Grain ing; Oak; Veneer.
Quartering : Of Timber. This term applicd to timber means timber baving scantlinge from 2 in syuare up to 6 in . squarc.

QUARTERN LOAF. A loaf of bread weighing 4 lb ., which is known as a quartern loaf, is not a fancy bread, but a household quality, and inust be sold by weight. In making a batch of bread the dough for each loaf should be weighed olf before baking. or it will be impussib!e to obtain equal-sized luaves See Bread.

QUASSIA. The wood of the quassia tree in thic furm of chips is ased both as a tonic in medicine and in gardening to destroy insects. The chiel medical preparations are infusion of quassia, dose $\frac{1}{2}$ to 1 fluid oz, concentrated solution of quassia, and tincture of quassia \& to I Huid dram. Quassia is frequently combined with iron in bitter tonics prescribed for anaemia and delility The infusion is often made at home by letting the chips stand overnight in cold water, or by leaving water in a bowl made of quassia woorl. The action of quassia is mainly in the mouth. where it stimulates the gustatory nerves; the gastric vessels are reflexly stimu!ated, with the result that the gastric juice pours out. 'This secretion is temporarily diminished when the bittes saliva itself passes into the stomach. It is sunctines empluyed to kill threadworms, \& to $\frac{1}{2}$ pint of it being injected int, the rectum

Garden Uses. In the garden quassia is uscful for clearing gooseberry or currant bushes of caterpillars in spring. The chips are boiled in the proportion of 1 oz to a quart of water; a similar quantity of soft soap is added, and the bushes are sprayed with the mixture thus obtained. See Insecticide: Spraying.

QUARTREFOIL. The quartrefoil is a conventional treatment of a llower form with four lobes which is employed in stone and wood carving, and is a common feature of Gothic ornament Like the trefoil and the cinque. foil, it is based on a geometrical construction. See Stone; Wooldcarving
Queen Anne Style : Decoration \& Furniture

## The Graceful Elegance of the Walnut Period

> Pieces of furniture made in this style are referred to in a number of articles in our work. The reader may therefore consult suchentries as Chair: Drawing Room; Sercen Settee: Tapestry. Sce also Furniture: Lacquer: Marquetry: Mirror: Silver: and the articles on the immediately prece Jing und subsequent period styles, William and Mary: Georgian

In England the end of the 17 th and begin the walls and had thick sash bars. The win ning of the 18th century were marked by a period of great beauty in furnishing and interior decoration. At the end of the reign of Charles II walnut had superseded oals for finer pieces; by the time of Queen Anne the age of oak had practically finished except for strictly useful and farmhouse furniture. In the main her period was distinguished from those of the Restoration and of William and Mary by greater comfort and less stateliness, by elegance and grace rather than opulence of ornainent and the grandeur which made the best furniture of the preceding periods only suitable for the homes of the magnificent.
Queen Anne furniture is also simpler than that of the Georgian styles, including Chippendale, which followed. It is this simplicity of line combined with exquisite beauty of work. manship, the lovely use of colour in lacquer and needleworl, omamental china and ntirrors, impoted Oriental carpets and rugs, which inade her perind style at once compaob and homely and yet richly varied. It was open to Easlern artistic influence and the comforts which commercial overseas trade were making more generally possible.
The architecture also underwent a change, largely brought about an the result of fresh ideas from Holland during the previnus reign moulded and reproduced by wnch distinguished men as Sir Christopher Wren and Sir John Vanbrugh. The last named was responsible for the most famous house of the period, Blenheim Palace. Dutch architects also did much work in the royal palaces and had a great influence on Queen Anne style in build. ing, as also had the carvings of Grinling Libbons on the interior decoration.
The smaller houses were of brick, and built for the most part on rectangular plans The shaping of the gables with scrolled outlines was one of the most characteristic Dutch features. The winduw frames were llush with
the walls and had thick sash bars. The windows had comparatively amall panes. The hoorl or perliment, and flanked by futed colunns. while hlacli and white marble was userl for the curverl steps.

Interior Decoration. As the principal ruoms of the house became co-ordinated in design, the
upper and lower parts of the chimney prece were designed to harmonize as a whole instead of as separate features. Internal doorways were made decorative by the introduction of boldly moulded architraves and pediments Carving was employed in the decoration of mouldings on the panels, but was on the whole sparingly used and with good effect.

A beautiful drawing room or parlour of this period style is illustrated in trig. 1 The panels are 3 ft . wide and reach fom dado to cornice. The dado shows a projecting moulding running all round the room, while the pancl mouldings are enriched with carving and pediments, the detail of which forms part of a co-ordinated scheme enhancing also the fireplace and the door (not seen in illustration). Over the fireplace is a picture let into a panel arranged for its reception. Swags of carved fruit and foliage surmount it. pilasters are employed at either side.

Bolection moulding is characteristic of this style. Up to this time it had been usual for the pranels of a room to be recessed below the level of the stiles and muntins which surmund them, the intervening moulding being practically an elaboration or agreeable modification of the square section of the edge of the board. But the bolection moulding became a feature in itself and projected in front of both panel and stile.

Walnut was employed in some cases for panclling, but less expensive was the pine panelling, which was usually painted cream or light green. Occasionally it was lacquered and painted in Chinesc or Indian style with coloured decorations and raised and gilded portions on the panel designs.

Wallpapers were imported from China and a few were manufactured in England with hand-blocked and part stencilled designs showing Oriental influence, but these were rare, and the most general form of interior decoration was painted panelling.

The plaster ceiling of a Queen Anne room was "sually panelled out in a large way in conformity with the walls. The mouldings would he prominent, and the decorative enrichment, although bolll, wou!d be contined to suitable positions and not scattered indis. criminately. The floor would be of oali boards


Queen Anne Style. Fig. 1. Drawing room or parlour decorated in typical Queen Anne style, with large panels surrounded by broad raised moulding enriched by carving. The chimney piece bas a panelled picture and pilasters, and the carpet is Oriental

Courlesti of lVifle Allom \& Co
or parquet The fire basket grate for burning coal was speedily ousting the open heartls for logs.
Typleal Furniture. Domestic furniture of the Queen Anne period was chiefly of walnut, although heantiful pieces are existent made of other fruit woorls such as pear, plum and apple, and much fine work was lacquered, especially cabinets and chairs. Oak, cliestnut, cedar, and other woods were used for constructional or foundntion work, and walnut for the outer parts of the pieces. The bulk of this walnut furniture was veneered, probably as much upon deal as upon oak, although naturally the existing pieces are mainly the oak ones


Queen anne Style. Fir. 2. Cbair covered in retit point needlework and having cabriole legs with club feet Courtesy of M. Harris of Sons walnut, acacia, olive-wood, and laburnum side tables, however, are in existence. enloyed, and finely grained walnut loga were set aside for oyster grain veneer. in Fig. 4. This knee-hole dressing-table is furniture does not rely on ornament, but on exal like the knee-hole writhetable the perfection of grain, line, and proportion. The be noted as they are typical of Queen Anne varnish used cannot be initated by the acid style. Bureaux of the hureau-bookcsse type bleaching preparations employed to simulate the effect of period walnut

Inlaying and marquetry were as nuch used in Queen Anne's time as they were in that of William and Mary, and this is a feature of many picces in those styles. Cross-banding, featheredging, and herringboning were used upon bureaux, chesta, and grandfather clocks. A characteristic feature of the marquetry of the time was its enclosure in panels outlined by parts of circles, and frequently combined with oblongs having rounded ends The grounds of these panels were of wood differently coloured from that of the rest of the piece. The escalloped shell is a characteristic detail of the period It is shown above the panels in Fig. 1 and also on the chair decorated in lacquer work, Fig. 3.

The general lines of furniture became curvilinear instead of vertical and horizontal, and the cabriole leg was now first introduced and reached the form in which it was standardized for the next 50 years, with variations in knee ornaments of shells and acanthus leaves, and in scroll, club, hoof, claw, and claw and ball feet. Stretchers disappeared from chaira and settees during Queen Anne's reign and reappeared in some of Chippendale's pieces, expecially in the Chincse style.

Queen Anne chairs, settees, and stools had upholstered sents. Moreen was employed as an upholstering fabric, velvets and brocade sometimes, but the bulk of these pieces for parlour use were covered in needlework. Cross-stitch and petit and gros point were employed in coloured wools on canvas. A winged or grandfather work is shown in Fig. 2.

Some of the chnirs were marle with pierced, scrolled, deep rails, and with turned or scrolled legs; while others, more typical of the period, were without the piercing and scrolling, but had hoop and splat backis Settees in the form of two linked chairs were also products of Queen Anne's day. The broken pediment and also the lunette or semi. circular shapen pediment observed in architecture were scen in mirror frames, bureaux, and china cabinets.

Drcasera on cabriole legs replaced the heavier ones of thic 17 th century ; sideboards and large dining.tables

A representative piece of furniture is shown exactly like the knee-hole writing-table of the
period in construction. The handles should Courtestl of Countru Life and Gill \& lleigate. Lid
style chair covered were made in great variety and also double in beautiful needle. chests of drawers or tallboys. Built-in cup-


Fig. 3. Chair, dating from Queen Anne's time. with cabriole legs and stretchers. Fir. 4. Walnut knee-hole chest with seven drawers and a cupboard, the walnut toilat mirror completing a beautiful piece of bedroom furniture
baking-powder and mixed with the grated rind of a lemon, \& lb clean currants and $1 \& \frac{\mathrm{oz}}{2}$ candied peel, all cut into small pieces. Turn tho mixturo into some sinall greased fancy cake tins and bake the caker in a hot oven for 20 min
QUEEN LILY. Three species of the queen lily. phaedranassa, a S. American half-hardy bulbous plant, may be grown in Great Britain in a warm sheltered border out of doors, or in the greenhousc. Some of the best arc the scarlet ventricosa, vermilion-shaded schizantha. and yellow chloracea.

QUEEN OF THE PRAIRIE. This is a herbaceous species of meadow sweet botanically named Spirea lobata, about 4 ft . high, producing heads of rosy carmine Howers in June it should be planted in a shady, moist torder during autumn

QUEEN POST. In building, this name is given to two posts in a roof truss used for supporting a large roof with a span of from 30 to 45 ft It is not so generally employed as the shorter king post truss, but is suitable for a small roof with a Inntern light.

The roof truss comprises at least 9 elements. The horizontal member, called the tie beam, reaches from onc side of the building to the other, and rests on the walls. The queen posts are tenoned into the tie beam, and the principal rafters are framed into the latter and the top of the qucen posts. A straining beam is fitted between the two queen posts, and struts are placed between the latter and
mixture, and bake it for $\&$ hour When it is nearly cold spread on it a layer of jam, and on top of this pile the stifly beaten whites of eggs. Put the pudding back into the oven until the meringue is a good biscuit colour See Meringue: I'astry.

QUEEN'S WARE. This term wan first adopted by Josiah Wedywood about 1765 th describe his improved cicnm-ware, of which he presented a breakiast service to Queen Charlotte. Cream ware was the Lasis of all the earthenware fabrics produced at an carlies dato by Whicdon, even when the nature ol the body was concealed by agate and other decorations The paste was a mixture of flint and clay, as used for Staffordshire saltglaze

The mprovements made by Wedywood tesulted in an earthenware ol liglit texture, in various ahades of cream, straw. and salfron, well potted, with a soft glaze His final improvement was to introduce Cornish growanatone The effect was such that delft and salt-glaze were driven out of the market Wedgwood's own services of dinner, dessert, and tea ware were usually made in this material, which is stil! produced at Etruria. He decorated it in hand-painted designs, and a sparing use of fire-gilding, and sent large quantities to Liverpool to be transfer-printed. Gold lustre was also employed.

The collector may usually identify this ware mainly by the Wedgwood mark, hecause some rivals attained a very close imitation of its


Queen Post. Wustration showing the emplogment of two uprights in a rool truss
the rafters. A straining sill is fixed hetween qualities, notably Elijah Mayer of Hanley the queen posts to prevent the stress from Queen's ware was produced in most of the the struts shearing the tenons of queen posts
Iron stirrup straps connect the queen posts and the tie beam, and three-way straps are secured on each side of the rafters, queen posts, and straining beam. A typical example of a queen post roof truss is illustrated See King Post

QUEEN'S CUSHION. The popular names of quecn's cushion and doredale muss aro given to one of the nossy saxifrages named hypnoide. This is a hardy low growing plant which forms spreading moss-like tufts and hears white flowers in May It flourishes in the rock or wall garden, or as a border edging. in well drained soil in sunshine or slight shade The varicty Kingii is of particularly dense growth and makes a delightful moss-like cushion though it does not flower freely.

QUEEN'S FLOWER. This is one of the names of the Indian crêpe flower, Lagerstroemia indica, a shrub or amall tree suitable for cultivation in a greenhouse having a minimum teniperature of abnut 50 degrees It bears beautiful rose-coloured flowers which have prettily curled or crimped petals, hence the name cièpe flower. It may be grown in large pots or in a burder; a we!! drained compust of loam, peat and sand suits it.

QUEEN'S PUDDING. To make queen's pudding, boil up $\frac{1}{2}$ pint milk with 3 oz . castor sugar, a little lemion rind, and 1 oz butter, then pour this on to 3 oz breaderumbs. Allow the whole to cool slightly, and mix in the yolks of 2 eggs and the juice of a lemon. Line a piedish, with 3 oz . short pastry, and put a strip of pastry around the edge. Fill it with the
styles already mentioned at Lecds, while at Stockton, down to about 1848, a reproduction of the Etruria fabric was made by Smith and marked W. S. \& Co.'s queen's ware See Pottery: Wedgivoud.

QUENELLE. The rich white forcemeat known as quenelle is served sometimes as an entíe, but is also used as a garnish for soups and inade dishes. Quenelle may he made either with meat or tish, but the meat must consist of veal, poultry, or game, and the fish of some delicate varicty that can be pounded very finely.

When quenelles are served as a garnish for clear soups they are made up with teasponss, then are poached and laid at the bottom of a hot soup tureen, the soup being poured over then gently.
Chicken Quenelles. For these put 10 oz . cold chiclien through a tine mincer and pound it well. Melt $\frac{3}{}$ oz butter in a saucepan, add twice as much Hour, and mix the two nutmeg. Mix these ingredients with the ingredients well before adding gill white flesh of the fish, shape the quenelles and foach stock. Bring the whole to the buil, cooking as for chicken guenelles. it until it ceases to adhere to the sides of the pan, and keeping it well stirred. When the mixture has been allowed to cool slightly, add the minced chicken, ssason the whole with pepper and salt, and beat in an egg. lound all these ingredients together, then rub them through a sieve.

Shape them into quenelles in the following way Well fill a tablespoon with some of the


Quenelle. Quenelle of chicken served with white sauce and garnished with green peas
ficsh of the fish, shape th
as for chicken guenelles.

A very simple tish quenelle mixture nay be quickly prepared by pounding the flesh of : large whiting in a mortar with the hardhoiled yolks of 2 cggs, 2 oz bread panada (the bread to the soaked with builing millk, hot stock or water), 3 oz . (resh butter, and acasoning Separate the yolks and whites of the egga, and steam the yolks in a cupl or jar by thenselves, leaving the whites raw. When


Queen's Ware. Cup and saucer bearing the Wedgwood mark: the transfer was printed at Liverpool Brithsh Museum
mixture, shaping the latter with the aid of a knife dipped in hot water to form the quenelle into an oval Then dip another iablespoon into hot water, and with it remove tise quenclle from the first spron into a well. greased frying-pan filled with boiling water or ntock. Punch the quenelles for a hout 12 min , keeping them basted with the water

When they are cooked, take them out ol the pan, drain them well, and arrange them on a dish, afterwards coating them with some white sauce made from 2 oz each Hour and butter, 3 gills milk, 1 gill good, flavoured whita stnck, a squecze of lemon-juice, and a suffi. ciency of seasoning.

Quenelles of veal and rabbit aĭu made in exactly the same way. They may be varied by adding equal quantities of lean ham or bacon, and a little tinely chopped onion In making all quenellea, scasoning is important. Care nust be taken to prevent then being insipid. Garnish with green peas, or chopped French heans, or sprigs of parsley.

Fish Quenelles. For these use whiting for choice, as it is casier to work with: but most lish can be used. Skin 3 large rock Whiting and remove all the tlesh from the bones. then pass it through a wire sieve. The back of a wooden st:oon is hest to use for this purpose. Allow for each whiting 40 oz bread or Hour panada, 2 eggs, and ecasoning of cayenne pepper and salt, also a little mace or
other ingredients are well mixed work in one tablespoonful chopped parsley and the whites of the eggs whipped to a stiff froth. When all are incorporated the quenelle meat is ready

QUICK. The hedge plant quick, or hawthorn, may be planted during late autumn, winter, and early spring in soil which has been dug over to the depth of about 2 ft . The plants should be put in about 6 in . apart. A double row will make a much stiffer hedge.

Qüickset Hedge. This is a very old term signifying a live fence or hedge set with quicks, a name generally applied to Crataegus Oxyasantha, the common hawthorn. For the production of a quickset hedge thorough soil plecparation is essentia!, the ground being deeply trenched and allowed to settle down before planting either in Oct. or early Nov.

Four-year-old plants of quick are to be pieferred ; they should be planted about 8 in . apart, and cut back to about 6 in of the ground tevel. Cutting back in drastic fashion induces strong growth from the basc. Some growers prefer a double row of plants. Hedge bottoms should always be kept clean, and the soil regularly forked over. See Hawthorn; Hedge.

Quicksiüver. This is an alternative name for the chemical element mercury ( $q$ v.)

QUICKSTEP : The Dance. The fundamental steps of the quickstep are the natural and reverse turns, from which all variations ale built up The natural turn is generally used on corners, the reverse (usually a section only) on the straight. As in the Fox Trot (q.v), a slow step (S.) takes two beats, a quick step (Q) takes one; the latter is danced on ball of foot. Only one walk or, at the outside, two should te done between the steps. The weight of the body should be forward (without leaning forward) towards partner.
The natural turn, counted S.Q.Q.S.S.S., is danced as follows. The man steps forward with right foot (on heel first, but going immediately on to ball) turning on it to R. (S.); steps to side with left foot (Q.) and closes right foot (R.F.) up to it (Q.) ; steps back with left foot (L.F.), turning on it to R. (S.), closes R.F. back to L.F., turning from L. heel to R heel (S.) and steps forward with L.F. (S.). (See Fig. 1) The girl (see Fig 2) steps back with, L. $F$, turning on it to $R$, to side with
R.F., still turning, oloses LF. up to R.F., The girl's quarter turns are executed by steps forward with R.F, turning on it to R., stepping back with L.F., turning on it to R.. tc side with L.F, and brushes R.F. through' (close to L.F.) as she steps back with it.
A three-quarter turn should be made on the complete step Contrary body movement (CB.M ) is used on the lst, 4 th and $6 t h$ steps. The 2nd, 3rd and $4 t / 1$ steps (Q.Q.S. ) constitute a chassé ; this figure, however, may be taken straight, turning, or to the side in other variations of the Quickstep.
The reverse turn (Figs. 3 and 4) is counted S.S.S.S., Q.Q.S. The man steps forward with L. F., turning on it to L., to side with R F., still turning, back with L.F back with R F., turning on it to L., closes L.F., back to R.F., turning to L on R . heel ( Q Q.), and steps forward with L.F. C.B.M. is used on the list, 4th and 7 th steps. It should be noted that on the counts "Q.Q." the man actually makes one step only; but the girl makes two steps, therefore it is so counted
The girl's reverse is as follows: Step back with R.F , turning on it to L., close L.F. back to R.F., turning from R. heel on to L . hicel, step forward with R.F., forward with L F., turning on it to L . Take small step to side with R.F. and close L.F. up) to R.F. (Q.Q.), and step back with R.F. C.B.M. is used on lst, 4 th and 7th steps.

The most popular variations are the Quarter Turns and the Kig.\%ag, and an attractive movement can be made by joining them together, making the last step of the quarter turns the first step of the zig-zag
The Quarter Turns, Figs. 5 and 6, are counted S.Q.Q.S. SQ.Q.S. The man begins facing diagonally to R. He steps forward with R.F., turning on it to $R$, to side with LF., still turning, closes R.F. up to L.F. and steps diagonally back with L.F. Steps back with R.F., turning on it to the L., closes I_F. back to R.F., turning to $L$. on $R$ Leel ( $\mathrm{Q} Q$ ) and steps forward with L.F.

Both girl and man make a quarter turn to the $R$. on the first four steps and a quarter turn to the L. on the last four. C.B.M. is used on the 1st, 5 th and 8th steps. It will be noticed that the 1st, 2nd and 3rd steps are similar to the 1st, 2nd and 3rd of the natural turn and the 5 th, 6th, 7 th and 8 th similar to the 4 th, 5 th, 6 th and 7 th of the reverse turn
stepping back with L.F., turning on it to R..
to side with R.F., still turning. closing L.F. up to R.F., and stepping diagonally forward with R.F. She then steps forward with L F., turning on it to L., taikes a small step to the side with R.F., closes L.F. up 10 R.F., and steps back with R F. C.B.M is used on the 1st, 5th and 8th steps.

The Zig. Zag is composed of five slon steps, as follows : The man steps forward with I. F., tuming on it to L, to side with R.F., still turning, back (and across behind R.F) with L.F., bringins partner outside, closes R.F back to LF. and stejs forward with L.F. The girl steps back with R.F., tuming on it to L. closes L F. back to R.F , turning from R. lieel on to 1, heel, steps forward with R.F outside partner, to side with L.F., and brushes R.F. through (close to L.F.) as she steps back with it. In this figure a quarter turn is made to the L. on the first two steps, and a quarter turn to the R. on the last three. C.B M. is used on the 1st, 3rd and 5th steps. It should be noticed that the first two steps are similar to the reverse turn and the 4 th and 5 H h to the 5th and 6th of the natural turn

Another attractive variation that may be used with advantage after the quarter turns or the natural turn is the Cross Chasse. counted Q Q.S. Fol!uwing the last siep, of the quarter turns or natural turn, as the case may be, the man lakes a small step to side with R.F., closes L F up to it, and steps forward with R F. outside partner, going straight intu the 2nd, 3rd, 4th, etc, of the steps of the Quarter Turns or other suitable variation C.B.M. is used on the 3rd step. The girl takes a small step to side with L.F., closes R.F. up to it, and steps back with L.F. to go straight into next variation. C.B.M. is used on 3rd step

Other well known variations are the Quick step, Charleston step and the Drag.

In the accompanying diagrams the R.F. is shaded, the left in outline only. The dotted outline shows the position of font after a turn has been nade on it. Diagrams will be easier to follow if the dancer faces the direction in which the tocs are pointing and turns the diagran as he or she turns See Dancing; Fox Trot: Tango; Waltz.


QUILLAIA BARK. Panama or quillaia bark, because of its chief constituent, sa ponin, has the peculiar characteristic of forming a frothy solution in water. It is inodorous, but has an acrid taste, and is used as a febrifuge and diuretic. It is useful in forming emulsions, and in the form of tincture of quillaia is an ingredient of numerous shampooing preparations. It is an expectorant, but carc has to be taken in using it internally, as it may cause irritation of the digestive tract.

Cleaning Uses. One ounce of quillain bark, stewed for an hour in enough water to cover it, provides a simple means of freshening up suits that have become shiny. The liquid should be strained when ready for use, and then applied on a piece of material of the same colour as the suit itself. Fairly vigorous rubbing is required, and when this has been completed a clean. damp cloth should be placed over the suit and a hot iron used for pressing See Emulsion.

## Quilts and Quilting

## Modern Coverlets Worked in Simple and Traditional Designs

## This article includes instructions for making a down quilt, patchwork quilts and some details for hand quiltin; work. Readers should also consult the entries on Down: Embroidery: Nighe W'ear Case: Patchwork: Woolwork

A quilt is $n$ padded hed coverlet usually of the depth of the dorm padding will become silk, satin, or sateen, with an interlining of sheep's wool, flannel or cotton wool or packed with a down filling. The down obtained from the eider duck is the hest, and, inoidentally, the most expensive. Snme kinds of patchwork quilts are made without interlining and used over a separate lining, but the original idea was that the patchwork was the outer covering stitched through to a foundation lining. The stitching which holds a lining padding in place under another material is known as quilting.
Down Quilts. The down paddeal quilt is sometimes called an eiderdown, but only the most expensive are filled with the down from the breast and neck of the eider duck which is the softest filling known. Less expensive ones arc cygnet and goose down, separated from the feathers and purified before use Vegetable down is not suitable for this purpose as it so soon loses softnces and becomes lumpy Occasionally kapok is used mixed with biri down when a cheaper filling is required.

Down quilts are sold in double or single bed sizes and in many qualities. They can be made at home and covered with self-coloured material, or with panels, horders, or centre pieces of plain material, used in conjunction with a patterned fabric. When both plain and fancy materials are to be used, the panels and horders must be cut out and machined together. If the quilt is to he made entirely of one kind of fabric, the quilting design can be lirst marked out in chalk and then with a acking thread on to the silk. Artificial silk is quite suitable for this purpose and cotton backed satin is also used. Some people prefer sateen for the underside of the quilt as it is less likely to slip off the bed than the other fabrics. For a quilt to be used on a double hed the silk will need joining, but this will probably not be necessary for a single bed or cot quilt.
Sometimes an inner case of down proof sateen is made, but this adds to the weight of the quilt. The case is formed by joining together the two pieces of silk or other fabric cut or made up to the required size. The wrong side of the naterial should be soaped or waxed, as shown in Fig 1, before making up in order to retard the passage of the down. A piping of the same or contrasting material along the seam gives a professional appearance when the quilt is finished. One end must he left open fur filling.

In the home the down has to be carefully put into the case by hand, and the end which was left open must be sewn securely. It should then be placed quite flat on to a large table or bed, and the down arranged as evenly as possible by careful shaking and tapping with the outstretched hands. Without moving or disturhing the down, tack alnng the lines marked out for the quilting, ascertaining that all the tacking stitches go right through to the underside of the case. This process is most important, as otherwise, when quilting, uneven, and the wholc appearance of the quilt will be spoilt. It is best to use a tacking thread of a contrasting colour. Fig. 2 shows the quilt filled with down and tacked for quilting.
Quilting can be done by hand by stitching along the lines of the pattern and taking the needle through to the underside at each stitch but this would make the work rather laborious. It is therefore more ofien done by machining. Test the machinc on a piece of material similar to the cover: the stitch should be long, and neither top nur hottom tension


Quilt. Fig. 1. Showing the wrong side of the m rong side of the material being soaped
with down, and tacked ready for machining
should be tight. No trace of any puckers should be scen in the stitching.
When the machine is antisfactorily adjusted, raise the pressure foot to its greatest height, pass the quilt under it, commence stitching, and do not hurry the process. With the left hand carcfully smooth out any creases in both the top and underside of the eiderdown cover.

If a hand sewing-machine is heing used, a second person to guide and arrange the eiderdown is a great help. The quilting completed, the tacking cottons should he removed carefully so that no down is drawn through in doing so, and five or six eyelet holes should he buttonholed at convonient distances from the centre of the quilt to provide ventilation. In another form of quilted bedspreads, the designs of the patterned silk, satin, sateen or chintz used for the covers are outlined with running stitches taken through the interlining of wadding. These spreads are finished with brightly coloured plain shantung or cotton linings and are most effective.
Patchwork Quilts. For cottage bedrooms and for use with four poster beds patchwork quilts are always suitable. They may be made of cambrics, gingham, sateen and other similar materials, or of silks. Sometimes they are composed of blocks of linen 6 or 8 in. square embroidered in woolwork and joined by alternate plain squares of a contrasting colour. Edges may be linished with plain banding or with a binding. Transfers can be obtnined for such blocks. Another idea is to use alternate squares of a small patterned chintz and plain satcen. Designs for quilts which
more strictly deserve the name are made with patch work and hand quilting and are interlined and lined, the quilting being worked on the p!ain border and plain squares.
l'atchwork quilts can also be made by adapting the directions given in the first part of the article on patchwork (page 913). Sometimes the work forman panel in the middle of the quilt and a border of $18^{\circ} \mathrm{in}$. is added of plain material. Such patchwork requires a founclation. Haphazard, crazy patchworis is a way of using up odd scraps. but is conly suitable for a cottage quilt. Fancy stitches such as fenther-stitch, chain-stitch or blanketstitch are used to attach the patches to the foundation. Whatever the clesign decided upon. begin by tacking the first patch to the centre of the foundation and arrange the others round it.

A foundation for a quilt should be cut and made to allow $\frac{3}{2} \mathrm{yd}$. drop at either side of the bed and also at the end. When the top is conipleted turn in $\frac{1}{2 n}$. hem all round. If only the centro panel (large enough to cover the actual top of the hed) is of patchwork, a cotton foundation is cut just of the same aize as the panel and the lining may be chosen of a suitable colour and cut the full size required so that it also forms the border.
Otherwise cut the lining material carctly the same size as the quilt, tack it in position, turn in the raw edges, and fell to the patchwork. The most suitable material for lining

depends on the kind of fabric used for the patches. Sateen, woolback satin, jap, or Shantung silk is preferahle for backing more elaborate silk or brocade patchwork. For cotton quilts use only cotton or linen for lining, a small patterned old English print, cascment cloth, crash or coloured lawn are the materials which are generally employed.

A more formal type quilt is not made upon
a foundation, but the patches are cut out in geometrical shapes, such as triangles, squares, hexagons, and octugons, each piece being mounted on fairly stiff paper. I3lack and white triangles placed so as to form a boxshaped pattern is a familiar design that imitates tiling, but the best effect is gained with octagonal shapes. Cut out a template the exact size of patch required and cut the pieces of mounting paper from this so that all the patches correspond. Place a paper hevagon on the table and see how the edges may best be joined to the surrounding patches without overlapping.
Cut out all pieces of material allowing $\ddagger \mathrm{in}$. turnings, place them on to the paper shapes, turn the raw edges, and tack to the paper.

Prepare a nuinber of pieces in this way before commeucing to join them together. Place them edge to edge, right sides outside, and sew them with very small stitches, taking only a few threads of the material, or the patches will not lie flat.
When all the shapes have been joined together, a plain or quilted border can be stitched by hand or machined on to the patchwork, and the lining made in the way already described. It is particularly necessary when making such a patterned quilt to cut each
shape with accuracy, or the effect is spoilt, inaccuracies showing much more readily on a large surface than on small ones The paper used for mounting the patches must be torn away before the quilt is lined.
Rosette Quilt. Most attraotive for a coun. try bedroom is a form of quilt dating from the 18th century, or earlicr, made of rosettes. Some originals seen came from the West Indies, the materials used for the rosettes being soft, patterned cottons as worn by the plantation negroes. Any prints, patterned lawns or sateens may be used, provided that tho scheme is harmonious and the effect light and dainty
The method of making is simple Cut out a cardboard template the size of a small saucer (about 5 in . in diameter), the paper shapes to correspond, and the picces of material allowinc for turnings. Having tacked these to the paper, whip mund the edges of the material, and before drawing up tear anay the paper. Each patch or rosette is like a little flattened circular bag with the gathered top uppermost and is juined by a few stitches to the adjacent patches, but made up in auch a way that the quilt has an openwork effect through which the separate lining of some pretty plain coloured sateen shows.

lined with muslin and padded with cotton wool. The pillow foundations inay be made of sateen and stufied with down or kapok. Fig. 5 show's an example of a charming sachet in Italian quilting in which the design stands out with a raised effect. This work is equally suited to decorating a comtorter, to be laid over the foot of the bed, to match the sachet ur for a cot quilt, and such work would form a heautiful presont.
The cxample illustrated is made of white georgettc quilted over pink crêpe-de. Chine. The padding of the design consists of bright coloured wools. These are threaded between the two matorials in the lines of the design and show through the georgette with the most delicate effect when quilted.

QUINCE. This Persian tree (Cydonia vulgaris) is hardy in Great IBritain and is worth planting in small numbers in southern districts for the sake of its Howers and its !arge, hard, pear-shaped fruits, which make excellent marmalade. They need more than the usual quantity of water when used in this way. The quince is chiefly valued, however, as a stock on which to bud pear trees; it is known as a dwarfing stock, because it bas the effect of divarfing or restricting the growth of the pear trees and thus enconrages earlier fruiting. For gardens of rest ricted size pear trees of the quince stock should be planted. The chief varieties are the apple-shaped, pearshaped and Portugal. One named the Ser bian quince, introduced from the Balkan countries, is said to produce goorl crops even on young trees.

Quince Jam. The ingredients required for making quince

Fancy Quilting. Plain quilt. ing usually consists of lines of back-stitching arranged to cross diagonally alsout 1 or 2 in. apart. This is used sometimes with an interlining of wadding to make comforters, or small quilted spreads, and cot coverlets of silk or satin and may be done by machino or hand Fancy quilting in which the stitchery forms a pattern is also employed on materials for such coverlets. Fig. 3 shows a traditional design from Walea for a full-sized quilt. This style of work dates at least froin the Tudor period and is still corried on by women in the colliery villages. 'The quilts are interlined with sheep's wool or cotton wool,
 covered with sateen ur silk or other washable material and stitched all over by hand, as shown in the illustration.

An example of English quilting is shown in Fig. 4. This cot coverlet is of quilted satin, back-stitched by hand with embroidered motifs worked in padded satin-stitch, stemstitch and darning-stitch. Desigus for quilting may be obtained through embroidery pattern services. Traditional guilting patterns are adapted to transfer form. Designs are also obtainable for quilting babies' shoes and bonnets, and for hedroom slippers, dressinggowns and jackets.

Italian Quilting. Small decorative pillows and night wear sachets to match the bed auilt are dainty accessories. They may be madr of satin, taffeta or crêpe, the quilting,
jam consist of 6 lb . quinces. 3 pinte water, and 1 lb . lump sugar to cuery pint of pulp. Peel and quarter the quinces, and, after removing the cores, put them into a preserving pan with the water. Stew them slowly for several hours until the fruit is soft. then rub all through a wire sieve and measure the pulp. Put the whole back into the pan with the requisito amount of sugar, and boil it for $\frac{3}{3}$ hour, or until it sets

Quince Jelly. To make this jelly. necl and quarter a few quinces, and, after removing the cores, weigh the fruit. and to every it of this add $\frac{1}{2}$ pint water. Cook slowly until the fruit is soft. then strain the whole through a jelly bag, and measure the juice. Tn every pint of this add 1 lh . sugar; put both


Quince. Hardy fruit resembling the pear, and much used for jams and jellies
intu a preserving pan, and boil rapidly for a boul $\ddagger$ hour, or until they set. See Fruit Jelly

QUININE. Along with other alkaloids quinine is contained in cinchons bark. A large number of salts are formed with it, those nost in use being the sulphate, the hydrochloride and the acid hydrochloride. The drug has a marked power to reduce fever Its most atriking characteristic is its power to cure malarial fever by killing the parasite

The anmoniated tincture of quinine is common and efficient remedy at the start of a cold in the head, or influenzal attack. A teaspoonful in a wineglass of water, at hourly intervals until 4 doses have been taken, will often cut short such an attach, if begun carly.

QUINOL: In Photography. This is a photographic developer which is slow in action and tends to produce deusity in the high lights of a negative rather than to bring out details in the shadows or low lights. It thus gives negatives with great contrasts, which, while useful for special purposes, such as copying hack and white drawings, are excessive for ordinary negatives. When quinol is mixed in the right proportions with metol, a very valu: able developer, known as metol-hydroquinone, or M.Q., is obtained, in which the defects of both quinol and metol are overcome, the combined developer being quick acting, clean, and giving good gradation. See Hydroquinone: Metol-hydroquinone; Negative.

QUINSY. Acute inflanmation of the ton sils going on to the formation of pus is known as quinsy. It niost commonly attacks children and voung adults. An attack often follows exposure to wet and cold, and a person who has one attack is likely to have another.
Usually the patient first complains of sore throat, with dryness and some pain in


Quilting. Three examples showing different types of quilting. Fig. 3. Hand quilting in traditional $\mathbf{W e l s h}$ design. Fig. 4. Modern English band guilting. Fig. 5. Italian quilting
swallowing. Pain may be felt in the ear and on opening the mouth. The swelling of the tonsils increases rapidly, and the temperature rises, sometimes to $105^{\circ}$ while the pulse goes up to 120 or 130 beats per minute. The tonsils are very red and are coated with mucus. The patient's strength may rapidly decline. An abscess generally forms between the second and fourth day of the disease, and it bursts commonly into the mouth, but sometimes in the pharynz. This may ocour during sleep or in a fit of coughing. Inatant relief follows the bursting of the a bscess. Frequently in children the disease does not follow this severe course. Treatment should be supervised by a doctor.
Quinsy is infectious, the patient should therefore be kept isolated. To guard against further attacks the neck should be bathed with cold water every morning, and the mouth should be rinsed morning and evening with solution of potassium permanganate, 4 drops
in a half glass of watcr, diluted glycerin of borax, 1 in 20 , or a similar wash. See Tonsillitis.
QUINTAL. This measure of weight is really a hundredweight, being either 112 or 100 lb., according to the scale used See Hundred. weight.

Quire. This measure is used in selling writing-paper. A quire contains 24 sheets, and 20 quires make a ream. See Notepaper

QUIRK. This is the name given to a nariow channel or groove separating one portion of a moulding from another. The name is also applied to the bead or fillet of a beading plane, and a tool, similar to a metal spokeshave, known as a quirk router, is obtainable for use in forming quirks. See Moulding.

Quoin. This is the name given the external angle, or corner, of a building. See Brick: Concrete.

## RabBit Keeping for Pleasure or Profit

## With Some Attractive Recipes for Cooking Rabbit

The reader may consult the article Fur and those that will help him to make a simple rabbi butch, e.p. Amateur Carpentry: Chiscl: Hammer. See also Belgian Hare: Havana Rabbit
suoner or later Frosted greenstuffis or roots should also be avoided but, contrary to common belief, there is no harm in wet greenstuff so long as it is fed in reasunable quantities. Greenstuff of some kind or other, or roots, ahould be fed to all rabbits at least once a day.

As regards concentrated loods, an albuminoid ratio of about 1 to 5 is suitable for all rabbits, but this proportion may be varied according to nge The materials commonly employed for other farm atock are also useful for rablits and cover a wide range The following mixture has been tound to give gnod results in practice: bran 6 parts. barley meal 2 paits. hest white fish meal 1 part. all by weight, mixed well together and water added till it is crumbly and moist Separated milk: buttermilk, or whey, if availahie at a cheap rate, forms a valuable foodstuff and may he used to moiaten the ninah in the place ol water. Milk in any shape is particularly useful tor very young rabibits and breeding does and less fish meal is necessary where it is used.

Rules for Feeding. All rabbita should be fed twice daily at any convenient fixed times in the morning and evening The bulk of the ration is better given in the evening The following plan will be found most convenient. In the moming nll rabbits should be given as much concentrated food as they will clear up in ahout id hours In the evening they should receive a liheral ration of greenstuff or hay, or other bulky food All nuraing does and youngsters up to the age of about three months should he given the same amount of concentrated food at night as they had in the morning; and rabbits from nhout three months to six months old and pregnant does should be given about half this proportionate amount Other rabbita should ber Liven no concentraterd

Rabbits can be kept in $n$ comparatively amall space, and be maintained to a considerable extent on waste products from the ganden or allotment Green food for a few animals can usually be ohtained for the labour involved in collecting it. Rabbita are worth keeping both for their fleah and their fur while their manure is of value to the soil

The principles of rabbit keeping are outlined in Ieafleta 265 and 376 issucd by the Ministry of Agriculture The animala must be fed wisely, as unsuitable food quickly upsets them and prevents them from thriving. A properly balanced ration of sound and nourishing food should always be provided. Green food and roots judiciously given ensure good digestion. Generally speaking a rabbit thrives on a daily supply of food equal to 2 oz per 1 h . of its live weight. Water should always be supplied Clanges of diet must be effected very gradually and feeding should always be nt recular hours
lor breeding docs and for young and growing stock than for older rabbits

Bulk food, in the case of rabbits. covers a very wide range, almost all growing or dried plants, not directly poisonous. being useful A lew only need be inentioned : calbango. cauliflower and broccoli leaves, carrot and paranip tops, pea haulms. strawherry runners. the leaves and twigs of nearly all deciduous trees, e-g apple prunings, poplar twigs and leaves, clippings from hawthorn heages, etc Kohlrabi dried nettlea. hrambles swedpe


Rabbit. Pedigree varieties that are grown for their beautiful fur. 1. Silver. 2. Giant. 3. White. 4. Lop-eared Rabbit

A prospective purchaser of rabbits should visit a show and study the rabbits there. He should also read the papers devoted to them, note the names of succesaful breeders, and make inquiries about their reliability A breeder should not start operations with more than one breed. If the rabbita are to be kept for pleasure and for their flesh, one of the heavier breeds, auch as Belgian hare or Rhenish giant, should be selected

Suitable Foods. Feeding materiala are dividel into two classes, bulk food and concentrated fool. The hulk food represents the main part of the ration for ordinary cases Concentrated food is used to supplement the bulk food It is required in larger quantities
before Christmas, mangolds, nfter Christmas, oat, straw, etc, are all useful. Beet leaves and potato parings may be given, while such plants as dandelion, aow thistle, clover, chickweed and groundsel are good

With regard to greenstuff, special care should be taken to avoid sudden changes of any kind. Thus, if rabbita bave been fed during the winter on a bulk food composed mainly of roots and hay, it is dangerous to change suddenly to large quantities of cabbage or dandelion. Care should also be taken to avoid the use of grass or other plants which may have been contnminated by the excreta either of other rahbits or of dogs, or trouble from internal parasites will certainly ensue

lood at itll at night, only in the morning In the early spring and summer the feeding value of greenstuff is far higher than it is later on, and it is quite possible during that time to rear rablits on food of this kind alone Later on, however, concontrated food becomes increusingly necessary if the best results are to be ohtained, while if rabbits have heen fed on bulky food alone it is difficult to get them to lake to concentrates. It is leetter, therefore, to feed a small quantity of concentrated lood even in the spring and early summer. It is important alwnys to inquire as to the previous feeding of newly purchascd rabbits and to introduce any changes gradually.
Stock should be watched and individual requirements studied. Most rabbits will cat a good deal more than they really require, and some suffer in consequence. The rate of growth of youngeters of breeds which have an arlult weight of about 6 to 7 lb . should be 3 to 4 oz . per week. If large quantities of succulent greenstuffe or roots are being fed water is not very necessary, but it is prudent to kcep a supply of clean water in the hutches of brceding does and young stock.

Pedigree Rabbits. Perligree rabbits of the best known and most popular brecds are just
as hardy and as prolific as their humbler relations. They may be fed on anything which a pig would ordinarily eat, excepting salty things, with this proviso, that all food given to rabbits must be absolutely sweet and fresh Every imaginable type of table scraps, oddments of left-over pudding. crusts of bread, vegetable parings, apple peel, banana skins, orange peel, cooked potato peelings, oven tea leaves, if set aside during the day in a white enamelled pail or bowl, may be utilized These are chopped up roughly, scalded with boiling water, well drained, mixed to a dry crumbly mash with a fow handfuls of dry bran and given to the rabbits just before bedtime

Rabblts for Fur. The following are the best known and most popular breeds of pedigree fur rabbits: The Giant Blue Beveren is a very large-and beautiful rabbit, whose thick, soit fur is of a blue-grey colour. It makes up into all sorts of wraps intended for hard wear, fulllength fur coats capes, stoles, and muffs, besides being in much demand for trimmings of every description. There are certain cleverly dyed blue-grey furs on the market which may be at once detected by gently blowing the fur apart. The natural-coloured fur grows from a creamy white skin, but the dyed variety will be found to spring from n blue-grey one.

The Giant White Beveren is a snow-white rabbit with a rather long, soft coat and pale blue or pink eyes. Its fur makes evening wraps, children's coats and cape, and fur trimmings. For furs for home wear this rabbit is well worth breeding, but it would not be, as a rule, worth while to breed it for selling, on account of the strong competition in imported white rabbit furs.

The Black Beveren, or Sitka, as it is sometimes called, is a big rabbit with long, lustrous, soft, blaok fur, which makes excellent coats, stoles, muffe, and wide bands of trimming for frocks and suits The Chinchilla enjoys special popularity, on account of its very beautiful soft, grey-shaded coat, which should resemble real chinchilla as closely as possible in colour. It makes good wraps and coats and is much used for summer wear.

The Havana is a good-sized rabbit, not quite as big as the foregoing breeds. Its fur is an attractive and useful shade of brown. It makes good coat collars and cuffs, stoles, muffs and trimmings. The Argente de Champagne is a large rabbit whose rather long coat is of a very pale grey. When born the young ones are quite black, but they silver gradually through the black fur, so that at about 13 weeks they become silvery pewter colour. Their fur is useful for all ordinary purposes.
The Silver Grey is a rather smaller rabbit with a short, hard coat of closely mingled black and white hairs. Its fur makes good hardwearing collars, cuffs, muffs, and stoles to wear with tailored suits. Of uncommon and attractive appearance, it makes up well into useful short coats. The Black-and-Tan is quite a small rabbit, very prettily coloured. Its coat is a fine glossy black, with dull orange points and hairs, which makes narrow drese trimmings, and is much used for fur-backed gloves and fur-lined bedroom slippers. The White Polish rabbit, which has pink eyes, has a short white coat so closely resembling Russian ermine that it is in great request for trimmings as a substitute for that very expensive pelt.

In all breeds alike a furrier cares only about the thick winter coats of fully grown rabbits, and the quality of the fur makes more difference in the actual value than the choice of breed. It is best to start with only one or two varieties of pedigree rabbit, of which the Chinchilla and the Blue Beveren would be a very suitable choice. It is, of course, necessary
to keep the different breeds absolutely separate : to mix the strains would be to spoil the pedigree stock.

Pedigree fur rabbits should be bred from three times a year, after the age of 7 months, preferably from January to July. The youngsters should be in full adult fur at from 5 to 7 months old, and must then be watched very carefully and caught at the right moment for killing, i.e. when the fur is fully through, and before there is the slightest sign of the impend ing moult. Good pedigree stock can usually be obtained at prices ranging from 10s. for a promising youngster to as many guineas for a prize-winning adult, from reliable breeders. A start may be made with a buck and 2 to 6 does of the same breed, according to the accommodation available. Each must be housed in a separate hutch from the age of 11 or 12 weoks onward until old enough to breed from or for killing, as if run on together they fight or soil each other's fur, which spoils it for selling purposes.
Diseases of Rabblts. Canker of the ear is cansed by an itch mite burrowing in the skin. Its symptoms show the base of the ear hot and inflamed, and the orifice and interior crusted with scabs. To treat it, the scab should be softened with a warm 5 per cent solution of lysol, using a small brush or a stiff feather. When it is soft the scab should be carefully scooped out with a hairpin or a wooden skewer, and burned. The inside of the ear should and burned. The inside of the ear sho


Pig. 3

Rabbit Eatch. Fis. 1. 8mall and easily constructed batch with two
 showing out in partition. Fig. S. Corner joint of framed door
bo freely dust wis flowers of sulphur, this treatment being repeated after 4 or 5 days. If the animal continues to hold
its head on one side it means that the ear drum enough for its inhabitants, and it should be so has been pierced. In this case the disease will probably be fatal, so the rabbit had better be killed at once.
An itch mite in the skin is also responsible for the complaint known as scab. In this a scurfy scab is seen on the nose, eyelids, lips, forehead, or the base of the ears: later it spreads over the body. In the early stages the skin is inflamed and scaly, and small red pimples-form. The hair falls out and the animals scratch themselves a good deal. To cure it, the hair should be cut off. The scab should be thoroughly softened with soft soap, washed off with a warm 2 per cent solution of lysol, using a stiff brush, and anointed every day with one part of Peruvian balsam in one part of the spirit. Daily painting with tincture of iodine is recommended, but care must be taken to avoid the eyes.

Some rabbits suffer from inflammation of the eyes. In these cases the eyes are red, with a tendency to water. The eyelids stick together and diacharge matter. The trouble may arise from draughts, dirty or damp hutches or injuries and scratches. The eyes should be washed with camomile tea and 2 per cent boracic acid.

Other rabbits suffer from loss of hair, this taking the form of bald patches on the coat. It may be caused by a woakening of the hair follicles through poverty of blood or nervous trouble; or it may be due to hair mites which are seen as small white spots, especially on the flank, chest and tail. When it is due to a weakening of the hair follicles, the cure is to arranged as to admit of being cleaned quickly and easily. The hutch, moreover, should be ready before any stock is bought. With the exception of the hay rack, there need be no internal features of any kind in it. Partitions are not necessary, since movable nesting boxes can be used in their place. Outdoor hutches should stand on tarred bricks. They should always be arranged to face a wall or hedge, or some other object that will give shelter from the wind.

Two kinds of hutches may be used, one being at least 4 ft . and the other 3 ft . long. Both kinds should be about 3 ft . deep, from back to front, and about 18 or 20 in . high. The large hutches are used for breeding does and their progeny: the smaller ones for stud bucks, resting does, and growing youngsters. If rabbits are kept in any number there should be about three large hutches to every two small ones.
For the need of those who only keep rabbite on a small scale, a strong and easily constructed hutch is shown in Fig. 1. It has two compartments and is sufficiently roomy for breeding purposes. Figs. 2 and 3 show the front and side elevations, and other details are given in Figs. 4 and 5.

The sides should be made first; they are 24 in . high in front, 18 in . at the back, 19 in . wide, and formed from $\frac{4}{4}$-in. boards. Unless the wood is glued up to provide a piece of the required width, and this will mean very careful planing, tongued and grooved matchboarding should be fitted together to form the correct

restrict the amount of food to very little. The food given should be good and nourishing, with a high content of oil ; for example, carrots, cloves, linseed, hemp, lucerne, sunflower seed, and linseed oil in a mash. When it is due to mites, the complaint can be cured by anointing the bald patches with petroleum or linseed oil. The best cure, however, is to bathe the animal in a " or 3 per cent solution of lysol, afterwards rubbing it dry and placing it in a warm spot away from the draughts. Care should be taken to avoid getting any lysol in the animal's eyes, while the hutch must be thoroughly cleaned and disinfected.

Rickets, evidenced by crooked forelegs and an irregular gait, is usually inherited. It may, however, be accentuated by giving the animal an undue proportion of food that lacks lime salts, potatoes and roots, for instance To cure it is impossible, but it may be prevented by frequent changes of food and putting some salt in the mash. A small saltspoonful of calcium phosphate, two or three times a week. is also helpful.

Rabbit Hutches. The hutch should be located in a dry place under shelter : it should be large

width when the outer tongue and groove have been removed A l-in. square fillet should be nailed or screwed across the bottom and a 2 -in. by $\frac{3}{3}$. length secured in the same way across the top; the latter piece should be fastened on before the top is trimmed to the correct slope. The two ends are joined by the flooring at the bottom, suitable $3-\mathrm{in}$. boards to a width of 18 in being nailed to the bottom fillets to give a length of $42 \frac{1}{2}$ in between the sides. At the top (front) a $44 \cdot \mathrm{in}$. by $3 \frac{1}{2}-\mathrm{in}$. by $\mathrm{f}-\mathrm{in}$. length is let in as shown, and a similar length should he let into the sloping top so that the outer edge is in away from the back.
The middle partition is fitted in position, suitable slots being cut to allow for the top pieces, and an opening must be cut at the hottom back comer; this should be about 6 in . or aо square. A horizontal batten can be fartened to the partition on a level with the edge of the opening. The back is nailed on direct to the bottom boards and the top piece, and nails driven in from the ends as well as into the partition. The solid door is of tongued matching nailed to lengths of 3 in . by 1 in wond, and carefully fitted in the space; either cross garnet or ordinary back flap hinges, sa shown, can be used to hang the door The wire-covered framed door is made from 2 in. by 1 in. wood, either halved at the çorners, or preferably, joined with the mortise and tenon joint.

## Securing the Wire Nettink

The frame should be covered with stout wire netting on the inside, but the ends of the netting should be turned in neatly and secured with wire staples. The four legs or supports are out from 2 in. square material and notched out at the top half-way through, allowing a distance of 12 in . below and from 6 in. to 8 in. above the notch. These pieces are screwed on to the ends a short distance from the edges. The roof is composed of pieces of matchboarding 4 ft . long joined together to project about 2 in in front and at the back. groove to prevent the water running from the roof into the interior should be planed or cut with a gouge. Another method of forming it is to plane a V-shaped cut with a rebate plane.

A goorl way of housing a number of rabbits is to have $n$ stack of hutches one above the other. These oan be made on the lines suggested, but for protection against the weather it may he well to coat the whole of the woodwork with crcosote. The floors can be waterproofed by melting some pitch in an old saucepan, adding about a tableapoonful of tar to every lb of pitch, and basting all the cracks and crannies of the floor with the hot mixture. The whole should then be treated with a hot firt-iron to work the pitch well into the wood The floor should be strewn with sand, which may be thoroughly incorporated in the pitch by the nid of a blow lamp. Grent care should be exercised in melting the pitch, and the job is best done out of doors

How to Cook Rabbits. Boiling or stewing are the most usual methods of cooking a rabbit, but it may be roasted, baked, or made into soup or pies. When buying rabbita select those that are plump and free from discolora. tion, and pay attention to the eara, claws, and teeth. The ears should tear easily, the claws be smooth and sharp, and the teeth small
Unlike harcs, rabbits should be paunched immediately after they are killed, the atomach and intestincs being removed, and the inside thoroughly cleaned. If the rabbit is not to be cooked at once, hang it up until it is required, then remove the ears and cut off the legs at the first joint, skin it, and remove the eyes This is usually done by the poulterer if the rabbit is bought from a shop.

The kidneys and the fat that surrounds them should next be taken out, the diaphragns broken, and the heart and lungs drawn. The liver, heart. and kidneys only should be
reserved. Wash the rabbit well in two or threa bowls of oold salted water, then let it soak for about $\frac{t}{2}$ hour in some alted tepid water.

Only young rabbits should be roasted or baked, the older ones being better auited to stewing. Simmer the liver, heart, and kidneys in asilted water. When tender chop them finely and add them to some veal forcemeat (see page 481). Stuff the rabbit with the forcemeat, ow up the opening, and truss with the fore lega backward, the hindlega forward, and the head in an upright position. Tie a piece of fat bacon over the back, then put the rabbit into a tin with some dripping, and cook it in a moderate oven

Baste it frequently, and when it is almost done take off the bacon, dredge the rabbit with flour, baste it again, and let it brown.. Serve it on a hot dish after removing the atring and skewers, pour some thickened brown gravy round it, and serve more of the latter separately in a hot tureen; $\frac{?}{}$ hour to 1 hour is the time required for roasting. Red ourrant or rowanberry jelly, forcement halls, and rolls of bacon may be used as a garnish.

The dish called jugged rahbit is prepared in the same way as jugged bare. For boiling, first prepare the rabhit as directed. Truss it neatly, put it into a stewpan with enough white stock or water to cover it, and add 2 peeled and sliced onions, a bunch of parsley and herbs tied together, 4 cloves and the same number of peppercorns, and a little salt

Bring the whole to the boil, then akim it well and let it simmer gently for 1-2 hours, according to the age and size of the rabbit. When it is tender, lift it out of the pan, remove the string, and put the rabbit on to a hot dish, pruring over it some onion or parsley sance. Some neat rolls of toasted bacon should be used as a garnish.
Casserole of Rabbit. Draw and clean a rabbit, cut it into nent joints, and leave these to soak for about $\frac{1}{2}$ hour. Then dry them and put them into a pan containing 1 oz. hot melted dripping, adding also a chopped onion. When the rabbit is browned, take it out, and add 1 oz . flour to the fat in the pan. Brown that also, then pour in $1 \frac{1}{2}$ pints stock, and stir the sauce until it boils.

Into a casserole put alternate layers of rah. bit and thiok slices of peeled and par-boiled potato, using about $\frac{1}{2} \mathrm{lb}$. of the latter. Add a small bunch of herbs and seasoning to taste, then pour in the sauce. Put nnother $\frac{1}{2}$ lh thickly sliced potatoes on top, cover the casserole, and cook its contenta in a moderate oven for about lif hours, or until the ineat is tender Then take out the herbs and serve the whole in the ossserole, using a few molls of lightly fried bacon as a garnish.

Rabhits also make excellent curries, fricassécs and quenelles. Reripes for these three methods will be found under the general headings, Curry, Fricassée and Quenelle in this work Cold oooked rabbit can be used as a filling for patties by mixing 4 table spoonfuls chopped rabbit with 1 gill white sauce. Add chopped paraley and seasoning to trate.

Rabbit Stew. To stew a rabbit, cut it, after soaking, into neat pieces. Fry them lightly with an onion as for casecrole of rabbit, and put the pieces in a stew-jar. Add the flour and stock to the fat in the pan, and when smooth add two sliced carrots and a diced turnip. Boil up. add th belly pork cut in small picces, simmer for a fow minutes, then add to the rabbit in the stew-jar. Season well, and stew gently for $1 \frac{1}{2}$ to 2 hours.

Another excellent way of cooking rabbit is to stew it in milk. Put it in a pan with enough milk or milk and water to cover it, add an onion, a blade of mace, a bay lenf, and pepper and salt to taste, and stew it gently until it is tender 'T'hen take out the rabbit, place it on $n$ hot dish, and pour over it some thickened
gravy. Fried rolls of bacon should garnish this dish of stewed rabbit

Rabbit Pie. To make a rabbit pie cut a prepared rabbit into joints of a convenient size, and coat them with flour Then mix them in a pie-dish with $\& \mathrm{lb}$. bacon cut into small pieces, 2 teaspoonfuls chopped parsley, the grated rind of half a lemon, and seasoning to traste.

Pile the mixture fairly high in the centrc, pour in enough good brown stock to make the dish three parts full and garnish the sides with some small forcement balls. Cover the pie with rough puff pastry or short crust (see Pastry), leaving $n$ hole in the top, and bake it in a hot oven until the rabbit is cooked and the pastry lightly browned
Rabbit Soup. 'To prepure a noursshing soup, cut up the remains of a cooked rabbit, dipping the pieces in flour. Melt a lump of dripping in a saucepan and lightly fry the rabbit in it, together with a chopped onion. Pour in a pint of water and bring the whole to the boil, skimming it well. Slice a fairly large carrot, and add it with a bouquet gami to the soup. Simmer the latter for 2 hours, then strain and thicken it with 1 oz . flour mixed with any good brown sauce. Cook the soup for a further 5 min ., and season it well

## before serving

RABBIT WOOL. The soft, Huffy wool manulactured from the skin of the Angora rabbit is popularly known as rabbit wool. Because of its silky texture it is employed in white or a pale colour to make babies' knitted and crocheted caps, and it is used extensively as an edging for knitted coats and frocks
When the garment is finished, the rabbit wool should be brushed with a wire brush such as is used for cleaning suède.
RABIES : In Dogs. The disease known as hydrophobin when it affects human beings is called rabies in animals. The most commonly affected of these are dogs, wolves, and foxes, but almost every warm-blooded animal is susceptible to the poison of rabies. The dog is the chief propagator of the disease.

Rabies practically no longer exists in Great Britain, having been banished by the muzzling order and other sanitary measures. It exists abroad, however, and this renders necessary the enforcement of quarantine with regard to imported dogs
The first signs of rabies in a dog are as follow: He becomes sullen and fidgety, he has a suspicious look in his eyes, and continually licks the injured part through which he has been infected. If his ear has been bitten, he scratches it without cessation Occasionally he vomits, and very often eats such things as straw, grass, pieces of cloth, or carpet, etc.

The madness develops rapidly, and in the next stage the dog becomes exceodingly badtempered. It is not safe for even his master to go near him. He attacks other dogs, flies at strangers, destroys his bed, and if he is chained up, gnaws the wood of his kennel. About the second day of the disease a Targe quantity of saliva flows from the dog's mouth. This continues for only 8 or 10 hours, and then the animal suñers from insatiable thirst. Unlike a human being suffering from hydrophobia, a rabid dog has no difficulty in swallowing, and therefore he has mol dread of water. The rabid dog drinks constantly, but in many cases paralysis of the jaw muscles sets in. This may quickly extend to the body and limbs, and the animal then staggers or falls. If he barks the bark is hoarse and unnatural. About the fourth, fifth, or sixth day death comes, sometimes with convu!sions, but more often without a struggle
If anyone has been bitten by a dog, the animal should on no account be killed, but should be confined and observed. If he
appears to be rabid the bitten person should undergo the Pasteur preventive treatment of hydrophobia. The animal is killed, and its spinal cord, packed in glycerin, accompanies the patient to the Pasteur institute. See Dog ; Hydrophobia: Quarantine.
RACE GAME. Games of this type exist in great variety and new ones are constantly appearing. The principle of all is the same. A piece of cardhoard is marked for the course, and on it horses, counters, or other articles are placed, one for each of the players. The latter are provided with dice and each moves his horse or counter according to the number of his throw.

In some of these games obstacles are marked, and if a player, instead of passing over one of these, just reaches it, he is penalized by having to go back a certain distance or in some other way. Sometimes the course is the map of a country, across which the playets must go

RACQUET. This implement is used in several ball games, notably lawn tennis. while the hattledore is in origin the same. In sclecting a tennis raequet it is essential to choose one that feels thoroughly comfortable when swung in the band. This is the main consideration; others are weight, balance. the size of the handle and the nature of the gut. See Badminton; Lawn Tennis.

RADIATOR: In Heating. In the home the term radiator is used to denote a heating clement, such as a gas fire or an electric heater, but by far the most frequent use, though scientifically incorrect, is to denote the multitubular unit in a central heating system from which the heat is dissipated into the room, Actually the heat from such a unit is convected, and not directly radiated to any extent. However, radiator is the accepted trade term for this type of heating unit.

The most common form of radiator consists of a series of cast-iron loops, or pipes, through which the heated fluid passes. This fluid may be hot water, stcam, or hot air. In most domestic central heating systems the heating fluid is low-pressure hot water. With separate gas-heated radiator units steam or hot air is employed. See Boiler; Central Heating; Electricity; Gas; Heating; Hot Water Supply.

RADIATOR : On Motor Cars. A radia tor is an important part of the internal combustion engine. Considerable heat is generated in the cylinder walls by the firing of the compressed gases on the explosion stroke, these explosions occurring at from about 200 to 2,000 a minute
Rising in proportion to engine speed, a very high temperature is reached, and, unless a suitablo means is provided by which to cool the cylinders, the walls would be made red hot, and the pistons would scize or even melt, if of aluminium. With air-cooled engines the temperature is kept within reasonable limits by providing the outside of the cylinder with fins (cast integral with the cylinder block), by means of which the heat generated is the more quickly drawn off and dissipated to the air. In the water-cooled system the radiator is


Fig. 2 AirSpace
used to cool the water after it has flowed round the cylinders, and before it again passes to the cylinder jackets, where the water once more becomes heated up before Howing to the radiator. The cycle of operation continues either by the thermo-siphon or pump system, so long as the engine is running. Beyond occasionally replenishing the radiator with water, the systemı requires no attention Only soft water, such as rain water, should be used, otherwise the whole of the system will, sooner or later, become coated with a deposit similar to that on the inside of a kettle, which will serionsly interfere with its efficiency.
The radiator and water passages must he an designed that free circulation is obtained, and the water temperature docs not excced $212^{\circ} \mathrm{F}$., that is, boiling point at atmospheric pressure. Boiling may cause trouble in several ways. Steam locks may cause a burst, and at írequent intervals it will be necessary to fill up to replace the loss caused by evaporation and splashing over. In the latter case, thic loss may canse the water to fall to a level at which the circulation, if by thermo-siphon, will cease to function.
Should this happen, it inay be unsafe to fill up with stonecold water, because its sudden contact with the excessively hot cylinders may quite easily cause the metal to crack. Further, if all the water has boiled away the heat of the cylinders will be such as to cause the fresh water to boil the instant it is put in, with the risk that a serious explosion will result. The only safe course to adopt in this case is to allow the engine at least an hour in which to cool down.

The efliciency of the radiator is dependent upon the speed at which air passes through its interstices, which in turn is governed by the wind and road speed of the vehicle, i.e. as the engine speed rises, so will the road speed increase, presuming the car is in top gear, thereby increasing the air pressure on the mdiator. This conls the water more quickly, but since the engine speed will often be very high in relation to the road speed, as when climbing a hill in a low gear, it is common practice to fit a suction fan, driven off the engine, behind the radiator, to ensure as far as possible a draught of air that shall be proportionate to thic demands of the engine

Radiator efficiency dejends very considerably also upon climatic temperature, i.e. the radiator that is efficient in very hot weather will be too efficient in cold weather. In these circumstances, the fan, if fitted, should be disconnected, or a part of the radiator screened off. If this is not done the petrol consumption will be excessive, owing to the fact that the thermal efficiency of the engine will be too low. In other words, at a given road speed a wider throttle opening will be called for than would be needed during the summer months. From the foregoing it will be scen that over-cfficiency can be easily remedied, whereas over-heating of the engine, caused by too sinall a radiator, cannot be cured, cxcept by the fitting of a larger one, which will be found a costly business.

There are two main types of radiator-the
gilled tuhe pattern and the honeycomb The former is the least costly to construct, but each tube nust be of a fairly strong section of a bout $z_{4}^{3}$ in. inside diameter to be of sufficient strength to support itself. Consequently, the volume of water contained will ainount to a fair quantity, and, owing to the fact that the cooling power of the gilled tube is lass than the honeycomb pattern, a greater volume of water has to he carried by all radiators of the former class.

Fig. I shows in detail the method of con struction of the gilled tube radiator, from which it will be seen that there are only two points that are likely to leak, nancly, the top and bottom junction of the tubes with the body of the radiator, discounting the rest of the radiator that is common to both types. The tubes are arranged in vertical rows, those in the second row standing behind the gaps in the first, and so on.

The honeycomb radiator is constructed on entircly different lines. There are two forins, the original tubula one, as shown in Fig. 2, and another in which shaped plates are used ns the components (Fig. 3). In the original type the tubes are used in short lengths, arranged horizontally across the body of the radiator; the ends being left open so that the air can pass through the tubes instead of round thic outside, as is the case with the gilled-tuhe pattern just de scribed. The tubes are all shajed at each ond in the form of a hexagon, making them similar in appearance to the

Radiator. Fig. 3. Portion ol a
boneycomb type radiator, built p on the Gallas principle double ended box-spanner. 'The ends of the tuhes are slightly larger in diameter than the remaining portion: therefore, when the tuhes are packed closely so that the flats of the bexagons fit up together, a space is left between the round portion of the tubes, and it is between these spaces that the water flows

All the tubes are held together by soldering, one method being to immerse to a dopth o about ? in. the hexagon faces of the hlock of tubes.

With the thermo-siphon system the height of the radiator in relation to the engine is of considerable importance. On no account should the bottom of the radiator be morc than a little if any below the level of the cylinder water jacket. This is very important, because, as is well known, cold water will not risc. Owing to the lay-out of the chassis this feature cannot always be observed, and in such cases a water pump is installed to ensure a proper flow.

The repair of the gilled-tubc radiator is a simple soldering job, but the repair of the honeycomb type is far more difficult. A temporary repair can be mado by securing a plate coated with red lead over the leali, holding it in position by a long bolt passed through one of the tubes and screwed up tightly. See Motor Car.

Radio. See Broadcast Receiving Set: Wircless.
RADISH. This popular salad vegetable is grown for its red or white roots, which mav be long, round or oval. The quality depends largely on the rate of growth, thereforc seeds should be sown on rich, friable soil to ensure rapid development. Successive sowings may be made out of doors from February to August. The earliest sowings should be on a sheltered border, and during summer a slightly shady place is most suitable; seeds are sown in shallow drills 9 inches apart. Radishes should be pulled while the roots are young.

For spring sowing the long-rooterl varieties are preferred and the round or oval sorts for sowing in summer

By sowing secds on a bed of tine soil on a hotbed in a garden frame in January or carly


Radish. An attractivesalad veqetable. Those illusfrated are of the variety known as the turnig radish

Fehruary, excellent small roots will be availa lile long before those raised out of doors are ready. The large Black Spanish and Chinese Kose radishes are useful for winter salads; they are raised from seeds sown out of doors in July-August; as the plants are vigorous thoy must be thinned to 6 inches apart.
RADIUM: Medical Uses. The element radium, obtained from pitchblende, etnits rays of three sorts : a , or atoms of helium : $\beta$, or electrons; and $\gamma$, which resemble X.rays When these fall on living tissues they produce irritation. This may only be of such a degree as to stimulate the tissuc cells to increased activity, but it may reach a point where the cells are killed. The healthy cells of the body exhibit a greater resistance to irritation than do
those composing growths; hence it is possible, by regulating the amount of irritation produced, to kill the abnormal cells without scathe to the normal ones.

It requires judgement and experience to accomplish this, because it is clear that if the dosage is not sufficient for the purpose it may actually encourage tumour growth; while if it is excessive, damage may be done to the healthy tissues.

A large number of morbid conditions are treated with radium; some it cures and in others it acts as a palliative. Amongst these may be mentioncd birth marks, rodent ulcer, and other forms of cancer, sarcoma. lupus, myomata, cataract, lieloid scars, ringworm. leukaemin, pruritus, Giaves' disease. and no on. Radium emanation, a heavy gas, in glass or metal tubes, can be intenduced into the substance of tumours, and into the cavities of the hody, e.g the larynx. The latter is a great advantage, allowing, as it does, of a direct effect on diseaned tissues which camot well be treated with X-rays.

Drinking water containing radium emanations is said to have proverl markedly beneficial in rheumatoid arthritis, a disease which often shows little response to other forms of treat: ment. The waters at Bath, Droitwich and other spas are radio-active. Sea-water contains hotli radium and radium emanation. It is probable that the benefit derived from mud baths in rheumatism and allicd disorders is due to radio activity.

RAFFIA: For the Garden. A fibrous material greatly used in garden and greenhouse for tying plants, raffin is commonly confused with best. Actually raffia is a natural grass imported from Madagascar, whilat bast is usually obtained from the inner bark of the lime tree. They are similar in appearance and, horticulturally, serve the same purpose. Another substance known as raffia is made from strippings of the palin Raphia. See Apple: Bast: Grafting : Mistlctoe; Kose.

## Raffia Work: Embroidery and Weaving

## Methods of Decorating Useful Articles with this Fibre

Some ideas are here given of the wide possibilities of this work which mny ensily be varied or claborated. The reader should also consult the entries on Bread Basket; Embroidery: Hairpin Work: Rush Work: Wistepaper Basket: Work Basket

Strands of raffia are woven into mats, baskets, hats and other articles. They are surface, as in the tea cosy illustrated, also used for embroidery purposes and for shown in the Anierican cloth tea-trolly mat making motifs which may be applied as trimmings. In its natural colour, which is similar to that of atraw, raffia can be hought from the florist, and then dyed to the deaired shade; but it is sold ready dyed in a wide range of colours at liandicraft stores and in most art work departments in big shops, together with raflia varnish, sjecial canvas, needles and raffia cloth.

If dyeing is done at lome, the raffia should first he soaked in warm water for an hour. This process makes it more pliable and enables it to take the dye more ensily than would otherwise be possible. Almost any lind of dye used for household purposes is suitable, hat dye, applied with the brush with which it is usually sold, giving particularly good results. When a brush is used, the dye is best applied to the finished article, not to the nnwoven strands of raflia, for the latter would be a tedious process and an even effect difficult to obtain.
Rama Embroidery. The most suitable trimming for rush baskets. mats, hats or garden cushions is embroidery in raffia. It is equally useful for table mats in American cloth, raftin cloth or for tea cosies with canves foundations. Sometimes heads are employed and also wools in order to enhance the effect; sometimes the embroidery completely covers
the surface, as in the tea cosy illust rated,
(Fig. 1), or is only used to form a horder, as shown in the Ancrican eloth tea-trolly mat When embroidering with this fibre select designs that are suitable. Conventional or geometrical patterns are best. Nitural raltia ahould be soaked in warm water and allowed
to dry for a few houra before working. 1yed raftin having been already soakad does not require damping unless it feels brittle to the touch. Designs can be traced on canvas or raffia cloth over carbon paper. When the embroidery is meant to be flat, a warm iron may be preased over a damp cloth on the back of the work when finisherd Satin, blanket, lazy-daisy and stem stitch (see Embroidery) are the stitches most suitable for working the fibre, and special needles are sold for use with raffin, or crewel needles may be used for finer work. Raffia strands are split into narrower threads when the embroidery demands it.

A stiff canvas is preferable to a soft one and the mesh must be large enough to take the raffia strands. Rug canvas is suitable for large pieces of work Sperial raffia canvas has only a single thrcad mesh. Brond strands of raffia cover backgrounds best. Raffia cloth is a pleasant fabric for garden cushions and cosies and is also very useful fur covering such things as blotters and bookends to be embroidered with designs in raffia

It is always advisable to strengthen the back of this cloth with thin muslin or canvas before embroidering. The edges of a large picce of work such as a cushion cover should be tacked between strips of muslin to prevent fraying whilat embroidering. The raftia cloth is obtainable hoth natural and dyed and in three qualities, fine, medium and coarse.
Book-ends of white wood, raffia cloth to cover, raffin strands in various colours for embroidering the design for which a chart is provided, leather for the base of the bnok-ends to prevent it scraping a polished table and gold galon for finishing the edges of the work are ohtainable for a few shiliings from the FrancisLewis Studio, 18, Soho Square, London, W. 1. The hook-ends make a charming gift or add a decorative note to a table. A pretty hlotter or writing pad can easily be made to match, using raffia cloth over a cardhoard foundation lined with shot taffeta and finished with gold galon. Raffia cloth covers for bridge markers are also decorative, and pochettes can be made from this inaterial, or of canvas embroidered with designs in coloured raftia

For the tea cosy (Fig. 1) a picce of canvas 16 in . by 22 in is required. The width of the cosy at the lottom should be 13 in . across and the deptli shon!d be $9 \frac{1}{3}$ in. Malie the outline 1 in. larger than the finished article to allow for shrinkage in working
The simple design of apples and leaves inay be copied frec hand on to proper and transferred hy ineans of carbon paper. Alternately, any fruit border transfer of suitable size (about 3 inches wide) may be used. Begin ly working a straight edge of bright blue rallia over two holes and then a row of black. Fill in the background round the fruit with the blue. The apples are worked in yellow and two shades of orange. The leaves are filled in with green, working from centre to edge in satin stitch. Above the border a row of black is worked.
The rest of the design is filled in as follows: Work a vertical line in black exactly in the centre of the cosy. Work over 2 holes Then work a similar line on either side 2 in. from the centre, and another at a similar distance Fill in the spaces between, using a serics of vertical stitches over 4 holes, then over 6 hodes. Continue in this manner until the whole of the cosy is filled in Thent work the other side in the same way.

When finished place the two sides face to face and machine together, turn right side out, make $\Omega$ plait of black and white raffin and stitch this round the join, making a loop at the top for a handle. The cuds of the plait should be knotted, leaving the ratia loose to form a tassel. Split this up very finely to simulate silk.

Wrap some large wooden beads with orange ratiai by passing the needle through the hole and over the beiul. Thread a needle with a


Raffa. Fig. 1. Tea cosy embroidered in natural, black, yellow, blue and orange raffa on cọarse canvas and lined with deep blue sateen
strand ol green raffia pass it through the board through the centre opening, taking care wooden bead, thread a small black head on to it, pass back to make the stalk, lenving the black bead as a finish to the base of the large bead Make 6 berries in this way, tie them securely together with some green raffia. and stitch this at the base of the handle Pad the cosy with layers of cotton wool wadding and line it with blue sateen to match the blue raffin used for the border Raffin cloth may be used instead of covering the canvas with raffia embroidery The border and finishing would be worked in the same way and $\frac{1}{t}$ yd. of the raffia fabric would be required

Luncheon mats for garden or loggia table use and tray cloths for service trolleys are most practical when mude of almond green American cloth with an applied canvas border embroidered in raffia and with coloured beada at the ends The trolley mat illustrated in Fig. 2 should measure 18 in. by 12 in (without the beaded ends). Cut the American cloth to this size, place a piece of canvas under it and cut $\frac{1}{2}$ in. larger all round. Trace or draw the geometrical design on the canvas and embroider in brightly coloured raffias, using black for the The edge (see diagram $B$ ) is worked by outer edge Leave half inch of canvas for threading the needle with a contrasting shade turning. A large-eyed needle should be used.

When the bordcr has been worked, cut out the inside of the canvas and oatch down the embroidery to the American cloth with a fine needle and silk. Turn the edge of the canvay over that of the American cloth and buttonhole round both with black raffia. Buy or make a fringe of wooden beads to match the colours of the embroidery. Attach this to the raffia buttonholing at each end and finish off the two sides of fringe by using a large black head and a small coloured one.


Fig. 3. A, mat made of colonred raffia strands wound over a cardboard fonndation and woven in the centre. $B_{\text {, edge worked with running stitch. }}$ c, method of placing strands for central weaving. D, details of knotting

Weaving and Plaiting. Other effertive uses for raffin consist of weaving and plaiting the strands to make baskets, mats, hats, and other articles. Table mats are extremely simple to make in this manner. Oval and round cardboard foundations may be purchased or a set may be cut from a strong sheet of cardboard (imperial size). Six round mats 7 in. in diameter, 2 oval dish mate 9 in. by 6 in and one large oval 11 in. by 8 in make a set For $\Omega 7$ in. mnt (sce Fig. 3) a centre should be cut out in the cardboard of $2 \frac{1}{2} \mathrm{in}$. for the ovals cut out an opening in proportion. The raffia is simply bound over the card.
board through the centre opening, taking care to overlap the strands each time so that the cardboard does not show through. Near the end of each strand, thread it with a sharp pointed crewel necdle and take it through the cardboard and make firm by pushing the end beneath the already wound raffia strands. Continue winding till the cardboard shape is covered. Two or three strands may be used together to cover the cardboard more quickly


Rafla. Fig. 2. Mat for a tea trolley made of rreen American cloth with an applied reometrical design worked in colone reometrical desi
rafta on canvas of raffia and using a running stitch. Bring the needle up through the cardboard each time, then reverse the mat and bring the needle up through the same holes so that the stitches cross.
The centre werving is begun by taking a strand of the same coloured raffia as used for the edge straight across the opening; threading through the cardboard on the other side and bringing the strand back to the other side of the opening to give a double thickness. Fasten off and repeat round the opening; eight atrands should be sufficient for a smali mat (see Fig 3, C).
Now weave in and out of these strands from the centre for about 1 in. in diameter. Make a row of knots all round close up to this weaving, one on each strand, and then a second row of knots, leaving a small space between them and the weaving. Detail for the knots is shown in Fig. 3, D. More elaborate borders can be made to such mats introducing several colours with fanoy stitches. An example of weaving with raffia on a cane foundation is given in the article on Breal Basket, page 140

A plaited raffia basket is illustrated in Fig. 4. Rush may be used instead of raffia and instructions for making the plait, whioh can be equally well used for raffia, are given in the article on rushwork The five-way plait with five strands is particularly good for the purpose. Start at the bottom, making a small flat mat by sewing the plait together with raffia of the same colour. The base should be about 9 in . in diameter Make a circle of plait exactly the same size, and build this up to form the sides of the basket, which should measure 5 to 6 in. high. Fasten it off by stitching the end of the plait inside, arranging it so that the edge is even. Sew this part firmly to the base, then take two plaita, and twist them to form a handle. The two ends must be firmly stitched inside the basket, one being sewn where the side
was finished off The raffia flowers are embroidered on to the basket direct, using a long needle. Pink, mave and fuchsia shades are always pretty if the lining of the basket is chosen to match one of these colours Make a few rather short loop stitches for the centre of each flower, and round these make long loop stitches of a contrasting colour for the petals The less raffia is handled the better the result. For the stems twist a little green raffia round a piece of string or piping cord, stitching it here and there to hold it in place. One or two pockets should be made in the silk or satcen lining of the basket, and a cover can he made by cutting the lining sufficiently deep to meet over the top when drawn up by a slotted ribbon. A small bunch of Howers provides a pretty finish at cach end of the handle, or beads may be used as explained in Fig 1

Applied Raflia Trimming. Flowers or fruit may be worked separately like the spray shown in Fig. 5 These are effective for trimming beach or garden hats for ornn. menting fruit, bread or wastepaper basketa. A piece of canvas larger than the spray required is used to work on Sketch the design and fill in with the coloured raffia strands, using long buttonhole stitches from centre to edge. Use green for stalks and leaves The centres of the flowers are of beads. Cut awny the superfuous canvas from the spray when the embroidery is finished

RAFFLE. A raffle is a way of selling an article by chance or lottery. The price is subscribed by all the persons who take a share therein, and by drawing lots, or by some other chance method, one of them wins the article. At bazaars, and also privately, articles are disposed of in this way. A raffle, however, being a lottery, is illegal, even if held on behalf of charity, and persons who promote one are liable to prosecution. See Lottery.

RAFTER. A rafter is a support for the roof of a building, particularly those membera running upwards from the wall plate to the ridge board. Rafters are generally made of timber, although metal is occasionally employed. The size most commonly used for a house is 4 in . deep and 2 in . wide, placed not more than 14 in . apart. The dimensions of the rafters should be in accordance with the following table, in which the first column gives the distance between two points of support and the second column gives the respective depth and breadth of the rafters. The sizes given are those in commercial use and approximately the size of the material as it leaves the saw

Length of bearing
not exceeding
Dimensions


Rafters are practically always put in one continuous piece : they are generally notched


Fig. 4. Work basket in plaited raffla embroidered with raffa fowers. Fig. 5. Raffa flowers snitable for an applied trimming o a wastepaper basyet or garden hat
to fit on to the plate, which is the timber on the top of the wall. and are cut at an angle at the opposite end, so that they bear against the rilge board or other point of support. They are usually supported in the middle of their span by a long, horizontally disposed timber known as a purlin. Ther are prevented from sliding outward by means of collars, horizontal timbers fixed between opposite pairs of rafters. and have to resist heavy tensile strains.

A serviceable method of fixing small rafters is illustrated in Figs 1-2, which show how the rafter is fitted to a single or lean-to roof. At the upper end the rafter bears against the

single wall plate, and at the lower end it is bird-mouthed or notched to the wall plate (Fig. 2), both ends being secured to these two plates by means of stout nails. The same method is adopted in the case of a span roof, and the construction ansirers all requirements for any kind of roof that the amateur craftsman is likely to undertake. The correct angles are obtained by the use of a bevel sifuare and by accurate measurements. The best plan is to cut one of the rafters to fit perfectly and then usc it as a pattern. Ses Ceiling: Faves: Gutter : House: Roof, etc.

RAGGED ROBIN. This is the common name of a familiar wild plant (Lychnis floscuculi). Two varieties are worth growing in gardens, alba, white, and rubra plena, with double rose coloured blonms. They grow about 18 in high and thrive best in moist soil.

RAGOUT. This term is applied to certain rich meat stews, generally brown in colour and flavoured with vegetables and herbs

For beef ragoût, any of the cheajer cuts, such as steak for stewing, round, etc., may be used. Wipe $1 \frac{1}{2} \mathrm{l}$. beef, cut it into neat picces about 2 in. square. Heat 2 oz . good dripping in a saucepan, lay in the becf, a few pieces at a time, and fry them quickly till lightly browned on each side. Lift them out on to a plate and stir into the fat 1 oz . Hour. Fry this carefully until a rich brown, stir it frequently with a wooden spoon, as flour quickly burns Pour in 1 pint good stock or, failing that, "ater and a little of some variety of meat extract.

Stir this sance until it boils. Add the neat and 2 tablesponfuls each of carrot, turnip, and onion, cut in large cubcs, a small bunch of herbs, and 6 allspice. Simmer the ragoût for about an hour, or until the nicat is thoroughly tender.

Arrange the picces of beef in a circle, or some other neat style. Scason, skim and strain over the sauce, and put some of the best pieces of the vegetable in the centre, addling, if liked, a few stoned olives heated in the sauce. Other vegetables in season can be adderl, such as green peas, fincly cut French heans, etc Mutton can be made inton a ragoût in the same way, a few tomatoes being used in addition to the other vegetables.
RAGS: Their Uses. Household uses can be found for many kinds of rags. Thus kitchen rugs can be made from woollen rags by clipping the cloth into oblongs of uniform size, say 4 by 1 in ., and looping these through
a canvas back-cloth, pieiced for the purpose Coloured patterns of a simple sort can be formed, and if rug.maling is contemplated it is advisable to save scarlet and other brightly coloured woollen rags for the ornamentation of rugs predominantly of a darker colour. Mop-heads for polishing floors can be made by cutting old blanket into uniform strips and joining the pieces at the centre. Iron-holders and stair-pads are other uses for thick woollen cloth Linen and sill rags are valuable for polishing furniture and cotton ones for applying metal-cleaning liquids and pastes.
Too large an accumulation of rage is to be avoided. but by keeping an orderly system of rag-baga, one for nes sort and one for another, the household need never be short of kinds suitable for all purposes. See Rug.

RAILING: For House and Garden. A railing is essentially a fence composed of rails or poles, and is used to mark a boundary of one hind or other, or to serve as a protection


Rafter Method of fxing rafters for a simple leanMethod of fxing rafters hor a simple lean-
Fig. 1. Top end spiked to wall plate Fig. 2. Feet bled-mouthed to plate
(c.g. around a basement area, or the well of a staircase, guarded by balusters and handrail).
Borders and open spaces, such as lawns or flower beds, are often provided with light. low railings made of wrought iron, either
painted or galvanized. These are purchased in lengths, complete with standards, generally having an inverted U-shaped foot. and have merely to be driven into the ground The joints hetween the scetions are united by ineans of bolts passed through holes in thi standards.

When erecting railings on a low brickwork wall, one method is first to put up the standards, then the flat top rail, placing the railing bars through the holes in the top rail, plumbing them with the aid of a plumb line, and alining them with a cord stretched between standard and standard, and then making the feet secure with strong Portland cencont mortar worked up into the form of a cappin! on the wall.
Another method is to use the standaral aron coping, which is generally 9 in in width and more or less $V$-shape in cross-scction. This is bedried in cement mortar on top) of the wall, and provided where neccssary with holes for reception of the standards. In some designs of villa railings complete panels of an arnamental pattern are provided, and these are set on the upper and lower raila A common arrangement is to use cast or wrought iron standards and to hang the gate on them The standards are generally provided with braces to give them stability, and are set in concrete or stonework The horizontal mem bers are fixed to the standards, and the whole completed by the addition of the necessary ornamental pancla or railing bars. An alternative plan is to build two brick pillars. one on cach side of the gate. and hang the gate between them. In such cascs the horizontal rails are emhedded in the brickwork.

To preserve railings they should be painted at frequent intervals, certainly not less than ance every three years. The paint used should be of good durable outdoor quality. and before it is applied the railings should he thoroughly well brushed and all traces of rust and dirt removed. The paint should be well brushed into all cracks and crevices, is it is here that decay is most likely to occur:

## Railways: Model Engines \& Rolling Stock

Practical Advice on Installing and Equipping a Miniature Railroad
This contribution describes the construction and running of a Gage No. 0 Railay, with all its details Information is given on the selection and operation of clockwork. stam and electric locomotives The model engineer should refer also to the associated articles on Engine and Locomotite

A model railway built for the private plensure of its owner and friends may take one of many forms. It may comprise a tiny No. 00 (尽-in.) gauge system complete with all sorts of buildings and scenic effects in a space not much larger than an average dining room table. At the other extreme is the railway laid in a park perhaps several miles in extent. constructed to a gauge sufficiently large to serve some useful purpose. Passenger-carrying miniature railways form a popular feature of certain of our pleasure grounds.

For an indoor model railway-a type of line which comes within the scope of this article-the standard gauge of No. $0(11-\mathrm{in}$.) is recommended

The average tank engine model mensures 13 or $13 \frac{1}{2}$ in. long orer the buffers, and a six-coupled express engine from $15 \frac{1}{2}$ to $19 \frac{1}{2} \mathrm{in}$. overall length, according to type. A four wheeled goods wagon is $5!$ in. and an a verage model bogic carriage 13 in . in length This means that a goods train consisting of a tank engine and ten trucks measures just under if ft . in length, allowing for looseness of couplings, and a passenger train of an engine and three coaches will measure at least 5 ft . ong These dimensions will be useful to renember when it comes to planning a model railway to fit a given space.

An attic mom can be made to accommodate a system providing reasonably intereating
possibilities in both the construction and the linal operation of the line. The minimum curve recommended is 3 ft . radius, but, for the larger types of express engines so often modeller, curies with 4 ft radius may he used for points and ill station yards, with 4 ft . j in. to i ft . 0 in . radius curves on the main or other fast running lines. Super-elevation of the outer rail neal not exceed in on the aliarpest curve.
Lay-out Plans. The question of the lay out of the track must eventually be determined by the shape of the availaile site and its overall dimensions. The clockivork engine is more suited to the non-continuous typo of plan, but with the clectrically driven engine controlled from a point alongside the line it does not very much matter whether or not a circular lay out is adopted. For a steam inodel $n$ continuous portion of main line is essential, as most models will run for about fifteen to twenty minute non-stop, and the methods of outside control provided are somewhat primitive.

Where the plan is arranged on a terminus to terminus system a railway operated by clack. work engines should be designed with regatil to the length of run to be obtained, with a train load, at a single winding. This length varies from $1 ; 0$ to 100 feet. The distance between the starting and finishing points should therefore le $a$ definite fration
of-nr equal to-the average run of the weakest locomotive used on the system. In this way a model railway can be successfully operated by clockwork locomotives to a time table working without the labour of winding hecoming a noticeable factor, so long as several locomotives arc available.
Where a long room is available the two main stations may be at the adjacent ends of a non-continuous plan, such as that shown in Fig. I, the distance between the termini being equal to one half, one third or the total minimum length of run of the clockwork engine. In the case of an electric engine each station and half of the main line can be under the control of a separate operator.
Where the exigencies of the site demand it, the terminals may be placed quite closc tngether, as in Fig. 2, or may be combined as one unit. In the plan illustrated an additional (passing) station-a country roadside station with a simple equipment-is shoirn in about the middle of the main line. This railnay, if electrically controlled, could be morked by eithor one or two operators, the eections being arranged to suit.
Fig. 3 illustrates a plan much used for all types of lucomotives, but particularly suited to the steam engine. The main linc is con. tinuous, and at the same time a short-distance or local train may run from terminus A to terminus B, and an express train starting from A may make as many circuits of the continuous track as the signalman at the junction signal hox desires before being switched over into torminus B. The order of departure and arrival fast main line portions should emergo from is reversed on return journey. The terminal the straight or slightly curved scctions. stations are comparatively close together and are inside the circle, an advantage where a one-man control is necessary. For electrical control the rails may be divided into three sections. The junction signal box may contain slritches for the continuous main linc and the junction, and stations A and B can be controlled from their reapective signal boxes. The stations may be different in plan. In addition to the passenger platforms, terminus $A$ has a loconotive depôt, while terminus B may be provided with a goods yard.

Lines on Different Levels. In sorne cases, to get more features in a given space, the linea are arranged on difierent levels. For instance, it may be an advantage in the plan shown at Fig 3 to extend the stations over the top of the continuous main line, which is made to run in a tunncl under the station. This is possible only where a sufficient length is obtainable from the junction where the upper and lower levels meet. The head room required for an over and under crossing is about 5 in in No. 0 gauge, this dimension allowing for the depth of the track and ita supports. This means $2 \frac{1}{2} \mathrm{in}$ up and $2 \frac{1}{2}$ in down, and since the maximum gradient should be about 1 in 40 , a length of 100 in. is necessary to effect a crossing. It is possible to steepen the grading to 1 in 30 (the length between the level portion and the over and under crossing being 75 in .) where the trains can be rushed down and up tho necessary inclines.
Points to Note. Other points to be considered in planning aro the following :
(I) If prossiblo always provide a means for the engine to run round its train at an arriving platform or station. (2) Where a train has to shunt into a siding there must always be
 that it extends clear of all wheels and othe parts of the engine outside the running rails (Fig. 4, B). At the points the conductor rail is omitted from between the tracks and extended along the outside of the tracks. The shoe is thus always in contact with a conductor rail, either inside or outside, and cannot fall below ito proper level. The rails are arranged as shown on the plan (Fig. 4, A)


Third rail coniductor (omilled al points \& crossings)
Fir. 4. Electrically operated system. A, arrangement of conductor rail at crossings. B, extension of collector shoe to reach outside conductor
enough room beyond the points for the The made-up tinplatc track usually supplied longest train contemplated. (3) A turn. for toy electrical locomotives has an all-level table may be used to switch engines into system of rails, and the above remarks do various sidings, taking up much loes space not apply. The standard points and erossings than that occupied by points. (4) An oval are nade in such a manner as to cut out plan without any straight line is much hetter (i.e. render electrically dead) that portion of than a square plan with short straight lines the running track that is crossed and touched and curves at the corners. Straight portions by the collecting shoe on the locomotive, and are necessary, of course, to accommodate no short-circuiting can therefore occur. With stations. (5) Points to branches leaving the amateur-built tracks using points of orthodox design some such device as that shown in Fig. 4, B, is necessary.
Signal Systems. Signals are used in full-size railway engineering to indicate to the driver the state of the road ahead of him, and also to show the direction in which the points and crossings he may encounter are set for his train.
The semaphore signals are of various patterns and ralues, including home distant, and shunting or subsidiary signals. The absolute stop signal, termed a home signal, is shown in Fig. 5 . The permissive signal known as the distant signal indicates the state of the home signal which follows it. The distant when at danger (see Fig. 6) is a warning to the driver that the home signal ahead is against him, and that he must be prepared to stop at it. It may be "off" (i.e. at "line clear") when he nrrives within sight of it, but that does not matter, for he lias had the warning. On model railways distant signals are not absolutely necessary, ns in the casc of an electrically operated railway the signalman is also the driver. They are therefore useful as ornaments only. In a clockwork railway the distant signal can be on the site of the trip gear opcrating the brake on the engine, or the latter may be used instead of a visual "distant."

Dealing with shunting or subsidiary signals, the ringed semaphore arm shown in Fig. 8 is used for sidings or branch lines. For shunting purposes a small or "calling on" arm is often fitted lower down on the same post as a home signal to call on an engine for a limited distance past the main home signal at danger.

The home signal semaphore is coloured red on the front with a white stripe, and white on the back with a black stripe Tho lenses are red for danger and green for the lowered "all right" position. In the distant signal

yellow takes the place of rad both on the signal arm and in the "danger" lens. The chevron stripes on the arm are coloured black, back and front, and the end of the semaphore is always "fish" or "swallow" tailed, as shown in Fig. 6.

In many of the latest types of signuls the semaphore arm has an upward inclination from the horizontal for the line clear position as shown in Fig. 7. In this kind of signal, thercfore, the arin risce into the air instead of falling. The dutted outlines in Figs. 5. 6 and 7 show the lino clear position of the arms.


Railway. Fig. 11. Diagram showing the standard dimensions of rolling stock and permanent way for model railways, pauges No. 0 and No. 1 . A scale of measurements for cach rauge is given at foot. For references see accompanying table
Colour Light Signals. These are now coming numerous, as the final development is not yot into use, especially on urhan lines of railuay. complete. Light signals may he very casily In such signals a powerful electric lamp modelled by using the small light bulbs now is placed in a funnelshaped recess facing readily obtainable in the lower voltages the driver, and this light can bo seen quite clearly both day and night. The systems are



Fig. 9


Fig. 10
Railway. Model Signal Systems. Fig. 5. Home Rainway. Figodel Distant signal. Fig. 7. Howard inclining signal. Fig. 8. 8iding or branch line semaphore. Figs. 8 and 10 . Colour light signals

One system in which two lights arc employed (Fig. 9) is very suitable for model railway work. The danger position of the pair of signal lights is shown at $A$ in Fig. 10. The combination functions as a home signal, and a distont signal for the next section. One (the stop aignal) lamp shows red and the lower one yellow. A train must not pass this sigual. The next state (B), the upper light showing green, indicates that a train may pass up to the next signal. The third state (C), in which both lamps show green, means that two sections alicad are quite clear.

Model Buildings. Station buildings, bridges, tunnels, embankments and cuttings arc accessnrios essential to תuy permanent lay out. For a railway that must he dismantled after use these units may be made in separate components, laid alongside the line when in operation. For any railway that is permanently installed in $a$ room allotted to it, proper track material obtained in loose parts is recommended. A firm foundation about 2 ft .10 in . or 3 ft . from the ground level shonld be built up, and the sleepers nailed to this. Ballasting can he effected by glueing the surface of the base and sprinkling chickengrit on it while it is tacky. Where the track is purchased in lengths, with the wood sleepers made up on longitudinal battens, the hallast should be laid in loosely, as a considerable depth is necessary to reach to the top surface of the sleepers. Ready made tinplate track should only be employed when a permanent track is not possible.
Electric Locomotives. It is important, before purchasing an electrically diviven model locomotive or the component parts for making one, to know something of the various systems employed.

For use with dircet current of any voltage the ordinary electric motor with a scries wound field and armature is the best possible unit for traction purposes, whatever the size of the locomotive may be. The only disadvantage it has is that reversing inust be done either by

| Ref. l.etter | Description | $\begin{aligned} & \text { Gauge } \\ & \text { No. } \end{aligned}$ | Gange <br> No. 1 |
| :---: | :---: | :---: | :---: |
|  | Maximum loading Gauge: Width .. .. .. Height <br> " ., " HeiRht at side. | in. | il |
| $\begin{aligned} & \mathrm{A} \\ & \mathbf{B} \\ & \mathbf{C} \end{aligned}$ |  | 29 | 31 |
|  |  | 31 | \% |
|  |  | 3k | 41 |
| $\underset{\mathbf{E}}{\mathbf{D}}$ | Gauge between ratils Space between tracks ("six -foot way") | 17 | 11 |
|  |  | 2k | $3{ }^{3}$ |
| $\begin{aligned} & \mathbf{F} \\ & \mathbf{G} \\ & \mathbf{H} \end{aligned}$ | Between wheel tirrs Tire width <br> Bulfer centres width нpart | 18-1 $x^{2}$ | 1\% |
|  |  | t | 18 |
|  |  | 18 | 2\% |
| J | helght fmm rail |  |  |
|  |  | -18 | 18 |
| $\underline{L}$ | Madimum loco. Width <br> Maximum conch body width | 24 | 3\% |
| M | Side height coach hody Maximum helght of toco. chimacy imin rail | 148 | -18 |
|  |  |  | 51 |
| 0 | Platforn edge fromi track centre |  |  |
|  |  | 14 | $2 \%$ |
| P | Plationn height above rail level | $1{ }^{\prime \prime}$ | 1.1 |
| Q | Minimum width of platform | 23 | 4 |
| 1 |  | 26 |  |
|  | lvernge width of plat- form | $3{ }_{3}$ | 43 |
| $\mathbf{S}$ | Neareat inturo on plat form | 13 |  |
| T | Neareat bridge pier orMinimum width of bridges (double line) | 114 | 218 |
|  |  | 61 | O, |
| v | Nearest himilding on platforill. | 113 | 28 |
| w | Nearatpurapeet |  |  |
|  |  | 13 | 28 |
| K | Ncarest platiorm | 18 | 11 |
| Y | Minimum height of platform awning . | 27 | 4 |
| L | Dinimum clearance of over line bridge | 28 | 51 |
|  | Single linc tumnel Double line tunnel Station nanie boards | Use |  |
|  |  | attac | hed to |
|  |  | dra |  |
|  | Outline of loading gange | Sce dime | A, B, C nsions |
| S 0 | Slecper sizrs (ordinary type) | $2\} \times 1$ | $31 \times 1{ }^{1}$ |
| S S | Slemper apacing: average enntres | 11 | $31.10{ }^{\text {a }}$ |
| T N | 1 lb in the model effunis |  |  |
|  |  | tons | scr |
| R H | Rail height for seale track for ordinary track | $\frac{1}{2}$ | 3 |
|  |  | 1 | 1 |



Kailway. Well arranged gauge No. 0 indoor railwas with tracks on two different levels Courlesn of JV. J. Hassett-Lowlie
a hand switch, or an antomatic polarised relay switch on the engine. It is necessary to reverse the relation between the direction of the currents in the armature and the wound field magnet. Simply reversing the supply of current to the rails will not make any difference to the direction of rotation of the motor.

All the larger and better qualities of model clectric locomotives have a mound field, and since roversing from a distance is desirable, a permanent magnet switch or reverser is usually fitted in the locomotive. This switch is sensitive to the direction of the current, and when the operator changes it over from positive to negative, or vice versa, the switch follows this movement and changes over the connexions in the motor, thereby effecting a reversal of the engine. Smaller models, in gauges Nos. 0 and 1 more particularly, a re fittell with motors having permanent magnet fields (like a car magneto). The field polarity is therefore constant, and the only path for the track current is through the armature of the motor. Changing this over reverses the motor.

Electric locomotives fitted with permanent magnet lields and also those with series motors and polarisel relny switches are usable only on railwass operated by direct current. Accumulators are the only really natisfactory sonrce of supply. However, it is possible to break down the house supply (dircet) current through a resistance or lamps, and this method can be used on model railuays where one or two engines only are employed.
The voltages used vary from 4 to 25 , the higher voltage, of course, decreasing the amperage consumed, and getting over many othor dilticulties. For a 4-volt loco. a 6 -volt accumulator should he installed to allow for drop in voltage and speed regulation. For a 25 -volt installation the sorrce of supply should be about 30 rolts maximum

In every section of the line governed by a separate opera tor a resistance switch to regulate spleed and a com. mutator switch to change over the current direction and effect reversal arc necensary. These may he combined and worked by one handle. The line may

## MODEL RAILWAY SYSTEMS IN GENERAL OSE

 Gauge No. 00 (合 in.)Scale, f mmi. to the foot: ithth full size
Rather smadi for avemge nudel maker; allows for a completo ralvaly aystem in amall room. loolling stock and track parts obtainable in various styles. Locomotives, except for two or three desigies of a very cheip hilil rather more expensive than No. (1 gange models.

## Gainge No. 0 (1t in.)

Scale $\overline{6}$ Ganing to 1 foot ; ith fill size
Most popular gange. Stean, electric and clockwork locomotiven of all kinds and valucs reudily obtaimable. Almost ccery accessory necesenry to a complete railway available. Recommended for electric and elockworh oleration.

Gauge No. 1 (lif in)
Sculc 10 mm to 1 foot; ith full slze
Somembat larger than No 0 gauge but quite as satisfuctory. This gange is recommended for st cimm models.

## Gauge 23 in (" Hulf-inch" scaie)

Actual scale 17,32 in. to 1 foot; npprox. Ird fu! size
Smalleat outdoor gange that ean be reconmended. Suited to locomotive of the "engineer made" type Smallest practical size ior coal and charcoal Hred boilers

Gauges 3\} in., 41 in., and 5 in.
in. scale and 1 in seale.
Standard panges used in making locomotives of an engineering elaracter without regard to the trachs on which they may rin. Used for passenger hauling ut Model Railway club exhibitions.

$$
\text { Gauges } 6 \text { in., } 7 \frac{1}{2} \text { in., } 8!\text { in , and } 15 \text { in. }
$$


Gaukes sultable for garden, cstatc and pleasure griund railways. Opernted with loros. Working by stcam or internal combustion engines

Clockwork Model Locomotives Clockwork is to be preferred as a mochanism for driving model locomotives where juveniles have to he catered for The youngstor can do no harm to himself or his surroundings in its use At the same time this form of motive powor is often employed by the more advanced molei railwryman. Where the latter's concern is chiefly railway operation, and he desires accuracy of visible cletail hoth in the track and rolling stock, then the spring motor has many advantages. The railway should the designed to suit the length of run at one winding

The modern merhanism can be supplied with reversing gear, brakes, and speed changes. Within recent years a variable speed governor on the lines of the gramoplione governor has been applied to the hetter quality motors A means of reversing from the trark is usua!ly litted, but it is rathet a clumsy device not recommended except for the small fourwheeled shunting enginc. a type of model for which the arrangenient was first introtuced. However, although the trip-genr is provided on the locomotive, the reverser need not be used, as special trigger rails are required to operate the mechanism. Clockwork locomotives should not be run with the wheels spinning in the ait. nor should the engine lie


Model London, Midland and Sco:tish express locomotive, Royal Scot Courlesh of Messrs Basxetl-Lowhe. Led
eft wound up for indelinite periods after usc I'he gears slould be kept quite clean, washed occasionally with paraffin, and lubricated frequently though not copiously with a light sewing machine or cycle oil

Spring motors were at one time fitted to morel engines nas largo as $\frac{21}{2} \mathrm{in}$. gauge. but the tendency now is to limit the use of this motive power to gange No. 0 ( $1 \ddagger \mathrm{in}$ ) and gauge No. ( 0 ( $\frac{5}{8} \mathrm{in}$.) locomotives

Steam Models. The steam loco. as a working morlel depends for its success on the provision of a setisfactory fire to turn the water in the boiler into steam at sufficient pressue Thero are practical reasons against making scale models of any type of locomotive in the gauge No. 0 size to work by steam power: 'The Inarger engines-those of American proportions more particularly-are quite easily modelled, and if the boilers are raised up, without regard to scale, to give more room for the flame of the lamn, it is possible to make a small type of locomotive steam well Of course, a small boiler means n short !ength of run.

Al! successful No 0 gange model steam locomotives are lired with methylated spirit lurned in a special form of vaporising lamp. The pilot wick vaporises the fuel and keeps the lamp alight As a rule plain cylindrical boilers with the flame undernenth are enployal in conjunction with these vaporising lamps. The same system is also used for No. I genge models, and as the boilcrs of these locomotives have a morc generous capacity, the length of run can be increased from eif minutes in a gauge No 0 scale model to 41 minutes in $\Omega$ similar gauge No. I engine.
'lhe stean pressures usod are somewhat low. varying from 15 to 25 J 1 b . per aq inch. This allows thin plates to le safely used in the construction of the boilers increasing
incidentally the value of the surfaces heated action, and the arca of the roof governs the by the lamp. The cylinders are usually of thic piston valve type, and work with very little frictional loss. There is no packing of any kind, and therefore pressures used nust the comparatively low. Care is required in lubricating the cylinders and valves, and the oil should be of the proper type and grade recommended by the makers, quite free from dirt and grit. Friction must be kept at the minimum, so that the low hoiler pressure can be used with effect.

Spirit reservoirs are usually poportioned so that the fuel is cxhausted binfore the water in the boiler seaches a dangerously low limit. The safety valve should be examined each time the engine is used to see that it has not stuck up during the period of disusc Rcversing is usually arranged by a change over valve, worlied from the cab, which commutates the directions of the "live" and cxhaust " steams
RAINPROOF CLOTH. Oilskin or mack. intosh cloth is neederl to resist really heavy wettings, but the treatment which makes it waterproof closes up the pores of the fabric. Rainproof cloth, while fairly resistant to ordinary showers, is just as well ventilated as unwaterpmofed fabrios Cottons, woollens, and silks can all be rainpmofed and, although principally employed to make raincoats, they can he used for ordinary suits and dresses.
'The processes used affect only in an imper. ceptible degree the appearance. touch, and colour of the article These processes cannot, however, be attempted at home without inviting disappointment and courting risks. The goods need first to be prepared and to have all grease removed, and the most efficacious results are obtained from a combination of chemical and mechanical methods. The cloth is best impregnated with a chemical (acctate of alumina), and this, unless properly donc, may spoil the colour.

The goods are then dried and given an in finitesimally fine film of was, and it is important to haye the right mixture of waxes. The "as may be rubbed on dry, when it is almost impossible to avoid the production of shiny streaks; or be applied in a melted state, for which purpose a trace of wax is laid on by means of a metal roller ; or the wax may lee dissolved, e.g. in petrol, into which the cloth is dipped.

A rainproof coat when wet is best dried near a firc. Mackintoshes are spoiled by heat ; rainproofs are bencfited, if not placed too close

RAINWATER: Domestic Uses. The co!lection and storage of rainvater is import. ant, especinlly in the came of any country house that depends upm a well for its water supply Care has oftell io be exercised in the consumption of the drinkiug supply, owing to the well or other sousce of supply being low during prolonged dry weather. In this case it is a gieat boon to hare a gool supply of fairly clean rainwater: Rainwater has the advantage of being soft, and is theiefore very effective for washing purposes

The uses to which the rainwater can be put depend upon the condition of the water, itself. If it is stored in a clean tank or cisteri, and properly filtered, it can bic used for almost any purpose in emergence. even for trinking, if iirst boiled. As so much dejicuds upon the state of tho water, it is worth while w see that it is caught and stored in clean tanks where it will not he greatly affectel by the surroundings. The rain will wash dirt off the roof, making the water in the collection tank dirty. To overcome this trosible, nil applaratus known as a "rainwater separator" may be used. The action is for the first foul washings of the roof to be turned anay to waste, only allowing the cleaner purtion of the rainfall to be stored. The apparatus is automatic in
action, and the arca of the roof governs the ize of the separator.
In inany cases it is almost essential to filter the water befure it is used for any domestic purposes, this being done by connecting the collection tanl: by means of a pipe to a modern filter. If the collection tank is in an expored position the fap should be covered by a wire gauze, of as finc a mesh as possible: this prevents small sticks and the like loom finding their way into the tank if the tank is placed near the roof an overllow should be made flowing to another tank or water butt, on the ground level or other convenient position. If this is not done, and the mof tank should overflow aftor . heavy rain, the interior of the house would probably suffer.

It is sometimes difficult to place a single tank so that it collects the whole of the rainwater, as the gutters cannot all slope in the same direction. For this reason water butts or tanks should be placed at the various out inderground tank and then pump it out by means of an urdinary hand pump, as required. The diagram shows how a large underground tank can be built of brick and rendered in cement. The rainwater passes first through a filter hed containing clean washed gravel and coke.

RAISIN: In Cookery. The dried fruit of the grape vine known as the raisin is extensively used in cooker!. Nuscatel raisins, which are dried on the vines, are considered to be the best, and, together with almonds, are often used as a dessert fruit Sultana raisins are prepared from a succial secdless grape.

Raisins should always be cleaned hefore use The simplest way of doing this is to rub them on top of a sicve with a tablespoonful of flour. but if they are very dirty they may be washed in the same way as currants.

Before raisins are mixed with other ingredients, the stalks should be carefully removed, and the stones taken out with a Iruit-stoning machine, if a vailable. Raisins are usually cut into small pieces. A little butter rubbed on hoth sides of a knife will prevent the fruit from sticking to it: if a food chopper is used, a few drops of lemon juice should be added instead. Ruisins can be bought ready stoned.
Raisin and Apple Pic. Raisins and app!cs together make the following excellent pie Niash and stone $f$ th raisins, leave them to soak in a basin of cold water for a fow hours, and then peel 1 I . apples, cut them into thick


Raisin Batter. A wholesome, steamed pudding appreciated in the nursery
ometimes to an possible to lead some of the water with milk, and bake the pie in a hot oven for
slices, and remove the cores. Strain off the water from the raisins, reserving it ; stand a funnel in the centre of a pie-dish, and fill the latter with the raisins and apple mixed together, a lew slices of thinly pared lemon rind, and 3 o7. Demerarn sugar
Adil ahout a gill of the water in which the raisins were sonked Make 6 oz . Haky pastry, roll it out to a thickners of din., and cut from it a picce large enough to cover the top of the pie and some narrow sirips for the cdges. Damp the erges of the dish. put on the strips. damp these also. and then lay on the top
 Rainwater. Sectional view of underkround tank and fler bed, showing how the
water is purifed in clean washed gravel and coke. before being delivered into e cement lined stornge tank
with milk, and bake tho pie in a hot oven for ahout $\&$ hour, or until the pastry is lightly brow ned and the fruit cooked. Serve it dusted with castor sugar

Raisin Batter. To make this steamed pucdding, arld $40 \%$. prepared raisins to an ordinary batter pudding mixture (see page 70). Decorate a greased mould with a few raisins, and pour in the mixture. Cover with greased paper and a lloured pudding.cloth, and stenm it for about 2 hours.

Rais.n Chutney. Chutney made from cqual quantities of apple and raisins can be prepared thus: Peel and cut 1 th apples and half that quantity of shallots into dice. mix them with l lb. stoned raisins, al lb. brown sugar, 2 oz salt, $\frac{1}{2}$ oz. mustard seed, pint vinegar, and cayenne to taste. Simmer them gently in a pan over the fire for about $1 \frac{1}{2}$ hours, then put the mixture into a dry jar or bottle and tie it down when cold.

Raisin Dumpling. Add (ioz. prepared raisins to ordinary suet dumpling mixture, divide it into small even-sized portions, and rall these into halls on a lloured pastry-board. Cook them rapidly in a saucepan of hoiling water for about $\frac{d}{}$ hour, or until they rise to the surface of the water, then take them out and serve them with sugnr, and, if liked, some custard anuce.

Raisin Wine. Boil together $\mathbf{f} \mathrm{lb}$. raisins and 6 gallons water, and when the fruit is soft rub it through a sieve so as to remove the stones. Then put the pulp back into the pan, pour it, with the water, over the sugar, and add $\frac{d}{d}$ pint dried yeast spread on toast. Leave the mixture to ferment, and when fermentation has almost ceased, put in 2 quarts of elder Howers tied in a muslin bag. taking them out again when the wine is sufficiently flavoured. Bottling may be done as noon as the wine is clear. See Batter; Dumpling: Pastry: Sultana.

RAISING PLATE. The name is given to a small heam which rests upon the tie heams in a mof for the purpose of supporting the lower ends of the conimon raiters. The expression is also applied in some districts to the pole plate, or wall plate.
The general purpose of this timber is to raise the rafters above the level of the brickwork composing the wall so that air can circulate
around it Another function is to tie the ends of the rafters together and also to distrihute the load by apreading it over a large area See Rafter: Roof.
RAKE. The garden twol named a rake is used for covering in newly sown seed, dragging nut surface weeds from beds and horders, for tidying top onil, and as an implement to separate crocks and stones from fine earth Rakes with steel-tonthed heads about 12 in long are hoth efficient for open-ground work but for llower-bed raking and dressing, tools of half that length are more suitable. If found preferable, a wooden - tonther rake may be used See Casting Gardening ; Nail

RAM : For Raising Water. The hydraulic rant utilizes the momenfum of a volume of moving water to force a portion of the water to a higher level than that of the original head The principle is illus. trated in Fig. 1. Water falls from the reservoir through pipe $A$ to a ram chamber having a valve $V^{1}$. The delivery valve $V^{2}$ is kept closed while $V^{\prime}$ is onen, owing to the greater pressure of water in the delivery pipe. When the velocity of the water escaping past $V^{\mathbf{1}}$ through the holes 00 reaches a certain figure this valve is suddenly forced up rgainst its seating, and the trapped water opens $V^{2}$ and enters the delivery pipe until its momentum is cxpenderl. Then $V^{2}$ closes, and $V^{2}$ opens again, the cycle of operations continuing as long as water is supplied with sufficient head to pipe A The grenter the lift, the smaller is the proportion of the water forced into the delivery pipe.

As a guide, it nay be taken that the quantity, D, delivered will be equal to half the quantity (F) that enters the ram chamber multiplied by $\frac{W}{Y}$ in leet, where $W=$ the working fall and $\mathbf{Y}=$ the total lift from the ram. Thus if the working fall be 10 ft . and the delivery head 100 ft ., and $F=200 \mathrm{gal}$. per minute, then I) $={ }^{2002} \times{ }^{10}$ giol gal. per minute.

The ram illustratad in Fig. 2 is suitable for working falls from 3 ft . to 10 ft ., with delivery up to a height of 100 ft . This latter figure does not take into account losses due to friction, which virtually increase the delivery head and diminish the practicable height to which water can be raised See Pump; Water Supply.

RAMBLER : The Rose. This term is applied to vigorous climbing roses chiefly of two types, those raised from Rosa multiflora and others raised from Rosa wichuraiana The multiflora ramblers are rather less rampant than those of the wichuraiana type; favourite varietics are Blush Rambler, Goldfinch, Pemberton's White Rambler, Tausendschon, Tea Rambler, and Violetta and Veilchenblau (the so-called blue roses). All these are suitable for covering poles pillars and arches. Some of the hest ramblers of the wichuraiana type are Alheric Barbier, American Pillar, Aviateur Blériot, Chatillon Rambler, Pink Climber, Dorothy Perkins, Dr. Van Fleet, Emily Gray Fraicheur, Hiawatha, Sander's White, Scarlct Climher and Thelma. These are suitable for covering arches, arbours and trellis. See Rose.

RAMMER. An earth rammer is used to consolidate the surface of the ground when making a path, or after erecting a post. A heavy wooden rammer is employed when setting paving stoncs or cobbles. It measures about 3 ft . in height and 8 or 9 in . in diameter, tapering towards the top, where it is furnished with a single hand grip. A
second grip is fitted at right angles nbout hall way down, and the lower end, or head, is shorl with hoope to prevent it splitting.

A rammer with an ion head is handy in thegarden and costs little The shaft is abont 5 ft . long, and the head may be from about 7 lb . to 10 lb . in weight and cither circular or rectangular in shape. A head which is should be selected. In use the shinft is grasped between both hands, raised about a foot off the ground, and driven downward with a throwing action For lighter work the rammer is hela firmly int the hands, and the ramming is effected rather more by pressing or pushing the earth downwards.

RAMONDIA. This is a charming rock garden plant with a rosette of large leaves; it bears pretty purplish flowers in early summer The hest are Heldreichii, lavender blue; pyrenaica, violet purple; and Nathalide, purple Ramondia must be planted llat against a shady rock with its roots in a crevice filled with a compost of loam, peat (or leaf-soil) and sand Propagation is by sowing sceds or by division in late summer

RAMPION. This is the common nanie of phyteuma, a genus of hardy plants helonging to the bellflower family. They thrive in well drained gritty soil in the mek garden Some of the best are canescens, lavender hlue: comosa, blue and white ; and orbiculare, purplish: they are increased by division in spring. Tho dense clusters of hoom on rather short stalks give these plants a bizarre appearance.
RANCIDITY. A chemical change which is termed rancidity takes place in fats or oils when exposed to unfavourable conditions of the atmosphere, or kept 100 long without proper preserpation. This change produces a most disagrecable taste and smell. and renders them unfit for food

Butter particularly has a tendency to become rancid, and this tendency is increased if it is made up without the addition, or the very scanty addition. of salt. Hut once butter has acquired a rancid taste it is not possible to restore it completely. though it can be much improved. Wash it well and melt it slowly over the fire, skimming it from time to time; then strain it and let it cool Sometimes butter which is actually fresh persesses a rancid Havour: this is due often to une ven churning or neglect to extract all the buttermilk.

Both olive and almond oil have $n$ tendency to hecome rancid Neither of these should be kept too long, and never in a very warm place; the bottles must be well corked Fish oil quickly acquires a rank, unpleasant taste. See Butter ; Fat : Food: Oil ; Suet, etc.
RANDIA. This is the name of the plant from which Indinn ink is made. It is a hothouse, cvergreen flowering shrub with white or ycllow fragrant blossoms, horne in spring. The soil required is a mixture of loam, peat, and charcoal, and the temperature should average not less than $60^{\circ}$. Propagation is by cuttings taken in the spring.

## Ranges for Large and Small Houses

Advice on Choosing and Firing this Adjunct to the Kitchen

Arlicles rela:ed to the one below include those on Anthracite Stove; Conl; Fuel. See also<br>Boiler: Central Heating: Cocker; Kl:chen; Oven

The older type of kitchen range earned for he tilled around with brickwork when the range itself an unenviable reputation, consuming as is being fitted into the house The design of a it did large quantities of fuel: often with flue is the work of a specialist just as much as poor and variable resulta. Thic causc was the design of the regulation of the air supply to generally to be found in badly designed or the firc. Too small a flue will give an incffective inefficiently built flues; open fires and badly draught, as will unnecessary projections, sharp constructed fire grates ; the absence of proper angles or oracks in the flue itself Too large a means of draught regulation; the absence of in sulation from the front and sides; the lack of a highly polished top, and in the de sign and placing of the loot-water hoiler. These defects are overcome in modern types of kitchen range. which are scien. tifically designed and provided with various fuel and abour-savink devices
Instead of supplying merely the working portion of the range and leaving the flue to bc built up in brick work by the builder, the stove manulacturers provide iron flues, which can


Range. Fig. 1. Small portable range, very economical and portable range

Huc will callse nusch of the heat given out by the fire to pass up the chimney A badly constructerl tlue may give rise to back diaughte, cnusing the smoke to be blown out into the kitchen.

Well dcsigned ranges are ly no means expensive, and the pur chaser should not be sntisfied with just what the builder cares to supply, but should take tho trouble to enquire of one or two manufac. turers, stating the duty required of the range and the approximato amount lie wishes to spend on it. If there is cnough cooking to


Range. Fig. 2. Larger type, with high pressure boiler, rack, and bot closet. Fig. 3. Single-oven range of conventiona patrern having ename Fig. 5. Oil-fred double-oven range with glass and steel canopy 2.3. Smith it liellstood, Lid., and 5, Irrior Oil Burners, Llal
keep tho range going during the cold weather, enclosing three sides of the fire box and thus the stove can be made to give a plentiful having a high degree of efficiency supply of hot water for baths and other domestic uses, but it must not be supposed that this will be obtained without an extra consumption of fucl, over and above that normally entailed in cooking.

In the warmer montha, when the range is only required at intervals for heavy duty, recourse can be had to the gas cooker which is gencrally installed in most houses as a matter of course. The problem of hot water supplies can bo overcome by the use of a gas circulator, this being brought into operation during the time that the range is out of use.

When a boiler and a gas cooker are fitted in the kitchen it is often a convenience to install a small portable range in the scullery Fig. 1 shows an efficient and inexpensive range obtainable in quite small sizes, ranging from 24 in . wide ( 28 in with a side hoiler) to 42 in . wide. This range can be obtained with enamel finish at an extra charge.

Fig. 2 illustrates a larger range of the same type, having a plate rack above, and fitted with a high pressure hot-water boiler A useful hot closet is provided in the skirting underneath. When the cooking requirements are greater there are two types of range which can be considered, the one (shown in Fig. 3) following conventional lines and the other (Fig. 4) being an approach to a pattern favoured on the continent, where the stove stands out in the kitchen, thus gotting sidelight and permitting accoss to the side of the range. In the latter an L -shaped boiler is fitted

The single oven range shown in Fig. 3 is made in sizes to suit a recess from 36 in . to 54 in . wide. The back and sides are tiled, and the base is enamelled. The type of boiler fitted depends on the quantity of water required to be heated, and the least powerful will deal with a 20 -gal. cylinder The bigger boilers arc somewhat expensive, and run into us much as a small independent boiler. It is generally better, when the hot water requirements are large, to install a separate coke-fired boiler for the purpose
An Oil-Fired Rangc. A larger range is illustrated in Fig 5, with two ovens and a glass and steel canopy. The range shown in the picture is arrangel for oil firing, a method quite practicable with stoves of this magnitude, though it involves some considerable outlay on the oil burner plant, storage tank, etc. The system illustrated is the "Prior," utilizing a trough shaped horizontal burner. The oil is fed hy gravity at the bottom of the trough. and the air necessary for combustion is supplied at low pressure from a blower. The sane pattern of range is available for coal firing.

A cooking stove of different design and principle has bcen evolved by a Swedish scientist and is now on the market. It depends upon the accumulation of heat for its efficiency. The fuel used is coke or anthracitc, and though the stove be kept alight day and night continuously, the total annual consumption is only about $1 \frac{1}{3}$ tons. The heat is accumulated by a heavy and massive iron
barrel surrounding the fire-the latter being quite small-and is conducted to other parts of the cooker in the proportions necessary The temperature of the Larrel is controlled by an automatic device which regulates the draught accordingly. The walls of the cooker are insulated so that very little heat escapes and the kitchen does not get ton warm A tank holds ahout 10 gallons of hot water, which is maintained at a temperature just below boiling point and is available for cooking or washing-up purposes. Features of the "Aga" cooker, as the stove is namied, are a boiling plate, over which toasting and frying are clone, a simmering plate and two ovens. The two hot plates arc covered when not in use by circular insulating lids which prevent heat being dissipated.
Combination Ranges. It is sometimos a convenience to be able to combinc in one stove the means of warming a room, heating water for the bath, ctc, and cooking. The range shown in Fig. 6 is typical of $a$ kind which allows a fair amount of cooking to be done at need, while preserving the comfort and cheery appearance of the open fire Beneath the oven is a griller, and above is a hot plate on which a saucepan, etc., can be kept warm after heating on the fire below. A hot-water boiler is located at the back of the fire. This kind of stove can be fitted into a recess in the kitchen in place of the ordinary range.
The Fuel to Use. Some of the combination appliances are specially designed for burning anthracite and coko, with which they give very good results, but in most ranges a good long. flame coal is the best fuel, as the Hames are extremely useful in heating the oven. The advice of the maker should be taken as to the most suitable fuel. Where kitchen coal, nuts or cobbles are recommended, care should be cxercised to find hot, frec-burning, clean coals which are well sized

When lighting the fire, woorl or paper or a firelighter should be employed in the ordinary way, care being taken to allow air to pass through freely from below. Coal and cinders from the previous day's fire should be built up lightly above the wood, and when oombustion is well eatablished further coal nay be added. The dampers should he arljusted according to whether heat is required first for hot water or cooking purposes. Much time will be saved if care is taken to use only paper and wood which are thoroughly dry, and it will assist matters greatly if the coal has heen kept in a dry place. Trouble is sometimes experienced in lighting a


Range. Fir. 6. Combination stove which cooks, heats bath water, and warms the sitting room Samiuel Smith.d. Sons, I.1d
lire, owing to the flues being cold, in which enso wood should he burned freely for a short tinio in order to warm up the range.

It is not adrisable to nllow a fire to become too low ; but it this has been done, only a very sinall quantity of fuel should be added to the dull fire. The fire should then be rakel, the draught opencd, and when the lire is burning more briskly fresh luel added, due care being taken not to put on too much at $n$ time.

In those ranges which depend to a great extent upon llame for heating the oven and boiler, the fire should he stoked at the time when oven or boiler heating is required, so that full advantage may be taken of the flame produced in the early stages of combustion.
RANUNCULUS. Some of the worst garden weeds -hs well as many beautiful hardy flowering plants are contnined in this genus The weeds are the various wild buttercupe of which the most troublcsome is the common buttercup (Ranunculus acris). Fair Maids of France (Aconitifolius flore pleno), which bears small double white fowers on stems 20 in


Ranunculus. Bright gold fowers of an attractive litt!e plant for a ahrubbery or rock Rarden
high inl May is a charning plant for moist soil it is happy by the waterside or in the bog garden. Amplexicaulis, 10 in , with grey leaves and white Howers, and lingua, 2 ft ., yellow llowers in summer, are also good plants for inuist soil

Several alpine buttercups are delightful flowering plants for the rock garden; the best of them are montanus, yellow; alpestris, glacialis and parmassifolius, ivith white flowers in carly summer: they need well drained gritty, loamy soil and slight shade.

There ane some brilliantly coloured flowers among the florists' varieties of tuherous rooted ranunculus of which there are various types-French, Turban and Persian: the double Turban varicties are very handsome. Jhe tubers should be planted, claws downwards, in enrly autumn or in February-March in well-drained soil with which sand has been mixed frcely, if nccessary: they should be set whout 2 in. deep. It is ivise to protect the bed with bracken or evergreen branches in screre weather and to lift and store the moots after the leaves have diel down. See Bachelor's Button

RAPE. Rape is the popular name of a salad vegetable, Rrassica napus which is usually grown ansl sold as mustard in the mixture of mustard and ciess. Cultivation is the same as for mustard. When used as mustard in mustard and cress the proportions of seed to be used should be as two of rape to one of cress in bulk. If sown thickly on
vacunt ground and dug in when a tew inches ligh. rape maker an excellent gicen manure. See Cress: Mustarl.
RASH. An cruption on the skin or the: mucous membrance is popularly called a rash. It may consist of redness, piinples, blisters, pustules, or mixtures of these. Alost of the infections diseames have characteristic rashes, which observe $n$ fnilly constant rule with regard to the time of their nppearance in the course of a particular diseasc. They may be summarised thus: The usual day of appear ance : First day: erraipelas, chicken-pox, rubella or German measies (may be on sccond or thirl day). Sceond day: scarlet fever Third or fourth day : small-pox: the fourth measles. Fifth day: typhus. Eighth or ninth day typhoid fever.

The distribution of the rash: Frysipelas unless there is a wound, on the bridge of the nose and the cheelss usually. Chicken-pox. over the body and in the inouth. German measles the fice and neck, then over the trink and limbs Scarlet fever, the neck and
chest. then wer the body. Small-pox the forchensl and wrists, then over the borly Mensles, the forehead, face, neck, fauces. and over the body. 'Typhus, the abrlomen. then over the body Typhoid. the abolomen back. chest and clsewhere.

A rash may alsn be c!ue to poisons, cither those formed within the body in digestive and other dizorders, or those which are intronluced into the boily: and a rash often follows the use of antitoxic sera.

RASP: Its Uses. A rasp is a kincl of rough file used for shaping wood and other comparatively soft inaterial. Amongst manv varieties the ordinary pattern is that known is the half-round, one side being llat and the other semicircular in cross section. Rasps are also obtainable llat, circular and square in cross section.

A cabinet rasp is a half-round rasp with bather finer teeth than the ordinary liud. The mugher types are employed for primary shaping and the rabinet rasps for further finishing the wood

## RASPBERRY AND RASPBERRY DISHES

## Success in Growing the Fruit and its Table Uses

The fol:owing article follows our usual plan. The grouing of the bush is $f$ rst desarited and infermation fiven ahout diseases and pests that attask it. Then come de:ails about preparing raspberries in various ways for the tahle

Rich soil is essential to the successful Queen Alexandra and November Abundance cultivation of the raspherry, an invaluable if required for jam or for cooking purposes. hardy bush fruit Before the canes are put raspberries should be gathered as soon as they in, the ground ought to be dug deeply and manured. A mulch or top dressing of manure in spring is also advised. Every 3 years basic slag, 4 oz . to the square yarl of ground. should he applied in autumin. The plants ought to he 2 ft apart in mivs $\overline{\mathrm{j}} \mathrm{ft}$. from each other.

In spring tho cancs of newly planted raspberties should be cnt down to within ubout $G$ in. of the ground to force the de. relopment of fiesh strong shoots which will hear fruits the following year. No further pruning is needed until nfter the fruits are gathered. The old canes ought then to be cut right out and a limited number of new ones, five or six on each plant, ought to be tied to the support. Similar pruning should be done every year when the fruits are over. Farly in the summer numernus fresh shoots or suckers will develop, but those in excess of the number required should be pulled up. They may if necessary be transplanted to form $n$ fresh plantation

Some of the best red varieties of summer fruiting raspberries arc The Devon, Superlative, Perfection, Park Lane, and Royal. Lloyd George is called a perpetual - fruiting variety because it locars fruit in autumn as well as in summer. It is pruned in the way described above. Yellow Antwerp) is one of the best yellow rasp). berries.

Autumn fruiting raspberrics, which bear crops in September and October, need quite different pruning from the summer fruiting raspluerries All the canes must be cut almost to the ground in spring, for the fruits will be proclucel by the fresh shoots Good varieties are Hailsham.


Rasphery Cultivation. 1. Soil preparation: $a$, well-dug bottom soil ; b, manure. 2. Plantina up to old soil mark: $n$, firm soil. 3. Maiden cut down (a) after planting. 4. The result. 5 and 6 . Theory of pruning: $a$. removal of tips encourages tip fruit only: $a, b$ and $c$ graded pruning.
the best method. 7. Planting too close. 8. How to train a clump. the best mathod. 7. Planting too close. 8. How to train a clump.
8. Training on wires : $a$, old canes cut out


Raspberry. Left. Large and luscious berries of the Perfection variety, a favourite kind with fruit growers. Riabt. Autumn fruiting variety known as Lloyd George
sticliy substance, the whole then being biwnt. In addition an autumn soil fumigant of 1 part naphthaline to 10 prarts finc coal ash should be forked in.

The raspberry weevil is difficult to deal with, because of its nocturnal habits. It must be sought at night time while engaged in feeding, when all affected shoots must be well shakien deer a board smeared with tar or with some similarly sticky substance.

Activity of the raspberry weevil is generally evident by badly eaten foliage, appearing without the presence of insects during daytime Soil fumigation with a recognized preparation dusing late autumn is a good remedy, also spraying with lead arsenate before any of the canes fruit. A more homely remedy consista of ashes soaked in paraffin and sprinkled round the plants. The weevil hides in the soil during the day.

Raspberry Moth. The raspberry moth is sometimes a serions pest. If an infected plantation be examined early in May it will be seen that many young shoots have withered owing to the attacks of the small red caterpillars of this moth, which bore their way into the shoots. The remedics are to keep the ground clean, frec from rubbish, weeds, old sticks, etc., and to spray the raspberry canes in winter with paraffin emmlsion. A further remedy that will be found effective in destroying the raspberry moth is to spray late in March with lime wash marle by using 12 lb . of quicklime in 10 gallons of water.

Raspberry Sawily. The larvac of the pest called the raspberty sawfly feed upon the pith and cause the canes to shrivel. Cater pillars are about $\frac{1}{2}$ in. long and may be identified hy their colouring of insipid green. The only remedies are burning of canes containinc grubs and spraying with lead arsenate paste during the late autumn. The paste should be purchased ready mixed, and used in the proportion of $4 \mathbf{0 7 .}$ to i) gallons of water. The mixture is very poisonous.

How to Cook. If required for jam or for cooking purposes, raspberries should be gathered as soon as they come readily off the cane, just in advance of perfect ripeness Choice raspberries intended for dessert should be picked with whites Pour the the stalks just before they are ripe enough and hake tha pudding in a moderate oven to drop off. Discard any damaged berries until it is set. and place the others in a glass or chinr Raspberry Trifle. Spread $\frac{1}{2} \mathrm{H}_{1}$. raspberries fruit dish. Castor sugar may be sprinkled on a large dish, sprinkle them with castor over them a little while hefore they are to sugar, and leave them for about $\frac{1}{2}$ hour, mixing be served, or it may he handed round at with them 3 mashed bananas. Split 6 small
the tablc. Like strawberries, raspberries may also be served with castor sugar and cream. Raspberries are mixed with red currants for stewing or for making into pies and tarts or for jam. With bananas, raspberries can be made into a good fruit pures.

Raspberry Jam. To every lb. of fruit used in making raspberry jam, I lb. sugar should be allowed Pick over the raspberries, and put them into a preserving pan with the sugar ; cook then very slowly, and keep them well stirred until the sugar has dissolved.


Raspberry Trifle. A very delicious fruit trife made with fresh fruit

Then bring the whole to the boil, and continue boiling for about one hour or until the jam sets when tested on a colld plate.

Raspberry Jelly. A very good raspberry and claret jelly can be made as follows: Boil up $\ddagger$ pint raspberries, $\$$ pint claret, $\{$ pint lemon juice, 407. sugar, the rind of a lemon, two cloves, and 23 oz. melted leaf gelatine. Strain the whole through muslin, and then pour a little of it into a wet mould.

When it sets, decorate it with some chopped pistachio nuts, cover these with a little more jelly, and let this set also. Then pour in what remains and put the mould in a cool place. When its contents are set, turn them into a glass dish and it will be ready to serve.

Raspberry Pudding. A raspberry pudding, in which red currants also are used, is made thus. Line the edges of a deep dish with a strip of short-crust pastry, and into the dish put I pint raspherries and half that quantity red currants. Sprinkle over them 2 oz. castor sugar; then heat up the yolks of 3 eggs, add to them another 2 oz. sugar, and lastly stir in lightly the stiffly whisked

Raspherry Moth an injarious insect pest which attacks the young shoots. Below is sean the larval form of the insect
Hn permission of the Miniserstry of Apri.

sponge cakes spread the cut sides with rasp berry jam, then arrange them tastefully in a glass dish and soak them, first with 1 gill hot milk and then with t gill sherry.

Make a pint of thick, vanilla Havoured custarl, and leave it to coosl, and when the sugar has well soaked the fruit, pile the lattel in small heaps on the sponge cahes. I'our the custard over them, stand the trifle in is cosel place, and then ilccorate the top irith 1 gill whisked cream, sweetened and llavoured with vanilla and garnished with chopped pistachic nuts and raspberries.

Raspberry Vinegar. This fruit vinegar is made loy putting 1! lb raspberries into a jar covering them with I pint white wine vinegar and letting them stand for 10 days. Stir then daily, then strain off and measure the liquid allowing I th. cane sugar to every pint Boil the vinegar and augar together for about 10 min., taking the scum from the top, and let the whole cool before bottling it. It should he kept in a cool place

Raspberry Wine. This wine is made by putting ${ }^{6}$ quarts ripe raspberries into an earthenware vessel, bruising them well with a heavy wooden spoon and then pouring over them if quarts cold water. Let them stand until the following day. stirring them fre quently, then strain the liquor through a fine hair sieve, draining the fruit thoroughly.

To each quart of liftuor add I lb. lump sugar stir the whole occasionally until the sugar is dissolved, and then turn it into a cask. Bung the latter looscly for several days until formentation ceases, thon tighten the bung and let it remain thus for 3 months The wine may then he bottled for use.

RASPBERRY BUN. For this bun take Iflb. llour, 8 oz margarine or butter, 2 eggs , n pinch of salt, \& lb sugar, 2 teaspoonfuls baking powder, some raspberry jam, and some milk. Rub the margarine into the flour, add the dry ingredients, the eggs (beaten) and sufticient milk to make a stiff paste. Make into about 24 buns, and place them on a wellgreased baking sheet. Make a liole in the top of each, and put in a little raspberry jam. pinching the dough together about it. Balie them in a hot oven for ahout 15 min See Bun; Cuconut Cake; Rock Bun.

RASPBERRY GATEAU. This rich sweet can be made by sieving together $\mathbf{6}$ o\%. flour. 2 o7. cornllour. half teasponnful haking:


Respberry Gateau. A rich sweet suitable for serving at parties
powder, and a pinch of salt. Rub into them ilb. butter, then stir in 1 oz. eastor augar, and mix the whole to a stiff but pliable paste, with the yolks of 2 eggs , adding milk as required. Roll the paste out to a round shape about an inch thick, line a deep, greased sandwich tin with it. hrush it over with milk, and hake for 20 min . in a briak oven

Jet it cool on a sieve, then split it into halves, and spread the inner sides with rasp)berry jam, filting the two picces together again. Whisk the whites of the 2 eggs to a stilf froth, fold into them $\& \mathrm{lb}$. castor augar and what remains from \& lb . raspberry jam, and add a few drops of cochineal. Shalic the mixture on top of the cake in small heaps,
put the cake back into the oven so that the ineringue may set, and sprinkle over it a few blanched and chopped pistachio nuts.
RASPBERRY SHORTCAKE. For this cakc take \& lb. Hour, 3\& oz butter, 2 oz lard, $\frac{1}{2}$ tensponful baking powder, a pinch of salt, teaspoonful lemon juice, and an egg Sift the llour, baking powder, and salt into a basin, then rub in the fat lightly with the tips of the fingers Beat the egg, poup it into the centre of the flour, add the lemon juice, and mix all into a firm duugh. Knead it thoroughly and divide it into two portions, and roll these portions into two rounds about $\$$ in thick and 8 in across
Thic paste must not be rolled out more than once, oo it must be shaped during the rolling. Lay one round in a cake ring, brush the top with oiled butter, and place the other round lightly over it. Bake these in a moderately quick oven from 15 to 20 min and let the cake cool. Strain the juice from a bottle of raspberries and make the fruit into a purée. Cream 2 oz. fresh butter, and add 4 oz . icing sugar and the raspberry puree. Split the shortcake in half, and arrange a layer of the filling between the two halves and garnish the top with the remainder of the mixturc and whipped cream. Put the shortcake into a dish, make a syrup with the raspbery juice and pour it round.

RAT : How to Destroy. There are no more unwelcome visitors to a house than rats, which not only raid the larder but do much damage to property and are notorious carriers of disense.

The two kinds of rats found in Great Britain are the black and the brown rat. The former has increased rapidly in numbers during recent years, and is well known as a earrier of the plague. It has a tail an inch longer than its body, which is about 7 or 8 in long. The brown rat, which more commonly infests houses, is licavier in build and longer in body, with a shorter tail and a coarser fur, grey-brown above and white below.
'The first intimation of the rat's arrival is very often the discovery of a biggish hole beside a garden path, generally near a dust bin or the back cloor. If a fox terrier or other dog is kept it will often be the first to give the alarn by scraping furiously at the hole. Very often the intruder has got inside the house undiscovered, and announces its presence by unmistakable gnawings and crunchings at the woodwork. It may have visited the lander during the night, and scraps of food dragged about the floor tell their own story. The rat is not usually to be detected by smell, although he is a confirmed scavenger and may have come straight out of drains that need overhauling. Where poultry are kept the presence of a rat is soon announced by fathers lying about; eggs begin to disappear and chickens, too, unless prompt measures are taken.
Preventive Measures. One of the first things to be donc is to cut off all possible sources of food supply, for rats acldom remain in any place wherc they cannot easily obtain food for their young ones. The practice of leaving grain or other food lying about in poultry runs encourages their visitations, and the same remark applies to refuse allowed to accumulate in gardens or back yards instead of being put away in dustbins. Where the foundations of a house are concreted and the brickwork laid in cement the building is rendered to some extent rat-proof, and preventive measures of this kind, together with the use of galvanized iron shecting, arc particularly adviobble for stables; granarics, and farm buildings
Brsement windows aro protected by a covering of heavy galvanized wire netting of $\frac{1}{2}$ in. mesh: Burrows under floors from which
rats have been dijuen should the tilled with concrete, broken glass, or orockery and cement. But the most inportant, as well as the least expensive. of all preventive measures is to cut off ford supplies, particularly in the form of garbage, and sec that the dust hin is properly covered. especially at night.

Usc of Poison. So far as private houses are concerned, the two principal methods of destroying rats are by the use of poison and by trapa. Various preparations containing phosphorus, strychnine or arsenic are sold evcrywhere by chemista, grocers, and oil merchants. Many of these are in the form of a paste, which is spread on some strong sme!ling food, such as a piece of kipper or bloater, a scrap of bacon or cheese.

The bait thue prepared is placed far enough down the hole to be beyond the reach of cats and doga na far as possible. A point to bo noted in purchasing theso rat poisons is that if they have been kept a long time in the tradesman's shop the virus may prove less effective, at least in its immediate results This explains why rats have been known to consume repented lloses of poisoned food without apparently experiencing any ill effects, and other measures have had to be resorted to.

The greatest care should he exercised in keeping these poisons where neither children nor domestic peta can get at them, or where they might be mistaken for something else, with disastrous results Children should be specially warned not to touch the tin or box containing the poison, which should either be put away on some high she!f, or preferably kept under lock and kev. It is always a difficult matter to safeguard hens unless the poison can be placed outside the run, and even then there is the risk of fowls getting out and being poisoned, while in addition birds have been known to pick up the prison and drop it inside the run

## Another Kind of Bait

A less dangerous varicty of bait is provided by the use of cither barium carhonate or red squill, as powder or liquid extract. An effective mixture of the first kind consists of onc part each by weight of barinm carbonate powder, grated cheese, dripping and line oatmenl. The fat is melted and mixed with the dry ingredients into a thick paste. Two parts of rolled oats may be substituted for the checse and oatmeal. A good red squill recipe is made up of 1 part of red squill, $2 \frac{1}{2}$ parts of fine oatmeal or rolled oats, and $1 \frac{1}{2}$ parts of dripping. Sugar is also used as an ingredient in rat poisons, another recipe consisting of 1 part of red squill and 2 parts each of fine ontmeal and castor sugar, which should be ruhbed through a finc sieve and thoroughly mixed.

Liquid extract of sed squill can be obtained from any chemist. The method of using it is to mix some of it with an equal quantity of cold milk that has been boiled, add sufficient bread to form a thick paste, and lay it in saucers or tin lids in places frequented by the rats. Should only the powdered form of red squill be available. it should be mixed with bread and milk in the proportion of 3 or 4 oz . to a pint of milk. Preparations containing red squill are probably the safest to use for poultry runs.

Another method of waging war on rats is by employing a acientifically prepared virus composed of cultures of microbes. Tho effect of such a poison is to infect the rat with intestinal discasc, which is contracted by others. This method, however, is attended by a considerable element of uncertainty, and it has the grave objection that the infocted rats become carriers of the diseasc, with serious risk to human beings Punsigation with sulphur dioxide gas is resorted to in warehouses, ctc., but is not alvisable for bouses.

Use of Traps. 'Ihe oldest contrivance for killing rats is by means of a trap. The chiel proint in its fnvour is that it involves no such risks as accompany the laying down of poison about a house, and when properly laited nnd set it very often achieves its purpose when other methods have failed The principal varictics include the wire trap in the form of a rectangular box, $1 \frac{1}{2}$ to 2 ft . in length, which opens with a powerlul spring. The door of the trap is held open by a catch so as to afford access to a brited hook, and the slightest displaccment of the hook, as when a rat enters and nibbles at the bait. releases the catch and closes the trap, leaving the rat a prisoner Stecl gins or toothed spring traps are in use, and nlso the ordinary spring trap which kills the rat when the spring is released. In the varnish or bindlime trap strang lithographic varnish is spread on a piece of card board about 15 in by 12 in

It sometimes happens that $n$ rat nfter eating the poisoned bait, goes to its nest nud dies there, with the result that an offensive smell invades the housc. In such esses a goorl deodorizer is found in chloride of zine, which should be applied in the following manner A hole is bored as near as possible to the spot hom which the evil odour is supposed to cmanate. It may be neccessary to use a brace and bit for this puiprose 'The chloride of zinc is dropperl into the bole, which is then elosed with a colk
Legal Points. The Icgal side of the subjoet has been dealt with in several Acts of Parliament in recent years, as the necessity for destroying rats became more generally recog. nized. Under the Protection of Animals Act, 1911, rentricting the use of poisons, it is a complete defence to a charge of contravening the Act that the poison was used to kill rats, provided all reasonable precautions were taken to safeguard domestic animals

A more important change was made by the Rats and Mice (Destruction) Act, 1919, by which the occupier of land or buildings is bound to take all reasonable and neccssary steps for the destruction of rats and mice, and in default is liable to a fine of $£ \bar{u}$, or $£ 20$ in a case where he was served with a notice under the Act.
RATAFIA : Its Uses. This name is given to a llavouring essence made from the kernels of certain fruits, as apricots and cherries It has an almond like flavour, and should be used only in small quantities, a few drops being sufficient for most purposes. It can be bought in small bott!es from most grocery stores, but can also be made at liome.
To prepare it, pound the stonce from 2 lb . morello cherries, with 1 oz . blanched bitter almonds and $\Omega$ little brandy, thon turn them into an earthenware jar, and pour over them four breakfastcupfuls good brandy. Cover the jar tightly, and let its contents stand for $1 \frac{1}{2}$ months, shaking them twice daily. Then strain the:n through a sieve lined with blot-ting-pajer. and add 8 oz. or more of whitc sugar candy previously dissolved in a gill of cold water. The liquor may then be bottled for use. The ingredients nay be reduced provided that the same proportions are maintained
Ratafia Biscuits. Tho ingredients for ratafia biscuits are $\ddagger \mathrm{ll}$. ground almonds, 7 oz. castur sugar, mixed well in a clean bowl into a paste with the whites of 3 large cegs, a few drops of ratafia cssence and a squecze of lemion juico These ingredients should be added graclually. The paste is transferred to a bag, made with stiff pajer or with canvas (co:nct shaje), and with the bottom aperture-made by cutting off the point with scissors-about $\frac{1}{2}$ in. in diameter.
The little biscuits are then forced out by e mple pressure on the bag, which is properly closed at the top. They are laid out, a little apart, on paper, then Hattened on toj with a
wet brush and sugar dusted over. They are ratey to be paid by the owner instead of by baked in a warm oven until nicely coloured The papier is afterwards wetted on the back, and the biscuits removed, after which they are dried for some time in ony wnem place

Ratana Pudding. Beat up 3 oggs and put them into a pie-dish, and in the incantime heat $1 \frac{1}{2}$ pints milli in a pan with 2 dessertsponnfuls sugar Pour the latter when hot over the egge, mix all well tngether, and then add a little ratafia llavouring Cover the surface of the custard with mtafia biseuits, and hake the pudding in a moderate oven for ahout to min., or until the custard is set.

Care must be taken in enoking that the pudding does not brown on top, and to prevent this it may be covered with a plate. The oven should be cool, otherwise the pudding will hoil and canse the cage to curdle. See Custard: Forcing.

RATCHET. The purpose of a ratohet is to permit movement in onc direction and not in another. The shape of the tecth and also that of the pawl may vary and may often be disguised in various forms, but exsentially the principle remains the same though. out. In general, when a ratehet forms part of a mechanism, the pawl is kept in engagement with the teeth of the ratchet hy means of a light spring.

The ratchet is employed in watches and clocks to prevent the spring flying backward after it has been wound up. In some lawn mowers a ratchet drive forms part of the gearing which rotates the knives Another application is in the frec wheel of a bicycle. while further cxamples arc found in the ratchet brace and ratehet screwdriver. Sec Paivl.

RATEABLE VALUE. The ratcable value of a dwelling house is the amnount at which it is assessed or valued for the purpose of paying the local rates Usually this value is the rent less an allowance for repairs, generally about one-sixth, although this allowance varics in different localities A house for which $£ 60$ a year is paid in rent wi!! have a ratenble value in the neighbourhood of $£ 50$. On this amount the rates and also the incornc tax are paid. At definite intervals houses are revalued for this purpose, and householders who think their rateable value too high can appeal against it to the local authority Sce Income Tnx; Rent.

RATES. Money needed to meet the expenses of local authoritien, such as town and urban councils, is raised by means of a rate levied on tho occupiers of all property within the district. Rates ano thus the complement of taxes, the one providing the national and the other the local resenues.

In raising rates the first thing is to make a valuation of all the property in the area covered by the council. Ench house and building is valued at a certain sum, known as the rateable value, this being something less than the annual rent. Thus a house for which the occupier pays a rent of $£ 60$ will be rated at $£ 50$, or thereahouts. The deduotion thus made represents an allowance for repairs, etc.

On this rateable value the rates are asacssed, being at the rate of so much in the $£$. For instance, if the ycarly rate is 7 s . Gd., a man whose house is rated at $£ 48$ will pay $£ 18$ a year in rates. The rates are assersed and collected by the local authority, being paid in some places half ycarly and in others cuery quarter. With the moncy the local nuthority meets, directly or indirectly, the exprenses of roads, sanitation, fice libraries, workhouses, etc. ; also part of the expenditure on cducation.

If a man owns the boise he lives in, he himsself pays the rates. The rating authority may in the case of houses whose rateable value does not exceed fl3 (or any higher value provinusly in force in the district) require the
the occupier. The owner is entitled tonn allowance of 10 per cent. if he phrs in advance It is also frequently arranged, even in the eave of large houses, that. the ouncr shall pay the rates The amount in these cases is charged to the tenant, who pays a sum, every werk or month, for rent which is really rent and rales together. For doing thin the landlord is usually allowed to deduct somet bing from the a mount lie pays in rates.
In Iondon and other large cities flats are usually let on the anme terms as small houses. The landlord pass the rates and charges an inclusive sum to the tenant. When coniparing rents this important consideration aloould not tre ovarlonked. A flat for which $£ 70$ a year is charged may be cheaper than a house let at £50. It all depends upon which party pavs the rates and upon their amount

Under the Rent Restriction Acts Inndlords who are respnnsible for rntes oan add to the rent any extra amount they are called upon to pay for ratcs; also they must reduce the rent if the rates are iedaced Rates are not charged on buildings that are unoceupied. The local authority can isauc summonsea and then distrain if rates are not paid, and in enses of hank. ruptey any amount owing lor rates is treated as a preferential debt.

Ratepnyers dis. satisfied with the nmount at which their houses arc valued can appeal, but such an appeal must be suppurted by very strong evidence to have any chance of success. To make an appenl, the rate payer should first cummunicate with the clerli of the local nuthority for the district in which he lives, who wil! inform him whal stepe are to be talien The only other remedy is in use whaterer influence he has to secure the clection to the local anthority oí men who will practise economy in spending the public inoney and so reduce the annual amount that is payable in the $£$ on the ratoable value

In Scotland the system differs. There the rates are divided between the owner and the nccupier, ench paying about one-half.

Societics instituted exclusively for the purposes of scienco, literature, or the fine arts, and supported wholly or in part by annual voluntary subscriptions, arc exempt from all rates, ns also are churches and voluntary achools.
By the important Act passed in 1028 hereditaments occupied as railrays, canals or docks, and those occupied as factories or workshops, unless primarily occupied and used for any of the following purposes: (a) dwelling house; (b) retaii shop; (c) distributive rholesale business; (d) storage; (e) publio supply undertaking (e.g. gas or water works), are rated at only onc-quarter of their not annual value. By the same Act agricultural land was entirely relieved by rates. In cases where premises are ued partly for the above purposes and pertly for other purposes, the annual value must be appertioned between them. See Income Tar; Ront; Repairs.


Rat Tail. A tapering formation as scen on these two spoons

RAT TAIL. This phrase is used tor the tapering formation found on the backs of many table sponns and table forks. It was introduced by English silecremiths about Ifif0 in arder to strengthen the handles af sponns. This rat lail formntion or shaping lasted for nearly a century, when it uas replaced by the tongue or shell, but it has been reproduced by morlern makers. See. Spmon; nlso illus helow.

## RATTAN: For Basket Work. For

 lonicstic purposea rattan cane forma a convenient matcrial for cleaning drains, but it is also extensively used in basket inaking. The whole cane is utilized to a inrge catent for making chairs and many linds of strong baskets; the outer akin is peeled off and used for caning chairs, one side of it being quite smonth and bright.The inner portion, known as pulp or pith, is treated by machinery and drawn through holes in a metal plate, the resulting material being available in lengtlis of several diameters, ranging from the finest, 00 , to the thickest, No. 15 The appearance of the prepared pith cane when made up in the form of a basket can be improved by singeing the minute fibres which are left on the outside Cenerally the matorial is used quite plain, but it can be dyed or stained.
The main advantage of rattan for baskct work is its length, and for this reason it is largely used, and forms a inost convenient material for boginners in haslict weaving. Owing to its lightness the rattan is particularly adapted for making light and fancy haskets. Used in conibination with raffin, it forms an excellent material for making table mats. See Basket Making: Osier.

RATTLESNAKE PLANT. Alan termed the rattlesnnke orchid, this plant belongs to $n$ genus of orchids botanically known as Gondyera. It is generally grown in stove or greenhouse. but there are two hardy species, pubescens and repens, which may be grown outdours where the position is inild and sheltered

Pubescens grows ahout 3 in . high, hears white Howers, sometimes called adder's violets, during summer, with dainty foliage of green veined with silver; it thould be planted in pockets of peat and leaf-mould during spring. See Orchid.

RAVIGOTE SAUCE. Cold ravigote sauce can be made by adding 3 teaspoonfuls chopped parsley, chives, chervil, tarragon, and shallot, mixed in equal quantitics, to $\frac{1}{1}$ pint mayonnaise sauce, and tinting the whole grecu with vegetable colouring

To make hot ravigote sauce, boil togethes $\frac{1}{d}$ gill each whito wine and tarragon vinegar and a choppel shallot. When the liquor is reduced to $\frac{1}{2}$ gill, pour in a breakfastcupful ol whitc sauce, and add also If dessertspoonfuls of chopped parsley, tarragon, and chervil, inixed in equal quantities. Boil up the whole, and then simmer it all a few minutes before scrving. See Mayonnaise.

RAVIOLI. This is a popular Ita!ian dish composed of noodle paste with a snvoury stuffing. Directions for making the paste will be found under the heading Nondlo.

For the stuffing use the following proportions of ingredients : 4 oz . cooked chicken, 2 oz. cooked ham, l oz. grated Parmesan oheesc, 1 yolk egg, 1 tablespoonful thick white sance or cream, 1 tablespoonful tomato sauce. 2 teasponnfuls finely chopped parsley, salt, cayenne, grated nutmeg to well scason, a few hrown breadcrumbs

Pound all the ingredients until smooth, and rub through a wire sicve. Season well. Roll out the noodle paste as thinly as possible, and stainp out rounds about 2 in . in diamcter. Place n amall spoonful of the stuffing in the centre of half the rounds and wet the edges.

Cuver cach with another round and press the edges well together. Put thom in a pan of rapidly boiling salted water and boil quickly for about 2 nin.: stirring gently, then hoil slowly for 10 min . Jift them out with a fish slice, drain well und place in layers in a well-buttered dish, conating each layer with toinato sauce and a good sprinkling of grated cheese. Cover the top with a good layer of sauce, sprinkle with bmwn brendcrumbs, and lot with pieces of butter. Re-heat in a hot oven for a few minutes. and serve at once. Anv kind of coolied poultry or game may he used for the stufling.

RAY: How to Cook. When smootlihacked this fish is usually called a skate, but if the surface of the back is studded with spines it is called a thornbacki It must be skinned and crimped, and may then bo hoiled or fried, and served with $n$ suitable garnish and shrimp or enper sauce.

As a rule the fish is purchased from the fishmonger ready skinned and crimped, but if this work has to be undertaken at home, proceed in the following manner: Cleanse the ray, reserving the liver, and remove the skin both sides, then lay it flat on the hoard, and with a sharp knifo cut off the tail and detach the ficsly parts from the spine bonc on either sides. Cut the pieces into long strips by cutting through thic cartilaginous or tinny parts. Place these strips in cold water, then turn the fish over and repent the process. adding the strips thus obtained to those already in water. Leave the pieces of fish in water, changing it frequently until the atrips nppear crimped.

To boil ray, put the crimped picces into a saucepan with sufficient water to cover them, and add 1 wineglassful vinegar, 2 oz salt. and a bunch of parsley Let thio water boil up, and then simmer for 15 min . Drain the fish and keep it hot. Put the liver of tho fish in a small saucepan, and cover it with some of the liquor in which the ray was hoiled: cook gently for 5 min . and then strain. Dish, the pieces o? ray, cut the liver in slices, and lay over them. Pour over Hollandaise or sonio piquant sauce.

Slices of the crimped ray can be curled round with a small pieco of liver in the centre; they can then be dried in sensoned flour. cgged and crumbed, and fried in boiling fat. The liver is very rich in oil, therefore only small portions must be served with each slice. Blanch the liver hefore dressing it. See Fish: Hollandaise Sauce; Skatc

RAYNAUD'S DISEASE The condition that is known a Raynaud's disease consists in a disordered action of the vaso-motor nerves to the bload vessels, principally those supplying the extremities. By firm contraction of sma!! nrteries a part is deprived of blood and is blanched, or by dilation of the small veins the part is engorged with vonous blood and is blue, or from interference with their nutrition certain tissues actuslly dic.

Men may be affected, but women are more liable. The disense is most like'y to occur betwren the ages of 15 and 30 . It may follow the acute infectious discases, and is often associated with Bright's discase; other diseases and heredity may also play a part. Cold is the chief exciting cause. The whitening of the fingers is popularly refeired to as dend lingers. See Gangrene.

RAZOR. The varieties of razor in general usc, which aro known as the hollow ground and the safety, are made and used on different principles. One of the main distinctions is in the matter of blades. A good hollow-ground razor consists essentinlly of n strong steel blade, which will lnst a lifetime. In the arfety, on the other hand, the blade is only one piast of the mechanism, and it requires to be renewed from time to time, for which purpose
a supply of suitable thades usually accompanies every razor

In use the hollow-ground has a more or less dingonal movement, nnd can be applied at any convenient angle. The safety must be held in a vertical position and moved straight doirn, never horizontally nor transversely. Each of the two varieties provides an effective means of shaving when properly used; the clioice of one or the other is a matter of individual preference

There are various patterns of safcty razor. In gencra! they comprise a head on which the blade is secured, and a stem or bandle. Some are provided with a means of stropping the blades. The blado is sometimes a solid stcel one, bollow ground like the older type of razor, but is more ofton a very thin steel plate of fine grain.

The chief characteristic of the hollow-ground tazor is the contour of the blade. It is thinnest in the centre, so that it has tho appearance of being holloworl out. The cutting edge is slightly wedgo shaped, the back thick and at-rong The width of the blade is from $\frac{1}{2}$ to ${ }_{6}$ in., the lengt $h$ about $\bar{t} \frac{1}{2}$ in., of which the actual blado measures 3 in., the remaining $\underline{2 f}$ in. being the tang.

The care of a hollow-ground razor consists main!y in lieeping the edge lien by the use of a good leather strop. At rare intervals it may require setting on the stone. After usc it should be laid nside for at lenst one dry, as the rest is good for the cdge, which otherwise will vorysoon become dull. The same razor should never be used every day, nor oven on two sucoessive days. The best plan to kecp them in good condi. tion is to linve 3 or 4 razors, and never


Reaction Example of a reaction less than tivo.

As it is not ensy to tell a good razor from a had one by inspection, it is hest when buying razors to lie guided by the name of the maker and the reputation of the retail shop.

Sharpening the Razor. The routine sharpening of $n$ razor consists of 20 or 30 double passes on the lenther side of the strop every time the razor is uscd, and is preferably done after slinving, so that the cdge has a few days' rest between stropping and use. The strop is hung up on a strong hook at the height of the chin from the tloor, the handle is grasped in the left hand and pulled hard to keep the strop quite flat. This tension is important, as a weak pull will result in the strop cur!ing minutely round the blade so that the ellge gets rounded instead of properly keen. With the other hand the razor is then sivept boldly up and down the strop with the blade lying flat, the back pressing only lightly, but the edgo firmly. The reversal at the end of the stroke is efficted by a turn of the tight wist, which lifts the edge and lays its other facc on the strop as the return stroke is commenced.

During stropping n faint drag should be felt and n swishing sound heard, not a scraping noise, and the blado may emit a ringing note, but this is almost inaudible. If a strop gets accidentally gashed, it is best clisearded and
replaced. The only dressing required on the leather is n mere touch of oil or grease, and the application should he postjonerl as long as the lenther retains its so!! p!iability and its velvety appeniance.
After a period of regular use and stropping n razor loses its kcenness of edge; it should then be given 10 or 12 light double passes on the canvals side, lieeping a very heavy tension on the strop, followed liy the ordinary work on the leather. A hlade that is not restored by this treatment, or that is found to require it nt frequent intervals, needs a touch of the oil stone; if the owner lins enough confidena to attempt this operation hiniself he shofild use a finc carborundum stone moistened with, paraffin, using light pressure and much care and patience. A magnifying glass may be employed to examine the progress of the work from time to time.

The blade must be held with the edge on the stone, hut the back overhanging so that the two planes ground on the stecl meet on the edge at a very fine angle. This is facilitated by the faces of the blade being ground hollow: Before resarting to such a drastic remedy as stoning it is well to try if a dull razor can be restored by $n$ month's rest out of use on tiv 10 min . in:mersion in irater kept builing all the while. I keen edge must le maintained on a ra\%or both fo: the sake of get ling a clean and com?o:table shave, and to avoid cutting the face, an accident generally due to a dull blado. See Slaving.

REACTION: In Wireless. Jhis is a mothod whereby tho high fiequency alternating currents in the anode circuit of a wireless receiving valve are tiansferrod back into the grid circuit of the valve, thereby reducing the losses in that circuit and thus increasing the efliciency of the receiver.

When the amount of energy transferied back is suflicient completely to overcome the losses in the grid circuit the valve will oscillate, and if the grin co:l is coupled to the aerial circuit interference will be causerl to nearby receivers.

There are several nays of ohtaining reaction, most of which utilize an inductance coil magnetically coupled to the grid coil. The transfer of energy may be controlled by adjusting the number of turns on the reaction coil, by varying the distanco between the reaction coil and the grid coil, or by using a fixed reaction coil in conjunotion with a variab!e capacity (reaction condensor).

A popular method is to employ n fixed reaction winding magnetically coupled to the grid coil, liaving a reaction condenser of 0001 to 0002 mifd . in series between one end of the reaction winding and the anode of the valve. It is necessary to insert a high frequency choke or a resistance of about 10,000 ohms lietween thie anode of the valve and high tension positive to confino the high frequency curnents to that part of the circuit containing the reaction condenser and coil.

A refinement is to employ a dilferential reaction condenser. This comprises two sets of fixed vanes and one ret of moving vanes, each half of the condenser having a cajacity of 0001 to 0002 mfl .

One scheme is tu connect the moving vaner to the anode of the valve and one set of fixed vanes to one end of the reaction winding. The other set of fixed vanes is joined to earth or low-tension negative.

The advantage of the differential method is that adljustments of the reaction condenser have a negligible effect upon the turing ol the grid circuit.

In all methods of obtaining reaction it is essential for the reaction coil winding to be in the same dircction as the grid coil "inding to which it is coupled. Lack of maction in receivers employing plug-in coils may frequently be remedied by reversing the

Ivo leads to the reaction coil holder. See against the edge of the job and planing Condenser; High Frequency: Inductance: until the rebate is completed

## Oscillations

Ream. A ream consists of 20 quires of paper. A quire contains 24 sheets, and therefore a rean contains 480 .
Rear Axle. See Differential Gear: Live Axle: Propeller Shaft.
REBATE : In Cabinet Making. This is a kind of groove that is made on the edge of a piece of wood in the form of a step. An example is that found on the back of almost all picture frames. The purpose of the rebate is to provide a space in whioh some object, such as a panel, can be used so that its surface or one of its surfaces may finish llush with the top surface of the framework

Genera!ly spenking, tho rebate should be used in places where one piece is to fit into, and be supported by, another. For example, boards may be rebated to a hall of their thiokness so that, when the two prepared boards are bronglit together, the rebates in each will enable both faces of the boards to finish flush and form a level surface. This is a rebated joint
Rebate Plane. This is a tool specially made for cutting rebates. The simplest form is a narrow, hardwood plane with an iron that is the full width of the body of the p!ane Useful sizes are those of $\downarrow \mathrm{in} ., 1 \mathrm{in}$. and I! in. wide

The plane may he made with either a skew or square mouth; the skew generally is pre forred, because the shavings escape more firely, so that there is lass liability of the plane choking. Such a tool, however, is not very satisfactory for the actual work of inaking the rehate : it is rencrally used for cleaning it out, after it has first been prepared with the cutting gauge or hy chiselling.

'To be effective, n rebate plane requires some means to prerent it from slipping sideways on the wood. The tool known as a fillister is a development of the simple rebate plane with the addiion of a lence or glard to prevent the plane wandering over the surface of $t$ he wood. The fence is a movable piece of liardwood clamped to the sole of the plane by setscrews. These may be adjusted so that the width of the rebate can be regulated. A small brass shoe-piece controls the depth of the rebate, and a separate cutter is provided for cutting the inner edge of the rebate. The sash fillister is somewhat similar to the inoving one, but the fence is supported on two rods which slide through the body of the plane. It is used by first adjusting the fence and the stop to the equisite width and depth of the rebate. The cutter is similarly adjusted, and the plane is worked along the edge of the timber, taking care to keep the face of the fence

Another type of rebate plane, as used for olcaning up the rebate. is that known as the bull. nosed plane, generally made in metal. This is only 3 or 4 in . long, and is extremely useful for all kinds of work. It is virtually a small metal plane in which the plane iron terminates on the front of the tool, so that it is possible to cican out rebates, or any other hollows, right up to the end of the slot See Plane
RECEIPT : In Law. A reccipt is a formal written ackowledgment that a debt or bill has teen paid. In Great Britain receipts must hear a twopenny stamp or the equiv. alent, which inust be cancelled by writing across it. Any person who gives an unstamped receipt for $£ 2$ or more is liable to a penalty of $£ 10$, and the unstamped receipt is worthless as evidence if the creditor again claims the money, although it may be afterstamped at any time and so become available as evidence if the penalty is paid.

A receipt serves as evidence that a debt has been paid, but the person who gave it is always at liberty to show, if he can, that although he gave a receipt he did not receive payment: or that there was a mistake of some kind. The receipt is not conclusive against him, although a court of law would require very strong evidence for it to decide against a receipt which had been properly worded

A receipt, however, is not necessary in English law: A debtor, for instance, cannot rcfuse to pay what he owes because his creditor refuses to give him a receipt. At the same time. if the creditor should refuse a receipt and the debtor declines to pay on that account, the judge will probably make the creditor pay the costs because his conduct has been unreasonable.

If the debt is paid in cash, a receipt should always be obtained, and kept for a time so that it can be produced in case a claim is made for payment. If the debt, however, is paid by cheque, a receipt is not so necessary, as it is always possible to prove that the cheque has been passed through the bank. A cheque, however, proves only that money has been paid; it does not prove that the money was paid in resprect of the debt which the creditor is claiming. It is not necessary to keep receipts for more than six jears, as after the lapse of that time a debt cannot be claimed They are, however, useful as evidence of the prices which have been paid for various articles.

Filcs for keeping receipts in order are sold by stationers and others. If they are placed on the file in the order they are received, as they should be, there will usually be little difficulty in turning quickly to a particular receipt when required. See Bill
RECEPTION: How to Arrange. The most usual form of reception is that which follows a wedding, and is given by the bride's parents or nearest relative. Invitations are issued about three weeks before the ceremony and are included in the invitation to the wedding.

Invitations for other receptions, which are mercly formal "At Homes," are issued on "At Home" cards. Such receptions are given either in the afternoon or cvening to introduce some suecially important newcomer or guest ; or by persons in an official position, such as the mayor of a town or the member for a constituenej, to enable
them to meet all householders or voters as their guests, the sole qualification being that the guest should be a member of the municipality or a voter.

Such receptions are naturally large, and are usually held in some public hall or rooms: where light refreshments are provided. The catering is generally given out to some competent firm, which will quote a price for thic numbers to be catered for and submit a statement of what that price will include It is usual to provide some form of amuse ment for the guests, music being the most popular. The musical items should not follow each other without a panse, but at rather long intervals, and people should have plenty of opportunity for meeting each other. See At Home: Evening Pnrty; Invitation: Wedding.

RECESS: Its Fitting. In a house n recess is a small semi-enclosed space formed by a depression contrived in $\Omega$ wall or near the juncture of two walls. Typical examples occur at either side of the break-forward breast of a fireplace, and are usually ter minated at their outer sides by the adjacent walls of the room. These recesses are partic ularly useful for the erection of fitments. as the two sides and the back are already formed by the walls. In a sitting room shelves can lie fitted for books, or glazed doors can be framed and shelves provided for china and glass. For a dining room with two recesses in a bungalow or cottage, the dresser illustrated, with instructions for making, in page 388 would be a most useful fit. ment, with shelves for books or chinn in the recess on the other side of the fircplace. Corner seats with shelres above for books are also space-saving furnishing ideas.

For bedrooms, cupboarda are usually the best fitments; one with shelves and the other with space for hanging clothes. Such cupboards are fully described with diagram for construction in page 32

RECIPE. A recipe is a formula for the preparation of a mixture or compound of any kind. It is chiefly used in cooking and medicine Directions for making cakes, puddings, sweetmeats, etc., are known as recijes, as are directions for making up medical prescriptions. Other classes of recipes are those for maling up various bouschold requisites, such as glue or starch, and for compounding the scents and mixtures used for toilet purposes.

RECTIFIER. In electricity this is an apparatus for converting an alternating current into unidirectinnal pulsations. Examples are the crystal or the thermionic valve rectifiers used in wireless receivers, and the metal or vaive rectitiers employed to charge L.T. batterics or provide H.T. current for receiving valves. In the latter case these pulsating currents are first passed through a filter circuit and smoothed into pure direct enrrent.

Volve rectiliers may he cither half-wave or full-wave. A half-wave rectitier comprises two clectrodes, viz. filament and anode. If tha filament is heated and an alternating current applied between the anode and filament, then current will flow through the valve during the positive half cycles of alternating current and will cease to flow during the negative half cycles. Thus the valve will deliver unidirectional pulsations which can he smoothed into ripple-frec direct current. By suitably arranging two half-wave rectifiers both the positive and negative half cycles of alternating current may be rectitied. This is the principle of the full-wave rectifier, in which two anodes are contained in one glass hulh Half-wave rectifiers are suitable for use in eliminators where only a comparatively smiall output is required

Dry rectifiers may comprise a number of metallic plates clamped together in alternatc layers, thic combination being arranged so that
a fric pasange is offered to alternations of one polarity and a path of extremely high resistance to alternations of opposite polarity One combination possessing this rectifying property is copper oxide and coppar

Dry rectifiers may be connected in circuit to give cither half-wave or full-wave rectification, and may a!sc be constructed to supply Iarge D.C. outputs. They require no uplicen. Other types include electrolytic rectifiem, in which two electrodes are immersed in an clectrolyte (e.g. Irad and aluminium in a solution of sodium plospliate), and gasculus restifiers, which may tako the form of a glass bulb containing an inert gns such as argon and the positive and negative clectrodes See Eliminator

RED CABBAGE. This is a reddish leaved variety of cubbage, grown principally for pick!ing. Tho finest plants are obfained
from secels suwn in August, but $n$ sowing in March will provide nesful pickling cabbages in late antumn Blood Red is one of the best varieties.
REDCAP FOWL. This hreed, which is essentially Britieh, takes its name from the large rose comb, which in a first-clars specimen measures about 5 in . by 4 in , and is covered with fine fed points which are known ns work Its eges weigh about 2 oz ench, and the cockerels when fatted are much appreciated as spring chickens. The weight of adult males runs from $0 \frac{1}{2} \mathrm{lb}$. to $7 \frac{1}{2} \mathrm{lb}$., and that of the females from 5 lh . 10 6it lb . Scc Chicken Fowl ; Poultry.
RED CAP PUDDING. This is identical with black crp pudding except that the currants which give the latter its name arc substituted by small pieces of glace cherries See Black Cap Pudding.

## Red Currants from Garden to Table <br> Hints on the Successful Cultivation of this Fruit

Atteation may be drawn here to the articics on other fruits that can be grown in English gardens, c.n. Black Currant; Gooseberry; Loganberry: Plum. See also Jam

The red and white currants are profitable be well rooted by the following autumn and
bush fruits and their management is simplo. They should be planted in autumn-at 4 ft apart-in well tilled and manured soil in a sunny place In the spring following planting the branches of young bushes should be shortened by about half In subecquent years the pruning consists of chortening the side shonts in July to within about six leaves of the main branches from which they grew and in winter pruning them agnin to within about $\frac{1}{2} \mathrm{in}$. of the base of the past sumener's growth. This treatment will reault in the devclopment of fruit spurs. Care must also be taken to thin out the bushes to present overcrowding. Red and white currants may he grown as single, double or tieble-stenimed cordons on a wall facing north: there the fruits will ripen later than those on bushes in the open garden. Cordons are pruned in the way already described.

Some of the best varicties of red currant are Fay's Prolific, New Mad Dutch. Perfec tion and Raby Castle. Of white currants Transparent and White Versaillaise should be clinsen.

Both red and white currant bushes are easily propagnted by cuttings, 10 in long, inserted out of duors in autumn in narrow trenches 6 in deep: a layer of annd must be placed in the bottom ol the trench and the cuttings made firm at the base They will


Red Curraat. 1. Soil preparation, showing bottom spit well manured. 2. Planting. 3. Good cutting. 4. The same suitably prepared. 5. Cutting planted; $a$, sandy soil. 8. First year pruning. 7. Secoud year praning. 8. Encouraining truit spars (a). 8. Mulching: $t$, manure under top soil
may then be transplanted to a reserve plot until large enough for planting permanently

Currant bushes benefit by a top-dressing of manure on the soil in epring, and once in three gears basic slag should be put on the ground in nutumn, at the rate of 4 oz . per square yard
Pests of the Bush. Among the many pests that are harmiful to red currants is the clearwing moth, which causes shrivelled foliage, the only remedy being remuval and burning of affected shoots and leaves. The shoot borer bores into buds and shoota, the remedy being a spraying with caustic wash in winter and burning of affected shoots during growth. The currant sawfly defoliates bushis, and itn larvac may be cleared by repented spraying witl, a good insecticide emulsified in soft sonp. Other pests inclucle the magpie moth, white woolly, brown scale, and winter moth.
Currant-leaf spot is $\Omega$ disease nppearing in the form of dirty black markings upon the foliage, shrivelling the leaves and weakening the remaining growth. Bushes thus affected should be sprayed during summer with a solution of sulphide of po'assium, all fallen lenves being promptly burned. Handy preventires of currant troubles are syringing with strong lime-water, or soot-dusting in early inorning while the leaves are damp with dew.

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For protcction against birds there is notling better than old fish netting. When wasps are troublesome the bushes should be enshrouded in old curtains or butter. mualin.

How to Cook. When added to other fruits red currants serve to bring out the flavour, as, for example, when a tait is mado of raspberries and red currants. The juice is frequently added to red fruit "hile boil. ing, and improves both the flavour and the colour

Red currants should lie stewed in a strong syrup of sugar and water.

Pick and wash the fruit and put thein with the syrup in a stewpan Let them boil up and then remove them from lire till cool Replace on fire to boil up again before serving. Red currants are better when mixed with, raspherries for puddings, tarts, or flans
Red Currant Cream. This is made with $1 \frac{1}{2 l}$. picked ied curiants Put them into a stewpan, mash them with a wooden spoon, and then stew them gently in the oven or over the fire until all the juice runs out Strain the !ignor through a hair siere, measure it, and return to the stewpan To every pint of juice add 6 oz granulated sugar mind 2 oz gelatine dissolsed in 3 toblespoonfu!s warm vater.
Stir all togetlier until the sugar is nelted, then lwil them for $n$ few minutes, slimming the toj. Put into a hasin 1 pint cold milk or cream, and when the currant juice is nearly cold, strain it in by degrees Turn the whole into a mould to set If the cur. rants do not yield 1 pint juice $\Omega$ little water may be added.
Red Currant Ice. Use $\frac{1}{2} \mathrm{lb}$. red and 1 ll . whitecurrants and I gill rasp-berryorstrawberry purće to 1 pint rich custard, and proceed ac. cording to the gencralinstructions which arc given for making ices in pages 614-615. Red Currant Jam. To make well-flavoured and brightcoloured jam with red currants, pick the fruit, which must le vory dry, and put it into a pre. serving pan. letting it boil up, and continue boiling
 for 5 min Then add l lb. lump sugar for ench lb. fruit, and boil all together, stirring and pressing tho fruit with $n$ wooden spoon and skimming well; 35 min . should be sufficient to oltain a firm jam, but it may be tested by dropping a little on a cold plate
Red Currant Jelly. To make this, top and tail $8!\mathrm{b}$. red currants, and put them into a jar with 2 gills water and $\ddagger \mathrm{lb}$ granulated sugar Cover the jar with a salicer, put it into a large saucepan of water, and cook its contents gently at the side of the fire until the fruit is soft and all the juice extracted from it. Pour off the juice and drain it through a jelly bag. then put it into a preserving pan, nalding if lb. ump sugar to every quart of the fruit juice.
Boil the whole for about 40 min. or until it wil! set whon teated on a cold plate, and in the meantinc keep it well skimmed and stirred When cold, put the jelly into dry pota, tie it down, and store it in a cool, dry placa Red curmnt jelly is served with lare, roast or jugged rabbit, venison and sarldie of mutton: some people servo it with leg of mutton.

Red Currant Syrup. 'Lomake this, pick Iflls. red currants and ? lb . white curiants, and put them into $n$ bow! with II lb . strawherries or raspiberries. Press the fruit with a potato masher or wooten spoon in ordor to crush it, and strnin off the juice. Ifave this to ferment for about 6 days. then strain into a preserving pan, ald I 1h. lump sugar, and boil all toget her, taking off the scum as it riscs. When thoroughly boiled, cool it and bottle it for use.

RED HOT POKER. This is $n$ familiar hardy perennial with large tufts of narrow leaves and dense cylindrical clusters of small. brilliantly-coloured flowers on stems varging in height from 2 to 3 ft . Its botnnical name is Kniphofia or Tritomn, and it is known also as the torch lily, on accuunt of its torch-like inflorescences. The plants are hardy in well. drained soil, but they are apt to perish in ground that becomes water-logyed in winter. In cold districts the plants should be protected by placing bracken or other material round them. During the winter sume of the leaves will be disfigured by frost and wind; they should be cut off in spring when fresh growth begins.

The best time to plant is in March or early April; if the ground is heavy, sand and leaf. mould should be adrlcd An increased stock can be obtained by division in spring, but the planis dislike being disturbed.

The common red hot poker is Kniphofia aloides, which grows up to 5 ft . high and bears orange-red blooms, there are many varictics of this. A few other first-rate sorts are Macowanii, coral red, 2 ft ; Nelsoni, yellow, $2 \frac{1}{2} \mathrm{ft}$. Northiae, red and yellow. 4.5 ft . ; and Tuckii, vellow and red. Of the modern varieties Royal Standard, orange-red, 3.4 ft.; Goldelse, yellow, $2 \frac{1}{2} \mathrm{ft}$; and Mount Etna, reddish, 5 ft ., are very showy.

RED LEAD. Red lead is a crystalline powder known in chemistry as triplumbic tet roxide, or lead orthoplumbate, nccording to its purity. It has many cummercial usages, of which one is the manufacture of flint glass. Its use as a pigment is conmon, and it forms the base of the priming coats in painting.

The misture of red lend and gold size is n useful drier for painting; the same mixture is applied to the screwed joints of gas or hot water piping to ensure n leak-proof joint. A length of tuw or hemp is smeared with the paste and tiristed into the threads of the pipe, which is then screwed home. See Plumbing

RED MULLET. Superior in llavour to the gry mullet, the small, rose-coloured fish known as red mullet may be cooked in a tariety of ways. Baking and grilling are the best methods, but boiling is unsuitable.

For grilling, clean and dry 5 fish, score the skin across at frequent interva!s on hoth sides, and then let them soak for ahout $\frac{A}{d}$ hour in a mixture consisting of 1 gill melted butter, $1 \frac{1}{2}$ tablespoonfuls lemon juice, and scasoning to taste. Turn the fish occasionally so that both sides may be equally well sonked, then grill them before a clear fire for about 8 min . Scrve then garnished with a few puts of maitrc d'hôtel butter.
To bake red inullet, prepare two large fish acore them as directed for grilling, and then lay them in a greased baking dish previously sprinkled with a little chopperl parsley and fine breadcrumbs. Add seasoning to taste, squecze over a little lemon juier, finally adding some more parsley and breaderumbs Just before putting the fish into the oven to bake, lay a few small lumps of butter on top. The baling should take about $\ddagger$ hour. See Fish; Grey Mullet.

RED SPIDER. This minute pest attacks the leaves, chiefly of plants growing under glass and on sunny walls out of doors, sueks the sap from them and, if not restroyed, seriously weakens the plants. Thia pest is most troublcsorne in warra, dry conditions


Red Hot Poker. Torch-like red and yellow flower beads of the handsome Kniphofa
it can be destroyed by syringing the lower leat aurface with a solution of salt, 1 oz . in one gallon of water

REDUCER: In Photography. Nega tives which are too dense or too nearly opaque to print properly may be reduced by chemical solutions, just as negatives which are too thin may be intensified These processes are only to be used with caution by the amateur, awing to the risk of permanent damage by stnining.

Attempts should always be made to get satisfactory prints from a dense negative by chousing a soft printing paper before resorting to chemical reduction. Soft grade or portrait grade gaslight paper will frequently give pleasing prints from dense negatives, which on the ordinary grade paper show liarsh results.
There are three clazses of dense or semi upaque negatives, due to (1) over-dcvclopment of a correctly exposed negative; (2) overexposurc and over-development; (3) under exposure and over-derelopment; the last caso being probably the most common with amateur photographers.
The first variety of dence negative is some times due to not making sufficient allowance for temperature in hot weather when develop ing in a tank. The negative is dense all over though detail is clearly visible: but the shadows, which should be nearly clear glass, show a good deal of deposit, and the high lights are nearly opaque, all delicate toncs being lost.

The jرrint is harsh in contrast. Thus white dresses in portraits print dead white without detail. The best and safest reducer for such negatives is ammonium persulphate, made un as follows

Soldtion 1
Ammonium persulphate
40 gr .
Cold distilled water
402

## Sodlum sulphite <br> Soldtio: 2

Cold water
20 gr.
The negative having been soaked for alsout half hour in plain water or, more safely, in distilled water, to re-wet it uniformly and soften the gelatine, it is placed in a small, clean dish and about 2 oz of solution No. 1
oured over it, locking the dish gently. In a bout 2 min . the salution will turn cloudy, and reduction will have begun 'I'ten process should be ubservad carcfully, and the nagative examined at short intervals to see that ieduc tion is not procceding too far. In 5 min ., or less, reduction should be complete, and the engative should be taken out, quickly rinsed. and at once placed in solution No. 2 for 3 or 4 min., Which stops the reduction. Plain water is not effective. Afterwards wash well in the ordinary way.

On no nccount shou!d the negative be kept for more than 5 min . in the persulphnte solution. If one application is nut sufficient, a second hath of persulpliate solution may he used after the No. 2 bath and washing. It is equally important that No. 1 solution should not be used twice, nor should more than one negative be treated at a time. Fresh solutions must be used, or immovable stains will result.
This reducer acts proportionately to the density of the negative, i.c. it attacks the densest parts more than the thinner parts and so reduces harsh contrasts. Uscd as described, it is safe in oporation with properly lixed and washed negatives. Do not touch the surface with the fingers during the process or permanent narks will be produced.
Clearing Dense Over-exposed Nesatives
In the second variety of undue density, caused by over-cxposure and over-devclopment, the negative generally appears of almost uniform density, shadows as well as higlı lights, and may be even so dense that the subject can only be seen with difficulty when the negntive is held up to a strong light. Long printing gives flat or foggy prints with plenty' of detail. Enlargement is impossible. Here the best reducer is Farmer's solution, used fairly strong. This solution, when strong, attacks the shadows more than the high lights and so increases contrasts ; when weak it acts morc evenly. This property is taken advantage of by using it both strong and weak in reducing these opaque negatives.
Either take the negative straight from the fixing bath or after washing is completed, but not drying. If the negative has been dried it must be soaked for at least $\frac{1}{2}$ hour. Place it in a bath of (reshly made and unused plain hypo, 4 oz . hypo to 20 oz . water, without any acid alum or other chemical ns used in acid fixing salts. Make a solution of 1 oz . potassium ferricyanide in 10 oz . water. Pour the hypo off the negative; mix in a few drops of the ferricyanide solution until the solution has an orange tint.
Return the mixture to the dish containing the negative and watch the result carefully. Reduction proceeds quickly, and if details in the shadows disa ppear they cannot be restored. Remove the negative, therefore, while it is still somewhat too denso, and wash well in running water for $\frac{1}{2}$ hour Reduction continucs in the first portion of the washing period.

Next prepare fresh hypo and repeat the process, using less ferricyanide solution, making the mixture of hypo and ferricyanide a pale lemon tint. This second reduction will proceed nore slowly and will be much more even, but must be cnrefully watched. The first reduction increases contrasts, the sccond printing qualities. The negntive inust finally be well washed to remove all yellow stain.
The third case, under-exposure and overdevelopment, is most common with the annateur, and is the most difficult to remedy. In fact, it may be said that the best thing to do is to mal:e another, but corrcct, exposure. The negative is hard with opaque high lighls, Hhin, detailless shadows, and poor gradations. The print shows excessive contrast.

When under exposure is not too groat, improvement can be made by using the anmoniun persulphate reducer described
ahove, taling great care not to carry the reduction so far as to destroy what detail exists in the shadows. In this case reduction only makes the best of a bad job Local reduction is often useful, ns when the stiy portion or some high light in a negative is too llense. This can be effected with Farmer's reclucer, made as explained above, and applied with a camel-hair brush to the parts to be recluced after the negative has been bathed in the plain hypo solution. See Developing; Fxposure: Intensilier; Photography.

REED : The Grass. The giant reed of New Zealand (Arundo conspicua) is a vigomous ornamental grass, which bears pale Hower plumes in late summer and autumn, on stems 8 fcet or more high. The Provence reed (Arundo donax), which is equally tall, has leddish flowers. Arundo phragmites is a common waterside reed in this country; $\pi$ variety with variegated leaves (aureo variegata) is ornamental. The New Zealand nnd Provence reeds should be planted in asheltcred place in moist loamy soil, and it is wise to protect them with leavesor other covering in winter.
They should be planted in spring; that also is the season to propagate the peeds by division of the clumps.
REED: In Moulding. Is used in woodwork, a reed is a narrow convex moulding which can be worked by liand with a carving tool or a special plane, or by machinery. It is the opposite of the flute is moulding, and is used as a cabinet decoration, principally on table legs and also on picture frames See Beading: Moulding.

REED MACE. Reed mace is a hardy nquatic perennial herb bearing brown inflorescences. It is beat planted at the margins of shallow ponds, lakes, and strenms, during spring or autumn, and is propagated by division in February or March. The botanical name is Typha Two British species are angustifolia and latifolia: these are the plants commonly called bulrushes. They may be cut in autumn for indoor decoration.
REEL: The Dance. The Scottish reel for ballroom dancing is either a foursome or an eightsome. In the foursome two couples engage, but there inny be any number of sets on the floor. The two men take up prosition by standing back to back with their reapective partners facing them. In the opening inovement the dancers trace the figure 8 with $n$ skipping step and finish it setting to partners, when the dance is continued with variations of the two essential steps. These are the high cut, or beating movement of the free leg on the supporting leg, which remains stationary with perfectly straightened knce, and a travel. ling, kicking step known in the schottische.

Both steps require the turning out of the knces, and all work is done on toes and ball
ul the loot. in neither hop nor spring should the hecl touch the ground when coming down In the high cut the beating of the free leg should he on the ealf of the supporting leg hehind, and not on the ankle. In the travelling step a sjpring is inade on the first heat ; on the second and third beats there is no lorward movement, but a closing movement with the front foot and beat behind with the back fout

The Eightsome Reel. For the eightsome reel four couples take up position in a set as if for the Lancers The same steps as for the foursome are used in a modified form in the first part, but the special fenture of the dance is in the second jart, when cach woman dances in turn in the centre with each of the four men, while the others form a ring round the couple. Then each man goes into the centre and dances with each woinan in turn, and finally the tirst jart of the clance is repeated

The essence of Scottish dancing is the brilliance of the footwork; every step is performed witl angnlar precision and has a perfect place in the dance. When a reel is to be introduced into a programme it is quite usual for those who intend to engage in it to practise together, as, though there are only the limited number of correct steps, the arrangement admit of great rarintion The
arm work in Scottish reels should he below the lerel of the head, with a bend in the elbow emphasising the angularity which is char acteristic of the national dancing

In the Irish reel the body is held erect, and the arms passive at the sides almost throughout, so that nothing should distract the attention from the beauty of the footwork. The reel is a much quieter dance than the jig, the tapping movements being executed with great delicacy, and the whole effect should be of sparkiling lightness. The technique of Irish and Scottish reel dancing can only he acquired by most people, after lessous froin a good teacher, with a great deal of practice Reels should be danced with spirit, but without exuberance or exaggeration. See Highland Fling; Irish Jig; Schottische.

## Reflex Camera. See Camera

REFRIGERANT. Any drink which reliever thirst and allays feverishness is. called a refrigerant Examples include lemonade and all drinks made with fruit juice or with citric and tartaric acids. Thirst may often be best relieved by demulcent drinks, such as barley water. oatmeal water, or milk and water. A free use of iced drinks upsets digestion See In perial Drink: Lemonade.

## REFRIGERATORS FOR USE IN THE HOME <br> \section*{Modern Methods of Keeping Food Fresh}

Our articles on Kitchen and Larder may be consulted in association with the one below. Sec also Ice Safe : and the entries on th: various foods, e.g. Apple: Beef: Milk: Mutton Pork

Mechanical and other devices for reducing the temperature of the air in an enclosed space are known as refrigerators. Until recently the sole method of refrigeration or cold storage available for usc on a small scale was that of utilizing natural ice as the cooling agent. This system is exemplified in the ice safe described and illustrated on pinge 616. There are now several other systems available which are entircly automatic in action, needing simply a connexion to the elcctric mains, or the maintenance of a tiny jet of flame beneath the generator, according to the type of apparatus employed.

Refrigeration by the systems just mentioned depends upon the difference at a given pressure between the boiling point of certain volatile fluids (e.g. ammonia, boiling at $28^{\circ} \mathrm{F}$. below zero, or sulphur dioxide, boiling at $14^{\circ} \mathrm{F}$.) and that of water ( $212^{\circ} \mathrm{F}$.). The process is also dependent upon the law that when the pressure applied to a liquid is raised the boiling point is raised also. In order to freeze water it must be exposed to a temperature lower than $32^{\circ} \mathbf{F}$., and in order to obtain this lower temperature the water inust be brought in contact with a medium (the refrigerant) whieh has a lower boiling point than water. To make the process continuous and automatic the refrigerant must be caused to yield up the heat extracted, and then be made available for further use.
Heat abstracted from the substance in the cooling chamber is caused to evaporate a volatile fluid circulated in pipes around the chamber. The volatile fluid is then compressed, and its boiling point thus raised, so that it can be condensed and re-liquefied at available temperature, and the heat removed. The fluid now tlows back to the coil surrounding the cooling chainber, again to abstract heat from the food, ctc., therein contained
In the mechanical refrigerator the compressor is a pump olerated by the electric motor. In the non-mechanical type there are no such moving parts, the necessary pressure and movement of Huids being obtained by heating the generator cylinder with a gas or paraffin flame, or with an electric element.
The cycle of operations in a non-mechanical absorption system is illustrated in Fig. 1.

Heat applied to the aqueous solution of ammonia in the " boiler" liberates ammonia gas, which is then liquefied in the condenser. The liquid ammosia (as it is then) evaporates in a cylindrical vessel projecting into the refrigerator chamher, abstracting heat from the latter. The now gaseous nmmonin passea next to the absorber, there to be taken up by vater. The squeous ammonia falls liy gravity to the pumping coil, where the hent generates gas bubbles and so lifts the liquid through the punping pipe to the boiler. This pumping action slso causes the wenle liquid in the boiler, after liberation of the aininonia, to be returned to the absorber:

The function of the hydrogen is to assist hy its pressure the evaporation of the ammonia gas. The hydrogen, being freed from the ammonia gas by the dissolving of the latter in the absorber, returns to the evaporator via the gas heat exchanger It is cooled by passing through pipes on the outaide of which cir. culntcs the cold gas mixture exhausted from the evaporstor. The liquid heat exchanger lowers the temperature of the weak liquid as it passes from the hoiler to the absorler: The vessels and pipes forming the refrigerator unit are charged with the necessary hydugen. ammonia, and "ater at the factory, and are then bermetically senled A supply of cooling water fiows through the pipes surrounding the condenser and the absorber, and a heating llame or clectric elcment is kept in action while refrigeration goes on.

The compression refrigerator system illus trated in Fig. 3 works as follows: Liquid sulphur dioxile from the receiver D is ndmittell to the cooling coil by an expansion valice, 13, and cuaporates, extracting heat from brinc surrounding the coil, and thus cooling the refrigerating chamber. The gas goes on to the compressor, C, is compressed, and so made condensable at ordinary temperature. It is then passed through a radintor eoil, F, and clianges to a liquid, being stored in the liquid receiver 1), ready for further use. A thermos. stat, E, controls the electric motor for the compressor, statting up the latter when temperature rises above a predeterminci degrec, and stopping the motor when the desired low teinperature has been atinined.
 Courlesu of Electrolux. Lid

1 teaspoonful gela. tine, which has been placed in a cup and covered with cold water, left till soft, and then mixed with 3 tablespoonfuls of boiling water and stirred. Pour this amount of disaolved gelatine into every quart of milk and cream uscd The cream should be whipped and the tray containing the mixture should be removed every half hour until frozen and the ice cream stirred thoroughly. Salads, cold pies, melon and other fruit, milk, beer or soda water, are all greatly improved by refrigeration.

Now that firstclass refrigerators can be obtained on the hire purchase system extending over two years, and £4 or £5 down pays for installation, they bave hecome within the reach of many Choice of a Refrigerator. Whether an ap more people. The housewife should consider the paratus of the absorption type (Fig. 2) or one advisability of including one in her kitchen of the compression (mechanical) type (Fig. 4) equipment, not only from tho points of view is selected depends mainly on the operative of efficiency and labour saving, but also because agent available to the purchascr. The former fresh food is of more importance to the family can be obtained in rather smaller sizes, and has than anything else. Every year there are cases the advantage that no motor is needed. A of food poisoning which could be avoided connexion to the water supply is necessary if proper refrigeration of food was the rule and, unless oil is used for the heater flame, the apparatus must be connected also to the gas or electric service. In the mechanical refrigerator the condenser is generally air cooled, a fan sometimes forming part of the apparatus Both types are controlled by thermostats, and effective safety devices are incorporated. A gas, oil or electrically operated refrigerator will prevent waste of food in summer and in muggy winter weather. Lt will also enable the housewife to turn out dainty frozen dishes for the table with a minimum of trouble and expense.

With its assistance a cream or jelly can be mixed early in the day and will be set in time for lunch, or can he kept for the next day. Sundacs and ice cream can be mixed and left in the refrigerator until the mixture is frozen. When making, it is $n$ good plan to add


Refrigerntor. Fig. 3. Diagram showing cycle of operation in n mechanical (compresgion type; apparatus. A, epaporating coil surrounding cooling chambers: B, expansion valve which requlates flow of refrigerant: C, compressor: D, lignid gulphur dioride receiver; E, thermostat : F, radiator. Fig. 4. Larger refrigerating cabinet in which the cooling unit is operated by means of an electric motor

Sourleay of Kelvmator, Lt:

Careful attention should be given to from house to house with the duat casta refrigerator. Naturally it must be kept spot. lessly clean, or its end is defeated It should be looked at every day, washed out with a weak solution of soda and water whenever necessary, and each morning wiped over with a clean, damped cloth.

REFUSE: Its Removal. This term in cludes excretal refuse from house and stable, ashes, dust, waste from food, street sweepings, and trade waste. The removal by hand of dust bin refuse and street sweepings is known as scavenging. The removal from time to time by hand labour of excretal matters from privies or cesspools is known as the conservancy system. This method has to be resorted to in country districts, but in towns and cities excrement and waste water are removed in drains and sewers by what is called the water carriage system

All forms of refuse are likely to cause a nuisance or encourage discase if kept stored in or near the house for too long a time. For this reason the householder has a clear duty to see that the storage and disposal of refuse is carried out on hygienic lines. The quantity of refuse stored on the premises should be reduced as much as possilile by burning the easily destructible refuse every day. Vegetable and food scraps generally should be dealt with in this way, as they are particularly prone to give rise to trouble by decomposition.

The material that is not burnt should be stored in a hygienic type of metal ashbin with a well-fitting cover. The latter should always be kept in place to prevent the refuse from being blown away by the wind, and also to protect it from rain, as dampness favours decomposition The contents should be removed at least twice a week if possible. Horse manure should be removed frequently from stables. Nuisance from smell and flies is often caused by this form of refuse, but can be reduced by storing the manure in the cart in which it is to be removed

In country districts, where refuse is frequently dumped on the land, care should be taken to see that the refuse is well covered by at least 6 in . of soil until it has been well purificd by natural means, otherwise nuisance from sinell and flies will result. Excretal refuse must be treated with particular care, and where a cesspool system is in use it should be kept in good order, and care taken that any water supply in the near vicinity is not polluted thereby.

The practice of disposing of house refuse by dumping it on the surface of waste land and so making a shoot is not to be recommended, unless it is strictly controlled by the local authority. What is known as the Bradford System is the best form of controlled tipping. This is successfully carricd out in many large towns without causing any nuisance, and at a very great saving to the ratepayers. The inain feature of this system is that the refuse is tipped in layers about 6 ft. deep to proper levels. Care is taken that all tins and hollow receptacles are filled up solid. At the close of the day's work all refuse is covered up with soil or road sweepings about 6 to 9 in . deep. Special care is taken with any fish offial or other foul matter, which is buried deeply. Screens are provided to prevent light materials from blowing about.

There is no doubt that the most sanitary way of disposing of house refuse is by burning it in some form of destructor. Excretal refuse in most towns is carried away by the drains to the sewer, and so to special sewage works.

Duties of the Local Authority. The collection and removal of house refuse is a duty that devolves upon the local authority in every district. It is usually assigned to the sanitary department in towns and cities, and a staff of dustmen is employed for the purpose, who go
from house to house with the dust carts Ashpits are cleared by the dustman without assistance, but in some towns the houscholder is expected to get his dustbin taken out into
the strect and put back in its place affer it has been emptied. It is not an ideal or sanitary method, since people must pass rows of dustbins on the pavement, often standing in the hot sun Fortunately this practice is rapidly dying out.

Should there be any neglect or omission to clear a dustbin or ashpit, as may occur where a tenant has just come into a house that has been empty for some time, the sanitary au. thority should be at once informed in writing, as they are bound by law under a menalty to make the necessary arrangements . The tenant on his part should ascertain the time at which dust is collected in his neighbourhood, and make arrange. ments accordingly.

Open dust carts without protection of anykind are still employed, but the closed or partly closed type now used in many towns is more hygienic, as it involves little or no rish of dust being scattered a bout the roads in stormy weather The insanitary, high dust eart is rapidly giving way to thi motor dust van with a low loading line Many of these have automatic covers to secure dustless loading.

It should be noted that local authorities are only bound to remove house refusc; where a trade is car. ried on, and there is nothing in the nature of domestic work associated with it, responsibility for the removal of the refuse rests with the person who is carrying on business ont he premises. It is not always an easy inatter to decidc in which catcgory a given case may fall, and litigation has heen necessary to clear up doubtful points. Thus, clinkers from a steam laundry are trade refuse, but those from an hotcl are house refuse; but most authorities make arrangements to remove on payment of a sma! Ifee.

Garden rubbish should not be put in dust bins, although this is frequently done; if the quantity is not excessive the dust man may fake it if he chooses, and as a rule there is no difficulty, but with large quantitics the occupier must arrange for the removal as if it were trade refuse.

A better way of diaposing of garden and other similar refuse is to burn it in an incinerator. See Cessprool; Drains; Dustbin; Incinerator, Rubbish; Sanitation; Sewage.
REGENCY STYLE. In furniture decoration and architecture this is the term employed for designs created between (about) 1795 and 1830. Regency style was an offshoot of Empirc style and the designers were the modernists of the late Georgian period, though they were influenced by the work of Sheraton and Robert Aclain. Regency style at its hest was a wholesome revulsion from the trivial debased ideas borrowed from French
furniture of the worst school which had beconie fashionable at the end of the 18th century.

An archacological revival produced the Empirc style in France and its English derivative. An attempt was made by the leading designers to adapt Greek, Roman and Egyptian types of furniture and architectural features to contemporary use. Classica! influence had largely swayed the Adam designs. hut the Regency adaptations were on heavy, simple lines and some connoisscurs consider that beauty of form is rare in pieces of this period except in those which show direct development from the Sheraton school and in some of those designed by George Smith.
The originator of the Regency style in


England was Henry Holland, arclitect to the Prince Regent and designer of Carlton Housc. He applied detailed drawings of Roman fragmenta to designs for furniture, etc., and the work produced from these belongs to the more graceful examples of Regency style. The most characteristic work, however, wns the result of designs made by Thomas Hope, who, besides other sources of classical inspiration, drew on the cult for Egyptian designs which were the vogue in France. in 1804, after Napolcon's invasion of Egypit. In 1807 he published a book entitled "Household Furniture and Interior I lecoration," which contains illustrations of the picces most sought by collectors of Regency lurniture.
Kooms werc usually papered, marbled effects mado to resemble blocks being particularly liked and classical designs were popular on satin papers. Borders and mock pilasters were used. Marbled paper pillars, tinted to appear round were another feature, while doorways were sometimes grained to simulate rose and green marble. Pelmets and curtains were severe in form ; heavy satins, striped fabrics, and silk damasks were used for these and for upholstering furniture. Pictures were hung by tasscled cords instead of wire.
The association of strongly figured woods with inlay of brass and bronzed metal is characteristic of Regency furniture. Imboyna wood and zehra wooll were used as reneers for sccretaires and cabinets which were often enriched at the corners by Egyptian terminal tigures with heads and feet of ormolu. Mahogany and rosewood pieces were frequently decorated with gilded carving. English cabinet making of this period was of a high standard.

Chairs of this sty le commonly have a serollover back, and the legs splay out in a curve.

The settee illustrated is characteristic of the solid type of furniture made during this ןeriod, while the armchair shown in Fig. 2 is an example of the lighter style and is decorated with brass inlay The seats and backs are in some instances of cane mesh Circular tables, supported by a centre pillar and four splayed-out and curred supports, were made. and sofa tables with two end supports having yoke-shaped feet were introduced. Reeding was a favourite decoration. Towards the end of the period the short fluted straight sofa leg displaced the splayed support. Regency and Empire style franlily inspires certain modern designers and is particularly suited to the formal houses built at a bout this period A very simple adaptation for a small dining room is illustrated and described in pages 359-360. See Empire Style; Sheraton; Victorian Style.

REGISTRATION. In Great Britain certain facts must he registered, i.e. an official record of them must be made and kept in some public place. Such are births, marriages, and denths, which must all be registered with a registrar appointed for the purpose. Names used for husiness purposes, if they are not the exact names of the persons using them, must be registered. There is also a scheme in practice for registering the titlo to land. Letters and parcels can be registered for anfety. Motor cars and motor cycles must be registered. See Birth; 1)enth; Narriage ; Motor Car; Motor Cycle; Postage

REGISTRY OFFICE. This name is given to a shop or other place of business that serves as an agency for engaging domestic servants, governesses, ctc. Usually those requiring servants pay a fixed fee on entering their names and stating their requirements, and a further sum, which is a percentage on the wages given, when they are suited. Servants are not charged.

REHMANNIA. This is n herbaceous perennial, 2 or 3 ft . high. It is hardy in well-drained soil in the comparatively mild southern and western countics. and in summer bears rosy-purple flowers sonewhat resenbling those of the forglove but having $n$


Rehmannia. The rose-purple fowers of a plant
suitable for the greenhouse of for out of doors in mild districts
pronounced "lip." A variety named Pink Perfection is usually preferred to the typical kind because of its more attractive colouring. Rehmannia thrives in ordinary non-clavey garden soil with which sand and leaf-mould or peat have been mixed; it is an excellent pot plant for the cool greenhouse. Propagation is by seeds or division in spring. The secdlings must be raised under glass.

REINS. The reins are part of the harness of a horse, being used to hold it when it is ridden or driven They consist of two long straps of lenther ; one end is fastened to each side of the bit and the other is held in the hands of the rider or driver, who is able by this means to control and direct the movements of the horse. Reins are sold by saddlers and should he kept clean and bright by polishing. See Driving; Harness.
REJECTOR: In Wireless. This is a tuned oscillatory circuit comprising an inductance and capacity in parallel The device offers a high impedance to oscillations having a frequency to which the circuit is tuncd, and a low impedance to all other frequencies. Rejectors may be employed for the elimination of interfering broadcast transmissions.

A simple and effective rejector may he constructed as follows: Procure two (M) mifd. (maxinum) compression type semi-variable condensers, one bascboard-inounting coil holder, two terminals, a wooden baseboard, size 4 in $x 4$ in., and an ebonite terminal strip 4 in $x 2 \mathrm{in} . \times \frac{1}{4} \mathrm{in}$. 1)rill two holes in the ebonite strip for the terminals and also two holes for sccuring the strip to the kaseboard. Screw the terminal strip firmly to the baseboard and mount the two terminals in position. Next place the two semi-variable condensers and the coil holder on the baseboard and secure by means of wood screws.

Iooking at the rejector from the front (terminal strip end), join the left hand (aerial) terminal to one side of each compression condenser respectively Connect the reinaining side of the left hand compression condenser $\left(C_{1}\right)$ to one terminal (socket) on the coil holder. Join the other terminal (pin) on the coil holder to the remaining side of the right hand compression condenser ( $\mathrm{C}_{2}$ ) and thic remaining terminal on terminal strip.
Operating Details. Disconnect the aerial lead from the aerial terminal on the set and transfer to left hand terminal on rejector terininal strip. Join right hand terminal on strip to acrial telminal on set To oliminate a transmission working on a wave-length between 250 and 400 metres, insert a No. 50 coil in the rejector coil holiler (a No. 60 or 75 coil will be required for wave-lengt ha belween 400 and 550 metres). Set the right hand compression condenser to about one half its maximum value and adjust the left hand condenser until the interfering transmission disappears If neccssary a tinal adjustment may be carried out on the right hand compression condenser ( $\mathrm{C}_{2}$ ).
If the interfering transmission is particularly troublesonc try various settings of $C_{1}$, endeavouring cach time to find a corresponding adjustment for $\mathrm{C}_{2}$ for the minimum strength of the unwanted atation.

RELAPSING FEVER. An acute infectious fever, which is liable to a relapse or a series of relapses with intervening periods f́rec from fever, is, on this account, known as relapsing fever. The disease has occurred in epidemics in Great Britain and Ireland. Its incidence is favoured by overcrowding and want. and from the latter circumstance it was also known as famine fever.
RELAY, This is an electrical device usually comprising an electro-magnet having an armature which is arranged to close a switch in a local circuit when a relatively weak electric current flows through the inagnet windings. One household application is in the wiring of burglar alarms.

A relay station is a low power broadcast transmitter which radiates the prograinmes supplied by land line from a distant studio. Relay stations are intended to serve only a small area. See Bell; Burglar Alarm.

RELISH: In Cookery. A relish is any savoury ingredient calculated to give a piquancy to plain or tasteless dishes. The term is applicd also to special dishes which give a zest to the appetite. Pickles, sauces, chutney, and all table condiments arc considered relishes, and are added to meat and sauces to enhance the flavour. See Chutney ; Cocktail; Condiment; Hors d'Oeuvres; Picikle ; Sauce.

REMOTE CONTROL. This is a device for operating electrical apparatus at a dis tance. A locally controlled relay is usually emploved to make or break the nain circuit See Relay.


Rejector. Showing details of the rejector which is described in the text

REMOVAL. When a move to another house or flat has been decided on, it is advisable to obtain estinates from several firms of removal contractors. Representatives will call nt the house and make a calculation of the quantity of goods that have to be dealt with. and on their reports the estimates sent in by the lirms will be based.
It is always best to deal with a firm which has a staff large enough to cope with all omergoncies and experienced in the careful handling of all kinds of domestic furnishings. They will probably have a fixed scale of charges, and their estimate will include all the costs of packing, removing, unpreling, carrying furniture upstairs, fixing overmantels. ctc. They provide their own packing cases, and talie all responsibility for the goods while they are in their charge and which have been packed by their statf.
The sum charged dejrends largely on whether the goods ealı be packed into a single van or whether two or more may be required. It is advissble to sort out and dispose of all rubbish before moving, both on the score of less property to remove and of the opportunity afforded for getting rid of useless possessions.

Preliminary Arrangements. Before the removal there are various matters connected with the new house that should receive attention. Plumbing should be overhauled to see that all the taps and pipes are in working order. Roof gutters may need cleaning out, and the cisterns should be tested. Perhaps a new gas cooker is required; a goyser may have to be installed and new gas fires. Is this work may entail fresh pipes it should be finished before removal.

Where electricity is used the fittings should be decided on and all electrical work done before decorations, which also should be completed as far as possible before the furniture is brought into the house. Another labour saving point worth noting is to have
carpeta cleaned and delivered at the new home in time to be laid before the furniture is placed in the rooms. This does not apply to stair carpets, rugs or small carpets. The first would have too much traffic over them and the others are easy to lay and no heavy furniture need be placed on them. Linoleirm may also be fitted and laid wherever necessary. The house will, of course, have been thoroughly cleaned when the decorators have finished their work
Curtains and blinds may also be put up when the windows have been cleancd. Sometimes the incoming tenant arranges to take over such fixtures as pelmet boards, curtain poles and rods, blinds, lighting fittings and linoleum, and this also facilitates removal If these preparatory arrangements are all properly attended to and personal belongings are carefully packed in drawers of wardrobes and chests and well covered over, it is surprising how quickly a new home can le settled.

Packing Smaller Articles. Wherc there are many ornaments and much plate, china and Hlass, these things are usually packed the day before the removal under the supervision of the foreman. In any case packing cases are provided for smaller articles and pictures and for books. Large pictures should he protected by plenty of thick wrapping paper and moulded frames by. sacking. The firm will naturally only be responsible for goods packed by their own men, so that while it is always advisable to mention articles of particular value, it is best to leave the actual packing of them to the foreman.

Kitchen utensils and gardening implements are generally put in last. The former are packed in cases, with the exception of things which will be immediately required and which are best placed in a special box, so that they are easily got at on arrival. When the fumiture is being taken out, wardrobes and sideboards may be unscrewed and removed in sections if necessary, and this is the rafest plan where heavy furniture is concerned, as well as the most convenient. The leaves should always be taken out of a dining table and the table firmly screwed up to its smallest proportions, otherwise the screw underneath is
liable to become atrained or warped in transit Trouble with the piano depends mainly on its location in the house. If it has to be fetched down from an upstairs room careful handling is required not to damage walls and banisters; should there be sharp comers to negotiate, it may have to be taken out through a window, and an extra charge is made by the firm for the necessary apparatus

On arrival at the new premises the contractor's men look to the mistress of the house for instructions as to where all the things are to go, so it is always beat for her to be on the spot. Besides directing the disposal of the furniture, she will also see that any heavy picces which were removed in sections are properly screwed together again, and that mirrors. etc., over fireplaces are fixed in position

Where the removal involves a railway journey from one town to another the work of packing has to be very efficiently performed if breakages are to be avoided. Not only ornaments and amall articles, but every piece of furniture requires to be carcfully wrapped up and all edges and corners protected with straw or other material. Miriors and the more delicate pieces of drawing-room furniture need special attention, so that the packing-up takes longer to complete. The journey is made by goods train or motor vans, the contractors making all the necessary arrangements.

Legal Points. The important point for the householder to remember is that goods in transit are carried by the railway at the owner's risk, and, however carefully safeguarded, they are exposed to the risk of fire, whether in the goods yard or on the journey. It is therefore false economy not to take out an insurance policy covering the risk of fire while the furniture is in transit. Another point to note is that when more than one firm are engaged in the removal the householder should specially stipulate for an inclusive estimate, that is to say, an estimate which covers any charges made by the firm at the other end. Sce Electricity ; Fixtures; Lease Rent: Warehousing, etc.

REMOVE: The Course. A remove consists of the substantial dishes of the mest
course. Roast. boiled. or braised whole joints are removes, also beef à la mode, In rided fillets of beef or real, saddle of mutton, haunch of venison, or braised ham, etc. The remove follows the entrée.

RENANTHERA. This epiphytal orchid, shy blooming and suitable only for culture in a stove house, may be grown on bloctis of wood as described for other species in the article on orchids. It requires a minimum temperature of $60^{\circ}$ The growing period is from March to October. when roots reguire syringing twice daily. Plants rest during the winter period, and then require less moisture at their roots. Sec Orchid

RENDERING: With Mortar. Render ing consists in covering the surface of brick work or other structure with a coat of Poitland cement mortar. The rendering coat applied to the exterior of a house makes it more resistant to the weather. In a cement water tank the rendering keeps the water in the tank, or it may be used on the walls of a cellar to keep out damp. Rendering is often carried out for no other reason than to produce a smonth. impermeable, hard surface, an example of this being in the internal walls of a bitchen or of a scullery

The amateur will find that rendering with cement mortar is particularly beneficial to house property. The procedure to be followed must be guided largely by the nature of the work. In the case of small work, such as the briokwork immediately surrounding a trapped gulley at the outlet from the sink, it suffices to daub the wall with cement mortar, applying it with a trowel and smonthing it off. With a large aren, as, for instance, the whole of the exterior walls of a house, the rendering cont is kept uniform in thickness with the aid of screeds.

These are battens of wood about 2 in . wide and 1 in . thick, nailed to the wall to act as guides. They should be placed not more than 10 ft . apart, and set vertically with the aid of a plumb-line. Some horizontal screeds should also be put up. These can be kept straight by stretching a light line from one enil of the building to the other, and adjusting the
screeds until they are exactly parallel with it.


Rendering. Fig. 1. Preliminary spatter dash cont to rovide a key on brickwork. Fir. 2. Combings to furnish key
Courtesy of the sritish Porliand Cement Association, Lld

The screeds should he packed up so that the back of them is ahout $\frac{3}{3}$ in away from the normal wall surface, as this is necessary to provide for the first coat of mortar being worked underneath the screed The screeds are removed when the first coat has set Another plan that is sometimes adopted is to make the screeds in stmong cement mortar by working them up unt:l they are flat and true, and then allowing them to set hard. The wall surface at this atage has a series of ridgen upon it both vertically and horizontally, the upper surfaces or tips of the ridges heing on a level and true. In either case. the surface of the screed is used as a guide when finishing off the rendering coats

Rendering on Brickwork. With brickwork it is first necessary to rake out all the joints between the bricks and also to hack over the surface of them to roughen them so that they act as a key for the first rendering coat. In new brickwork which is intended afterwards to be rendered, facing bricks are often used which have a serrated surface. Another method of providing a key is to apply a spatter dash coat of cement and aand (l part sand. $1 \frac{1}{2}$ parts coarse graded sand, and 1 part water, all measured by volume) This is dashed on to the brickwork, leaving an uneven surface (Fig. 1). The spatter dash coat is left to dry for a couple of days.
Before applying the first coat, the face of the work is brushed down to remove the dust, and the hricks thoroughly wetted to assist the adhesion of the mortar. The latter may he prepared on a banker, or platform of wooden boards, in the proportion of one part of Portland cement and 4 parts of sand, for the first or rendering coat. The sand must be good clean, and sharp. and free from salt and earthy matter.

The proportions are obtained by measuring in bulk, using a pail or rough box for the purpose. The sand is measured up first, putting it on the hanker, and then measuring up the amount of Portland cement. This is put on top of the sand, and turned with the shovel two or three times. The remainder is stirred in with the shovel. Water is added and the whole mixed to a working consistency. It is applied to the brickwork with a large trowel, working as quickly as possible, filling the whole of one of the spaces between the screeds, working off the surface to an approximate fair surface, and trueing it up and straightening it by means of a floating rule

The work proceeds until the whole of the required surface is covered. The second or fining coat is applied usually ahout $\frac{1}{a}$ in thick, and should be composed of 1 part of Portland cement and 2 parts of sand, hoth measured by bulk. The same grade of sand should he used in the fining as for the rendering coat. The fining coat should be applied to the rendering coat as soon as the latter has set, hut before it is too dry, otherwise the fining will not adhere properly. A key is needed for the second coat and this is effected by combing the surface of the hacking coat when the latter has commenced to dry out and harden. The indentations should he about $\frac{\ddagger}{}$ in. apart and not more than $\frac{1}{k}$ in. deep (Fig. 2).
The surface is generally finished with a hand float, made of pine or other soft wood; in hetter-class work it is hrought first to a uniform face with a traversing rule, and then finished with a hand float. During the finishing process, the surface of the mortar must be kept wet with a brush, working up the face with the hand float in a kind of circular motion, as this tends to eliminate inequalities on the surface. This process is often known as scouring ; in addition to keeping the surface clear, it has the effect of hardening and consolidating the face

Finished in this way the mortar will dry out with a closely grained, compact, and smooth surface. If desired, it can be relieved by
jointing, that is, forming lines on the face junket and curds and whey. Rennet is about $\frac{1}{t}$ in wide and $\frac{1}{d}$ in deep, ruling them prepared from the stomach of a newly killed with a jointer. Other surface finishes are by calf. The stomach is thoroughly cleansed various methods of trowelling (Figs. 3-5). with salt and then drained for 3 or 4 hours. Alternatively, the work, if brought to a Afterwards it is stretched and well salted, smooth level surface, may be painted with and kept in the salt. one of the branded paints specially prepared for concrete and cement work. The ordinary paint is useless under these conditions. If it is desired that the aurface shall he waterproof the best plan is to use a recognized waterproofing material, which is generally obtained in powder form. and should be thoroughly mixed up at the time of preparing the mortar. See Cement: Damp: Mortar; Plaster.

RENNET. This is used in order to obtain a curdled condition of the milk. It is also employed for a similar purpose in making Curd; Junket.

## Rent and the Rent Acts

## The Leral Relations Between Landlord and Tenant

Agreements; Distraint; Landlord: Lease; Rates, are a few of the other articles that touch upon
Agreements; Distraint; Landlord: Lease; Rates, are a few of the other articles that touch upon
the aubject of rent. See also Furnished House; Ground Rent; House; Removal; Repairs
Rent is the money paid lor the use of houses or land. It is usually paid either weekly, or monthly, or quarterly, although landlord and tenant are at liberty to make any other arrangement about it For nearly all the smaller houres in the country rent is paid weekly, the collect or calling for it on Monday or Tuesday of each week. For the larger houses it is paid quarterly. Monthly payments are less common. but in London many persons pay rent for houses and flata by monthly instalments.

Furnished houses are usually let at a rent calculated by the week, but in this case it is not, as a rule, paid weekly. This division between weekly and monthly or quarterly corresponds roughly to the division between salaries and wages

The tenants of small houses usually pay rent and rates together, the weekly payment covering not rent only hut also rates. The landlord in such cases pays the rates from the money he receives. A number of flats are let on the same principle of an inclusive rent, as are most furnished houses. The landlord is obliged to show the amount he pays in rates, and under the Rent Restriction Acts he can increase the rent in order to cover any increase in the rates. Conversely, he must reduce the rent if the rates are reduced.

In some localities the plan of charging the rates on small houses direct to the tenants has been tricd, hut usually it is found that the other scheme is the more economical. The weckly rent paid by the tenant of a small house covers also any income tax which the landlord may have to pay on the property in question. In the case of larger houses, the Lenant pays this, but he can deduct the amount from the rent, and the landlord, if he is not liable to pay income tax, can recover it in the usual way.

Rent is not due until the midnight of the day upon which it is reserved to be paid, e.g. if rent is payable on Midsummer Day, it is not payable until midnight of June 24. Therefore it is not overdue until nfter midnight, and cannot be distrained for until it is overdue.
Rent Restriction. At common law land lord and tenant may agree on whatever rent they please, but with regard to certain dwelling houses this power is restricted by the Increase of Rent and Mortgage Interest (Restriction) Acta, 1920 and 1923, following certain earlier acte passed in 1915 and onward. These acts apply to dwelling houses huilt on or before April 2, 1919, where the annual amount of the atandard rent or rateable value does not exceed : in the metropolitan police district £105; in Scotland £90, and elaewhere $£ 78$. The meaning of "standard rent" and "rateable value" is given below. Dwelling house
includes a part.of a dwelling house which is let as a separate dwelling, e.g. one room in a house.
The acts do not cover furnished houses, ot rooms where attendance is provided at an inclusive rent, provided always that the furniture or attendance forms a substantial part of the letting. A house is none the less a dwelling house because part of the premises is used as a shop or office, or for any other husiness or professional purposes, but the acts do not apply to premises let for business purposes only.

Attendance always means attendance within the premises let; so that where the tenant of a flat which forms one of a large number in some London miansions pays for the services of someone to scrub the common staircase, and this payment is included in his rent, he is not apparently excluded from the act by reason of that circumstance.

For all dwelling houses within the acts there is a standard rent, and this standard rent is in the first place the rent at which the premises were let on Aug. 3, 1914. If they were not then let, the standard rent is the rent at which they were last let before that dise, or, if not let before, the rent at which they were first let after that date. Rateable value means the rateable value on Aug. 3, 1914.

Suppose the premises to have been let to tenants in the normal way continuously, no landlord can charge more than the standard rent until he has given a lawful and proper notice of increase. The notice must be one to expire at the end of 4 clear weeks, unless such notice is given on sccount of an increase in the rates, when it need only be one clear week Every notice must be true in substance, ie not false or misleading. No notice of increase of rent is valid unless the tenancy has been determined either by the lease running out or by notice to quit having expired.

In other words, the landlord can only give a notice of increase of rent where the tenant is holding over hy virtue of the act, and, but for the act, could be evicted. But if a tenancy may be terminated by notice, e.g. a weekly or yearly tenancy, if the landlond giver notice of incrase, it operstes as though it were a notice to terminate the tenancy from the earliest date at which it could be terminated by notice.

Rent Increases Allowed. The amount of the increases which may be charged is as follows
(a) On nay amount spent by the Inndlord on inprovement or structural alteration excluding decorations and repnirs, 6 per cent Interest on the capital sum if expenditure hefore July 2, 1820, and county court on the ground that the expenditure was unneressarv.
(b) The amunnt by which the ourrent rates exceed the rates payable on Aus 3, 1914.
(o) 15 per cent of the net rent. The net rent is, In casea where the tenant paya an inclusive rent (l.e. a rent which Inrludea ome payment in roapect of the ratas, which are then paid by the landlord), the standard rent leas the amount of the rates: in other caser (l.e. where the tenant pays his own rates to the ratandard rent
(d) Where the randlord is respohsible for the whole of the repairs, 25 ner cent of the net rent, and where he the reaponsible for part of the repairs mome amaller'amuunt fo lie elther agreed or declded by the county court.

When the tenancy is a sub-letting of part of a house, the sub-tensant may bave his rent increased by 10 per cent on the net rent of his part, and an amount equivalent to 5 per cent of the net rent of the dwelling house compris. ing the sub-tenancy may be charged to the tenant of the whole house. The tenant of $a$ house who sublets it in parts is bound to give his landlord, on temanc. a statement of particulars of the sub-tenancies The effect is that a tenant who aublets may increase the rent of his sub-tensnt by 10 per cent, but must band over hall of that increase to his own landlord

A tenant who has been served with notice ol increas under (c) or (d) above may, if the. bouse is not in a ressonsble state of repair, apply to the sanitary authority and obtain a certificate to that effect, and serve it upon his landlord; and thereupon he will have a good defence to any action brought for increase of rent and will not be bound to pay the inoreases till the place is put into proper repair. The certificate is not a defence if the state of the premises is due to the tenant's own fault. A landlord who transfers to a tenant any liability which he himself was under is to be deemed to have inoreased the tenant's rent to the eztent of that amount.

Decontrolling Houses. By an act of 1923, dwelling houser which have been protected by the Rent Reatriction Act may be " decontrolled," i.e. taken out of that protection in certain cases The restrictions will cease to spply in an $y$ of the following events :
(1) If the landlond was in possession of the whole of the dwelling house on the July 31, 1923, or came into possession of it at a later date. "Landlord" here means either a free. holder or $n$ tenant under a long lease at a small rent, and a dwelling bouse is not decontrolled if the tenant of a house who sub-lets rooms (and so is in a sense a landlord) comes into possession of one of the "dwelling houses" into which he bas divided the house, for be is not a " landlord" for the purposes of the act, liurther, where a Inndlord has let a house and his tenant has sublet part of it, that part will not become decontrolled if the landlord gets possession of the rest of the house on the tenant going out.
Posscsaion means actual possession, and the dwelling-house will not become decontrolled if there is merely a change in the tenancy with no interval between the end of the old tenancy and the beginning of the new tenancy. Thus, if a tenant whose tenancy runs from Saturday to Saturday, goes out on a Wednesday, having paid rant for the full week, and the new tenant enters on the following Monday, paying rent from the Saturday, the landlord will not at any time be entitled to possession, although he may actually enter, and the house will not be decontrolled. There must be an interval between the tenancies for which no rent is due by anyone The landlord should always enter the premises between the tenancies or send his agent there, in order to eatablish definitely that he is in possession. Acts such as having the dwelling-house cleaned or painted are very astiafactory evidence of being in possession.
(2) If the landlord grants to the tenant after the 31st July, 1923, a lease of the dwell.
ing-hnuae iot "term ol not reas than two yoars, ending not earlier than one gear after the date fixed at the time at which the lease is granted for the expiration of the Rent Restriction Acts. The Act wes due to expire on 25th Docember, 1931. in England, and on 28th Mav. 1932, in Scotland, huit, acoording to a statement made in Parlinment in Sept., 1931 it will be continuel for some time alter these dates. The granting of a lease will not operate to decontrol any dwelling-houses which are part of the principal dwelling-house and which are sublet to sub-tenants of the tenant to whom the lease is granted. Once a dwelling house is decontrolled. the landlord can charge any rent he nleases for it This means that there is a return to the usual house-letting syatem practised before the War, whereby the landlord in letting his house to a tenant obarged an economic rent, i.e. a sum to cover initial costa and show a fair margin of profit.

Arrears and the Rent Acts. A landlord can nut levy a distress for rent in the case of a dwelling-house within the Rent Restriction Acta without previously obtaining the leave of the county court.

Whether a house is within the Rent Kc atriotion Aots or not, an under-tenant or louger may obtain protection for his property against any diatress levied by the superior landlord for rent due by his tenant (i.e the immediate landlord of the auh-tenant). He should serve on the superior landlord or his agent a declaration in writing made and signed by him stating that the landlord's immediate tenant has no right of property or interest in the goods sought to be distrained, and that the same are the property of the under-tenant. An inventory of the goods referred to must be annexed to the declaration

## Tenants and Sub-Tenants

The declaration must also set forth the amount of rent (if any) due from the sub. tenant to the tenant, the times at which future instalments become due, and their amount, and must contain an undertaking to pay direct to the superior landlord instead of to the tenant any rent due or to become due until the arrears for which the distress has been levied have been paid off A landlord, when the rent due by his tenant is in arrear, may serve upon any aub-tenant of that tenant a notice requiring him to pay all future rent to the landlord, instead of to the tenant until the arreara have been paid off. When a sub-tenant receives such a notice he must pay bis rent to the landlord.

Deductions from Rent. Rent is invariably a net amount und not subject to any discount or other reduction, such ar $^{4}$ is customary in trade. It is only under exceptional circumstances that a tenant is entitled to make a deduction when paying his landlord An example of this is where the tenant has been called upon in an emergency to pay the ground rent and has done so in order to pro tect his own interests and to avoid trouble, or perhaps simply for the convenience of the landlord, or in his alsence. In such a case the tenant is entitled to deduct the amount from his next payment of rent. In the same way, when a lodger's goods are included in a distraint for rent duc by his landlord to the owner of the property, he can deduct their value, if they should be sold, from the amount of rent.

Quarter Days. For the larger housea rent is usually payable in England on one of the four statutory quarter days, namely Lady Day, March 25 ; Midaummer Day, June 24 : Michaelmas Day, Sept. 29; and Christmas Day, Dec. 25. In some tenancies, where no quarterly paymenta are expressly stipuleted for, the rent is payable at the end of each year, but in the great majority of leases and yenrly tenancics rent is payable on the quarter days.

When a house us vacant a tenant may be allowed to enter before the quarter day stated in his agreement. Refore the Great War, and the consequent shortrge of houmes, it was not unusual for a landlord to charge no rent 'or this extra period as an inducement to the tenant to take the house Now, however, the tenant will generally be expected to pay the lull rent from the date of entry. If he decides to leave the house before the tenancy has expired he is not entitled to make any deduction from the rent.

Recovery ol Possession. When premises are let for a fixed period the landlord cannot as a rule recover possession until the end of the period It is, however, in varin bly provided in a lease or agreement that the landlord ahall be entitled to recover possession if the tenant commita a breach of any of the terms of the letting -eg fails to pay the rent due, or to keep the premises in repair or uses the premises for some purpose for which he is forbidden by the ngreement to use them. In such a case, however. the landlord must firat serve a notice on the tenant and give him an opportunity of making good the breacher, and the court will not allow the tenant to be evicted if he does so and pays rensonable damages and costs.
When premises are let for an indelinite period, e.g. weckly, monthly, or yearly, the landlord cannot recover possession until be has served a notice to quit on the tenant, or the tenant has served one on the landlord, unless the tenant has committed some breach of the terms of his tenanoy which gives the landlord a right to recover possession.
Glving Notice. The length of the notice to quit may be atated in the tenancy agreement. If not, it will depend on the nature of the tenancy. In a weakly tenanoy. a week's notice is required, expiring on the day of the week on which the tenancy commenced. Thus, in a Monday to Monday tenancy, the notice must require the tenant to give up possension on some Monday at least one week after the notice is served. A month's notice must be given in a monthly tenancy, expiring on the date of the month on which the tenancy commenced. In a tenancy from year to year, six month's notice expiring on the day of the year on which the tenancy commenced. must be given. If the tenancy commenced on a quarter day, e.g June 24th, notice given on the previous quarter day but one, ie Christmas Day, will be sufficient, although there are not $18: 3$ days between Christmas and June 24th; but if the tenancy comnienced on a day not a quarter day, the full six montha' notice ( 183 days) must be given.

The notice should be in writing, addressed to the tenant and aigned by the landlord, and must atate clearly the promises to which it refers and the date on which it expires. A common printed form of notice much used by landlords requires the tenant to leave "on or before" a certain date. This form of words has been stated to be a bad notice and should not be used. A tensant is entitled to remain until midnight on the last day of his tenancy, so a notice expiring at noon would be bad. This branch of the law is very technical and all the reguirements must be strictly complied with. The notice may be served either personally or by post. A suitable form is as follows:
26. Plowden Road,
W. 20.

Octnber 1st, 1931.
I bereby give son notice to quit the premises now occupied by yoll as my tenant at 1/6, rountala Road, W.29, on Monday, October 12th, 1931
(Signed) Joun Dos
To:

## Elchard Roe, Esq. <br> 176, Fountain Řnad, <br> W. 29 .

No rent must be accepted for the period after the notice to quit hes expired (i e after

October $1: 2 t_{1}$ in the illustration) or the notice will be completely invalid Arrears may be accepted at any time. This does not apply to premises within the Rent Acts.

Notice and the Rent Acts. When a house is protected by the Rent Acts the landlord can only recover possession by applying to the court He must serve a notice to quit in the ordinary way, but his application for possession will be granted only if he can prove
(1) That the tenant has failed to pay his rent, or to perform some other obligation of the tenancy (see helow).
(2) That the tenant, or some sub-tenant of his, or some person living or lodging with him, Lhas been guilty of conduct which is a nuisance or annoyance to other occupiers, or that he has a!lowed the house to deteriorate by his neglect.
(3) That the tenant has given the landlord notice to quit and the landlord has in consequence taken some step, such as selling the house with vacant possession, which will scriously prejudice him if he cannot get possession. It follows, therefore, that a tenant in an ordinary case is not bound by any notice to quit he may give.
(4) That the landlord reasonably requires the house as a residence for himself, or for some child of his over 18, or for some person in his employment. In this case, however, the landlord must satisfy the court that some a!ternative accommodation suitable to the tenant is available. Altemative accommodation need not be provided in the following cases: (a) where the tenant was himself employed by the landlord and occupied the house in consequence of his enployment which has now ceased (e.g. was the manager of a shop who lived over the shop); ( $b$ ) where the landlord hecame landlord in some way other than by huying the house after May 5th. 1924, and requires the house ns a residence for himself or a child over 18, and the court is satislied that greater hardship would be caused by refusing to evict the tenant than by evicting him.
There are other grounds on which the landlord is entitled to recover possession, notably when the tenant has sublet the whole of the dwelling house, hut the above are the most important in practice It should be noted that even if the landiord suceceds in establishing one or other of the facts ahove, the court wi!l nevertheless not grant him possession unless it is satisfied that it is just and reasonable to do so. This is very important in practice, especially in a case where the landlord claims because the tenant is in arrear with his rent. In such a case the court will allow the tenant to remain in possession so long as ho pays his current rent and a small sum weekly of the arrears. If he fails to do this, the landord must again apply to the court, and if the court is satisfied thint there is no reasonable prospect of the tenant paying, it will grant an order for possession. When premises are within the Rent Acts, the Inndlord may accept rent after the expiration of the notice to quit.

These provisions restricting the right to recover possession will cease to apply to any house which is Gecontrolled, but the ohtaining of an order for possession on one of the grounds set out above will not of itself clecontrol a house.

It is a criminal olfence for a landlord to ask any prenium for letting a house to which the Rent Acts apply. A tenant, however, may agrec to accept a lump sum for giving up possession, hut landlords should exercise great care in entering into such an agreement, for it may be impossible to enforee it against the tenant. who may take and spend the money paid by the landlord and then refuse to perform his part of the bargain.

The Law in Scotland. In Scotland rent is paid hall-yearly as a rule on onc or ot her of the two term days, which are Whitsundav: May 15, and Martinmas, Nov. 11. These are called the legal ternis to distinguish them Irom the other dates in the Scottish legal calendar Candlemas. Feb 2, and Lamnias Aug 1, which are conventional terms Rent mav te paid on either of these latter terms if there is an agreement to that effect, but so far as the ordinary business of house letting is concrined tlie term days observan throinghout Scotland are Whilsunday and Martinmas.
A peculiarity of the northern system is that a tenant may enter on May 15 or Nov..11, hut in all the burghs he moves out at the end of his lenancy on diflerent dates. The moving-out dates are lixed a fortnight later than the term daps, namely May 28 and Nov 28.

The equivalent of the written or printed form of agrcement by which many English tenancies are governed is a document known as a missive, in which is set out the duration of the tenancy, the amount of the rent and when it is payable, the rates for which the tenant is responsible, and whatever conditions have been agreed upon as to repairs. No tenancy is effective until the missive has heen signed by the tenant

## House Letting in Scotland

The business connected with the letting of houses is carricd on as in England by house agents or factors, but a considerable portion of it is in the liands of lawyers. This applies especially to property let on weekly or monthly tenancies, hut it also includes larger houses and flats which are !et by the year or leased for longer periods The law agents undertake the advertising and letting of the property, collect the rents. and see that the conditions set out in the inissive are duly observed.

Notice to terminate a letting of a house must be given in writing forty days before Whitsun (May 15) or Martinmas (Nov. 11) if the letting is for over a year. If the letting is for four months or less the notice must be given some time not less than a third of the total let before the end, and if over four months then forty days before the end. All these periods may be altered by agreement between the parties concerned.

Special provisions apply to small houses entered in the valuation roll at a small amount. The maximum figure varies according to the size of the burgh in which the house is situated. No agreement for any letting of such a house is valid if made more than two mont hs before the let is to begin; lets for more than a month can only be ended on the 28th of a month at noon, and those for less than a month on a Monday at noon ; 40 days' notice must he given if the let is for 3 months or more. and a notice equal to a third of the let if the let is for less than three months. None of these conditions can be altered by agreement. If a tenant of such a house is seven days in arrear with his rent. the landlord may give him 48 hours' notice.

REPAIRS: To Houses. When $\pi$ house is let for a term of years the agrecment usually contains a clause stating whether the landlord undertakes all reasonable and necessary rejairs, or whether the liability rests on the tenant. In the $n$ bsence of such a clause there is no liability on either side so far as the agreement is concerned, hut there may be a statutory liahility. In Scotland, on the contrary, the landlord is liable for repairs, nud if he fails to carry them out the tenant may do so and deduct the cost from the rent.

Sometimes there is a covenant in a lease under which the premises are to be delivered up in a good state of repair on the expiry of the lease. The tenant should understand that in such a case he is liable to put the house in proper repair whatever may have been its
condition when he entered it. In this and all other cases everything depends on the terms of the agreement, and before he puts his signature to that document a tenant should always take the trouble to ascertain exactly what his pusition is in regard to repairs Thus the tenant is liable to the landlord for any disrepair if under an expiress agreement to yicld up the premises in gond repair
The usual oovenant in an ordinary tenancy other than by lease is that the tenant must keep the premises in a pmper state of repair. fair wear and tear excepted. and leave them in such a state at the end of the tenancy : and that the landlord shall have the right to enter the premises at any time or within reason to see that they arc in a proper state of repair. The landlord is under no liability to do repairs unless he has expressly agreed to do so, or there is a statutory duty imposed on him. Where liable, and he refuses, the tenant can do them and sue the landlord for the cost. The tenant cannot deduct such cost from the rent.
The tenant is bound to take ordinary care of the premises and to tnake good any damage done during his tenancy. He is not bound to replace windows or door panels that were hroken before he entered into possession, but if these or any other fittings should get broken afterwards he is liable for the repair.
A ronf which leaks after a tenant has taken over is often a matter of dispute. Apart from agreement or statute the landlord is not liable. It has been held in the courts that it is the tenant's duty to see to its repair': hut this is a doubtful proposition In most cases a landlord, in his own interest, will repair it so as to preserve his property : hut he would be quite within his rights in refusing to do so, and then the tenant in his own interest would prohably do it

## Repairs and the Rent Acts

Under the Rent Acts the subject of repairs acquired increased importnnce. Wherc the landlord is responsible, increase of rent is conditional upon a house being lept in proper repair, and he is dcemed to be responsible for all necessary repairs for which the tenant is not expressly liable. A certificate from the sanitary authority that a house is not in a reasonable state of repair is a good defence to any claim for increased rent.

A landlord is liable to his superior landlard or freeholder for repairs if the property is leaschold, and those who own their own house should carefully study the covenants of their lease. The ground landlord can compel him periodically to re-point the brickwork, etc. The landlord who is his own frecholder is liable to the local authority if his property becomes dilapidated.

Houses inhabited by the working elasses stand on a different fouting. The landlord here is deemed to warrant that the house is in a hahitable state when the tenancy begins and to contract that it shall be kept in reasonable repair during the tenancy. Such houses are those the rent of which docs not exceed $£ 40$ a year in London; $£ 26$ elsewhere. In no case does the implied warranty hold when the letting is for threc years and upwards, not determinable before that time by either party, and when the lessee has agreed to put the house into habitable condition.

A tenant who has agreed to repair and keep in repair his house is not hound to make a new house of it Unless he has expressly agreed to paint he need only paint so far as is necessary to preserve wood or imnwork, and not for decoration. Regard must be had to the kind of house, its age, situation, and the like. Thus a tenant of a house in Grosvenor Square, london, undertaking to keep it in repair, must conform to a much higher standard than a tenant in Mile End Road.

If the tenant fails to repair, when bound to do so, he will he liable in damages, but these
damages must not exceed the actual loss suffered by tho landlord. When a house is shortly to be pulled down or structurally altered, no damages can be recovered for failure to repair it.
A tenant should take care to see that the house is in good order before he enters it, for there is no implication of law, except as to working-class houses, that they are in such a state when let. unless they are let furnished. There is not even an implied condition that an unfurnished house is habitable: so if the new tenant finds tho drains aro unsound. he has no remedy unless the landlord waitanted them to be sound. See Dilapidatinns ; Drains: Rent.
REPOTTING. As plants raised from seeds or cuttings increase in size it becomes necessary to repot them, i.e. to placo them in larger pots of soil to provide the mots with the extra nourishment needed. The first repotting of the seedlings or rooted cuttings is in smail flower pots, $2 \frac{1}{2} \mathrm{in}$. wide: the next shift is to 5 in . pots, which are large enough for many kinds of flowering plants: 6,7 or even

8 in . flower pots are required to ensure the full development of certain kinds, e.g. chrysanthemum, cineraria, herbacenus calcenlaria.
Before disturbance for repotting, a plant must receive a thomugh soaking some few hours in advance. To turn a plant out of its pot grasp the stem between the fingers and invert the whole : then give the edge of the pot a sharp rap on the edge of a bench, and lift it clear of mots and soil. With a stick pick out the old drainage crocks and remove lonse soil.

The now pot must be scrupulously clcan, and it is worth while ensuring this condition by scrubbing it out with hot water. Clean crocks are desirable also. Suitable composts vary with different classes of plants. For palms and aspidistras, 2 jarts loam and half portions of leaf-mould, peat, and sand will be found excellent. The same materials in equal portions will satisfy ferns, whilst 2 parts good fibrous loam, 1 part well-decaved manure, and a littlo well-washed silver sand will suit such plants as fuchsias and geraniums. See Fern ; Potting.

## Repoussé Work in Brass and Copper

## Particulars of a Process that Gives Charming Results

This contribution should be read in conjur.ction with the article on Bowl. Where the elements of
simple repousséwork are explalned. See also Metal Work: Napkin Ring; Piercing: Silver Work

In its strict application, repoussé work mcans the formation in relief in thin metal of a pattern beaten up from the reverse side, but it now generally includes the shaping as well as the decoration of the article. It is a handicraft that can easily be done in the home, a workshop not being essential for its processes. Brass and copper are commonly employed, the most useful thicknesses of metal being from 26 to 22 imperial standard wire gauge.
In selecting the metal its ductility is of importance. Silver, although expensive, will bear considerable expansion and is pleasant to work on. Of the inexpensive metals copper is extremely ductile ; it can be finished with an agreeable surface and is not liable to crack. Brass is harder, and not so suitable for high relief, but for many small articles it is very useful. Pewter is extromely soft and easily worked, but it is liable to split, and only in the thinnest sheets can it be used for higli relief with any success. Iron and steel, particularly if thin, are capable of considerable expansion, but the repoussé ornament should be restrained.
Repoussé work may be begun with a few touls, the principal ones being shown in Fig. 1. The first is the hammer, the head of which should be steel, or at least steel faced; the handle of special form is about 10 in . long, quite slender for two-thirds of its length, and terminating in a knob of a flattened oval form. A boxwood mallet with a similar handle is also necessary.
A selection of small punches is required; these for a beginning should comprise a tracer, a number of raising tnols, pearls, punches, and matting tools. A steel scribing point is necessary, but it can be made from a knitting-needle ; a pair of shears, compasses, try-square, and steel rule complete the worker's equipment.
Although a number of small articles can be made without it, a pitch block is essential for good work. This is a block of wood covered with a thick layer of cement made by melting 4 lb . of best black pitch in an iron pot and stirring in $f \mathrm{lb}$. powdered resin and $\frac{1 \mathrm{l}}{\mathrm{b}}$. Russian tallow. When thoroughly mixed, add 4 to 5 lb . of plaster of Paris.


Fig. 1. Good outfit for the amateur, by means of which most of the work illustrated can be done courlesh of C. J. Ilucknett it Co., I.Id.
off the block. If the metal is warmed and wiped with an oily rag, any adhering pitch can be removed. The pattern should he plainly visible on the other side of the metal. and that side is now placed uppermost and fixed in the cement. A brass punch is placed between the raised marks and the hammer used to drive it into the metal.

It is better to work along gradually, making a slight hollow, and to repeat the proceas several times, rather than attempt to reach the required depth at one blow. It will be seen that much depends on the shape of the punch. If some hard brase rod and bar is obtained, it will be possible to form suitable shnpes with a a file. The sliaped end of tho punch must be quitc smooth and polished, as any uneven marks will show on the other side of the punched surface Having sufficiently deepenel the pattern, the metal is removed from the cement, warmed, cleaned, and then replaced with the raised surface uppermost

The shape of the pattern is now adjusted with the tracer, but this time it is placed on its side, so that hammer blows properly directed will work the raised pattern to its correct shape. This is a simplo operation, but care must be taken that only the lightest hammer blows are given, otherwise there is risk of driving the tool through the metal If the metal has liccome uneven during the previous work, it can bo levelled with the mallet, removing it from the cement and placing it on the sandbag, and when necessary on the flat iron, taling caro not to damage the raised surface.

Ornamentation of the Ground. If it is desired to punch or indent the surface of the ground, or give a matt effect, the metal must first be thomughly cleaned. Useful tools are the pearls, mado of round steel rod ground to a round point and polished; these are usually provided in 3 or 4 sizes. By obtaining n number of 5 in . lengths of $\frac{3}{16} \mathrm{in}$ steel rod, it will he possible to make suitable pearls, nnd also a tracer, which requires grinding to a blunt edge on both sides. Steel punches are made in the samo way, by using rod of suitable thickness and grinding the ends to the required shape. All steel punches must he hardencd and tempered, and the ends of them must be highly polished.

The methods described are suitable for all raised work, but with high relief it is necessary to removo the metal frequently for the purpose of annealing. Continusl hainmering, either direct or through n punch, has the sure effect of hardening the metal, and it is only when it is soft and ductile that the material can be thinned out. As a rule, the harder the metal is the more frequently must it be annealed.

More Elaborate Work. When the repousse worker has had experience in raising simple forms, nnd desires to attempt more elaborate work, it will be neccsarary to do some of the preliminary sinking on the sandbag. Owing to the skill required in the successful manipulation of the mallet and the prevention of undue straining of the material, it is not advisable to attempt this stage of the work until a fair knowledgo of the properties of thin metal has been gained.

When the sandbag is used, the surface of the flat iron, or a suitable hard surface, should be used in conjunction with it; after every few blows with the mallet, held as at Fig. 3, the work must be straightened on the flat surface: and frequent annealing must not be forgotten. The deeper the sinking is carried the thinner the metal becomes.

The surface finishing of repoussé work is an important matter, and consideration of the purpose of the finished work enters largely into it. If it is desired to tool the raised surfaces to any extent, it will lie necessary
to fill up the hollows before the motal is placed on the cement block. The surface modelling is done in the same way as ordinary raising, but using greater care. Punches suitable for working the particklar shapes are used. The tracer, omployed as descrilicel above, is a useful tool to define shapes.

Repousse decoration of bowl shapes is not so simple as in flat work, and diferent methods must be employed. Figs. 4 to $\overline{7}$ illustrate some of the progressivo stages in the process of decorating a small fruit dish. For a small bowl where it is impossible to use a punch. the method is to use a snarl held in the vico and a hammer. Sevoral shapes of snarl must be provided, and it is hardly possible for the amateur to attempt much of this work without a large equipment. The raising is carried ss far as pmssible with the snarl, and then tho bowl is filled with cement, so that the main portion of the work can be done from the front. Pinfessional workers rely almost entirely on surface modelling to obtain the effect, and are content to bulge tho decorated surface beforehand.
The sclection of suitablo designs is not difficult : many are to be found in the pages

of this Encyclopedia. It is important that the shaping should be done as far ns practicable before the ornament is worked. It is often possible to do the shaping and the decoration at the eamo time ; but it is only with a fow shapes that it is possible to shape the work after raising a portion of it Simple forms for trays and dishics can be done on the sandbag, and with the aid of one or two metal worker's stakes of varying sliape (see Silver Work) all but the most claboratc forms can be worked.

The method of procedure in advancerl work is very littlo different from ordinary raising, the main consideration being that of modelling. It is not always easy to gauge correctly the amount of sinking necessary to produce a pleasing surface effect ; only exporience en ables tho worker to obtnin tho approximate depth so that removal from the block can be reduced to a minimum.

With large bonls it is always advisable to completo the shapc as far as possible before the docoration is appliod, and also to use tho sandhag and mallet to heat out prominent portions of the design. This method assists the raising, because tho metal is spread more evenly than is possible on a large surface when only raising tools are cmployed.

Final surface linishing should not be nttempted unless the hollows have heen filled completely with pitch; if there is much work to do, it is advisablo to use $n$ harder pitch than is generally employed Matting tools should bo used always with discretion, and in lange work must be avoided for purprses of background effect. The main object in employing them sloould bo to give texture to leaves and drapery.

Cleaning and
 Finishing Themetal when worked is warmed and cleanerl and then dipped into an acid bath; it is washed and dried and then polished with a hard brush and powdered puinioe. If r highly polished surface is desired the prominent portions


Repoussé Work. Showing how the various toals are held and used for the successful execution of this decorative metal wark. Fig. 3. Inclination of the mallet when beating aut a hallaw in a flat piece of metal. Fig. 4. Method of holding the tracer. Fig. 5. Tracer held on its side to true-up shapes in the design. Fig. 6. How to hold the punch. Fig. 7. Method of holding the mallet for flattening metal
should be burnished and finally coated with cascade. The practical unit of resistance is lacquer. but it is usual for a plain surface to be left and then lacquered. A common finish for copper is oxidizstion: this is effected by dipping the metal in a solution of ammonium sulphide and thomughly washing when the desired colour is renched. Owing to the offensive odour of this liguid, the work should be done out of doors. To retain even the oxidized surface it should be lacquered.
REPP. The name rep or repp of this furnishing and dress fabric cones from the fact that the surface is ribbed.
The best furniture repps are made with threads of two different thicknesses running in both directions of the cloth. The structure is firm, and in good colours repp is a suitable material for covering chairs, settecs, etc. See Upholstery.

RESEDA. This is the botanical name of mignonette, a familiar plant with sweetsmelling flowers. It is sown out of doors in April for summer bloom, and in pots in August to produce winter blooms under glass. Resedn glauca, a hardy perennial with grey-green leaves and pale flowers in summer, is a useful border plant.

RESIN. The best-known resin, or rosin, is obtained by the distillation of crude turpentinc, which oxudes from pine-trees. It varies in colour from a pale amber to dark


Resiatance. Showing a complete resiatancecoupling unit as deacribed in the tezt
brown, according to its purity or method of preparation. It is a brittle solid with a glasslike fracture.
The solid resin is used for giving violin bows a grip on the strings, and in powder form is employed by golfers and tennis players to incresse the grip of the hands. Dissolved in turpentine or benzine a simple form of varnish is obtained, but the surface of the varnish is not sufficiently hard unlesm copal or mastic renins are also used with it.

Resin is used in soap making, and resin soap is supplied in the form of a coarse powder for household cleaning purposes, but owing to its colour it is not suitable for washing linen.

RESISTANCE. This is the opposition offered by an electric circuit to the How of clectric current. The resistance of a wire is directly proportional to ita length and in. verszly proportional to its cross sectional ares.
Copper and silver have a low resistance per unit length, whereas certain alloys, e.g., manganin, nichrome, etc., have a high resiatance per unit length.
Resistances are frequently employed in wireless receivers to prevent the passage of high frequency currents, to reduce voltages, and in certain methods of coupling valves in

Resistance Coupllng. In a wireless receiver this is a method of coupling the values of a low-frequency magnificr in cascade by means of resistances.

A resistance is connected in series with the anode of the valve and the signal voltages across the resistance are applied to the grid of the following valve by way of a coupling condenser The coupling condenser acts simply as a mcans of preventing the high tension voltage from reaching the grid of the valve. It offers a free path to the amplified signal voltages. A grid resistance or leak is joined between the grid of the valve and grid bias negative to allow the negativo charge on the grid to leak away and to maintain the grid at a steady negative potential.
The amplification per atage in a resistancecapacity coupled amplifier can never exceed that of the valve itself, and this figure is reached when the value of the anode resistance becomes infinity. In practice it is possible to obtain a magnification of about two-thirds the amplification factor of the valve. The use of $n$ high value anode resist ance in an endeavour to achieve the maximum amplification results in a loss of the upper musical frequencies and reduces the general brilliancy of tonc. become low pitched.

In general the value of the anode reaistance should not be greater than 250,000 ohms. When faultless reproduction is dosired the values of the anode resistances may be 100,000 ohms or even lower. The use of too high a value anode resiatance in the anode circuit of a detector valve may produce a complete lack of reaction. The coupling condenser should be sufficiently large to pass the lower musical frequencies, and 0.01 mfl . is a common value. It is essential for the condenser to possess high insulation, and for this reason the dielectric should be preferably of good quality mica. The grid resistances may have a value of 1-2 megohms.

A pmoperly designed resistance-capacity coupled low frequency magnifier will give very faithful reproduction, but the magnification per valve stage is considerably less than that obtainable with transformer coupling. See Annde; Capacity; Condenser; Dielectric: Grid; Resistance; [Rlenstat.
Respiration. See Breathing.
REST CURE. In the treatment of a large number of disorlers rest is an important. or it may be a necessary, element ; but the form of treatment for functional nerve diseases, such as neurasthenia, etc., associated with the name of W'cir Mitchell, is popularly known as the rest cure. The patient is kept in bed, but besides this is isolated, no that mental rest is secured as well as bodily.

The treatment includes more than reat, however, as an effort is made to improve nutrition by a genernus diet, including milk, and electricity and massage are used to improve muscular tone. The treatment is very suitable in some cases of neurasthenia.

REST HARROW. This is the common name of a gmup of hardy perennials or ahrubs (ononis) which bear pea-shaped Howers in summer. One of the best, suitable for the rock garden, is Ononis aragonensis, 18 in . high, with yellow flowers. Ononis fruticoss bears rosepink blooms. They should be planted in light or well-Irained s il, and in a sunny prosition. Seeds sown in summer or
cuttings taken at the samo time provide an increased stock. The commun rest harrow which grows wild in Britain is Ononis spinosa, a low-growing somewhat shrubby perennial with rose-pink blooms.

## RESTRANNER: Use in Photography.

 Chemicals used to prevent too vigomus a developing action on a negative or development paper are known as restrainers. Putassium or ammonium bromide is most commonly emplosed. They tend to delay density in negatives or bromide and gaslight papers while detail is formed. Potassium bromide is best kept as a 10 p.c. solution, i.e. containing 1 gr . of bromide in 10 min . of solution. Dissolve $\frac{1}{2} \mathrm{oz}$. ןpotassium bromide in $4 \frac{1}{2} \mathrm{oz}$. of distilled water and add about 5 min . of the solution to each ounco of developer.RESURRECTION PLANT. This is a most curious plant, known alao as the Ruse of Jericho: its botanical name is anastatica. If placed in water it has the extraordinary power of reviving even after it has been kept dry for many months, hence its popular name. Seedlings may be raised under glass in spring and planted out of doors in summer. After the leaves fall the plants become somewhat woody and remain dormant until put in water.
RETAINLNG WALL. Where the special function of a wall is to resist strain imposed upon a structure by adjacent earthwork it is known as a retaining wall. A common application of it is found in basement houses whero a low wall is provided to keep the carth in position around the area. See W'all.

RETCEING. An involuntary and unsuccessful effort to vomit is called retching; gas is sometimes expelled. When it exists it is often a useful thing to drink large draughts of warm water, or very hot water may be sipped. See Sickness; Vomiting.

RETINOSPORA. This is a group of handy evergreen conifers which is now merged in the genus cupressus or cypress. In gandens, however, the name retinospora still persists. One of the most beautiful is Retinospora pisifera, of which there are many varicties: argentea and squarrisa are handsone groyleaved kinds while plumosa aurea has yellow or golden leaves. Another species is Retinospora obtusa, of which attractive varicties are aurea and gracilis aurea. Planting should be done in September or carly Octuber or in April-May in loamy soil. Propagation is by cuttinga in a fraine in September. See Cypress.

Retouching. See Spotting.
RETRIEVER. Of the four varieties of retrievers the curly-costed are so few in number that they are seidom seen except at show


Retriever. Prize-winner of the aturdy short-coated Labrador variety
eyes which give him a kindly appearance, and he is as intelligent as he looks. The shoulders are so well placed as to give freedom of action. The body is shortish, of medium length in couplings, thus enabling him to gallop. The front lega are perfectly straight The Labrador is another variety Here the cont is peculiar, being short, very thick and somewhat like fur to the touch. There is scarcely any feathering on legs or thighs Altogether he is squarely, sturdily built. The eye, which should be a dark hazel, is sometimes still too light. The retriever is a first-olass dog for work, and very frequently proves the winner at field trials. The golden retriever is of Russian extraction.
Training. A retricver puppy may be broken in very early, the first step being to gain his confidence. Encouraged by the reward of a biscuit he should be taught to come at a gallop in response to a low whistle. To teach him to drop, take him into a quiet spot. secure his attention, and hold up ono hand, pressing him into $n$ recumbent position with the other. The command drop should be repeated every time He should remain in this position even when his master walks away; but if he refuses, he may be fastened to a peg untíl he does so. At six months old he may start learning to retrieve. He is first taught to fetoh some soft object, such ня a rolled-up bandkerchief, which his master throws a few yards in his sight, with the order "go fetch." The distance is extended gradually, until the object is dropped when he is not looking and he is ordered " hie seek" See Dog; Kennel; Mange, etc

REVERSI. This indoor gamo is played with (if counters on a bonrd resembling a chess board, but usually somewhat amaller.


Rheostat. Types of rheostat sultable for use as volume control in a wireless receiver

It can, however, be played on a chesy or draughts board. The 64 counters are red on onc side and green on the other. They are divided between the two players, one treating bis as red and the other treating his as green. The players in turn place onc on any vacar.t square on the board, each keeping his own colour uppermost.
The ohject of the game is to place the pieces so as to enclose one or more of the hostilo pieces between two of his own. This done, the enclosed pieces, which must be in a straight line, join the other side, i.e. they are turned over and so changed from red to green or vice versa. The game continues until all the pieces have been played out, and the player who has the most of his colour on the board is the winner.
REVOLVER. A revolver may be described as a pistol with a revolving cylinder, in which are a number of cartridge chambers. Several shats can therefore be fired withont re-loading the weapon. With revolvers may be classed the weapons known as automatic pistols, which have a magazine. The law about owning and carrying revolvers is the same as it is for pistols and other firearms.

In brief, these regulations decree that no person may possess any firearm or ammunition unless he holds a certificate to do so, such certificate being granted by the chief police officer of the district in which he resides. To secure a certificate of this kind the applicant must satisfy the police that he has good reanon for needing the revolver or other firearm, and that its possession is not likely to cause any danger to the public safety or any breach of the peace
lor these reasons a certificate will not be granted to anyone who is of intemperate habits, or is in any other way considered unfitted to possess a firenrm. The cost of a cortificate is bs. It should be renewed on Jan 3lat every year, and a fee of 2 a . odd paid for the renewal. The law provides also that any dealer who sells a revolver or nther fircarm must take the name and addiess of the porson to whom it is sold. These facts must be communicated to the police, and also put on record. It must be borne in mind that the possession of a certificate does not absolve the holder from procuring a gun licence.

Rovolvers are distinguished by the size or calibre of the bore, the unual sizes being 22 , $\cdot 32 \cdot 38$, and -455 . The smallest size, i.e. 22 , is of little value except as a target weapon. The 38 is the smallest calibre that can be relied upon to stop an assailant, but the defensive uses of the otliers are by no means negligible. Cartridges are sold according to the calibre See Gun.

RHAMNUS. Several hardy shribs of no great decorative value are included in this genus The British buckthorn (Rhamnus cathartica), a leaf losing shrub, 12-15 ft . high, bears black lierrics in autumn. The wood of Rhamnus frangula, another British shrub or small tree, makes excellent charcoal. Rhamnus alaternus, an evergreen, and its varicties with variegated leaves, are useful for shrubberies: they reach a height of 8 - 10 ft . The bark of one species of rha mnus supplies the medicinal preparation cascara sagrada. Propaga. tion is by cuttings in $n$ frame in late summer

RHEOSTAT. This is a variable rosistance userd in an electrical circuit for reducing voltage Rheostats having a value of 30-50 ohms are sometimes employed for contrulling volume in wireless reccivers, and are connected in series with the low-tension supply of a battery-operated screengrid valve. See Resistance.

RHEUMATIC FEVER. The chief danger in rheumatic fever or acute rheumatism is that the heart may become affected. There is fever, profuse sweating, inflammation and great pain in the joints, the attack lasting from 2 to 6 weeks, or longer, and the sufferer is liable to be attacked again. The younger the patient the greater is the liability to heart injury. In children the pains may be slight, and may be described as growing pains. There may be very little fever, but anacmia may develop, and a frequent accompaniment is choren, or St. Vitus's dance.

As soon as the disenso is recognized the patient should go to bed, and should wear a Hannel nightdress made to open all the way down; the sleeves should either be very loose or be slit from shoulder to wrist, and fasten with buttons. This is to facilitate the frequent bathing which is neccssary because of the sweating. Four or five nightdresses should be prepared. Remove the sheets and lot the patient lie betwcen soft.
ine blankets, or provide llamel sheets Absolute rest is essential, and thene must be $n o$ visitors. The general treatment is that of fever (q.v.), but a thomugh course of salicylates must be administered. When tho patient is convalescent, attention should be paid to the state of the throat and the question of removing diseased tonsils may have to be considered. The patient, especially if a child, should he seen by a doctor from time to time for some years after an attack of acute rheumatism.
RHEUMATISM. This term is applied verv loosely to a number of diseases differing from one another fundamentally. They are all. however, characterized by pain and inflammation in the joints or muscles or tendons. eto. See Fibmsitia : Lumbago


Rheumatlsm Root. A spring-flowering dwari plant suitable for a shady rockery

RHEUMATISM ROOT. This name has often been applied to a species of Jeffersonia, a hardy dwarf plant suitable for shady crevices in the rockery or as an edging for borders It beara white llowers during spring. and is best planted in October in ordinary sandy garden soil. Propagation of the plaht is by seed or by division of roots.

RHEUMATOID ARTHRITIS. The chronic joint disease known as rheumatoid arthritis is not a rheumatic affection, and must also be distinguished from osteo-arthritis, in which bony changes aro early and distinct. It is a chronic intlammation of the synovial membranes of joints and of the fibrous tissues which surround the joints
As in other chmnic arthritic diseases pain. swelling, and atiffess are likely to be increased by cold and dump, or by unaccustomed or undue strain on the joints. The joints of the fingers just below the knuckles aro generally those first affecterl, and usually in both hands, then the disease appears in the knces and feet : but it may involve nearly all the joints of the hody.

The prime cause of rhemmatoid arthritis is the activity of certain bacteria of low virulence. These form foci of infection, most commonly at the roots of the teeth or in the tonsils, but it may be at other situations in, or on, the body. The treatment of the disoase should therefore begin with a search for some such focus and an attempt to clean it up, with, possibly, a course of vaccine treatment in addition.

During the acute stage the patient should be kept at rest, and, as the deformity is caused in the first place by spasm of muscles the affected joints should be splinted in such $n$ position as to prevent deformity. When, however, the acute stage has passed off, the joints aro freely and fully moved by the doctor or someone under his direction.

Various methods, including fomentations, baths of various kinds, diathermy and electrical treatment, are used to diminish pain and swelling. Massage, whirlpool baths and electrical stimulation are also useful in preserving
the tone of the muscles The diet should be gener ous Cod liver oil is often a uselul addition Ultra violet rays aro often used in order to increase the general resistance to infection. and guniacol car honate of sulphur may be given to dismfect the bowel

RHODANTHE. This is a pretty half-hardy annual with pink or white ever lasting llowers which !ast a long time when cut. It is chielly suitable for culti. vation in pots in the green house although seedlings may be planted out of doors for the summer. Seeds are suwn under glass in March or out of doors in May. The chiel kind is Rhodanthe manglesii. The correct name of this plant is Helipterum manglesii. Other heliptermns supply the immortelle flowers which when dyed in various colours are used by florists in making wreaths and other lloral devices.

## RHODEISLAND

 RED. There are two varietics of this American breed of fowl, the single combed and the rose combed, and it is one are also decorated tiles, basell on the patterns of the hest winter layers. The rich brown of tapestry hangings. Very thick pigments. cggs in some strains average $\mathbf{2} \mathbf{\alpha} \mathbf{d}$ oz., the general red, blue, or turquoise, outlined in black, average being $\mathbf{7}$ or 8 to the lb . It carrics a lot and often on soft grounds, impart to the of lleah, which is of good colour and tine tiavour. clecorative scheme an opulent effect. TheThe hens are inost excellent mothers; the inscriptions are usually Persian
chicks are hardy and mature quickly Adult males weigh 6 lb to 8 ll ., and the females 5 lb . to 6 lb . They do well on frec range, also on the semi-sensitive system, but are not to be recommended for intensive or confined quarters, as they become very broody

The colour should be deep, rich red and even throughout; the tail should be black, and the wings should show black in both primaries and secondaries when opened out. The two colours must be clear and distinct; what is known as a peppered wing is a ball fault in an exhibition bird. The neck hackle of the male should mateh the body colour ; in the female it should be tipped with black. The comb, lobes, wattles and eyes should he red. the legs and feet rich yellow. See Fowl ; Poultry.


Rhodian Ware. sixieentlt century Turkish jng baving a blue back-
ground decorated with creamand red flower buds
$B_{u}$ permigsion of the Director, Viclopil
und Albert Museum. S Kensinuton

RHODIAN WARE. Some modern faience bowls and jugs which attempt to recapture the colont and design of medicval Rhodian pottery are brilliant and decorative, but it is hardly possible to mistake thom for the genuine old ware. 'This was produced from the 14th to the 18th century in the asland of Rbodes.

At first, owing to the fact that it was made by I'ersian exiles. it followed very clusely the inspiration of Persian ceramics. It was fabricated of a sandy, arti ticially fused, and highlv vitritied clay. covered with a hard, thick, glassy paste The forms include shallow dishes, ewers, flowerholders, lamps, and domestic ware generally. The decora tions comprise naturalistic Howers such as roses. tulips. and carnations, be sides birds. arahesques. and $\mathbf{a r i o u s}$ other types of oriental designs

Sornetimes the designs consisted of ships and conts of-arins, done for the conts-ol-arins, Jone fore

After the departure of the carly craftsmen they were replaced by Latin potters, who derived their ceramic motives from Eumpen tapestries, and continued at work until the middle of the 16 th century. After that Turkish workinen carried on the tradition, but the pottery: gradually deteriorated, until by the 18th century good work was no longer made See Pottery.

RHODODENDRON. This is the finest evergrcen flowering shrub suitable for cultivation out of cloors in the British Isles. In recent years numerous new species have been introduced from Western China and other far Eastern districts, and many hybrids have been raised in gardens at home A representative selection will provide hlossom from early


Rhododendron. 1. Tub planting: $a$, sand ; $b$, sandy peat; $c$, chopped turf : $d_{\text {. }}$ wood blocks. 2. Lawn planting: $a$, grass; b, sandy peat. 3. Cutting, with heel. 4. Pot prepared for cutting: a, silver sand. 5. Cutting plunged for rooting : $a$, moss ; $b$, fibre: $c$, steam pipes; $d$, glass; $b_{\text {, boz }}$ 6. Old plant plunged in open border on base of cinders spring until June. The leaf-losing azalen, which is regarded by gardeners as a distinct shiub, is now merged in the genus rhorlodendron hy botaniats. A few evergreen rhododendrons are beautiful shrubs for the heated greenhouse.

The rhododendrons of chief value to the ainateur garilener are those hardy evergreen kinds which provide such a brilliant display of blossom in May and June. Almost all of them are hybride or crossbreds which have been raised in gardens and nurseries, and new varieties are introluced every year. These are some of the most attractive: Bagshot Ruby.
S


Rhododendron. Flower clusters ol one of the
numerous beautiful varieties
Broughtonii, rusecrimson: Coma, pink: Cynthiu, rose crimson: Diphole Link; Doncaster, red: Everestianum, lilac-10se; fastuosum II pl., maluie: Gomer Watcrer hlush. Ioder's White: Nichacl Waterer: bright real: l'ink l'earl, ruse pink, and Sapplio, white will darli blotches. Nobleanum bears its red flowers in spring, sumetines in winter if the weather is nitd Other early llowering varictics are Ascot Rrilliant, red: Handsworth, white. and IRosa Munili, blush.

Thero are many beautiful rhododendrons ainong the npecies of wild typres of other lands. Some of them are low growing and suitable for ose-phe the rock garlich. e.g. : (auricum, hirsutum, rose-red: moupinense. blush: and racemusum, pale mse Angustinii, a taller shrub, bears benutiful lavender blue flowers in spring. The Swiss alpine rose is Rhododondron ferrugineum, a divarf with rose-red blooms

The Himalayan rhododendrons develop into immense bushes in sheltered gardens in mild purts of the country. but they are scarcely suitable for general planting-not because the shribs are not harily, but beeause they hloom early, and the Howers are liable to be spoilt by frost. Among them are: campylocarpum, yellow: urgenteum, cream-white ; Falconeri, with very large handsome leaves and pale flowers: and grande, whitc

Hardy azaleas inake a brilliant display in May and Jume. The colours of the llowers


Ruby-red clusters of bell-shaped fowers of the variety rhododendron, Bagshot Ruby
range through pink, salmon, apricot, rose. ahle Two of the most heautiful are javaniyellow and orange. No shrub surpasses then in splendour when they are in full beauty There are numerous named varieties.
The rhododendron is perfectly easy of culti vation if planted in lime-free loamy or peaty soil that does not dry out in hot weather. A slightly shaded situation is to be preferred to one in full sunshine, though the latter is suitable providing the soil is deep. The two most important details of cultivation are to remove the faded flowers to prevent the development of sced pods and to mulch the soil with leaf-mould in April When rhododendron bushes have hecome overgrown and need to be cut hard back this work should be done in April.
The cvergreen greenhouse rhododendrons should be potted in a compost of sandy peat : a minimum winter temperature of $60^{\circ}$ is suit-

## RHUBARB AND ITS HOUSEHOLD USES

## How to Grow Successfully and Cook Appetizingly

The entrics Forcing; Kitchen Garden contain further information bearing on this subject.
Sec also Flan; Frtier; Pastry and other cookery entries
The edihle rhubarb is Rheum rhaponticum, children, and it has a secondary astringent a hardy perennial which thrives in a deep rich soil. The roots are planted in February, about 3 in. beneath the surface, and in rows 2 to 3 ft . apart every way Before planting, sone well-mited manure should he worked into the soil. No stalks should be gathered from freshly planted rhuharh, and all flower stems shorild be reinoverl.
Forced rhu. barb is oh. tained by covering 2 -year-old plants with headless casks or harrela and surrounding the latterwith fresh manure or dry leaves. After large roots have been forced and cut, the old st nols may be divided in Narch, and replanted. For forcing in artificial heat under glass, 3 -year oli ronts are the best. They should be lifted and placed in darl corners in the heated greenhouse, or it frames with
 hottom heat. conditions which are and darkness are the forced rhubarb may thrive hest
Some of the hest varicties are Champagne, Albert, Victoria and The Sutton. All except Victoria (a late variety) are suitable for forcing. Of the ornamental kinds of rhubarb which are grown solely for the decorative value of the leaves and flowers the best are Alexandrac, Emodii and palmatum. They are vigorous plants which llourish in ordinary soil and may be propagated be division in autumn.

Use in Medicine. The thubarb used in medicine is obtained from the root of a plant grown in China and Tibet. It is one of the safest and most widely used purgatives for
children, and it has a secondary astringent
effect which makes it particularly useful in checking diarrhnea. Rhubarbincreases the llow of gastric juice into the stomach, stimulates the normal digestion, and also the liver. Consequently it is often prescribed in small doses as a stomachic.

Uses in Cookery. Rhuharb is widely used in cookery, being made into preserves, puddings, pies, compotes and many other swects. Stewed rhubarb with custard is a very popular dish in spring. It should be used when young and tender. The stalks only should be cooked, these being first wiped with a damp cloth and then cut into convenient lengths. lior stewing, pies, etc., a generous allowance of sugar is needed the quantity varying according to the age of the rlubarb. Add a little water and about 2 in of lemon rind. Young forced rhubarb and one or two var:ctics of young outdoor rhubarb stalks need not he peeled
Rhuharb makes excellent pies to be eaten hot or cold. Use short crust pastry. The rhubarb should be cut into short lengths and need not he stewed previously.

Rhubarb Charlotte. Stew \& lb. rhubarb cut into short lengths in a pint of water, the grated rind and juice of a lemon, and $\frac{1}{2} \mathrm{lh}$. sugar, and when the fruit -s soft, add the stiffly whisked whites of 2 eggs and $1 \frac{1}{2}$ oz gelatine previously dissolved in pint water and then atrained. Line the aides of a mould with sponge fingers, pour in the inixture and leave it to set. When cold, turn it out, and serve it with some vanillaHavoured custard.

Rhubarb Chutney. Stew 2 lb. rhubarb cut into short lengths with $\frac{1}{2}$. sugar. and in he meantime mix together 3 minced onions, 2 tahlespoonfuls fine salt, half that quantity curry powder, $\frac{1}{1}$ teaspoonfuí cayenne pepper, $\&$ lh stoned raisins, and ahout 3 pint inalt vinegar. When the rhubarb is tender, pour the mixlure over it, and stir the whole over the fire until it is well conked. Then turn it into jars and tie it down.

Rhubarb Flan. Wipe | |h rhuharb, cut it into thin slices, sprinkle it with 3 oz caster sugar, and leave it for an hour. In the meantime make 6 oz . flan pastry and hake it a light brown. When the rhubarb has stood for the required time, let it cook slowly in the oven until it is tender, then put it aside to cool. Add more sugar if required

When the pastry is cold, fill it with the rhuharl), reserving a few pieces for decorating the top, and over it heap the stiffly whisked whites of 2 cggs sweetencd with 2 dessertspoonfuls castor sugar. Put the flan hack into warm oven so that the meringue may set and place a few small pieces of rhuharh on top. It should be served cold

Rhubarb Fool. Rhubarb fool is made in the saine way as gooseberry fool, $\frac{1}{2}$ lb sugar being allowed to each pound of rhubarh.

Rhubarb Fritters. For these fritters, cut some voung. tender rhubarb into pieces a hout 3 in . long, dip them in batter and fry them in hoiling fat. When they are a golden-brown colour, lift them out and drain them, and serve them sprinkled with castor sugar

Rhubarb Jam. The ingredients are 1 lb each rhubarb and sugar, ! oz. lump ginger and the rind of half a lemon. Cut the rhuharb into pieces about ${ }^{3}$ in square and put these into a preserving pan with the sugar. Heat them slowly until the sugar has dissolved: then add the ginger, bruised and tied in a muslin bag, and the thinly peeled lemon rind tied in another bag. Bring the jam to the boil and continue boiling for about $1 \frac{1}{2}$ hours, removing the ginger and lemon before putting it into pots and finally tying it down.

Rhubarb Pudding. A baked pudding can he made from I lb rhubarb, $\$ \mathrm{lh}$. fine breadcrumbs, and sugar to taste. Peel and cut the rhubarb into short lengths, put a layer of it into the hottom of a deep buttered dish and sprinkle it with castor sugar. On the top put a laver of crumbs, and continue in this way until the dish is full, making the last layer of breaderumbs. On top place a few sinall lumps of butter and a little more castor sugar and bake the pudding in a hot oven until it is lightly browned. A boiled rhubarb, pudding can be made in a hasin lined and covered with suet crust. Cover with greased paper and a cloth and boil $1 \frac{1}{2}-2$ hours. See the directions for making Apple Pudding in page 29.

Rhubarb Wine. This fruit wine is made by cutting $5 \frac{1}{2} \mathrm{lb}$. rhuharb into short lengths, leaving them unpecled, and putting them into a wooden vessel. Mash them well to extract


Rhubarb. 1. Typical root. 2. Good planting: a, manured soil. 3. Division of clump. 4. Forcing in a box: a, covering boz: rests for same

the juice, pour over them 1 gallon cold water, and leave the whole for eight days, stirring occasionally:

Strain and measure it, and to every gallon of liquor add $3 \frac{1}{3} \mathrm{lb}$. white sugar and the juice of If lemons. Stir the mixture at intervals until the sugar has dissolved, then pour the wine into a cask and leave it in a warm place to ferment. When fermentation has ceased, cork up the bunghole and leave the wine in a cool place for about five months before bottling it.
REUS. These hardy shrubs are grown for the sake of their ornamental leaves or flowers. The sap is poisonous. One species, Rhus toxicodendron, or poison ivy, is a dangerous plant, for touching the leaves may lead to serious illness in people who are susceptible. There is, however, no need to cultivate this plant, for several others are more decurative. The most familiar is the Stag's horn sumach (Rhus typhina) which has very long, deeplycut leaves. The Venetian sumach (Rhus cotinus), known also as smoke bush, is very attractive when the cloud-like inflorescences are in full beauty in summer. Rhus cotinoides is valued for the sake of the brilliant autumnal colouring of its leaves. The sumachs, which
form large bushes, thrive in ordinary soil and are increased by seeds or root cuttings in spring.

RIB : Of the Body. There are 12 ribs on each side of the chest, of which the upper 7 are united by cartilages directly to the breastbone. These are called true ribs. The remain. ing 5 are known as false ribs. Of thesc latter the eighth is joined by cartilage to the seventh, the ninth to the eighth, and the tenth to the ninth. The ends of the eleventh and twelfth ribs are free, and for this reason these are called floating ribe.

Fracture of a rib is a common accident. Occasionally the fractured end may penetrate the lung. The symptoms of fracture are often very slight, but when such an accident is suspected, a doctor should be at once consulted. First, aid consists in applying the centre of a broad fold handage over the painful spot and tying on the uther side of the chest. According to the situation of the fracture another bandage is applied above or below the first. Their object is to limit the movement of the chest wall, but they should not be tight enough to cause pain. If any pressure at all is painful they should be left off. Later the doctor may continue with bandages.

## Ribbon Work and Trimming

## Effective Uses and Methods of Mahing Applied Decorations

Directions for making accessories which can be charminely trimmed with ribbon work may be
found under such headinge ss Bag; Curtain; Cuahion; Nighi Wear Case. See also Applique Work; Artificial Fiowers; Embroldery : Lald Work Rafia: Tranafer
l'he simplest form of ribbon work consists of making bows, rusettes and gathered ruchings: the most elaborate is combined with embroidery or appliqué work, and used to decorate furnishing accessories. Although frequently seen on cushions it is perhaps most suitable for pieces of needlework such as bedspreads, pelmet and curtain borders, handkerchief and nightwear sachets. The raised or looped formations of ribbon, often


Ribbon Work Fig. 1. Embroidered custuon, the chrysanthomum heads boing worked in narrow embroidery ribbon, while the stallys and leaves are in stom and satin etitoh
used in the work, make it less practical for hard wear than ordinary embroidery unless narrow ribbon is actually employed like a coarse thread, as in the example of the cushion illustrated in Fig. 1

Bows and Rosettes. Even a bow for trimming requires to be properly made, especially if the ribbon is wide. Leave an end and form a loop with small pleats, twist it round with cotton. Repeat the making of loops, measuring their length carefully until the required number is made. Arrange the loops to lie in even numbers each way and lcave an end to match the one at the beginning. Make a tie over with a separate piere of ribbon, sewing it tightly or loosely according to taste. Flat bows are made
by folding ends of ribbon over without pleating to form the desired size, and tacking them down A shorter piece of ribbon is then folded in the same way, so that the shorter bows lie Hatly above the longer ones, and stitched down. A flat tie-over strip is placed acroes the ribbon and finished off neatly at the back.
Ribbon rusettes are made in various ways. A small circle of stiff muslin or buckram is first cut out. To this are tacked the ribbon loops, any length desired, beginning at the edge and working towards the centre, longer loops being used towards the centre to make a rounded rosette. For another kind of rosette a wide ribbon can be used and folded over and the edges gathered strongly together. These are drawn up and sewn to the muslin or buckram foundation, beginning at the centre and work. ing round to the edge. If a narrow ribbon is used it is not folded, and if one with a picot edging is selected it gives an attractive finish.
Wheel-like ribbon decorations which form corner trimmings for cushions or sachets are easy to make on a muslin foundation. The centre is of puffed or ruched ribbon, and the edges are finished with loops and ends cut diagonally, the effect being like a big daisy. Garters can be quickly made of ruched ribbon. Two lengths are needed of $1 \&$ yd. each of 1 -in. wide ribbon. Contrasting colours may be used and stitching on buth sides connects the two lengths through which an clastic, wide, is run. The ribbron is gathered over this to the required size. The garters are inished with tiny rosettes or a ribbon Hower
Covering Small Articles. Ordinary wooden coat hangers can be made attractive when covered with satin or chiné ribbon. They need first to be padded with cotton-wool, sprinkled with sweet-smelling essence, or some perfumed powder, and then covered with ribbon gathered to fit the arms. One yard of 3 -in wide ribbon is enough to cover the wooden portion, and narrow ribbon to match is used to cover the metallic hook. At the base of this a buw, rosette or ribbon flower may be stitched if the hangers are being made for a gift or sale of work.
Ribbon-covered perfume sachets are easily made by sprinkling little pads of cotton wool with perfume or with sachet powder, covering them first with fine muslin, and then with
ribbon. An attractive effect is obtained when 2 narrow ribbons are interlaced to form a lattice work, the ends being mitred and left free. Long sachet pads to line the bottom of a clicst of drawers or wardrobe are made of perfumed wadding covered with coloured muslin, which is bound by ribbon in a contrast. ing colour.

Inexpensive shoe trees are made daintier il the wooden portion is painted or gilded and the metal bar is covered with about 1 yd. of 1 -in. wide ribbon. The ribbon is doubled and gathered over the metal, the gauging being drawn up entirely to cover it. A louped bow in the centre of the metal bar may be addcd if liked.

Plaited ribbon and jap silk to tone make a pretty sachet set. Two different-coloured double satin ribbons, $f$ in. wide, should be obtained, the quantity needed depending upon the size of the sachets. Having cut out the silk for the cuver and for the linings, the ribbon must be cut in lengths, each piece being in duplicate, one of each colour. The longest strip should go diagonally across the cover from corner to corner; the others follow in order of length.
The plaiting may now begin. Assuming the colours chosen are pink and deep rose, a pink strip is started from the left top corner and is carried across to the opposite one. This is stitched down to the edge of the cover. Across it lay a piece of rose ribbon, the shortest length used, and stitoh the two ends of this down, one un the left side and one on the right. For the next two rows, one on either side of the first row, two lengths of pink ribbon are* needed and over thein a piece of rose-coloured ribbon is placed, this passing under the first strip. Two more pieces are then laid across, and over and under these a piece of ribbon of the other colour is plaited.

The work proceeds in this way until the whole is covered. It will be easy to see whether the alternating colours are in the right order: but other points need watching. The edges of the ribbon lengths should just touch one another, and the ends should not be cut until they are stitched down. The stitches must be small and neat and the lengthe must be cut off slantwise. The corners need especial care, for here the ribhon is liable to bulge and refuse to lie flat. Care must be taken, too, that no uncovered spaces appear in the plaiting. When the plaiting is finished a cording of silk should be made to match the rose or pink, or the sachets may be finished off with a silk or tinsel bought cord or with a narrow gimp. For making up see Night Wcar Cases and Sachets.

Rlbbon Embroldery. For certain kinds of embroidcry ribbon makes an excellent medium, the flower-embroidered cushion illustrated in Fig. 1 providing a good example of the work. Choose a design that is not uvercrowded, transier it to the material, and then stretch the latter on a frame First embroider the stalks and leaves in thick silk, using stem stitch for the stalks and satin stitch for the

The large flowers should be rather paler than the small ones, and, if a chrysanthemum design such as that illustrated is chosen, make the undersides of the Howers a darker shade than the tops. Cut a piece of thin embroidery ribbon about 0 in . long, thread one end thmugh a needle with a very large eye, and pull up from the centre of the flower. Hold the ribbon flat with the left hand and put the needle down through the material at the tip of the petal. Use 2 or 3 shades of ribbon, making any petals that are underneatl darker than the rest. Do not pull the ribbon ton tight.

Embroidery ribbons can be succesafully used to work designs on tea-cosies. blotters and sachets. Beads may form centres to ribbon flower, or French knots in silk may be worked for this purpose. Many designs for raffia work

to twist for the desired length For a bud hid lidward VI
and lidward VII
Ribes speciosum, the on the oross if the pink rib thon used is wide enough) $2+\mathrm{in}$. by 2 in . Fold it in lialf lengthways and the cor ners to the centre (L). Pleat it twice each side so that the pleats meet in the centre (M). Cut a piece of ribbon the same shape, slightly larger and fold round the first piece ( $\mathbf{N}$ ) Make a cup from the green ribbon $I$ in. wide, cut as for the leal $(\mathrm{H})$, fold in turnings down the $V$ ahaped end, fasten one point to one side of the bud and the other point to the other side Wrap the cup over and twist ribhon below to make the stalk (O)
Ribbon Fern. This is the popular name of a greenhouse fern, Pteris serrulata.
RIBBON GRASS. This name is given to a vigorous
can be adapted for ribbon work. These narrow ribbons can also be uscd uccording to instructions given in the article on Laid Work, being cuuched down on to the maietia instead of being pulled through. More elaborate embroidery can he done in this manner, which is suitable for working designs on fine Cabricy

Ralsed Ribbon Work S'prays ol Howers which can be made separately and then npplied to trim cosies or sachiets are no diffioult to make with a little practice. Roses are effect:ve flowers for this type of ribbon work and details of making are illuatrated in Fig. 2 For the centre of a rose cut a strip of pink taffeta rib bon $1 \frac{1}{6}$ in. by 7 in. Fold it in half lengthways and gather twice as shown in ${ }^{3}$ Draw up the two threads tightly and finish off Rull up and stitch tirmly (C) Next talie an oblong ed in by 2 in. to make petal. Fold it in half lengthways and slope off the edges to the fold, as sliown in $D$, and gather round the raw edges, folding over each edge at the fold. Draw up the thread and fold this finished petal over the centre (E) The other petals should he each a little longer and wider and shaped as shown in Fig. 2, F. When all the petals are separately made, stitch them round the central ones und the rose is finished, as slown in $G$.
The leaves are from green riblon cut $1 \frac{1}{2}$ in wide by 2 in Fold it in half lengthways and slope off the top $(\mathrm{H})$. Gather down the point and the fold (J), then draw up, turn the ribbon right side out, and open up the leaf; Hatten out, pleat the base into proper shape and stitch it down firmly (K)

The various pieces of the spray can be tirst sewn to a piece of muslin if liked or applied directly on to the article to be decorated. No stalk is visible in the spray illustrated in Fig. ?, A, hut one is easily made by taking a short length of string, twisting a narrow green ribbon ruund it. inserting a leaf and continuing


Ribbon Work. Fig. 2. Applied ribbon trimming spray of garden roses made of pink and green tafleta ribbon, with diagrams for cutting out and sewing. See tert
perennial grass with pretty green and white caves (Plıalaris arundinacea variegata) Known also as gardeners' garters, it flourishes in ordinary soil, grows 2 ft. high and is increased by division in autumn. Phalaris canarienss provides the well-known seeds for cage hirds: it is an annual raised from sceds sown in spring.

RIBES. The family name of the currant and gooseberry is Ribes. In practice, however, the name is naually applied to the llowering currants, which are grown for decorntive purposes only. These shrubs thrive in ordinary soil, and may be planted at any time during the autumn, winter, or early sping. The only attention they need is pruning after Howering, and a top-dressing of well-decayed manure in autumn. Propagntion is best effected by means of seeds sown in the autumn, or by cuttings, layers, or suckers struck at the same period

The chiof kinds are aureum, fragrant yellow Howers ; aurantiacum, yellors, nnd sanguineum, red There are several varieties of the latter, of which the best are atrosanguineum uchsin-flowered currant, should be grown on a wall; it bears orimson, somewhat fuchaia. like Howers

RIBSTON PIPPIN. The dessert apple known as Rihaton Pippin is of medillm size, russet-brown in colour, and possersen a Havour second only to Cox's Orange Pippin It is a self-fertile variety, requiring a warm, welidrained soil, and is in season from November to January See Apple: Ieesert
RICE : The Food. Being very light and easily digosted, rice forms a valuable article of uliet, but ns it is almost entirely a starchy food and deficient in protein, meat or pulses should be taken with it Its good value is increasel by cooking or serving it with milk. On the average rice contains a bout 80 per cent of starch, 7 per cent of protein, tat less than d. wnter 12, and a trifle of mineral matter

When it is boiled rice absorbs abont five times its weight of water If not sufficiently boiled it is liable to cause indigestion To many prople one of the disadrantages of rice is that it has a slight binding effect This fanlt can be corrected by eating it with prunes, stewed Ínit, or jam But in cases of looseness of the howela this effect makes rice a valuable remedy.

The poliahed rice. which is commonly used, is deficient in the vitamin which prevents beri-beri This has been removed in the thin skin Where the dish consists almost wholly of polished rice beri-beri develops, but there is not this danger in a mixed dish, including milk, eggs, etc.

Two kinds of rice are employed, of which the pure white Carolina is usually preferced for purldings Rice llour and ground rice nie also inuch used for cakes, etc. The former is much more finely ground than the latter. Curry is served with Patna rice, which has long, pointed grains that separate easily after cooking. Rice should always he thoroughly washed before using, and to boil plainly should be scattered into fast boiling salted water: keep the lid off the pan and boil for $n$ bout 15 min .

An excellent rice and apple sweet can be made from 4 large apples. $\frac{1}{2} \mathrm{~b}$ rice, 4 teaspoon luls castor sugar, 4 cloves, and a little apricot jnm sauce. Boil the rice in solted water for about 10 min ., then strain it, and divide it into six equal portions. Grease four small hasins, and put a portion of rice in each, pressing it to the sides and hottom so that it acts as a lining. Peel and core the apples, place one in cach hasin, together with I teaspoonful sugar and a clove; then divide the two remaining portions of rice into halves, and cover the apples with them, pressing the rice well down. Put a piece of greased paper


Ribbon Grass. Close growing clumps of the decorative border plant. The variegated leaves are ver attractive in bouquets. of in vases of cut Howers
over each basin, and steam the contents for about an hour, or until the apples are soft and the rice tender. When the moulds are cooked, turn them out on to a hot dish, and serve them with a ssuce made by boiling two tablespoonfuls of apricot jam with a gill of water.

Rice Gâteau. Boil together 18 lumps of sugar and $\frac{1}{\text { gill of water until they become a }}$ golden brown colour, then use them to coat the inside of a hot pudding basin. Wash $\& \mathrm{lb}$. rice and cook it, until it is soft, in a saucepan of boiling water; then drain it and mix it in a basin with 2 oz butter.

Leave the mixture to cool before adding 3 o7. granulated sugar, \& lb. seedless raisins and a little vanilla flavouring, and when these are uall mixed stir in 2 beaten eggs mixed with 3 or 4 tablespoonfuls of milk. Turn the whole into the caramel-lined basin, cover it with a greased paper, and steam it for 1 hour in a saucepan of boiling water. The water should reach no higher than a third of the way up the basin. When the mixture is cooked, turn it on to a hot dish and decorate it with cream. The caramel will be found to coat the pudding

Rice Meringue. Cook $\ddagger \mathrm{lb}$. rice in a pint of milk until it is soft and has absorbed all the liquid, and let it cool a little before adding sugar to taste, and the beaten yolks of 3 eggs.

Pile the mixture up high on a flat dish, spread a thick layer of jam over it, and on top of this nut the whites of eggs, sweetened and whipped to a stiff froth. Dredge the whole with castor sugar, and then put it in a warm oven for a few minutes so that the meringue may set and become lightly browned.
Rice Pudding. The requisites for a rice pudding consist of 2 oz . rice, 1 pint milk, 1 oz . sugar, 1 oz . butter, and a little grated nutmeg. Wash the rice and mix it in a piedish with the sugar, pour over the milk, and on top grate the nutmeg, adding the butter with it. If time allows, stand the pudding aside for about an hour before cooking it, so that the rice may soften; then bake it in a moderately warm oven for $1 \frac{1}{\frac{1}{2}}$ to 2 hours, first bringing it to the boil and then letting it cook slowly. Another method is to put the rice with water to cover in the pudding dish, and cook in the oven until the rice swells and softens. Then add milk, etc., and proceed as above.
Rice Soup. A thick rice and tomato soup can be made from 2 oz . rice, a large tin of tomatoen, a carrot and an onion, a pint stock, a few celery seeds, and pepper and salt to taste. Put the rice, together with the peeled and sliced vegetables, into a saucepan, add the tomstoes with their liquor, the stock, the celery seeds tied in muslin, and the seasoning.
Bring all to the boil and then cook them slowly until the rice and vegetables are soft, stirring occasionally to prevent the rice from sticking to the pan. Then take out the celery seeds, rub the soup through a sieve and reheat it. If it is not of a good colour, add a few drops of cochineal
Rice Water. For sick persons and convalescents rice water is a cooling drink. To make it, wash 1 oz . Carolina rice, soak it for 3 hours in a pint of warm water, then boil it for an hour and strain it. 'Jo check diarrhoes rice water is thickened with isinglass, a teaspoonful to the pint. Cinnamon stick, clove, or lemon may be added to flavour the drink and a little sugar if desired.
A pleasant and also nourishing beverage for an invalid is made by boiling a tablespoonful ground rice with $\frac{1}{2}$ oz. candied peel cut small in $1 \frac{1}{2}$ pints of good milk. The rice is first mixed into a smooth paste with cold water and should be boiled for at least $\frac{1}{2}$ hour and then strasined.

Risotto. For a dish of risotto fry a chopped onion in 2 oz . butter in a stew-pan, then dilute it with $1 \frac{1}{2}$ pints stock. Stir in $\frac{\mathrm{lb}}{\mathrm{l}}$. prepared rice and cook for 20 min ., stirring Irequently. When swelled, sprinkle in 3 oz . grated cheeso, 1 gill tomato sauce. a grate of nutmeg and seasoning. Cover the pan for a few minutes and serve very hot.

Another savoury way of cooking rice, known as rice à la Milanaise, can be prepared by boiling some rice as directed for curry making, draining it thoroughly, and then frying it lightly in smoking hot fat. When it begins to brown, sprinkle in enough grated cheese to give it the desired flavour, and add also some cold, cooked and shredded fish, poultry, or game, and seasoning to taste. Mix and heat the whole thoroughly, and then serve it on a hot dish. See Curry; Ground Rice; Kedgeree.
RICE FLOWER. The Australian evergreen tlowering shrub Pimelea, or vice flower, grows about 3 ft . in height, and there are pink and white Howering varicties. It requires greenhouse treatment. The potting matcrial should be loam, peat, and silver sand, and the temperature that of a warnı, well-ventilated greenhouse. The points of shoots should be nipped off to induce bushy growth, and water must be given frecly cxcept in wintar-time. Propagation is by seeds sown in light sandy soil in springtime undér glass, or by cuttings taken at the same season of the ycar. Pimelca spectabilis posserwess white flowers in dense globular heada.


RICEARDIA. This is the botanical name of the white and yellow arum lilies which are so much valued for cultivation in pots under glass. The common white arum lily, Richardia (or Calla) aethiopica, is a South African herbaceous percnnial which bears large white flowered spathes in winter and spring under glass : in mild districts it may be planted by the waterside out of doors.

The usual method of cultivation is to pot the roots in Sept. in a compost of loam with a little decayed manure, keep them in a frame for 6 or 8 weeks and then force them into bloom in a heated greenhouse. Tho soil must be kept thoroughly moist when the plants are in full growth. When the flowers have faded arum lilies may be planted out of doors for the summer or gradually dried off in the flower pots. In September they are repotted.

The yellow arum lilies, Elliottiana and Pentlandii bloom in summer under glass During the winter the roots are at rest, the soil in the pots being kept dry. In Febiuary they are repotted and started into growth in a warm greenhouse.

RICHELIEU WORE. Although-this form of work comes under the class of linen emtroidery and has been mentioned in the general article on Embroidery it is so effective and wears so well that fuller details are here given. It may be used on house linen and also for dress and women's and children's underwear. It may be worked equally well on crêpe-de-Chinc, silk or linen. Floral, geometrical and figure designs are employed as motifs.

The materials required are the ground material such as those mentioned above, embroidery cotton of loose twist, linen lace thread, or embroidery silk, according to the ground material. Ali these working threads


Richelieu Work. Fig. 1. An effective form of linen embroidery consisting of motifs of conventional or original degign joined by worked bars. Fig. 2 .
Adaptation of ladder work for a border, showing the Adaptation of ladder work for a border, showing the
use of battonhole - Btitco
are made in many sizes, and that which is used should correspond with the texture of the ground material. A firm thread is used for the outlining, while a softer twist may be emploved for the bars and filling stitches. Ordinary long sewing needles are required and a pair of small embroidery scissors, very sharp, and with fine points, as the matcrial has to be cut away right under the pearl edge.
A transfer design is needed, suitable for this work. It should have bold patterns for the motifs, which are neld together with worked bars. Those who can do frechand drawings can make their own designs and trace them on the material with the aid of carbon paper. In the design illustrated four small motifa are placed together and an outline drawn to form a square; this can be varicd with a diamond, circle, or other shape to suit the purpose. Black has been used for the material so that the white stitchery should show up more clesrly. This in reality would be ugly and the needlework always matches the ground material in colour.

Richelieu work in its original form consisted only of buttonholed motifs and buttonhole bars with bullion-picots; but in its modern form it is mixed with Reticells work, hence the appearance of twisted bars and woven bars. Filling and veining stitches are introduced to make the motifs more interesting. Stem
stitch, back stitch and satin stitch are the nost used together with French knots for flower centres. After the design is transferred to the material, work over all the out lines of motifs and the outside edge of the design with small running stitches, then proceed to work the bars By the old mothod the outlines were buttonholed first and the hars laid as they were reached; but experienco has proved that stronger work is the result of working all the bars first and passing a button-hole-stitch through the end of each bar as the outline progresses.

Working the Picot Bars. The lower part of the illustration shows the outlined motifs and the connecting hars worked in various ways. To work a bar with bullion picot, secure the thread on the wrong side of the material and liring it up on the main outline of design; press the needle under onc of the stitches on a small motif, piching up a tiny piece of the material. Pass the needle back again under the stitch on outside of design, then hack ngain under the stitch on the motif; there should now be three threads laid. Now buttonhole from right to left half way across this bar, placing the stitches close together.

When the centre of the har is reached make a picot thus: Pass the needle up through the last huttonholestitch made, to about twothinds of its length, holding the needle in place with the right thumb, and with the left hand $t$ wist the thread ten times over and round the ncedle, from right to left, pushing the twists towards the eve of the needle, but still keeping tha right thumb on them. Draw the needle through with the left hand until the thread can be felt pulling under the thimb; then remove the Inticr and draw the needle through. Pass the needle up from below through the last hinttonhole stitch, draw through, and continue buttonholing to the end of the bar

A butlion picot often comes on the outside edge of a piece of work, when a Richelieu horder forms the edge of a teacloth, for instance, and in this case the picot is worked on the outline of the design. When the ncedle is inserted in the last stitch the thread is passed under and round the needle from right to left; push the needle through the twists, pull up the thread so that the spiral forms a semicircle, then continue to buttonhole the outline until the next picot occurs.

Where the space to be spuanned is wide, cross-bars are used as seen in the centre of the illustration between the two motifs on the upper half of the design, and where a space is long, branched hars are worked aa sces. nt the lower left-hand corner of the design. In order to work the cross-hars lay three threads obliquely across the space, fill one half with buttonhole-stitches and a picot in the centre: now lay threc threads from the last hittonhole stitch to the opposite corner of the space to make the third arm of the cross. Fill with buttonhole stitches and a picot, and bring the needle up through the last atitch at the centre. Lay three more threads right opposite to form the fourth arm of the cross. Bring up the needle again through the centre of the bars and fill the remaining fourth arm, which is half of the first long one laid.
A branched har has the first threads laid between one motif and another, half of which is buttcaholed with a picot halfway if the space permits. If it is a short space, the picot is omitted. Then the threads are lain for the branch bar either to the outline of the design or to another motif, as the cuse may be; work this har in the usual way then the needle is passed under the first bar and the remaining half is worked to match.

Twisted and Woven Bars. Twisted bars have only one thread laid, the second is twisted two or more times round it asco-ding to the
length of the bar. This should on!y be em. ployed where strong linen thread is used for working or where the space to be spanned is quite short, as lietween points of petals and the outside line in the illustration. Woven bars have three throads laid, and the needle talien under and over each thread as in darn. ing, always taking the working thread round the outside enge of the laid thremes.

To work the main outlines buttonhole from left to right as in scalloping, so that the pearl edge comes on the outside of the motif and on the inside of the square outline seen in the illustration. When all the huttonholing is done the nateria! has to be cut away under the pearl edge, taking care not to cut the bars. In the ilhastration the top helf of the material is cut away and shows how the bars connect the motifs.

Ladder Work Borders. On a linen of loose texture effective horders to Richelieu dewigns can be worked with buttonholed edges and bars under which the material is cut away.
Draw two threads about $\frac{1}{2} \mathrm{in}$. apart. These will form two lines for the buttonholing the pearl edge coming on the drawn thread line. Begin at the hottom left hand corner and work upivard, buttonholing the whole si:le, then turn the work so that the opposite edige or line will be at the left. and groceed to work upward as on the opposite side. When about $\frac{1}{d}$ in. is clone begin to lay a bar, the distence between the bars depending on the fineness of the material, and according to how much work it is desired to put into it. The illustra. tion given has been enlarged in order to show the detail more clarly. Pass the needle upward through the pearl edge of the buttonholestitch exactly opposite. now cross the ladeler and pass the needle up through the pearl edge of the last buttonhole stitch made on the second side of the ladder. Cross the ladder again and pass the needle up through the same stitch, on the opposite side. There arc now three threads laid, and these should he buttonholed as shown, working under the threads only, not through the material, as this will be cut away afterwards. Continue buttonholing on the second side of the ladder for $\frac{d}{}$ in., or according to the space to te left, then work another rung. When all the work is finished cut away the material right under the pearl edge, taking care not to cut the stitch, and buttonhole thic cut ends at the top and hottom of the ladider. See Embroidery: Ti ansfer.
RICKETS. A nutritional diseane of children, rickets, or rhachitis, usually hegins in the period between the sixth and the thirtieth month. In important factor in its production is the absence, or even shortage, of the supply to the tinsues of a sutstance described as vitamin D. This vitamin is present in sufficient quantities in the mother's milk when this is good. If, however, the mother's milk is thin, or if a child is fed on starchy foods, even with the addition of fat in the form of margarine, thete will be atarvation as regards this essential vitamin. This may apparently occur, also, if a child suffers from constant indigestion, especially if diarthoca is present.
$\lambda$ deficiency of the anti-rhachitic vitamin is made good if the body is sufficiently exposed to witra violet rays, either in natural sunlight or artificially produced. Fats deficient in the vitamin acquire it by being submitted to these ray's.

Rickets begin insidiously, hut sononer or later the child becomes restless and peevish, with a certain amount of fever and free sweating. from the head especially, when it sleeps. There is great tenderness over the body, the slightest touch heing resented. Tho appetite and digestion are impaired, and commonly there is constipation alternating with dia. rhoea The child tends to hecome pot-hellied. Another symptom is that teething is delayed,
the ends of the long bones beconce swollen, so that the wrists and other joints are unduly large, and there are rows of enlargemenis down each end of the chest in front. The child is slow in beginning to walk; the muscular weakness may be so great as to suggest paralysis.

As time goes on, the frontal eminences on the skull become enlarged, producing a hoad, square forehcad, and sometimes portions of the skiulf towards the back of the head becone thin and papery. The toones of the legs bend, causing how leg or knock knee, and there is commonly llat foot. The spine develops a hump and the walls of the chest are llattened; the bleast bone may be pushed forward, a condition described as pigeon breast. Sometimes, however, particularly if there is masal ohatruction, as from adenoids, the breast bone is depressed, forming the funnel-shaped chest. Children suffering from rickets are prone to certain nervous trouliles, such as convulsions, tetany, and a spasmodic type of choking, known as laryngismus stridulus.

It is nost important to prevent rickets. This can be done by giving a child the diel, the sunstine, the fresh air, and the excrcise which it requires.
A list of foods containing vitamin D is given under the heading liet. If natural sunlight is not available, a course of treatnent by artificial ultra-violet light'should be procured, if possible. Cod-liver oil is a very valuable addition to the diet, but should be given in an emulsion, or with malt, in view of the diffeulty of digesting the plain oil.
The child should not be allowed to get on its feet until the boncs are sufficiently strong, and to prevent its doing so it may he necessary to attach long splints to cither side of the hody and the corresponding limb. When tenderness has disappeared, gentle massage of the muscles should be employed, however. See Bow Legs ; Convulsions; liet; Light; Vitamin.
RIDDLE. More usually known as a sieve, this is an implement used for separating coarser material from that which is finer. See Sieve.

RIDGE BOARD. The topmost timber of a roof which is known as the ridge honrd is a horizontal board, and runs along the ridge or apex of the roof. The upper ends of the rafters hear upon it. See Corrugated Iron; Rafter : Roof.
RIDGING: In Gardening. This is a method of cultivation which exposes the largest possible area of ground to frost, snow, rain and wind, which help to disintegrate hard lumps and render the soil friable. It is carried out in autumn or carly winter, and is clone by throwing up the soil in the form of ridges.

RIDING. I good rider must have good hands and a good seat. Hands, by which is underatood a natural sensitiveness and responsiveness, together with a capacity for under standing animals ridden, cannot be nequired ; they are inborn The rules for good riding are summed up in the lines, "Your head and your heart keep up, your hands and your heels keep, down. Keep the knees close to your horse's side and elbows close to your own."
To mount a horse the rider should face its left side and, standing well forward, gather the reins up short in his left hand. He should take care not to hold the off rein tighter than the near one, as that may make the horse nove in a circle with the prospective rider on the outside of it.

Having with the left hand, which still holds the reins, taken a lirin grip of the horse's mane, he should steady the near stirrup with the right hand and then put his left foot into it. He should place the right hand on the furt her side of the cantle, or back of the saddle, and keeping the right leg atraight and high, so as to swing clear of the croup, should spring on to
the horse He then stendies the right stirrup, into which he places his right font, and is ready to start.

Both hands should hold the reins, the knuckles being upward, not downward as when driving. They should exert only the minimum amount of pressure nccessary to control the horse. The rider should learn, however, to grip with the thighs. knees, and sides of the legs. but should not grip hard unless :t is necessary The shins should be kept vertical and the feet parallel to the sides of the horse. When going slowly he should keep) the hall of the font on the tread of the stirrup, but when galloping he slonuld push it further through See Bit: Bridle: Horse : Pony; Saddle, etc.

RIFFLER FILE. A riffler filc is a doublo-ended file of peculiar formation, comprising a plain metal part, or bar. ourved at either end, these ends being cut to form the teeth of the file They are made in a wide variety of shapes and coarseness of cuts, and are invaluable when working hollow and rounded shapes in metal, fibre, or other material.
This type of file is used largely for cleaning up the corners and angles in chasings and engravings. It can be manipulated in odd corners in a manner that would be impossible with any other tool. See Casting; File.
RIGOR MORTIS. The stiffening of the muscles whioh occurs soon after denth is known ns rigor mortis. The commencement-and duration of the rigidity vary considerably. See Denth.
RIM LOCK. In this type of lock the case has a rim round it by which it is fixed with screws to the surface of the door. The bolt. or bolts, shoot into a box staple fixed in position on the dour jamb in the ordinary way. This type of lock is inore unsightly than the mortise lock, owing to the case lreing exposed, but it has the advantage of not weakening the door to the same exient. For this reason, it is very oxtensively used In better-class houses it is only fitted to the domestic rooms, such as thie kitchen and servanta' quarters, spare bedrooms and the like. See Jatch; Lock.

RIND. The peel or akin of fruits and vege tables is called the rind. The outer skin of pork, ham, or bacon also is sposen of as the rind. In reality this term meansan outer crust. To rind is a north country equivalent for to render. Preparing and olarifying fat and butter by melting is to rind or render. See Candied Peel ; Clarifying
RING: In Jewelry. Two ancient designs in rings are still often reproduced. One is the snake ring and the other is seen in the gemmel rings with clasped hands. of which some fine specimens liave been preserved Onc in the Londesborough collection is of silver with two hands clasperl, and on one side of each of the twin hoops there is an engraving, showing that this ring belonged to somo personage of high mink in the 16ith century. Thereare earlier examples in the Braybrooke collection, not on! y with twin hoops but also with three hoops, a fine one dating from the and of the loth century.

Signet rings were used for signing documents from a very carly date, while the Egyptian scarab was mounted on a ring and worn as a charm against evil. An intereating old ring is illustrated in Figs, 1-2. Dendly poison was contained under the ornamental top, which could unobtrusively be opened and the poison
dropped into wine or food. Rings were used in connexion with betrothals and weddings from the earliest times.

Rings connected with ecclesinstical usages hnve always been regarded as symbolical of dignity and authority by priesta, and on all state occasions there is a special ring that is invariably worn by the Pope. The stone in this ring contains a very fine cameo of the head of Christ. The stone from which this cameo is cut is a peculiarly beautiful specimen of a blood-stone. This ring is placed upon the Pope's finger immediately after his election, and it is handed down from one Pope to another.

Thumb rings were frequently worn, and many of these are in private collections or in muscums. Some are regarded as of great value, and are known as decade-rings, having ten projections at intervals round the shank, which were used as beads for repeating Aves. Many of thescerings are engraved with the ligures of saints. A favourite inscription on the signets or the inner lining of the slank on religious rings is that of St. Christopher, the patron saint of Roman Catholics, as regards protection in times of accident or danger.
Silver lings are not frequently found; but in all well-known collections there are many specimens that are made of iron, also of other base metala with enamel. Some beautiful specimens of glazed earthenware rings have been unearthed at various times, set with very fine mosaic ornaments or with cornelians or lapis lazuli.

## Care of Rings. The cleaning of gem rings

 should be regularly undertalien if the gems are set in open settings. Diamond rings can be placed in hot water, and then a softtoothbrush should be applied to the backs of the stonos, and any dirt or dust should he carefully brushed away from the setting. Rings can be dried best by covering them in a small recep. tacle containing very fine boxworid sawdust. Which has been heated They should then be brushed with a soft, dry brushA simple method of cleaning gems infinger rings, providing the stones are not foiled, is to


Ring. Some examples of antique Ring. Some examples of antique
rings. Fig. 1. 16 th or 17 th century poison ring in Rolu, the lid of poison boz engraved with winged Eros or Cupid. Fir. 2 Poison ring shown open. Fir.3. 17th century ring set with small diamonds in form of basket of Gowers. Fig. 4. Scaraboid ring engraved with Egyptian signs, 17th dynasty, modern sething. All are slizbtiy enlarRed to show the details
Courtesy of Spinh if Son, Ltd.
brush the backs of the stones through the open setting with a moderately stiff toothbrush which has been dipped in a small quantity of whisky or gin The spirit evapuratee, and thus saves the necessity of drying them.

In all cases where imitation or foiled coloured stones need cleaning, there should never be touched with anything moist, and inust not on nny account be immersed in water or brushed with a damp brush. Imitation stoncs are usually covered at the back with a foil, and it is necessary that this should never be allowed to become damp. The liest method for cleaning foiled stones is to brush the settings round them with a bristle brush, to which a small quantity of powdered chalk should be applied

Rings containing valuable gems should be left occasionally with a practical jeweller to examine the settings through a micrascope. and to remedy any defecta that may he discovered in the settings.

The simplest way of removing a tight ring from the finger is to wash the hand in cold water, rubbing the joint of the finger with plenty of soap. If this method fails, draw three or four lengths of thread across a piece of soap, put them through the finest needle that will take then, and then pass the latter between the ring and the finger, drawing the threada after it.

If the point of the needle is kept slanting upwards there will he no danger of pricking the finger. Hold the threads close to the finger, then alip the ring along them. It will usually be found to work off quite easily. If neither of these methods is successful, it will probably he necessary to have the ring filed. Tho hand should never be washed in hot water when a ring is to be removed, as beat causes the finger to swell. See Jewelry; Napkin Ring.

RINGING: In Gardening. A process sometimes adopted for the purpose of inducing vigorous barren fruit trees to bear fruits. It consists of cutting out narrow rings of bark all round or almost all round the branches; if the rings are only one-eighth of an inch wide they may encircle the branches: if wider than that the rings must not be completed. April is a suitable month for this work.

RINGWORM : How to Treat. The term ringworm is commonly applied to certain skin disenses caused by parasitio fungi It may be found on the scalp, the Leard, non-hairy parts of the borly, and the nails.

Ringworm of the scalp, which is highly contagious, is characterized by the appearance of one or more roundish, partially bald patches, the skin being red in colour and covered with fine greyish scales. The disease is more common in children than in grown people. One of the commonest menns of spreading it is by using the brush and comb or wearing the cap of a child suffering from the disease.

The disease is trented by the application of parasiticidal lotions or ointments. Every day the whole scalp should be thoroughly shampooed with soap and hot water. Then the more patently diseased hairs, which will come a way easily, should be plucked out with a fine pair of tweezers. Finnlly, a colourless indine should be applied once or tivice daily to the patches. This treatment must be continued for a long time. The treatment which gives the quickest results when obtainable is the exposure of the patches to the $\boldsymbol{X}$-rays

RIP SAW. This is a hand saw particularly adapted for cutting in the direction of the grain of wood The teeth are specially sliaped for that purpose, the front of them being vertical instead of sloping slightly backwards, as in the cross-cut saw It facilitates the cutting of long lengths of timber, cutting mather faster and more freely than the ordinary saw. See Saw.

Rising Front. See Swing-back

RISSOLE. To make cold meat rissoles, Almost any kind of fish, except very coarse pass 6 oz cold cooked meat, weighed after it has been trimmed. through the mincer twice,
adding 2 shallots and 3 sprigs parsley, then make a thick sauce with 1 oz . butter, 1 oz . flour, $1 \frac{1}{2}$ gills stock, 1 teaspoonful lemon juice and seasoning of salt and black pepper. Add also a pinch of ground mace. The flour should be fried with butter, and the stock must be well flavoured with vegetables. Add the minced meat to the sance, mix and spread the whole on a plate to cool Chicken and game can be used, with the addition of a little hacon.

Meanwhile prepare a small quantity of rough puff pastry, using about 6 oz . flour and 5 oz. butter, or butter and margarine mixed together. This pastry should be rolled about the thickness of a penny. If the pastry is too thick it is liable to become too deeply coloured beforc it is conked, or before the meat is heated right through.

Roll the pastry out into a square, thin sheet, then take portions of the inixture (about 1 dessertspoonful) and lay these in a row along the near edge of the pastry, leaving about 2 in . between each and keeping the heaps far enough from the edge to allow of the pastry being folded over a little beyond the mounds. Now wet the edge of the pastry. fold the flap over the heaps and press them with the thumbs in shape of a half circle. Cut out each with a 3 in. lluted cutter

The rissoles are now ready to be egged and crumbed, and should he fried in deep boiling fnt. Use a frving basket, and shake thens while frying gently to detach them from the sides of the baskiet and from each other. Dish on paper and garnish with fried paraley.
The rissole may be fried without any coating. When so treated, the half circle is laid on a Houred plate, turned over quickly and then fried as if egged and orumbed. It must not be dipped in flour, but only dusted with it.
Fish Rissoles. Lobster makes gond rissoles. Cut the meat of a very small lobster into dice, add to these $1 \underline{1}$ gills good white sauce, 1 teaspoonful leınon juice and seasoning, also a little anchovy butter. Mix all thoroughly together and heat up to boiling point in a small sauce. pan. Cool the mixture, make it up into rissoles, and fry in the manner previously directed. fish, is suitable for rissoles, but the llesh must be mixed with good white sauce and pounded. Cooked fish should be used, and 4 oz . will need $1 \frac{1}{2}$ gills sauce. With the more delicate varicties of fish add a little cream to the sance.

Cheese Rissoles. For these mix 1 dessertspoonful corntlour with 1 gill milk, then cook and stir them over a low fire for a ferv minutes. Move the pan to the side of the stove, and when its contents have cooled slightly add $1 \frac{1}{2}$ oz. grated cheese, the yolk of an egg, and a small lump of hutter. Add pepper and salt to taste, together with a little mustard: then turn the whole on to a plate and leave it to cool. When it has ret, form it into rissoles, using a little flour to make it adhere ; coat each with beaten egg and breadcrumbs, and fry in smoking hot fat. Drain, and serve at once, grating a little checse over each. or for the attachnient of objects with thin enrs, or lugs, to plate work. Rivets are uscd in many ways in other spheres than engineering anil metal work. For example, soft metal rivets are employed to fasten the parts of leather and textile work together, and also for attaching metal fittings to bage and straps.

For use on wood. as in the planking of small boats, copper rivets or nails are employed with wishers or burrs of the same material. The rivot is driven through the two planks, and the washer put on and closed up to the work. The superlluous projection is nipped off and the end riveted over the washer as in Fig. 2. The head of the rivet must be supported by a heavy hammer, or other suitahle mass of metal.

When leather or a like material is being joined, it is necessary to provide rivets with heads of a large area and washera of a corre-

## Rivets and Riveting Explained

## Practical Information for the Amateur Mechanic

The metal worker should consult the articles under the heading of Metel : also Bent Iron Work : Casting; Repousse. Reference is also suggested to Crockery: Pocket Knife: Perambulator, etc.
A rivet is a metal peg, resembling a short riveted on to leather, it almost always takes nail, which is clinched over at the ends aiter the place of a washer. Bifurcatcd rivets being driven in place, as shown at Fig. 1. used in leather work have large, fat heads It provides a permanent fixing for two plates and a shank divided into two prongs. When the rivet is used. The generic term for this sponding size. When a metal fitting is being style of rivet is tinman's rivet (Fig. 4).


Rivet. Fig. 1. Three types of rivet heads. Fig. 2. Rivet used with a washer for joining two planks. Fig. 3. Bifurcated rivet need in leather $\quad$. Fig. 4. Tinman's flat-head rivet. Fir. 5. Showing the tendency of metal plates to shear the rivet when the latter is not securely fastened. Fik. B. Result of an anusual strain on a rivet. Fig. 7. Single riveted lap joint. Fig. 8. Double riveted lap joint. Fig. 9. Possible space for leakage between two plates. Figs. 10 and 11. Caulking and fultering io prevent this leakage. Fig 12. Driving the plates together by means of a bollow punch. Fig 13. Three stages in ormiag a snap head. Fig. 14. Another type of punch used in riveting

Where tho rivet is of a metal dissimilar to, should be removerl. so that. the sharl) edges that of the plates being joined it should be of the holes are slightly chamfered, or the softer of the two. All rivets should be quite soft. If found to be too hard, so that the heards break off, the rivets should be annealed.

Joining Metal Plates. Riveted jointa in metal plates reyuiring to be secured to each other in the strongest possible manner aliould be made so that the rivets themrelves nre subjected only to a shearing stress. This means that the strain should be such that the two plates tend to cut the rivets in the same manner as the blades of a pair of acissors, as seen in Fig. 5. There should be little or no tendency to pull the head off the rivet, as is shown occurring in Fig. 6. For thin sheet metal work, rivets from $\frac{1}{\prime} \mathrm{in}$. to $\mathrm{I}^{\frac{3}{d}} \mathrm{in}$. are commonly employed The spacings may be from $\frac{1}{d}$ in. to 1 in. reapectively.

Rivets in tanks and toilers subjected to pressure, and those used in stee! structurcs, usually have a diameter equal to about twice the thickness of the plate. The spacing depends upon the kind of joint and the relative strengths. For a single riveted lap, joint, as illustrated in Fig. 7, the spacing would be about five times the single-plate thickness. Rivets under B in. in diameter are usually driven cold. A single riveted lap joint of good design has a tensional strength of only about 5:) per cent of the solid plate. In a double liveted joint, as at Fig. 8, the proportionate strength may rise to 70 per cent. In no case can a riveted joint be made as atrong as the original plate unless the plate is thickened up in itself at the rivets.

Caulking and Fullering. In larger work, that is to say, where plates of over ${ }^{3} 6 \mathrm{in}^{2}$ are employed, the joints are made pressure tight againat liquids and gases by caulking and fullering. Alt hough the plates may be drawn closely together around the rivets, they may not touch each other between them, as indicated in Fig. 0. There may be small open spaces under the heads and around the atalks of the rivets capable of creating a leak. The process of caulking and fullering hurrs the metal over at these places. It is done by blunt chisels of various shapes, and requires skill and experience to be a success. Fig. 11 shows at $A$ the cdges of a rivet being caulked over; at $B$, the plates of a single riveted lap joint are being similarly operated upon. The use of a fullering tool is shown at C in Fig. 10. In a thin sheet metal object such caulking is impossible, and the same result may be accomplished by wldering, brazing, or welding.
Forming the Snap Head. In order to pull together the plates of a riveted joint in shicet metal preparatury to hammering the rivet over, a hollow set punch may be used. Fig. 12 shows a combination set punch having in addition a recess or snap for forming cup or snap-headed rivets. 'The holding-up tool used beneath may also be provided with a sinking to suit the shape of the rivet being diven, and act as a anap in addition.
To form a snap head, the projection of the shank of the rivet before it is hammered over should be about $1 \ddagger$ times its diameter, as shown at 1). Fig. 13. The final neat rounded shape is ohtained by the use of the rivet snap, as at $F$, after the head has been forined roughly into a conical shape, as shown at F.. The blows, in the first part of the operation, should be clelivered at an angle, following around the rivet with a hammer of suitable weight. It should not be hit directly end on in the centre. The only exception to this method would be in the case of a countersunk rivet, as in Fig. 11, where the metal would for the most part be spread out by means of directly central hlows.

The holes in the plates may be drilled. or punched out in a machine for the purpose. In either case, the burr thus formed
rounded. A drilled hole is to be preferred to a punched one, as the metal around a punched one is weakened in the operation, and the strangth of the plates is thus locally impaired.

Rivets for cold driving should always be thoroughly annealed befure use. Iron rivets are to be preferred for this purpose, as the heads of stecl rivets are apt to crystallize when hammered over cold. Copper rivets used in a presaure-tight joint, to be soldered subsequently to riveting, should be tinned before use. This will ensure their taking to the solder. l'irst they sliould be cleaned by dipping in nitric acid The use of countersunk or Hush rivets should be avoided whereever it is possible, especially in cases where the rivets are subjected to the slightest tensional stress. A pan head, or snap (cup) headed rivet is much to be preferred. Rivets should be purchased with one head already formed. Plain wire should only be employed where both heads are of the countersunk form, and where the rivet is a long one.

ROACH: The Fish. The best season for this fresh-water fish is from early autum: until the end of Mareh, and it should not be eaten before the beginning of August To tell when roach is in good condition, examine the lins and the scales; the former should be red in appearance and the latter smonth to the touch; if rough, the fish is not gool. To prepare the fish, wash it, scale and gut it, and then wash agnin in clear water

Roach may be boiled or fried. Tu hoil, wipe the fish and score then cach side in 3 or 4 places. Put them into a stcwpan and just cover them with lukewarm water To each quart of water add 1 tableapoonful vinegar, 1 dessertspoonful salt, a bouquet garni, and 1 tablespoonful grated horseradish. Simmer from le min. to a quarter of an hour, and serve with parsley or anchovy sauce.

For frying, prepare the fish, washing them well in salted water, then wipe them quite dry. Dip in seasoned flour and fry them in a fryingpan in-butter, or in deep briling fat. When the fish are brown and crisp dish them on a disht paper, and hrush them with a little butter, which should be ready melted, and scatter over them dried and sifted sage, with seasoning of pepper and salt. The sage should be hented. and must be used sparingly. Garnish with fried parsley and cut lemon.

ROAD. Except on private roads, of which there are only, comparatively speaking, a few in existence, all persons have the right to travel on the roads at any time they like. As regards pedestrians, this right is unrestricted, save by the danger from moving vehicles; but drivers of motor cars, carts, carriages, and the like are legally bound to observe certain regulations, known as the rule of the road. They must also stop when directed to do so by a policeman on duty. Where a structure is crected on a road, the local highway authority may compel the person who crected it to remove it.

The extensive use of the raads by motorists has led to spiccial regulations for this form of traffic (for which see the article on Mntoring) and also, on the part of the associations of motorists, to special measures of assistance.

Warning Signs. To facilitate the safc and proper usage of the roads warning and direction signs of a distinctive character have been erected. At many road junctions and corners a white line is drawn in the middle of the road to compel velacles to keep to their proper side. Traffic signs inust now he of the size and type resctibed by the Ministiy of Transport
Roads and Property Owners. The owners of property have certain liabilities and duties with regard to the upkeep of roads. A householder who lives in a street which has nut been
taken over by the local authority is bound to bear his share of the cost of kecping the road in order, according to the length of his frontage to the road. Before a street is taken over the local authority will always require it to be properly made up at the expense of the owners of the property abutting on or served by it. In most towns and many rural districts the procedure is under the Public Health Acts or under the Private Streets Works Act Sitreet for this purpose includea a highway, road, lane, square, court, alley, or passage, whether a thoroughfare or not.

The first step is for the local council to pass a resolution to do such works as they deem necessary to any street or part of a strect which is not sewered, levelled, paved, metalled, Hagged, channclled, made good and lighted to their satisfaction. They must say whether they intend to proceed upon a mere frontage basis, or to take into account any works previously clone by the owners or occupiers of the premises; or to take into account the grenter or less degree of benefit to be derived by the respective premises. They may assess any premises which do not imınediately front. join or abut on the street, but access to which is reached from the street via a passage or otherwise. They may resolve to pay some or, indeed, all of the expenses out of the rates; but this is rarely done. They may include in the works the bringing of the street into level with other st reets.

Further Work of the Local Authority
The council's surveyor next makes plans and specifications, and prepares an eatimate of the cost, and submits to the council a provisional apportionment upon the several premises intended to be charged. In the absence of a special resolution, as above, the only premises which can be charged are those fronting, adjoining or abutting on the street, according to their frontage. I'laces of worship and burial grounds are not chargeable, but their sharc of any strect making must be borne by the rates.

Once a street has been taken over by the local authority, it is repairable by the inhabitants at large, and the householderowner has no more trouble with it. The most common objection to street works is that they are unreasonable, e.g. that the sewer proposed is too small, or unnecessarily large. A lucal authority may, however, lay an unnecessarily large sewer if they bear the surplus cost themselves. Again, an owner may object that the street has already been sewered once. After the scheme is finally approved by the justices, the authority proceed to do the work; and, when they have completed it, make a final apportionment on those liable, in the same proportions as the provisional apportionment.
Notice is served on the owners, any of whom may, within three months, object to pay. The only ground of objection is that the apportion. ment has not been validly made.
The cost of the work becomes a charge on the promises from the date of the completion of the work. Therefore, if A buys a house the owner of which has had the proper notice, and he sells it to A free from incumbrances, the owner must bear the cost of the paving, etc., if the work is completed before the day fixed for completion of the contract of rate. Otherwise A inust pay. As between the owner and a tenant of a house, the owner is liable to the local authority, but if the tenant holds on a lease wherein he has agreed to pry, in addition to rates, all imposition and charges imposed on the landlord in respect of the huuse, the landlord may claim reimbursement from the tenant. The local authority may make the amount payable by instalments spread over 30 years with 5 p.c. interest, and recover cach instal. ment from the tenant, the latter in turn boing able to deluct it from the rent. See Ratea.

ROASTING: Of Meat. Beforc nttompl. ing to roast or bake meat, preparations should lirst be made for heating the oven, either by building up a good fire and pulling out the damper over the oven or lighting the gas, or switching on the electric current. Gas or electric lient should be turned on nt least on min . before the nven is necded. The kind of meat to be cooked, its shape, proportion of lean, fat and bone must all be taken into consideration.
The time reguired for ronsting various kinds of meat and joints will be found under the different headings, Beef, Lamh, Pork, etc., and also in the Cook's Time-table in page 4 of wrappier. Part 13.
To prepare the joint quickly, scrape, wipe, trim. and tie it in shape. The usc of string is better than skewers, n.s the holes made by the latter allow the nutritive juices to escape Be careful that the lo ns and neck are jointed. Score the skin of pork with a sharp linife and rub it over with a little salad oil. Tie greaser prper over fatless meat, such ns veal, 10 prevent it from drying and scorching always removing the paper for the last 20 min to let the joint brown.

Put the joint on the trivet in a double baking tin if possible. The water in thic lower pan kecps the dripping from burning and causing an unpleasant amoke. Alternatively put a second in containing water on the shelf helow the joint. or add a gill of water to the tin in which the joint has been placed, adding more as it evnporates.

Place the joint in the hottest place in the oven for the first 10 min . This is most important. the object being to harden the meatalhumen on the surface. and thus seal up in the meat the juices that give liavour and nutriment. Then slacken the heat in ordel that the joint is cooked tiorough, not dark nor burnt on the outside and raw in the centre. After the preliminary sharp heat. the rule isthe larger the joint the slower the oven.
Basting the meat, that is, pouring a few apoonfuls of the hot dripping from the tin over the ineat. must be done frequently, to prevent it drying and shrivelling When cooked, place the joint on a hot dish and remove the string. Keep the meat hot whilst the gravy is made. Clear gravy is served with heef. mutton, lamb: thick with veal, pork, and stuffed joints.
Roasting Jack. The use of a roasting jack facilitates the turning of meat when ret to roast in front of the tire. The spit is occasionally called a jack, and the mechanical contris ance a bottle jack. The hottle jack is provided with an inside spring. When wound up it gives the spint, which is fastencd to it, a rotary movement bachward and forivard. so that the ineat is constantly changed in position and is oooked evenly on all sides.

The ronsting jack is a great convenience, ns it docs not require the constant attention of the cool: to prevent the mat from scorching on one side. By the aid of a roasting jack and a mest screen, meat can be roasted in front of the fire and cooked to perfection. It is thus actunlly roasted, whereas when placed in the oven it is balied. When roasted the air circulates freely round the joint, and all noxious fumes are entirely dissipaterl. See Baking: Beef: Dutoh Oven; Lamb: Mutton, etc.

## Robinia. See Acacia.

ROCAMBLE. A member of the onion family, rocamble is often called Spanish garlic, but is much milder than the true garlic. It is of perennial growth, and produces clusters of bulbs at root and stem, the former of the two bcing the mort suitable for propagation.

Cloves, or divisions, of bulbs are best planted in spring in light soil 2 in . dcep and ( 6 in njart. If preterred seed may be sown in drills at the rate of $\frac{1}{2} \mathrm{oz}$. per 25 ft ., crops taking about 8 monthe to reach full maturity. Bulhs should be


Rochea. Greennouse not plant with crimson flowers and succulent leaves
lifted when the foliage becomes yellow. and placed in the sin to dry, afterwards tying them in bunches and storing them in a dry place. See Garlic : Onion

ROCHEA. 'Thicse gicenhouse planta liear succulent leaves and llat bunchis of shows flowers in spring or summer. 'Ilhcy are casily grown in pots in a compost of ivell-drained sandy loam and need a minimum temperature of ahout 50 degrees. During the winter months they need comparatively litile water. Propagation is by cuttings inserted in pots of sandy soil in spring. liochea coccinea. with scarlet Howers in summer, is the favourite kind

ROCK BUN. Plain rock luns or rock eakes can be inade from $\frac{1}{4}$ ). butter. 1 Ih. flour 3 oz. castor sugar, 2 eggs, salt, and d teaspoonful baking-powder. Rub butter into llour, add sugar and eggs (benten), alsn flavouring of vanilla. Mix all well together and drop the misture, with two forks in small rocky heaps on to a tin lined with buttered paper. Cook the cakes in a moderatcly hot oven until they are lightly browned and firm 10 the touch.
To make fruit rock cakes. mix together $\$ \mathrm{Ib}$. flour, a pinch of salt, and 1 leaspoonful baking-poweler: then rub in 3 oz bulter and add 3 oz. sugar, $f$ lh. cleaned currants or sul. tanas and 1 oz. mixed beel, cut up finely. Stir a beaten egg into the mixture and then a little milk, kecping the whole to the desired stifiness. 13akc 1he cakes as directed in the previous recipe.

ROCKCRESS This name is popularly given to the white arahis. It is a low.growing, spreading plant much used in the rock garden and for spring flower heds; it thrives in ordinary well-drained soil and is increase by cuttings in June. The plants should he hard prunod after flowering. Aubrietia is the purple rock cress. See Aubr:etia.

ROCK CRYSTAL. A variety of colourless or nearly colourless and transparent quart\%, rock ervstal is found in different forms in many parts of the world In all forms it is an extremely hard mineral. being fusible only by the oxy-hydrogen llame and the electric furnace liock crystal is impervious to nost acids, hydrotluoric acid being practically the only exception.

A modern use of rock crystal is in the con siruction of lenses for photographic and optical work, the pelbbles for which are ob tained in Brazil. Large crystals, used in optical work, are found in the northern paris of Madagascar. The vellum stone of Madras is a form of rock crystal that is cut and polished and is then fashioned into ornaments Sep Lens.

ROCKER. The curved pieces added to the legs of a chair to uermit it to oscillate, or rock, to and fro are known as rockers. They are also used on criadles.
A projection or lever arm attached to a shaft that is capnble of motion in alternate directions is known as a rocker arm. This mechanism is found, for example, in the overhead valve gear of a motor car or motor cycle engine
ROCKERY. This term is commonly used in reference to a small rock garden or a mound of soil and stone so arranged as to provide a miniature representation of a rock or Alpine garden. Often a rockery is but a heap of soil and stones set in $n$ shady part of the garden and planted with ferns, London Pride, and a few other common plants But if it is in a sumny place and built correctly many choice Alpine or mountain llowers can be gown in a rockery. It slould be constructed in the way explained in the notes describing the rock garilen (q.v.)

ROCKET: The Plant. This is the popular name of an old fashioned hardy peren nial plant (Hesperis matronalis). Belonging to the wallilower family, it licars fragrant purple flowess in summer: the variety a ha has single white blooms. The double rockets, with white, lilac, or purple llowers, are very bcantiful, hut more diflicult of cultivation than the single linds: they should be incrensed by cuttings inserted in sandy soil in a frame or greenhouse in late summer. 'Ihere is no difficulte in raising the single rockets from scerls in early summer. looth single and doublo rockets llourish in ordinary well-tilled soil.

ROCKFOIL. This is the popular name of saxifrage, a large group or genus of charming llowering plants chielly suitalile for cultivation in the rock garden. adding greatly to its attraction. See Saxifrage.


Rackst. A delightful percnnial suitable for a sunny bed or border. This variety is well known for its delicate perfume

## Rock Gardens: Their Construction

## And the Plants that Give the Best Results

The reader of this article is referred to the entrics on the various plants and fowers suitable for the rock garden, e.g. Aubricria. Columbine; Edeluclss: Fern Gentian: Heron's Blll; Mass

The building of rock gardens, toth large with soil made firm Most alpine plants root and small. on which to oultivate alpine or deeply, and unleas thare is a fair depth of ani: mountain plants has made remarkable pro between the rocks they may deterorate or gress in late years, and this is not a matter even perish in dry weather It :s a mistake for surprise, for no plants are more fascinating to place one rock or stone directly on another than those which grow wild on the alpine there should be a good layer of soil between heights of Europe and other countries Most them, for many hlpines fourish best in crevicea of them bloom in axton'shing profusion and provide an enchanting display chiefly in spring and early summer. Most of them can be cultivated to perfection in this country $n$ a properly constructed rock garden.
The secreta of succeay are to choose a site in a sunny place and to provide thorough Oetw the rocks.
Ordinary non-clayey garden soil may torm the bulk of the material used in the rock garden; sand, leaf-mould and gritty material, such as broken stone or brick, must be mixed in frcely. Such a compost will suit numerous


Rock Garden : An eflective arrangement of plants. 1. Anemone bepatica caerulea 2. Androsace alpina. 3. Campanula rameri. 4. Primula denticulata cashmiriana. 6. Achillea argentea. 6. Adonis pyranaica. 7. Rock yarrow. 8 Alpine pink. 8. House leeks. 10. Aubrietla, Dr. Moles. 1i. Arabis alpina plena 12. Aethionema grandifors. 13. Gentiana acaulls. 14. Lychnig Lagascae. 15. Double gold dust. 16. Erikeron aurantiacus. 17. Iberla correaelolia 18. Aobrietia. Mrs. Lloyd Edwards. 19. Saxifraga apiculata. 20. Erodium macradenum. 21. Anemone pulsatilla. 22 Linum tenuifolium. 23. Saxitrara Ai200n. 24. Edelweiss 25. Phlox amoena. 26. Aubrietia, Firerior 30 Oeranit 32 Daphna 33 Remondia pyrenaica. 34. Gentiona acoulis. 35. Saxitraes $\begin{aligned} & \text { upestris } 33 \text { Ramondia pyrenaica. 34. Gentiana acaulis. 35. Saxitrara } \\ & \text { Camnosii. } 36 \text {. Lithospermum prostratum }\end{aligned}$ provided for at plant ing time by taking out holes nad tilling them with peat. or whatever is needed. If the avail able site is narrow. oare must be taken not to build too bigh ; other wisc the plants are almost certain to suffer from the effects of drought in summer.

The best time to put in rock plants is in September-October and early April As they are grown in small pots by nurserymen they can bowever be planted at any time, though it is unwise to set them in winter. In apring and early summer the rock garden must be watered very freely in dry weather. for it is then that the growth of the plants is most active They ought to be wutered thoroughly a lew hours before being planted it is an excellent plan to place a layer o drainage. Alpine plants are thoroughly hardy, stone ohips on the soil round about choice and do not succumb to frost, however severe; plants: this belps to kcep the roots moist. but they will not flourish in ill.drained soiL Perfect drainage is of the first inportance.

There are innumerable ways of building a rock garden : it is searcely possible or advisable to work to a set design. The aim should be to make it es natural in nppearance as possible, whether it be a miniature representation of a mountain chain. a boulder-atrewn slope, a rocky valley, or merely a grouping of rocks and soil arranged informally

If the soil is clayey it should be excavated to the depth of 10 or 12 in ., this epace then being filled with stones or broken bricks for drainage On naturally light land so such preparation is required. In setting the rocks care should be taken to place most of them on their broadest bases, and to ensure that they are firmly embedded in the soil: they should slope towards the mound of soil, not away from it Very few, if any, of the rocks should be placed on end; they have such an unnatural appearance. Here and there, however, to ensure a bold rock group or greater variety of outline it is permissible to set one on end A limited number of large rocks or stones is more effective than numerous small ones. it is diffioult to build a rock garden of distinction with the latter.

As the placing of the rocks proceeds, soil must be placed behind them, care being taken to sce that all spaces between thein are filled and that is essential to success. Vigorous spreading plants, such as pink. aubrietia alyssum, dwarf phlox, iberis or evergreen candytuft, nud arabis should not be set near oboice kinds, or the latter may be overrun and spmilt.
Stone for the Garden. The ohoice of a stone for building should be well considered In many parta of Great Britain igneous rocks, slates, shales, sand. stone, and limestonc are rendily obtainable, and of these the latter is unexcelled for rock work, cxcept in its orumbling form. Limestone in ita beat forms is beautiful alike in colour, outline, and texturc; it prossesses also the porosity that is exsential for the conveyance of moisture direct to the roots of alpine plante. In thuse


Rock Garden : how to arrange the stones. 1. Simple rock Rarden with base drainage. 2. Bad placing of stones. 3. Good placing. 4. Typical rock lopmation. 5. Good method of planting in pockets and fissures

Coustesy of Amatari Uarmenim
well-drained sol in a sunny place. The bellfowers are very beantiful, especially campanula pusilla, which bears a profusion of tiny blue bell-like flowers. Other good ones are garganica, G. if Wilson. pulloides and muralis, all of low growth, and carpatica. which grows a bout 12 in . high Most of them iike slight shade.

The silvery saxifrages are indispensable They flourish if planted in sunny pockets or crevices of gritty soil among the rocks; mortar rubble or a scattering of lime should be added A few beautiful sorts arc Aizoon, Engleri, lingulata, Cotyledon, and cochlearis The mossy saxifrages form moss-like evergreen cushions, and bloom very frecly in spring. They need well-drained soil in sun or whade Wallacei, hypnoides and muscoides are a tew of the best. The Cheddar pink (Dinnthus caesius) is easily managed in gritty soil, and edelwciss (leontopodium) flourishes in stony, loamy soil Veronica teucrium dubia hears masses of lovely blue flowers and thrives in ordinary rock garden compost.
Other indispensable sorts are the primulas irondosa und hirsuta, dwarf phlox, rock jasmine or androsace, vellow flax (Linum Havum), atonecrop or sedum, and houseleek Many of the gentians are somewhat difficult, they may grow, but often fail to bloom. One of the most reliable is Gentiana septemfida.

Miniature bulb flowers should be planted in autumn-c.g. hoop petticoat. angel's tears and cyclamen-Howered daffodil, squill, snowtlake, and glory of the snow' In spring sceds of low growing annuals may be sown to till spaces here and there; suitable kinds are toadflas. (linaria), portulaca, leptosiphon and violet cress (ionopsidium). Dirarf varieties of conifers, daphne. rhododendron, and other shrubs are often used in furnishing a rock garden.
ROCKING CHAIR. In a rocking chair the legs are mounted on curved rails, or rockers, so that the chair can be rocked backward and forward by a alight effort on the part of the occupant. Sec Chair.
ROCKINGHAM WARE. T'uo classes of pottery known by this name should be clearly distinguished. There is the ever-popular ware consisting of a cream-coloured earthenware hody, covered with a lead glaze heavily stained writh manganese oxide, which imparts to it a rich purplish-brown bloom, resembling a warm madder. This was introduced about 1788 by the Swinton worlis near Rotherham, and nained after the Marguess of Rockingham. on whose land the factory stood It was at its best down to 1806 , the carlier pieces having a plcasing variation in the glaze, which darkened as it slowly flowed down.
The modern Rockingham glaze, which is made at many factories at


Kockingnyw Ware. Plate of thia ware made about 1823 Brilish Museum home and abroad, tends to be flat and uriform, but in technical excellence modern Wedgwood and Ridgway Rockingham surpass anything ever done at Swinton. Pieces to collect include also the antique Cadogans-which werc lidless puzzle-pots filled from below, usually in the form of a peach, and a sprig of blosson for the handle-as well as the Toby snuff-taliers, often described as portraits of the great American Benjamin Franklin. The old mark was Brameld, with or without Rockingham Works. The Rockingham family crest of a griffin was adopted in 182:3.


Rock Garden. The blocks of stone have been laid out in rough terraces. On these terraces, between the
crevices of the rocks and even on the shallow steps, cluster such dainty rock plants as columbine, saxitrage. gentian, white rock cress, candytuft. aubrietia, and a host of others

Courtcsy ol Amateur Gardenima

There was also an output of cream-coloured and other ordinary wares, including dishes and plates enamelled with sprays of flowers, identified by the botanical name written on the back After 1806 much gnudy ware was turned out, and after 18.0 porcelain was also made. This continued down to 1842, when the factory was closed. A characteristic form of tea-sets liad the views painted inside the cups, with a simple gold design outside.
ROCKING HORSE. 'I'here are two main types of this toy, one somewhat simpler than the other, and each can be bought in several sizes and in various qualities of inaterial and fittings. The simpler type is mounted upon two curved rockers, the other on rockier bars. It is advisable, when buying, to choose a thoroughly strong horse, otherivise it will not stand the rough usage in the nursery to whioh it will probably be put. Most of these toys are portable, hut in some cases the horsc is fixed to the nursery floor

ROCK ROSE. This is the English name of cistus, a group of beautiful llowering shanbs, most of which are suitable only for planting in well-drained soil and n sumng place. The hardiest is Cistus laurifolius, 4 ft ., white. (Other beautiful sorts are crispus, 3 ft ., rose colour ; Horentinus, 2 ft., white; and ladaniferus, 3 ft., white and red They Hourish best in warm, southern gardens where the soil is dry Propagation is by cuttings in summer or by seeds in spring.

ROCOCO. This word is used in both architecture and furniture design for a style that is marked by an excessive use of curves and other forms of ornamentation, including shells, rockwork, scrolls, and foliage. It is usually introduced without regard to the constructional oharacter of the sork, and the figures are juinbled together.
This style prevailed in France and elsewhere in Europe in the 18th century, especially in its latter part. A few pieces of furniture by Chippendale and other English designers are in the rococo style, but these aro by no means their best work. See Louis Style.
ROD: The Measure. This measure of length, which is also called a pole or perch, and is much used in measuring land for allotments, etc., consists of $5 \frac{1}{2}$ yards, or $16 \frac{\mathrm{ft} \text {. Forty }}{\mathrm{f}} \mathrm{y}$ rods make a furlong. A square rod consists of

304 square yards, and 40 square rods make a rood In brickiwork a rod or rood consists of $16 \frac{1}{2} \mathrm{ft}$. by $16 \frac{1}{2}$ ft., i.e. $\because \overline{-} 2 t$ cubio ft . It conlains about 4,500 bricks and about 75 cubic ft . of inoitar.
RODGERSIA. These arc hardy ornamental plants which are grown in the bog garden, or in other deep, moist soil. One of the most striking is Rodgersia aesculifolia, which has large, handsome leaves and hears spikes of white llowers in summer. Pinnata, with bronze-coloured leaves and cream-white flowers, is another striking plant

RODINAL. This is a photographic developer with paramidophenol as the reducing agent and sodium sulphite as preservative. The original developm of the paramidophenol class was a German patent. Similar developers of British make are azol, certinal, kodol, and rytol. They are all concentrated solutions which licep exccedingly well and only require the addition of water for usc. See Jeveloper ; Paramidophenol

ROE. The milt or spawn of tish, which is known as roe, may be cooked in the fish or removed and made into savoury dishes The soft roe is used in the preparation of sarouries and hors d'oenvres, and the hard roe also han its culinary uses. See Coll's Ros; Herring; Hors d'Ocurres: Salinon.

ROGER DE COVERLEY. This is one of the old country dances and has its own individual tune. The dancers form up in two lines, men on one side, women on the other, parthers opposite to each other. The top, woman and the bottom mian then chassé between the lines with their right hands extended, take hands and turn round, after which thev return to their places. The tops man and bottom woman do the same

The manoeuvre is rejeated by the original couple, this time with the left hand, and is followed by the second couple as before. Next time they circle round each other back to back, and finally how and curtsy ; in each case the second couple follow
When all these figures have been done the leading woman and man face towards the top of the room and, whecling outward, lead the other cuuples down to the hottom Here they take hands and form an arch, beneath which the other couples pass. The couple which
originally began the dance is now at the bottom of the row, while a fresh couple is at the top. and the dance continues ns before It follows that each couple gors through the figures $t$ wice, once when at thic top of the row and once when at the hottom.

## Roll. See Bread

ROLLER BEARING. The essentia! difference het ween the roller and the ball bearing lies in the point of contact. With the ballbeasing the point of contact may he said to be a mathematical point, whereas iwith the roller heasing it is a lince equivalent to the length of the rollers The roller bearing provides a far greater hearing area, ands a much heavier load can he sustained than-by the ball type of equal size With the latter, light thrust loads are ho.ne by the point of contact of the balla with the groove in which they run; heavy thrusts are catcred for by the specially designed thrust berring that is usually cmployed in conjunction with a journal ball bearing
Oring to the abaence of a groove in the races of the roller bearing, a thrust load is not prossible, and to overcome this a roller bearing is produced ha ving taper rollers that run in taper races. This will take a heavy thrust in one direction: where opposed thrusts are present, two bearings are employed. Sce Ball Bearings ; Lubrication
ROLLER SKATE. Several kinds of roller skate are manufactured, the hest heing those fitted with hall-bearing whecls. They are made in several sizes, and generally each size is adjustable within certain limits The wheels are made in boxwood, aluminium and steel. Roller skates should be strongly made, and, as serious accidents may occur through the use of skates made of chcap materials, it is advisable to purchase only the hest quality.
The rollers shonld the kept well oiled, using a good quality lubricating oil. For rollers with plain hearings thin oil should be used. but for ball bearings it is advisable to use a thicker oil of the nineral kind which will not dry. Rust may be avoided by liceping all the mctal parts rubbed over with vaseline. It is not enough merely to wipe the parts over with a vaselined rag: the metal surfaces must be thoroughly well rubbed with a soft rag impregnated with vaseline. If the skates are to he placed on one side for any length of time. it is advisable to wipe them over with melted tallow
Small repairs, as new axles, wheels, screws, and rubber pads, can he done at home, but the necessary materials should be purchased. Parts can he obtained from the makers generally much cheaper than they can be made at home. See Skate.
ROLY-POLY PUDDING. There are scveral varictics of this pudding: the plain suet roll, currant roll, or pluin dulf. jam roll. treacle roll, and raisin roll. These arc ali boiled. The roll is sometimes haked insteal, and filled with jam, syrup, or a lind of Banbury cake mixture. When baked, the crust is often made with dripping or dripping and butter mixed. See Pastry; Suet Crust.
ROMAN HYACINTH. Bults of this favouritc early lower are less plentiful than formerly and are therefore expensive. Other hyacinths of which the bulhs have been specially prepared for forcing are grown in. stead. If Roman hyacinths are potted in August-Seplember in loany soil, placed in a shady frame for five or six weeks until weld rooted, and grown in a slightly heated green. house or room window, they will blonm towards the end of the year. They also do well in bowls of libre indoors. The bulbs are useless after llowering. See Bulb: Hyacinth.

ROMDNEYA. This striking perennial is commonly called the tree poppy: it reaches a theight of about's ft., has grcy-grcen leaves,


Rondeletia. The fragrant red flowers of $R$ adorata, an attractive rreenhouse dot plan
and hears large white poppy-like flowers in summer. There are two kinds, varying only slightly in appearance, Coulteri and trichocalyx. The most suitable position for these
plants is in a border at the font of n sunny wall in loamy soil In cold districts the stems are usually cut down by frost in winter, but if the roots are protected fresh shoots will develop in spring. These plants are increased by root cuttings placed in a box of sandy soil in a frame in spring.
ROMULEA. This is the name of a group of spring flowering bullos with flowers sone what resenbling those of the crocus They should be planted in autumin in sandy, loamy soil in a sunny sheltered position, or they may be grown in flower pots in the greenliouse Some of the best sorts are bulbocodium, blue and yellow, Clusii, lavender, and sjreciosn lavender-rose.
RONDELETIA. This evergreen flowering shrub, suitable for the greenhouse, grows to about 5 ft . in height. Its fragrant llowers are horne in compact heads in the summer. Rondelctins flourish in a compost of loain with a littlc peat and sand added
The temperature of the house should vary from 50 to 70 F ., according to the season Propagation is by cuttings struck in sand in the springtime. The favourite lind is speciosa or odorata. which has red llowers.

Rood. This measure of surface contains 40 square rods or 1,210 square yards. Four roods go to the acre. Sce Square Measure

## Roofs OF MANY Kinds

## Features of the Principal Types Used in Domestic Architecture

This artic!e. af.er describin? common methods of toofing and the materials used, denls in detail with the construction of a tupical ronf. See Corrugated ir-n; Cottage; Eaves: Gutter: House: Key; Mansord: Paranet: Purlin : Ratter: Slate; Thatshing; Tile cte.

Roofs are distinguished firstly by the ma. terials used for covering them, and sccondly by their form of construction. They may he covered with thatch, stone, tile, slate. lead, zinc, copper, iom. glass, bitumen, o. asphalte, etc., and according to the kind of material so will the form and method of construction vary

There arc flat, lean-to, couple or span, hip, mansard, and M roofs. 'These are further divided into low or high-pitched roots, as their sides make gieater or lesser angle with the horizon. In carpentry the ronf is the timber framing by which the covering materials arc supported: this in general consists of plates, principal rafters, common rafters, purlins, ridge boards, etc.

Filat roofs are covered with lead, zinc, or asphalte after heing formed with the neccssary wood construction, but roofs of ferro-concrete are conimon. Flat roofs are given a slight pitch or inclination, in order to throw off water that may fall on them in the form of rain or snow. The pitch may he anything between $4^{\circ}$ and $8^{\circ}$. The smalness of the pitch in the case of a lead covering is on account of the fact that lead will creep with the


Roof. Typical example of a span roof
varying influences of the temperature. For this reason the sizes of the pieces of lead are restricterl to a maximum of 7 ft . by 2 ft . 6 in It will he appreciated that the bigger the piece of lead used the more evident will be expansion and contraction. For similar reasons the sizes of zinc are restricted when used on a flat.
The formation of flat roofs varics according to their size. Ilates and joists form the main structure. the size of the joists varying with that of the roof To the joists are nailed T. and $G$. hoarding, which should he laid lengthways to the fall; the flat area is divided up into hays by the use of molls and drips. For an asphate covering the structure of the roof is similarly formed, or the base may he ferro-concrete.

Lean-to Roofs. Lean-to roofs have only one side or slope, the top part of which is generally fined to the main wall of anotlier building: they are commonly used for covering outhouses and sheds. The construction is very simple. A plate is fixed on to the main wall of the building that is to carry the top of the rafters. and another plate is fixed to the main wall of the shed or outhouse. Rafters are nailed to the two plates; an intervening purlin would be fixed if the common rafters were more than 10 ft . in length hetween the supports.
The pitch varies according to what kind of covering material is used. If the roof is tiled or thatched, $45^{\circ}$ would be a suitable pitch, $30^{\circ}$ for slate, and $10^{\circ}$ to $20^{\circ}$ for corrugated iron. If tiles, slates, or thatch are used the common afters should not exceed 12 in. apart, but with corrugated iron they may he placed 2 ft apart.
Span Roofs. Span or couple roofs have two wloping sides. They are composed of rafters that have their heads cut and fixed to a ridge hoard, and their feet to the wall plates at the base. The common rafters are arranged so as to project beyond the ualls of the building at least $(\mathrm{in}$. in order that any water falling from the roof will fall clear of walls. This kind of roof depends entirely upon the stability of the walls that carry it, because it has no tie l.cam to hold it in, hence if used for work of a permanent nature the span should not excecd 12 ft . If an addition to this kind of roof is made in the form of a tie heam it will take a
wider span. 巳t may be added to that given in the former case, but the roof then hecomes What is known as a closed span or couple roof The span on $n$ roof may bo increased by placing a piece of timber across the tien na a binder. Ties and binder are spikenl together and a long bolt known as a king bolt connects the binder with the ridge hoand at intervals of 7 ft to 8 ft . If the tie beams were not so supported they would san towards the centre These tie beams may be used ns ceiling joists, but the clear span for sucha roof should not exceed 20 ft
If it is desired to lake advantage of some of the space in a span roof the tic beams may be raised ahove the wall plates to a maximum height of half-way up the rafters; the ties in such a case are called collars, and the roof is termed a collar roof. This is not su strong a roof as the two preceding ones. In the ordinary couple rool much of the strain is placed unon the walls to which the plates are fixed. There is a tendency of the roof to spread, and the walls are thrust outward

Most buildings equire a roof with a span bigger than those mentioned, and additional timbers in the form of purlins and struts have to be introcluced. In houses of moderate size intermediate supports are found in the form of partition walls, upon which the ceiling joists or tie heams rest and from which struts are supporterl. While at the ends the purlin is built in tho wall. In onder to carry this type of purlin a collar is fixed to about every sixth pair of rafters. The collars are supprorted in turn by the struts that take their licaring from the supports benenth. This type of rool will take a span of 30 ft ., and may be formed at $30^{\circ}$ to $45^{\circ}$ pitch.

With a roof of the span mentionel it is hest to employ tivo purlins if it hes a pitch of $45^{\circ}$, thus dividing the length of the rafters into three. The top purlin is fixed on the collars The lower purlin is of a trussed design; that is, it has $n$ top and hottom memher, with intervening struts and tics in order to stiffen it up, and to prevent any sag.
Two span or couple ronfs may be built side by side to cover one span, such roofs being called II rools. A valley gutter, formed between the two roofs, is lined generally with lead, and arranged so as to fall towarla both ends ; that is, its highest bay is in the middle of the length of the roofs. A curl roof is one having the slope broken on two or all of its sides. In suchinstances the head of the rafters, wheic the slope changes, is cut and tixed to a heavy purlin or curb, these purlins being held together by tie beams or joists. In acldition to the top purlin another is fixed midway between the head and the feet of the rafters which are attached to the wall plate. The curb roof may be finished in the form of a Hat roof. As a means of lighting curh roofs, dormer windows are invariably introduced: when these roofs are nsed under suitable conditions they have a very pleasing effect, and they have the further important advantage of utilizing all the available space in the roof.

Roots tramed on 10 trusses form the best but the most expensive type of root 'Ille trusses inost gencrally used are the king prast and queen poat truse. These are lormed of faily large timbers and consist of a tie beam, principal rafter, struts, and a king prost. the queen truss nas two posts callexl qucon posts. These frames or trilsses are sup. ported by the walls, and


The joints used iri framing the two kinds of trusses are common to hoth. The head of the principal rafter is secured to the king post by stub tenon and shonlder, in addition to the 3 -waly strap. 'The struts and the baso of the king poast are joined with $n$ joint like that used at the head. I'lic head of the struts is joined to the principal rafter by the use of a stub tenon immed late! y under the purlin The hottom iron strap with the gib and cotter allow lor the tightening up of the joints on the tie beam and hase of the king post in the case of slight shrintage or ang of the inaterials
A mansard or a Frenc roof is formed by a combination of the ling post and queen post trusses: the former is placed rest on the wall plates; the trusses support over the latter, a combination which allows the purlins and tho pole plates, which in much of the space in a coof to be usefully turn carry the common rafters, th: feet of employed. Ihis type of roof is used in conthe lattor reating on the poleg plates. A truss mof is hetter able to withstand heavy loads than any of the roufa mentioned. All its meinbers are either in tension or compression. and with careful design it can be arranged so as to convey the loarl of the roof on tho angular points of the truss.
'Lhe head of the king post is prepared to receive the ridge board; at the hend of the truss there is a 3 -way iron strap, und at the hase there in also $n$ strapl of iron lititesl with a gil) and cotter. 'These straps hoth assist in producing a rigid structure 'the parlins are arranged so ns to rest on the pincipal rafter at the point of intersection of the strut: the pole plate is fixed on the erd of the tic beam

The queen post truss is intended for confs with a wider spun The 3-way strap, hotton straps, gibs and cotters will he used in duplicate, seeing there are two posts. Between the posts $n$ straining sill is placed at the base, and at the head as atraining beam.

'I'hoy are very heavy, end oftell prone to be damp. Concrete is much used for Hat rools, and when blended with a suitable waterproof composition and properly laid, it undoubtedly gives excelient results
'Ihatch, carried out in straw, recds, or beather, is held in disfavour by fire insurance authorities, and is generally considered to

harbour vermin and insects A thatcherd house is warm in win ter and cool in rum. mer, so that thatch has much to commend it when it can be properly used It is not practicable as a rooting material in any place where it is liable to be ignited by aparks, or from any other causc.
Corragated and other galv nized irons are not suitahle for divellings, despite the fact that they are fairly lasting, fire proof, vermin-proof, and impervious. Galvanized iron is hot in sumimer and cold in winter, and the nuise made by rain falling upon it is against its domestic use. Nevertheless it is probably the cheapest practicable roof covering. and for outbuildings, poultry houres and the like is a highly ratisfactory misterin, provided it is used in a reasonable manuer with due regard to its linsitations.

Construction of a Typical Roof. As an example of the construction of $n$ roof of a small houre, Figs 1 to 7 show progressive stages of the work. The walls having heen erected to plate height, that is, the height at which the brickwork terminates and the roof begins, a wooden tie, or piate, is laid horizon. tally upon the wall and bedded in mortar.
The next step is to prepare n number of rafters. These will generally measure about 4 in. deep and 2 in. broad, and will reach from approximately 12 in . heyond the face of the wall to the spex of the roof, that is, the junction with the ridge hoard One ond of the rafter is cut at an angle, so that it bears up against the ridge board, while the othor end is notched to fit on to the opposite portion of the plate. Having prenared a number of rafters. the work of erecting the ridge commences, for which purpose it is convenient to lay the ceiling joists in place on the top of the wall plate (Fig. 1).

The ioists are simpiy placed in position, being opnecd at approprinte distances apart, about 14 in . centres, and spiked to the plate to prevent them shifting. 'I'wo rafters are placed in position on the plate and against a ceiling joist, two or three rafters' longth from the end of the ridge. The upper enils of the raiters are pressed together so that they bear against the ridge bonrd, which is placed in position between them. The feet of the ratters are spiked to the plates, and their upper ends to the ridge board, the other end of which is
meanwhile supported in any confenient manner The sanic operation is gone through near the other end of the ricke, after having plumb dup the first pair of rafters hy comparing with n plumb-line auspended from the ridue to the ceiling joista. $\Lambda$ cros. strut is generally nniled tomporarily between the rafters and the plate to keep them from shi!ting.

Another pair of rafters is added near the centre of the ridge. after having tested the latter to ree that
it is no sagging or twistung. When the rest of the mfters are set in position in pairs One pair of rafters is set up ngainst the inside elge of the brickwork. and it the barge hoard is to overhang the walls more than a few inches, an outside rafter is nceded 'The ridge boarl projects a few inches beyond the line of the barge board. Where the rool terminates against a chimney stack, the ridge board is sup. portel on a brick corbel built out of the stack. or is carried on the end of $n$ pair ot rafters.
'lhe junction of two such roofs results in the neet! of fitting n number of short ralters to : dingonally placed meniber known as a hip ridge board, when it is at an ontside anglo, and a valley board when it is an inside angle. These are fitted in much the same way as the other rafters, except that it is nenessary to cut the ends to a different bevol. and to hevel the sides so that the board fits snugly into the angle between the two ridge boards This stage is illustraleal in Fig. 2 The triangular apace between the ridge and the valley or hip hoard is then filled up with short or jack rafters, the ends of which are cut to $n$ bevel in two planes, that is, the top and side of the rafter each shows a bevel. These are spiked in position similarly to the rest of the work.

## Supporting the Rafters

'To support the rafters, long horizontal heams of considerable strength aro provided, called purlins (Fig. 3). They are placed in position and provided with adeyuate menns of support at each end, and also at intermediate stages. At the ends they are generally built into the hrickwork of the gable. and at the hip are jointed to the hip or valley loards, and furtlier supported by collars or horizontal crosspieces of timher spiked to the rafters immediately beneath the purlins Struts are then ritted to intervening wall supports, unless the patition walls are carried out in brick, when they may lie huilt in position. Braces, or diagonal timbers running from the plate to the junction between the purlins and the gable ends are then spiked to the underside of the rafters, to take up the strain due to the pressure of the wind on the end of the house, and to prevent the roof from twisting.

An opening round the chimney stacks will have to be worked liy means of a trimmerthat is, a piece of wood jointed into the nearest continuous rafters-and to this trimmer the short rafters which have to terminate ngainst the stack are fixed (Fig. 4) A bracket piece is fitted to them and some roof boarding whereon to set the flashing for the chimney stack.
Valley boards (Fig. 5) are fitted to support the guttering material. 'These are simply


Roof: stages in construction. Fig. 1. Showing how ends of rafters and ceiling joists tht to tae plate. Fig. 2. Valley board and common raiters in place. Fig. 3. Parling in place, also dipand valley and tile Fig. 5. Dalley boards in place to support guttering. Fig. 6. Filling between the rafters to prevent ingress of wind. Fig. 7. Verke on gable end
rough boards nailed to the rafters and run from the eaves to the ridge in the angle bet ween the two roofs. The eaves are formed by cutting the overhanging ends of the rafters in two different directions one a vertical cut to provide $n$ bearing surface for the fascia board and the other liorizontally cut, to provide a support for the soffit board. Thesc boards are spiked to the ends of the rafteis and to each other. The near sidn of the soffit board. where it bears against the wall. may be supported by rough grounds to which it is nailed. The spasce between the rafters above the plate is filled in with brick, or any other material that will close up the aperture. to prevent the wind from driving underneath the ralters (Fig. 6).

At this stage the roof many be finished in scveral ways. The whole may be boarded with rough boards (or tongued and grooved boards in very good-class work), and thic tile or slate battens set upon them. Or weatherhoarding may be used set the wrong way up : that is, with the thick end uppermost, thus providing ledges whereon to lay the tiles Otherwise, tile battens may be simply nailed to the rafters, and the boarding omitted. On the score of economy this can be recominended, but it is generally considered that boarding before tiling the roof makes it perfectly weatheright, and gives a more equable temperature. In the case illustrated the rafters were simply battened for tiles. The battens terminate against the valley boards, or any other boards, such os those for the gutter. The next step is to lay the gutters, such as the valley and those around the ohininey stack, and also to put up the flashings. After this process has lieen completed the roof may be either tiled or slated.

The verges, or overhanging ends, are finished in various ways, hut the method in Fig. 7 reaults in a good appearance and is cconomical. A 9 in . hoard is cut to shape and set vertically against the ends of the purlins and plate, and the tile battens naided to the top edge. A moulding is then run along the upper erlge, the tiles laid flush with the edge of the mou!ding, and the joints pointed or filled in with cement mortar. The roof is completed by fixing the guttering. If stack pipes or iny other projections such as lightning conductors or flagstsfis are to be fixed to the roof, the fitting of the framework or brackets for them is best effected before undertaking the tiling.

Sheds and Outhouses. A simple nicthod of covering a boarded roof suitahle for a small shed is by using bituminous felting material The boards are generally set vertically-that is, they run from the plate to the ridge-and are supported by two or more purling, according to the size of the roof. The rooting material. if similar to tarred felt, should be laid in $n$ continuous strip from eaves to eaves, and should be nailed to the boards with regulation felt nails. The edges should overlap about 2 in . and he made watertight by the cenient generally obtainable from the makers of the rooting moterial. The edges are then covered on the outside with laths of wood ahout 2 in . wide and $\frac{t}{2} \mathrm{in}$. this:k; which should be bedded on the rooting cement and secured with stout wire nails.

A flat roof, as of an outhouse, can be laid in much the simne way. In this rase, it is of paramount importance that the joints between the strips of roofing material be rendered watertight with a liberal application of rooling cement. The seams should then be nailed with felt nails, spaced ahout 2 in. apart; but with this type of roof the difficulty is to render the side wall joints watertight. One wey to do this is to employ efficient Hachings, while another is to turn up the edges of the rooting material so that, when finished, the whole is very much like a large, shallow
tray. A fall must be provided in two directions down to the underlving slates with a joint ao that the rainwater can drain away to a of the same compound. Cracks, holes, ete, down gutter, and thence to a rainwater liead or other discharge pipe.
Repairing Leaky Roofs. The repair of leaky rools, and the way in which these difficultics are overcome, depends upon the nature of the roof covering. and is denlt with under such headings as Damp; Gutter ; Slate ; and 'l'ile

There is $a$ number of patent preparations sold for repairing roofs. An old slate roof can be made wnterproof by using a plastio bituminous compound. I'his is applied to the bottom edge of loose slates, which are bedded are filled up, and the surface of the roof is treaterl with a liquid preparation of bitumen. Sheet motal roofs can be reconditioned in a similar manner, using both the plnstio and liquid preparations.
In the case of a small roof covered with bituminous materinl, if this gets punctured through any cause. it can generally be dealt with by fixing a patch of similar material upon it and cementing down and nailing around the joint. Should it crack or split for any length, it would le best to cut out the affected section und provide a whole new piece.

## Roof Gardens: Planting and Treatment

How to Utilize Accessible Leads and House Tops
This article suggests idcos for transforming tlat roof spaces into welcome openair adititions
to the home. SSe also Arch: Garden Furniturc: Logzia: Trellis: Vcranda: Window Box,
and the entries on the various plants and shrubs mentioned
If a tiny garilen or balcony loggia, with growing flowers, creepers and shrubs to give a fresh, countrified nir. can be made on a drab lead, the recessed roof or the top of a town house, it will usually afford both interest and pleasure. Where twindow bores are not allowed a rmall flat piece of ronf can often be utilized for flowers without infringing regula tions. An awning can be fixed at no great cost which can be raised or lowered at will, and such garden furniture provided as can bc ensily movol, adjusted and folded awny when not in use. A grass mat is a pleasant addition when the surface of the roof is level, and adds to the gay appearance of the garden. Where there are children the clouble protection of a strung railing and a flower box showld be constructed on the open end wall of the lead or roof. The railing should also be fenced so that it affords no foothold.
Trel!is screens, as shown in Fig. l, make a delightful background and also alford privacy. When possible walls-unless of an attractive brick-should be washed with some good colour, such as dcep cream, palc !eaf green, ochre, or lemon yellow. Simple wind-screens can be contrived of Japanese matting.
In Fig. 1 fuchsias, geraniums, violas, petunias, etc., are planted in boxes painterl gicen, and hanging baskets are attached to the trellis.


Roof Garden. Fig. 1. Boxes of ivy-leaved geraniums and fuchsias, with wistaria, etc., on the trellises

In some of the newer houses architects have planned a terrace, balcony or roof garden, and such gardens are also to be found on the top of the more recently-built Iondon flats. The discovery of the value of light in the prevention of various diseases is now fully recugnized, and a terrace garden such as that shown in Fig. 2 is of immense value as a place where sun and air can be enjoyed. Such a roof space is formed by a sct back upper storey
The use of reinforced concrete for flat roofs makes thic planning of a mof garden easier, as it is possible to plant herlges in troughs and to lay out formal gardens with clipped box and other shruls. Rock gardens in miniature have nlso heen successfully made high ahove the traffic of city streets. Quick growing vines provide a green background; garden ormaments can he added, and in some cases a playing fountain.
Fig. 3 illustrates a kitchen roof garden. Tomatoes do particularly well grown in boxes and runner heans are hoth practical and decorative. On a large roof space the amateur may plan both flower and vegetable gardens, dividing them by means of a vinecovered trellis. Marrowr, cucumbers and mushrooms will grow together with minor crops of lettuce, radishes and mustard and cress. In addition paraley, mint and sage may be usefully cultivnted.
For this nore ambitious type of roof garden a tank for supplying water at air temperature with which the plants can he conveniently watererl during dry weather, and a good-sized can for the purpose, will he found useful.
Cultural Details. General cultural details essential to the success of roof gardens are careful and regular watering during spring and summer ; spraying of foliage in the evenings of hot days; forking-in of some good fertilizer once a fortnight during summer, and gentle pruning of trees and shrubs to keep their growths compact as they increase with age.
In the many cases where it is impracticable to lay down beds and borders, moof gardening is usually accomplieherl by means of pots, tubs, and hores. Common butter-tuhs are excellent for small plants, but larger specimens. such as trees nnd shrubs, are best accommodated in halved barrels or paraffin casks. The latter will require thorough cleansing, and a good method is to fill it with shavings and fire the interior until the oil is hurnt out. All receptacles brought into use will require holes drilled to nllow water to escape as well as thorough drainage crocking. Soil must be of gond heart and quality, owing to the difliculty of frequent change. Rich loam, leaf-mould, peat, decayed manure. coarse silver sand, and some good chemical fertilizer, will form excellent stock for compost. Each lox or tub should be nearly filled, with sulficient apace lt ft for watering. Arrangement


Roof Garden. Fig. 2. Roof garden on a country bouse. In the boxes antirrbinams and otber plants are krowing, while trellls work is provided for climbing shrubs Conrtesn of Our Homes and Gardens
is a matter of individual taste and structural convenience, a tuh in each corner, with boxes hetween, being a cominou base for most roofgarden schemes. All receptacles should he given a coating of preservative.

Trees, Shrubs and Flowers. The mof gardener has at disposal a pariety of trees, shrubs, climbing plants, perennials, annuals, hulbs, and alpine plants if the garden is suitably planned for the giowth of the last named.

Among other shrubs that will thrive with eare are the spindle tree, rhododendrons, spotted laurel, Jews nallow, liarberrics, akimmin, privet, mock orange, flowering currants, and amall standard hay trees. Single specimens of these need to be grown in tubs or boxes at least 18 in . wide and deep. There is scope for plants of olimbing or senii-climbing hahit, attached to chimney-stacks or poles, or trailed across trellis. Perennials that do well include Virginian creeper, Ainpelopsis Veitchii, white and yellow jasmine, mountain clematis, Clematis Jackmanni, and climbing roses. Amongst annual climbers which are of great use are canary creeper and nasturtium.

Annual flowers that are easily grown from seed sown in boxes are gudetias, clarkias. candytuft, nasturtium, sweet peas, alyssum, marigolds, eschscholtzias, annual chrysanthemuns, and Virginian stock. Tender anmuals and biennials, such as stocks, zinnias petınias, Phlox Drummondi, lobelins, geraniums, ageratums, fuchsias, and tobacco plants may be procured as seedlings.

Handy perennials are not always successful on roofs, but early flowering chrysanthemums, Solomon's seal, irises, creeping Jenny, carnations, polyanthus, London pride, perisinkles and sweet-tvilliams, will do fairly well. All the nbove must have plenty of water, preferably enrly in the morning and after sunfall. Bulbs, including lilies, may be grown, but the crocus has a special attraction for town sparrows, and is not reconimended.

ROOK PIE. Only young hirds should be used to make a rook pic. The following is an old country recipe : Take 6 to 8 young rooks, draw and skin them carcfully, and immerse them in cold water for 2 or 3 hours. Then split them and remove the linck bones. IVashis them carefully, changing the water twice, and dust each biril with a seasoning of salt and pepper, then pack them closely in a pie-dish.


Fig. 3. A kitchen garden on the house tops. Tomatoes are grown in bozes at the back, runner beans at the sides, and a marrow In the tub in the centre Courtes, of Our llomes and Gardens
crops develops many fibrous roots, which in turn prevent tho early running to seed of mature plants.
There are certain plants which are most easily propagated by cuttings actually taken from theroot. Such plants include the horscradish, bou. vardia, seakalc, oriental poppy, Japanese anemone, anchusa and burning bush.

Root Pruning. This practice is carried out by gardeners chiefly for the purpose of restricting the growth of vigorous unfruitful apple, pear, and plum trees and of encouraging the development of fruiting spurs The method is to dig a trench twisted together with the aid of a wheel used at 3 to 4 ft . from the trunk of the tree in by rope-makers. For domestic purposes rope autumn after the leaves have changed colour is used for lifts and lifting apparatus, such as and to fork awny the soil from beneath the blocks and tackle, and for various other purtrec until the thick roots are exposed; these poses. It is liable to deterioration through are then shortened by half or even two-thirds and fresh loamy soil is placed among them and pressed firmly.
Tho result of this trcatment is to check the growth of the trees scvercly for the next year or two. A better plan is to lift the young trees annually in autumn during two or threo ycars following planting, shorten long thick roots and replant immediately. This will probably prevent the need for severe root pruning in later ycars. If it bocomes necessary to root-prune old-established trees the roots on one side should be pruned one year and those on the other side the following year. See Division; Propagation; Pruning.

ROPE. Although this name is often given to cord over $t \mathrm{in}$. diameter, ropo is properly cordage over l in. diamcter. It is made with threads of hemp and other fibre, such as Ilax,

## Roses: Varieties Old and New

Bow to Obtain the Best Results in Garden Display and for Cutting
The amateur gardener may consult Flowe. Garden: Pergola: as well as such entries as Disbadding; Pruning. Attention is also drawn to the colour plate with this articie

The rose is the loveliest of all garden flowers ; it is now represented by hundreds of varieties, of which nany have been raised within recent years. The new ones are far superior to the old ones for garden display and for cutting for decorative purposes indoors; they bloom frcely not only in summer but, in autumn too, and a collection of the up-to-date varicties must be considered indispensable by every garden lover. It is often said that the new roses are less fragrant than the old ones, but that is not wholly true, for many of the latest novelties have sweet-scented blooms. A garden planted with a representative selection of the beat roses is almost as gay in September as in June and July; the plants continue. to make fresh growth during the summer and early autumn months and almost evory shoot is crowned with blossom.

Roses may conveniently be grouped into five main classes-ramblers, climbing roses, dwarf or bush roses, standards, and shrub roses. The modern types and varietics in cach of these classes are immensely superior to those seen in the gardens a generation ago and they ought chiefly to be planted.

Rambler Roses. There are two chief types of rambler rose-the wichuraiana and the multiflora. The varieties of the wichuraiana type are more popular, for they aro vigorous and easily managed, many of them have handsome lustrous leaves and all bear a profusion of blossom in high sumnicr. The following is a selection of the best : Alberic Barbier, pale yellow; Aviateur Blériot, yellow; American Pillar, rose and white; Chatillon Rambler, pale pink; Dr. Van Fleet, blush; Dorothy Perkins, rose pink; Emily Gray, yellow; Excclsa, crimson ; François Juranville, salmon yellow: Gardenia, cream; Hiawatha, crimson; Lady Gay. rose pink; Fraicheur, pale salmon; Minnehaha, deep rose; Sander's White, and Thelma, salmon pink.
Their management is simple. They ought to be planted in autumn or in early spring in deeply dug and well manured soil, and in March all the stems or branches should be cut down to within six inches of the ground. This treatment will force the development of fresh strong shoots from the baso which will bloom well in the following year. In subsequent years pruning should be done as soon as
the flowers have faded by cutting out the old stems which have flowered and tying the new shoots to tho support.

The multiflora type of rambler is less coinmonly known than formerly; it is being superseded by those of the wichuraiana type. Favourite varieties are Blush Rambler, with apple blossom-like clusters of bloom; Crimson Rambler, bright red; Tea Rambler, salmon and copper; Mrs. F. W. Flight, rose and white; Pemberton's Whito Rambler; Tausendschon, rose pink; and Violetta, lavender violet. Thesc need the same treatment rs given for wichuraiana rambler roses.

A few of the old rambler roses are still planted. Among them are Felicité Perpétuc and Aimće Vibert, white; Rêve d'Or, yellow, very rampant, and the yellow banksian rose which must be planted against a sunny wall and left unpruned until it is well established, and then needs to be thinned out.

Climbing Roses. The true climbing roses are less rampant than the rambler roses, though still vigorous enough to cover poles, pillars and arches; they are suitable also for walls. There are two types of these, those which are naturally of climbing growth and others called "sports," which have devcloped accidentally from dwarf roses and are distinguished by the prefix Climbing, c.g. "Climbing Ophclia."

Of the former, some of the best are Allen Chandler, red; Gloire de Dijon, salmon buff: Lady Waterlow, carminc-salmon; Lemon Pillar, pale yellow ; Madame Alfred Carrière, almost white; Scarlet Climber ; Souvenir do Claudius Denoyel, red; Wm. Allen Richardson, orange and yellow ; and Zephirine Drotthin, the thornless rose, rose pink.

Of the climbing "sports," the following are favourite roses-Climbing Carolinc Testout, pale rose; Climbing Independence Day, yellow: Climbing Lady Hillingdon, orange ycllow; Climbing Madame Herriot, orange salmon: Climbing Ophelia, blush: Climbing Sunburst, yellow:

The way to prune rosos in the first group, which are naturally climbers, is to cut out parts of the old branches in late summer or carly autumn to make room for new shonts. Special care is neerled in pruning the climbing "sports." They siould not be cut lown in the spring following planting as is advisable with the other climbing and rambling roses : mercly the tips of the branches are cut off.
Bush Roses. The dwarf or bush rose is perhaps the most important type of all: it reaches a height of from 18 in . to 2 or 3 ft ., according to the varicty, and if suitable sorts are chosen will supply blooms from June until November; but if tho weather is mild the trees may be planted between then and the middle, or even tho end, of March. Thoso planted early will be nost satisfactory the first year.
Success depends vary largely on correct preparation of the ground. This ought to be dug not less than two spits, about 20 in . deep; farmyard and stable manure or hop manure must be nuixed freely with the lower spit, and basic slag, 4 oz . per square yard, should be scattered on the soil when digging is finished, and forked beneath the surface. The rose bed or border ought to be prepared a week or two in advance of planting. Before the trees are put in the branches should be shortened by half. In exceptionally cold or exposed gardens it is wise to protect the bases of trees by heaps of old ashes or soil, but in most places they do not need this protection.
Pruning the Trees. This important task should be carried out early in April. All newly-planted trees, i.e. those put in between the previous October and March, must be pruned severely. Thin weakly shoots should be cut out and the three, four, or five remaining branches must be shortened to within five or six buds of the base of the previous year's
growth. This treatment will force the tres to send up fresh vigorous shoots which will hloom in summer.
In subsequent years the spring pruning must not be so severe unless it is wished to obtain bluoms for exhibition. Weakly shoots must be cut right out and the remaining branches shortened by about half or twothirds, according to whether they are vigorous or only moderately vigorous.

The summer pruning is just as important as the spring pruning If the hlooms are out for home decoration they should be removed with long stems; if the roses are left to fade on the trees the shooto which produced them should be cut to within three or four buda of the hase. As a result of this treatinent fresh strong shoots will grow that will bear blooms later on. It is an excellent plan to cut back nll shoots in this way as soon as the hlooms have faded: there will then be a succession of new shoots which in due course will hear flowers.
Best Garden Roses. The following is a list of the best bush or dwarf rose trees which will furnish a good display in the garden and provide llowers for cutting: A. M. Rouycr, reddish upricot: Betty Uprichard. carmine
growth, and after the tirst year they should be prunedlightly The hest varieticsare : A. Hill Gray, lemon ycllow: Anna Olivier, pale rose and buff ; G. Nahonnand, pale rose ; liady Hil. lingdon, yellow; Lady Roberts, apricot and
copper: Maman Cochet, rose; Marie Van Houtte, pale yellow and rose: Madame Antoine Marie, rose and white; Molly Sharman Cravford, white: Mrs. Foley Hobhs, whito tinged pink; Mra. Herbert Stevens, white: Muriel Wilson, palest len:on; White Maman Cochet and W K. Smith, blush white. For garden decoration the tea roses are less comnionly grown than formerly, as the hybrid teas have superseded them.

Pernetiana Roses. The Pernetiana roses, named after M. l'ernet, a French grower who originated this type, are remarkable for their intense and brilliant oolouring: the first yellow roses were pernetiana varieties. Very few of the true old pernetiana roses are now grown; they have been cross-bred with the hybrid teas and as a result a new race with the vigour of the latter and the rich colouring of the pernctianas has been raised. The best of this type are the following: Angele Perntt,


Madame E Herriot, deep salmon: Dazla, orange scarlet; Golden Emblem. yellow; Gwyneth Jones, orange carmine: Hortulanus Budde, red; Independence Day, yellow: I Zingari, orange and scarlct; Lady Roundway, copper yellow; Mrs. G. A Van Rossem, orange apricot; Ruth, carmine and ornngesalmon, and Souvenir de Claudius P'ernet, yellow. The flowers of many of these varieties are "thin," that is, they have few petals. The trees seem more susceptible than others to the attacks of hack spot, the worst disease of roses. They necd the same treatment as the hybrid teas; the shoots are rather linblo to die back in winter, therefore at the spring pruning the damaged parts must be cut off.
The liybrid perpetual roses form one of the oldest groups in cultivation. They are distinguished by vigorous growth, large well-formed double blooms chielly of one colour, but they do not Hower so freely in late summer and autumn as the hybrid tea roses

Favourite varieties are: Alfred Colomb, red : Captain Hayward, red; Cbarles I efebvre, crimson : Duke of Edinhurgh, red; Fisher Holmes, crimson; Hugh Dickson, red (vigorous, makes a large bush), Mrs. John Laing, pink. Ulrich Brun ner, rose ; a nd Victor Hugo, crimson. In spring, thin weakly shoots must be cut out, and the main hranches of the past summer's growth cut back by ahout two thirds
The divarf polyantha or haby rambler roses aro very popular for filling formal flower beds, for they bloon more or less all through the summer and early autumn. In spring they may he hard proned to keep them dwarf, or pruned lightly if it is wished to have hushes two feet or more high. A few of the hest are Alice Amos, rose and white; Chatillon Rose, rose pink; Eblouissant, crimson; Ellen Poulsen, rose; Katherine Zeimet, white; Kersbergen, crimson; Mrs. Cutbush, pink; Rufus, bright orimson.
Certain beautiful roses of vigorous growth soon develop into hushes from 2-4 feet or more high; they are not suitable for planting among
and salinon; Caroline Testout, pale rose; Clarice Goodacie, white: Emma Wright, salmon orange ; Ethel Somerset, pink; General McArthur, red; Golden Gleam, yellow; Julién Potin, vellow; Lady Alice Stanley, rose ; Lady lirrie, salmon and copper; Lieutenant Chauró, red; Lord Charlemont, crimson; Mabcl Morsc, yellow; Madame Abel Chatenay, carmine rose; Madame Buttertly, deep blush; Mre. A R Barraclough, carmine rose; Mrs. Henry Morsc, bright rose ; Mrs. Henry Bowles, rose; Mrs. Wemyss Quin, yellow: Ophelia, blush; Rapture, deep hlush; Rev. F. Pase-Roberts, ycllow; and Shot Nilk, cerise and salmon. All these belong to the class called hybrid teas They grow and flower freely and are strongly to be reconmended to amateur gardeners. The other types of rose which are grown as bushes or divalfs are the tea, bybrid perpetual, pernetiana and dwarf polyantha or baby rainbler.

The tea roscs thrive hest on well. drained soil: they are ideal for planting in a sunny border at the foot of a house wall. Most of them are of rather tuiggy spreading


Rose : four beautiful varieties. 1. Hugh Dickson, in colour midway between crimson and scarlet. 2. Mrs Bryce Allen, a rose of great fragrance, with rose-plak petals. 3. Clarice Goodacre, a vigorous, free-fowerinz rose which bears
ivory-white blooms. 4. Betty Uprichard, an excellent variety that bears blogsoms ranging in colour from delicate salmon-pink to glowing coppery carmine, suffused with orange
$1082 a$


$$
1082 b
$$

the ordinary dwarf or bush roses, but look well in beds on the lawn, or they may be set in a sunny shrubbery. If planted in deeply dug and manured soil and pruned in late summer hy cutting out old branches or parts of them they will soon hecome eatablished. Some of the best are the modern hybrid musk roses, which hear hunches of hloom throughout the summer and early autumn months: Clytemnestra, salmon-rose; Felicia, rose-pink with yellow flush: Pax, white, and Penelope, salmon-pink

Others are Hugonis, single, yellow, early Howering: Moyesii, deep rose red flowers and handsome fruits, and rubrifolia, grown for the sake of its reddish shoots, which are most useful for cutting for decorative purposes. The Japanese Briars ( varieties of Rosa rugosa) form large bushes and bear single and double flowers: the fruits of the single-flowered varieties are handsome in autumn; the showiest variety is Conrad F. Meyer, a very vigorous shrub with thorny branches and bearing large double fragrant rose-pink blooms in May and June.

The old fashioned roses, e.g. the moss, Provence, York and Lancaster, are little grown nowadays, probably because they hloom only in summer. They should be planted in a sunny place in well tilled and manured soil ; pruning, which is done late in March, consists of cutting out all thin weakly shoots and shortening the main branches of the previous year's growth by ahout half

Standard Roses. Standard rose trees need similar treatment to the bush and dwarf roses of the same name. In planting care must be taken to keep the uppermost roots within 2 or 3 in . of the surface of the ground. The stems of standard roses are briars, and all shoots which grow on them should be cut off. They ought to be ataked securely at planting time to prevent damage in windy weather The stems of standards are $3-4 \mathrm{ft}$. high those of half standards 2-2! ft . high

Some of the best roses to grow as standards are Betty Uprichard, Caroline Testout, Clarice Goodacre, Emma Wright, Ethel Somerset, Fran Karl Druschki, Golden Gleam. Hugh Dickson, Indejendence Day, Iady Hillingdon, Lady Pirrie, M. D. Hamill, Madame Butter'Hy, Madame Melanic Soupert, Mrs. H. Bowles, Mrs. Wemyss Quin, Ophelia, Shot Silk, and W. A. Richardson.

The tea roses do well as half standards, but many other varieties can also be obtained in this type of tree. A few suitable sorts are Christine, Emma Wright, General McArthur Lady Pirrie, Los Angeles. Lond Charle mont. Nadame But terlly, Miss C. E. Van Rossem. Mrs. H. Morse, Rev. F. Page Roberts, and Shot Silk.

Fragrant Roses. The following varieties of roses, which may be grown as dwarfs or standards, have sweet-scented flowers: Angele Per net, orange yellow : Avoca, crimson; Bedford, crimson Cherry, yellow and rose: Clarice Goodacre, white ; Cornelia, rose: Dame Edith Helen, pink; Daily Mail scented rose. crimson: Ethel So merset, pink; Etoile de Hollande, crimson Felicia, pale rose and yellow: General

McArthur, red: George Dickson, crimson: Golden Gleam, yellow: Gustav Grunerwald, carmine rose; Hadley, crimson: Hoosier Beauty, crimson; Hugh Dickson, red: Ivy May, blush with deeper shading: Julien Potin, yellow ; Lady Alice Stanley, rose ; Lady Helen Maglona, dark red; Lady Pirrie, salmon; Lady Worthington Evans, crimson : Laurent Carle, carmine: Lieut. Chauré, red: Mabel Morse, yellow : Miss C. E. Van Rossem, crimson; Madame Abel Chatenay, salmon rose : Madame Butterfly, blush: Mrs Bryce Allen, rose pink; Mrs. G. A. Van Rossem. npricot: Mrs. John Laing, pink: Ophelia. hlush: Penelope, salmon rose: Shot Silk, cerise salmon: The General, red; Victor Hugo. crimson; Ulrich Brunner, rose red: Viscountess Folkestone, blush.

The best artificial manure tor rose heds is known as Tonks manure. It can be purchased from horticultural sundriesmen, and should be applied in March at the rate of 2 oz. per square yard of ground. Regular attention to such details as hoeing, "eeding and cutting out weak useless growths helps to cnsure success in rose growing. Suckers, i.e. shoots from the briar stock on which the named variety of rose was budded, must he uprooted as soon as they are seen; they can generally be distinguished by their prickly stems and light green leaves composed of seven leatlets.
Diseases of Rose Trees. 'The worst disease is black spot. This is a most serious trouble : the leaves are disligured by dark blotehes, and in a bad attack they fall. sometimes to such an extent that the trees hecome leafless in summer. All diseased leaves should be gathered and hurnt, and in winter sulphur should be scattered frecly on the soil and on the rose trees. Further precautions are to spray with Bordeaux mixture or with liver of sulphur (one oz. in two gallons of water) occasionally in spring and early summer. Alt shoots cut off in pruning ought to be burnt.
Mildew is another common discase of rose trees; it is recognized by the presence of greyish mould-like patches on leaves and stems, and is most. prevalent in late summer, especially in continued wet weather. Sulphur is the best antidote, and measures similar to those recommended for destroying hlack spot should be practised
Insect and Other Pests. Rose trees are ubject to the attacks of numerous pests. The commonest is aphis or greently, which can be destroyed hy spraying with one of the . advertised insecticides. or with paralfin


Roses : the best wags to plant them 1. Correct planting oi dwari bush. 2. Bad planting. 3. Standard, staked and planted : $a$, tarred end 4. Plantiug a climber: a tarred end. 5. Dwart, potted and prined 6. Pruning cuts
emulsion, which is made by dissolving a handful of soft soap in a little hot water adding two gallons of warm water and an eggcupful of paraffin. Various caterpillars attach the leaves, and the rose maggot often damages the Hower buds; these pests should be searched for and destroyed. Rolled leaves ought always to be cxamined
The attacks of the rose leaf hopper cause white blotches on the leaves, especially o rnse trees on walls; red spider and thrips, two minute pests, are chiefly troublesome on roses under glass and on walls-they attack the lower leaf surface: the frog-hopper or cuckoo spit infests the young shoots, the rose slugworm eats away the tissuc of the leaves. and the leaf-rolling sawtly rolls up the leaves until they become mere strips

A nicotine insecticide, sold by horticultural sundriesmen, is the hest wash to use against most of these pests. The leaf-cutting bee, which cuts semiciscular pieces from the leaves and uses them in its nest, is difficult to deal with: it should be watched, and if possible traced to its nest so that the latter can be deatroved
Roses in Pots. Pot roses grown under glass should be lifted from the ground in Octolier placed in (; in pots in a loamy compost, and placed in a cold greenhouse. No artificial heat whatever should be given the first scason After flowering. which will be scanty in result plunge the fots out of doors in ashes during the summer months, ic-pot in early autuinn. prunc in November, and then remove to a heatedgreenhouse All indoor roses should he stood out of doors. after flowering, in the summer. Climbing roses grown under glass should be planted in o well-drained border al loamy soil


ROSE BAY. The name of rose bay is applied to Nerium oleander and Epilobium angustifolium. The former, which is described under Oleander, is a greenhouse evergreen tlowering shrub. The latter, a hardy perennial herh of the evening primrose order, sometimes called the Fronch willow herb, produces willow-like folinge with crimson fowers. It grows to a height of 4 ft ., and flourishes by the waterside or in ordinary soil The illustration shows n dwarf splecies of Epilobium known as obcordatum. See Oleander

ROSE CAKE. Rose cakes are sinall vanilla llavoured cakes, so called hecause of their colour. They can be made by creaming together 3 oz . butter and 3 heaped tableapoon fuls sugar, then adding by degrees 2 or 3 eggs and 3 o\%. Ilour, beating the mixture well as each egg is added. Then mix in 3 heaped tablespoonfuls of cornflour, a little vanilla flavouring, and a few drops of pink colouring. Bake the mixture in small greased tins in a moder ately hot oven for ahout $\ddagger$ hour

ROSE CAMPION. Sometimes called rose of heaven, this is one of the showy border plants known as Lychnis, or campion. It grows a bout 18 in ., and produces rosy flowers in summer. See Campion; Lychnis
ROSE GARDEN. The ideal aspect for a rose garden is south or south-east, and all beds and borders will repay thorough trenching


Bose Garden. PLan of an offeotive rosery lad out in a small rarden. A-E, weeping of pillar roses: $\mathbf{F}-8$, etandard roses: $\mathbf{T}-\mathbf{W}$, hali-ntandards : numerals, bushes: double letters and $\mathbf{A}_{1}-I_{1}$, climbing roses
before planting. The design shown in the $1 t$ is hardy, grows 5 ft . or more high, and diagram is easily adaptable to larger or smaller bears single or double flowers of various colours spaces, and, if planted with good varieties, in late summer. See Hibiscus; Lavatera. will provide an attractive rosery. Its length and width respectively are 40 by 34 ft . The round centre bed has a diameter of 4 ft ., whilst those placed in the grass panels are 2 ft . wide. Paths uniformly have a breadth of 2 ft ., except under the entrance arch. where 2 ft . extra is allowed. South, east, and west borders are 3 ft . wide. and the north border 4 ft .

Pillar or weeping standards are planned $A, B, C$ D. and $E$. $F$ to $K$ are ordinary standards.
Beds T, U, V. and W aro devoted to halfstandards.
The outside panel bods, numbered 1 to 46 , and the side borders numbered 8 to 51 , are entirely planted with bush or dwarf roses.
The top borders, facing south, and numbered
1-7, 52-58, accommodate tca-scented roses.
Hybrid perpetuals are placed from 59 to 77 ; the first 12 being fragrant reds and the other 7 whites and pinks.

Behind these against the south fence. At to II, a delightful background consists of Penzance briars.
Suitable climbers for the trellis and remaining fences are arranged at $\mathrm{An}-\mathrm{Cc}$ and Tr-Vv. Varieties should be chosen from the selections given in the article on Rose on the previous page. See Pergola; Trellis, etc.

ROSE MALLOW. The shrub Hibiscus, or Syrian Mallow, is known as rose mallow.

ROSEMARY. This favourito shrub, which growe from 3 ft to 5 ft . high, has fragrant leaves, and bears pale mauve flowers in spring. It thrives best in well-drained soil, and must have a sunny place: a border at the foot of a house wall suits it well. Its botanical name is rosmarinus officinalis. Regular pruning is unnecessary, but straggling shoots shou!d be cut back as soon as the Howers are over. Propagation is by cuttings in boxes of sandy soil placed in a frame in August.

British grown rosemary yields cseential oil in the proportion of 24 oz . to 1 cwt . of leaves. This oil, which is distilled from rosemary leaves. is much used by manufacturers of scented soaps and perfumes like eau-deCologne.
Medicinal Uses. In medicine the essential oil of rosemary acts as a carminative and stimulant, and is a useful remedy for flatulence. The dose is $\frac{1}{2}$ to 3 minims on a piece of sugar. The oil or the spirit is of ten included in hair lotions. Insects do not like it, and it may be used to keep them away.
Rose of Jericho. This is another name for the resurrection plant (q.v).

ROSE OF SEARON. This is the popular name of a low-growing evergreen plant which bears large single yellow flowers in summer (Hypericum calycinum). It will thrive beneath trees, and if cut down each spring provides attractive greenery.

ROSETHE MULKEIN. This beautiful rock garden plant (ramondia) has large wrinkled leaves and bears bunches of purplish flowers in early summer. It must be planted in a crevice facing north or east, the rosette of leaves flat against the rock: a compost of loam; peat, and sand is suitable Ramondia pyrenaica, pale violet-purple, and Nataliac purple, are the two best kinds.
ROSEWATMR. As its name implies, this is a water manufactured from rose petals. It is made from what remains after the distillation of otto or attar of roses, and has to be diluted with twice its volume of water before use. It is used in toilet preparations and is also mixed with glycerin and applied to relieve chaps, etc. Occasionally, rosewater is employed as a Havouring agent in cookery. See Otto of Roses.

ROSEWOOD. This is a fancy hardwood of a rich dark colour, red or brown, with wavy streaks that are almost black. Formerly it was much used for pianos and cabinets, and as a veneer on plainer woods. To-day it is used to a slight extent for pianos and also for handles to carving tools and to the squares and levels used by woodworkers. It takes a good polish, but, as it is rather oily, glue is unable to get a good hold on it. One reason for its decline in popularity is that it has a tendency, even when well polished, to develop minute cracks in the pores of the wood.

The finest rosewood is the Brazilian variety. In character this is of a heavy, dense nature, rather coarse and open in the grain. Indian rosewood, known also as blackwood, has the same general characteristics as the Brazilian See Wood.

Rosin. This is an alternative name for resin. (q.v.).

ROSIN PLANT. Bearing two other names, Silphium and compass plant, this is a hardy herbaceous perennial belonging to the daisy order, bearing yellow flowers in sumnier. It is most suitable for a wild garden, and best grown in bold groups, requiring little or no attention, and ordinary soil.

ROTATION: Of Garden Crops. This may be termed a acientific method of cultiva-


Rosemary. Sprayz of the tragrant ofergrien shrub, from the oil is distilled for medion of which oil is dirtilled for medical and other uses
tion, based on
the principle that, although plants extract the same foods from the soil. there is a marked difference in the a mount used by any given kind.

As the requirements of all plants differ in regard to potash, nitrogen, and phosphates, any undue depletion of one or another has to be prevented by rotation in order to main. tain an equable fertility.

Under syste. matic rotation, crops of the same family should not succeed each other, whilst those with long perpendicular roots that feed at some depth
be followed by shallow feeders extracting nourishment only from the upper Inyer of soil

A simple method of rotative cultivation is to divide land for vegetables into 3 plots of equal size, recording them as 1,2 , and 3 , and cropping each on a three years turn-about system in the following manner.
Plot 1. First year: Beet; carrots: parsnipg potatoes. Second year Celery : beans: leeks letfluce: onions; pens: spinach; turnlps. Thirid year: Brussels sprouts:
ilowers ; kale s savoys.
procoli: cabbage : cauli lettuce onlons. year. ycar: Brussels sprouts: spinach; turnlps Second Howers; kale; savoys. Third ycar Beet. paranlps: potatoes.

Plot 3. Firat yca
cabbage: caulillowers: kale asels sprouts: broccoli lieet: carrots: parsnips; potatnes. Third year Celery; beans: lceks. Icttuce: onions. peas spinach: turnips.

ROUGE : The Make-up. No cosmet ic requires such careful and individual choice by its users as rouge. The exact sliade which enhances the particulart ype of face and colour ing of hair and eyes, the right amount for use by day or artilicial light, and the correct placing on the cheelis should all be considered by any one who wishes to improve her appearance by the application of rouge. Another important point which is frequently overluoked is the harmony of lipstick and rouge. It is not uncommon to see an orange shade of the latter and a cerise shade of the former applied at the same time, with unfortunate facial results.

Rouge is sold in three forms, liquid, compact, and as a crean. The first is rarely used, the second is convenient for application during the day, and the third is generally chosen by those who always employ rouge before powdering and after vanishing creain. It should be applied with the third finger in a little triangle com posed of three dabs on the cheek bone. For a thin face a fourth dab of rouge may be placed a little lower down. Then the dabs of colour are carefully blended with the second finger In the evening a touch of brighter compact rouge is sometimes given to gain added brilliancy.

Anyone who wishes to give a less full appear ance to her face by means of rouge should place it high on the clieek-hones, just beneath the eyes. Women with fluctuating colour should avoid the use of rouge. A heavy rouge also detracts from the eyes. It is easier to spoil the appearance by the abuse of rouge than to effect improvement by its use
The nearest shade to the natural colour is the right one in all cases Only very fair women with golden or red hair should use rouge with an orange tint. A raspberry red is the safest shade for most girls for both face and lip rouge.

Older women if they use a brilliant rouge may look hard and unnatural. If very pale a delicate shade of coral or rose should be faintly suggested. Dry rouge is the best for occasional evening use, as it is ensier to apply the exact amount required by this menns when rouging is not part of the daily facial make-up. See Beauty ; Make-up.

ROUGH CAST : For Walls. The surface treatment for walls known as rough cast consists in coating the face of the wall with mortar and, while it is still wet, throwing fine washed gravel or other hard material on to it. The surface becomes broken up and more or less filled with the small pieces. Rough casting is often used in lightly built houses for improving the weather-resisting qualities of the walls, and also for its decorative value.

In some buildings the whole of the work may be rough cast. but in others only the upper storeys or particular parts. In any case, the genera! treatment is the same. First the inortar, which should preferably be made with Portland cement, is prepared and the whole of the wall surface rendered with it. A supply of clean, washed gravel, finely broken stone, or similar hard material should be prepared. It is then picked up on a trowel,
thrown against the wall surface of the cement and allowed to set hard. The surface is often finished by washing it with cement wash Lime mortar can be used, but it has not the weather-resisting qualities of the Portland cement mortar. The propertics of the latter in this respect may be further increased by using one of the weatherproofing preparations
Rough cast as a structural material is easily and quickly applied to framed buildings, such as are built up of a timber framework and covered with expanded inetal lathing. In such cases the lathing is first covered with a sufficient thickness of the inortar This may consist of coarse stuff applied in one or two coats, according to the nature of the work. The rough cast may consist of stone and grit or washed gravel, mixed with hot lime and thrown on.with a trowel.
The rough cast may be made up in buckets. and should be applied to the walls in a semi-liquid state The surface should be finished by immediately washing it with lime inixed with a little ochire to act as a colouring material In many forms of timber and half-timber construction the rough cast is applied to a timber lathing, and the first coat is made of lime mortar well mixed with hair The second coat is also of lime mortar, and the rough cast is applied to this See Cement: Mortar Plaster: Rendering

ROUGH PUFF PASTRY. Although it is not quite equal to the real puff pastry, this is more economical, and can be made to serve many of the purposes for which puti pastry is necessary See Pastry.
ROULETTE: The Game. Although large sums are staked on roulette, the gaine can be played with counters. For this purpose a table fitted with a wheel, or a wheel alone can be bought, these being reproductions or modifications of the one used at Monte Carlo. The main principles are as follows although variations can be and are introduced.
The wheel is sunk into a cavity, either in the table or elsewhere. The base is on ball bearings, and it is marle to revolve very rapidly by turning. with the hand a small crosshar that rises from its axis. Round the whecl is a circular hoard divided into numbered compartinents, and on one or other of these the players stake. As the machine moves, a ball is thrown into it, and when it comes to rest the winning number is indicated by the resting ball.
The numbers on the board ane arranged as follows: $0,32,15,19,4,21,2,25,17,34,6$, $27,13,36,11,30,8,23,10,5,24,16,33,1$. $20,14,31,9,22,18,29,7,28,12,35,3,26$ Zero is coloured green; the others are white and red alternately. In the full game there is a lay-out at each end ol the table, and this is marked out into various divisions for the stakes. Down the centre of each are 12 rows of 3 squares cach; these contain the figures 1 to 36 , and at the top is a square for 0 On each side of these squares are spaces representing passe, manque. pair, impair. black, and red, and at the bottom are spaces marked oul I' 12, M 12, and D 12. The stakes may be laid on any of these squares.

Stakes can lie placed on any single number, or on two, three, four, or six numbers, and on yarious other combina.
tions Stakes are placed on P 1:2, M 12, and D 12, which refer to premicr, milieu, and dernier, and on the numbers 1 to 12,13 to 24 , and 25 to 36 respectively. On rouge, or red the stake is that the winning number will be red, and on noir, or black, that it will be black. Impair means that it will be an odd number, and pair that it will be an even one Manque means that the number will be from 1 to 18 , and passe that it will be from 19 to 36 . Players can stake on zero as a single number The odds against any single number are paid at the rate of 35 to 1

ROUP : A Poultry Disease. One of the most contagious diseases known to poultry breeders is roup. There are soveral forms of the disease

Diphtheric roup may be known from the swollen head and faces, and the yellowish and whitish patches or ulcers. In nasal roup there is a yellow discharge from the nostrils When the yellowish and whitish patches are seen in the mouth and throat, it is styled Avian roup Another form causes the eyes to swell and exude matter, and the numeroue membranes carry cheesy deposits. Roup in any form calls for complete isolation of al affected birds and of any that have been in contact with affected stock. If the birds are kept together, the disease will rapidly spread. with serious consequences to the poultry keeper

Remedies. In mild cases permanyanate ol potash will effect a cure. Crystals are mixed with the drinking water sufficient to make it a rosy pink, say as much as will cover a six. pence to 2 gallons of water.

Another remedy is sulphate of copper One ounce of the sulphate should be dissolved in 8 oz . of water, and given in the proportion of 1 oz . to cach gallon of water The face and head should be bathed with warm water, in which some disinfectant has been sprinkled and the mouth and throat painterl with carbolized glycerin. In bad cases the birds should he given warin food only

Carbolic powder should be well sprintiled about the houses, runs, and pens, and all houses and runs thoroughly cleansed and disinfected after the attack hias passed. They should not be used again for several months See Poultry

ROUT CAKE. The rich, sweet cake or biscuit mixture known as rout cate is made up into small fancy shapes and served with tea or light refreshments. To make it, sift 1 lb fine tlour and mix with $\frac{1}{2} \mathrm{lb}$. picked and clean currants. Put these in a warm place. Now beat to a cream $\frac{1}{2} \mathrm{lb}$. fresh butter, add the same quantity of castor sugar, and heat again till very light. Keep the basin just warm. and use a wooden spoon to beat with


Rowette wneel for nome players. It is sunk in a circular wooden surround, the latter being divided into compartments, each bearing a number from 0 to 36 on either a red or a black ground

Add alternately the llour and 3 eggs, which should liave been beaten
Mix these ingredients in by degrees and very lighty. pour in a little at a time 1 teaspoonfil rach rose and orange llower-water and 1 tablespoonful madeira or brandy. Dust $n$ baking-tin with sugar and llour and droj the mixture, which should be rather stiff in texture, on to it in little heaps. These must be even. Bake them in a hot oven. The cakes will cook in a few minutes, and should be about the size of a two-shilling piece.

Rout cakes are sometimes madc up as light spongy biscuits and baked in fancy tins, or they are moulcled on wooden blocks. The mixturc for thesc cakes is rather different from the first recife Rub 4 oz . butter into 1 |h. flour, add 1 dessertspoonful grated lemon rind, and $8 \frac{1}{2}$ oz. castor sugar ; make up the paste with 2 eggs well beaten and 1 very amall teaspoonfil carbonate of ammonia disalved in a little milk. Bake the cakes in greased and floured fancy tins in a sharp) oven.

ROUTER: The Plane. The router is used for inlay work or for finishing the bot toms of rccesses. A typical pattern is made of malleable iron, not unlike a spokeshave in apprearance. It comprises a working face through which a cutter projects, the amount of projection governing the depth of the recess. The carver's router has a hardwood block through which the iron, or cutter, projects, and is lixed in position by means of a hard. wood wedge. Various widths of cutter may be used. The tool is a combination of chisel and plane. It is worked forward and backward and in various directions until a Hat surface has bcen obtained on the bottom of the recess.
A modification of the router is used for cutting reeds and mouldings in positions remote fron the edge of the timber, or for similar purposes in curved wort Some routers are provided with adjustable grooves may be cut in the work parallel to the edge. See Plane.
ROWAN. Tlis familar ornamental tree, which is known also as the moun. tain ash, is, botanically, a crab (Pyrus aucuparia) and its red fruits, which are veryshowy in autumn, are useful formaking into jelly. It grows $20-30$ feet high and flourishes even in poor soil, is an excellent tree for town gardens and for planting in strects.
Rowan Jelly. This is served with game and venison. To malie it, the berries are first carefully wrshed, then placed in a preserving pan with enough water to cover them, and allowed to boil until soft. This takes $\ddagger$ hour or longer, according to the quantity. The berries are then tranaferred to a jelly bag, and crushed slightly before straining.

When all the juice has been extracted and has been thoroughly strained through the jelly bag into a basin or other dish, it is poured into the preserving pan. and sugar is added in the proportion of 1 lb . to each pint of juice. The liquid is then put on to boil and left until it jellies, which can be tested in the usual way by pouring a little into a saucer. The jelly is then poured into jars and sealed up. It should not be used for some time, is rowan jelly improves with keeping, and may be stored away for two years. See Jelly


Router Plane. Wood carver's router, with wooden stock. the cutting iron being secured by a wedge

Courlesil of 18. Mellujah. Lid covering, the outstanding is rubber lloo which is its durability. It aninntage of 10 to 30 years, accorling to its thicliness and the amount of wear it receives; being of self colour, or inlaid, it does not show wear. It can be liad in n variety of plain colours, also in marbled designs, so that colour schemes can be maintained, and by using borders of the same material in different shades various effects can be obtained. The marbled patterns are much more serviceable as they do not show footmarks so readily as the plain colours.
Laying the Rubber Floor. The material is made 3 ft . and 4 ft . wide by $\frac{1}{8} \mathrm{in}$. thick, but it can also be had in narrower widths for borders. and $\frac{3}{16}$ in. thick if desired. It can be laid direct on concrete, and in the case of a new building this is a great advantage as it saves the cost of Hoorboarding. The concrete must be thoroughly dry, ot herwise the rubber, being impervious to water, would hold any damp and cause knife dipping the latter in cold water occasionally
Cake: Icing.

## RUBBER

Uses Rubber has many practical applica. tions in the home in the form of mats and floor coverings, gloves, waterproofs, footwear and toys also countless uses for accessories it kitchen equipment. for games, the car and the garilen, etc. One of the most mportant furnish. gs is rubber lloor

ROYAL FERN. This is one of the most handsome of hardy ferns and is especially auitable for planting he the waterside. though


Rogal Fern. Osmunds palustrls, an evergreen necies of royal fern grown as a pot plant
it will thrive elsewhere in deep soil that docs not dry out in hot weather. It belongs to the group of so-called flowering ferns, for the spores are on separate shoots, not, is is usual, on the backs of tho fronds. The royal fern (Osmunda regalis) grows wild in some parts of Great Britain and in moist soil caches a height of 3-1 fect.
ROYAL ICING. To make this icing use 2 lb . icing sugar, 4 whites of eygs, and the juice of 2 lemons. Rub the icing sugar through a hatir sieve into a basin, make a well in the centre, and put in the slightly beaten white of egg. Mix in a little sugnr from the sides, add half the strained lemon juice, and mix the whole to n rather moist paste, adding more lemon juice as required If the lemons are large, all the juice may not be nceded. Use the icing at once, sinoothing it over with a large

Rubber Mats. For the bathroom there are marbled rubber mats, rubber tiling mats, sponge rubber mats, and diamond or corrugated patterns. It is advisable to have such mats with n roughened surface to prevent slipping, a smooth surface of rubber becoming very slipiery when wot. One rubher nat that
$f$ m They are generally made the cxact measurenosing to come over the edges. Risers can be fitted to give continuity of design, and verv pleasing effects can the obtained, particularly in marbled designs, if these are related to the larger clesigns used for hall and landings.

Stair treads can also b3 made with corim. gated or pyramid rubber matting, 直 in . or ${ }^{3}{ }^{3} \mathrm{in}$. thick, and separate nosing can be supplied to suit. The rubber mattings can be tacked on to wooden stairs or cemented on to stone stairs, although in the latter casc it is advisable to plug the stairs and screw the treads down.
the covering to sweat undernenth. eventually becoming loose and uneven. It is cxceedingly comfortable to walk on, quite silent, and, being a non-conduct or, does not allow cold to pass. If laid on a stone floor any unevenness will quickly show through, as the rubber, being pliable, fills the joints underneath and beds into every crevice; it is advisable, therefore. to see that the floor is levelled up hefore laying tho covering. Where large areas are covered and long lengths of the materinal used, the flooring need not be fastened down; it will lie llat by its own weight, providing it is not displaced hy moving heavy articles over it.
'lo stick the covering to a wooden floor certuin varieties of glue or cement can he used: this is advisable in doorways or where small picces are used to fill up comers. Special cements are used for sticking rubher floor covering to concrete.

The following is the method. Put a coating of the cement on both the underside of the lloor covering and on the concrete, using a brush about 3 in. wide ; allow both coats practically to dry before putting the covering down. It is hetier to cement the whole of the covering rather than the edges only, as in the latter case the material may bulge in the centre. Trim with a sharp knife, dipping the linife in water to make it cut easier.
There is no dilliculty in cleaning rubber floor covering. but it is necessary to scrub with cleaning powder, in addition to the use of ordinary soap and hot water, and wipe thoroughly dry. Petrol or ammonia must not he used, as these tend to soffen the tubber, and milk or oily subatances are also injurious

Rubber Tiled Flooring. Rubler inlaid tiling is a more expensive type of floor covering, but very good designs are made, and more elaborate patterns can be obtained than in the shect form of rubber covering. The inlaid tiling is made to suit the area to be covercd, and laid by men who specialize in this class of work; for this reason a plan or accurate measurements of the lloor is necesanry. For the house, ${ }^{3} \mathrm{if}$ in. thick will he quite serviceable, and this is the thinnest made. The design being made to suit the shape and size of the llomr allows for great scope in this direction, such as the use of panel designs, black and white tiling effects, or plain ait shades. It malies an excellent floor covering for the entrance hall, having the advantages of variety of design, durability and silence. It should he washed in the same way as ordinary rubber covering, but need not he polished, as the surface is good and readily cleaned.

Such Hoorings also have a beautiful effect for a dining room (see page 359). Nearly 100 colours and shades are available, enabling many designs and colour schemes to be elfiectril. These iloorings are non-a hoor bent and $1 /$ - gienic. They are therefore also most suitable for $t$.. nursery or hathroom.
Rubher stair treads can be of inlaid tiling hey are generally made the cxact measureosing to come over the edges. Risers can be

Stair treads can also bs made with corrmeads down.
can be placed in the bottom of the bath is fitted with suckers on the underside which keeps it in place ; this mat enables a person to recline confortably.

Rubber door mats can be made in practiv cally any size or shape to fit into a well or doorway. The general thickness is in., fnd they are perfornted in various patterns, and can be had lettered or witli monograms inlaid in a contrasting colour. The perforated rubber door mats are very seldom worn out; they are generally bmken by misuse and made unsightly. Care should therefore be taken not to fold or double the mat when it has been removed; it should be laid tlat or rolled. It can be scrubbed in the usual way.

There are rubber mats inade for use in the kitchen sink; these usually fit on the extension piece of porcelain sinks, and lave a grooved or roughened surface to prevent the dishes from slipping whilst draining. Other mats are the protective rubber table inats, usually made in coloured inarbled designs. Being thin and non-slipping they are useful under linen embroidered mats to prevent marks from hot plates and dishes on the polished surface of the table.

Rubber Gloves. Thin rubber gloves protect the hands when doing housework. They should be one or two sizes larger than ordinary gloves, and the hands must be dry when they are put on, or rubbed with French chalk to allow the gloves to slip on easily. If these gloves get torn or punctured they can be patched in the same way as a cycle tube, care being taken that the place to be patched is clean and dry before applying the solution. The amall cycle patches with tapercd edges are the most servicenble because they are not likely to turn up at the edge. The same method of mending may be applied to goloshes.
New Uses for Rubber. One of the uses to "hich rubber is now being put is for the upholstering of articles of furniture. For this either pneumatic or sponge rubber is employed. lubbler is also much used for brushes of all kinds, while buckets and other household utensils, egg cups for example, are made from it. In the kitchen and scullery the sink can be lined with rubber and the tables covered with it. Flowers made of rubber are sold for household decoration, while articles made from it include bulb howls, napkin rings and knife handles. Handbngs for ladies are also made from ruliber.
Rubber Solution. The name is given to a substance mainly consisting of rubber dissolved in benzol or naphtha. The composition varies with different makers. It is used for cementing rubber, and particularly in connexion with the repairing of cycle or motor car tires and tubes. See Flonr; Goloshes; Hose Pipe; Hot Water Bottle; Motor Car, etc.

RUBBER PLANT. The true rubber plant, Hevea braziliensis, is the one from which the rubber of commerce is collected. It may be grown under hothouse conditions, but has little attraction for foliage purposes.
The name is sometimes applied to the semi-hardy evergreen plant ficus elastica, which is usually grown as a specimen in ornamental pots for the puposes of room decoration. The plants flourish in ordinary potting mixture on tables and in windows ree from draughts. See India-rubber Plant.
RUBBER STAMP. Used for printing initials, dates, names and addresses, etc., with the aid of an inked pad, stainps made of rubber are obtainable in many shapes and sizes, mounted on a brass plate or metal frame and provided with a wooden handle.
RUBBISH: In the Garden. Accumulated rubbish in the garden is a conmon eyesore in plots of modest dimensions. Its disposal is not a difficult task, however, if dealt witl, in a systemntic nianner, and heaps


Rubbigh. Showing bow to dispose of garden retuse by means of burning 1. Ground base for furnace. 2. Method of building body. 3. Incinerator o operation. 4. Method of shelter : $a$, iron or zinc cover

RUCHING: In Needlework. The trimming, known a ruching, consists of a strip of material, with a gathering thread run down the middle, from end to end, and sewn along the gathering to the article it is to trim. Ruchings, or ruches as they are often termed, may also he pleated or boxpleated.

The atrips of mater ial for gathered ruch. ings are nearly always cut on the cross of the grain, so that their edges can be pulled out with the fingers into llutes, to emphasi\%e the frill Strips for pleated or box

There are two methods of disposal-burning pleated ruches are cut on the straight and deep burial. Every garden of modest size might be planned with facilities for the disposal of waste. In one corner a fair-sized hole should be dug, and therein may be thrown every bit of decayable vegetable matter from household and garden: indeed this may he augmented with sweepings from Hue and chimney and scrapings from the fowlhouse, all heing inade fairly firm and spinkled with lime.

Farly in the year the whole mass should be turned out and sprinkled with lime. In such manner rubbish is converted into a natural fertilizer of much value, particularly when trenched in for deep-rooting crops.

Everything that will not easily decay, such as liardwood, tree prunings, and cabliage stalks, together with weeds like dandelion and dock, should be burned, the ash being stored in a dry place for use in spring.

A Brick Destructor. The burning of this hard rubbish is best accomplished by means of a destructor built of bricks as shown, a simple structure with free circulation of air, which will burn steadily and quickly reduce its contents to a fine ash rich in fertilizing power. The lid is necessary to the contrivance, hecause it kecps refuse in a dry state, and allows accumulation until time is convenient for burning. Autumn leaves should be collected and placed in a large heap, covered with wire netting and left in the open until decayed.

All straight sticks from tree-prunings, with the exception of soft ones, should be kept for staking. See Incinerator; Manure.

RUBBLE: For Masonry. The term rubble refers to pieces of stone of irregular size and shape, and is applicable to practically any kind of stone. Simall and, irregular pieces of brick known as brick rubble are used in the formation of concrete for the foundations of buildings. Rubble walls are constructed of irregular-shapod stones. See Crazy Paving; Path; Stone.

RUBUS. This is the botanical name of an important group of shrubs which includes the raspberry, loganberry, and hlackberry, and others of purely ornamental value. Of those with handsome flowers the beat are Rubus deliciosus, with large white single Howers, and odoratus, with purple blooms.

RUBY. The value of the ruby is determined by its colouring, which varies in different specimens from a pale rose tint to dark red The latter, known as masculine rubies, are the more valuable, some of the finest being more costly than dianonds of the same size. In hardness, the ruby equals the sapphire. Garnets and red tourmalines, which are used as a substitute for rubies, sometimes resemble these gems closely in colour, hut they are softer, and can be detected with a tile.

Ruchings may be of any width, ranging from very narrow to very wide. The length the strips should be cut depends upon the nature of the ruche. For a gathered ruche a strip measuring half as long again as it is when finished should be allowed. That is, if a atrip of gathered ruching about 20 in . long is wanted a strip of 30 in . must be allowed For pleater or boxpleated designs, strips three times the length are required.

When joining crossway strips to gain the length required for gathered ruchings, malie the joins on the straight of the grain, which means they will run slantwise ncross from edge to edge

The edges of ruchings may be hemined, bound with narrow strips of material, picotstitched, or rolled. A finish for the edges of ruchings made of taffetas is a fringe, this heing achieved by fraying out the edges with a pin Another linish is pinking
To make a gathered ruche, cut and join the atrips wanted, and neaten the edges; then fold it up into halves, quarters, and further subdivisions, if possible, and mark each fold with a

pin or chalk line. Fold the article it is to trim into an exactly similar number of sections, and mark to match. Next run a gathering down the middle of the strip, draw it up slightly, and pin it to the article so that the marks correspond, thus making certain of the fullness being diatributed evenly; then run the ruche to the article along the middle. I desired, a line of fancy stitchery can be used to secure the ruche.

To make pleated or boxpleated ruchings, cut, join, and neaten the strips; then set thein in pleats, running a tacking along top and bottom edges as they are formed, and well press them afterwards. Run a cotton through the middle, to keep the pleats permanently in position, and sew them to the pelmet, cushion cover, garment, ctc. See Bag; Pleating
RUE : The Herb. This familiar herb is of some decorative value in the garden : it grows 3 or 4 ft . high, has greenish-blue leaves and yellow Howers in summer and flourishes in ordinary soil in a sunny border. Propagation is by seeds sown in spring.

## Rugs: Oriental and Other Makes <br> How to Make Wool and Rag Rugs at Home

In connexion with this article on tloor rugs see also Canvas Carpct: Colour: Hall: Kirman Rug: Mat: Nursery: Persian Carpet. Turkey Carpet Weaving: Wool. Information abnut Travelling Ruga is given under that heading
With the increase in number not only of in pattern, and of luxuriant pile. Bokhararuga smaller rooms. but also of parquet and wood include the styles called Turcoman, Afgian and block floors, and the employment of rubber and composition paved and tiled floorings, rugs are in greater demand than ever. There are also the hygienic and labour-saving merits of ruga to be considered, which make them suit. able for nursery and bedroom use in place of the all-over carpet, which cannot be daily removed from the floor for cleaning purposes
Rugs may be roughly divided into six classes. Samarkand The patterns are hased upon roses turned into octagons, with hooked diamonds and other geometrical motives woven all over. Similar borders are in soft, brownish-reds with blue and greens. The wide webbing at the sides should on no account be sacrificed. Modern pieces are exported coloured with aniline dyes and of inferior designs.

Chinese rugs are beautiful, and in many Oriental rugs: those made at Axminster, Persian rugs there is a prevalence of Chinese


Rug. Parsian prayer rug, crimson and green velvet. embroidered in silver thread. The fleld has a niche with scrolling stems and inscriptions. From the Mashbad Shrine
Wilton and other western carpet manufac- designs and motives. The two best known are turing centres; skin rugs; hand-woven rugs the cloud band and the dragon The former is in geometrical and other modern designs; rugs symbolical of heaven. Symbolism plays a worked with wool on canvas; rag rugs.
Oriental Rugs. Although European weavers hegan to employ their looms for rug and carpet making in the 15 th century, copying the knotted examples which were imported from Turkey, until the age of machinery Oriental rugs far excecded the supply of those made in the West.

Like other textile fabrics, Oriental ruga have interlacing warp and weft threads; in
to these fundamental threads they are composed of countless short pieces of coloured yarns, the cut ends of which form the pile. Each knot or tuft is tied by hand. Many or few dyes may be employed, but in most Oriental rugs an immensc number of shades are selected to make the design, thus giving the weaver great scope for original work. Knotting may be fine, which adds to labour but enhances beauty of forms employed; or it may be coarse, in which case bold patterns are generally worked.

With regard to Persian ruga, it should he noted that many rugs not strictly made in Persia are described under that title. IndoPersian rugs are well woven and of fine colour, but the detail of the designs is not usually so good as in the Persian carpets which influenced them. Some of the Caucasian rugs arenotably rich in colour, intereating

Garden carpets and rugs havc designs of gardens with walks, trees and flower-herls Such patterns were made as far back as the lith century in Persin.

Other rugs come from 'lurkey The demand for them is a large and growing one, and the industry that meets it has its headquarters at Istanbul and Smyrna. Imitation 'Turkish rugs are produced in British and conti nental factorics, but in thesc lighter shades predominate, and, though they are excellent reproductions of what are known as fancy Turkish rugs, they are not truly Oriental in character, as they lack the typical enstern colouring. They are designed chiefly for stair case and corridor use.

The best eastern ruga fetch high prices, and their colour and texture last through many lifetimes. Good modern examples can, however be bought at morlerate prices, which are woven by hand, the colouring of the better kinds being heautiful owing to the dyeing processes still in use for this class of work.

Among the most interesting Oriental rugs are those known as prayer ruga, made pri marily for the devotions of Mahomedans. 'They usually comprise $a$ niche, the point of which is directed towards Mecen, and beneath it is supposed to be placed a morsel of dried earth from Mecca, upon which the worshipper rests the forehead when he is at prayer Ritual objects may be portrayed near the niche, and from the point there sometimes hangs a lamp or a floral pendant. The ahape of the niche is a guide to the make of the rug

There are at least thirty ty pes of niches, those from Persia heing usually curved, and all others woven in straight lines. Caucasian and 'Turcoman лгe always, and Persian uaually, recog. nizable by having the field well filled with ornamental motives; while Turkish have plain fields, as the more conservative Mahomedans obey the Koran, which forbids them to cony figures. These rugs seldom exceed 6 ft . by 4 it
The Persian prayer rug illustrated has two horders filled with 18th-century conventional Horal patterns and inscriptions of the profes sion of the Islamic creed. The field has the curved and pointed niche with scrolling atems, flower motives and inscriptions. The rug is lined with silk and gold tissue dating from the same period.

English Rugs. Another class of rugy is manufactured in England by the Axminster Wilton and other carpet factories at home. These differ little except in size from carpet aquares, and are frequently made to match these, being useful for filling odd pieces of floor space in a carpeted room. Mohair rugs in black and self colours, though uninteresting, are very durable. Tufted wool


Rug with effective pine cone design worked in shades of tarra-cotta, biscuit, pale green, gold, tan, and deep blue
rugs are excellent for bedroom or nursery, and nost of them are reversible. Fibre rugs woven in good colours are suitable for bungalow and informal rooms Skin rugs of leopard, tiger, wolf, raccoon. bear and goat are handsome, but when laid on parquet floors have the great disadvantage of slipping easily. Skin hearth rugs are hest removed in summer weather, as they tend to give a room a hot appearance

Beautiful ruge are hand-woven in straight geometrical designs. The colourings are harmoniously graded and often in browns. natural wool colour, and a variety of beige shades. The interest is gained by subtle shading, and the patterns are usually of the simplest kind, such as cubes and broken stripes, and just sufficient to introduce pleasing light and shadow effects. Colours may appear to contrast violently, but this contrast is obtained in the same way as in old tapestryby the skilful use of several gradations of cach colour so that it never appears dead or crude

Handworked Wool Rugs. There are various methods of making wool rugs, but the general one is to hook the wool through the canvas or hessian to give a series of little tufta so closely worked together that they form a pile like that of a carpet. The canvas takes the place of the warp and weft threads of the Oriental rug. There is apecial canvas to be ohtained for the foundation marked in squares of 8 ridges. If the wool is of fine quality like the 6 ply Turkey rug wool, it is worked into every ridge, hut if of the coarser 2 ply cahle wool it is only knotted into every alternate one.

By means of a gauge, the wool is cut into little equal pieces, each ahout 2 in . long (Fig. 1), ready to be hooked into the canvas. To make the actual knot, a coarse crochet hook wi!l do. though there are several patent instruments on the market. One, Fig. 2, is like an ordinary crochet hook with a movable latch, which preventa the hook from catching when drawn back through the canvas. Another, Fig. 4, is like a pair of pliers which by a simple device knots the wool on the canvas in one opera. tion. Both make the same slip knot.

Chart designs are available from the various wool shops marked in squares to correspond exactly with the squares on the canvas This

makes the working out of an intricate de end of the rug is reached that should be sign very simple indeed. But simpler still for turned in in the same way. (See Fig. 10.) the plainer designs is the canvas which has been The selvedges at the side of the canvas are stencilled with a pattern. Line the rug when strong enough without turnings. The easiest finished with black hessian which will make it manner to work is to place the canvas on the softer to the feet and more durable in wear table and knot in rows from left to right, the When beginning a rug, turn in the end for finished part being nearest the worker.
If in and work through the two thicknesses. Patterns may be inspired by Oriental This will give a firm colge, and when the other motives auch na the pine cone design illus.


Rug : webuuu ui making. Yig. 1. The wool is cut in short uniform lengtos by means of a grooved gauge. Fig. 2. Regulation rug-making book resembling an ordinary crochet hook with movable latch. Fig. 3. Another method is by use of a bollow metal tube into which the wool is threaded. Fig. 4 . Knot-making tool in use. Fig. 5. Daing regulation hook: to knot the wool on the canvas it is frst doubled and drawn through under a ridge. Fig. 6. The book is pushed through the loop so that the wool lies behind the latch, and the two loose ends are booked. Fig. 7. These ends are pulled through the loop, the latter sliding over the latch. Fir. 8. The knot is then pulled tight and a similar tuft made in the nert ridge, and so on. Fig. 9. A row
an inch of canvas ghould be turned up on to the face of the work
trated, or they may be simply geometrical and worked in dark brown, havana brown, and three shades of beige, as in the other example shown Designs should always be conventional even where figures are introduced into nurvery rugs Squares, circles, triangles, and simple designs of llowers and leaves are all suitable for rug making, but the art of the designer lies in combining them successfully.

The particular kind of wool used is a matter for individual taste. What is known as cnble wool is a curly 2-ply yarn. It is more lustrous than Turkey rug wool, and produces a rug of a softer and longer pile. The pile of Turkey wool however, is wonderfully firm. It measures about $\frac{1}{2}$. in depth, and resembles more closely the pile scen in Eastern rugs.
A most ingenious way of making a pilc rug on hessian is by the Kwikumak method. The instrument, Fig 3 , which is fitted into a wooden handle, is a simple hollow metal tute pointed at the end and having a hole about I in. from the end. Through this hole the wool is threaded. As the instrument is pushed through and through the hessian following a stencilled pattern, it leaves loop on the other side of the material. These loops, when afterwards they are cut evenly with the scissors, form a close pile
Rag Rugs. There are two methods of making ray rugs In one the rag is pulled through the canvas with a large crochet hook while in the other the raga may be braided or twisted and sewn together. All kinds of rags are suitable for this purpose. For a hooked rug a piece of strong open-meshed hessian or sacking is required Having measured off the required size, hem or crochet it all round to give a firm edge. Stencil or draw in chalk a pattern upon it; an oldfashioned posy or wreath of Howers worked in bright colours in the centre suits these old world rugs. Various grotesque nnimals and birds were also worked in the brighter rags, leaving the more nondescript coloured ones for the bacliground.
For a hooked rug, the rags need to be about $t$ in in width more or less, according to the thickness of the various materials It is not essential to rew the strips together, though the longer they are the quicker they can be hooked through Use a coarse crochet hook for the work: the canvas is often stretched in a frame, but it is easy to work without. Place the pile of strips under the canvas either in the lap or under the table. Hook the strip of rag through the canvas to form a loop about $\frac{1}{2} \mathrm{in}$. in length. Then make another loop close by, and continue until the canvas is covered The loops are then clipped to give an even, mossy surface. A hooked rug should be lined with hessian to give it greater strength. To braid a rug like that shown in Fig. 11, it is necessary to cut the rage about 3 in witle If they arc made


Rug. Fig. 12. The strands are plaited ologely and evenly to make braid for the rug shown below hin be sewn together and pinned on to something firm. As soon as 1 ft . or more of the plaiting is finished, the sewing together is begun This is done with strong, waxed thread When making a circular rug, the braid is then wound round and round flatly, edge to edge, and the needle passed through and through in close, invisible stitches. A little practice is required to make the braid lie flat If too tightly wound it will buckle, but it must not be too loosely done, or the work will look rough
To make an oval rug, begin with a long. shaped centre, and wind round it. A dark centre usually looks well with outer rings of light and dark alter nately. A skilful braider can work in the colours while she is plaiting to a definite design. As the end of each strip of rag is reached, sew on another one. It is just as well if the strips are uneven in length, as then the joins will not come all in one place ; but this, of course, must happen when introducing a fresh colour, and then the join must be neat. Rag strips, in. wide, can be crocheted, using a large hook. Before beginning, join the strips together and wind into a ball. Begin by making 5 chain, join into a circle and then crochet round, increasing in order to make work lie flat.
narrower than this it is 'ather difficult to turn in the edges as ncatly as is necessary for tidy work. The edge should be turned in a bout $\frac{1}{2}$ in., and the strip folded over in half lengthways. so that the raw, fray ahle edges are insidc. This may be done while braiding, but if the material is stiff and wiry it is better to press it into its proper folds. Strips may be joined together to give lengths of about $1 \frac{1}{2}$ yards each, and are best folded and pressed beforehand, and wound on to pieces of cardboard to keep them in good shape.
Plait the rtrips closcly and evenly, just as hair is plaited, with 3 strands, as illustrated in Fig. 12. The ends

RULE : For Measuring. Of the many varieties of rule in ordinary use some are of wood and others are made of ateel and other materials Those made of wood range in sizc from the 6 in rule supplicd with small sets of drawing instruments to the 6 ft . lath used by the glazier. For amateur use the most convenient is the 4 -fold 2 ft . rule. This is marked on both sides in opposite directions, and although usually divicled into Athe and ${ }^{2}$ teths, it can be obtained in ${ }^{3}$ othe and $\frac{1}{1}$ the

In making accurate measuroments with a wooden rule, the edge should be used so that the marks can be transferred direct, and when several measurements are required on the surface of a board, they should be added together. For example, if distances of 2 in., then $f$ in. then 1 in and 6 in. are required, the method is to mark off 2 in lirat from the edge next 2 多 in., then 3 多 in., and finally $4!$ in

The 4 -fold rule can be employed na a square by folding it in the centio and the two halves together at the knuckle joint between 5 in. and 7 in., as at $A$, below. In dividing wide boarils into equal parts, the quickest method is to lay the rule diagonally across the wood so that opposite corners are touching. For example, supposing the board to be 103 in ., and it is required to divide it into 4 equal parts, the pencilshould be placed at 3 in., 6 in .


Rule. A, method of using folded us. of as suare divide a board into equal parts
a nd 9 in., and lines drawn through these points parallel with one edue, as at B , above. The rule is again useful in the latter operation, as it can be held between the fingers of the left hand, the pencil placed on the point, the brass tip of the ruler placed against it, and, with the fingera of the left hand acting as a guide, both ruler and pencil can be drawn down the wood. This is called lining with rule and pencil.

The engineer's steel rule is obtainable with. out a joint and engine divided into 12 in ., with the usual sub-divisions; the rule is also 2 -fold, and a 1 ft . 4 -fold The steel rule is essential for accurate metal working, the first-mentioned size being the most suitable.

Steel rules should be rubbed oc. casionally with an oily rag, as perspiration from the hands and dampness will soon make then rusty. See Measurement; Plumb Rule.

RULE JOINT. Used for tables and drop leaves, the rule joint is a method of hingeing two pieces of wood together so that a neat, closed joint is shown when the leaf is down. It is better than the square joint, which shows a space between the two hinged pieces. The joint is shown in Fig. I with the leaf up and in Fig. 2 with it down: A is the fized top, $B$ the leaf, $C$ the centre pin of hinge, and $D$ the commencing point of the curve of the joint. It will be seen
in Fig. 2 that a semicircle is formed when the leaf is down, the centre being at C , and that this neces. sitates the hinge being let into the wood. The hinge (Fig. 3) is specially made for rule joints, and is known as the table hinge: it is similar to a back flap, but as it is attached with the knuckle in the wood, the screw holes are countersunk on the opposite side. Hinges are made in sizes from 1 in . to $1 \frac{1}{1} \mathrm{in}$, 11 in . and 2 in.

The table hinge should not be confused with the rule joint hinge shown in Fig 4, which is used for another purpose. The method of marking out is shown in Fig. 5 ; the two pieces of wood should be the same thickness, and the gauge line at $C$ should be the depth of the hinge. The distance of the centre $\mathbf{C}$ from the end of the wood should be about $\frac{7}{7}$ of the thick. ness of the wood. Special planes are made to form the joints, but the latter can be easily out with ordinary rounds and hollows.
The first stage in working the round is shown in Fig. 6, a rebate being cleanly cut to the level of D. The second stage, in Fig. 7, consists of rounding the corner to a true quadrant, and then forming the hollow in the opposite piece so that the edge at the top equals that at $D$ and the curve is the exact opposite to the round. The two parts are placed together and the slots for the hinges marked out and cut. The short part of the hinge is on the side with the round and the pin of the knuckle is exactly under the top at $D$. The work can be polished in the ordinary way before the hinges are attached, but they should have been fitted previously. The rule joint hinge shown in Fig. 4 can be employed for narrow flaps, the edges of wood being shaped as above, but it is more suitable for hingeing flaps which are to fold over flat, and is used in some oard tables. See Hinge ; Joint; Rebate.

RULE OF TEE ROAD. By this phrase is understood the rules that should be observed by persons who drive vehicles of any kind on the roads. In Great Britain the main rule is to keep to the left. Another important rule is when overtaking another vehicle to pass it on the right. In crossing, the driver should bear to the lcft and pass behind a vehicle coming from the left. Drivers who infringe these rules are liable to legal penalties. See Driving; Motoring : Road.

RULER. The two words rule and ruler are often confused; the former relates to measuring and the latter to the drawing of lines. Although the rule can be used for the latter purpose, the jointed rules are not convenient. The ordinary boxwood 12 in . rule serves the double purpose; but the round ruler, generally made of ebony and about 1 in . in diameter, is useful for drawing parallel lines as well. See Rule.

RUM: The Liquor. Rum is a spirit distilled from fermented juice of the sugarcane or from molasses. It is coloured with caramel and improves with keeping. Sometimes pineapple and guavas are added in the making. Rum and milk is said to be one of the most powerful restoratives, and an oldfashioned remedy for a cold is a steaming


RUNNING: In Needlework. This is the simplest stitch, and the first to be taught in needlework. The needle is passed in and out of the material at regular intervals, taking up 3 or 4 threads at a time in a horizontal line. If the fabric is sufficiently soft and thin, several stitches are taken on the needle at once before the thread is drawn out. This stitch is used for plain seams and for making gathers. See Gathering; Seam.
RUPTURE: Its Treatment. In its widest application rupture or hernia is the abnormal protrusion of part or the whole of an organ of the body through the wall of the cavity that contains it. It occurs chiefly, however, in relation to the contents of the abdomen, and in the majority of cases the part which thus comes through is a portion of the intestinc. The cause is generally either weakened areas in the abdominal wall or increased pressure of the abdoninal contents due to some injury or sudden strain, as in lifting heavy weights, but thero are also other causes, as, for example, severe chronic cough in old people.
There are several kinds of abdominal rupture, the most common being inguinal hernia in the groin: femoral hernia is also in the groin, and umbilical hernia at the navel. A ventral hernia is a protrusion through a weak spot such as may be present in the scar of a wound, as, for instance, after the operation for appendicitis. A strangulated hernia is one in which the circulation of the blood is obstructed and is always dangerous.

A rupture appears as a rounded or pear. shaped swelling, the lower end usually being the broader. It increases in size when the patient stands, coughs, or makes a muscular effort. If it is a reducible hernia, it slips back into the abdomen when the patient lies down and presses on the swelling with his hand. (On his standing up it again comes out.
'The treatment of inguinal hernia consists of the wearing of a truss, or an operation for what is known as the radical cure. When a truss is used, great care should be taken never to let the inteatinc come down cven once, for whatever closing of the part has been effected will be at once undone. In adults a truss should fit perfectly, otherwise it may do harm by causing inflammation and favouring strangulation.

Femoral hernia is more common in women than in inen. A rounded swelling appears in


Rommer. Largo-sised rummer, the ongraved
decorative decign inoluding agrioaltural implements Courteay of Cech Davis
front of the thigh towards its inner side just below the junction with the abdomen. As in other forms, the treatment is either palliative by means of a truss or curative by operation.

There are three varieties of umbilical or navel hernia : the congenital, which is very rare : that in infants and children, which is common : and that which occurs in adults, most frequently in women who have had several children If properly treated this form of rupture in infants can be cured easily. The edges of the opening should be drawn together and held so by a strip of plaster. or a penny or a disk of lead may be wrapped in lint, placed over the navel, and held in place by strips of plaster In adults the palliative treatment consists in wearing a truss, or sometimes an abdominal belt which requires the addition of a truss pad. If obstruction occure, the lump becoming larger and firmer, the doctor should be summoned immediately.

In strangulated hernia severe pain extends through the abdomen, and there is vomiting, constipation and collapse. The doctor should be instantly summoned when a patient who has a bernia suddenly finds that it will not go back. When he has pain or discomfort in the lump: when he suffers from obstinate constipation, or from nausea or sickness. The
alarnı may prove to be groundless, but it is important that no risk should be run.
To prevent hernia, infants should be kept, if possible, from excessive crying and constipation should be prevented. Adults should avoid wearing belts, and excessive muscular straining after operations on the abdomen. Women should avoid tight lacing, and wear an abdominal bandage after childbirth.

RUSCUS. A group of low-growing, hardy evergreen shrubs of which the chief kind is the butcher's broom (Ruscus aculeatus) : this grows $2 \frac{1}{\mathrm{ft}}$. high, has apiny, so-called leaves (which are really modificd branches), and small greenish llowers.

Male and female llowers are on scparate plants and both kinds must be planted to ensure a crop of the red fruita in autumn. The butcher's broom will thrive in shady places.

RUSH: In the Garden. A few of the rushes are attractive waterside plants, but most of them are of little value in gardens. One of the most striking is the porcupinc rush (Juncus lacustris zebrinus): the leaves are marked with bands of green and white. In Juncus spiralis the leaves are spiral.

Rush Lily. Another name for the satin

## RUSH WORK: A USEFUL HANDICRAFT

With Directions for Making and Repairing Chairs, Stools and Baskets
For information on related sub, cets the reader is referred to the entries Basket Making; Cane; Osier: Raffia; Wicker Work, etc.

When dried the rush is used as a chair seat ing is in Figs. 1 and 2, and for making baskets and mats, and more rarely as a floor covering It provides a strong, soft, comfortable and inexpensive seat, and has the advantage of being easily worked.

Two varieties arc commonly used, ordinary rush, known as green, but more of a brownish green in colour, and salt rush, known as golden rush, and of a yellow colour; the latter is considered to be the better quality for general work. The rushes should be gathered in the late summer and carefully dried; they require no other preparation, as the drying leaves them in the form of libre. They are obtainable in large bundles in lengths up to 6 ft ., and after dipping them in water and leaving them for a fow hours they are ready for use.

Reseating a Chair. Although the framing of chairs is of special design when the seating is of rush, it is possible to re-seat almost any kind of frame provided that the corners, which will not be covered by the weaving, are built up to the same level as the rest of the seat. If a chair is to be re-seated with rush, all the old material must be removed and the framework thoroughly cleaned; but it will bc helpful to the beginner if he or she notes carefully the method of weaving when removing the old rush, to see where the rushes are twisted and where they are used singly, and also where and how extra lengthe are added.

The rails of the rush seat chair frame are mortised in about $\}$ in helow the top of the legs, and a corresponding amount is left on the outaides, but the inner sides of the rails are usually flush with the inner faces of the legs. Begin with one long, stout fibre and secure the thick end to the inside of the framework, as in A, Fig. 3, using a stout tack or a clout nail Bring it over to the front rail, quite close to the raised corner, and commence to twist from left to right. Carry the twisted portion down on


Rush Work. Fig. 1. Seat of rusi-seated chair. showing method of weaving the twisted rush in
sections. Fig. 2. Underside of seat with rush left


Rush Work. Fig. 3. How weaving is begun. Fig. 4. Reel knot lor joining lengths of rusb. Fig. 5. Professional knot. Fig. 6. Two lengtis twisted to form a strand. Figs. 7. and 8. Stages in weaving. Fik. 8. Small rushseated stool. Fir. 10. Two-colour twist
hand, using the thumb turned down and the one next to the latter and fingers to keep the on its right. The same movements of the plait even The right thumb and finger ahould be used in every hand is used to do the stroke for the building up of the twist. As plaiting, each length the thin portion of the rushes is reached, of rush being brought add a new length.
from the back over Rush and Cane Combined. The melon. towards the centre shaped hasket in Fig 11 is a very effective New lengthare placed way of using rush, the framework being made on the inside of a right- of split cane. The first stage is to make an hand length, and the oval band with a length of stout split cane, the 2 lengths plaited to- joint being made by making 2 tapering cuts gether, leaving the end so that the ends of the cane can he joined up of the old one minder- evenly and hound together. A useful size is neath when finished 12 in . by 9 in . A second hand is now made in with.
The plaited braid at Fig. 14 is particularly effective ; it is formed by first plaiting 3 rushes as at Fig. 3 for 6 in ., then one of the lengths is held firmly in the left hand while the right hand is used to push up the plait to reducc its length to about 2 in. Note the length which was held tight, so that when another 6 in of plait is done, the same are length an be held altern while the other two are pushed up close to the first.

The method is to dissolve $\frac{1}{} \mathrm{oz}$. green aniline dye in 1 pint hot water, then add $\ddagger$ gill strong vinegar Apply the stain with a brush, giving the work 2 or 3 coats, according to the depth of the colour required. When the stain is quite dry, make a size by dissolving $\frac{1}{2}$ oz. glue in 1 pint hot water and apply this while still hot to the whole of the stained surface.
Rush scats that have a few broken strands need not be re-seated if the rest of the work is in good condition. The method of repairing is to pull the broken strands through to the underneath, and to join on a new length to the corresponding straight length. The new piece should be twisted and pulled through to the top, carried over the frame, and then tied with a loop after passing it under a few strands. There is a limit to which repairs of this kind can be carried, but if the material is not very old and has not perished the work it can be lone with success.
It is usually the front edges of the seating which wear away quickest, and if many of the strands have given way it will be more satisfactory to re-seat the whole.
Rush for Baskets. Rush is used in making haskets, bags, and in other small ways. It is often combined with cane to produce such useful articles as the basket illustrated in Fig. 11. It is worked in its natural form and also twisted and plaited. Examples of plaiting are shown in Figs 12-16.

The simple twist at Fig. 12 is done with two rushes as follows: Tie the thick ends together and secure them to a hook in the wall or over a convenient nail. Hold one rush in each hand and twist outward, then take the right-hand rush over the left one, at the same time hringing the latter under the right one. The rushes are transferred to the opposite hands and the movements repented, inserting a new nush when required and keeping the twist of a uniform thickness.
A double twist is accomplished by first making 2 simple twists as above and tying them together and treating them as single rushes, but the twisting should be in the opposite direction, that is, from left to right ; this prevents the twist curling.
The 3-way plait at Fig. 13 is commenced with 3 rushes tied together and held in the left

The 5 -way plait at Fig. 15 is made with 5 rushes by interweaving each rush diagonally under one and over one, the outside rushes being so arranged that they start from the back and come forward over the next rush and towarda the centre. Wider plaits can be made in the same way by using 7,9 or 11 rushes.

The rattle twist at Fig. 16 is made with 5 rushes of even size tied together and held vertically by the tied portion in the left hand Take one of the rushes and bend it behind the two next to it on the right; do the same with the others in order, until they are laid down. Continue by laying each rush in its turn across the centre and over the last one


Rusb Work. Fig. 11. Combined with cane, rushes can be woven into a basket with twisted bandle. Fig. 12. Simple twist. Fig. 13. Three-way plait. Fig. 14. Plaited braid. Fig. 15. Five-way plait. Fig. 16. Rattle twist Fig. 11. courtesy of Druad Handicrafts
centre of the basket the work being kept as close as possible, because the damp material used in the first place will shrink when it dries

The handle can be given a decorative finish by twisting the rush spirally round it and carrying a wide length of coloured raffia with it, so that the raffia is covered in one turn and exposed in the next. and so on throughout the length. A stronger basket can be made by using tapered ash splints.

Plaited rush forms a mostconvenient and cheap method of filling up the sides of many kinds of basket woven either in cane or osier and suitahle for wastepaper or work baskets.

RUSK : The Biscuit. Rusks are made in small round shapes As soon as they are baked they are split open and reheated until they are so crisp and dry that they will keep fresh for some time when packed in airtight tins lined with grease-proof paper.

To make, sift I lb fine flour, with a pinch of ralt, into $n$ basin, then dissolve 2 oz butter in $f$ gill milk Cream $\frac{1}{2}$ oz ycast with 1 teaspoonful castor sugar and stir into it the warm milk and butter. Now beat in 3 cggs Pour these ingredients into the centro of the Hour and work them into a dough. Cover the bowl over and let it rise till very light. When risen, knead it till smooth, then make the dough into balls about the size of a large egg, only fatter Lay these in rows on a floured baking sheet and let them prove. Bake in a ljot oven for about $15 \mathrm{~m} / \mathrm{n}$. Talie up the rusks on to a sieve, split each in half and return to the tin with the broken side uppermost Crisp them in the oven, then cool and store them.

Rusk Pudding. A very good steamed pudding can be made witl rusks. Sonk 4 rusks in 1 pint milk for $\frac{1}{2}$ hour, then beat these up fine, add 0 oz cleaned and picked currants, 2 oz. choppred candied peel, the rind of a lemon (grated), $\frac{1}{1}$ tenspoonful nutmeg. and a pinch of salt. Cream 2 oz. butter with 3 oz castor sugar, add by degrees 2 wellbeaten eggs, and atir this to the rusk mixture. Steam in a buttered basin for about if hours. Serve it with sweet or brandy sauce.

RUSSET: The Apple. Apples of the russet family are distinguished by $n$ skin of rough texture and russet-brown colour. Generally these are of brisk flavour, and include the wetl-known Ard Cairn, Boston, Brownlee's, Egremont, Golden, Pincapple, and Royal russets.


Russian Cake, made in four separately prepared blocks and coated with almond fcing

RUSSIAN CAKE. Whisk 4 egge with 9 oz castor sugar for about 15 min ., or until the mixture is freo from dark otreaks, then fold into it $\frac{1}{2} \mathrm{lb}$ flour previously sieved with 1 teaspoonful baking-powder. At the same time add $\ddagger \mathrm{lb}$. melted butter and, if necessary, a small quantity of milk.
Mix the whole lightly, then turn half of it into a small greased baking-tin lined with greased paper that reaches just above the sides. Colour the remainder of the mixture with a fow drops of cochineal, put it into another prepared tin of the same size, and bake both in a hot oven for ahout 10 min . Then turn the cake carcfully on to a sieve to cool and take off the greased paper. When cold, cut ench arke into long strips.

Warm a little plum jam, thinning it down, if necessary, with a little water, rub it through a sieve, and then take two strips each of the white and pink cake. Brush one side of each with the jam and atick them together, arrang. ing the colours alternately. Wrap the block tightly in grease-proof paper, lay it on one side, and then proceed to make another block in the same way.

Prepare some almond paste, rolling it out to a long, thin sheet. Brush the outsides of tho blocks with warm jam, then cover them with the icing, smoothing the surface with a knife whioh has been dipped in hot water. Sce Almond Paste.

RUSSIAN POOL. This billiard game is soap, as it cannot resist the alkalis therein played on an ordinary billiard table by two Gas ands electric light fittings, grates and or more players. Five balls are necessary, radiatorf, are among the great number of white, yellow, groen, blue, and black The artioles t that can be protected from rust white is the ball struck by the cue. A gaine by a galvanizing process. consists of 200 points, or any other number that may bo agreed upon

To begin the game, the black ball is placed on the spot, the blue on the centre spot, the green on the left, and the yellow on the right corner of the $D$. The striker then plays the white ball from within the $D$, and his opening stroke must directly strike the black hall. He can then play at any of the others The play is very similar to that in ordinary billiards. Scores are sccured by making cannons, by sending the white ball into a pocket off one of the others-a losing hazard, as it is called-and by sending a coloured ball into a pucket, a winning hazard. In Russian pool, however, the black ball can only be used for the two top puckets; the blue for the two middle puckets, and yellow and greer, for the bottoll two pockets. For a simple cannon 2 points are scored If the black is used for a hazard 9 points are scored. The blue scores 7 , the green 5 , and the yellow 3 .

The rules of the game are drawn up by the Billiards Association and Control Coisncil. See Billiards; Pool; Snooker Pool

RUST : How to Avoid. In the home all fittings or articles that are made of steel or iron arc liable to rust. This a speara in the form of yellow spots, and is due to damp, exposure to the atmosphere, and sther causcs which set up chemioal action in che metal.
There are a nuinber of methods of protecting domestic utensils from rust Stainless steel and rustless iron have been perfected. The former is used not only for table knives, but for fireirons, stair-rods, and other articles of the kind. Rustless iron is employed for making garden tools, fire grates, kitchen utensils, name plates, and blind littings.

Galvanizing is a protection against rust in certain cases. It is suitable for bolts, chains, and other door and window fittings, as well as for bedstend and other springs, but not for anything that comes into contact with

Clean ilng Agents. There are various compositiol 18 for removing rust, but probably the most genorally useful cleansing agent is paraffing. Where the rust has been allowed to cat, into the metal some special hind of lubrifant inay be needed. For example, if the fireiryons have got badly rusted, a mixture of $t_{\text {wo }}$ parts of rottenstone and one part of sulo,hur is generally effective.
A useful method for cleaning up any iron $k$ fitchen utensil that has developed rust in the i/nterior is to put potato peelings in it with water and a lump of soda, and boil it up. For a tin kettle or pan that has rusted, a goud plan is to boil up borax and water in it and afterwards scour it thoroughly.

Articles that are not in regular usn or that have been put away for a time, during the holidays, for instance, should be safeguarded against rust. Many housewives are in the habit of using vaseline for this purpose, ot hers apply lard. An effective preservativo may be made with lard and camphor, in the proportion of $\frac{\downarrow}{2}$ oz. of the latter to 1 lb . of the former ; a little blacklead may be added as colouring. Grates, fireirons, etc., should be rubbed with this coniposition, loft for 24 hours, and then dried with a cloth. They will be rustproof for some time afterwards.
RUST FUNGI. Roscs, carnations, chrysanthemums, and other garden plants are liable to be attacked by rust, a fungoid diseaso appenring in the form of brownish or deep orangc patches. It is very common among wild roses, and its spores are carried to cultivated kinds by wind, insects, and birds.

Leaves and stems of roses are both liablo to infection, and infected leavea must be carefully collected and burnt, whilst other parts should be eprayed with a solution of potassium sulphide, 1 oz . to a gallon of water. Other plants may he treated in the same manner. See Rose.

## Rustic Work in Garden Furniture

The Making of Seats and Other Requisites for Outdoor Use
For thls form of crafismanshlp, the reader should consult, in oddtiton to the contribution below, the
entries on Archi : Pergola:
Under the heading of rustio work is grouped all that class of work, such as the construction of garden seate, small summer bouses, arches, and the like, which is built up by the most simple methods from unhewn timber. The material can be obtained at low cost in country districts, and is variously known as cordwood and poles. The best material is oak, but any of the hardwoods, such as chestnut or hornbeam, answer vcry well.

Opinions differ as to stripping off the bark where flowering plante are to be trained over the structure, there is far less risk of harbouring insects if the bark is peeled off The timber may bc varnished or treated with wood preservatives, but many prople prefer toretain the natural colour. Rustic work in cludes decoration with eleft timber, which offers considerable scope to the amateur wood. worker.

So far us jointe are conccried,


Rustic Work Fig. 1. Armchair, with details of the principal joints employed in its construction
these are almost always made with stout nails. either of the French or wire pattern, or of the wrought iron cut class. To ensure firm contact between the joints, both of the meeting surfaces should be slightly axed, to form a more or less flat surface where the parts fit together. as in Fig. 4. It is impossible to get any set design for this class of work, as the material. heing in its natural state, will be of quite dilferent shapes.

The timber used may be either the smaller branches of such trees as oak, the roots of fallen trees, or if straighter wood is required, having at the same time the natural appearance, the branches may bo trimined off the tops of such trees as larch, so as to leave the branch knots sticking out a few inches in a very rough state.
Rustic Armchair. Fig. I showsa rustic armehair that is simplo to make.

more pieces, us illus trated in Fig. 2. The exact construction will be governexl by the material at hand. In any case ineans should be provided to support the hack, so that it will be firm and rigid. The apace between the top rail and the rear seat rail should be filled in with ocld pieces of rustic material, arranging them so as to form rough dinmond-shaped openings, and nailing

Fir sapling or oak with the bark removed may be used. The front and book legs may he $2 \frac{1}{2}$ in or 3 in in dinmeter: the sent rails, arms, and top back rail about 2 in.; other rails If in. : and uprights on sides and back from ? in to If in. The general sizes for the chair are as follows Width over logs, 2 ft .3 in . depth over legs, 1 ft .10 in . height to seat, 1 ft 4 in . or Ift 5 in .; height to arm, $\geq \mathrm{ft} .4 \mathrm{in}$. height to top back rail, 2 ft .10 in . ; total height to top of back, 3 ft .2 in.

The principal joints are effected by means of dowels, preferably of oak. If we take the lixing of the seat rails to the legs as an example, the ends of the rails are slightly hollowed to fit them firmly to the top and seat rajl respecthe leg, as A, Fig. 1 The dowel is then prepared tively. The llat seat itself is of strong batiens and glued or painted in as indicated by the fixad to side rails on the legs at either end dotted lines. In the same way the top ends of of the seat.
the legs are bollowed to fit the arms and back rail respectively (see B) The arm is similarly fixed to the back leg.

The narrower rails and the uprights are fixed as at $C$. The end of the entering part is pared to a blunt point, and then driven tightly home into a hole bored to receive it. Fixing otherwise is clone with nails, these as a rule being driven in slantwise to provide a wedge. The seat is made from ten to twelve lengths of matcrial 2 in . to 3 in . wide, semicircular (or rather less) in scction. These are fised by nailing fillets to the inner faces of the seat rails. Across these fillets the seat laths, after being cut and trimmed to fit, are laid and nailed. Care should be taken to drive all nails well home. The back has a slight rake, so as to make the lean more comfortable.

Garden Seat. A strong rustic garden seat, such as that illustrated in Fig. 2, may be constructed in the following way. One end is lirst made up from three pieces of the wood, with the piece for the back, about 9 to 12 in . longer than the piece intended for the front, which should be about 2 ft . long These two pieces are joined together by the third or arm rest piece, using stout nails, and two cross members fixed in the shape of the letter $X$ between them as $n$ supprort. The other end is constructed in the same manner.

The two ends are joined together by longer pieccs, about 4 ft . in length, one to the front legs and onc to the back. These should be straight poles, or ordinary prepared wood of sufficient strength, as they represent the framework of the seat. Other lengths of rustic material are arranged as cross-braces hetween rails and front and rear legs, so as to hold them firmly together. The next step is to prepare the back, the top rail of which may be formed of a single piece of wood, or of two or

Fig. 3 shows how a seat can be built around the stem of a tree, so as to make a very pleasant garden sent for the summer time. The seat is supported by three legs, but where it surrounds the tree enlirely, more support will be necessary. The legs are cut to the required
length, set in position, and the arm-rest pieces fixed between the back uprights and the tops of the legs. The whole is rigidly braced with cross-pieces between the supporting legs, and the rails and supports for the seat The seat itself may be made in a similar manner to that described above

Joints in Rustic Work. In constructional work (e.g. the building of a summier house or the erection of a trellis) the important point is to see that the structure is rigid and stable. This is nccomplished by diagonal bracingthat is. arranging the timbers more or less in the form of the letter X The joints are mostly simple butt jointe, and are not inherently rigid. To remedy this defect the most practical plan is to cross-brace the uprights and horizontal members. The leading methods are described below, and other details will be found in the articles on Arch: Summer House : and Trellis.

Fig. 4 shows the method of axing the joints, that is, roughly flattening one side of each of the two pieces to the jointed, in order that they may fit together more conveniently for nailing.

Fig. 5 shows a good method of making a strong joint for; say, the seat rail to the legs of a ohair. It consista of sawing and ohiselling out a small piece of the leg in the manner shown, in the requisite position on the leg, and of such width that the rail will fit exactly into it. The joint is secured by ineans of a nail, or nails, driven through the leg into the top of the rail. The end of the rail should be sawn off as flat as possible.

The method of nailing the cross-pieces is illustrated in Fig 6, which shows a flat iron being held at the back. It is necessary that some means should be provided for the aupport of the material against the blows of the hammer. In some cases it might be better to use a large hanimer as a support, or the head of a small axe, but in general the means provided are governed by the position of the joint to be nailed. If some support is not given, the repeated blows of the hammer may not only cause the jointing pieces of wood to slip about, but might also break some other joint that has already been made. All nails should be driven well home, and if the points project, these should be clinched and Hattened


Rostic Work. Fig. 4. Axing the jolnt. Fig. E. Making a strong joint. Fir. 6. Nailing with flat iron at back for sapport. Fig. 7. Finishing of ends with spokeshave. Fig. 8. Another finish, with rouge and mallat
down, so that there is no possibility of their catching into and tearing garments.

Two methodr by which the ends of the rails and arm rests may be finished are shown in Figs. 7 and 8. In Fig. 7 the edges are being rounded off with a small spokeshave. This inas the advantage that the chance of getting splinters in the hands is greatly minimized, and avoids a good deal of damage to the cnds, as often, if the end is knocked, and the edge is still in the rough state, the outside grain is splintered, necessitating the splintered piece being torn right off. In the method shown at Fig. 8 a gouge and mallet aro employed and the end worked round as indicated.

RYE: Its Uses. Flour made from rye grain is suppused to contain more gluten than any other Hour except wheat. Because of the many diseases that attack rye, this flour is used only to a small extent, but when free from disease, it forms a palatable and nourish ing food for those with whom it agrees. With others, however, it sometimes causes stomach trouble and diarrhoea, and a great number of epidemics have been traced to its use. It niakes good, if rather coarse, bread, and can also be used instead of thour for making girdle cakes.

RYTOL : The Developer. This is a photo rraphic developer in tabloid form which is made by Burroughs, Wellcome \& Co., Ltd. It is an all-purpose developer of the paramidophenol class. It is clean-acting and nou-staining and aeeds only to be dissolved in water with a tabloid of rytol accelerator.

The tablet form makes it very convenient to store and to take about when developing has to be done on a journey or away from home. For normal dish development rytol is used as follows


The tabloids are broken up in the water with a glass rod, and, if atirred a little, dissolve quickly. Tables for development with rytol by time and temperature, for all brands of plates and films, are given in the Wellcome Photographic-Diary. The Watkins' development factor for normal contrast at normal strength is 12 See Developing.

SABLE: The Fur. The costly and highly prized fur known as sable is obtained from the animal of the same name, a species that is closely allied to the common marten.
There are several varieties of sable, that known as Russian sable being the most valuable. This is glossy and dark hrown in colour, and in the liest akins merges into a dim black towards the back. The darker the fur is the more valuable it becomes.

Cheaper kinds of sable are those exported from Canada. These also are thick and soft, but they are of a lighter shade, and are tinged with yellow. Experta are employed to hrush the tips of such sable with dye so that they more closely resemble the best Russian variety See Fur; Kolinski; Marten.

SACCHARIN. Glucidum, or saccharin, is an intensely sweet coal-tar product used instead of sugar by those suffering from diabetes, corpulence, and other affections in which sugar may be injurious. It ranges in aweetness from 300 to 600 times that of cane sugar, but has no nourishing qualities, and is excreted from the body unchanged. See Diet; Sugar.

SACCOLABIUM. The stove cpiphytal archid called saccolabium requires a temperature from $65^{\circ}$ to $75^{\circ}$. It may be grown in hanging baskets of teak, attached to blocks of wood, or in pots filled to the rim with crocks, charcoal, and splagnum moss. Its
growing period is March to November, and extent, everything depending upon the make resting time November to March. The plant and the care which has lioen bestowed "pon demands a moist atinosphere, and must then. The life of a saddle is increased many always be grown near the glass. It should be years by proper attention, whereas it is dewatered generously from March to September, and moderately afterwards. Propagation is by offeets. See Orchid.

SACHET. The small perfumed cases sold by chemists and used to impart a delicate fragrance to women's clothes are known as sachets. They are than liquid perfumes, but are often more lasting.

Larger sachets are made for holding handkerchiefs. gloves, stockings, etc. They are simply large squares or ohlong pieces of wadding. plentifully sprinliled with perfumed pow der, covered with fine muslin. and finally sewn into satin or sill: coverings and trimmed with embroidery, painting or ribbonwork. The edges In saddle-rooms airers
 ainting or ribbonwork. The edges In saddle-rooms airers and wooden liorses arc larger sachets are made in the same way and is dry, the lining should le brushed with a stiff used as nightdress cases. A long strip of wadding can be perfumed, covered with muslin and used as a lining to a drawer. On it resta the underwear, which absorbs the faint perfume, and can be protected with a similar covering sachet to keep out the dust. See Lavender; Night Wear Case ; Pot Pourri.
SACK: A Spanish Wine. The old name of a dry Spanish wine resembling sherry was sack. The following is Sir Walter Ruleigh's recipe for sack posset: Boil together $\frac{1}{2}$ pint of sherry and $\frac{1}{2}$ pint of ale and add gradually a quart of boiling cream or milk. Swecten the mixture well, and flavour with grated nutmeg. Put into a heated dish, cover and stand by the fire for two or three hours.

SADDLE : For a Horse. A good fitting saddle is just as important as a good fitting pair of boots. A badly fitting saddle is one of the most fruitful causes of injury to the back and withers of the horse and may either temporarily or permanently disable the animal. No matter what the shaple of a home may be the suddle has always a tendency to work forward, so that unless it fits properly, bruised withers and galls will result. Apart from this, comfort to the horse means conifort to the rider, loth of which features are inseparable from a properly fitting sarldle.

The rules for sidille fitting may lie summarized as follows: There inust be no pressure on the withers. There must be no pressure on the central line of the hack. Shoulder-blade movement must be ahsolutely free. There must be no pressure on the loins. The ribs must bear the weight in all evenly distributed manner, extending from the play of the shoulders to the last rith on either side.
In buying saddles many persons purchase second-hand ones, preferring one that has been used to a new one. The best saddlers have generally a number of these on sale, and are quite willing to fit them, or allow approval to approved clients. Good second-hand saddles are always in demand, and can be bought for about 75 per cent. of their original cost, in some cuses for less than half.

If it is a second-hand saddle that is desired, particular care should be taken to note the condition of the leather, the stuffing, the strength of the saddle-tree, the breadth and width of the arches, and the quality of the leather. Second-hand saddles vary to a large
in weight and ligh a francwork of stecl and wood, with hair st ultings. The sidesaddle, though still used by horsewomen, has been largely superseded by the seat astride

Directly a saddle is taken off the horse's back it should be exposed to the air in order to dry the lining, after removing the girths and stirrup leathery, and sponging the surface of the leather with warm water to re move mud stains. creased through careless treatment. It is a safe plan never to buy a saddle that has been either patched up, restitched, or repadded

A saddle suitable for $n$ hunter or hack ahould be made of the clioicest pigskin, light kept for this purpose. As soon as the saddle
is dry, the lining should lie brushed with a stiff brush, and the leather trented with a good saddle soal), polished with a brush and rubber.

The saddle should be kept covered up when not in use, and never left exposed to the emanations arising through decomposing organic matter from the stable, as nothing tends more towards rotting the leather. It is a great mistake to have saddle brackets placed in stables, and what applies to the saddle is equally applicable to harness. Another matter is to avoid the use of too much water. A sponge and chamois leather will Jo all that is necessary towards the renoval of mud and mud stains In suminer the saddle should always be aired in the open, as artificial heat destroys the vitality of leather. See Harness; Horse; Riding, etc.

SADDLE : Of Mutton. This is a largo joint consisting of the double loin from both sides of the sheep. The usual method of cooking is roasting as described under the general article on Mutton. See Carving.

SAFE: For the Home. A safe is a strongly built container, usually of steel or iron, it which money nnd other valuables can be ke"t secure. In its construction special devices have been introduced in onder to guard against the risk of fire and the attacks of burglar. There are various patterns, some of which aro suitable for the home, and a few of these are here described.

In one form the safe is very small, and equal in dimensions to an ordinary brick, being built into the wall in the place of $\Omega$ stretcher, that is, a brick which is laid lengthwise to the direction of the brick work of the wall. The brick is removed from the wall and the safe built into the cavity. Such a safe is located usually behind a picture or other article of furniture to concenl its whereabouts. A hiding place for a small safe or a strong box can be contrived beneath the lloor boards, locating it in $n$ situation where it is ordinarily concealed by a carpet.

The safo illustrated is $1 f$ in. thick at the thinneat part, has a drill-proof door, drillproof rivets, and two gunpowder-proof nonbreakable locks. The internal arrangement usually comprises shelf and drawers, the latter being provided with locks and keys.

Home Safes. To assist saving, a home safc can be obtained from all post offices where banking business is transacted. This safe is a locked box, the key of which is kept by the
post office authorities, who will open it when it is brought in and place its contents to the credit of the depositor's account. There is no oharge for a sale, but at least 2 s . must be deposited in it when it is taken out.
Home snfes are also supplied by the banks. From the Midland Bank, for example, a strong box of convenient size, with separate compartments for coins of various denomina tions and for notes, can be obtained on opening a home safe deposit account with an initia deposit of ls. or more. The key is kept by the bank and the contents are credited to the holder's account from time to time as the safe is bought to the bank and emptied.


SAFE IIGHT This is a0merther ber term uscd to indicate a light by whiol sensitive plates or papers may safely be developed. Actually no light is completely safe. If a plate be left near an ordinary dark rooms lamp with a coin upon it for 5 min ., and is then developed, an image of the coin will be seen on the plate.
The guiding rule in dark rocm illumination is to liave sufficient light to work in comfort without allowing any direot rays from the lamp to fall on the plate or film, and to avoid exposing the plate or film even to rellected diffused light longer than is absolutely necessary. Thus during development the developing dish can be kept covered with a card, lifting it only for a few seconds when examination of the plate is necessary.

A large light in the dark room is better than a small lamp. With the large lamp properly arrunged there is ample light to see all objects in the dark room, and to work in comfort, while the plates, if kept out of the direct rays of the light, are much less likely to be fogged than if they are held close up to a small so. called ruby lamp, which may be, actinically, extremely unsafe, and yet leaves the dark room in an unoomfortable, murky gloom.
The ideal arrangement is a ceiling reflector lamp, such as that shown in Fig. 1, by which the whole of the dark ronm is illuminated, hut with diffused light, so that no direct rays can reach plate or film. The screen should be about 10 in . by 8 in.
The Wratten darkroom lamp (Fig. 2) made by the Korlak Co. for gas, oil, or electric light, takes screens 7 in. hy 5 in . and 10 in . by 8 in These acreens are interchangeable according to the work in hand.

The screens for these lamps are sold separately as anfe lights, so that the amateur may aclapt an old lamp if sufficiently large, or may contrive one for himself out of wood if for electric light, or tin if for gas or oil, the whole of the interior being painted dead white.


Safe-light screens arc of different oolours according to the purpose for whioh they are required: pale yellow, for gaslight papers ; orange, for bromide papers; red, for ordinary plates and films: deep red, for fast ordinary and orthochromatic plates ; green, of various shades, for very fast orthochromatio and most panchromatio plates.

A fairly simple and satisfactory form of red light is made by placing a small electric light in a red liquid. Dissolve 100 gr of eosin dye and 1 oz . of potassium bichroniate in hot water, using just sufficient water to dissolve all but a small portion of the dyc. It is essen. tial fhat the solution bould be liltered before use
A small lamp, such as a pocket lashlight bulb or a motor headlight bulb, should be used, care being taken to protect the holder and the wire from conthot with the solution. Holder and wire may be covered with insulating tape coated over, after it is in place, with Chatterton's compound. A wide-necked bottle is filled just below the neck with the solution, and the bulb inserted, the wire being led through the cork. 'This will be a safe light for all ordinary plates, but not for panchromatic plates and filnis. See Dark Room; Developing

SAFFRON: In the Garden. In the garden this is Crocus sativus. In its cultivated forms it provides the saffron of commerce, a colouring matter obtained from its dried stigmas. It flowers in autumn, and should be planted in August, and will thrive in ordinary well-drained soil. See Crocus; Meadow Saffron.

SAFFRON: Uses in Cookery. The yellow colouring and flavouring agent known as anffron is manufactured into saffion water or essence, which can be lought in small
castor augar, mix them till a liquid is lormed, and then add $1 \frac{1}{2}$ gills hot milk mixed with the prepared aaffron water Strain the whole into a well made in the centre of the flour, etc., mix all to $n$ rather slack dough. then cover the basin and leave its contents to rise in a warm place for about $1 \frac{1}{2}$ hours.

Turn the dough on to a floured board, knead it for a few minutes and then divide it into small equal portions Mould each to a smonth bun shape, and place them on a greased baking-shect, leaving a space between each to allow for them to rise. Let them stand in a warm place for another 20 or 30 min . : use more flour to mould ; then bake them for about 15 min . in a hot oven.

When cooked, bruah them over with a glaze made of $\frac{1}{2}$ gill milk and 1 dessertspoonfu! castor sugar, and return them to the oven for a few seconds so that they miny dry

Saffron Cake. The use of the saffron not only Havours the cake, but gives it a bright yellow colour. Prepare the saffron water as for aafiron bun. Make the cake according to the recipe given for plain cake in page 174, saffiron water lseing used to moisten the dry ingredients mixed with an equal cuantity of mills to make rather leas than $\frac{1}{2}$ gill of liquid in all.

Saffron Tea. This is made by infusing a pinch of dried allron in a gill of hot water for a bout 10 min. , then straining it out and adding $\frac{1}{d}$ gill or more brandy and sugar to taste. The tea may be served either hot or cold.

SAGE. Chiefly used in cookery for flavouring and scasoning, sage is a hardy berh. The seed should be sown in a sunny, well.


Sage. Leaves of the fragrant tonjo berb
drained soil in carly spring, and the young plants shifted he sonn as thoy are large enough to handle. Stock is hest increased by slijes or cuttings, which may be taken annually. When the shoots are ready to out they should le tied up in bunches and hung, foliage downwards, in a dry loft or shed. The leaves may be rolled off when quite crisp and stored in dry, airtight hottles.

Sage Gargle. A good gargle can be miade by boiling $\frac{1}{2}$ pint sage leaves in, 1 pint water until the liquid is reduced by one-half. While boiling leep the pan covered, only removing the lid to observe the relluction of the liquor. Then atrain it and mix with the liquid an equal quantity of vincgar, port wine, and $1 \frac{1}{2} \mathrm{oz}$. honey. Bottle it for use, nnd warm it when required as a gargle.
Sage Tea. To make sage tell, put into a jug foz. freah sage leaves, jour upon them 1 pint
boiling water. Cover the vessel over and infuse it for 10 min ., then strain the tea and take as a tonic dose from $\frac{1}{2}$ to 1 wineglassful.

Sage WIne. To make 2 gallons of this modicinal wine ? peck sage lcaves will be needed, 2 gallons water, the whites of 2 eggs, 8 lb . raisins, 2 lemons, 1 orange $\frac{1}{2}$ pint brandy. $\frac{1}{2}$ oz isinglass, 3 oz sugar candy (brown) Piok the sage leaves, using either red or green Stone the raisins and cut them small. Loose dessert. raisins are best.

Boil 1 gallon water with the whites of the eggs, and pour it over the sagc leaves, which should be put into a wooden bowl. Put the rasins into another bowl with the rinds of the lemons and orange pared thin, also the strained juice, and pour over thess the remainder of the water, which should have been boiled up and allowed to become lukewarm. Cover over each vessel and leave till next day, stirring both occasionally

After leaving them the required time, mix both liquids together, and let them stand again, but this time for $\mathbf{6}$ days. Then strain into a cask or stone jar, previously putting into it the sugar candy. Let the wine work, and keep the vessel full while the fermentation takes place.

When the wine ceases to work add the isinglass and brandy and bung it up. Let it stand 10 weeks, then if not clear pour it off, strain, and return to the cask or jar with another $\frac{1}{2}$ oz. isinglass. Keep it twelve months before bottling.

SAGINA. This is a close-growing carpeting plant, known as pearlwort, which is sometimes used as a groundwork or an edging to Hower lorders: it bears tiny white flowers in summer. The yellow-leaved variety, aurea, is a favourite plant for use in carpet bedding designs. Ordinary soil suits it and propaga tion is by division

SAGITTARIA. The handsome water plant known as arrow-head or sagittaria is about 2 ft . in height, with spiky leaves and white flowers. The double-flowered variety is liner. It is in blossom in early summer, and should be planted in water about 10 in . deep. When first eatablished the roots may be sunk in a basket, after the manner of planting water lilies. Propagation is by seeds sown in spring-time, or by division of the roots of the plants at that period. See Water Lily.

SAGO. The best kinds of sago, which is prepared from the pith of a species of palm, are known as pearl sago, and are sold in amal and large grains. Sago is fairly nourishing, and its importance as a food may be compared with that of rice or potatoes. Its value for invalids consists mainly in its soothing effect on the stomach.

To thicken soup with sago, sprinkle it into the soup while boiling and cook it about 20 min ., stirring often to prevent it from be coming lumpy or sinking in the pan and browning. Use 2 oz . sago to each quart of soup, and cook tho grain thoroughly.

Sago Drink. Sago makes excellent invalid drinks and can be prepared in two ways. One method consists of putting 1 oz . rather large pearl sago into a saucepan with 1 pint cold water. Place the pan back from the fire, but in a warm position, and let the grain soak for 2 hours, then bring it to the boil and simmer for 20 min ., stirring frequently. Add 1 wineglassful port wine, a little grated nutmeg, and sugar to taste, and serve hot. For the second method, soak 1 oz. simall sago in cold water for 1 hour, strain off the water, and add $1 \frac{1}{2}$ pints new milk. Stir this over the fire until the food value of the sago is quite incorporated with the milk, add a little grated nutmeg, and sweeten to taste. Strain off the milk from the sago just before the latter has softened, sweeten and flavour it, and leave it to cool. It should be skimmed before serving.

Sago Mould. To make this, boil up I pint tail. Therc should be black shadings in face milk in a pan with a few pieces of thinly cut and ears. See Dog: Kennel. lemon rind, then sprinkle in 3 oz . washed sago, and simmer the whole gently until the mixture thickens and the sago is cooked

Keep it well stirred, take out the lemon rind, and let the mixture cool slightly at the side of the fire before adding 1 oz butter, if dessertspoonfuls sugar, and a beaten egg. Stir all these over gentle heat for a few minutes so that the egg may cook, then pour them into a wet mould and lea ve them to set. Serve the mould either with jam or stewed fruit
Sago Pudding To make a plain sago pudding. soak 3 oz . small sago in cold water for 1 hour. Meanwhile boil up slowly it pints milk, adding 1 oz sugar and a strip of lemon rind Pour of the water from the sago and stir it by degrees into the boiling milk; let all boil slowly for 15 min ., taking care to stir frequently. Remove the lemon peel, pour the mixture into a greased pie-dish, and bake it in a slow oven for about $\frac{1}{2}$ hour. Always boil the sago with the milk before baking the pudding; if this is not done the grain is liable to sink in a mass to the bottom of the pie-dish.
A richer pudding is made by beating 2 eggs with if oz. sugar and adding them to the sago and milk before turning it ifito the pie dish Omit the 1 oz . sugar given in the previous recipe. Butter the pie-dish for the richer pudding, and scatter 2 or 3 small pieces of butter on the top when the pudding is ready for the oven; also dust with castor sugar Bake about 20 min .

Sago and apples together make another good pudding Prepare it by soaking 2 to 3 oz . washed sago overnight in a pint of water, and the following day add $\frac{1}{4} \mathrm{lb}$. sugar and 5 or $(\mathrm{i}$ moderate-sized apples, peeled, cored, and finely chopped. Mix these well, then turn them into a greased pic-dish and bake them in a moderate oven for about 1 hour. The pudding may be served either hot or cold, and with cream or custard
SAILCLOTH. This fabric is a sort of duck made in cotton, linen or heinp, and in several degrees of coarseness and heaviness. Very stout cloths for outdoor structural uses or making hammocks and atretchers for deckchairs, can bo got from firms manufacturing window blinds for shop-fronts. The choice should be guided by the purpose in view. See Canvas.

ST. BERNARD. This dog may be either rough-coated or smooth, points otherwise being the same. They should have enormous bone, with absolutely atraight front legs, and no inclination to be cow-hocked behind. The latter, however, is not always achieved, as heavy dogs are very troublesome to rear straight. The richer the colour the better. It may bo red, orange, various shades of brindle, or white with patches of either. In portance is attached to the distribution of markings, which include white muzzle, white blaze up face, white collar round the neck, and white on chest, forelegs, feet, and end of


St. Beriard. Smooth-coated specimen of this bandsome breed of large dog

ST. BERNARD'S LILY. The popular name of a hardy herbaceous perennial (Anthericum liliago) in St. Bernard's lily. It grows 2 ft . high, has narrow leaves and bears white. Howers in summer.

St. Bruno's Lily (Anthericum liliastrum) is 3 ft . high and has large, white, funnel-shaped, ily-like flowers.

If the soil is clayey, leaf-mould and sand should be dug in frecly before planting. Propagation is by division in spring.

ST. CLOUD WARE. The soft-paste porcelain made at St. Cloud, ncar Paris, at the end of the 17th century represents the oldest chinaware produced in Europe, and it wis the

st. Cloud Ware. Pastille barner in modelled write porcelain: early $18 t \mathrm{~h}$ century. Heigat 5 in . Ull vernitasion of the Director. Victoria Alvert
forerunner of Sèvres. The fine regular paste can be recognized by its yellowish tinge, and the forms, which imitated those of China and Japan, were decorated with simple designs in a rich blue outlined in black, and heightened by a brilliant glaze. The factory was closed i 1773.
There is an ainple supply of whito pieces with modelled ornament, in the form of cups and saucers, jugs, flower-pots, statuettes and grotesque figures. A Chinese pattern especially favoured for reproduction was a white porcelain with prunus blossoms in relief In painted ware the underglaze-blue decoration prevails, but there are also pieces with red, purple, and yellow enamel. See Sèvres.

ST. DABEOC'S HEATH. A beautiful hardy heath (Daboecia polifolia) which grows wild in parts of Ireland and is often called Irish heather. It is about 12 in . high and bears urn-shaped reddish purple flowers in late summer; the white variety, alba, is very pretty. This heather should be planted in lime-free loamy soil ; peat may be added with advantage.

ST. JOHN'S WORT. A group of hardy flowering shrubs and plants (hypericum) of considerable value in the garden. One of the most useful of all is Hypericum calycinum (Rose of Sharon): it thrives in shady places and bears large yellow Howers in summer; it should be cut down each spring.

Androsaemum, 18 in., yellow flowers and black fruits, and inoserianium, 12 in ., are other good kinds. The best of all the shrubby species is Henryi, 2 ft . high. Coris is a charming little plant for light soil in the rock
garden. All have ycllow flowers and thrive girls than in boys. It may first be noticed in ordinery soil. The shrubly kinds are increased by cuttinge in a frame in summer, the others by division in spring.

St. Joseph's Lily. This is one of several names given to the Madonna lily (Lilium candidum). See Lily.

ST. JULIEN : The Wine. One of the best known brands of French claret is produced in the St. Julien district in the Nedoc. The name is often applied loosely to oheap clarets The higher-clnss St. Julien grouths nre of deeper colour and greater body and variety than the more delicate prorluots of Latour and Lafite. The bouquet closcly resombles the raspberry.

ST. VITUS'S DANCE. St. Vitus's dance, or chorea, is a nervous disease of young children which is much more common in
bout the unconsciously to jerk the hands or limbs about, twist the head, or pull faces. Instead of walking normally, the ohild's gait becones a series of jerky, irregular movements. An inherited nervous dispusition, debility. fright, or precociousness of mind are predisposing causes of the somplaint.
A child auffering from chorea shquld be placed at once under medical care, if for no other reason than that it is liable to or may be actunlly suffering from rheumatic discase of the heart. Rest in bed may be nocessary at the beginning, with a liberal diet of milk, eggs, and soups. Except in severe casps the symptoms pass of during slcep When the child is allowed up, and particularly when it goes out of dorre, care stoulld be taken to protect it from tho teasing of other ohildren.

## Salads and Accessories to Salad Making

## Many Dainty Ways of Serving these Health-giving Dishes

This aricie deals with a selection of appelizing salass, which in their various seasons fand place in the menu all the year round. Sec also Fruit Salad: Hors d'Ocuvres: Mayannaise: Ollve; Supper; Tarragon: Vinegar

Salads may be divided into plain aalads which accompany some dish and skilfully composed salads which form a course in themselves. The former kind are made of salad herbs and vegetablea, either raw or cooked and allow'cd to become cold, with the occasional inclusion of certain fruits. The latter kind contains among other salad ingrodients nuts, eggs, fish, cliceao, meat, game or poultry; or are composed entirely of mised fruits and served as the sweet coursc at luncheon or dinner. The secret of success lies in the proper blending of ingredients and the cool, inviting appearance of the finished salad. This may be served in a glass, china or pottery howl, or individual portions may be placed in salad saucers, or on glass plates. Fig. 1 illus. trates a plain salad appetizingly arranged in a out glass bowl, with glass servers, oil and vinegar bottles and salad plate. Fruit salade may be
served cither in a fruit set or in sundae glasses.
In making salads the first easential is to see that the ingredients are perfectly fresh. If tinned goods are used, they should be of first-class quality and removed from the tin immediately after opening it. In warm weather salad herbs, fruits, etc., gain added crispness by being kept for a few hours in a refrigerator When this is not possible a wire vagetable raok placed in an airy larder is the best receptacle to hold such items as endives, bunches of watercress, spiring onions, radishes and lettuces.

Salad vegetablos should be handled as little as possible, but must bo washed thoroughly in cold salted water. Watercress requires cleansing in several waters, mustard and cress should have the small black sceds removed. Endive and lettuce are prepared by cutting off the root and any outer leavea unft for use; the smallest leaves and henrt should be set aside for garnishing the top of the salad. Outer leaves of lettuces should be torn in pieces and not cut. The roots of spring onions should be cut off and the tops trimmed before washing, and afterwards the outer skins removed. Radishes may be sliced, but if small, round, and of bright colour, they form an effective garniah when left whole.

Alds to Preparation. Wire baskets are sold or straining the water out of lettuces, etc. after washing them. A clean cloth should be used where a basket is not available, held by the corners and the walad shaken gently in it until the ingredients are dry Moisture left on lettuce and other vegetables mins the salad and prevents the dresaing from properly adhering to them. The strainer illustrated in page 673 can be used as a salad basket; and another excellent device shown in the same page is the tomato slicer. A cutter with which cucumbers can be finely

Salad Dressings. The dreasing should not be added to the salad until it is ready to serve A good way with a green salad is to place the made dressing in the bottom of the bowl, reserving the portions of the salad to be used as garnishes, put the other ingredients into the drcssing and mix thoroughly. A simple French dressing is served with salads which accompany gamo, poultry, etc., but a mayon naise or thickencd dressing is usually best for those served an a separate course, with the exception of a salad composed entirely of fruit. Fruits such as bananns, apples, oranges, pincapple and chopped or ground nuts are now introduced into green salads and dresserl with mayonnaise. The best oil and vinegar should be used for dressings Rancid oil or malt vinegar completely ruin the flavour. Lemon juice may be subatituted for vinegar and oream or unswectened condensed milk is an excellent addition to a thick dreasing. Dircetions for making a mayonnaise dressing aro given in page 778.
A French dicesing for the lettuce and endive salad to accompany pqultry, eto., is made by mising 3 parts best salad oil with 1 part white winc vinegar. The lettuce leaves are dried, put into a basin, seasoned with salt and pepper, and equal parta of chopped tarragon leaves, chervil, parsley and chives (or onion) are scattered over them The salad is carefully lifted out when required, leaving any moisturc that may have drained from the leaves in the bottom of the hasin and placed in the mixed oil and vinegar in the salad bowl. The leaves arc turned about gently in the drcssing until thoroughly coated and served at once on side plates. The salad bowl may be rubbed round with a orust of bread containing a clove of garlic.

A dressing for a vegetable salad may be madc of 3 tablespoonfuls salad oil, 1 teaspoonful tarragon vinegar, 2 dessertapoonfuls white vinegar', salt, pepper, $\frac{3}{\text { teaspoonful madc }}$ mustard. The same quantity of lemon juice may be substituted for vinegar where the latter is not liked and ? teaspoonful castor sugar may be added. Put the mustard, salt and pepper into a basin and gradually stir in the oil; then add the vinegar, mixing throughly.

Salad Cream. A very good recipe for a salad cream whicl can be made in large quantities and stored in bottles is ns follows: The ingredients consist of the yolks of 6 hard-boiled cgga, 6 oz. butter, 2 oz . castor sugar, 룔 oz salt, 1 oz dry mustard, ca yenne pepper to taste, $\frac{1}{2}$ pint cream, $\&$ pint salad oil, $1 \frac{1}{2}$ gills white wine vinegar, 4 tablespoonfuls tarragon, chervil, and tonato vinegar mixed together, 2 tablespoonfula Worcester sauce, and 2 tea spoonfuls anohovy sauce.

Rub the eggs through a wire sieve, then pound them in a mortar till a perfectly amooth paste is obtained. Work the butter and sugar together until they are very light and creamy; in oold weather the butter inay be


Fig. 2. Cucumber slicer with which cucumberg can be thing and evenly cat. Fir. 3. Aluminiam erg cutter with which hard-boiled eggs may be sliced for garnishing salads
just melted, but it must not be allowed to oil or the mixture- will curdle. Add to the eggs the butter, sugar, salt, mustard, and pepper, and thoroughly incorporate them: then by degrees moisten the paste formed with the cream and, when that is mixed, work in the sauces. Last of all the ingredients. put in the oil and then the vinegars.
The oil must be mixed in first very carcfully and a few drops at a time. When thoroughly incorpornted add the vinegar. It is best to use the mortar entirely for mixing, as it prevents waste of ingredients If by any chance the salad cream curdles, it can be restored by placing the mortar in a pan of hot water and stirring till smooth again

A simple dressing may be made by passing the yolk of a hard boiled egg through a sieve, beating it line with a fork in a basin, then adding I saltapoonful dry mustard, saltspoonful salt, 1 teaspoonful castor sugar, I tablespoonful salad oil, I tablespoonful vinegar, and cayenne pepper to taste.

Brazilian Salad. This salad may be served either as hors d'oeuvres or as a separate luncheon course The ingredients are white grapes, apples, celery, brazil nuts and lettuce. Skin and pip the grapes, chop the apples, celery and nuts finely, mix with salad cream and place on crisp lettuce leaves either in a bowl or on small plates.

Butter Bean Salad. Soak and boil $\frac{1}{2} \mathrm{lb}$. butter beans until tender. Strain away the liquid. Add a little butter and seasoning to taste and leave the beans to get cold Mix with mayonnaise or thick salad dressing, and garnish with half slices of beetroot, strips of pimento and finely-chopped parsley.

Carrot Salad Raw carrot possesses dietetic value and a good luncheon salad may be made by grating enough carrot to fill a brealifastcup, sprinkling it with chopped parsley, a small piece of grated lemon rind, a dusting of pepper, salt and castor sugar. Add a little oil and lemon juice, just sufficient to moisten, and mix all togethe: Arrange small lettuce leaves lightly coated with the dressing round the salad, and garnish with freshly-grated carrot and pieces of olive.

## Cauliflower Salad. An excellent winter

 salad is made with cauliflower. Divide one large cold boiled cauliflower into sprigs. Sprinkle them with salt and pepper, and heap them up neatly in a salad bowl. Cut two tomatoes in slices and arrange them as a horder round, sprinkling them with a little chopped parsley. Pour about gill mayonnaise sauce or any other good salad-dressing over the cauliflower, and serve.Slices of beetroot which have been dipped in vinegar may be used with or instead of tomatoes.

Celery Salad. Equal quantities of raw apple and celery are cut into small pieces, placed in a bowl, and covered with mayonnaise sauce. A border of sliced tomato or bectroot may be added to this dish, which must not be prepared too long before it is eaten, in case the apple should become discoloured.
A nother celery salad which is excellent with cold pork, goose or chicken is inade of diced celery, beetroot and potatoes and chopped nuts. Cold cooked chestnuts may be used instead of the diced potato.

Cheese Salad. Cream checse is liked by most people as a luncheon salad ingredient, but any soft cheesc may be used or a cheess crab may be prepared. This is made from $2 \frac{1}{2}$ oz. dry cheese, $\frac{f_{2}}{}$ teaspoonful each made inustard and salad oil, salt and pepper to taste and enough vinegar to bind the whole into a paste. Grate the checse and mix with all the other ingredients until the paste is smooth. Serve small portions on a green salad previously prepared with French dressing.

When using a cream or soft cheesc cut it Continue these layers until the dish is full. into rounds, dip lettuce leaves in French arranging lettuce on top Garnish with the dressing and arrange round the bowl, place sieved yolk and chopped white of egg.

Lettuce and Fruit Salad. The ingredients are. I grape fruit, $\frac{1}{2}$ cupful chopped nuts. I cupful whitc grapes, 2 oranges, 2 tomatocs, 1 lettuce. Peel the grape fruit and orangea and divide into sections, skin and remove pips. Also skin and remove pips from grapes. Place fruit and nuts on top of lettuce, cover with mayonnaise and horder with tomato slices. Garnish with a tew grapes. shredded heads of 2 lettuces, add 1 ta blespoonful white tarragon vinegar, and season the mixture with pepper and salt. Then pile it high in the ccntre of a dish, cover it with mayonnaise sauce and garnish it with alternate groups of lettuce leaves, quarters of hard-boiled egg, shredded gherkin, and stoned olives. Endive may also be used as a garnish.

Crab Sa'aj. A good fish salad can be made by chopping up the flesh of a crab, moistening it with a little mayonnaise sauce, and then putting the mixture into 3 or 4 prepared tomatoes. The latter are scalded in boiling water for a couple of minutes, the skins removed, and an incision made in the top of each so that the inside can be scooped out with a small spoon. Sprinkle a little pepper and salt inside the empty tomato cases, and let them drain before filling them with crab. Garnish the salad with lettuce and cress.
Crayfish Salad. An equal quantity of crayfish flesh should be mixed with cold white fish which has been flaked and boned. Layers of lettuce, cress and endive, of lish and of hard-boiled eggs are placed in the bowl, cach layer being moistencd with salad cream. Sprigs of tarragon and chervil, cut gherkin, and strips of red chillies are used to garnish. Mayonnaise dressing may be used and a salad composed of turbot, halibut or hake without the crayfish can he prepared, and garnished with anchovies

Egg Salads. Hard boiled eggs may be cut in half and placed round a shallow glass bowl. In the centre is piled a mixture of diced potatocs and beetroot, seasoned and flavoured with chopped pickles, parsley and onion, and moistened with salad dressing. The eggs may be stuffed with pounded sardines and served on lettuce with a spoonful of mayonnaise sauce on each half of egg.
Another good egg salad is made of thick slices of hard-boiled eggs. An extra egg is boiled for garnishing and the yolk and white of this are separated; rub the yolk through a wire sieve. and chop up the white linely. Whip 3 tablespoonfula cream until it just hangs on the whisk, stir 3 tablespoonfuls mayonnaise sauce into it, and season the mixturc carefully.

Put a layer of crisp, clean lettuce in the hottom of the salad bowl, then one of egg, next of cold cooked macaroni cut into pieces about 1 in. long then a sprinkling of chopped celery and parsley, and a little dressing.

Lobster Salad.
To make a lobster salad. take the meat from a lobster, cut it into pieces of a convenient size, and season these slightly with salt, vinegar, and pepper. Shred some inner leaves of lettuce into the bottom of a salad bowl.cover itwjth a layer of lobster and нliced cucumber, and cover again with lettuce. Conlinue with these
plete, and decorate
 layers until the salad is complete, and decorate the top with slices of egg, tomato, or beetroot. Just hefore serving pour over some mayonnaise sauce and acld a sprinkling of powdered coral.

Orange Salad. A salad that goes well with roast meats, or accompanies wild duck. is made from a small cucumber, sweet oranges and chopped nuts. Most of the cucumber should be peeled and soaked for an hour in cold water hefore being cut into very thin slices. Prepare the oranges, removing all pips and pith. Arrange on cucumber slices and cover with salad cream, garnishing with the nuts and a horder of very thiuly cut unpeeled cucumber slices.

A good orange salad can be made by mixing the prepared orange quarters with chopped potatoes, apple and olives. The dressing for this salad is made of oil and orange juice, pepper and salt. and the salad is served on lettuce leaves, or in half orange skins placed in grape fruit glasses.

Prawn Salad. Take 1 pint shelled prawis, and sprinkle them with French dressing. Wash 2 moderate sized cabbage lettuces. and pull the leaves into small pieces. Put a layer of lettuce in the dish, cover it with prawns, then pour over it some mayonnaise sauce. Add another layer of lettuce and prawns, and continue until the bowl is full. Mayonnaise sance should cover the whole. The top should now be decorated with slices of tomato, cucumber, and hard-boiled egg, sprigs of cress, etc.

Salmon Salad. To prepare, take out the boncs, break the fish into flakes with a fork and pile it high in a salad bowl on a bed of green salad.

Pour over it some mayonnaise or salad dressing and leave it in a cool place for a little while before serving it; garnish with some sliced hard-boiled egg, a few crisp lettuce leaves, some cress, sliced gherkin and strips of pimento.

Sardine Salad. 'This salad is best served in individual portions. To prepare it, put a layer of thinly sliced celery in the bottom of each bowl, cover it with a little boiled and finely chopped onion, and then add a layer of sardines, skinned, boned, and cut into small pieces.

Cover this with some more celery, pour over it a little oil and vinegar dressing, and finally put on a layer of sieved hard-boiled
egg. Coralline pepper makes a good garnish for these salads.
Russian Salad. To make this salad, take 1 lb mixed cooked vegetables such as carrot. turnip. peas, French heans, potato and beetroot, and cut them into dice. Arrange them neatly in a glass salad bowl, adding a little cucumber and celery if liked: dress them with salad dressing made with crean or condensed milk instead of oil, and garnish with a border of sliced tomnto and chopped celery.

If preferred. a few sardines or anchovics boned, tailed and cut into halves may be placed on top of the vegetables. The chopped yolk and white of a hard-boiled egg may then be used as a suitable garnish
Another variety of Russian salad is made by arranging the flaked remains of any cooked white fish in a salad bowl, and covering the top with strips of anchovy and sardine, and some chopped gherkin, hard boiled egg, und capers. Slice some cold boiled potatoes thickly. place a border of these round the salad, and pour some mayonnaise over the centre.
Turkey Salad. An excellent supper salad is inade from pieces of cold turkey, which are cut uj and mixed with diced celery and sliredded endive and moistened with salad cream. Fresh, crisp lettuce leaves should be placed round the ealad and it should be garnished with chopped chestnuts, slices of hard-boiled eggs and gherkin.
Salad Bowl. Because salads are served in different ways, according to individual taste salad bowls may vary both in size and design. The larger ones, which are intended to hold walad for several persons, are deep bowls of cut or plain glass, pottery, china, or polished wood They are accompanied by salad servera, which consist of a two-pmnged fork and a spoon to match the bowl.
Smaller salad bowls, designed to hold just enough for one person, are also made of wood, glass, and china. They are sometimes preferred to the larger kinds, and are nlways useful on occasions when salad for une is required. Semi-porcelain, wood, glass, and pottery sets are obtainable for fruit salads comprising a bowl and six individual plates
SALAD BURNET. The hardy perennial herl, l'oterium, or salad burnet, bears leaves used for tlavouring salads and soups. It requires a sunny, dry position in ordinary light soil, and must be watered freely in time of drought. It is best planted during early spring in rows 6 in . apart and rows 8 in . asunder, removing Hower stems as soon as they appear. Roots should be lifted and replanted every year. Salad burnet is raised from seed sown in shallow drills during April or September.
SAL ALEMBROTH. The combination of perchloride of mercury and sal-ammoniac or sal alernbroth is a powerful antiseptio which has been used in surgery. Sal alembmth gauze and sal alembroth wool are useful antiseptic dressings for discharging wounds, ulcers, etc. The gauze and wool are usunlly tinted blue with un aniline dye, which becomes bleached when wet with the discharge.
SAL-AMMONIAC. Ammonium chloride is commonly known as sal-ammoniac. It is a common vapour inhalation in the treatment of chronic catarrhs and inflammations of the throat, larynx, and bronchial tubes.

Sal-ammoniac is used to make the electrolyte in batteries of the Leclanche type. See Ammonia; Battery; Bell.
SALE OF WORK. A sale of work is much the same ns a bazaar, though strictly speaking at the former nothing but needlework should be sold. In modern parlance the terms are practically interchangeable. Small sales of work may be held in the home with the aim of collecting money for charities. See Bazaar.

SALES : Advice About. The disposal of goods at reduced prices is known as a sale.

The time and manner of a sale vary according to the method and urgency of disposal, an auction sale being usual when the goods have to be sold without delay The sale of secondhand goods and many small articles is often effected through the advertisement columns of daily papers.

Special and after season sales are held for clothing and household furniture and requisites Bargains are often obtainable especially in slightly soiled house linen and blankets, in shoes, gloves, stockings and furs at the better class stores and shops.

SALICIN. A crystalline glucoside obtained from the bark of apecies of willow and poplar, salicin is used in the treatment of acute rheumatism. In the stomach and bowel it is converted into salicylic acid Pron. Sal-e-sin.

SALICYLATE. A salt of salicylic acid is called a salicylate. Those most often used in medicine are sodium salicylate, methyl salicylate or oil of wintergreen, salal or phenyl salicylate, and bismuth salicylate.

SALICYLIC ACID. A colourless, crystal line substance, salicylic acid is found in various plant products, including oil of wintergreen and oil of sweet birch, from which it can be prepared; but it is also prepared synthetically. It is used in treating ncute rheumatism, in doses of 5 to 20 grains but usually sodium salicylate, dose 10 to 30 grains, is preferred.

Excessive dosage with these substances causes symptoms of poisoning, referred to as salicylism, such as fullness in the head, noises in the ears, deafness. dimness of vision, sickness. delirium and cardiac depression. Such symptoms should at once be brought to the notice of the doctor.

Salicylic acid acts as an antiseptic, and is sometimes used as such in a lotion. It assists in dissolving off the horny cells of the skin and is used to remove corns and warts and in the treatment of skin disenses in which there is much scaling or thickening. See Aspirin:

## Wintergreen.

SALINE. Salts of the alkalis and of magnesium are used as purgatives under the name of saline. They include sodium sulphate, Rochelle salt or sodium, and potassium tartrate, sodinm phosphate, and Epsom salt or magnesium sulphate. The dose varies from $\frac{1}{2}$ to $\frac{1}{2} \mathrm{oz}$. Salts are best administered in warm water just after getting out of bed in the morning. Pcople who take salines habitually ought to take some other purgative, e.g. castor oil, at intervals. Sec Aperient ; Cathartic.
SALISBURIA. One of the most beantiful of all trees which are hardy in the British Isles. It is popularly called the maidenhair tree, because its leathets resemble the fronds of the maidenhair fern ; its hotanical name is Ginkgo biloba (Salisburia adiantifolia). The maidenhair tree is one of a limited number of leaf. losing conifers; it will eventually reach a beight of 60 ft . or more, though it is slow growing during its carly years. It is of graceful growth, and its fern-like leaves, which turn to pale gold in the autumn. are very beautiful. It thrives in ordinary soil and does well in town or country gardens.
SALIVA. The fluid poured out into the mouth consists of the mixed secretions of the salivary glands. These are the parotid, between the ear and the angle of the jaw; the submaxillary, under the horizontal part of the jawhone; and the sub-lingual, under the tongue. The saliva is an alkaline Huid; it lubricates the muuth and food, and digests starch by means of the ferment ptyalin which it contains. Among its various contents are the carbonate and phosphate of lime, which tend to adhere to the teeth and form tartar.
Muinps is an acute infectious disease in which there is inflammation of the parotid glands, and occasionally also of the other two
salivary glands Any of these glands may suffer from simple inflammation due to exposure to cold or injury, etc Hot applications to the skin over the gland may give some relief in early stages
A profuse llow of salivn, reteried to as salivation, may arise from dyspepsia, stomatitis, the excessive use of mercury and other drugs, such as arsenic indide of potassium, antimony, and tobacco and other causes The treatment depends on the cause.
SALLY LUNN. A kind of teacake baked in a round cake tin or cake ring is known as a Sally Lunn.

The following is a good recipe: Use 1 lb . flour, $\frac{1}{}$ teaspoonful salt, a scant $\frac{1}{2}$ oz. yeast, 1 teasponful castor sugar, 1 esg, $\frac{1}{2}$ pint sour milk or milk and water, and $1 \frac{1}{2}$ oz butter Save just sufficient of the egg as an egg wash for the cake when baked. Sift the Hour with the salt into a bowl and make a well in the centre, melt the butter in a pan, add the milk, and bring to the warmth of new milk.

Beat the egg, reserving a little ns directed, add to the milh, and varm it sufficiently to take the chill off it. Cream the yeast with the sugar, and gradually mix the milk and egg to it. Turn the liquid into the centre of the four and work all up into a dough, kneading it smooth.

Have ready four medium-sized tins, warm and grease them. Now divide the dough into four equal portions, work each portion into a smooth round, and lay them in the tins Place these on a baking shicet, cover them over, and set thein to prove in a warm place. When they have risen to double their size, hake them in n goud steady oven for 20 to 25 min. Turn the cakes out of the tins on to a cake-wire and brush the tops witli egg

Salmi. This term is used in cookery to deacribe a superior kind of ragoût made from game or poultry. See Game.
SALMON. Sometimes called the king of freshwater fish, salmon is, strictly speaking, also a salt fish, for it spends part of the year in the sea and the remainder in rivers. British salmon is considered the best, and is in season from early February to the end of August, but Canadian, Dutch, and other imported salmon can be obtained all the year round.

When buying salmon, select a fish with a small head and tail in proportion to its size, broad, thick shoulders, silvery bright scales, and tlesh of a pinky red sliade Salmon may be kept for several days after it is caught so long as it is stored in a cool place. but the fresher it is when cooked, the better
How to Cook. To boil salmon, remove the fins and gills, scrape the scales and cleanse the fish. Put it into a pan or fish-ketitle containing enough boiling salted water to cuver it, and let it cook slowly. The time required for cooking depends upon the weight of the fish, 10 min . being allowed for every lb . and 10 min extra

Salmon may also be grilled, but it should first be cut into slices about 1 in . thick, wiped with a cloth, and then brushed over with salad oil or melted hutter and seasoned to taste. Cook these before a clear fire or under a gas griller for about $\ddagger$ hour, and serve them with maitre d'hôtel butter, or any suitable sauce may be used.

To fry salmon, cut the tish into slices, wipe them with a oloth, brush them over with benten egg, and then coat them with breadcruinbs. Melt some fat in a frying-pan, and when it is smoking hot put in the slices, frying them on both sides until they are golden brown in colour Then drain them on paper and serve them hot with the addition of Hollandaise sauce.

When cooking chilled imported salmon, the flavour is improved if it is allowed to soak for an hour or longer in slightly salted water.
'I'hen dry the fish well, and cook by any o! the methods given for fresh salmon

Smoked salmon, cither cooked or in its raw state, is often served as hors d'oeurnes, while a special preparation of it, known ns lax, is preserved in oil. Both are cut into thin slices and garnished with herbs or pickles. Tinned salmon makes up into yood sandwiches, fish cakes, and various other delicncics

Salmon Cakes. Tinned salmon may be used to make tish cakes or fritters Break about half a tinful of salmon into flakes, mix it with \& lb boiled rice, and bind the two with the yolk of an egg. Add a little lemon juice and seasoning to taste, and heat the mixture in a pan over the fire. Then spread it on a plate to cool, shape it into round cakes, brush there over with white of egg, coat them with breadcrumbs, and then fry in smoking hot fat.
Salmon Chartreuse. Rinse a plain border mould in cold water and coat it thinly with melted aspic While it is setting remove the akin and bones from 1 lb . cooked salmon and pound the flesh in a mortar with 6 boncd anchovies and the yolks of 3 hard-hoiled eggs When the mixture is smooth, add $\frac{1}{2}$ glass sherry, the juice of $\frac{f}{\ddagger}$ lemon ; rub the whole through a hair sieve, scason it to taste with salt pepper, cayenne, and a little nutmeg, and then add to it a gill of lightly whisked cream and a little more than $\frac{1}{2}$ pint warmed aspic jelly. Pour the mixture into the prepared mould and leave it to set, serving it cold, with a little salad sprinkled witl। dressing heaped up in the centue.

Salmon Mayonnaise. Cold boiled salmon is needed to make a mayonnaise. Choose a middle cut of salmon, bo:l it according to the directions already given, and, when it is cold, take off the skin and cover the fish witl thick mnyonnaise sauce (sce paye 778)
Serve it garnished with thin, overlapping slices of cucumber If the fish is not specially cooked for the purpose, but the remains of cold ralmon are used instead, they may be flaked, piled up high on a dish, garnished with green salad, and the sauce poured over them.
Salmon Mousse. To make this, take the skin and hone from $\frac{1}{2} \mathrm{lb}$. cold boiled salmun, pound it well in a mortar, and then add to it a small teacupful of hot and seasoned fish stock in which a little gelatine has been dissolved.
Rub the whole through a sicve, then whip it up with 1 gill thick and slightly salted cream. Turn the mixture into a prepared souffé tin and place it in ice for a few hours before it is to be served. Chopped nspic makes a good garnish. See Fish; Lax; Maitne d'Hốtel; Potted Fish

SALMON TROUT. Salmon trout is a species of trout which migrate to the sea. In taste and colour their Hesh differs but slightly from young salmon. Salmon trout can be cooked according to any of the recipes given for salmon and trout. See Trout.

SALOL. By the interaction of salioylic acid and phenol (carbolic acid), salol may be obtained. It is insoluble in water, and is usually preseribed in cachets or suspended in mucilage. The dose is 5 to $\mathbf{1 5}$ grains.

Externally, it is sometimes diluted with powdered chalk or talcum as an antiseptic clusting powder. Internally, its chief uscs are as an intestinal disinfectant and in the treatment of rheumatic fever. In the intestine the drug is decomposed into carholio acid and salicylio acid. A solution in alcohol, with the addition of aromatics, is used as a mouth wash.

SALPIGLOSSIS. Amongat half-hardy annuals salpiglossis is valuable for cut bloom under glass, and showy for beds and borders outside. Propagation is by seeds sown in a frame or greenhouse in spring. Care must be


Salpiglossis. Brilliantly coloured flowers of an anoval plant much grown for ladoor decoration
taken not to sow too thickly, and to give the scedlings plenty of ventilation, or they may damp off. After they have leen hardened off the young plants may be safely planted out in June. Different varieties have such shades as blue and gold, golden yellow, gold-veined crimson, and purple. By sowing seeds under glass in September and growing the scedlings in alight warmth in ordinary potting compost a fine display in spring is assured
SALSIFY: The Plant. An excellent root vegetable for winter use which is casily grown in well tilled friable soil, free from fresh


Salsity, which somewhat resembles a parsnip in appearance and an oyster in flavour
emon juice. Put into a manure, from sceds sown out of doors in May ; the rows should be 15 in. from each other and the scedlings thinned to 8 or 9 in. apart.
During summer the only attention needed is to hoo frequently between the rows In autumn, when the tops have died down, the root may be lifted and stored in soil at the font of a wall or fence, or dug as required. If a fow ronts are left in the ground until spring, the fresh whoots, if out when a few inches high, furnish what are known as chards.

How to Cook. Salsify has heen popularly termed the oyster plant from its supposed resemblance to the oyster in flavour.
To prepare it as a vegetable, scrape the root gently, and lay it in cold vater to which has been added a tablespoonful of stewpan 98 much water as will a required to cover roots, add salt to it and let it boil up Drain the salsify, cut each stick into pieces 3 or 4 in long.

Plunge the pieces into the boiling milk or milk and water, add 107 . butter and a good squeeze of lemon juice, boil un and cook for from 30 to 40 min ., or until the pieces are
tender. Dish the salsify and keep it hot, then strain the liquor and keep it for making a thick white sauce with which to cover the roots Salsify may also be cooked according to any of the recipes given for celery. See Batter Fritter ; Sauce.
SALT: Household Uses. Salt is indis pensable in cookery and as a prescrvative of meat and other vegetables. One of the simplest and most effective of cleansing agents, salt removes stains and grease.
There are several grades of salt, and it is customary to keep the finest for the table and a coarser sort for cooking and other purposes. The latter is genemlly the pure rock salt, while the refined white table variety frequently has ground rice or some other ingredient added to prevent it from caking. All salt should be kept in a dry place, as it is highly susceptible to atmospheric changes and quickly loses its savour if allowed to become damp. Salt easily corrodes the silver or other metal of which many salt-cellars are made. and for this reason these should be lined with glass, kept clean and frequently replenished.

For culinary purposes salt is used for scasoning all dishes and is added to the water in which vegetables are cooked. Fresh fish or meat not required for immediate consumption should be spinkled with salt before being put away in the larder, and this precaution should never be omitted in hot weather, howevel secure the larder or meat safe may be against flies or bluebottles. In making ices the free\%ing mixture consists of ice well sprinkled with salt, which in dissolving keeps the temperature of the ice lower
Salt is an excellent cleanser for dishes of all kinds, especially for enamelled warc and for removing stains, for cleaning baths, bamboo furniture, ctc. Bcfore blackleading a kitchen range any grease spots should be got rid of, and this can be done effectively by rubbing with salt. When sweeping a carpet salt may be sprinkled over it to clean it and bring up the colour.

Amongst other uses for salt, a handful thrown in front of the fire makes it burn clear and hot for toasting. A bout a teaspoonful dropped into the bowl of a paraffin lamp will cause it to give a better light.
In medicine chloride of sodium, which is common anlt, has valuable therapeutic properties in the form of salt and brine baths. It is often employed as a gargle for the throat and is given as an emetic dissolved in hot wnter. See Emetic.

Garden Uses. There are various uses for salt in the garden; for instance, rock salt is an excellent stimulant for asparagus, bcetroot, and other vegetahles. This salt should be used at the rate of 7 lh . to the rod, but not more. Its valuc in this respect is due to the fact that it !iberates the potash already in the soil, so making it feed the plants that need it.
Salt is also used for killing weeds. It is useful for clearing them from gravel walks, especially in cases where, as domestic animals are kept, poisons cannot safely be employed. It should be applied in dry weather. See Fertilizer; Weed.

SALT BOX : How to Make. Owing to the corrosive effect of salt, the use of nails and metal fastenings is avoided as far as possible in making a salt box, which is usually of wood : because of the damp nature of the material the wood should be fairly thick and close grained. Beech is well suited for the work, but ash is often used, and American whitewood can be utilized. A convenient shape, illustrated in Fig. 1, incasures $10 \frac{1}{2} \mathrm{in}$. by 7 in . at the base, $4 \frac{1}{2} \mathrm{in}$. in front, and 7 in . at the back up to the lid. The wood is ${ }^{3} \mathrm{in}$. thick, the corners dovetailed.
Commence by planing up the front, $A$, to 49 in . by in ., and cut to 10 in . The sides, B ,
are the same thickness, and 7 in . wide, with a length of $7 \frac{1}{2} \mathrm{in}$. The back, C , is $10 \frac{1}{4} \mathrm{in}$. by $9 \frac{1}{2} \mathrm{in}$. by $\frac{3}{3} \mathrm{in}$. and the bottom, $D_{\text {, }}$, $9 \frac{1}{2} \mathrm{in}$. by 6 in. by ${ }_{4}^{3} \mathrm{in}$. The pieces are set out as in Figs. 2, 3, and 4 : the dovetail pins are cut on the ends of the front piece, A, the distance between the shoulders being $9 \mathrm{in} .$, and then placed on the sides in turn to mark out the exact shape of the sockets, as in Fig. 3.
Thesame is done with the back, C , as in Fig. 4 and then a $\frac{1}{\frac{1}{8}} \mathrm{in}$. wide and $\frac{\mathrm{in} \text {. deep grove is }}{}$ ploughed ? in. up from the bottom edge of each piece t, take the botton piece, $D$. On the latter plane a rebate to correspond with the grooves, $\frac{8}{}$ in. up the edge and $\frac{1}{1} \mathrm{in}$. deep, and complete the sides, B, by sawing off the front corner and planing smooth. Mark $1 \frac{1}{2}$ in down at the top of the back each side, saw off the waste, and plane down smooth, and then bore a $\ddagger$ in. hole 1 in. down in the centre. The parts are now ready to fit together, as in Fig. 5, and if the juints are true they can be glucd up and left to dry.
In the meantime the lid is prepared, one piece being $11 \frac{1}{4}$ in by $6 \frac{1}{2} \mathrm{in}$. by $\mathrm{s}_{3} \mathrm{in}$., and the other 111 in by 1 in . by $\frac{3}{3} \mathrm{in}$. The front edge of the large piece and both ends of hoth pieces should be rounded and filished smooth with glass paper. The glued box can now be trimined at the ends and cleaned up with a sharp smoothing plane, the top edge of the front being planed to the slope of the sides, and the narrow portion of the lid screwed on from the back Its lower edge in front must be planed down $\frac{1}{8}$ in., so that the sloping lid can be fitted. The top edge of the latter is now bevelled sufficiently to fit, and then attached with stout leather hinges, 2 in . long and $1 \frac{1}{\delta} \mathrm{in}$. wide. A neater job is made by cutting recesses $1 \frac{1}{2} \mathrm{in}$. from the ends to take the leather, which should be secured with $\frac{1}{2} \mathrm{in}$. mund-head screws.
The outside of the box should be sized and varnished; the inside is left plain, so that it can be washed out when necessary. On account of the action of salt on metal it is not advisable to use plain butt joints or to nail or screw the box together. The work can be
simplified by screwing on a plain base, whioh can be fitted on the outside and screwed from the bottom or fitted between the sides
SALT CELLAR. In England the first salt cellar was a large bowl placed in the centre of the table. This was ancceeded by a covered vessel known as the standing, or stecple saltes which was a fashionable piece in the 16 th and 17 th centuries, and was made of silver, rock crystal, and other valuable materials, some being, in add tion ornamented with gold or precious stones. Examples are highly prized
The modern salt cellar, which is a smaller vessel, came into vogue about 1700, and has been made in a great variety of styles. Round, oval, and octagonal examples exist both in silver and in Sheffield plate. Some stand on four feet and others on three, while some are without feet. Others have a square base. The claw and ball, the lion's paw and the stepped cone are among the types of feet found.

Decoration takes the form of embossing, piercing and chasing. Some have beaded and others gadroon edges. Designs such as those illust rated are much copied for modern silver salt cellars; others are made of glass, china, pottery and clectro-plate. Thesc metal containers should have glass linings, otherwise the salt is liable to corrode the silver or plate. Usually made in pairs or sets of four, salt cellars should match in style the pepper and mustard pots in use on the table. With most salt cellars a small spoon is provided. See Silver: Table Laying

SALTING: Of Food. By adopting this method of preservation many foods are kept in good condition which otherwise would rapidly decay. Also many articles of diet which only last for a season can be preserved and become Fig. 3 and spice. all kernels should be removed. The meat must be rubbed all over in every part, and any hollows left by skewers or kernels being cut out should be filled up with salt. A round of beef weighing 20 lb . will take 1 l lb . salt. Meat should be salted ss soon as possible after being killed if the weather is warm, but if the atmosphere is chilly or frosty it ahould be kept for a few days, and if the frost is in it, it must be thawed hefore being salted. In very cold weather the chill must be taken ofi the salt before it is used. To make

Fig 5
Salt Bor. Fig. 1. Salt bor made from close-gralned wood. Figs. 2-4. Showing how front, back, and sides are dovetailed into each other to svold use of nails. Fig. 5. The parts ready for gluelog together meat red, a little saltpetre should first be rubbed over it.

To salt fish, clean and wash it, then dry it thoroughly and cut it open down the back. Wipe it with a clean cloth, score it, and place
valuable adjuncts to dishes or may form dishes in themselves and help to vary the menu.

To salt food, the dry salt may be rubbed over the surface, or it may be made into liquid brine with water. Salt pork is treated with brine. Fig. 4 also heef and occasionally mutton. The brine often has an admixture of saltpetre, sugar

When meat is plainly salted
a layer of salt on it each side. Keep the salt on it three days, then liang it up to dry or smokeit. Lometimes thespine bone is removed from the fish before salting
Some varieties of green vegetables may be salted and will keep all the winter. The best


Salt Cellar. Two beautitul examples of old silver sale cellars, belonging to the period of George III
vegetables to treat in this fashion are French beans or scarlet runners. The beans must be cut on a dry morning, wiped, and laid in earthenware jars in lnyers with a good sprink. ling of salt between each layer. Let salt cuver the top of them. Secure them from the air and kecp in a cool, dry cellar. See Beef; Pickle; Pork

SALTPETRE. Communly known as nitre or potassium nitrate, faltpetre is a natural product obtained by the lixiviation of earth, where the occurrence is in the form of an efflorescence; purification is effected by crystallization. It is used merlicinally for the treatment of asthma and culds; it is a constituent of some explosives and fireworks, and in chemical fertilizers. Wall or limesaltpetre made by fixation of nitrogen from the air is used as a manure. As a brine, saltpetre is employed in the salting of meat.

## Salts. See Epsom Salts; Saline.

SALTS OF LEMON. This preparation, which is known also as oxalic acid, consists of equal parts of cream of lartar and potassium oxalate. It is ured for cleaning white straw hats, remuving iron stains from linen, and fruit stains and other marks from woollen and silk materials. It is exceedingly poisonous, and should therefore be kept well nut of the reach of children Directions for treatment in cases of poisoning are given under the heading oxalic acid (q.v.).

SALUKI. Of this dog there are two varieties, the rough and the smooth, the former being the more popular. Tbe rough coated hnve feathers on the ears, on the limbs and on the tail, but the smouth dogs are free from this. In height the saluki varies from 24 in . to 28 in . according to the locality of its origin The females are smaller than the males. In general conformation the bread resembles the greyliound. In colour the saluki is either fawn, cream, white, red, grizzle, black and tan or tri-colour. As a breed thev


Saluki. Specimen of this breed of dos which somewhat resembles the greyhound
are very nice dogs, usually aweet tempered, obedient and intelligent

The bead should be long and narrow, the eyes dark or hazel, ears well feathered and also the limbs, whilst the tail should bave a superabundance of feather on it and he carried in the so-called ring-tail fashion.

SALVER. There is no hard or last rulc as to the distinction between a salver and a tray, but in general a salver is regarded as " smaller edition of the tray proper. It is used for carrying a single cup of tea or other drink, and also by a servant for presenting a letter or card. A sniall salver is generally kept for this purpose on the hall table. larger aalver makes a charming addition to the broakfast table when used as a stand for the coffee pot and hot milk jug

Salvers are made of silver and Sheffield plate, as well as of

which is emphasized by the moulded designs and scenic reliefs pressed upon them This ware was supposed to originate in Samos

During the Greco-Roman period the manufacture was taken up by a number of provincial potteries, especially in Gau! and the Rhincland Almost all the so-called Samian ware found in conjunction with RomanoBritish remains was imported from these centres and its production did not survive that period
This eart henware which is more precisely called terra sigillata, is distinguished by its close grained body, sometimes showing traces of having boen turned in the lathe. and displaying, when broken, a light-red fracture all through It is coateduniformly with a thin, tranaparent sealing-wax glaze, which was produced by means of a solution of green vitriol. It is usually specimens date from the 17 th century, but and dishes are gencrally small, and are seldom ones made in the 18th, and having ball and claw feet A great variet $y$ of decoration was used thereon by the $18 t h$ century silversmiths and their successors, these including the gadroon and ornament in the shape of dolphins, masks. shells, scrolls, vine leaves, etc Old salvers of Sheffield plate are usually tinned on the underside See Silver: Trav.

SALVIA. The botanical name of sage, of which there are some splendid ornamental kinds suitable for the greenhouse and for planting out of doors. The purple sage (Salria virgata nemorosa) is the best of the hardy kinds; it is a showy herbaceous perennial, 2-3 ft. high. with violet-purple flowers in July-August. Propagation is by cuttings in a frame in apring. Salvia azurca Pitcherii, 4 ft . high, is a lovoly blue-Howered plant for a warm sheltered border, at its best in late summer.

The scarlet sage (Salvia splendens) is one of the most brilliant of summer bedding Howers, and is invaluable for the greenhouse also. Seedlings raised in a heated greenhouse in January-February will provide plants for putting out of doors early in June, or cuttings can he taken from the old plants in Auguat. and kept safe from frost in winter. Exceptionally fine varieties are Pride of Zurich, Fireball and Harbinger, which should be chosen in preference to the type.

The blue sage (Salvia patens) is a half-bardy tuberous rooted pcrennial easily raised from seeds sown in warmth under glass in February ; the scedlings may be planted out of doors early in June, or grown in pots for greenhouse decoration. In autumn the tubers should be lifted, stored in sand for the winter and started into growth again under glass in spring.

The hardy annual sage called the Clary (Salvia horminum) is raised from secds sown out of doors in September or in April; its heauty lies in the coloured bracts which surround the small Howers. The purple-blue variety named Blue Beard is the hest.

SAL VOLATILE. Aromatic spirit of ammonia, commonly called sal volatile, is a reliable heart stimulant in fainting, shock, etc. It is also sometimes prescribed before meals as a gastric stimulant in chronio indigestion.

SAMIAN WARE. Modern reproductions of the lustrous red terra-cotta fabrics which go by the name of Samian ware are attractive in form, suggesting a classical atmosphere,
found unbroken. See Pottery.
SAMOYEDE. The samoyede dog belongs to the Arctic breeds, sharing in common with the others a foxv head, small, erect ears. a tail


Sampler dating from 1800, with small flgures, birds and trees. ambroidered in coloured silks upon fine canvas. In the centre is the following moral verse: "Virtue the chiefest beauty of the mind, the nobleat ornament of human kind. Virtue our saferuard and our guiding star, that atirs up reason when our senses err"


Samoyede. Breed of white Arctic dog which has
curled over the back, and a close, soft undercoat, through which long harsh hair grows, forming the outer coat. This is usually of a very brilliant white, and is of a texture that does not soil readily. They are smaller than one would expect in dogs that are capable of drawing heavy weights, the males weighing about 50 lb , and bitches about 10 lb less Those who own them find that they are very sociable and well mannered. See Dog; Kennel.
SAMPLER. In its earliest form a sample was a picce of work that exhibita in a smal apace all the stitches and processes of the work which it represents. Calico samplers were provided for tho young in carly Victorian days in order that plain stitchery should be practised.

A sampler of that kind would exhibit plain liemming, hensstitching, back. stitching, gathering and setting into a hand, pleating, tuckrunning, running and felling, buttonholea and sewing on buttons, whipping and setting on a frill, the insertion of a gusset, piping, how to put on a crossway false hem, an ordinary calico patch, how to sew ou a tape, how to make a loop and eyelet hole Featherstitch and French knots as simple forms of decora tion would also be shown.

Docorative sainplers, such as the one illustrated, were worked by old and young from Elizabethan times down to about 1840, aftes which they went out of fashion. Now that such great store is set on period needlework again, old samplers aro being copied and originals are sought in antique shops. Samplers can be turned to charm ing account by being mounted on pole
fire screens, blotters, work bags, etc. On page 177 an excellent idea for a calendar, utilizing a modern sampler in cross-stitch, is illustrated and described. Designs can be obtained in good needlework departments, and those interested in the subject will do well if able to study the examples in the Textiles Department at South Kensington.

Although modern samplers are often worked quickly in cross-stitch, this does not do justice to the beauty possible in these pieces. In a sampler such as the one illustrated a great number of stitches are employed. The proper stitch should be used to form particular objects. Satin-stitch and stemstitch are used for animals and figures, petit point fills in vases and cross-stitch is reserved for trees and the dark portions of the border. All objects illustrated on a sampler are much conventionalized. Some interesting modern samplers have central motifs of motor cars, speedboats, airships and borders introducing modern musical instruments. In one case these subjects were copied from magazine advcrtisements on to fine canvas and con ventionalized in the stitchery. If preserved, such samplers will have a historic interest in years to come, and to-day make amusing needlework pictures when glazed and mounted in narrow black frames.

SANATORIUM. An establishment for the treatment of the sick may be called a sanstorium, though the name is more especially used for places where convalescents or consumptives are treated. Sanatorium treatment of consumption is valuable, not only because patients are under direct supervision in conditions as favourable as possible, but because the patients receive a proper training in looking after themselves. See Consumption

SAND: In Gardening. Sand is an important ingredient of garden soil. Clay land is greatly improved by an occasional application of builder's sand. Silver sand is used in the preparation of potting composts : plant cuttings often form roots better in sand than in soil.

SAND: In Brilding. The three main sources from which sand is obtained for building purposes are pit, river, and seashore. The fine sand is used for plasterer's mortar, the more coarso varietics for ordinary mortar. Its function when mixed with mortar is to produce regular shrinkage of the materials, and also channels for crystallization in setting

Pit sand is the first in quality, and has sharp angular grains. It may contain impurities such as clay, earth, or organic matter. River sand is practically free of impurities, but owing to the action of the water its grains arc not sharp and angular. Sea sand is not to be recommended for building work, especially plastering, because the saline matter it holds attracts any moisture that is in the air. This will result in damp walls, and prove injurious to decorating on them. Sea sand is, however, used for bricklayer's mortar, and is very useful in constructing playing pits for the children. See Brick: Cement ; Mortar.
SANDALWOOD. This is a hard, close grained, yellowish-brown wood. It has a fragrant smell, which increases with age, and when it is burning there is an aromatic odour. Ground into powder, it is used in cosmetics, and an aromatic oil is distilled from it, and used in medicine as an internal disinfectant. As a wood it is used chiefly for small fancy ware, carved articles, finger plates for doors, etc. See Wood.
SANDARAC. Among resins of the lao kind, sandarac is an important substanoe. It is a hard resin of yellowish tinge which melts at a heat of $300^{\circ} \mathrm{F}$. and breaks with a lustrous fracture, exuding from pine trees in North Africa. It is known variously as pine
gum, white pine resin, and gum juniper. It is completely soluble in spirits of wine, and photographic negative varnish, and is also used by book binders and for school blackboards. Being hard, it requires making more elastic by mixing with a West Indian resin known as elemi. This material is much used to soften or toughen varnishes. See Resin ; Shellac.

SANDBAG. Used in repoussé and art metal work, the sandbag is a leather or linen receptacle filled with well-washed silver sand. The linen or canvas covered bag is useful for supporting the pitch block and deadening the noise made by the hammering. The leather bag of 3 in . to 9 in . diameter is made in two shapes, one with a hollow centre, known as a ring, to hold the pitch or cement bowl used in repoussé work and metal chasing. The other, in the form of a round pad, is used for beating out metal to a hollow form. To preserve leather sandbags, the cover should be wiped over with an oily rag. See Repoussé.
Sand Box. See Pounce Pot.
SAND CAKE. A variety of cornflour cake, this is made by sieving ? lb . cornflour, then measuring out 1 oz . of it and mixing it with $1 \frac{1}{2}$ teaspoonfuls baking-powder. Separate the yolks from the whites of 3 eggs, beat up the yolks, and stir half of them into $\frac{1}{\frac{1}{2}} \mathrm{lb}$. castor sugar, previously creamed with 7 oz . margarine. Beat the mixture for 5 min . before adding the remainder of the yolks, continue beating for a fow minutes, and then fold in the larger portion of the cornflour.

Add the whites of egg, whisked to a stiff froth, and also a little lemon or vanilla Havouring; mix the whole thoroughly, and lastly stir in the baking-powder and the remainder of the cornHour. A little milk may be used if necessary. Turn the mixture into a greased cake-tin, lined with greased paper that reaches just above the top of the tin, and bake it in a moderately hot oven for about $\frac{3}{8}$ hour. Then takc it from the tin, carcfully remove the paper from round it, and let the cake cool on a sieve.

SAND GLASS. Sand glasses, which are also known as hour glasses, are used to measure time; for instance, the time needed to boil an egg. See Egg Boiler ; Hour Glass.

SAND MYRTWJ. This dwarf evergreen flowering shrub belongs to the family of heaths, and botanically is known as Ledum. The chief kind is buxifolium, about 6 in. high, with small, glossy leaves and white flowers, being particularly suitable for the rock garden.

Sand myrtle thrives in equal parts of leafmould, peat, and sand, with plenty of moisture at all times. It is planted in spring or autumn, and propagated by layering of shoots in October.

## Sandpaper. See Glass Paper.

SANDSTONE. Consisting of a compactod mass of sand bound together by lime carbonate, iron oxide and silicas, sandstone as a building material is comparatively soft, lending itself easily to delicate architectural decoration. For this reason it is often carved and embellished, frequently in a very elaborate manner. See Stone.

SANDWICE. It is always advisable at a picnic bridge, or informal evening party to have some less well-known but really good sandwiches to introduce to the guests. When estimating quantities it is well to allow two sandwiches per head (where other refreshments are also provided). Three quartern sandwich loaves to 3 lb . butter will make sandwiches for 100 people if the bread is properly cut.

Almost any kind of cold meat or fish can be used for sandwiches, while other savoury fillings include cheese, sliced hard-boiled egge, potted meats, olives and cream cheese, nuts
and salad vegetables. S'weet sandwiches may be filled with jam, honey and banana, lemoncurd, walnuts and stoned raisins. grated chocolate, or honey mixed with chopped nuts.

The bread should be thinly cut and fresb, though not too new, or it will break in the making. A very sharp, long-bladed knife should be used. The filling should be laid on one slice, seasoning added if required, the remaining piece of bread prossed firmly on the top and the edges trimmed. For picnic purposes the crust is often allowed to remain as the sandwiches keep a better shape. For afternoon tea or buffet service the crumb only is left and is cut into square, diamond, or triangular shapes. For bridge parties it is sometimes stamped out with cutters into spade, heart, diamond and club shapes. Plain biscuits, rye biscuits, toast, bridge rolls and brioches are all used for making sandwiches in place of ordinary bread. The first two are good for savoury pastes and crean cheese fillings; thin, hot, toasted brown or white bread is liked for Canadian loaf cheese and for hot bacon sandwiches, while small finger rolls are suitable for any kinds of fillings and brioches for sweet sandwiches. Potted meat or fish paste sandwiches are dainty for tea when the bread used is sufficiently thin and fresh to be rolled.

The bread, biscuit, toast or roll should always be buttered. Butter adds to the food value and prevents juices from the fillings soaking through the sandwich. The butter should be creamed with a wooden spoon before spreading on the uncut loaf. Fillings must not be scanty or the sandwich will be dry and tasteless, but they must not be so lavish that they ooze out. Pack sandwiches for a picnic in waxed paper and wrap wet butter-muslin, or a napkin wrung out in cold water, round the whole until they are required.

Meat Fillings. Meat used for sandwich making should be free from gristle and cut into very thin slices or pieces of convenient size. Ham often improves beef, chicken and tongue. If savoury sandwiches are wanted. either tomato sauce, finely chopped pickle or chutney may be spread over the layers of meat. Seasoning must not be forgotten. All kind of sausages, cut into thin slices and the skins removed, make good fillings. Pate de foie gras is a favourite filling. Doubledecker sandwiches are liked with a layer of chicken and another of finely-chopped salad moistened slightly with mayonnaise and separated by an extra piece of buttered bread. Grated ham may be used with or instead of the chicken, and both will make an excellent filling for a hot, toasted sandwich. The meat is first warmed in a saucepan with a little butter and chopped parsley and then spread on a piece of buttered toast and covered with another piece.

Fish Sandwiches. Cold fish should be Haked and freed from bones. It requires sauce, or cucumber, tomato or lettuce salad to make it tasty. Bloaters, smoked haddocks and kippers make excellent fillings for brown bread sandwiches. Remove the skin and bones and mix with a little anchovy sauce and cayenne. Lobster or crab is good when pounded and mixed with a little thick mayonnaise sauce. Cod's roe with cream and seasoning makes popular sandwiches. l3reak up 3 tablespoonfuls cooked roe, season it with anchovy essence, pepper and a squeeze of lemon-juice and moisten the whole with a tablespoonful of cream. Spread the mixture on thin brown bread-and-butter and form into sand wiches.
Sardine sandwiches can be made in several ways. The fish should be drained from the oil, skin and bone removed and pounded, adding seasoning and a squeeze of lemon-juice. An excellent filling is made by adding the yolk
of a hard-boiled egg. I teaspoonful enchory essence, I dessertspoonful anchovy paste and 1 oz. butter to the sardines, pounding them to n smooth mixture and spreading on brown or white bread-and-hutter.

Egg Sandwiches. The yolks of two hardboiled eggs make a good filling when mixed with anchovy essence, chopped olives, and sufficient cream or creamed butter to bind the ingredients. Another egg sandwich is made of slices of hard-boiled eggs and tomatoes, or the slices of hard-boiled egg may be noistencl with asalal cream and placed between two layers of finely chopped ralad.

Cheese Sandwiches. Cheese may be grated. mixerl with butter and seasoning and spread on a layer of chopped watercress betwoen thin bread-and-butter. Alternatively it may he cut into thin slices, spread with mustard, sprinkled with seasoning and made into andwichcs, with rye crisp breal well buttered and Havoured with ehopperl gherkin.

Crean chese is good mixed with walnuts or other nuts, or with chopped olives. Chopped lettuce or watercress, or finely diced apple and celery with cream checar, may also be used as a filling for thin brown bread-and. butter.

Sweet Sandwiches. Mixed nurs and sweetened whipped ercam make a good filling spread over a thin laver of apricot jain on split, swectened brioches, white or brown buttered finger rolls, or alices of plain cake. Chopjed and stoned dates with pounded almonds and lemon-curd make an unusual sandwich with buttered currant bread. Honey may be substituted for the curd if a sweeter mixture is liked. French plums are excellent with walnuts and creain. Chocolate grated and mixed with whipped cream Havoured with a few drops of vanilla essence may be used hetween thinly s!iced bananas and hread-andbutter, or the grated chocolate with pounded almonds and enough swectened cream to form the mixture into a paste makes an excellent filling for a sandwich of wafer biscuits. Sponge tingers are equally good when put together in pairs with whipped cream and strawberry or apricot jam between.
Sandwich Sets. Practical and decorative sets for sandwich service are obtainable in china, pottery, glass and in a variety of shapes and sizes. The dish for the sandwiches is usually oblong, and plates to match are often square in shape. Small tiered and plated stands to hold several plates of sandwiches are uscful for tea and bridge parties, as they take up less apace on the table.

SANDWICE CAKE. The phrase sandwich cake is usually applied to a light, spongy cake baked in two shallow tins or cut into two after haking, and then spread with jain. Directions for making such a cate will be found under the heading jam sandwich. Cream, chocolate icing and other mixtures are sometimes uscd as a filling instead of jam, the cake being then named accordingly. See Janı Sandwich.

SANDWORT. The prpular name of a group of beautiful low-growing rock-garden plants (Arenaria) which bloom in spring and carly summer. The finest of all are montana and grandiflora, which soon apread if planted in gritty soil in a sunny place and bear a profusion of white flowers.
The Balearic sandwort (Arenaria halcarica) should be planted in light soil at the foot of a shady rock, which it will cover with a veil of delicate leaves and tiny white flowers. Propagation is by secds sown in spring in a frame.
SANITATION: Of the House. The important points about any system of sanita. tion are to see that the refusc of whatever kind is removed completely, rapidly, and continuously, and that it is protected as much as
possible from the outside nir. Methods used in the country where sewers do not exist are called conservancy metlooda, and in towns where sewers and a plentiful water-supply exist, the water carriage system is used. In both of these systenis waste waters and excretal refuse have to be removed.
Conservancy Methods. Dealing first with conservancy methods, the old types known as privy middens and privics are thoroughly insanitary and should be abolished as the material is never completely or rapilly removed, and is not protected from flies, etc. Earth closets and pail closets are less objectionable and can be made reasonably sanitary if emptied frequently, at least twice a week, and kept scrupulously clean. The material should be dug into trenches well awny from the house or any sounce of water supply, and should be covered with at least four inches of earth.
lath and washing water should not be allowed to run into the nearest ditch, where it may gire rise to a nuisance, but should be run through a serics of porous drains at a depth of about 6 in. helow the ground. This is better than running it on the surface of the soil. At the house end of the pipes a grid should be fixed to strain off large particlea, which might clog the pipes if left undisturbed.
Cesspools should be connected with the housc in the same way as a sewer. They should be placed at a safe distance from the house or water supply, and must be ventilated, and constructed so as to be watertight. Perindic removal of the contents of the cesspool is neccasary if the water supply of the house is small. If taking the waste water of the house also, the overflow pipe may lead the sewage either under apecially prepared land or on to a proper filter-bed, but care must always he taken that the water supply is safeguarded.
Water Carriage System. Coming next to the water carriage system, this is the ideal method, as refuse is carried away completely, and rapidly by a flow of water. The main drain is partly below and partly above ground. The latter part is called the soil-pipe and is carried well ahove the roof of the house and coverod by a wire cage to prevent binls from building nests and blocking it; the open top allows air to circulate through the drainage system. Into the soil pipe open the discharge pipes for water closcts, slop sinks and urinals, all of which have a proper trap, with an adequate seal of water to prevent drain gases getting back into the house.

Baths, washing and kitchen sinks must also have a trap, but they discharge into a pipe on the side of the house, distinct from the soil pipe, and then into a gully. This gully is again trapped before discharging into the main drain. Rain water sometimes has a pipe to itself discharging into a gully. The different discharges finally reach the drain and then pass through a final trap before entering the sewer, so preventing sewer-gas from entering the house drain.
The householder can always obtain the help of a sanitary inspector from the health office of the local authority, and would be well advised always to have a thorough inspection undertaken bcfore entering a house. In particular is it necessary to have the drains tested by a competent inspector.
The matters that the householder himself can decide are to sce that all sanitary appliances are made of smooth, impermeable material : that the water closet is of good type: that the flush is adequate; that the traps are sound, actually contain water and are not blocked; that outside and inside pipes and taps do not leak and are of sound material, and that lavatories are well-ventilated and in the right position. The sanitation of a house requires considerable supervision. All appliances, and water-closets in particular, must be
kept clean. The pan of the latter can be cleansed at intervals with a rag moistened with spirits of salt. or by using one of the powiler preparations advertised. If an accessible trap geta blocked it may be cleared by unscrewing the stopper which is at the hottom of the trap: but this is only possible with the traps of sinks, basins, and baths.
The kitchen sink and its trap can usually be lept clean by pouring down it every week a pailful of boiling water containing $\frac{\mathrm{lb}}{\mathrm{l}}$. of soda. A smell in a sink can lie removed by pouring in a pailful of hot water containing a tablespoonful of permanganate of potash and allowing it to stand for a coulple of hours. Grids over gullies and pipe heads must be kept clear of leares and dehris. Gullies in the open must be cleansed regularly, and in summer when the water in the acal may evaporate, they should be llushed with water.
The Chemical Closet. This closet uses exactly the opposite principle to the dry carth closet ; reliance is placed upon liquid chemicals for the inmediato sterilization and the disintegration of sewago and paper, an as to produce an inoffensive liquid.

There are two kinds generally in use the portable and the permanent. The former consista of a ventilation chamber through which an air draught carrics any chemical fumes to the outlet pipe at the back of the seat. The inner containor is provided for the reception of urine and excreta. For operation in this case, a charge of 1 pint of chemical is added to I gallon of water and placed in the container. The matter entering the container becones deodorized and sterilized. When full the contents may be disposed of in a similar way to that employed in the earth closet. The sewnge may, however, be used as a manure after it has been mixed with alacked lime, decaycd vegetation, and earth. This type of chemical closet is largely used in motor coaches, acroplanes, small cottages, etc.

The second tupe is for buildings of a more permanent character where no sewers exist. An underground tank is provided into which the closets empty direct. When the tank is full, the contenta are disposel of by opening an outlet valve which lets the contents discharge into a sonkiaway, where it percolates into the earth. Should the soil not be suitable (e.g. clay), then an ordinary cesspool is used from which the contents are discharged over the eartli. or it may be carried awny to any convenient place for disposal. See (iesspool; Drains: Earth Closet: Pipe: Septic Tank: Water Closet, cte.

SANTOLINA. The botanical name of $n$ group of hand $y$ shrubs with fragrant leaves and daisy-like llowers in summer: they grow 18-i4 in. high, thrive in ordinary well-drained soil, and make attractive low hedgos, or may


Santolina. Soft downy foliage of the species
be planted in the rock garden. The chief kinds are the grey-leaved. yellow-flowered Santolina clamaccyparissus and the greenieaved, white-llowered viridis. Propagation is by cuttings in a frame in late summer.

Saponaria. See Soapwort.
SAPPHIRE. Sapphires are found in almost every shate of blue. In some specimens a blueviolet tint is seen, in others cornflower blue. The lnst named are the most highly prized. Large sapphires are generally cheaper than rubies of the same size, but a Hawless sapphire of a deep shade always commands a high price. The value of the gem is best judged at night, hecause the cheaper stones lose their blueness, and some of them appear almost black in nrtificial light: but good stones retain their colour.
Rings, brooches, pendants, and bracelets are all set with sapphires. Diamonds are almost invariably used with them, for the intense blucness of the sapphire accentuates the whiteness of diamonds by contrast.
Stones that are sometimes confused with sapphires include the blue tourmaline and the bluc topnz. These, of course, are inferior gems, and usually may be detected by their light. ness. They are also softer than the genuine stone, and are therefore more easily seratched. Sce Diainonds: Jewelry.

SAPWOOD. The wood of very young trees, known as anpwoonl, is gencrally light in colour and porous. In some trecs the colour changes very little indeed as the tree grows older and such are called sapwood trees. They are found in Great Britain among the sycamores, breches, and hollies.
Although sapwood may be regarded as imperfect timher, there are onc or two cases in which its value is considerable, exceeding that of heartwood or wood that is completely mature. For instance, the sapwood of the hickory has a greater value for handles and the like than the henrtwood. Many of the American woods are noted for their abundant sapwood, notably the satin walnut, the lohlolly pine and the basswood. See Wood.

SARDINE. Among the cheap varictics of the so-called preserved sardincs, sprats, very small herrings, brisling or pilchards are substituted for the real fish. Nonc of these, however, possesses the delicate Havour of the true sardine, which is caught off the cossts of Brittany and Sardinia from June to the middle of October, and is, ns a genernl rule, preserved in oil or tomato mauce and exported.
Sardincs are useful as a savoury. also for serving as hors d'ocuvres and in salads. Sardine nustard, which is employed to give a zest to fish dishes and also for spreading on savoury biscuits, is made by pounding the sardines and mixing with hard-hoiled egga, chopped shallot, dry mustard, oil and scasoning.

A good way of preparing sardines consists of cutting the tails from a small tinful of these lish, removing the hones and then Haking the Hesh into small pieces. Melt 3 oz . butter in a saucepan, add la oz. llour, mixing it well in, and then pour in gradually $1 \ddagger$ pints white stock, stirring all the time until the mixture boils
Then cook it slowly for a few minutes, add to it the flaked fish, a teacupful of breadcrumbs, a little of the oil from the tin, 3 teaspoonfuls tomato sauce, a squceze of lemon juice, and salt and cayenne to taste. Mix all thesc ingredients together, then turn them into a small pie-dish, sprinkle the top with browned crumbs and reheat in the oven.

Fried and devilled sardines make another good dish. The fish should be split open, honed, and folded together again, then sprinkled with dry mustard, cayenne, salt and lemon juice and allowed to stand for about 15 min . They should then be fried in a sauté pan in their own oil and served on crouttons of
fried bread. Another method of frving sardincs
is to skin them, dip them in batter, and then cook them in a pan of smoking hot fat. Serve garnished with parsley.

To grill sardines. drain them from their oil, cont them with sicped llour, and then cooks them hefore a clear tire or beneath a gas griller for 4 or 5 min . Serve them inmediately with a plate of brown bread and butter, garnishing them with lemon. Sardinc egg.s can be made in the same way ns anchovy eggs, substituting sardines for anchovies.
To make n sardine omelette add 3 or 4 chopped sardines and a teaspoonful anchovy essence to a plain omelctte mixture and cook as deseribed under omelette.

A nother savoury can be made by removing the hones and skins from eight sardines. Then take some thin slices of brow"l bread, butter them, and cut them into lingors, each rather larger thun a sardine. Place cach sardinc between iwo of theso fingers, press thein together, and fry a golden brown in hot fat.
To prepare rardine toast, remove the heads and tails from 4 sardines, split the lish open, and take out the backhonc. Then lny the halves together rgain, hent them in the oven, and place on tinger-shaped picces of hot huttered toast.

Keep them hot, and in the meantime melt $\frac{1}{2}$ oz. butter in a small sauccpan, add to it 3 yolks and 1 white of egg whisked together, 3 teaspoonfuls vinegar, and a little salt and cayenne. Whisk this mixture over a slow fire unt! 1 it becomes thick and creamy ; take care that it does not hoil, or the eggs will curdle.

## Sash Windows: Renewing the Cords

## Practical Instructions for Carrying out Repairs

With the sid of the illustrations and directions tere given, the amatcur mecianic will be
ab!c to keep his sashes and cords in order. See also Burglary; Casement: Glass; Window

A sash window is a type of opening and closing window in which the upper and lower windows are weighted to facilitate their movement in an upward or downward direction. The window is halanced by means of heavy iron or lead weights, arranged to move up or down in a well in the framework. Two such weights are usel to cach moving window, being arranged onc on cither side of it. The weights are connected to the window with sash cords, which passover grooved pulleys sunk llush with the framework. The pulleys are placed at the extreme top of the framework.

In modern work both upper and lower sashes are movable, hut in some of the o!d designs only the loottom sish is arranged to move. consequently the ventilation of the room sulfers.

The sashes are arranged in the frame so that they pass cach other as they are raised or lowered. They alide in grooves formed by the casings of the frame, and are suspended on sash cord. Although betwern the sashes there is a parting slip, the centre rails of the sashes are arranged so that they meet, and they are splayed so as to form a good fit in order to prevent then rattling. and to make them wind and water tight. It is on the centre rail that the fastening is fixed in order to keep the window closed.

The sash cord is attached to the window by means of 1 in . wire nails hammered through the cord. An alternative method to this employs a screw and washer which is turned home at the end of the cord. A circular recess is usually made in the side of the winclow in which this screw is placed. Two common methods are used for the attachment of the cord to the weight. One has a loop threaded through an eye in the top of the weight, the frec end of which is hound to the length of the cord with fine string. The other method simply has a knot tied at the end of the cord after it has lieen passed through the cye in the weight.

Pour it over the sardines, sprinkle with chopped parsley and red pepper, and serve. Sardincs and tomntoes on toast may be prepared in the same way, cxcept that a little mashed tomato is sprend over the toast hefore the sardine and the egg mixture are added. See Hors d'Ocurres; Omelette; Sindwich.

SARDONYX. This is a particularly heautifu! variety of onys, composed of alternate layers of white or light-coloured chalecdony and rich. orange-brown cornclian. See Onyx.

SARSAPARILLA. The dried root of a tree imported from Central Imerica, and known as .Iamaicn sarsaparilla, has been used medicinally, but it is not now included as a remedy in the British l'harmacoporia. In the dried form it would appear to have no medicinal properties.

Sarsaparilla is a common ingredient of manv tonics and blood purifying mixtures, in which other drugs arn included. Common preparations are: The liquid extract of sarsnparilla. dose, 2 to 4 lluid drams: the concentraterd compound solution of sarsaparilla, dose, 2 to $s$ tluid drams. The drug is in no ciremmstances prescribed by itself. Pron. Sir"sa-pa-ril'a.
SARSENET. The name has to a large extent droppied out of usc, locanse oldfashioned sarsenet has been superseded by Jap silk, white, black. or coloured. The material is a plain, thin, and rather shiny silk. Sarsenct ribbon is suitable for making soft binding for the edges of dress seams, perambulator rugs, cot blanticts, and so on.

Where this sccond inethod of construction is cmployed care must be taken to prevent any free eird of cord from fouling the movement of the weight. The weights used for window sashes are extremely long and thin, in order that they may slile in the small space in the frame allotted to them.

Repairing the Sash Cord. It sometimes happens that a sash cord breaks nfter the windows have been in use for some time; consequently the balance weight will fall, and the sashes will he hard to move. It is not a difficult matter, however, to replace a hroken sash cord, and the process is clearly shown in the photographs on the next page.
ligs. 2 to 10 illustrate the renewal of the cords in top and bottom sashes of the double window frame, shown at Fig. 1. Procectling with the lower window first, it should he raised some distance, and if it shows any tendency to drop down, it should be kept up with a atick of wood. In the majority of cases this precaution is not necessary, as the defective sash usually jams readily.
The head at the bottom of the window frame is removed with a chiscl. The tool should he placed as nearly as possible under the nails holding the bead down. To prevent damage to the paintwork the point of a knife should be used to hreak the joint hetween bead and sill before prizing up the bead.

Onc of the side beads is next removed, when the lower sash may be swung clear, and the broken cord removed from the frame. The fitting of the new sash cord is carried out as detailed below for the top sash.

In enses where it is only necessary to repair the top sash. the bottom sash must also be removed, this being done lirst (Fig. 2). When detaching the cord, take care that it does not conce away suddenly. as if that should happen the weight would drop, pull the cord right through the pulley, and be lost inside. When

or a " mouse " is used with u length of atring. to one exact length to cut the new cord repuires mouse end which the cord is attaohed. The careful consideration. If it is not long enough, is a long. thin leaslen weight, small the weight will be drawn to the top beiore the enough to pass over the groove in the pulley. window is closed. in the case of the bottom snsh. and having a loop at one end for the attach. If the cord is too long a top sash will not close, ment of the string. The other end of the string owing to the weight baving already reached is securely fratened to the new cond. The the bottom. The best plan is to make a rough mouse is pushed over the pulley and drops measurement of the length of the cord tacked down into the weight box, carrying with it the to the sash, and to mark this length downward string. Fig. 7 illustrates the use of a picce of chain for the purpose.

Having pulled the cord through to the hole from which the weight was withdrawn, this end of the cord is joined to the weight. In Fig. 8 the inethod adopted is to bind over the frec end of the cord with strong string. The the sash desig free end of the new cord is left hanging while on with 1 in . wire nails. During this operation the old cord is removed from the sash. This it is important to sec that the end of the cord latter operation is performed with a small cold is carefully tucked out of the way, na it may chisel and a hammer, as shown in Fig. 9 below. sulisequently cause trouble by jamming if left. loose. A nail or two at the very end of the cord will obviate any possibility of trouble in this direction. Wherc new ansh cords are fitted oll both sides of the sash they must lie of the samo length.

The replacement of the sashes will not present any difficultiea, as the operations are the reverse to the dismantling processes. In $\Omega$ double window, as shown in lig. I, one sash should be finished hefore tackling a similar window on the other side in order to avoid confusing the beads or even the sashes. The depressions mado by the nails in the fillets may be filled in with putty, which is brought up lorel with the woodwork. If the work is carcfully done a coat of paint will hide any trace of removal or replacement. While the new cord is out it is a good jlan to rub it over with linsced oil.

SASH CRAMP. This is a tool used by woodworkers for cramping up a frainework of consiclerable size All patterns comprise a stiff inetal bar having one adjustable jaw, which can be moved along the length of the bar and secured by a tapered peg or wedge. The fixed head comprises a clamp serew, which forces a movable head along the har.

The work to the oramped is placed between the jawsand tho movable jaw secured by the pin on the side of the framework. The screw is rotated and pressure brought to bear upon the fraine by means of the wliding head Generally, two of these cramps are needed for a frame, so that equal pressure may be excrted on each end.
the cord is nearly off it should be finally removed by hand, and a knot tied in it to prevent any riak of losing the end.

Removing the Top Sash. The top sash may now be removed, as in Fig. 3, by prizing away the parting slip. Fig. 4 shows the sash taken out. with the broken cord. An opening at the bottom of the frame is normally covered by a fillet. which has to the removed, but is frequently difficult to find owing to its being covered with paint. A few taps with the hammer will crack the joints, when it may be removed, as in Fig. 5. The weight is disclosed behind this partition, and is then removed, as indicated in Fig. 6.

In order to fit the new cord n length of a more flexible material is first run over the pulley and down the space inside. A piece of chain


Sash. Fig. 1. Set of double windows of which the sashes are to te repaired. Fig. 2. Removing lower sash from framework. Fig. 3. Removing parting slip, after which top sash may be swung out of frame. Fig. 4. Showing broken sash cord. Fig. 5. Removing fllet in frame to give access to weight pocket. Fig. W. Weight being removed from pocket. Fig. 7. Chain being used to run new cord over pulley. Fig. 8. Method of attaching new cord to weight. Fig. 9. Removing old cord with bammer and cold chisel. Fig. 10. Fizing new cord to sash with nails

Sash Tood. A alyecial type of hrush known 9s a sosh tool is ndapted for puinting the eashes of windows. See Print.

SASSAFRAS. Tlie dried root of the sRasnffras tree contains a volatile oil which gives it an astringent aromatic tnate. Sksmafras is practically never used internally oxcept as an ingredient of the concentrated compound solution of sarsaparilla. Tise oil is used to destroy lice and nits. which it does very effectively. It is also used in the treatment of ringworm.
A few chips of massafras or woud added to ordinary tea are said to have a beneficial result if taken by persons suffering from rheumatism. Sassafras lcaves abound in mucilugc. and can be used for thickening soups.

SATEEN. Cheap satin that is balf silk and half cotton is often called sateen to listinguish it from the more expensive al!-silk satin. Cottons made with a satiny face and used principally for linings are called sateens. They show a more or less finc, round twill. They are dyed in a variety of colours, and are also obtainable patterned. Close-woven cotton sateens are suitable for covering down quilta, and the best are exceptionally close-textured, and sold as down proof. implying that the feathers will not work their way through.

SATIN. This fahric has a shiny aurface, with a short nap which hicles the thread structure more or less completely. Pure silk satin drapes better and is softer to the touch than either cotton backed or artiticial silk satin. The last kind is most useful us a furnishing fabric.

Wool back satin is chietly used for dressing gowns and for frocks and coats for small children.

SATIN FLOWER. The satin llower is a hardy perennial plant, excellent for small herbaccous borders, hernuse of its neat habit,


Satin Flower. Delicate blue flowers and spiky leaves of Sisyrinchlom Bermudianum
graceful growth, and briglit flowers. It has narrow leaves and thickened rootatocks
The best known species is Sisyrinchinm grandiforum, with purple or mauve flowers in spring : height about 1 ft .
The white form, album, makes charming clumps in the herbaceous border, and is also suitable for the rockery. S. angustifolium, with narrow leaves, and pale blue flowers in summer, and Bermudianum, blue, is also worth growing.
Satin fower does well in loam with a liberal admixture of leaf-mould and sand. Propagation is by seed and by division in spring.

SATIN WALNUT. This is the name given to thio wood of the sweet gum, a common tree in the swampy purts of the lower Mississippi rallcy, where it grows to n large size ; it is also found in most parts of the United States. The tree is similar in appearance to the maple, but it exules a liquid known as red gam or liquid. ambur. When cut the timber is of a brown shade, varied at times and occasion. nlly markedwith black ätripes.

On account of its even straight texture and the widths in which it can bo obtained (up to 18 in . with an average of 14 in .), it is a useful wood for the amateur. It is used for furniture making, fretwork, and wood-turning; it is easy to work, takes a goon polish, stains well and forms strong glued joints. The wood is liable to warp and twist. but with proper scasoning this can be reduced to a minimum. In working satin walnut, it is advisable to cut up the material some time before it is planed. but the wood should be kept in a warm room and not allowed to get damp. Satin walnut can be used for carving on account of and even grain. It is also made up in the form of plywood. See Plywood; Walnut; Wood.

SATINWOOD. The varieties of satinwood are named after the part of the world from which they come. Satinwood is used as a veneer, for small cahinets, in fretwork and inlaying, and for the backs of hair brushes and other fancy articles. In colour it is light orange, and has a close, smooth grain with a lustrous, mottled and sntiny surface, and $n$ transparrnt appearance.

Satinwood works well, but takes glue rather badly, owing to the dense nature of the wood : it polishes well, and a fine finish can be obtained on it. Adam, Hepplewhite and Sheraton used the wood freely, but. owing probably to its acarcity, in small quantities. It was employed in conjunction with mahog. any and fancy woods of all kinds, such as amhoyna, tulip wood, and purplewnod. Designs were often painted on satinwood pieces. When


Satsuma Ware. Vase in modern white Satsuma ware with crackled uriace and slightly raised design
the satinwood is carefully selected its beautiful marking or grain requires little or mo decoration beyond a handing or hinrder of mahogany. See Inlaying: Marquetry; Pier Table; Shera ton; Veneer; Wood.
SATSUMA WARE This is the highest class of Japanese pottery, and as the name is freely applied to the productions of other factories, as well as to modern counterfeits, the utmost caution is needed in the purchase of pieces o named.
Some Satsuma warc has an ivory gleam with lowtoned pigments, and minute jencillings in gold. Another type was produced in pure white, with a net work of lines in the glazo surpassing the intricacy of Chinese crackle. Some redclay bodies were decorated with yellow or black monochromes, especially for incense boxes and tea jars. Others were coated with metallic llambé glazes, dis. playing reds and violets, and other combinations resembling shot silk. A class of faience producer during the 19 th century is decoratcd with opulent enamelled colours and gold. s often vellumlike. or has coloured glazes. The genuine warc, which is never porcelain, s sometimes claimed to go back to the 16 th century. It may be recognized often by thic string mark on the base, showing where the picce was detached from the wheel, and also hy the fact that the spirals in the paste turn from left to right, because the wheel was rotated by the Satsuma potters with the left foot

The pieces were always small. Some of the hetter examples of modern Sutsuma are producerl in the studios at Kobe and Tokyo, and are highly prized by connoisseurs. These picees are not to be confused with the regular industry which has existed for many years in Yokoliama, Kyoto, Awata, and other pottery centres in Japan, engaged in fabricating for export modern pieces of so caller Satauma. They can be readily detected by their poor workmanship, their coarse decoration. gilding, large size, and their yellowish tinge. See Pottery.
SaUCE MAKING

## Recipes for Piquant, Savoury, Sweet and Store Sauces

Fpom these foundations most sauces can be made by adding different Havourings and seasonings. Sec also Apple ; Brandy; Bread; Cranberry; Espapnole; Hollandoise; Horseradish; Ma,tre d'H8iel ; and Mint Sauces. In connexion with the Store Sauces, the entries Apple; Chutney ; Ketchup; Pickle; Soy; Vinegar, should be consulted

Sauces, savoury and sweet, are the liquid should never he used in place of butter, as it is accompaniments to meat, fish, poultry, too oily and does not mix smoothly with thic vegetables: sweet puddings and dessert. flour. The flour must be a good white, The savoury sances differ from gravy in that especially for a white sauce, otherwise it wil gravy is the juice extracted from the food be a dirty, unappetizing colour. It must br cooked, sonietimes thickened with a little quite dry and free from lumps. flour, whilat sance is a mixture of thickened Care must be taken not to overcook the fat, stock or milk and fat, with scasonings adderl.

There are numerons sauces to serve with all cooked foods, but with the exception of the few which have for their bascs oil, wine or vinegar, or fruit (viz. mayonnaise, Hollandaisc or mint sauces; npple, cranberry, gooseberry, etc.), they are all variations of two standard foundation sauces-brown and white sauces.

For successful sauce maling it is necessary to use the very best ingredients. Margarine
as this will spoil the Havour and cause globules of oil to rest on the sauce; it will also he indigestible. The flour must always be hlended smoothly with the fat before any liquid is arded. Flour must be thoroughly cooked. otherwise the sauce will have a rough, raw taste. All sauces containing flour should lie cooked at least five minutes after adding the liquid. For savoury sauces at lenst half the liquid added must consist of brown or white
atock. Care and judgement must be used in scasonings. Too much will destroy the distinctive llavour of the sauce; too little will make it insipid. The best rule is to taste it during the making.

White and Brown Roux. A white or brown roux is the thiokening for white or brown sauces. The roux consista of the first mixing of the flour with the fat. In white roux care must be taken not to cook the flour until it browns; in brown roux the fat and llour are cooked until they turn brown. There are other liaisons, or thickenings, for sauces, such as eggs, arrowroot or cornilour mixed with water, or a blend of raw butter and flour, but for standard foundation sauces white or brown roux is generally used.

When sauce is frequently required it is a great saving of time to kecp a quantity of white and brown roux ready made. It will keep for weeks if tightly covercd. A heaped-up tableapoonful of roux will thicken a pint of liquid. The roux when wanted should be alightly heated by the side of the fire, and the heated liquid added slowly, stirring until boiling.

To make white rous to thicken half a pint of liquid weigh 1 oz. Hour and 1 oz. butter. Melt the butter in a thick saucepan, and then stir in the llour very gradually. Let it cook for several minutes, stirring all the time, until it becomos a smooth crcanny paste, but be careful it does not change colour.

Brown roux is made in exactly the same way except that it is cooked longer to brow" the flour, and to hasten this the lieat may he increased, though it will need constant watching and stirring. When time is short the Hour can be browned first in the oven, but as it hurns very quickly it nust be carefully watched and turned over to brown evenly. If the roux is for immediate use, the liquid (milk, or milk and water: atock, or atock and water) is added at this stango. Then it is only necessary to ald the seasonings and llavourings to achieve the particular sance you wish to make. All nalles are amnother if strained through a tine pointed strainer, or tammy cloth, unless they contain paraley. capery, or other aolid ingiedients that must he kept in

Unless sances are served immediately they arc apt to go lumpy, atiff, or form a skin on top. To prevent this, and nlso to keep the auce hot, the sauceprall containing it should he atood in a larger pan containing hot water to come half-way up the saucepan. The snuce should be covered with a lid, and if it is a thick sauce a little piece of butter, or a spoonful of the liquid from which it is made, placed on top of it. This prevents a skin forming, and can he stirred into the sauce before serving. If a bain-maric is available, it is the best means of keeping the sance hot
Foundation White Sauce. After making the white roux as already Ilescribed, add slowly $\frac{1}{2}$ pint liquid (milk or mixture of milk and water: white stock or fish stock and water). Stir until hoiling and cook for live minutes, add salt and pepper to taste, and use.

From this foundation saluce can be made Anchory, Parsley, and Caper sauces. (Sce entrics under separate headings in this work.) Also, Onion sauce ( 2 large onions, hoiled, drained and chopped, added to $\frac{1}{\frac{1}{2}}$ pint white sauce) ; Egg sauce ( 1 hard-boiled egg. chopped, adderl to $\underset{\perp}{\underline{1}}$ pint white sauce); Mustard sauce (2 teaspoonfuls dry mustard added with flour when making sauce); Checse sauce (2 oz. grated checse added to $\frac{1}{2}$ pint sance); Celery sance (add 1 small cooked and chopped head of celery to pint sauce). When white sauce is to he used for fish it should be made from fish stock, or half fish stock and milk.
Béchamel Sauce. This is $n$ rich white foundation anuce. To make it, take $\frac{1}{2}$ pint milk or equal parts milk and white atock, or fish stock, 1 oz . butter, 1 oz . flour 1 table-
spoonful cream, a small carrot and same quantity of turnip, 1 small onion stuck with cloves, $a$ few spriga of parsley and a bay leaf, salt and pepper.

Make the roux with butter and lour. Put milk in a saucepan with prepared vegetables, paraley and bay leaf, and simmer 15 minutes. Then strain, and add liquid gradually to the roux, stirring all the time until boiling. Cook for five minutes more, scason well and strain. Re-heat and add creain, and use as required. Use fish stock if for fish.

Melted Butter Sauce. This must not lie confused with white sauce. It is a sauce in which butter is the chief ingreslient, and is served with salmon or ot her choice fish, and with some vegetables. To make it, put into a small saucepan 1 oz . butter, melt it and add 1 oz . Hour slowly, then add a teacupful water and the juice of a lemon. Season with salt and pepper and cook for nnother five minutes. stirring all the time, then culd a little grated nutnieg and 3 oz . more butter. Stir until the butter is melted, but do not boil sgain. Milk should never be added to melted butter.

Allemande or Yellow Sauce. Half pint Béchamel sauce, yolks of two iggs, 1 tablesponnful crenm, I teaspoonful lemon juice. pinch nutmeg. Mix the egg yolks and cream together and mix into the Bechanel sance. away from the hent. Re-heat without boiling, then add the lemon juice and nutmeg Stir well and serve.

Bearnaise Sauce. Hall pint Béchnmel suluce, 2 tablespoonfuls vinegar, 2 finelvchopped shallots, $1 \frac{1}{2}$ oz. butter. 2 egg yolks, 1! tablespoonfuls stock.

Put vinegar in a small saucopan, add shallota and hoil until vinegar is reduced to half Stir in the hot Béchamel sauce. Beat up the egg yolks with the stock, and strain into the sauce. Whisk over gentle hent until well blended, but do not boil. Reinove from heat and mix in the butter a small piece at a time. Season and pour through a strainer Do not re-lient after adding the hutter as it will curdle.

Soubise Sauce. Half pint Réchamel sauce, 4 onions. boiled, well-drained and chopped, 2 tableapoonfula cream. Mix all well together and re-heat slowly.

Tomato Sauce. Half pound tomatoes. $\frac{1}{2}$ pint Bechamel sauce, pinch sugar. Bake the tomntoes in a gentle oven until soft, rub through a sieve and add the pulp to the hot Béchamel sauce. Add about half a teaspoonful sugar, stir well and re-heat.

Velouté Sauce. Half pint Béchamel sauce, I teaspoonful lemon juice, hay leaf, 4 peppercomis, I tablespoonful crean. Simmer the Béchamel sance with the hiny lenf and peppercorns for 10 minutes, strain and return to the pan to re-heat. Add the lemon juice and atir in the cream, re-hent, but do not boil.

Shrimp, Oyster. Lohster and Crab sance are made from veloutce sauce miade with fish stock. Add 6 chopped oysters, or 2 oz. chopped lobster or crah, or a gill of pioked and chopped shrimps to $\frac{1}{2}$ pint velouté sauce, as required A little lobster hutter added to lobster sauce is an improvement. (See Lolister.)

Foundation Brown Sauce. This is the groundwork for many savoury sauces. Take 1 oz . butter, $1 \frac{1}{2} \mathrm{oz}$. flour. $\frac{1}{2}$ pint hrown atock, I small onion, piece of oarrot and turnip scasoning.

Make the brown roux as described. Fry onion lightly and add to roux. Add stock away from heat, then add the chopped vegetables and seasoning. simmer for half an hour, then strain and make thoroughly hot to serve.

Chasseur Sauce. This rich brown sauce. served with venison, is made by boiling together $\frac{1}{2}$ pint brown sauce with I gill port wine, 2 oz . red currant jelly, I oz glaze, a squeeze of lemon juiceand a dash of cayenne. When liquid is reduced to $\frac{1}{2}$ pint, strain and serve.

Chestnut Sauce. This is made by adding $\frac{1}{\text { pint blanched, boiled and mashed cheatnuta }}$ to $\frac{1}{2}$ pint hrown sauce. Mix smoothly and make thoroughly hot before serving.

Piquant Sauce. Eapagnole (q v.) or brown nauce forms the foundation of this sauce. Sinmer together 1 gill vinegar, I dessertspoonful chopped onion or sliallot, 2 tablespoonfuls each chopped capers and gherkins. When the onion is tender, and the vinegar reduced to about half its original quantity, pour in 1 pint Espagnole sauce, boil up, and If necessary add noore seasoning. Just before serving stir in 1 tablespoonful chopped pursley.

Genevoise Sauce. This is a rich lorown fish sauce Idd 1 glass Madeira or sherry, and a few drops ench of garlic vinegar, lemon juice. and anchovy easence to I pint Espagnole sance Re-heat the sance, season it, and at the last moment whisk in $\frac{1}{2}$ oz. fresh butter, adding it in small fragments. Do not let the sauce re-boil.

Mushroom Sauce. Add $\& \mathrm{lb}$. Button mush. rooms tossed in hot hutter to $\underset{d}{d}$ pint Espagnole or brown sauce.

Reform Sauce. To make it, take 1 pint Espagnole sauce, $\frac{1}{2}$ gill vinegar, 12 peppercorns, I teasponnful red currant jelly, $1 \frac{1}{2}$ gills port wine or claret, cayenne pepper. Add peppercorns to vinegar, and boil until reduced to half quantity. Stir in jelly, wine and a few grains cryenne. Cook slowly for 10 minutes, add Espagnole sauce strain. re-heat and use

Sweet Sauces. There is a great variety of sweet sauces to he rerved with hoiled, steanied oi haked puddings, etc. Those most in everyday usc are custard saluce (aee Custard) and sweet white sauce, which is an ordinary white foundation smuce sweetened with 2 teasponnfuls sugar to the pint.

Jlam sauce is made by hoiling together 2 tablespoonfuls jam, it pint water, and a few drops lemon juice until reduced to twothirds. Strain and serve. Marmalade aauce is made in the same way, omitting the lemon juice. Fruit sauces though classed as sweet are often served with nieat and fish: e.g. spple sance. cranherry sauce with pork and turkej, and green gooseberry sauce with boiled mackerel. Treacle sauce is made by hoiling togetlier 2 tablespoonfuls syrup or treacle I gill water, 1 teas noonful lemon juice. until reduced to two-thirds. Thicken with I teaspoonful cornflour. For lemon asuce ald a tableapoonful loaf sugar to a breakfastcupful boiling water, having first rubbed two lumps over the rind of a lemon. Mix a desscrtapoonful cornflour with a little cold water, and atir into the sugar and water Bring to the boil, stirring all the time. Add the juice of a lemon, stir well, and serve. Orange sance is made in the same way, using half the quantity of sugar

Gooseberry Sauce. Top, tail, and wash a pint green gooseberries, and put them in a pan with a gill of water. Simmer until fruit is soft, rub through a sieve and put into a clean pan Add I oz. butter, 2 oz. sugar, a pinch grated nutmeg, and re-heat. A few drope of green colouring may be added.

Chocolate Sauce. 'I'wo ounces grated ehocolate, 1 oz . castor sugar, teaspuonful vanilla essence, $\frac{1}{d}$ pint water, 2 teas poonfuls cornflour. Boil sugnr, water and chocolate together for a few minutes. Blend cornflour with a little water and add to chocolate mixture. Stir until hoiling, add vanilla, and use.

Hard Sauce. A quarter pound fresh butter, 6 sweet almonds, 2 bitter almonds, 2 oz . castor sugar, 1 tablespoonful sherry, $\frac{1}{2}$ ta bles poonful brandy. Blanch, chop and pound the alinonds to a smooth paste. Cream the butter and sugar, add the almonds. Add the sherry and brandy, mix well and serve hot.

Store Sauces. Hesides the savoury and sweet sauces that are made for immediato use there are a number of piquant sauces or relishes
that can be stored to use for cold meat, fish poultry, etc. All these take a long time to make, and great care and patience are needed. The best ingredients must always be used

Harvey Sauce. One quart best vinegar, 3 or 4 anchovies, 1 tablespoonful soy (Indian or Japanese soy can be bought ready prepared for use), 1 tahlespoonful walnut ketchup, a grated sliallot, a grated clove or garlic, $\frac{1}{4}$ oz. cayenne, few drops cochineal Place all the ingredients in a wide-necked, unglazed jar. and cover closely. Let it stand for 14 days, stirring it once a day. Then strain off into hottles, cork well, and store in a cool place.

Tomato Sauce for Bottling. Bake as many tomatoes as are available in a slow oven until soft. Then rub through a sieve and measure the pulp, and to every quart allow 1 pint chilli vinegar, $\frac{1}{2}$ pint soy, 1 tablespoonful anchovy essence, 2 grated shallots, 1 grated clove of garlic, salt to taste. Put all ingredients in a stew pan and simmer until slallots and garlic are tender. Then pass through a fine hair sieve, and store in airtight bottles

Worcester Sauce. One quart best malt vinegar, 6 tahlespoonfuls walnut ketchup, 4 tablespoonfuls essence of anchovy, 4 tablespoonfuls soy, 4 grated shallots, salt to taste. Put all ingredients in a wide-nceked unglazed jar, cover closely. Stir the contents 3 or 4 times daily for three wecks, then strain ofl into small bottles, cork, and store in a cool, dry place.

Thick Piquant Sauce, or Chutney Sauce. One pint vinegar, 2 tablespoonfuls mushroom ketchup, 2 tablespoonfuls soy, 4 dessertspoonfuls chopped pickled walnuts, 2 dessertspoon fuls chopped chutney, $\frac{1}{4}$ oz. bruised garlic, 7 or 8 finely chopped anchovies. Mix all ingredients together in a wide-necked jar, let it remain in a warm place for a month Give the contents a good stirring daily. Pour off into small bottles, cover securely. and store in a cool, dry place.

SAUCE BOAT. There are two main types, and one of each kind is usually included in a dinner service. One is fitted with a lid and ladle and a stand to match, making it in effect a small tureen. The other is the sauce boat proper, with lip and handle made so that the liquid can be poured out as from a jug; of this kind there are some beautiful examples in silver and Shefficld plate.

Silver and Sheffield plate sauce boats made in the 18th century are valued by collectors. They are usually of the conventional shape, but with a variety of decoration on the handles and the feet, and sometimes round the rim The supports are in several styles, some having a plinth and others having claw feet. Less frequently seen are oval boats with two lips.

SAUCEPAN. Enamel saucepans are very casily kept clean, but should always be of good quality, or the enamel is liable to crack


Sauceran. Fig. 1. Saucepan made up of two semicircular pans which can be used separately or together over one burner. Fig. 2. Four square aluminium saucepans of different sizes, but made to $\hat{A}$ together so that they can be used over one light
and small chips find their way into the food. Iron saucepans are chiefly need ed where there is a range and are used for boiling vegetables, for certain stews and boiled puddings. They are too heavy for ordinary usc. Stainless steel saucepans afforl excellent wear, but are expensive to buy.

Copper saucepans are good conductors of heat but require to be lined with tin or nickel, as these metals arc not chemically acted upon by acids. Alumin. ium pans arc inost generally used, as they are light and easily cleaned. Most of the newer types of fuel and space saving saucepans are made in this metal. Figs. 1 and 2 illustrate examples of these pans, which are helpful on a small cooker.

Double saucepans for heating porridge milk, etc., are made in both enamel and aluminium ware. A modern development has a lip through which water can be poured to keep the milk, custard or sauce in the upper part from burning. Another saucepan which is uscful for milk has a patent lid, through the sides of which the milk can bubble and return through the centre without boiling over.

Vegctable saucepans comprise one with a wire cage, which when lifted up strains



Fig. 3. Wooden rack for h. Wooden rack
the peas, beans, etc., so that the water runs back into the pan. Another device has a special lock lid and a serics of holes on one side so that vegetables can be strained without a colander after they arc cooked. A dual purpose saucepan possesses a movable handle and a lid which can be converted into a frying pan by transferring the handle to it.

Cleaning Saucepans. Saucepan lids should be thoroughly cleaned and dried to keep them free from rust. As the cover should always be removed when not in use, a saucepan lid rack is illustrated in Fig. 3,
which has proved a convenient little accessory when placed near the cooker. Tiered metal saucepan racks which admit a free passage of air to the saucepans take up little room in a corner.
Saucepan brushes are sold in sets to hang up over the draining board. These can be used with cleaning and scouring solutions for removing hard deposits of grease and food from saucepans. Wire brushes should not be used for aluminium ware, which should be scoured with silver sand, rinsed and dried thoroughly. No soda should be used in cleansing aluminium pans or added to food cooked in them, as it turns them black. Food should not be allowed to stand all night in any saucepan. New pans should be filled with cold water, brought to the boil, emptied, rinsed out in clear water and thoroughly dried. Iron and cnamel saucepans may be washed with soapy water to which soda has been added. See Aluminium; Copper; Kitchen
SAUERKRAUT. Cabbage which bas undergonc fermentation can be purchased ready for cooking under the name of sauerkraut. This is served usually with sausages, ham or boiled bacon.
The French way of preparing this dish is without pickling and fermenting the cabbage. Wash and shred the white hearts of two cabbages very finc, removing the hard parts. Now wash the shreds thoroughly, using several waters, and drain them quite dry. Put the shreds into an carthenware pan with about 4 tablespoonfuls salt; add 8 peppercorns and a breakfastcupful white wine vinegar. Stir the cabluage well in the vinegar and let it remain for some hours. It might, if more convenient, be soused overnight and used next day. Wash it well before cooking, then put it into a casserole with 1 pint stock, $\frac{3}{4} \mathrm{lb}$. sliced fat bacon. Bring gently to the boil and simmer till the cabbage is tender. Add to the stock when cooking it a tablespoonful of vinegar.
SAUMUR. The delicate French sparkling white wine known as Saumur is an excellent substitute for champagne. It is sound, wholesome and light.
SAUSAGE : To Make and Cook. Sausages should always be purchased from a reliable dealer, and as many sorts contain more or less bread as well as beef or pork they should be cooked as soon as possible. To prevent the skins from bursting through the swelling of the bread, they should be pricked with a fork or a trussing necdle; there is less danger of the skins bursting if the sausages are blanched or scalded before being fried. Cook them slowly, turning them frequently until nicely browned. Serve them alone or with bacon, or on fingers of fried bread or toast. Sausages may also be toasted or grilled before a clear fire or under a gas griller.
The usual method of naking sausages consists in passing the meat through a mincer and forcing it into the skin or container. The meat may be passed through the machine twice. Have ready a well cleansed sausage skin, fix it on to the machine or hold it open and force the meat into it, then separate the sausages by twisting the skin at intervals of 4 in . Only fresh meat should be used, all skin and gristle being removed and a proportion of fat added. The meat is then cut into dice, breadcrumbs mixed in if desired, together with seasoning accorling to taste.
Pork sausages should be flavoured with sage; beef, onion and swect herbs; veal and ham, lemon and sweet herbs; for mutton a stronger flavouring will be necessary, and a small proportion of suct and breadcrumbs must be added. The flavouring may consist of shallots, anchovies, pepper, salt, and mace.
Sausage Forcemeat. The forcemeat known as sausage meat is used for stuffing fowls and turkeys. To prepare it, skin l lb. sausages,
put the meat into a basin, and mix it with 5 oz breadcrumbs, a pinch of powdered mace, and salt and pepper to taste, binding the whole with the beaten yolk of an egg. The finely chopped liver of a turkey can be added if desired. This forcemeat can also be made into balls, rolled in flour, and fried or baked.

Sausage Roll. To make sausage rolls, skin 1 lb . pork sausages, divide each into three portions, and put them on one side. Make $\frac{1}{2} \mathrm{lb}$. flaky pastry and roll it out $\frac{1}{8} \mathrm{in}$. thick, and cut it into pieces about 4 in . square. Turn these over to the other side, and roll the pieces of sausage into thinner rolls, not quite so long as the pieces of pastry. Place one on each piece, damp round the edges of the pastry and fold it over in half. Press the edges together, trim off any rough pieces, and with the back of a knife make two slits in the top.

Brush the rolls over with beaten egg or a little milk, put them on a baking sheet in a hot oven and cook them for about 30-40 min. When the pastry is cooked and of a golden brown colour, the heat of the oven can be reduced, and, if necessary, the browning shelf may be removed. When cooked, let the rolls cool on a sieve. See Hors d'Oeuvres : Pastry; Stuffing.

SAUTE. This French word means tossed. It is a method of cooking food that resembles frying, and is sometimes known as French frying. It differs from real frying in that less fat is used. Consequently the food so cooked should be turned or tossed frequently to prevent it from burning or sticking to the bottom of the pan. See Potato.
SAUTERNE. The white wine produced at Sauterne in the Gironde, France, is made from white grapes which are picked over-ripe, and is considered the finest of all naturally sweet wines. The best and most widely known sauterne is Château Yquem, the most delicately aromatic of wines in France, and probably in the world. It has a colour resembling liquid gold, with exquisite bouquet and flavour. Barsar is not so sweet and has a flavour of its own. Sauternes are usually served with fish and poultry, but may be drunk throughout a meal. See Dinner; Wine.
SAVELOY. A savoury kind of sausage often served as hors d'oeuvres, the saveloy differs from the ordinary pork sausage mainly because the pork used in its preparation is salted. When bought ready made, it is thoroughly cooked, and served cold. It is covered in a bright red skin, which must be pulled off the slices before they are eaten.

SAVINGS BANK. In Great Britain savings banks, which differ from ordinary banks in receiving money on deposit only, not on current account, are of two main kinds. These are the savings banks conducted by the state through the post office; and the trustce savings banks over which the state exercises supervision. In addition the joint-stock banks have departments for receiving savings, and in one or two places, notably Birmingham municipal banks have been opened. There are also savings banks in connexion with railway companies, while the army, the nary, and a number of schools have them. Some of these are worked in connexion with the post office Canada, Australia, and other parts of the British Empire have also savings banks under state control.

All these banks receive money on which they pay interest. This can be withdrawn at any time, usually after a very short notice. The rate of interest paid is usually low; in the post office savings bank it is only 6 d . in the $£$ for the year, or $2 \frac{1}{2}$ p.c.; but where security of capital is essential, banks that offer a high rate of interest should be avoided.
To open an account in a savings bank it is only necessary to fill up certain forms and de posit a sum of money. The post office will not
take sums of less than 1s. or odd amounts in pence, but penny banks and certain others take from a penny upward. Each depositor is provided with a book, which must be presented when money is withdrawn, and should be sent to the bank oncc a year in order that the interest may be added.

As regards the post office savings banks, the following conditions are laid down. An account can be opened for, or by, a person of any age, but if it is for a child under seven the money deposited cannot be withdrawn until the child is seven years old. Deposits in thesc banks cannot be attached in casc of debt. The annount which may be deposited in a single year is limited to $£ 500$. It is illegal for a person to have more than one account, or to have one account in the post office savings bank and another in a trustee savings bank. He may, however, act as trustee in accounts for the benefit of others
Money can be deposited at any post office which is a savings bank, and if it is for more than $£ 50$ a receipt will be sent from the head office. Otherwise the stamp and signature in the depositor's book is the only receipt. On presenting his deposit book at any P.O. savings bank a depositor can withdraw on demand any sum up to $£ 3$. If more than $£ 3$ is required a form of notice of withdrawal must be filled up and posted to London. These forms can be obtained from any post office.

The depositor receives a warrant for the amount, and he can get the money by taking this with his book to the post office named in his form of withdrawal. Sums up to $£ 10$ may be withdrawn by telegraph if the depositor pays for the telegram and a service charge of ls. in addition.

If a depositor wishes to authorize another person to receive payments from the bank on his behalf, he can sign a form for that purpose. Forms of application for claiming the deposits of deceased persons are obtainable at a post office. A depositor not under the age of 16 may nominate a person or persons to receive any sums from the amount due to him at the time of death.

SAVINGS CERTIFICATE. National Savings Certificates, formerly known as War Savings Certificates, offer a means of investing small sums in a government security bearing a high rate of interest free of income tax. The present issue, which is known as the third, was begun on October 1, 1923. The purchase price for a single certificate is 16 s . and the certificates are repayable at any time on application, together with any interest which has accrued. A single certificate of the third issue becomes worth $£ 1$ at the end of six years, and $£ 14 \mathrm{~s}$. Od. at the end of 10 years. National savings stamps of the value of 6 d . and cards to which such stamps may be affixed can be obtained.
Special facilities for the accumulation of small sums for investment in national savings certificates are also provided by savings associations established under the auspices of the National Savings Committee, Sanctuary Buildings, Westminster, S.W.1, and the Scottish Savings Committee, 122, George Street, Edinburgh, who will give information and advice on this subject.
No person or body of persons or institution authorized to purchase national savings certificates may either individually or jointly hold or have any interest in more than 500 single certificates, or other equivalent in multiple certificates. A person becoming entitled on the death of another person to certificates which bring his holding above that number may, however, retain the excess, but may not purchase more.

Interest. On the first anniversary of the date of purchase a certificate of the third
issue becomes worth 16s. 3d. Thereafter its value increases by the addition of 3d. at the end of each complete period of four months with a bonus of 1s. at the end of ten years. The following table shows how the value of a certificate increases up to the end of the tenth year :


Any certificate retained after the tenth year will increase in value by the addition of ld. at the end of each complete month.

Repayment. Repayment with accumulated interest may be obtained at any time on written application by the registered holder to the Controller, Money Order Department, General Post Office, London, except in the case of a child under seven, years of age. Forms of application for repayment can be obtained at inost post offices.

SAVORY: The Plant. Both summer and winter savories are used for flavouring soups and sauces. The annual is the summer savory, Satureia hortensis. It is raised from seed sown in April in drills, 6 in. apart, in rich soil in a sunny position. As soon as the plants are 2 in . high they should be thinned out to 6 in . apart every way. When the plants flower they should be pulled up and stored for winter use.

The winter savory, S. montana, which is an evergreen, thrives in any ordinary garden soil in a sunny position, and may be planted in spring or autumn, about 1 ft . apart every way. Propagation is by seeds or cuttings, and the shoots may be gathered as recommended above.

SAVOURY: The Dish. A highly flavoured side dish, known as a savoury, is served after the sweet, or may take its place when the dinner is informal. Savouries may be of fish, game, white meats, dressed vegetables, or some preparation of cheese or eggs. They are frequently served in china pipkins, ramekin cases, or may be dished altogether in silver or fireproof dishes.

Sometimes the savoury is of a very simple nature, such as Scotch woodcock or mushroom toast; at other times it may be more substantial, a cheese soufflé or dressed tomatoes; but it is always chosen to contrast with the entrée. It is really a substitute for cheese after a meal. In summer it is often served cold. See Anchovy; Aspic; Cheese; Tomato, etc.

SAVOY BISCUIT. Savoy biscuits are used in the making of many fancy sweets. These biscuits can be laid out on a sheet of cartridge paper by the aid of a savoy bag and baked in a fairly hot oven. Or bake them in sponge finger tins which have been floured and sugared

The ingredients and proportions to be used would be 3 eggs to 6 oz . castor sugar and 8 oz . flour. The eggs must be whisked stiffly for about $\ddagger$ hour with the sugar, then folded in quickly with the Hour and a little delicate flavouring, such as vanilla, added last; then place the mixture in a savoy bag to shape for baking.

SAVOY CABBAGE. A valuable hardy autumn and winter vegetable which is raised from seeds sown out of doors in April and May; it produces a large firm head of deep green, crinkled leaves. The seedlings should be planted out in summer, the large varieties at about 20 in . apart, the small ones at 12 in . apart. Of the large Savoys suitable sorts are Drumhead and New Year, and of the small ones, Dwarf Green Curled and Little Gem. For methods of cooking see Cabbage.

## Saws: The Various Types

## Their Different Uses and How to Sharpen Them

Other information on this subject will be found in the articles on the various kinds of saw, e.g Bow Saw : Cross Cut Saw ; Frame Saw; Hack Saw : Keyhole Saw: Pruning Saw. See also Amateur Carpentry: Tools; and the entries on the wondworking processes in which the use of the saw is essential, e.g. Dovetail Joint Mitre: Picture Frame

The cross-cut saw is used for cutting across the grain of wood, while a rip saw works along the grain. The average length of the crosscut hand-saw is about 26 in ., and the number of teeth to the inch depends on the work for which it is intended. The tenon or back saw, Fig. 1, is 12 in. to 18 in . in length, and the number of teeth to the inch about 10 . The top edge has a strip or back of grooved steel or brass, fitting the blade, and giving strength and rigidity.
The panel saw is a small hand-saw with line teeth that may be used for the same purposes as the cross-cut and ripping saws, and also as a tenon saw and for many woodsawing jobs. The amateur who wants a general-purpose tool is advised to buy this type. The dovetail is similar to the tenon, but smaller and with tiner tecth; its usual length is 10 in . It is used in making dovetail and other joints that entail very accurate work. For cutting beading and similar small work a light brass-backed saw is often used with a straight handle. like that of a bradawl.
For cutting shaped outlines in wood a bow saw is usually employed. The frame is generally of beech and the handles and blades can be

obtained sepmately, so that the latter may easily be cenewed. The saw blade is tightened for use with a tourniquet arrangement. This tightening is absolutely necessary, otherwise the blacle will snap, but when the saw is out of use the blade should be slacked off. In addition to the bow saw, compass and keyhole saws are used for shaped work, and for starting a cut to be completed by the bow saw.

The first difficulty which the amateur finds in using a saw, especially a cross-cut saw, is to start the cut. There is a tendency for the saw to jump about and inake a series of small jagged cuts on the edge of the wood. Figs. 2 and 4 show how the preliminary saw cut should be made and how the handle of the saw should be held. The left-hand thumb should be placed on the wood against the hlade of the saw to guide it. Then take two or three gentle up-strokes before making the first down or forward stroke. The pressure should be as light as possible. $\boldsymbol{7}$ The preliminary cut made, the sawing can proceed.

The two chicf rulcs for accurate sawing are to use long strolies, and not press too heavily. Any attempt to force the saw too quickly through the wood will make it more difficult to guide for one thing, and for another it will make the blade jam, the teeth not being able to clear theniselves properly. Draw the saw slowly backward nnil forwarl. and the work will be done more quickly and with less labour. About sixty strokes a minute with a 26 in. saw is right.

When sawing off a piece from $\Omega$ long board, both ends of the latter should be supported, and the board so kept horizontal. To use only one support and hold the hoard horizontal by the pressure of one linee is bad, because the board is bound to vibrate, and the sawing will probably be uneven, because the nttention of the worker is divided between it and the support of the board. When a long hoard has to be sawn acrose the midide, it is best to liave an assistant holding it to prevent the board sagging, and so binding the saw blade. During the last few strokes. when cutting a short or long picce, it should be supported, or it will break away and split the end of the hoard. The last few strokes of the saw should be as lightly made as the first, to prevent the breaking a way of the fibres of the wood at the corner. Short pieces of board may he held in the bench vice, תs in Fig. 3.

With a tenon or similar saw nearly all the work is done on the bench. The sawing should be clone against the bench stop, or by using a bench hook. as shown in Fig. I. The bench hook is hooked against the front of the bench, and the wood to be sawn is pressed firmly against the top of the hook with the left hand.

Considerable practice is required to saw a straiglit line and to saw squarely, particularly when using the cross-cut saw on thick stuff. A saw may be following the line marked on the top of the material, and yet be considerably to one sille of it underneath. The tendency generally is to incline the handle end of the saw towards the side on which the worker is standing. By giving what appears to be a contrary slope it will generally be found that the wood is being cut squarely, and a little practice will enable the amateur to keep his saw cuts squarc.

A saw may persistently saw to one side of a line when all the rules of sawing have been observed. This will be duc to a defect in the saw itself. Either the blade has twisted or the teeth of the saw have been set more on one side than the other.

A point the amateur often overlooks is the waste which occurs when $\Omega$ saw cut is made. A board l ft . in length when sawn exactly through the middle does not produce two picces each 6 in . long. Wach piece is 6 in . less half the width of the saw cut or kerf. When careful work is being done this width becomes important, and must be allowed for when cutting. Saw on the outside of the line, so that the saiv kerf is in the waste piece of wood. This will save much planing and fitting.
Setting and Sharpening. Saws should be set and sharpened at regular intervals, and they should be set before they are sharpened. The set is the amount to which the tecth are bent sidewavs. This is to make them cut a kerf wider than the thickness of the blade to allow the latter to run freely. Saws should be set to $\Omega$ maximum for cutting wet wood, or cross-cutting soft wood, and to a minimum for ripping hard, dry wood.

The simplest way of setting a saw is by means of a hand-set, Fig. 6, with the saw held in a vice. The hand-set contains a number of slots or notches of various sizes to suit different thickness of saws. A slot is fitted over a tooth, and the latter then bent over to the required angle. Alternate teeth are bent over on one side of the blade, and the remainder on the other. The accuracy of this method depends largely upon the eye of the worker, and a hand set with a gauge attachment is best for the beginner. When the tooth is bent over sufficiently the gauge just touches the blade of the saw, and this ensures that the teeth are set uniformly. There are other types of saw-set on the market. Professional saw sharpeners place the saw on a metal block with hevelled edges, and strike the tecth with a sawsetting hnmmer.

Saws are sharpened by filing the teeth with a three-cornered file. A proper and suitable sawfile has the same section as the tooth space,

Saw. Fig. 1. Tenon saw in use on work supported by a bench hook. Fig. 2. Making the preliminary cut with a cross-cut saw. Fig. 3. Short board held in bench vice. Fig. 4. Correct position to adopt when cutting a thick plank. Fig. 5. Ripping a long board through the centre

apples, cherries, larch pears, pincs, pluins, raspberries roses, turnips. and other trees and plants. The larvae of leaf-fecrling kiads should be picked off by hand, or, as an alternative, should be destroyed with sprinklings of the poisonous hellebore powder.

Pith-boring grubs can only be cradicated by removing and burning shoots that wither suddeniy. Cator-
and thus files the front of one tooth and the back of the preceding one simultaneously. Such files arc made in various sizes. a $4 \frac{1}{2}$ in. file being suitable for hand saws and a $3 \frac{3}{2}$ in for tenon saws. The saw should be held, teeth upward, in a long-jawed vice the teeth projecting only slightly above the jaws. A simple
wooden vice can easily be made by the amatcur. The jaws should be faced with a thickness of leather. The appliance has legs to stand on the Hoor against a hench or table and thus bring the tool to a convenient height for the work. Another way is to clamp the saw between two pieees of wood the length of the saw.

Before beginning, look along the top of the tecth and see that they are in a straight line. With a blunt saw it will be found that they are uncven, and the first thing to do is to straighten them. This is done with a flat file run over the points of the teeth. T'o ensure accuracy, fit the file in a groove in a picec of wood. The latter held against the saw blade acts as a guide and enables all the ends of the teeth to be filed with a perfect regularity.
The saw should be sharpened from the handle end. The file is held on a slight slope to the horizontal, as in Fig. 7, not more than a few degrees, and its direction should bc at an angle across the tecth, not at right angles. Two or three strokes of the file will suffice to sharpen each tooth. and the file should only be used on the forward strokes. The back of the tooth is filed to bring it to a sharp point again, though the front of the next tooth to the right gets filed away to some extent. When one set of tceth has been filed the saw should be turned over and the other set similarly treated. The file should still slope towards the handle when the saw has been turned.

The angle at which the file is pointed across the teeth varies with each type of saw. In the case of a rip saw the file is only just off the square ; with a cross cut, tenon or panel saw it is off about $20^{\circ}$ to $30^{\circ}$. The more the filing is done out of the square the finer the point and the keener the cutting. Naturally, the teeth are weaker, and saws thus will want more frequent sharpening. Generally speaking, sharpen finely for soft woods and squarely for hard woods.

Saw's when not in use should be thoroughly greased to protect them from rust. A grooved piece of wood the length of the saw should be prepared, and kept over the teeth when the saw is not in usc. To make such a cover, the grooved edge of a piece of stout matching can be ripped off to a width of about $1 \frac{1}{2} \mathrm{in}$. A couple of holes are bored to take a cord for tying it to the saw.

SAWFLY. Various kinds of sawflics are very troublesome in the garden, attacking
pillars injurious to young fruit must be combated by spraying with the poisonous arsenate of learl, whilst all fallen fruit should be immediately collected and hurnt. Kainit should be applied in autumn. See Apple Sawfly; Currant Sawty : Goose berry Sawfly; Spraying. SAXIFRAGE. This is one of the most important groups of rock garden plants, popu larly called rockfoil. There are several types, two of the most notable being the mossy and silvery saxifrages.
The mossy saxifrages form wide-sprcading masses of moss-like grecnery and bear white or reddish Howers in spring: they like well drained, sandy or gritty loamy soil and slight sharle, though they will flourish in the sunshine. Some of the best are ohypnoides (1)ovedale moss), white; muscoides, red; decipiens, red and Wallacci, whitc. Many showy crossbred forms have been raised and these are largely grown. e.g. Guildford Scedling, Crimson King, and sanguinca superba. Two, hypnoides densa and muscoides densa, are of dense growth.

There are some charming flowers among the silvery saxifrages, which should be planted


Saxifrage. One of the large-leaved aaxifrages, ligulata, which beara rose-purple fowera
in gritty soil containing linie, in sunny rock crevices. Most of them have grey-green leaves, and in May and June the dainty panicles of bloom are delightful. A few of the best are aizoon and its varietics, cochlcaris, white; Kolenatiana, pink: lantoscana superba white; Macnabiana, white with red spots; Hostii, cream with pink spots : and Tumbling Waters, whitc. Longifolia bears immense panicles of white flowers, but the plant dies after fowering.
A few of the most attractive saxifrages in the remaining groups are apiculata, ycllow; burscriana gloria, white; Gricshachii, crimson; Irvingii, pink, and oppositifolia, rose-purple. These, which flower early in spring, should be planted in very gritty soil or in the moraine. London pride, so useful as an edging to shady borders. is Saxifraga umbrosa; it bears pinkish flowers profusely in May. Saxifraga ligulata and cordifolia are vigorous plants with large leaves and spikes of rose coloured Howers in spring.
The usual way of propagating saxifrages is by detaching offsets, potting them in small pots of gritty soil and keeping them in a frame until they are well rooted. They may also be raised from sceds sown in pans of fincly sifted sandy soil placed in a frame in spring, but the scedlings grow slowly.
SCABIES: The Disease. The skin discasc popularly known as the itch is duc to the presence of the female itch mite, which forms winding burrows in which she lays her eggs, her position being indicated on the surface by a small vesicle or blister. There is intense itching, increased when the sufferer is warm in bed at night, and from scratching and other irritation cezema results.

Treatment consists in anointing the body from the neek downwards with sulphur ointment on three consccutive nights. The fourth night a hot bath is taken, and the patient gets fresh underclothing. What he has been wearing may be sent to a steam disinfector, be boiled at home, or things which would damage may be soaked in a solution of lysol.
The Disease in Poultry. A form of scabies, called depluming scabies, attacks fowls. It takes the form of feather cating, and is usually due to the small mite at the roots, but sometimes to lice. There are two kinds of feather plucking, the eating of the bird's own feathers, and the plucking of those of other birds. The discase appears usually about April, and is most prevalent in the spring and summer. Besides the loss of feathers the birds become thin and lay fewer eggs or none at all.

To cure the disease it is first necessary to isolate the affected bird or birds. The mites yield readily to treatment if oil of cloves is rubbed into the infected area, but a mixture of one part of creosote to 20 parts of lard is perhaps a better remedy. Another remedy is to wet the base of the feathers with soapy water, and then dust the birds with fresh pyrethrum. See Gapes; Poultry.
SCABIOUS. The pincushion flower or scabious is a delightful plant for the garden; there are perennial and annual kinds. The flowers of the latter are of various colourscrimson, maroon, lavender and pink. Seeds should be sown under glass in March, and the seedlings planted out of doors in May; these plants may be treated as biennials, secds being sown in summer and the seedlings set finally in autumn, when they will bloom the following year. The ordinary varietics reach a height of $2-3$ feet, the Tom Thumb varietics 12 inches.

The finest perennial lind is the Caucasian scabious (Scabiosa caucasica), which bears long-stemmed lavender-blue flowers of great value for cutting. It thrives best in welldrained soil. On heavy land it is liable to perish in winter, and there should be grown as


Sicabious. Flowers of the annual scabious varyin from a deep wine colour to pale blue
a biennial from sceds sown every year in May. Propagation may also be effected by division in September.
SCAFFOLDING: In Building. By scaffolding as applied to building works is meant the temporary plaiforms raised to varying heights to enable those employed on the job to work in comfort, and to support the materials which are being used for the structure.
The bricklayer's scaffold is the type used generally to assist in the erection of sinall houses, and it is made up with a number of members that are given different names, according to the position into which they are placed. The poles that are fixed in the ground are called stanclards. These are fir poles stripped of their bark, 4 or 5 in . in diameter and 25 to 30 ft . long. If longer poles are required two are lashed together. The hole dug for the standard is about 2 ft . in diameter and 2 to 3 ft . deep. Where it is not desirable to break the surface of the ground, the standards may be placed in tubs or boxes containing sufficient earth. The firm planting of the standards gives lateral strength to the scaffold.

The ledgers are horizontal poles fixed to the standards by means of scaffold cords or lashes; they are placed at the height required for comfortable working, from 4 ft . to 5 ft .6 in . apart. Scaffold cords are made of hemp or steel wire, about 20 ft . in length. It is essential that they should be in good condition, as it is upon the proper tying and strength of these cords that the security of the scaffold depends.
The standards are planted, as a rule, about 4 to 5 ft . from the building, with the ledgers firmly attached to them. A support is formed to receive the putlogs, one end of these resting on the ledger and the other bearing on the wall of the structure, for which purpose, on a new building, holes are left to receive them. The putlogs are lashed to the ledgers and securely wedged into the wall.

Putlogs are made from birch, 5 to 6 ft . in length and 3 to 4 in . square on section. They are spaced 4 to 5 ft . apart on the ledgers and form a base on to which the scaffold boards are placed. These latter are usually 12 ft . long, 9 in . wide and $1 \frac{1}{2} \mathrm{in}$. thick, and are often bound at the ends with hoop iron to make them durable. In erecting a scaffold, and particularly in laying the boards, great care must be taken. Traps must be avoided, that is, the overlapping of the boards on the putlogs, otherwise a scrious accident might occur. The boards are butted, but where the joints occur, two putlogs should be placed about 3 in. apart, in order to give ample
bearing for the boards at the ends. If the :caffold adjoins a roadway it is desirable to have guard boards at the sides to prevent any materials falling on to persons below. A safety rail may be provicled as an additional safeguard to the workers. A scaffolding may require bracing to give addlitional stability. Braces are formed with similar poles to those used for standards; they are lashed diagonally across the framework to the standards and ledgers.

Within the area of some local authoritics scaffoldings have to be approved by an offleer of that authority before they may be used ; this applies particularly to the London districts, where there are by-laws affecting the erection of any scaffolding used for building purposes. Scaffolding must be properly put together in spite of its temporary nature, because it invariably has to carry very heavy weights, and the lives of the men using it will be imperilled if strong and adequate framing is not provided for it. It is highly important that the services of an experienced workman should be utilized in raising anything but the most simple erection. See Trestle.

SCAGLIO'LA. Scaglio'la is a conıposition of coloured materials to imitate marble, which is sometimes known as mischia. It is composed of gypsum, or sulphate of lime, calcined to evolve the surplus moisture and to reduce it to a fine powder.

When it is required for use, sufficient water is added to the mixture to form a paste, and this causes the diffusion of the colours required. Experience alone can supply the knowledge as to which gypsums to mix in order to produce colourings. This material is laid on to brick walls in the form of a plaster, and may be trowelled to a smooth surface. See Marble.

SCALD: How to Treat. A burn produced by a hot liquid or vapour is spoken of as a scald.

The top of the foot is a common site for a scald, and when this happens the greatest care must be taken in exposing the injury. If the boot is on it may be better to cut the lace than loosen it in the usual way, and a sock or stocking should always be cut off. It will further help in the removal of a stocking if the foot is placed in warm water. As in burns from other causes, the first symptom to be treated is the shock-like condition. Warmth and stimulants are necessary.

In dressing the burn, if the skin is broken, greasy applications should not be used, as they interfere with the cleansing of the wound by the doctor. Cloths wrung out of warm boracic lotion are the best immediate application and they should be kept continuously moist with the lotion. See Burn.

SCALE: The Insect. An insect known as scale affects many shrubs and flowers, both indoors and out. The males are small black flies, and the females have the appearance of small scales, or plates, which affix themselves to the leaves or bark of plants in small brown or grey spots. Apples and pears, stonc fruit, roses and palms are those which are chiefly affected.

One remedy is to spray with paraffin emulsion; whilc, in the case of stem infection. methylated spirit brushed into the bark is effective. Paraffin emulsion is made by dissolving a handful of soft soap in hot water, adding an eggcupful of paraffin and two gallons of water. See Beeswax; Spraying.

SCALES : For Weighing. A pair of scales is a necessary adjunct to every household. In addition to those used in the kitchen for weighing food, scales are useful on the writing-table. For this purpose small pairs are made of brass and other metals, or of wood with brass fittings, with weights suited to the
weighing of letters and smail parcels. Scales are also used by photographers.

Kitchen seales are of two main types. One requires certain weights and works by means of a balance the articles weighed being put into a shallow pan on one side and the weights on the other. An ordinary pair will weigh anything up to $7 \mathrm{lb} .$, but larger ones can be bought. The other type works by means of a spring. weights heing unneccssary. The articles to be weighed are placed in a pan at the top, and their pressure moves a pointer on a dial to mark the correct weight. Modern examples are made of porcelain and are washable and hygienic. They usually weigh up to 14 lb .

SCALLOP : How t Prepare. Small portions of meat or fish cooked in a savoury manner in scaliop shells or dishes of that shape are called scallops. The name is that of a shellfish, and the shell itself is so hard that it is not injured by being placed in a hot oven. When the fish has been disposed of, these shells are often kept for cooking tish.
Scallops are usually obtained trom the fish. monger ready for cooking, but if they must be prepared at home open them with an oyster knife in the same way that an oyster shell is opened, then trim away the beards and black parts and wash them well in two or three waters. They are somewhat indigestible and it is essential that they be well cooked. The name is sometimes found spelt escalop on menus.
To cook scallops. parboil the fish in their own liquor for 5 min., then drain and keep them hot in their shells. Put the liquor into a small stewpan with 1 tablespoonful creany white sauce for each fish. Add a little extra seasoning and a squeeze of lemon juice, then make all hot over the firc. Pour over each scallop in its shell a spoonful of sauce, then coat with fried breadcrumbs. The shells should be well washed
Scallops may also be stewed. After preparing the fish well wash them, then put them into a stewpan, cover them with warm water, and simmer for from 15 to 20 min . Dish them in a china baking-dish covered with white sauce, which should be made partly with the liquor in which the fish have been stewed.

To fry scallops, prepare, wash, drain, and blanch them, then dip each in a rich light batter and fry in deep fat. Pile them up on a dish paper and garnish with fried parsley. Serve with them shrimp or oyster sauce. Add to the batter a little butter and season the scallops well.

SCALLOPING: How to Work. This is used to form a fancy edge on babies' clothes, underwear, frocks and house-linen. It is worked on white flannel with Hoss silk, on silk and cotton wear with embroidery cotton or silk, on linen with linen embroidery thread.
In the case of flannel, long-cloth and nainsook it can be worked on the single material, but when working on thin silk or crêpe-deChine it is advisable to sew a narrow strip of tissue paper or fine book muslin. under the edge of the material on which the scalloping will be worked. This prevents puckering, and gives a firm, even edge.

The design is put on the material by means of a transfer which is ironed off in the usual way. These transfers are sold by the yard in various shapes. The ordinary scallop pattern is in a semicircle; there are fancy vandykes made up of 3 or 4 semicircles on each side of it. The design illustrated is a wide one, each scallop measuring $2 \frac{1}{2} \mathrm{in}$. It is not necessary to buy a scallop transfer, as a coin and a soft lead pencil will provide various designs. For the average scallop, which.is about 1 in . wide when worked, a halfpenny will act as the tracing medium.

To mark the design draw a line across the diameter of the coin, so that the exact half
can be used. Pin the material taut on a drawing hoard. so that the cut edge is away from the worker, then place the coin on the material about of from the edge and draw

sicalloping. The aesign is padued and then worked on buttonnole stitch 'he materia being subsequently cut away from the outer edge

SCAR. The tissue which tilkes the place of norinal tissue in a healed breach of tissue from disease or a wound is called a scar or cicatrix. At lirst a scar is red and soft, but becomos gradually harder and whiter. It never contains hairs and sweat glands. like ordinary skin. When large as after an extensive burn. in contracting it produces puckering of the skin which may interfere scriously with movement. Scars, if irritated, rather readily developeancemusgrowth
round the coin from one point of the centre line to the other when a half circle will result on the material which forms the outside line of the scallop. To make the inside line, draw the coin inward until there is a space of $\frac{3}{16} \mathrm{in}$. from the pencil line to the edge of the coin, at the centre of the scallop). Again draw round half the coin, but beginning this tine on a level with the points of the first semicircle drawn. instcad of in a line with the centre of the coin.

For successive scallops the coin must be placed against the previous one, taking care that the guiding line is quite straight. As a further guide the starting point for the first semicircle could be marked on the coin. By the same method a permanent scallop rule can be cut out in stiff cardboard maling about ten scallops, and this can be moverl along for any tongth of material. Tiny scallops for babies clothes can be made with a sixpence. and the larger ones with a halfpenny and a penny, marking the shapes on the cardhoard.

Somotimes the work is padiled as shown at the right side of the illustration. The buttonhole work is done from left to right, holding the material with the cut edge towards the palm of the hand. After joining the thread on the wrong side, bring it through to the right side on the lower line. Then, holding the thread down in a loop under the left thumb, put the needle down through the material on the top line, and bring it up again on the lower linc, next to the spot where it came up before, as the work must be close and even. Draw the needle through, still keeping the loop down under the left thumb, and only release it as the last bit of thread is drawn through. This will make the pearl edge, and after the whole work is completed the material is cul away under this pearl edgo.
For the latter purpose a very sharp pair of embroidery scissors must be employed, so that the material can be cut clean away without cutting the embroidery stitches. See Embroidery : Night Wear Case : Transfer

SCALY LEG. This diseasc of poultry is due to a ting mite. The scales of the legs and feet become raised and separated, and a chalk-like excretion accumulates between and ovor them. The disease is slightly contagious. Infecterd birds are lame, have a difliculty in perehing, and get out of condition.
To cure the disease the isolation of the discased birds is essential. The legs should he bathed in hot water in order to soften the crusts. These are then romoved and a mixture of one part of creosote to 20 parts of lard is alplied. The limb, some days after treatment, should be well cleaned with hot water and soft soap. Sce Poultry.
SCANTLING. This is a term used in build. ing and carp ntry work for the dimensions of a piers of timber, i.e. its length, breadth, and thickness. The name is often applied to an actual piece of timher, which differs from other timber in not acrording with some series of standard sizes, in the same way as battens and planks. See Batten: Board; Plank.

SCARAB. Egyptian gems that are moulded or cut in the form of the sacred scarabaeus, or bcetlc, were originally used as amulets, and afterwards for personal ornament. They were made in all available materials, including green hasalt, lapis lazuli, serpentine, emerald cornelian, jasper, amethyst and onyx, besides wood, ivory and gold. The most numerous were in pottery or faience, covered with a bluiah -green glaze.

On the flat, oval base scarabs were usually incised with the names or representations of divine, royal and official personages, or with goorl luck mottoes and magical devices. Scarabs were also used as scals, being either strung round the neck or mounted in metal signet rings. Many imitations of old scarabs are made and used in modern fancy jewelry when fashion dictates. See Ring.

SCARBOROUGH LILY. The common name of Vallota purpurea, a half hardy bulb suitable for cultivation in pots in grecnhouse or room window: it bears showy lily-like scarlet flowers in August. The leaves are evergreen. During winter the soil must not be watered until moderately dry but in summer it must be kept moist.

The bults should be potted in carly summer. one in each 5 -in flower pot, in a compost of loam two-thirds, and leaf-mould one-third, with a scattering of sand. The Scarborough lily flowers most freely when the pots arc full of roots : repotting should be done only when absolutely necessary. In spring some of the old surface soil should be removed and


Scarborough Lily. Scarlet flowers of an evergreen plant for the greenhouse or room window
replaced with fresh compost. This plant, when well rooted, benefits by occasional applications of guano or liquid manure.

SCARECROW. Originally this was a dead crow strung up to a stake to scare other birds from the crops. Now the word is generally given to many types of bird scarer, including the familiar old man of the fields. made of a rough wooden cross upon which hangs an old coat topped with an ancient hat.

Modern scarccrows, which are known usually an bird scarers, are more effective than these examples that quiclily lose their terror in the eyes of feathered raiders. They include laths strung with bunches of tin, or pieces of glass attached to swaying hoops, and so slung that when the wind blows the tin or glass tinkles, alarming the birds and causing them to Hy away. Whatever type is adopted, the scarecrow must repeatedly be altered, hecause familiarity with the same patteril breeds contempt and ceases to puzzle the raiders. See Bird Nearer: Netting.

SCARF. The primary use of a scarf is to protect the throat and shoulders from cold, but frequently it is worn by women merely for its decorative qualitios.

A silk scarl $1 \frac{1}{2}$ yd. long and 1 ft . wide can be quickly crocheted in three shades of one colour. Two hanks of crochet silk are required of the palest shadcs, one of the medium and one of the darkest: also a No. 11 crochet hook. Make 8: chain and work 5 in. in the darkest shade; brealk off, join medium shade and work another 5 in. Breals off and join palest shade. Work this 34 in. and then linish off with 5 in . of the medium and 5 in of darkest shade.

Knitted Scarves Scarves are simple to knit. Any number of stitches may be cast on the needle, according to the width required. and plain or plain and purl knitting or some other pattern, used. The knitting should bo continued until the scarf is of the necessary length, then the stitches shonld be cast off and fringe added to the two ends. To obtain an even edge, slip the first stitch of each line.

A fringed scarf call be made in Shetland floss; 4 oz. tloss, a pair of No. 7 needles, and a medium size bone crochet hook are nceded to make it. The scarf measures 48 in . long and $11 \frac{1}{2} \mathrm{in}$. wide, and the linitting is worked at a tension that will prolluse about 18 stitches to 3 in . in width, and 30 rows to 3 in in depth.

Commence by easting on 60 stitches, and for the first row * knit li- wool forward knit 2 together 6 times, and repeat from ${ }^{*}$ to the end of the row, finishing with knit 12. Repeat this row 11 times, making 12 rows in all. The 13th row consists of * wool forward, knit 2 together 6 times; knit 12, repeat from * to the end of the row, finishing with wool forward, linit 2 together 6 times. Repeat this row 11 times, making 12 rows in all.

Then repeat from the first row until the work measures 48 in ., and cast off. For the fringe, take 6 lengths of the wool, each about 10 in . long, and with the crochet-hook pull through the first stitch at one end of the scarf, and knot.

Repeat this all along the row in about every third stitch of the knitting, and then fringe the other end to correspond.

A scarf made from brushed wool might be composed of two different colours arranged in bancls. For a scarf 2 yards long and 20 in . wide, 9 oz . of rose-coloured wool and 3 oz . of white wool are needed; but if thicker wool is used, these quantities must be increased accordingly. The white wool is used for the bands and part of the fringe, and the whole is done in plain knitting. Work at a tension of 5 stitches to the inch in width.

Begin by casting on 100 stitches, and knit 54 rows or 6 in. With the rose-coloured wool;
then 18 rows or -1 in. with the white, twisting the rose wool over the white before linitting the first stitch, so as to bring it in line. Work another ? in. with the rose wool, and then make another band of white. This also should he 2 in. wirle. Knit $1 \frac{1}{2}$ yd. with the rose wool, allowing for a second set of white stripes, and making the latter correspond with those at the other end. The searf will then be complete.

For the fringe, wind the wools over a card or thin book measuring 5 in. across, and cut them through at one end. Take two sirands together, double them, and with a bone crochet hook draw the loop of the threads through one of the wasting-on or casting-off stitches. This will depend upon to whish end of the scarf the fringe is first applied. Pass the ends of the cut wools through the loop and draw them up closely. Repeat this all along both curls of the scarf, clipping the hottom of the fringe to make it even. Lastly, brush the searf on one or both sides with the special wire brush that can be bought for the purpose.

Any other colours may be chosen instead of rose and white, and the scarf can be made a narrower width by casting on 60 instead of 100 stitches. See Crochet; Knitting.

SCARFED JOINT. In carpentry various kinds of scarfed joints are used when it is necessary to join the ends of timbers to increase their length. An ordinary scaried joint is made by cutting the two ends of the timber to a long ang!e, and glueing, dowelling, bolting, or otherwise securing the two parts together. It is essential to have both angles alike and both faces square to each other.
III the case of a lapped scarfed joint, instcad of making the joint at an angle, half of each end is cut away so that each picce of material can lap on to the other, as shown in Fig 1. This is a useful all-round joint, easy to malic, and is practically an ordinary lapped halving joint. When used in timber the joint should be square, and secured with nuts and bolts. Such a joint would not be suitable for an upright post which has to support a moving load. For the best proportions the longth should be twice the hreadth of the pieces that are to be joined.
The splayed scarling joint used for lengthening tie beams is shown in Fig. 2. Proper proportions for the length of the joint are alout $3 \frac{1}{2}$ times the greatest brearlth. The tabled scarling in Fig. 3 has the advantage that it naturally resists tension as well as compression strains, and shrinkage of the timber docs not seriously affect its security ; but it requires careful fitting. The sides of the timber have to be very earefully marked out and the lines accuratcly worked to them, all the joint faces heing kept perfectly square and true. see Joint.
SCARLET FEVER. A common infections discase, scarlet fever, or scarlatinn, owes its name to the vividness of its rash. The specitic cause secms to be a variety of streptococcus which gencrally enters the borly through the


Scarfed Joint : three varieties. Fir. 1. Lapped joint. Fig. 2. Splayed scarfed joint: Fig. 3. Tabled scarfed joint, a lype that resists both tension and compression strains from those parts. and throat have also a scarlet colour. called the red strawberry-tongue. Possibly the infection may pass backwards lisease A third com plication is acute rheumatism.

The general treat ment of scarlet fever is that of an infectious discase (q.v.) and of the state of fever (q.v.) The mouth and throat should be kept very clean by the use of
nose and throat; moreover, the infection is most often communicated by the secretions

The incubation period is usually about three or four days. Then the patient becomes fevered and suffers from sore throat and prolsably vomiting, especially if it is a child. On the second day the rash appears, first on the neek and chest but in the course of a day or two usually covering the whole body. with the exception of the skin around the mouth. The rash consists of tiny red spots, each being surrounded by an areola of pink. The mouth

The tonguc is furred at the beginning of the fever and may have the appearance described as the white strawberry-tongue. In this the surface is covered with white fur but is dotted over with red spots due to swollen papillae projecting through the fur. Later on the fur is thrown off, leaving a clean red surface, but the redness of the papillae is of a different shade and they are.still conspicuous; this is

With the appearance of the rash the temperature rises further, reaching $102^{\circ}$ to $103^{\circ} \mathrm{F}$. or more. The rash lasts for three or four days and then fades, the temperature also gradually declining. About seven days after the appearance of the rash peeling begins, and this usually goes on for two or three weeks at least.

Several very important complications may occur in scarlet fever. There may be inflammation of the kidneys. The urine becomes scanty and contains albumin and often blood, while there is swelling of the feet, ankles and face, or even more generally. Another complication is inflammation of the iniddle car. Infection passes up the Eustachian tubes from the nose and throat and commonly causes a suppurative disclarge from the car.

stored in any glazed vessel, such as one of the old-fashioned red breadpans, if placed layer for layer between rock-salt. It is quite possibie to have perfectly fresh beans at Christmas time by em. ploying this method. Scarle: runner beans are cooked in the same way as lirench an antiseptic month beans. See Beans; lirench Beans. wash (q.v.) several SCENT : The Various Kinds. The scent times daily, and it sold in shops consists of simple Hower cxtracts, will oftou be necessary rose, violet, etc., and of blended bourpucts. to use a nasal douche as well.

By inoculation with a vaccine a skin reaction is obtained in persons susceptible to scarlet fever, and these can then be given a prophylactic serum or vaccine. Sera are also used in treatment. See Quarantine; Rasl.

SCARLET RUNNER. This lavouritc climbing bean yiclds very profitable crops if well grown. It needs decply dug and manured soil to ensure that the plants do not suffer from lack of moisture in dry weather. It is not a success on poor land. Seeds should be sown during the second week in May at about 9 in apart in a double row, the lines of the row 18 in . apart: it is wisc first to put in tall sticks at 9 in . from each other on both sides of the prepared soil and to set one seed near each stick. A few seeds should be sown in a box of soil to provide seedlings which may be needed in case some of the seeds sown in the open fail to germinate. Another plan is to sow all the sceds in boxes of soil in a frame in April and to plant the seedlings in May. Stout sticlss 7 or 8 ft . high are needed to support the beans adequatcly.

Although the finest crops are obtained from plants in the open garden, runner beans do fairly well in partial shade and may be sown to cover a fence or trellis in suburban gardens.
The dwarling system is adopted by many market and some private gardeners. In this the rows are drawn about a yard apart, and the twiners pinched out regularly as soon as the plants have got well into bloom. Such a row makes a good border in a cottage or suburban garden. Under this mode of culture it is a good plan to sow a double row, the lines a foot apart, and to set the sceds in angles with each other at 9 in. apart. A pint of average runners contains about 180 beans.
The modern varieties bear large clusters of big, fleshy porls. Some of the best are l'rizewinner, Best of All, and Scarlet Emperor. The old varicty, Painted Lady has pink and white flowers.

Surplus beans should be stripped from the haulm at the first sign of frost. They may be
 Each season new perfumes of the second class appear from the great perfunery houses, where subtle ingredients are mixed to obtain something a little different from the scents already on the market, something exclusive, whic cannot be successfully imitated. The artistry which evolves a new, fashionable bouquet commands a high price : but, apart from this, the cost of materials and production renders it impossible for any good scent to be cheap.

To the make-up of these expensive seents go one or more of the natural perfames
dissolved in alcohol. Some of these natural perfumes are vahable in themselves, most are costly to extract. They include the essential o:ls or attars of flowers; the animal scents; ambergris from the sperm of whales; musk from glands in the musk deer, musk ox, and musk rat; civet from the civet cat ; balsams such as santal and opopanax from the wood of trees and shrubs : oils like bergamot from the skin of citron fruits: oils from lenves such as verbena and geranium: from roots such as orris; and from the vanilla and tonka beans, the last developing the principle for the perfume known as New Mown Hay

To obtain the essential oils from flowers in their absolute purity three processes are used. The first of these is distillation, in which the llowers, roses for instance, are heaped into boilers, through which steam passes, and gradually the essence oozes into a glass tube at the base of the still, to be collected in precious drops. The second process is effleurage, in which cold, purified grease is spread on glass trays and the flowers, jonquil luberose, or jasmine, are sprinkled over the surface to yield their scent to the grease, and the next day aro removed, when fresh blossonis take their place until the grease is thoroughly impregnater
Maceration is the third process. Nome grease is placed in a vessel and melted by a water bath at as low a temperature as possible. Into the liquid grease the flowers-this process is chiofly used for violets-are stirred, left immersed for a day, and strained off, fresh llowers being added until the liquid can absorb no more of the perfume.
In these last two processes the scent is extracted from the grease by alcohol being stirred into it for hours and then left quiescent, when the fat separates, relinquishing the perfume to the alcohol, which is drawn off, evaporated, and condensed, until only the pure essential oil remains. Orris root is used to imitate the essential oil of violet, and oil of geranium that of the rose. Even in the almost priceless Turkish attar of roses the petals are often sprinkled with geraniuin oil before being placed in the still.
Some of the cbeap scents depend largely for their composition on chemical combinations imitating the natural perfumes. Their chief defect is that often their imitative values do not last, and this accounts for the unpleasant odour of much cheap perfumery when stale, the chemicals used having been affected by exposure. Some of the cheaper flower perlumes are quite pleasant in use, but their chen pness is duc either to extreme dilution of the natural scent, in which case they have no lasting quality, or to a less expensive natural oil being substituted for that of the name of the flower on the bottle. Shortly after use they possess only a vague, meaningless sweetness.
Scent should be regarded as a luxury of refinement and worthy of a good price. The best qualitics are economical in use, as a few drops suffice to give the delicate fragrance. See Eau-de-Cologne : Glass; Lavender Water; l'ot-Pourri ; Sachet, etc.
SCHIPPERKE. The littlo skipper, to give an English rendering of its Flemish name, is an affectionate and lively small dog with an inguiring mind; a vigilant watch-dog, keen ratter and intelligent companion.

Wholly black in colour, he has a sharp foxy appearance, with a short straight back, well rounded at the hindquarters, and a dense, larsh coat which is developed into a bristling fril! around the neck. Tho legs are straight and small boned, the feet small and cat-like. There is no tail ; that is to say, some are born without one, the others have it docked in infancy. The small eyes are brown and bright; the cars small, sharp-pointed and carricd stiffly erect. The weight should be about twelve pounds. riec Dog; Kennel. Pron. Ship per-ki.

Schizanthus. The botanical name of the beautiful half-hardy annual called the butterfly flower (q.v.).
Schnapps. Hollands gin is also frequently known as Nchnapps. See Gin.

SCHNAUZER. This is a German varicty of terrier. It is a rough coated terrier, stoutly built, docked and weighing about 24 lb . In colour they arc grizzle or greyish and very active, sagacious, game and companionable. The schnauzer is a haudy dog and puppies are not difficult to rear.
SCHOOL: How to Choose. For those who require a day school the difficulty is not unduly great, because the choice is distinctly limited. A school in the neighbourhood of the home must be selected, and for many persons this will be a schoo! supported by the local education authority. The majority of these arc the elementary schools; but for the more advanced pupils there are secondary schools, where the teaching reaches a very high standard of excellence.
For those who desire to send their children 10 day schools of a different kind there is also ample provision. As regards boys, most towns have a public school in the shape of a grammar school, which is mainly attended by day pupils. These, with which the great day schools in London, St. Paul's, Westminster, Dulwich, and others, may be classed for our purpose, give a very good education at moderate fees. Travelling facilitics make it possible for many boys living in country and suburban districts to attend them. These schools, however, do not take boys until they have reached a certain age, 12 or thereabouts, and have attained a certain proficiency.

Younger boys may be sent to the kinder. garten department of a girls' school, or to some other school which provides training for juveniles, and from thence, when about seven or cight, pass to a preparatory school for boys, of which there arc many excelleut ones under private control. Siome of the large schools, St. Paul's, for instance, run preparatory schools quite apart from the main school.

The education of girls belonging to the same social class as the boys mentioned is provided for by a chain of public schools, controlled by companies not working for profit, and by a large number of private schools. The former invariably provide an excellent education, and most of them have a junior department, where both boys and girls are taken as soon as they need a school.

The latter class vary very inucb, and no general statement can be made about them. Those who think of sending daughters to a school of this class should make careful inquiries, especially from persons who have themselves sent girls there. Private schools


Schipparke. Champion of a breed ol small alert
dog which makes a trustworthy guard
are preferred by many on socia! grounds, and they are certainly better suited for children who, for reasons of health. are unequal to the strain of a public school.

Boarding Schools. For the limited class of parents who send their children to a boarding school there is a wide varicty of choice. Concerning the age at which they should be sent there is a certain difference of opinion. Some send boys as carly as 8 , and it is generally agreed that they should go not much later than 12 or 13 if they are to benefit properly from the public school training. Girls are usually sent to boarding school at a later age, not before 14, and this may be regarded as a sound principle.

For boys these schools may be divided into two classes. These are preparatory schools, nearly all private ventures, and the great public schools, as they are called. The curriculum and arrangements of the one are deliberately planned to lead to the other.

As, therefore, the private schools prepare for the public schools, parents should, if possible, choose a preparatory school that has a special interest in the public school for which the boy is intended. Monetary considerations are important here, as the fees of many preparatory schools reach a very high figure. Parents should, however, be warned against choosing a school merely because the fees are low. People only get what they pay for, or less in education, as they do in other things, and the cheapness may be made possible by economy in food or some other essential of health. Persons who cannot pay for a good boarding school will do much better to send a boy to a day school.

## Entering Boys at Public Schools

Parents who wish to eend their boys to one of the large public schools should enter the name as carly as possible. The age at which names are received varies from school to school, but the necessary information can always be obtained from the headmaster or the bursar.

As between ono public school and another, there is little to be said. The fees do not vary enormously, but it must be rememberecl that, though the schools at the top socially may not charge much more in fees than do the others, they cost more in other ways, as certain expensive standards of dress and living are maintained by the boys. Moreover, generally speak. ing, it is inadvisable to throw a boy into the society of those who in after life will possess far more moncy than he is likely to have, at least as a young man.
Of the boarding schools for girls, a few are public schools, run on lines not unlike those of the boys' schools, but the great majority arc private schools. For those with adequate means the public schools can be unreservedly recommended, but the private schools vary, both as regards charges and as regards efficiency, more perhaps than any other class, either for boys or girls. For one of these the choice should only lo made after very careful inquiry, whiclr should be in addition to personal inspection. Some of them make a great point of deportment, and training for the life of London society but this is useless, except for a few girls.
Many of these schools, and also many of the preparatory schools, are situated by the sea, and this makes an appeal to a great number of parents. It is quite certain that the sea air is. excellent for children, and regular sea bathing is a distinct advantage, but parents should not let these considerations outweigh all others.

Scholarships. Many boys are enabled to pass through a public school by the aid of scholarships, and in the same way boys from the elementary schools pass to the secondary ones. In both cases the compctition is fairly severe, and in the case of the best public schools it is very severe indeed. Those only
can hope to succeed who, in addition to marked abilities, are sent quite early to a good preparatory school and are specially conched.

Boys with good voices can obtain an excellent cducation in one or other of the choir schools, where also financial assistance is given tnwards the cost of educntion. For girls there ale not so many scholarships.

Other methods of educating children are practised on a smaller scale. There are one or two schools devoted to co-education, in which some persons belicve. Others send children abroad to be educated, Switzerland being popular for this purpose. In this way they obtain $a$ knowledge of modern langunges: but unless the school is a very good one it is probable that the loss is as great as the gain.

SCHOTTISCHE. In the ordinary schot. tische the first, second and third movements are the same as in the polka, the woman beginning with the right foot and her partuer with the left. The fourth movement is a slight spring on the toc of the commencing foot and then, as in the polka, the step is made, beginning with the other foot.

Having performed the full step from side to side, the half step is made by a little spring on the toc of the first foot ; left, man, right, his partner. The other foot is passed behind, rested on the toe, and a spring is made on the lirst foot again. Then the movement is repented with the other foot. The half step is used for turning.

In the Highland schottische the couple face each other, hop twice on the right foot, give a beat in the fifth position in front and one behind with the left foot. Then each passes to the left with the first 4 morements of the ordinary schottische and repeats the whole step to the right. They then join arms, turn round with 8 hops and repcat. See leel.

SCIATICA. Neuralgic pain in the great sciatic nerve running down the back of the thigh is known as sciatica. It is more common in men than in women, chiefly amongst those who are constantly exposed to the weather.
Throughout the course of an acute attack the patient is best in bed. At the start poultices along the course of the nerve often relicve the pain. At the same time they ensure the limb being kept at rest. After a day or two the poultices may be discontinued, large pads of dry cotton wool being wrapped about. the limb in their place.

At the onset of the attack some aperient, such as 2 or 3 gr . of cascara, to be followed next morning by a teaspoonful of Epsom salt, is usually advisable. To control the pain, aspirin in 7 to 10 gr . doses orery 4 hours masy be taken under medical advice.

Stimulating applications, such as liniments of belladonna, aconite or chloroform, the galvanic electric current, hot water douches, or alternating douches of hot and cold water may be tried. See Gout; Poultice; Rheumatism. Pron. Si-ĭt'i-ca.

SCILLA. This group of spring and early summer flowering bulbs is popularly linown as squills and blucbells. They are planted in carly autumn in ordinary soil and flourish in sumny or partially shaded places: blucbells are happy in deep shade. The bulls of the small carly kinds should be set 2 in . decp, the larger ones 3 in . deep. The best of the dow growing early spring squills are sibirica and bifolia with bluc flowers; they look well in the rock garden, tlower border and shrubbery and on the lawn.

The common bluebell is Scilla mutans, of which there are varieties with rose-pink palc blue, dark blue and white Howers. One named Scilla autumnalis, 6 in., has pur-plish-bluc Howers in early autumn. The Spanish blue bell (hispanica) 15 in., bears showy spikes of bloom in various colours in

May. The italian squill (ltalica) and the Good tca-scones can be made by sifting l lb. Peruvian squill (peruviana), 6 in., have finc flour with $\frac{1}{4} \mathrm{oz}$. carbonate of sonda, $\frac{1}{2}$ oz. pale blue flowers in early summer and are cream of tartar and a good pinch of sait intc suitable for the rock garlen. Scillas may be set in pots in carly autumn and grown in an unheated or slightly heated greenhouse to


Scilla. Three of these blue spring foowering bulbs grown in a pot for bouse decoration Courtesy of Amateur Gardening
provide bloom in early spring. They are suitable also for planting in bowls of fibre in the home. See Bulb; Hyacinth. Pron. Síl'a.

SCISSORS. In a pair of scissors the flats of the blades slide over each other so that a shearing action is obtained; the blades are ground to a wide angle, not a finc angle, as for a knife. Scissor blades should be bent slightly so that their natural spring makes the cutting edges scrape each other as the scissors are closed, and the pivot should be a screw locked by riveting the point over. Many houschold scissors lack these features, and the scraping action has to be got by a twisting action of the thumb and finger. It is thus difficult to use a pair of right-hand scissors with the left hand. To test the shearing action of scissors, when buying them the rings should be held one in each hand and the scissors opened and shut; under this test the blades should not llap freely, but a steady grind should be felt. though a pair that is stiff to work should be rejected.

Repairs. If scissors get loose after long service the pivot should be tightened a little by laying the scissors on a heavy piece of iron with the head of the screw down and drawing the rivet tighter by light hammer Hows on the screw point, the screw having heen first tightened with a screwdriver if possible.

When scissors get blunt the edges must be ground with an oilstone or on a grindstone, cutting at right angles to the plane of the flat of the blade, the scissors being held wide open for the purpose. On no account must any attempt be made to grind the flats of the blades. See Cutting-out; Grindstonc ; Pruning; Secateur; Shears.
Scolopendrium. This is the botanical name of the popular hart's tongue fern. See Fern ; Hart's Tongue Fern; Rock Garden.

SCONE : How to Bake. Scones may be cooked in the oven or on a girdle. The mixture for these cakes is usually of a plain character, and the raising agent employed consists of hicarbonate of soda and cream of tartar or baking-powder.

If a little extra time and trouble is taken by sifting the carbonate of onda and cream of tartar with the flour two or three times, the scones will be greatly improved. Buttermilk, or sour milk, is considered to be superior to fresh milk for moistening the dough, in which case a smaller proportion of cream of tartar is required for mixing with the carbonate of soda.
a basin. Work together 4 oz . butter and $2 \frac{1}{2} \mathrm{oz}$. castor sugar, adding, when properly creamed, 2 well-bcaten eggs and $1 \frac{1}{2}$ gills milic. Mix up the flour into a stiff dough with the liquid, roll it out about $\frac{3}{4} \mathrm{in}$. thick, and cut it into small round pieces.

Cut out as many as possible, then fold up the dough, roll it out again and cut another batch, proceeding in this manner until all the mixture is used up. The shaping must be done expeditiously, and as each round is cut out it must be turned over and placed on the bakingsheet. No fruit is added to these scones, and they should be scrved hot, split and thickly buttered. Brown scones can be made by using half wholemeal flour and half white Hour. A little more milk may be necessary to get the right consistency. For sultana scones add 2 oz. cleancd sultanas.

Excellent baking-powder scones can be made by increasing the quantity of milk for lea-scones by 1 gill, and adding to the Hour 2 heaped tcaspoonfuls of baking-powder in place of the carbonate of soda and cream of tartar. These scones should be shaped with a tablespoon dipped in flour, as they are toc moist to handle casily. They must be baked in a very hot oven, and caten hot from the oven. See Girdlc Cakc.
SCOOP. A scoop is a shovel-like implement used for moving food or other material. The shovel attached to a coal box is sometimes called a coal scoop, while the spoon cinployed for soft sugar is occasionally known as a sugar scoop. Other examples are the crumb and the marrow scoops. See Coal Box : Shovel ; Sugar Basin.

SCORCHING. For scorch marks on linen mix together $\frac{1}{2}$ pint vinegar, 2 oz . fuller's earth, $\frac{1}{2}$ oz. shredded white soap, and the juice of ${ }_{2}^{2}$ onions, and boil them up until they form a thin paste. Spread this over the marks, allow it to dry on the material, and then wash it out. The process may te repeated if necessary. The onion juice is obtained by peeling and slicing the onions and then pounding or squeczing them. Silk or wool that has been badly scorched will rarcly yield to treatment. See Ironing.
SCORZONERA : The Plant. A vegetable with long thin roots which is useful in winter though not very commonly grown in this country. It is easily managed in deep well tilled soil free from fresh manure. Sceds are sown in April in drills 12 to 15 in . apart, and the scedlings are thinned out to 9 in . apart. In autumn or winter the roots are dug as they arc needed.
SCOTCH BROTH: How to Make. The basis of Scotch broth is mutton, and it is Havoured with vegetables and thickened with pearl barley. To make it, take 3 lb . middle and scrag end of a neck of mutton joint it and cut all into neat pieces. Put these into a large sauccpan with 3 quarts cold water and $\frac{1}{4}$ oz. salt and boil up, skimming off all impurities.

Now prepare and cut in large pieces 2 goodsized turnips, 2 leeks, 2 onions and 1 head of celery; add these with a large bouquet garni to the mutton, boil up again and then simmer gently for four hours. Strain through a sieve into a basin, rinse out the saucepan and return the liquor to it, adding $3 \frac{1}{2}$ oz. pearl barley which has been washed and parboiled.

When the broth boils up again, add to it a mixture of fresh vegetables cut into dice. These should consist of 2 small carrots, 2 large turnips, 1 small head cclery with 2 onions and 2 lceks shrelded fincly. Season with salt and pepper and boil gently for I hour, skimming the broth free from fat. Sometimes carrots are omitted Whether the portions of mutton are served in the broth is a matter of taste.

SCOTCH BUN. This bun requires two days for making. To prepare the dough, sieve together 1 lb . flour and 3 oz . sugar. Then rub in a little less than $\frac{1}{4} \mathrm{lb}$. butter. When the mixture is quite smooth cream together $\frac{1}{2} \mathrm{oz}$. yeast and a pinch of salt; pour in $\frac{1}{4}$ pint cold milk, and strain the whole into the flour, etc. Well knead the mixture, and then leave it overnight in a warm room, covering the bowl in which it is placed with a thick cloth.
The centre of the bun must be prepared the following day with $\frac{1}{4} \mathrm{lb}$. of the above mixture, $\frac{1}{2} \mathrm{oz}$. spicc, $\frac{1}{4}$ teacupful treacle, a wellbeaten egg, $1 \frac{1}{2} \mathrm{lb}$. mixed raisins, currants, and sultanas, a few sweet almonds, and $\frac{1}{4} \mathrm{lb}$. shredded candied peel. Mix all these ingredients in a basin, afterwards kneading well and moulding the mixture with a little flour.
To make the cover of the bun, take the rest of the dough, rolling ${ }_{3}^{2}$ of it into a round, and lift the inside part of the bun into this. Then draw up the dough at the sides to reach the top, brushing beaten egg over the edges, and roll out the remaining dough for the top portion. Put on the top round as neatly as possible, and prick the bun all over with a fork, making deep holes all over the surface. Brush the bun over with a little milk, and bake in a moderate oven till brown. This should make a 3 lb . bun.
Scotch Fir. The common name of Pinus sylvestris, a conifer which is invaluable for planting in exposed places. See Pine.

SCOTCH KALE. This is a very hardy varicty of borecole or kale and includes dwarf and tall curled kinds. No type of winter green excels it for free yielding crops during autumn, winter, and spring.

The kale reaches a height of from 2 ft . to 3 ft ., with heads of deeply curled leaves, which are at their best after exposure to frost. Seeds are sown on a reserve border in April, and the seedlings are planted out in summer at $2 \frac{1}{2} \mathrm{ft}$. apart. See Kitchen Garden.
Scotch Pancake. This is another name for the tea-calkes known as girdle cakes (q.v.).
Scotch Terrier. See Aberdeen Terrier.
SCOTCH WOODCOCK. The savoury that is called by this name is prepared by mixing $1 \frac{1}{2}$ teaspoonfuls flour to a smooth pastc with 1 tablespoonful milk and putting what remains from a gill of the latter into a pan with 1 oz. butter. When these are hot, stir them on to the flour, mix all together, and boil them up.
Simmer them for a fow minutes, kecping them well stirred, draw the pan to the side of the fire and let its contents cool slightly before stirring in one by one the yolks of 2 eggs. Continue stirring the whole over gentle heat so that the eggs may cook, then add salt and cayenne to taste, and a teaspoonful of chopped parsley. Have ready some small rounds or squares of hot, buttered toast, spread them first with some anchovy paste, and then with the hot mixture. Send them to table at once, garnished with narrow strips of anchovy laid across the egg.
SCRAP BOOK. Brown paper makes an effective book. Sheets cut to the required size and stitched together with strong thread, or fastened at the corner with a piece of ribbon run through, make an excellent background for all kinds of pictures. Books for hospitals, especially for sick children, can be made out of coloured and glazed calico, pink or blue, with the edges pinked and a piece of silk cord or ribbon threaded through to kcep the sheets in place. If the calico will not take paste satisfactorily, a little seccotine or fish glue will serve the purpose equally well. The great advantage of such books is their lightness.

For the pictures themselves there is no need to seek far. Coloured advertisements cut out and pasted up neatly without the printed matter, and illustrations from bulb catalogues,
or those distributed by seed merchants are useful. Such pictures should be cut out in silhouette if the best effect is to be obtained. Old Christmas and birthday cards, scraps from crackers, and the covers of magazines all help to provide colour and variety. Flour paste is usually sufficient for this work, though for thick cards something stronger may be nceded.

SCRAPER: For Boots. In one sense this word refers to an article used for removing dirt from boots and shoes. Such are usually placed just outside the door of a house. Sce Boot Scraper.

SCRAPER: The Tool. The scraper is a tool for giving a better finish to an article already machined or worked. The type for woodworking, illustrated, consists of an oblong strip of sheet steel about 6 in . by 3 in . and in


Scraper. Oblong strip of steal beinz used as a finishes in woodwork
thickness about $\frac{1}{18} \mathrm{in}$. This tool is largely employed in cabinet making. The method of using is to hold it in both hands a few degrees out of the perpendicular away from the operator. The two thumbs are placed in the middle of the scraper on the side nearest the uscr, while the fingers grip the other side. Pressure now applicd by the thumbs will give the scraper a bend in the middle and away from the operator. The lower edge is put upon the work and a strong forward motion im. parted by the upper arm.

In the majority of cases the scraper is used in the same direction as the grain of the wood; but experience is the only guide in this
woolly after scraping; this can be cured by scraping with the grain but from the opposite direction. It is sometimes useful to approach the scraper to the wood in an oblique direction, this having a decided tendency to kcep the grain in place, but it has the disadvantage of making a slower cut.
The method of sharpening represents a radical departure from the standard practice of tool sharpening. The scraper is set firmly in a vice between two pieces of wood, the top projecting a little. A fine file is then run over the top, and the burr thus created removed with a fine oil stone rubbed on the top and sides. When both edges are sharp a round rod of hard cast steel or similar material is pressed on the edge of the scraper at an angle of about $45^{\circ}$ with it. The sharpened edge is thus destroyed and another burr created. This burr is the scraping edge of the tool.

Scrapers are extensively employed in metal fitting. Such a tool can be made from an old file, the teeth of which have been ground away on the grindstone and the edges ground sharp and smooth. Such scrapers are durable and efficient. See Cabinet Making; Metal Fitting.

SCREED. A projecting strip known as a screed is employed in plastering and rendering as a guide in the preparation of a flat surface. It may be of wood or metal or of the same material as the surfacing of the wall.
Wooden screeds are fixed to the face of the wall or other surface with the aid of rough grounds or thin packing picces. The face of the screed is levelled, or brought into line with the desired face for the work. Two screeds are set vertically and two horizontally, then all four are adjusted until their faces truly represent the outer surface of the wall covering. Lincs are stretched from one screed to another and any additional screeds added wherever they are requisite.

The wall surface is thus divided into a series of cells, the screeds being usually about 2 to 3 ft . apart. When this preliminary work has been clone the covering material is then applied, and afterwards levelled with a long batten. When the plaster has set sufficiently the screeds can be removed and the spaces filled in with plaster, etc., or more generally are embedded in the second and finishing coats when these will be of sufficient thickness.

In other cases screcds are made in the form of little walls of cement or plaster and their faces levelled, the spaccs between being -subsequently filled in with the same material. See Lath; Plaster; Rendering.

## SCREENS: USEFUL AND DECORATIVE

## Their Choice, Construction and Renovation

For further informa:ion on the work suggested below consult Marquetry; such entries as Embroidery; Fire Scrien; Inlaying; Lacquer; Lead Art Craft; Leather Work; Moulding; Mitre Joint; Painting on Texite Fabrics ; Patchwork; Plywood; Tapestry; Veneer.

To be decorative and practical is the twofold object of the screen. Styles which, by reason of spindle-like legs or of openwork carvings on their pancls, let through draughts, are only useful where they hide something unattractive ; if not required for this purpose they should be admitted to rooms only on the same principle as pictures-by right of intrinsic beauty.

When choosing a screen it is worth while taking thought and trouble to secure the right type, as it presents such a large surface to annoy or please the cye, and however beautiful in itself it can mar a room by being out of key.
Reproductions of rare and artistic screens can be obtained at a variety of prices, and for durability those in leather have cverything to reconmend them. In brown, antique finished hide with no trimming but brass nail heads, they look their best in an oak-furnished dining room or hall, while the embossed or lightly modelled heraldic device style of
ornamentation supplies variety to the same type of screen. The quaintly patterned and coloured leather screen, with its conventional fruit and floral motifs is; when placed against a plain wall, a joy in mellow richness of tint and the same may be said of those panelled with grouped figures after the style of various schools of painting.

The most beautiful type of leather screens are painted and lacquered. The illustration with a Chinese design might have graced a Queen Anne room (though screens were then often six-fold), or have been seen during the middle 18 th century period when Chippendalc and other great designers were influenced by Chinese styles. Copies of such screens look beautiful in rooms which suggest 18 th century furnishing. With certain severe types of modern interior decoration, plain gold lacquered screens may look more effective.
For the living-room tapestry screens are often suitable, and panelled with necdlework


Screen. Wooden screen with mountain landscape design inlaid with coloured marquetry and with inlaid line at the edges of the panels coloured marquetry and with inlaid line at the e
Courtes"/ of Rowle" Galleries
panels of this sercen will also be found in the arlicle on Lacyuer Work, and that on Enamel should also be consulted Floral designs can be selected a prett.y idea being to copy flowers from a cretonne used in the furnishing of the room. A beantiful effect can be achieved by treating the upper panels with pokerwork in colours (see 1. 977), staining the lower pancls and framework with marquetry stains. Wood carving can a!so b? effectively introduced in low relief and incised designs

Another form of decora tion is by means of glass and lead art craft (see page 706). A screen for a hall looks well with glazed upper panels trealed in this manner, the rest of the screen being stained or lacquered a bright colour. If canvals is used to cover the pancls, a conventional design may first be stencilled on the fabric (see Stencilling), or lesigns may be embroidered in coloured wools.

Making a Screen. The three and four fold screen can be made by the a mateur in many different patterns. The plain form illustrated in Fig. I will
serve as a guide to their construction. The plain screen can lee given a lecorative effect by means of the panels, which can be of omamental wood, and many linds of plywood are of valuc. Canvas in artistic sliades can be stretched on plywood and used as panels.
The construction of the framework of a screen is straightforward, but the material must be well scasoned to prevent warping, and planed quite straight and true For a ful!-size screen the wood should be at least 2 in . by ${ }_{4}^{3} \mathrm{in}$., but $2 \frac{1}{2}$ by 1 in . is advised. The extra thickness will make the screen heavie!, but this is not a disadvantage. Before the joints are marked out, the method of sccuring the panels should be determined. Two methods are suitable: in one the panel is let into a ploughed groove, as in Fig. 2, and in the other the panel is held in position by slups of beading, as in ligg 3 .
The haunched mortise and tenon joint for the corners of the grooved frame is shown in Fig. 4: the grooves should be ploughed to fit the pancling and carried to a depth of $\frac{3}{8} \mathrm{in}$. The same joint should be made at the corners in the case of a plain frame, but the tenon will be flush with the inner edges of the frainc. The choice of material depends on the panelling. If a canvas-covered pinel is litted, the frame can be of deal, pine, or whitewood stained to match the inaterial; if a decorative wood is used the framework should match the panels. The uprights and rails should be placed together in marking out, so that the position of the mortises, tenons, and shoulders can be quite accurately indicated.
In the present design the uprights are 5 ft .6 in. , and the rails 2 ft , with a $2 \frac{1}{2} \mathrm{in}$. by lin. framework, and the top panel should be lft .5 in . high. The frames should be cramped

1apestry are highly decorative. Drawing room screens may have Chippendale style mahogany frames, glass-topped and with lower panels of brocade. Sometimes beautiful old needlework is utilized under glass for this type of screen, or in combination with a gilt scrolldesigned frame in the French style. Cheap Oriental screens are not to be recommended. as the paper backing under the embroidered gauze is so easily split and torn.

All-glass panelled screcns are decorative in suitable rooms. and are useful where it is desired that draughts but not light should be excluded. Mirror glass is used in sectional designs, and such screens tend to make a room look larger. As a general rule, glass of any lind is more suitable when confined to the upper panels of a solidly constructed wooden screen.

For a bedroom plain-coloured canvas, silk or cotton material repeating an established tone in the room is restful and pleasant. A different patterned cretonne or thintz to that already draping the room should be aroided. Some people like a gathered washing material merely tied with tapes on to one of the wooden frames sold for the purpose, so that the whole thing can be washed. The objection to this type of screen is that it is not a draught preventer.

Decoration of Screens. For the nursery or living-room a wooden screen can be most decoralive, light and yet durable. The white enamelled example illustrated is most practical, as it is washable; the other wooden screen shown has a mountain landscaje design inlaid with marquetry of coloured woods. Less ambitious designs in marquetry could be confincd to the upper panels of a screen constructed after the style of Fig. 1. This screen could also be enamelled and decorated like the nursery screen illustrated. The animal pictures can be drawn frechand, traced, or stencilled and painted in oil colours. Ideas for the suitable decoration of the opper


Screen. Four-fold hide screen with antique gold lacquer design on a cream-coloured ground Courtes// of Waring \& Gillow. Ltd.
 melled wooden screen for a nursery, with
stencilled and painted in bright colours
up and carefully tested for squareness, and it should be noted that any carelessness in cutting the joints may cause the frame to warp. As much of the surface finishing as possible should be done before the frame is glucd up if the panels are let in the framing, the final cleaning up and subsequent polishing being done in the usual way, either wax or oil being preferable. The canvas-covercd panels are very effective; the material should be pasted on, or if it has been embroidered or stencilled in a coloured pattern it can be stretched and tacked carefully to the edges of the panels.

If beading is used it should have a rounded edge, and be secured to the frame with panel pins, the corners being mitred. An alternative design can be made to the same proportions with plywood panels of Oregon pine, a centre upright being fitted, and the panels secured with $\frac{1}{4}$ round beading. Made with deal framing and stained either brown or green, the screen is both-effective and inexpensive. The divisions can be hinged with the simple hinge shown in Fig. 5; or the usual form of screen hinge in Fig. 6. The latter enables the divisions to be folded in either direction, and keeps them close together. They are both easy to fit, slots being made to take the thickness of the material.
Renovating a Screen. A canvas or other plainly covered screen that has become shabby need not be discarded as useless, for it can be casily renovated. If the framework is stout, glazed calico can be used to cover it, being fastened round the edges by brassheaded nails, and in the folds by tacks.

By means of fish glue, scissors, and some bright-coloured pictures, the screen can be transformed into a gay and attractive piece of furniture for the nursery. Suitable pictures can be obtained from book wrappers, magazines, and old children's books. The pictures should be cut out neatly, brushed over with a thin coating of glue, special attention being paid to the corners, and stuck on to the screen.

One fold should be finished before another is begun, and the top row should be done first. It is generally best to start at a corner, not in
lainting on satin provides one of the most effective ways of renovating panelled screens. The frames themselves must be in good condition, and the satin of a colour that will harmonize with the wood. Embroidery and painting may be happily combined. IDesigns may also be outlined in coloured beads. If white or some pale shade of artificial silk

or satin is used, a glass covering that will protect it from dust and yet show the work to the best advantage is essential. Worked and painted panels can be made up into screens, the cost depending on the size and style of mounting.

SCREENING: In Wireless. This is a method of preventing interaction between two adjacent circuits by interposing a metal shield. The screening should be arranged so as to minimize both magnetic and capacity couplings, otherwise instability is liable to occur.

In simple sets a single metal sheet (usually of copper or aluminium ) may suffice, but

Fig 1


Fig. 4
the centre. It does not in sensitive multi-valve receivers it is sometime matter whether the pictures necessary to enclose the adjacent amplifying are the same size or not, but stages in metal boxes. In sets employing up as they must fit exactly into to five valves the screening is normally conthe width of the screen and they should not be overlapped, it will probably be necessary to have a very wide one, or one, or two narrow ones at the end of the row. Thin white varnish, as used for lamp-shades, should be brushed over the pictures to complete the work.

A screell frame can be covered with furnishing satin and decorated with shaped pieces of embroidery at the top of each panel framed by $a$ gimp trimming, which in a wider form edges cach fold of the screen. This method has been used successfully for covering an old screen, and dcpends on careful measurement, the neat strctching of the material over the frame and the skilful manipulation of the edging gimp. Hand cmbroidery or appliqué work can be used instead of bought pieces if more time can bc devoted to the manufacture of the screen, or the scheme lends itself to all sorts of combinations of materials and colours in forming pancls fined to the high-frequency stages. Inductance coils should be carcfully placed in relation to the screening, since if the coils are mounted too close to the metal shiclds a marked loss of efficiency may occur. The metal work comprising the screening is normally joined to earth, and thercfore to low-tension negative. It is essential to insulate from the screens all wiring not at carth potential.
SCREW : For Wood and Metal. The screw is a cylindrical piece of metal or wood having a spiral groore cut along the whole or a considerable portion of its length. At onc end provision is made for imparting a turning motion to it.

The wood screw has a tapered shank, which taper varies according to the nature and the application of the wood with which the screw is used. The thread resulting from the spiral groove cut along the shank is decper, thinner, and spaced farther apart in the wood screw than in the metal screw. The former terminates at its lower end in a sharp point. The metal screw, on the other hand, has a fine thread of little depth and in many patterns the thread is formed along the whole length of the shank. The shank is parallel and docs not terminate in a point.

In principle the screw represents an inclined plane moved by a force up or along another inclined plane. These are represented by the screw thread and, in the case of the metal screw, the thread of the screwed hole. The wood screw makes its own thread as it advances. Metal has such solid properties that only a hole of the correct diameter and shape, tapped out with a cutting tool having an identical pitch, allows the screw to be turned into it. The angle of the inclined plane is known as the pitch angle of the screw, and the spacing of the threads as the pitch. The difference of type between the two classes of screw is necessary owing to the entircly different natures of wood and metal.

The countersunk wood screw is designed to sink flush with the wood, and is used where an unbroken surface is required, as in a table top. The round-head screw is useful where the material is too thin to permit countersinking, and this type is also used for its inore decorative appearance. It is often japanned and used with rim locks, barrel bolts, and thumb latches.

Where a good appearance is desired iron screws may be blued, tinned, or finished to match any particular work with which they will be afterwards associated. Screws for outside work can be had with a galvanized finisl. Raised-head screws are a combination of the


Fig. 2

Fig 3


Fig. 5


Fig. 6

Screen. Fig. 1. Easily made wood and canvas three-fold screen. Fig. 2. Method of securing panels by a plougbed grovve. Fig. 3. Panel held by strips of beading. Fig. 4. Haunched mortise and tenon joint for framework. Figs. 5 and 6 . Types of screen hinges
countersunk and round-head pattern. These are often employed with a small brass cup, or socket, for use in hardwood, where they may be renoved from time to time without the risk of clamaging the surrounding wood.

To enable a screw to be introduced into wood, it is necessary to bore a hole somewhat smaller in diameter than the screw. This is most conveniently accomplished with a ginulet. After the loole has been made, the screw can bc driven with the aid of a screwdriver, or with a screwdriver bit in a carpenter's brace. If two pieces have to be screwed together, the screw can only bite properly into one of them, which should preferably be the thicker if there is any differencc. What is known as a clearing hole is drilled in the first piece, and the termination of the hole on the face of the work should be properly countersunk. The head should draw


Screw. Diagram illustratin3
process of screming in wood
shank can just turn is provided
Driving screws into plaster is a difficult operation; either it will be necessary to fix a wooden plug or to employ one of the patent fibre plugs. The method is described and illustrated in the article Plug (q.v.).

Screws for Metal. The thread and pitch of metal screws vary with particular requirements, two standard threads much in use being the Whitworth and British Association sizes. The former is the thread nost commonly used in machinery, and the latter for model work and small screws generally. Except for special purposes, the thread of a metal screw is taken to the head of the screw
Metal screws can only be driven into material after a hole has been drilled and tapped to receive them. The tapping process consists in making a screw thread of the same size and shape as that on the screw which is to be screwed into it. See Hand Screw; Sitocks and Dies.
SCREW CUTTING. So far as the amateur is concerned, there arc two ways of cutting a screw thread, namely, by the use of stocks, dies, and taps, or in a lathe. The first of these methods is described in the article on Stocks and Dies.

In using the lathe there is far more to be considered than a mere operating of the tool rest and the lead screw control nut of the lathe saddle. Some makes of small lathes are provided with a dog clutch on the lead screw instcad of a split nut on the saddle. The first thing to do is to set the change wheels in accordance with the table of changes provided, selecting, if possible, a pitch that has an even multiple of the pitch of the lead screw. In other words, if there are 8 threads to the inch on the lead screw, then 16, 24, 32, and so on are even numbers, and the dog clutch or split nut that governs the travel of the saddle may be engaged at any point without fear of the tool failing to come up in register with the partly cut thread.

If an unequal number of threads per inch must be cut, it will be necessary to stop the
lathe at the end of each cut and line up at the chalk marks previously made at two points, the first on the mandrel and the second on the lead screw. corresponding marks being made on the body of the lathe. As soon as all four marks line up the saddle may engage with the lead screw on no account before. This is illustrated in

## Fig. 1.

The work to be screwed is first turned to the required diameter, and a small extension, left on the end, turned to the root diameter of the thread, so as to avoid the possibility of cutting the thread too deep (Fig. 2). The work should then be placed in the lathe, either between centres or in a chuck, according to its shape. Next set the tool, ground level with the centre of the work, and at an angle of $90^{\circ}$ to the lathe bed.

Now approach the tool close up to the outside diameter of the work, so as to get the first position and reading of the handfeed index. If one is not fitted, chalk a mark on the hand wheel, then withdraw the tool a little way and place it, by means of the tool rest, about $f$ in. from the work towards the tail stock. Then return the tool about one-sixth of a revolution of the hand wheel nearer the work, as indicated by the position of the chalk mark just made.

Start the lathe, having first engaged the back gear and the lead screw clutch, and make the first cut, withdrawing the tool smartly when the end of the cut is reached, at the same time throwing out the lead screw clutch. Then return the tool towards the tail stock to its original position and set about $5^{\circ}$ deeper than the one-sixth just given : throw in the clutch and make the next cut.
This process is repeated until the thread is of the correct depth. In the case of work that is held in a chuck, it is an casy matter to test the progress of the thread with the part into which it is to be screwed. The chuck may even be unscrewed of the mandrel without fear of upsetting the register of the tool with the thread. Where the work is placed between centres great care must be

taken. if the work is removed, to see that the arm of the carricr that is in contact with the driving stud on the face plate is again the driving arm when the work is replaced; otherwise the work will be half a revolution out by the time the driving stud makes contact with the other arm, and this will bring the tool out of register with the thread. and break off. or soap and water should be used square thread section.

Great care must be taken in depthing the tool at each cut, and it must be borne in mind that the nearer the thread gets to completion, the greater will be the edge contact of the tool: therefore the depth of cut must be reduced gradually as the thread nears completion.


Screw Thread. Fig. 1. Standarj Whitworth. Fig, 2 Internation atandard (metric asstem). Fig. 3. Acme standard. Fig. 4 Buttreas
thread. Fig. 5. Common type of square thread. Fig. 8. Double thread hread. Fig. S. Common type of square thread. Fig. B. Double thread that the point of the tool will wedge up

If the above points are noted little trouble will be experienced when cutting fine threads, but for coarse threads, after the first 3 or 4 cuts, the tool should be very slightly moved by means of the tool rest across the thread. so as to cause it to cut on one face only, reversing the process so that the next cut is on the opposite facc (Fig. 3). The depthing of the tool is carried out as previously explained. When cutting a square thread this procedure is absolutely necessary for both fine and coarse threads. Plenty of thin oil

Screw Threads. There are two classes of screw thread, the triangular and the square. The former is used where grip and maximum security are required, and the latter where progressive movement is necessary with as little binding or frictional effort as possible. The lead screw that operates the saddle of a lathe is a notable example; in fact, the screws of all forms of high-class machinery that are a part of the various controls are of

The most common type of $V$ thread is the Whitworth, which varies in pitch, i.e. in the number of threads to the inch, in relation to the diameter of the bolt. The shape of the thread is shown in Fig. 1. One-sixth of the full depth of the thread is counded off at the top and bottom to facilitate the cutting of the thread, and to render the exposed thread of the male member, the bolt. less liable to injury. Where threads are formed by the use of stocks and dies, the shape of the thread will obviously be correct, but when the thread is cut in a lathe, such would not be the case unless great care is taken to see that the screw. cutting tool is ground to the angle of $55^{\circ}$ on the cutting faces.
Other standard screw threads are B.S.F., British Standard fine; B.A.S.T., British Association screw threads, the various sizes of which are stated in millimetres; B.S.P., British Standard pipe, used for all barrel work, such as gas fitting, etc.; and the I.S.T., International Standard thread (Fig. 2), better known as the metric thread. With
this type the angle of the thread is $60^{\circ}$, the top of the thread being flat and the bottom rounded. The American Standard sthe Sellers thead) is practic ally identical with the International in regard to shape of thread, but the pitch corresponds very nearly to the Whitworth table.

Two other types are the Acme and Buttress thread. The former, Fig. 3, is a modification of the square thread, used chiefly in machine tool work where a disengaging nut is required. Owing to the fact that the thread is wider at the botton for a given pitch than the equare thread, it is much strongcr
The Buttress thread (Fig. 4) is sometimes used where a screw has to resist a force acting always in one direction. It has one surface normal to the axis of the screw, like the square thread; the other,
as shown, is at an angle of about $45^{\circ}$. drill, and revolves automatically when the
The square thread in Fig. 5 cannot be handle is pressed down. A spring in the produced satisfactorily by dies, and has to be cut in a lathe. More than one thread may be cut on the same bar, if clesired, i.e. 2,3 , or more separate threads, termed leads, may go to make the complete screw, the pitch remaining the same in each case, as seen in Fig. 6. See Metal Turning ; Screw : Stocks and Dies.

## SCREWDRIVER: How to Use. A

 good screwdriver for general use is that known as the London pattern, which has a flat blade (Fig. 1, A). The cabinet screwdriver (B) with a cylindrical shank and oval or spherical handle is also a favourite. A long driver as used by electricians (C) is handy for many awkward jobs where the screw is difficult of access. In D) the blade and handle are forged from one picce of steel, the handle being made up to a comfortable grip with wooden scales riveted on.Ratchet screwdrivers (E, F) permit the blade to be kept in engagement with the slot of the screw during the whole operation of driving or withdrawal. Right or left-hand motion is secured by moving up or down a slide on the ferrule, and a centre position gives a neutral position, with the ratchet out of action. In another type the shank is spirally grooved like the shaft of an Archimedean


Screwdriver. Fig. 1. A, London pattern, which has a flat blade. B, cabinet screwdriver. C, long-shanked driver for electricians. $D$, screwdriver with blade and handle forged from one piece of steel. E and $F$, ratchet screwdrivers


Screwdriver. Fig. 2. Showing double-handed grip necessary for a large rewdriver. Fig. 3. Using screwdriver bit in brace hen driving a sc ward, it is started in the hole by taking it in the right hand and screwing it into the hole as far as it will go casily, without risk of cutting the fingers on the sharp celge of the head. The point of the screwdriver is then put in place in the slot in the head of the screw, the screwdriver being vertical, the palm of the right hand resting on the
end of the handle, and the thumb and end of the handle, and the thumb and

The process of driving the screw consists in turning the screwdriver to the right, while keeping a considerable pressure on it to prevent it from jumping off the head of the screw (Fig. 2). This pressure is liable to make the screw fall over to one side if it is excessive or directed out of the truc line before the screw is half-way home. 'The fingers of the left hand are, therefore, placed loosely round the blade of the screwdriver a little above the point, so that they can act as a check on obliquity.

When the screw is right home it must not be overtightened, since this may cause the screw threads to break the timber round them, which destroys the hold of the screw,
liable to happen with short or thin screws in soft woods. If it is found quite impossible to drive a screw it must be removed and the hole deepened or eularged before the screw is re-driven. With small. screws in hard timber, the screw should be withdrawn and the hole enlarged if the effort of driving becomes too great, or the screw may break.

A screwdriver scldoin requires any attention if it has been correctly hardened and tempered in the first place. After a lot of hard service, however, the point may get rather bruised and rounded, when it can be restored in a few minutes by filing with a smootl file on the two long flats and right across the point, being carcful to keep the actual Hat point square with the length of the ool and as thick as will enter comfortably into the size screw for which the tool is meant. See Plumbing.

SCREW PINE. The screw pine, also known as Pandanus, can be successfully reared in Britain in a hothousc, if grown in a moist and sunny position in ordinary potting soil in the intermediate house. It is lest propagated by means of shoots or offscts. It will attain a height of 3 ft . or more. Pandanus Veitchii is most frequently seen.

SCREW PLATE. Used for cutting small sizes in screw threads, a screw plate is obtain. able in two forms. One to hold dies consists of a flat frame of steel with an adjusting thumb screw at one end; the other is a Hat plate of stec containing a number of graduated holes forming dies. The latter tool is only serviceable for the smaller sizes, since no proper clearance is possible for the chips. See Stocks and Dies.

SCRIBER: The Tool. The scriber is used for marking purposes in every kind of metal work. It is made of steel hardened and sharpened to a fine point. The double end and is particularly gauge, being drawn along with one leg in
contact with skirting and the other, in line, fit, so that they may be made to stand up or Infantile scurvy, sometimes called Barlow's touching the dresser leg, so scratching a line to project below the base and overhang the on the latter showing the amount of material edge of the table or work being operated on, to be removed. When scribing the pilasters of a cupboard over the skirting, or to the wall, or when scribing a skirting board to the floor, the dividers are set to the greatest distance between the edge of the board and the wall or floor, as the case may be. See Cupboard: Dresser; Skirting Board.

## SCRIBING GAUGE. This instrument

 is used to obtain measurements from any Hat surface of predetermined accuracy. In as illustrated. The scriber is held in a in horizontal and vertical planes.
SCRUBBING BRUSH. The scrubbing brush used in the ordinary household consists of a plain solid stock, usually of birch, set with knots of bass, bassine, white fibre, or mixture.

In a machine-made scrub, a short piece of steel wire is punched crossways into each hole in the stock, pulling down with it a portion of the material used, and doubling it up to form the knot, the ands of the wire being forced into the wond at the bottom of the hole. It should be noted that the knots tightly fill the hole, otherwise there is little to prevent them soon falling out in use. Although a brush made by this process is not to be comparcd with a hand-drawn brush, it answers very well, providing the holes are well filled. A scrubbing brush with a long swivel operated handle, which obviates knecling, is illustrated in page $15 \%$.
SCRUPLE. This weight, used by chemists, consists of 20 grains , troy weight. Three scruples make a
the testing and marking off of engincering drachm and 24 scruples go to the ounce. See components of all kinds, the surface plate or Apothecaries' Weight. table is the basis of all morsurements.

The surface is a specially prepared casting, rilbed up at the back so that it forms a rigid base for any work laid on it, and with a top surface finished ofl to a high degree of accuracy. The smaller plates used on the fitter's bench are surfaced to $1-10000 \mathrm{in}$. by hand scraping in comparison with another plate, or by a patented grinding process. Work of all linds can be mounted on the surface table and with the scribing gange surfaces may ve marked out and tested, or machining and centre lines drawn on the job according to the requirements. A sheet of plate glass is sufficiently true for amateur usc.
The diagram, Fig. 1, indicates bow the bench surface plate and scribing gauge may be employed to mark out the levels of various lugs forming part of a casting. Theso lugs have to be planed off to the level shown by lines $A, B$, and $C$, which are all exactly the same height from the underneath side of the casting resting on the surface plate. The drawing at the same time shows the simplest form of surface gauge that can be made. This comprises a block of metal, the under surface of which is machincd Eat, and $\Omega$ steel arm pivoted to the block with a screw which will inake it work so stiffly that it will remain in any position to which it is set. This is hest acconiplished by fitting a double spring washer under the head of the screw. The end of the arm should be bent over, pointed, and be made of a steel that can be hardened and tempered
Metal work requires to be locally chalked where the scriber is to make a mark. 'To preserve the marks, should the chalk be rubbed oll, centre-punch dots are lightly hammered along the narked lines.
Figs. 2 and 3 illustrate a scribing block of a more claborate kincl. A V-slot in one of the vertical faces of the basc block is uscful for working against shafts and other round objects, while for obtaining scribed lines parallel to the edge of the surface table, or from any other straight edge, two pegs may be fitted in holes in the base. The steel pegs should be a push

SCULLERY. In small houses and flats the scullery is often combined with the kitchen. Sometimes where the kitchen is also used for meals, a scullery adjoins, which is provided with a sink and a useful cupboard fitted for brushes, brooms, cte., and also with shelves for cleaning requisites, and pots and pans, so that washing up, the preparation of vegetablcs, and rough work may not have to be done in the kitchen. A ncat little scullery of this type is shown in our illustration.

In larger houses the scullery equipment is necessarily more comprehensive. There arc usually two or even three sinks, and various labour-saving rlevices may be included, such as an clectric clothes washer, mangle and dishwasher. Furnishing and fittinge for sculleries are on the same lines as for kitchens. See Cuphoard; Kitchen; Pantry; Sink.
Scurf. See Dandruff: Hair.

SCURVY. It has long been known that scurvy, or scorbutus, can be prevented by including fresh food, especially vegetables and fruit, in the diet, and the disease is now rare, apart from war conditions. It has been found that the differencc between fresh and preserved or dried ood, as regards the liability to cause scurvy, consists in the absence from the latier of a complex substance called water-soluble vitamin $C$.


Scullery provided with sink and cuphoard. The walls are painted and there is a tiled surround to the glazed stoneware sink

Humphre! \& Vera Joel
kecping the blade resting lightly on the ground, and alightly pulling the tip of the hlade inward (Fig. 2). The scythe is then swung back to the right and the operation re prated, moving the fect forward slightly, and taling another cut of about 6 to ! in . of grass, according to the length of the grass to lic cut It is convenient to begin on the left of the work, and work down the grass in $n$ straight line. then returning to the starting point and again cutting to the right, as the tip of the scytho will be found always to come out into the space already cleared by the original cut.
Owing to the moisture in the grass the edge of a scythe rapidly loses its sharpmess, which is rwewed by tho application of a stone, specially prepared for the purpose, shaped like the round of $a$ ladder
SEA HOLLY. The name of a group of harily flowering plants (eryngium) which are qencrally of thistle-lilie appearance: the Howers, when cut, are useful for indoor decoration and last a long time. The beauty of the plants lies in the bluc or grey-blue colouring of the stems and thistle-like llower heads. 'lho sea hollics are casily grown in ordinary well drained soil in a sunny place. Some of the best kinds are alpinum, 2-3 ft ., blue; oliverianum superhum, 3 ft., blue; planum, : ft., small blue Howerhcads; and the new varicty named Violetta, 3 ft., violet-blue. Giganteum has pale grey-blue stems and Howers. The plants may be propagated by division in autumn or raised from seeds sown in a box of soil placed in a frame in spring.

SEAKALE. A vegetable valued for the young blanched succulent shonts in winter alld spring. It may be raised from seeds sown in spring in shallow drills drawn at 2 ft . apart.


Scakgle. Hlanched heads of this popular winter and spring vegetable

scylue: 1 wo movements in using thas tool. Fig. 1. Berinning of the stroke. Fig. 2. The end
removed, and the soil between the rows should be hoed frequently. In the autumin when the leaves have died down, the roots may be lifted and forced into growth imiler cover. Later supplies are obtained by covering the soi! over the roots out of doors, with heaps of sifted ashes or sifter soil and culting the new shoots as soon as they begin to pierce the covering. Scalale may be forced by lifting erowns from the beds out of loors, and placing them in a frame or house from which all light is excluded, in an average temperature of $60^{\circ}$. The young plants should receive liberal soakings of tepid water, and in about six weeks the seakale will be ready for cutting. If the bouse is not quite lark the lale will biennial from seels sown in boxes of soil in yellow or purple in colour and coarse in duly, the secdings heing potted subsequently illavour.

How to Cook. Sea kale is in scason from February to June. It may be boiled and dished on toast with sauce poured orer it, stcwed or made into sarourics.
To cook it, wash and trim it, then tie the heads into small bundles and plunge into fast boiling water. Boil the seakale quickly from 20 to $25 \mathrm{~min} .$, then drain it, untie the buncles and arrange them on a slice of toast. The sauce may be poured over or lianded round. Good melted butter sauce, Hollandaise or béchamel sauce, is most suitable.

Seakale may be boiled in stock and served with brown sauce. but the brown


Seakale: the test treatment. 1. Typical crown. 2. Prepared for planting. 3 and 4. Off-cuts or thongs trimmed and stored in pot of gand. 5. Thong developed for planting; two buds to be retained. 6. Forcing under manure : $a$, box; $b$ lid over sight hole; $c$, manure. 7. Indoor forcing in pots: $a$, plug for vent. 8. Outdoor culture: $a$, fne rich soil; $b$, manure ; $c$, subsoil ; $d$ blanching box
Courtesy of Amaleur Curdeninu

## Sealing Wax: Its Decorative Uses

Brilliant Effects that Can be Obtained by this Medium
This article belongs to the group of those describing art crafts, which includes, a mong many others Enamelling: Cesso : Italian Renaissance Work; Lacquer Work; Repousse Work; Stencilling

Scaling wax may be used to decorate candlesticks, boves, vases, etc., and to make smaller articles, such as beads and pendants. It call be obtained in every colour, from delicate shades of rose, mauve and blue to black, and also in bronze colours, silver and gold.
Surfaces coated with scaling wax are of pure colour, smooth and brilliant. The composition is a fine coloured lacquer, and for this reason oriental designs are particularly good carried out in gold or silver wax on a ground of vermilion or black wax. The draw back to the craft is that the wax, being brittle, is easily chipped. The advantage is that such chip3 can be repaired by holding the broken surface over a spirit llame and allowing the edges of the crack to run together. When working, if not satisfiel with the result the wax can be re-melted and the process started again.

The materials needed for scaling wax craft arc inexpensive, and requisites for the work are stocked by most stationcrs and at handicraft studios where materials for art crafts are sold. All that is required is a spiritlamp, a broad-bladerl knife, a wax spatula and a moulder, stcel linitting-needles of various sizes, methylated spirit, and scaling wax of various colours. In addition to thesc, a piece of soft rag should be handy for wiping the melted wax off the tools and drying the cooled bcads and pendants; a tumbler of cold water is needed, in which to cool the beads, etc., and the table-top should be protected by a narble slab or small shect of plate glass.

Making Beads. Beads can be made with sealing wax in the following manner. Heat a knitting-ncedle in the flame of the spiritlamp, and press it into a small piece of the wax. After deciding on the colour of the beads, or on the foundation colour if they are to be multicoloured, the wax of this colour should be broken into picces of an appropriate size.

Having got the bead on the needle, allow it to cool; then return it to the flame and rotate slowly. The bead will gradually hecoinc oval in shape, and the shaping may be assisted by the knife. A little nicety of judgement is required at this point to tell exactly the moment at which to take the bead out of the llame. If it becomes too hot the wax will Irop off, and, on the other hand, unless it is sulficiently heated the bead will suffer in shape. Very little experience, however, is necded to judge this point correctly, and the bead may be cooled by dipping it into a tumbler of cold water, if the heating goes too far before cxactly the right shape is obtained.
To blend other colours, two methods may be employed. The sticks may be heated one at a time and a little placed on the shaped bead. This is heated carefully and rotated slowly until the colours mingle with the foundation colour. After that it is cooled in water, dried, and passed quickly through the Hame again to restore the lustrc. As an alternative mcthod sealing wax of the desired colour is dissolved in methylated spirit to the consistency of cream, and the solution is painted on the shaped bead. This method is used when designs are painted on beads to obtain something of the effect of Venetian glass.
The bead must now be removed from the necdle. Heat the ncedle just above and below the bead, slide the bead backward and forward a few times to ensure a good hole for threading, and finally let it drop off the needle into a glass of cold water, which will set the shape. The special silk prepared for stringing heavy beads is suitable for threading, and any shape, round, Aat, oblong, oval, cte., will do for the beads. Pendants or a central plaque for the
necklace arc made on a picce of stout cardhoard cut to shape, a hole bored at cach side, and supported on a strong hairpin, the whole of the plaque covered with wax of any colour. Let the wax spread evenly over one side first hy holding the plaque over the flame once or twice. When this side is dry coat the other in the same way. When the plaque is quite dry, paint or stencil a design in colours, using wax dissolved in spirit.

Decorating Small Articles. One method of ornamenting candlesticlis and wooden cases for match hoxes. comh cases, bridge pencils and other small articles
 suitable for a bazaar stall is to warm whatever has been chosento be decorated, and atthc same time heat the tip of the stick of scaling wax Then, beginning at the top, dab the wax on in spots leaving a space between each spot, and every now and again hold the article over the flaine, rotating slowly and always in the same direction, until the spots of wax have melted and run smoothly over the surface. Repeat these operations until the entire surface is covered.

It must be remeinbered that this methol of decoration must not be apllied to any celluloid arlicle.
Colours may be blended by melting a sccond or a third colour over the first and blending all together over the Hame. Silveror gold wax may thus be used to fleck the background in an attractive manner over blue, green or black.

When a raised motif is required to decorate the corners or centre of a small article, or to make a border, the spatula and moulder may be used. Wreaths, baskets of flowers and tiny designs found on flowered china are specially suitable for this work. It is best to make a few trials with the hot sealing wax on a piece of cardboard and experiment on one or two flower shapes. Roses are easily modelled.

Mark a place with a pencil on the article where the raised work is to come. Heat the wax in the llame of the spirit lamp and let a tiny drop fall for each flower. Use two shades of pink for a cluster of roses and put several drops one over the other. Then, while the wax is still plastic, press with the spatula round the centre and make little separste dents to form petals and a dent in the middle of thesc for the rose centrc. Heat the tool a little if the wax becomes hard. The tiny leaves may be made of green, silver or gold wax and consist of a drop of wax, the spatula being drawn quickly through to make a central vein and shape the leaf.

Enamelling with Sealing Wax. The most artistic effects in sealing wax decoration are obtainable by using solutions of the different coloured waxes in methylated spirit. This
inexpensive craft has the appearance of line enamel work and can be used on a ground of sealing was to decoratc beads, or on wooden articles covered with the wax, or on pottery and glass.

The first step is to choose the article to bc so enamelled, and to decide upon the colouring. Then break up a stick of sealing wax and place it in a small bottle, covering it with methylated spirit. Cork tightly and leave overnight to dissolve. Shake it up well. Usc in the same way as liquid enamel ; a small sable brush is the best tool to employ.
Colour the design, attempting no shading, and working quickly and evenly. Practice is required to prevent the work from being patchy. The pressure on the brush must be even, and the sealing wax must be kept stirred. If it is too thick dilute it with methylated spirit. Kecp the bottles well corked, and clean the brushes in methylated spirit. The shading is added when the first coat is dry.

One section must be done at once and allowed to dry, as the work is ugly if the enamel is thicker on one side than another. As the work is dry in a very sliort time, it should appeal to those who have nowhere to put things during the drying process.

The illustrations give a good idea of the possibilities of this form of handicraft. Fig. ] is a useful flower vase. Its colour is dark brown, and it is decorated in white sealing wax sharled with fawn, the design being a ring of conventional applc blossom. Fig. 2 is a vase of white crackle ware, its decoration being done in sealing wax enamel representing multicoloured anemoncs. Fig. 3 is an alabaster powder box. The design on the lid, which was outlined entirely in black, shows brightly coloured flowers and leaves painted in sealing wax enamel. Gcometrical desigus and the Greck key pattern are also suitable.

SEALSKIN. The beauty and the dur ability of scalskin make it one of the most valuable furs in existence. It is usually


Sealing Wux. Fig. 2. Vase of crackle ware ornamented with a design of anemones. Fig. 3. Powder box in a!abaster, with decorated lid
made up into coats, but is also used for coat collars and cuffs.

Musquash is often treated to resemble scalskin, but may usually be recognized by its size. A large number of musquash skins are nceded to make a coat, so that the seams are numerous compared with those on a genuine seal. Coney and clectric seal, made from rabbit skins, are other skins, are other dog, an intelligent and entertaining companion Those who find it difficult to than it is owing to the long moustaches. distinguish between genuine and imitation The colour is uniformly white, or there may skins should examine the leather. In real scalskin this is never dyed, while in musquash and other imitations it is invariably of the same shade as the fur itself.
Sealskin is also imitated in a special kind of silk plush. This seal plush is generally dark brown or black, and is used for making winter coats, for trimmings and for travelling rugs. See Fur.

SEALYHAM. This type of terrier is a breed of small dog that has, during the 20th century, become very popular and fashionable. Founded upon a hybrid between the Jack Russell and Welsh terriers by later crossings

## SEAMS FOR PLAIN SEWING

## Some Helpful Directions for the Needlewoman

This article suggests reference to such entries as Dressmaking; Mending; Pattern; Sewing Machine, and also to various stitching operations, e.
The plain seam is the one most commonly used in needlework. To make it, lay together the two pieces of material to be joined, with the right sides facing and the two edges exactly level, and tack along the two thicknesses where the permanent stitching is to be put in. It is a good plan, when a garment is being cut out with the aid of a paper pattern, to mark the material round the pattern edges with chalk, so that, after the pattern is removed, there is a guide to the amount of material that should be taken up in seams, etc. After tacking, carcfully stitch the seam by machine; or, if small light articles are being made up, run the seam by hand if preferred, as in Fig. 1.

The stitching of all scams of garments should be commenced at the top, i.c. the waist of a skirt, shoulder of a sleeve, and so on If one of the two edges is on the cross or bias of the fabric, it should be laid uppermost, as it is apt to stretch out of shape. When stitching a shoulder seam, always ease in the back shoulder-edge and stretch the front, in order to get a better fit over the shoulder blades.

It is the custom, when stitching seams of dresses or coats that take a concave curve at the waist, to stretch this part of each seam, so that it will still more follow the curve of the figure. Seams that take a convex curve are held in, so that they will not stretch, otherwise the shape would be spoiled. In stitching the seams of a 2 -picce coat sleeve, commence by stitching the shorter or inner seam, and do the longer or back scam afterwards, easing in the clbow part of the wider or upper portion to the elbow part of the narrower portion, so as to give it more play at the bend of the arm. After any plain seams are stitched, remove tackings, and iron the scam edges open flat. If the seams are curved, however, be carcful to snip the tirnings here and there, evenly and regularly,
as in Fig. 2, otherwise it will not be possible to iron them flat; the material under the scam edges will become dented or cockled up. Many seams have their edges notched or snipped out in this way, even if they are not curved, merely to give a better effect and to prevent the edges fraying out too rapidly.

Unless the raw cdges of these plain seams are to be covered with a lining, they have to be finished off. In dresses it is usual to overcast the cdges, as in Fig. 2. In unlined coats or wraps, the edges are bound with lute ribbon or Prussian binding, the binding being folded double, so that the seam edge can be stitched between. In some silken materials that have little tendency to fray, such as taffetas, the edges are merely pinked out; in heavier materials of this nature, such as velours, they are often pinked out or herringboned down.

Overlapped Seam. This seam is applied in the making of outer garments, and also on underclothes, pyjamas, etc. It may be used to make skirt seams, to set in yokes, and to attach strappings. It is easily made. Turn in the edge that is to be uppermost, to the amount of turning allowed, and tack along; then lap it on to the remaining edge, and again tack down, as in Fig. 3. Machine as far within the fold as desired, taking care not to go beyond the edge of the turning. The raw edges can be neatened in any of the ways previously mentioned.

French Seam. A seam often employed on delicate materials, such as lawn, muslin, crêpe-de-Chine, net, lace and georgette is the French seam. To make, set the two layers of material together, with the wrong sides facing and raw edges level, and run or machine as close to the raw edges as possible. If it is not easy to stitch as near to these as is desired, cut the turnings a way quite narrow afterwards. Now turn the material to bring the wrong side outside, and the seam lying along the
with the Dandie top of the fold; then stitch the two layers Dinmont and the together again, close up to the raw edges, as in Cheshire terrier, its Fig. 4, so that these are enclosed in a little characteristics have tube. become fixed and type. it pc
it has short legs. a long body, strong neck, deep chest, and the short tail is carried vertically. The coat is short and hard, with crinkly, broken upper coat on the back. The drop cars lic close to the face the powerful muzzle appears broader be patches of biack or liver colour.
ally it is brown marked with black.
The smaller specimens are the more desirable. The Sealyham is affectionate and faithful, playful, and of quick intelligence; intruders are grected with continuous barking. A first-class dog for the home, it is withal a splendid ratter. As a sporting dog, he is estcemed for badger-hunting, for which his short legs and pluck fit him, whilst his steady baying enables the hunters to locate him and his quarry. The name is derived from the Edwardes estate, in Pembrokeshire, from the Edwardes estate, in Pembro
where the breed originated. Sce Dog.

Flat Seam. The stitch and fell seam is employed for flat seams. Lay together the two pieces to be joined, with right sides facing and one edge nearly $\frac{1}{4} \mathrm{in}$. bclow the other ; then tack along an $\frac{1}{8} \mathrm{in}$. below the narrower edge, and afterwards machine, run, or backstitch along this line. Fold the whole seam flat over on to the material, so that the narrower edge lies underneath, fold the edge of the wider turning under, and neatly hem down, as in Fig. ${ }^{6}$.
Oversewn Seam. The iop-sewn or oversewn seam is used when it is desired 10 join the selvedges of longcloth, calico, cambric, and similar cotton materials. Tack together the two selvedges and neatly oversew, working from right to left, as in Fig. 6, and making the stitches of an even slant. No knotted ends of cotton should show. Leave a generous end of the cotton, and push it down on to the edges towards the left, so that the stitches can be made over it, at the same time not letting it drop below the position at which the needle passes through the edges. When the seam is completely oversewn, open out the two thicknesses and lay them flat on the table, and press the stitches down with the thimble to make the seam flat.

Counter Hem Seam. A counter hem figures largely in the making of men's and boys' shirts, in which a specially strong, flat seam is wanted. Turn under one edge to the wrong side about $\frac{1}{8} \mathrm{in}$. and turn the other edge over to the right side to match. Lap one edge over the other so that the raw edges face, and run a line of tacking down the middle; then machine both edges down as close up to the folds as possible. If desired, hemming may be resorted to, instead of machining, as in Fig. 7.

Flannel Seam. On flannel materials, it is usual to use a stitch-and-herringbone seam. The edges are first stitched by hand or machine in a plain seanm, which is then pressed open flat with the fingers, and has the raw edges herringboned down, as in Fig. 8, the material being too bulky to permit of turning the edges under, as for hems.
Whipped Seam. When the edges of fine underwear or baby clothes are to be joined to lace, insertion, or beading, a whipped seam is generally employed. Take the material in the left hand, with the wrong side towards you and raw edge upwards, and roll this raw edge over towards you as a very tiny roll, with the thumb and first finger of the left hand, doing about 1 in . Let the roll rest over the first finger, with the beading or lace above, and whip them together as shown in Fig. 9, drawing the two edges together.
If the material is to have fullness, as in the case of a skirt part that is to be joined to a bodice by a band of insertion, the skirt edge must be rolled and whipped separately from the trimming, pulling up the cotton as the work proceeds in order to get the requisite fullness. After the edge is completely rolled and whipped, it is oversewn to the trimming exactly over the first stitches, so retaining the neat effect of the seam. This rolling and whipping can be used to apply a frill to an edge, the frill, if full, being rolled and whipped and drawn up, while the garment edge is afterwards rolled, and whipped to the frill as explained for beading.

Openwork Seams. Many blouses, summer dresses, baby clothes, etc., show open-work seams, which often have the effect of real hem-stitching. It is usually necessary first to hem or roll and whip the two edges that are to be joined, though in some cases a mere
turning in of the edges will sulfice. After the regulated if necessary. At the same time, a 1 wo edges are neatened, tack them down on to a strip of stiff paper, with the desired space between, and niake the openwork stitchery, with embroidery silk or embroidery cotton, according to the nature of the fabric.

One type of hand-worked seam is shown in Fig. J.0; but there are many others, simple herringboning being one that is much favoured, while another popular method is faggoting (see page 444) In all cases the needle should be slipled along one of the hems to bring it out to the right side in the position needed for making each stitch or group of stitches. After the stitchery is worked, the tackings are snipped and the paper removed. Openwork can also be used to attach lace to the neatened edges of underwear, etc.

SEA PIE. For this popular dish the following ingredients are required: l lb. buttock steak, $\frac{3}{3}$ lb flour, 5 oz. suet, a carrot, an onion, a small turnip, and pepper and salt to taste. Cut the meat and the vegetables into thin slices and place these in layers in a saucepan, seasoning them with salt and pepper and covering them with. cold water.

Let the whole simmer for $\frac{1}{2}$ hour, and then remove the meat from the pan. With the suct, Hour, and some water make a light crust and roll it out on a Houred board. Roll the meat in this crust return it to the saucepan with the vegetables and the liquor, and let it simmer for all hour.
Sea Pink. This is an alternative name for the plant more usually known as thrift (q.v.).

SEA SICKNESS. The effect of the up and down motion of a ship in the water is comparable to that prorluced by swinging, and in nıany people it produces a fecling of nausea and sickness, which culminates in vomiting and complete prostration. The scientific explanation of this troublesome malady is that it is due to a disturbance of the circulation in the brain and in the labyrinth of the ear.
While scrious results arc very rare, there is always some danger to those who are of apoplectic tendency, to sufferers from heart discase or rupture, and to pregnant women.
For three or four days before starting a voyage care should be taken that the food is readily digestible. The bowels should be
dose of 20 gr . of the bromide of ammonium may be talien three times a day, in a wineglassful of water after meals. This treatment may be continued during the first few days of the voyage. If the voyage is a short one, a single dose of this drug ( 30 gr .) should be taken about two hours before starting. Chloretone is often a preventive. A light ineal should be taken $\frac{1}{2}$ to 2 hours before the voyage. A firm bandage worn round the abdomen often acts to some extent as a preventive of sickness.
A person who is apprehensive of being sick should sit in a low deck-chair, either facing or with the back to the bow of the ship. The chair should preferably be on deck, but in a shelterel part. A safer position still is to lie down, preferably on the right side, and bring the knees well up towards the body. Above all it is essential to keep comfortably warm. If sickness threatens, it is best to abstain from solid food, to suck chips of ice, or to take a glass of iced champagne in sips. When there is much nausea, but no vomiting, the stomach will be relieved by taking a pint of warm water to which a pinch of bicarhonate of soda has been arded. This will empty the stomach and make the traveller more comfortable. When vomiting has continued until the stomach is empty, and distressing retching ensues, a little light food should be taken, if possible, such as gruel, arrowroot, warm nilk and water, or mill and sodawater. If the sickness continucs for some days other treatment will be required from the ship's doctor.

SEASONING. Every varicty of spice or herb which imparts a relish, or brings out more distinctly the flavour of ingredients used for culinary purposes, is a seasoning. The term does not always imply mere salt and pepper, although salt may be reckoned to be scasoning of the first importance. Next in order would come the various descriptions of pepper and herbs, such as are used in forcemeats.

Srasoning is largely a matter of individual taste, therefore quantitics given in recipes should not be too strictly adbered to. The safest way is to taste while cooking until the correct amount of seasoning has been added. See Flavouring; Ginger; Nutmeg; Pepper; Salt: Sauce; Soup; Spice; Stuffing, ctc.


Fig. 1


Fig. 9
Seam. Fig. 1. Plain seam run by hand. Fig. 2. Notched and overcast edges of a curved seam. Fig. 3. Overlapped edge. Fig. 4. French seam. Fig. 5. Flat seam. Fig. 6. Oversewn seam for calico selvedges. Fig. \%. Counter hem. Fig. 8. Seam in flannel with edges herringboned down. Fig. 9. Beading seam

SEAWEED : Its Uses. There are several kinds of edible seaweed, but few of them are caten except in the ncighbourhoods in which they are found, and even then only in limited quantitics. The most valuable of them is known as Irish or carrageen moss. It contains certain medical properties and is recommended for invalid dict. Another kind of seaweed, found along the Welsh coast, is sometimes used as food, and in Sicotland some varictics of seaweed are also cdible. See Irish Moss.
SEBORRHOEA. Certain conditions of the fat-producing glands of the skin cause an abnormal amount of secretion. This is known as seborrhoca or pityriasis, and is of an oily or a dry character. the latter taking the form of greyish or yellowish scales. The condition always begins on the scalp, from which it may spread llownward to the face. neck, and other parts of the body.

The local treatment for dry seborrhoca of the scalp is given under the heading dandruff. Where the scurf attacks the non-hairy portions as well as the scalp, a mild sulphur ointment such as the following may be lightly rubbed in once or twice a day
Precipitated sulphur
24 gr.
Benzoated lard
$1 \%$.
Local treatment of oily seborrhoca consists in washing the surface several times a day with soap and warm soft water, and then dabbing on the following lotion :
Tannic acid
20 mr
Methylated spirit
$20 \%$
SECATEUR. The pruning instrument known as a secatcur has two cutting blades fastened together by a rivet, and actuated by a spring after the manner of clippers. It is invaluable for pruning purposes in the garden. See Pruning; Scissors.

SECRETAIRE. For all practical purposes the secretaire is identical with the bureau or the desk, but the name is retained by certain pieces of furniture, mainly those of French make.
Secretaires in which the influence of French models is seen were made by Sheraton. Some of these were shaped somewhat in the style of a cabinet. See Ijurcau; Marquetry; Sheraton: Writing Tablc.
SEDATIVE. Any drug used to ca!m an excited nervous system, to relieve restlessness, to quiet an overstrung heart, or an irritable stomach or bronchial tubes, ctc., may be termed a sedative. As most of the so-called nerve sedatives have a greater or less depressing action on the heart, they should be used with caution, and never taken except under a doctor's supervision.
SEDGE. Under this name are included hardy perennial grasses, one or two of which are useful for the purpose of decorating moist spots in gardens, or by the sides of marshes in the wild garden. They are propagated by division of the plants in spring. Pendu!a, 5 ft ., is one of the best. Those with variegated leaves, i.e. Acuta variegata and Gallica variegala, are attractive. See Japanese Garden : Wild Garden.
Sedum. This is the botanical name of stonecrop (q.v.).
SEED : For the Garden. Every seed is really a plant in miniature, containing the embryo, together with the food required to assist carly development. To stimulate its growth, warmth, moisture, and air are necessary. Given these conditions the plant sends forth its radicle, or young root, into the earth, whilst the young stem bursts through the seed covering, gradually lifting the soil and making way for the seed leaves. After this has occurred, truc leaves form and hair ronts develop.
Sced should not be sown during very cold or frosty weather, hut from February onward, when there is gentle warmth from the sum and while the soil is in a friable condition without
excess of moisture. Sceds always germinatc best in darkness, and consequently sowings made in pans, pots, or boxes should be covered with glass, over which is spread a shect of paper to exclude both sunshine and light, as well as to conserve moisture and maintain some degree of warmth. As a gencral rule seeds should not be more than a year old, as their vitality becomes weaker with age, and slower germination results; some even become quite sterile.
Plants may be raised from seed in various ways e.g. sown broxdcast, in drills, in prepared beds, in cold frames, on hotbeds, and under cover of a greenhouse. Some seeds possess a hard covering and, consequently, are morc difficult to germinate speedily ; this may be facilitated by slightly notching the hard coat, taking great care not to cut deeper than the outer covering, or testa as it is termed botanically. Another method is to soak the seed for a few hours previous to sowing.

Depth of secd sowing depends upon size, and to some extent upon weather conditions. Some tiny seeds need hardly be covered at all, whilst large seeds like beans and peas must be sown deep to ensure the greater degrec of moisture requisite for their germination. Our diagrams show sowing methods in detail.

Seed Bed. A properly made-up seed bed is of great service in the garden for raising scedlings of flowering plants and vegetables to be afterwards planted out. The soil must be dug and the surface pulverized: the addition of sand and sifted leaf-mould is beneficial on heavy land.

Draw drills to the required depth with a stick or hoe, setting the line carcfully to ensure straight drills. After sowing seed and before removing the linc, label each row according to its contents, including date and weather conditions. Labels are made of plance wood painted with white flatting.

Seed Testing. In Great Britain an Act of larliament passed in 1920 made it obligatory for a seller of seeds to give to the buyer a written statement of the varicty, purity, and germination of the seeds in question. Seeds must not contain more than a certain minimum parcentage of injurious wecds. There is an official seed testing station at Cambridge. See Scedling; Sowing.


Seed. How to prepare a seed bed. 1. Antumn preparation : $a$, ridged top soil; $b$, manure; $c$, well dug bottom soil ; $d$, sand or exhansted manure. 2. Bed prepared: $a$, ridges and sand incorporated. S. Sowing: $a$, seed covered in ; $b$, rain channels. 4. Hardy and tender seedlings in one bed: $a$, top soil prepared as in Fig. 1 ; $b$, pockets of extra manure under tender seeds : $c$, manure; $d$, bottom soil; $e$, glass-covered shelters propped up and facing south

SEED CAKE. This cake derives its name discriminate between desired and undesired
from the caraway sceds that are added to a plain cake mixture.
Secd rock cakes are made by adding 2 or more teaspoonfuls caraway seeds to every $\frac{1}{2} \mathrm{lb}$. flour used, as in making ordinary rock cakes. See Cake: Rock Bun.

SEEDLINGS : Their Care, After seedlings have formed their first true leaves they require special attention. In the open ground


Seedling. 1. Sturdy seedling. 2. Attenuated specimen: $a$, where damping off begins. 3. Seedlings pricked off into pan. 4. Notched stick for lifting ting seedlings. 5. Efective protection against birds: $a$, nails in wood triangles ; $b$ black cotton. 6. Seedlings nnder frame on hotbed : a, plunged pots; $b$, box of seedlings; c, light. 7 . Soot protection against slugs. 8. Sun protection. 9. Planting for protection against frost. 10. Planting in depression to conserve moisture. 11. Same earthed-up during bad weather. 12. Seedling
lifted with a ball of soil
transplanting should be performed as soon as seedlings can conveniently be handled, whilst those raised in the greenhouse must bc placed close to the glass.
Great care is essential at this stage to avoid over-watering, giving the tiny plants just sufficient water to keep them moist: overwatcring is one cause of damping-off (q.v.).
Showery weather should be chosen for thinning and transplanting, as disturbed plants quickly recover if lifted and replanted without delay.
Seedlings should be carcfully thinned out, and in due course transplanted to form sturdy plants for garden and grcenhouse. Very tiny secdlings, like those of the gloxinia, should be handled by means of a small stick, notched Vshape at one end, as shown in our diagrams, which also indicate other ways of clealing with young and fragile plants. The smaller seedlings often produce the finest mature plants.

## SEIDLITZ POWDER. The effervescing

 powder of sodium tartrate is commonly called a seidlitz powder. It is a valuable saline purgative.SELAGINELLA. This family of greenhouse fern-like plants thrives in a mixture of loam, leaf-mould and sand. They require a shady position, and may be propagated by means of cuttings at any time of the year.

The plants are evergreen, of erect, dwarf, or trailing habit, and are differently known as tree, club or crecping moss. They succeed best in a tem perature varying from 50 deg. to 55 deg . from September to March, and from 55 deg. to 65 deg . for the rest of the year. Erect growers are involvens, martensii, and caulescens. Dwarf species include the excellent densa, whilst trailing kinds are cacsia and kraussiana. All these are desirable plants for a greenhouse.

SELECTIVITY. In wireless reception this is the ability of a receiving set to
broadcast transmissions. In considering the question of selectivity attention must be given also to sensitivity and quality of reproduction (or fidelity), because all threc factors arc interrelated.

The selectivity of a recciver is directly proportional to the number of tuned circuits, and may be increased by adding an extra tuned circuit between the acrial and the input to the set. This procedure may have an adverse effect upon the sensitivity, and in practice one or more high. frequency amplifying stages are usually employed in order to provide at one and the same time a gain in selectivity and sensitivity. The highfrequency amplifier more than compensates for any loss in sensitivity occasioned by the use of selective circuits.

The degrec of sclectivity is largely affected by the efficiency of the tuning inductances. A coil having high losses due to the use of too thin wire, an unsuitable ratio of diameter to length, large self capacity, etc., will cause damping, a factor which flattens the tuning and so reduces the ability of the receiver to separate stations. Circuits containing coils with relatively large inductance and condensers of small capacity are desirable from the point of view of selectivity, because weaker couplings between the stages can then bc employed without any appreciable loss in signal voltage.

A long aerial-earth system is detrimental to selectivity. A short single wire outdoor aerial or a small indoor acrial or frame is, therefore, indicated. The earth lead should be taken to its earthed point by the most direct routc. A good earth and an acrial which is free from high resistance joints are absolutely essential.

The aerial should be loosely coupled to the grid circuit of the first valve, either by way of a tapping point along the grid coil or by using a separate small acrial coil inductively coupled to the grid coil. An equivalent effect may bc obtained by inserting a small fixed or variable condenser in series with the aerial lead, a


Selaginella, or Resurrection Plant, an evergreen po! plant needing greenhouse cultivation
suitable value for the medium broadcast waveband being 0001 mfd .

Reaction, when intelligently employed, greatly improves the selective propertics of a sct. One of the difficulties in designing a recciver to give high selectivity is the possibility of high note loss. If the tuned circuits have very low losses, so that the tuning at resonance causes cutting of the side bands, there will bo a decrease in the high note response, the magnitude of which will depend upon the extent of the side band cutting.

This can be remedied by employing a bandpass filter, comprising ganged tuning circuits prior to the first high-frequency amplifying valve, the high-frequency stage or stages being either choke coupled or coupled by Hatly tuned circuits.

The band-pass filter can be designed to pass a predetermined band of frequencies, such as a band of ninc kilocycles in width. An alternative is to use a number of tuned high. frequency stages having cach tuning circuit comparatively flatly tuned; the required degree of selectivity thus being achieved gradually. This entails a multi-valve receiver. It will therefore be seen that in the case of small wircless receivers the clegree of sclectivity is a compromise involving sensitivity and quality of reproduction. Thus in a two or three valve set operated in the vicinity of a powerful broadcast transmitter, if the selectivity is sufficiently high to ensure the elimination of the nearby transmission within a few degrees on the tuning dial or dials, the sensitivity on distant transmissions may be decreased.

In general, a well-designed recciver provided with high-frequency amplification will be both selective and sensitive, whereas the degree of selcetivity obtainable in a small set without high-frequency amplification is mainly limited by sensitivity and fidelity. The use of the superheterodync principle is a method by which high selectivity may be obtained with the retention of simplicity in operation. Sce Superheterodyne; Wireless.
SELF HEAL. The cominon name of prunella, a low-growing hardy plant suitable for poor soil in odd corners. Prunella vulgaris is a troublesome lawn weed. The best of the cultivated kinds are grandiflora, purplish, and Webbiana, rose purple.
SELF-STARTER : On Motor Cars. Cnlike the steam enginc and the electric motor, which can be started by the opening of a valve or the use of a switch, the internal combustion engine must be rotated first before it will commence to operate. The name self-starter has been applied to the clectric starter, now a standard fitment on practically all classes of motor vehicles. See Starter.
SELF-TONING PAPER. Self-toning paper is a photographic printing-out paper, the film of which contains the chemicals necessary for producing a pleasing tone. All that is required with most brands of selftoning paper is to wash it for about 5 min ., and fix and wash again in the ordinary way. Gelatino-chloride self-toning papers, such as Ilford Intona, do not require the preliminary washing. Collodio-chloride, or collodion, papers require the initial washing. All self-toning papers have to be printed much darker than ordinary P.O.P., as a good deal of depth is lost in tho tixing bath, which is really a combined toning and fixing bath. This applies particularly to the collodion papers.
For all self-toning papirs a plain hypo bath of 2 oz . to 3 oz . of hypo to 1 pint of water will give good brown asd warm sepia to purple tones, according to the brand of paper used. See that the prints are properly fixed, and the instructions as to time for fixing which are given with each paper carefully followed. The hypo bath should not be too strong
for collodion papers, 2 oz . to 3 oz . to the pint, while variations in the strength of the bath do not affect the colour of the print. The normal bath preceded by washing gives a pleasing brown tone, but cold purple tones can be obtained by washing before fixing in a 10 per cent solution of common salt ( 1 oz . salt in 9 oz . water) and rinsing the prints in fresh water.

All baths, whether salt or hypo, must only be used once with self-toning papers. Not more fixing solution than is necessary to cover the print properly should be used, since the gold toning chemicals are on the face of the print itself. If too big a bath is used they will be diluted too much. Fixing baths for self-toning prints must not be acid; to make ccrtain of this a few drops of ammonia, or 10 gr . of sodium carbonate, may be added to each pint of the solution. Sclf-toning prints, as P.O.1'., must be well washed after fixing. One hour in rumning water or 5 min . in cach of 12 changes of water is necessary. See Toning.

SELTZER. Originally this was the name of a mineral water obtained from Selters in Germany, but to-day the word is used for certain artificial preparations that resemble, more or less, the natural water. Seltzer is a highly aerated alkaline water that contains bicarbonate of sodium, calcium, magnesium, sulphate of potassium, and similar salts. It is valuable in cases of chronic indigestion and disorders of the respiratory organs. See Mineral Water.

SEMOLINA : As a Food. Being a product of wheat, semolina contains considerable nutritive qualities and makes excellent milk puddings, but unless Havoured is rather insipid. The flavouring, such as lemon, nutmeg, or cinnamon, should be added when boiling the semolina with the milk so that it may be equally distributed.
To make a semolina pudding put 1 pint milk into a stewpan with a strip of lemon rind and a pinch of salt, and bring to the boil, then sprinkle in $2 \frac{1}{2}$ oz. semolina, and stir over the firc for about 10 min . to cook the grain. Beat together the yolks of 2 eggs with $\frac{3}{4}$ oz. castor sugar. Remove the pan from the fire and take out the lemon rind when slightly cooled add the yolks of the eggs and sugar, and lastly fold in the whipped whites of the eggs. Turn into a greased pic-dish and bake for 15 to 20 min . in a moderate oven. For quite a plain pudding omit the eggs, and add the sugar just before putting the pudding into the oven.

Semolina Blanemange. Boil up a quar't of milk, then sprinkle in $\frac{1}{4}$ lb. semolina, and stir well until the latter is cooked and the mixture thick and creamy. Add the grated rind of a lemon and 3 dessertspoonfuls castor sugar, and when the latter is thoroughly dissolved pour the mixture into a wet mould.
When the blancmange is set, turn it on to a dish, heap a small tinful of cherries round it and pour the syrup round. Cream should be served separately.
Semolina Cheese. For this savoury take 3 tablespoonfuls semolina, 2 oz . each butter and grated checse, a little milk, and pepper and salt to taste. Boil the semolina with the butter and half the cheese in a very little milk, and scason it with pepper and salt. When cooked, turn out the mixture into a pie-dish to cool, and then cut it into small,


Semolina Blancmange, a delicious and decorative party sweet
round cakes. Arrange these on a well. greased dish, sprinkle them with the rest of the checse, and bake them for about ten minutes in a hot oven.
Semolina Soup. Strain I quart white stock into a salucepan and bring it to the hoil, adding a few peppercorns ticd in a piece of muslin. When it reaches boiling point, sprinkle in $1 \frac{1}{2}$ dessertspoonfuls semolina. Continue cooking until the latter is soft and then draw the pan to the side of the fire, allowing the soup to cool a little.

Beat up the yolk of an egg, mix it with $\frac{1}{4}$ pint cream, and then strain it into the soup, stirring the whole until the egg is cooked. The peppercorns may then be taken out, a little salt added, and the soup served, accompanied by diced crontons. See Blancmange; Croûton.

## Sempervivum. See Houseleek.

SENECIO. This is the name of a group of annual and perennial plants, some of which are valuable in the garden, while others arc weeds. The most familiar of the latter is the familiar groundscl. Senecio (Jacobaea) elcgans is a very pretty annual which may be sown under glass in March, the scedlings being planted out in May or potted for summer decoration in the greenhouse. Or seeds can be sown out of doors in April where the plants are to bloon in summer.
The daisy-like flowers are of many bright colours, carminc, crimson, purple, etc., and the plants, which grow about 18 in . high, last long in beauty. Scnecio multibracteatus is a showy greenhouse perennial, 18-24 in. high, with rose-coloured blooms. Of the hardy perennial senecios the best are pulcher, 2 ft ., redrlish purple, which is suitable for the herbaccous border, and clivorum, Wilsonianus and tangutica, vigorous, rather coarse-looking plants, 4 ft . high, with large bunches of yellow flowers in summer, suitable for the wild garden or waterside.
SENEGA. Preparations of the dried root of Polygala senega are used in medicine for their stimulating effect on the lining membrane of the bronchial tubos. Senega is usually prescribed in chronic bronchitis where the expectoration is profuse and sticky, but is contra-indicated in acute bronchitis.

SENNA. The dried leaves of the senna plant are largely used in medicine on account. of their mild purgative action. Common preparations and the close of each are :
Confection of senua, 60 to 120 gr .
Compound mixture of senna, or black draught, to 2 fluid oz.
(6) to 120 gr .

Senna is commonly used for habitual slight constipation. The compound liquorice powder, which owes most of its purgative effect to its contained senna, is a common houschold remedy. See Apericnt; Constipation.

SENSITIVE PLANT. This name is given to Mimosa pudica, the leaves of which close together when they are touched by hand. This is a hothouse perennial plant and flourishes
in sandy soil in a sunny part of the house. It is often treated as an annual. and grown from seeds sown in spring.

SENSITIVITY: In Wireless. This is the ability of a receiver to respond to weak transmissions. A set which gives loud signals when tuned to a very weak distant transmission is said to possess good sensitivity, whereas a receiver which gives weak signals when tuned to a very powerful nearby transmission possesses bad sensitivity.

A set designed for high sensitivity normally incorporates one or more high-frequency amplify ing stages. See Amplifier.

SEPARATION : Of Husband and Wite. A husband is bound to support his wife in his home and a wife is bound to live with her husband. If the parties wish to put an end to these marriage obligations without putting an end to the marriage itself by a divorce, or if one of them has behaved in such a way that the other is entitled to refuse ro live with him or her, they may either (1) enter into a separation agreement, (2) obtain a decree of judicial separation; or (3) obtain a separation order from a court of summary jurisdiction.

Separation Agreement. By this the parties agree to live apart and not to interfere with one another, and the husband provides for the support of the wife and any children. The wife agrees not to make her husband liable for her future debts. The agreement must be made in contemplation of an immediate separation, and if a husband and wife who are still cohabiting enter into a deed whereby the husband promises that if at any future time the wife shall separate from him he will make her such and such an allowance, the agreement is bad. Immediately after the agreement the parties must cease to reside together, and merely ceasing to cohabit is not enough. If after a separation spouses decide to live together again they enter into a deed of reconciliation, and in this they may make provision for the possibility of their again being separated. A separation agreement is put an end to by the resuming of cohabitation between the parties. In cases where spouses have agreed to separate, neither can complain of desertion.

Judicial Separation. Whereas a separation agrecment may be entered into at the will of the parties and without any special cause, a judicial separation is a decree of the High Court and can be obtained only on proof of (1) cruelty ; (2) adultery, (3) desertion for two years or more ; or (4) failure to obey a decree for restitution of conjugal rights.
Cruelty may bo mental as well as physical. Jesertion occurs when one spouse refuses to live with the other without some reasonable cause, such as the exigencies of business. If one spouse deserts the other, a decree for restitution of conjugal rights may be obtained at once, and, if not obeyed, the other spouse may obtain a judicial separation without waiting two years. The court may also make orders for the custody of any children and for the payment of alimony to the wife. This is usually such sum as will make the wife's income equal to one-third of the joint incomes of husband and wife. Thus, where the husband's income is $£ 1,000$ and the wife's $£ 200$, alimony from the husband would be $£ 200$, making the wife's income $£ 400$ in all.

Separation Order. A married woman may apply to a magistrate's court for a separation order (1) if her husband has been convicted of an aggravated assault upon her or has been convicted upon indictment of any assault upon her and sentenced to a fine of more than $£ 5$ or imprisonment exceeding two months; (2) if her husband has deserted her or has been guilty of persistent cruelty or wilful neglect to provide for her or her children ; (3) if her husband is an habitual drunkard. The like
power is given to a husband whose wife is an habitual drunkard.
The separation order may make all or any of the following provisions: that the husband (or wife) shall no longer be bound to cohabit: some provision for the legal custody of any children (this does not include illegitimate children): that the husband shall pay a weekly sum not exceeding $£ 2$ for the maintenance of the wife and a sum not exceeding 10 s . a week for each child. Before the husband can be ordered to pay anything, there must be evidence that he has means, or is able to earn more than sufficient money for his own maintenance. The wife's means are also taken into account. If any change takes place in the means of either of the parties after the order, the husband may apply to have the amount reduced or the wife to have it increased, as the case may be.

A husband deserts his wife either if he leaves her or if he shuts her out of his house. A woman who has been guilty of adultery cannot obtain a separation order, and if a woman commits adultery after an order has been obtained, the order for the allowance cannot be enforced. The separation order is not enforceable while husband and wife are residing together, and the order comes to an end if they continue to reside together for three months after it is made, or if they resume cohabitation. Neither a separation agreement, a judicial separation, nor a separation order puts an end to the marriage.

Separation Allowance. This term is used in two distinct senses. In one it is the allowance that a husband makes to a wife on their separation. It may be quite voluntary, but it is often the result of legal proceedings and is linked with a separation order. When an order of this kind is made the husband is usually ordered by the court to pay a certain sum towards maintaining his wife.

This amount varies according to circumstances, the main, but not the only consideration, being the means of the husband. A weekly wage earner will be ordered to make a weekly payment, while a richer man is ordered to allow his wife a larger sum of so much a year. The court, in fixing the sum, will take into account the wife's habitual standard of living and also any income which she may possess in her own right.
The maintenance of the children, in cases where there are children, is a very important matter in fixing a separation allowance. If the wife is to bring up and educate young children she will obviously be granted a larger allowance than if she is not. The court may fix a distinct amount for a child or for the children which the husband must pay, this being in addition to the separation allowance made to the wife.

Allowances in the Fighting Services. In the other sense a separation allowance is the money paid by the state to the wives and dependents of soldiers, sailors, and airmen on active service. These allowances are very numerous and prominent in time of war, but there are comparatively few of them in time of peace. The amounts are altered from time to time according to variations in the cost of living and other matters.

Such a separation payment takes the form of an allowance of so much a week for a wife and so much for each child. A certain amount of the allowance is deducted from the man's pay, out of which he can, if he wishes, add to the allowance. Allowances to father mother, and other relatives are only made if they are dependent, either wholly or partially upon the soldier or sailor See Allowance.

SEPARATOR : For Milk. This is a dairy appliance used for separating the cream from new milk. The principle upon which most of these instruments work is that of centrifugal force. The milk is led into a chamber where disks of tin or similar metal are caused to rotate at high speed. This churns up the milk and causes watery ingredients to be thrown out to the outside of the bowl, while the cream rotates near the central axis of the disks. By various forms of mechanism the cream and what is known as the skim milk are separated and led off through different channels to separate collecting vessels. A small type is inanufactured as a hand-power machine, but other kinds are a vailable which are driven by electricity, thus giving a more regular rotation of the disks, consequent better separating effect.

## SEPTEMBER

## What to do in the Garden



## Food in Season

| Fish | Poultry and Game | horseradish: leck |
| :---: | :---: | :---: |
| Bream; brill ; eels; | Black game; caper- | lettuce: mushroom |
| flounder ; grey mullet; | cailzie; capons ; chick- | onions; parsnip ; peas |
| gurnet; haddock ; hake; | en ; ducks (wild and | potato; red cabbage |
| halibut; herring ; lemon | tame) ; fowls ; geesc; | spinach; sprouts ; to- |
| sole; perch; pike; | grouse; hares; larks; | inatoes; surnips; rege- |
| plaice; red mullet | leverets; moor-game ; | table marrow: water- |
| salinon ; skate ; sole ; | partridges; pigeons | ress |
| trout ; turbot; whiting | plover; pullets; rabbits; snipe; turkey; | ruit |
| Shellfish | turkey poults ; tcal ; | Apple; apricot; ba- |
| Cral); craytish : lob- | widgeon; woodcock | nana; blackberrics; |
| ster; mussels ; oysters |  | l illberries; cherrics |
| prawns; scallops | Vegeta bles | (morella) ; cranberries; |
| shrimps | Artichokes (globe); | demsons; figs ; yrapes : |
|  | aubergine ; beans; beet- | greengage; inedlars: |
| Meat | root; broccoli ; cab- | melons; mulberries ; |
| Beef; lamb; mut | bage ; carrots; cauli- | nectarine: oran |
| ton ; pork; veal; veni- |  | peach; pineapple: plum: |
| son | cucumber; endive; | quinces; nuts (various) |

## Notes for the Month

SEPT. 1.-Partridge shooting begins
SEITr. 29.-Quarter Day

Septicaemia. See Blood Poisoning.
SEPTIC TANK. A septic tank is employed in a particular process of sewage purification. It is used in certain towns, also in institutions and large houses in the country as a considerable amount of land is needed for the treatment of the liquid passing out of the tank. The tank makes use of certain germs which split up aud tirfuefy the solids that are suspended in sewage.

The tank is merely a chamber dug out of the ground and lined with brickwork, several feet in depth and roofed in, and of such a size that it takes the sewage 12 to 24 hours to pass through it. In some of these tanks there is no roof. but in either case the inlet and outlet pipes open below the surface of the sewage. A thiek scum forms on the surface of the scwage and this helps the germs by keeping them warm and protecting them from the air. Gases are produced which are highly intlammable, and these gases are sometimes collected and used as fuel.
After passing through the tank, a considerable amount of the solids in the sewage have been digested. The sewage is purer but, nevertheless, so black and offensive that further treatment is necessary by filtering through clinker or coke. or, in some cases, by distributing the sewage over a tract of land and allowing it to percolate through the soil. Some solid matter settles on the bottom of the tank, and has to be cleaned away every twelve months or so. Disinfectants, in any amount, added to the sewage prevent the septic tank from working properly.

Owing to the nuisance from small, these tanks should be placed at an ader,uate distance from a house. They are satisfactory in their results but require careful and skilled supervision, and are of no value for small domestic establishments.
The Semi-septic Tank. This is a variation of the scptic tank, for in this type the work of purification is not completed in the tank itself, and only the primary process of dis integration goes on there. The breaking down

## Servants and Their Duties

## Hints Towards Comfort and Contentment for Employer and Employed

Shorter entries, e.g. Butler; Chauffeur: Cook; Mousemaid : Nurse; Parlourmaid, deal with
the various duties of various classes of servants. See also Character: Employers' Liability: Housekecping; Insurance: Kitchen
When servants are engaged through the chauffeurs. They live in their own houses, medium of advertisements or a registry office, or in any other way, a personal interview should be arranged if possible. The smaller the household the more the mistress and servant or servants come in contact and personality must count if the best results are to he ohtained. It is also important for servants to se the style of the house or flat. Should a servant have come from a larger establishment, he or she may show at once that the new place will not suit; if from a smaller one, the mistress may feol that too much training will be requirel before the servant is up to the standard of the home and of the other servants kept.
After a satisfactory interview it is well to arrange for a personal reference. If the employer who is parting with the servant will give this, a better idea of the work and character is obtained both by the answers of the employer to the questions, which should be clearly thought out beforchand, so that nothing essential is missed, and by the aspect of the house. If a personal reference is unobtainable, it is never wise to accept from the servant a written reference. The late em ployer should be asked for a direct character, and this will be a better guide as to the servant's suitability for the new place.

Outdoor servants are almost entirely men, the two largest classes being gardeners and
of the solids is only partly carried out, and so the semi-septic tank is made on the smal size, so that the partially treated sewagc passes out to another stage for treatment. In this class of tank, therefore, the sewage is settled and partial liquefaction of the suspended matter takes place, besides the equalization in the strength of the sewage by its bricf stay in the tank.

The second stage is to pass this effluent out for oxidation. 'This is accomplished in scveral ways If there is plenty of suitable land available, it can be fed on the land, but the commonest way is treatment in one of the many forms of contact or filter beds now in use. These consist of a variety of materials of an indestructible nature. The essential fenture is plenty of surface area to ensure the growth of bacteria Probably the commonest material is a hard clinker, gauge one to three inches. For small systens one contact bed may be found sufficient, but in the large several beds. are used See Cesspool; Sanitation.
SERGE: The Dress Material. Most scrges are inclined to become shiny after long wear, and, on the whole, those which feel hardest to the tonch take on a polish first. Serges such as cheviots, with a short nap of fibre on the surface usually do not shine unti the nap has worn away, but the wearing-off of the Huif lends a thrcadbare appearance.

Botany serge is finc, soft, and warm, and the best. cloths of the sort show a neat and even twill. Serge shrinks less than flannel. and if white serge is washed and dried with care and bleached occasionally, it will be prevented from turning a dingy yellow. It is a useful material for sports wear and for children's coats. etc.
SERPENTINE LINE. In furniture this is a line used in design. The front of the piece is convex in the centre, whence it sweeps in wave-like form towards the wings, which hecome concave. It was much used by Hepplewhite for sideboards, dressing tables, etc. See Fender: Sideboard or sometimes in houses on the cstate of their employer, and, like other workers, receive a weekly wage. With domestic servants may he classed charwomen, jobbing gardeners, and others who work for more than one employer, doing a day's work here and there. They are paid so much a day.
Men servants classed as incloor servants are not very numerous. In larger houses a butler and perhaps one or two footmen are kept, and in some cases a ralet. Men servants, like the women, receive board and lodging as part of their pay. A manservant requires a licence.
Where only one maid is kept she is known as a general servant. Two maids usually divide the duties of cook and house-parlourmaid. Bigger houscholds may have in addition, a parlourmaid, between-maid, kitchen-maid and scullery-maid. A housckeeper may superintend the other women servants and there may be a lady's maid.

Nurses and under-nurses are kept in houses where there are children. In the larger houses their duties are strictly confined to looking after the children, but in the smaller ones a nurse-housenaid may be kept to do the work of a housemaid as well.

While it is impossible to keep to a hard and fast set of rules, a certain number are
essential to order and comfort. If more than
one scrvant is kept it is important to assign duties at the outset with even more decision than in the case of one experienced maid, who may be allowed to have some views of her owra

If a servant is to be put on board wages when the family go on holiday, this should be explained to her. The term board wages means the servant's ordinary rate of pay plus an allowance for food, and also for lodging if the house is shut up, the amount varying according to circumstances. When the maid accompanics the family, the question of board wages does not arise, but there may be friction if servants find themselves treated in this way without having been informed of it when they came.

Another matter to be decided when en gaging a servant is whether her friends shall be allowed to visit her This is a question that must be settled in every case in accordance with individual wishes

## Comfort Essential to Good Work

Goorl or bad servants can make or mar the home. They should be well treated and, if good, their work should be respected and appreciated, and a real interest taken in them. Perhaps the most frequent causes of complaint are uncomfortable bedrooms, badly furnished, more than one maid in a small room or more than two in any room, insufficient or poor quality of food, and the matter of outings. In newer houses a small sitting-room or recess off the kitchen makes for comfort.
It is impossible to expect good work from anyone who cannot sleep in comfort. If the house is too small to accommodate the desired number of servants, it is best to have daily help.

Good food, without waste, is essential. The mistress should retain complete control of the larder and, unless she has an experienced cook, herself solve the problem of left-overs so that they shall not be wasted or eaten under protest in the kitchen. Where a servant asks for some special inexpensive article of diet, it should be provided for her.
Outings In this matter hard and fast rules cannot be laid down. One afternoon and evening a week and every second Sunday afternoon and evening are the usual minimum. The hour of return in some places is fixed at 10 p.m. With a young servant this hour should be late enough, but if permission be occasionally asked to go to a theatre or other entertainment, it should not be withheld without good reason. Where there are several maids it may be difficult to arrange extra outings for all, and favouritism should be a voided.

In the case of the general servant, if she gets through her work, she should be encouraged to have as much time as possible to herself. In a small family an only servant is often lonely, and the kind and sensible thing to do is to allow her to invite a friend or rclative to the house. A special sitting-room is not possible in the small house, but if the kitchen cannot be comfortable, owing to its size, it can sometimes be arranged for her to use the dining room after the evening meal. A good servant commands, and is worth, high wages. When a maid is young and inexperienced a mistress must expect tactfully to train her if the home is to be well run.

Where three servants or more can be kept their work is so clearly defined in the kitchen, sitting-rooms, and bedrooms that a well. organized household becomes a simpler matter than where all the duties have to be performed by a cook-general and house-parlourmaid, or a general alone. Where only two maids are kept, it is essential that they should get on well together, and that any housework which the cook is expected to do should be clearly understood on engagement. It is usual for her to be responsible for cleaning the
dining room, breakfast room, should there be one, hall and steps. Sometimes she takes in the breakfast. and usually clears it away and washes up while the house-parlourmaid is busy in the bedrooms.
The cook assists in making the beds, and after that her duties are confined to the kitchen. except on the occasions when the other maid is out. The house-parlourmaid combines the duties of parlourmaid with that of housemaid, and should be dressed for luncheon. A simple dinner is usually arranged, with which she can cope, on the days when the cook is out. Where there are children a nurse-housemaid is sometimes kept as the second servant and the parlourmaid side of her duties require to be simplified.

Some people solve the two-servant question by engaging a husband and wife. They may both be trained servants. in which case the woman acts as cook-housekeeper and the man undertakes the duties of butler. When engaging a husband and wife the highest personal references are advisable, as it is a more serious matter if they have to be dismissed than is the case when a single servant provee a failure.
Maid's Uniform. The question of uniform sometimes presents difficulties, especially in the case of the general servant. Should she object to uniform she can usually be persuaded to wear an overall in the morning with a coarse apron for rougher work, and a dark dress in the afternoon with muslin apron, collar and cuffs. Very often if the mistress helps with the purchase of a smart uniform any difficulty in getting it worn is o vercome.
Where a parlourmaid and housemaid are kept some mistresses like to provide the afternoon uniform so that both maids, if required to wait at table, or to assist in pouring out the tea at an "at home," present an attractive appearance. Black dresses need not necessarily be worn; brown, blue, claret colour or bottle green are sometimes preferred, with a pretty style of cap, apron, cuffs, and collar. In the morning parlourmaids and housemaids wear cotton dresses. Small patterns are more useful than plain colours. The house parlourmaid should wear a clean apron under her coarser one, so that the latter can be quickly taken off should she have to answer the door or a sitting-room bell in the morning. A rubber apron is a convenience to protect the maid's afternoon uniform when washing up. Neat shoes are important.

Cooks wear dresses with short skirts and either large linen aprons or overalls in the kitchen. Caps are optional. Where there are stone floors to kitchen and scullery boots are more comfortable than shoes.
Where one manservant is kept he does not wear livery. Black coat and dark trousers is the customary uniform. In many houses where no regular servant is kept, the housewife is relieved, of the more laborious domestic duties by hiring the services of a daily girl. She may be engaged for the whole day, in which case she will probably wear uniform in the afternoon, or for the forenoon only, or for a couple of hours, according to requirements. Her wages are paid weekly and she may get her meals or not, as agreed upon.

Insurance. One of the duties of an employer is to see that his or her servants are insured under the national health insurance scheme and that the cards are regularly stamped. Any failure in this respect renders the employer liable to a fine. Servants are not insured against unemplowent, but it is desirable to insure them against any accident that may happen to them in the course of their employment. The best way of doing this is to take out a combined insurance policy which covers risk from fire and burglary and also insures the servants against accident.

SERVICE HATCH. As a general rule a service hatch is an opening about 2 ft . squarc provided with a door or doors, forming a means of direct communication from the dining room to the adjoining kitchen or pantry. It is particularly helpful in a house or fla! where only one maid is emploved. as the

meas can be handed through the service hatch from time to time as requisite, whilc the plates and dishes after use may be returned by the same means, thus obviating the neccssity of the maid entering the dining room.

In most cases the service hatch consist. merely of a door, which may be hinged or arranged to slide sideways or upward in grooves. The sides of the hatch are generally lined with wood, in the same manner as a door or window opening, and are also provided with a wide window board or shelf.

To prevent odours from coming through from the kitchen two doors or two sets of double doors can be provided, and the hatch made a couple of feet deeper. One set of doors will be hung on the dining room side of the wall, and the other on the kitchen side. The articles as they are prepared for table are placed in the hatch, and the doors closed on the kitchen side. Those on the dining room side are then opened whenever the articles are necded, and the dirty plates replaced, the doors being closed afterwards on the dining room side. In the case of the hatch illustrated, one the other is opened and kitchen or dining room is obtainable. No noise, sounds of talking, or sinell of cooking can penctrate. Hatches are sometimes arranged to open above built-in dressers, or form portions of the backs of sideboards. See Dining Room; Kitchen ; Pantry.
SERVICE LIFT. In houses with a basement kitchen the installation of a service lift saves the labour of carrying trays up and downstairs and also prevents food from getting cold during the transit from kitchen to dining room table. Before proceeding with plans for installation inquiries should be made to ascertain if there are any landlord's restrictions that preclude it. In some cases the local authority has requirements which must be met.
When the dining room is immediately over the kitchen the lift can be planned to rise in a corner of the room. Sometimes such a lift is of the disappearing type and is operated from

In the room side. kitchen, wheeled into the dining room and there converted into a rigid table
below ascending through a hole in the floor. When the cage descends the floor boards on top return to their usual position. In other cases a built-in cabinct conceals the lift.
A service lift can be operated by electricity or by hand power. In the former case it can be worked from either the upper or lower floor. In the latter case the hauling rope must be adjusted so that it is not loose enough to rattle against the casing, or too tight so that it grates. If a self-sustaining gear is used, the cage is locked into position as soon as either the winding handle or the hauling rope is released. The lift may be fitted with a brake worked by l foot pedal: in this case the lift is moved when the foot presses the pedal and the brake comes into operation when the foot is removed See Dining Room
SERVICE PIPE. This name is given to a pipe conducting the principal supply of water or gas to a building, made of lead or galvanized iron, respectively. Generally there is a stop cock in the run of the water service pipe in any convenient position $n$ or just cutside the building, so that the water can be entirely cut off if necessary. A draw-off cock should be placed on the house side of the stop cock so that the entire system can be drained.

In the case of the gas service pipc, this is usually the property of the gas supply company, and runs from the gas main to the ga: meter. See Gas; Pipe; Water Supply.
SERVICE WAGON. Known also as dinner wagons, service trolleys, tea wagons and table wagons, service wagons may bc obtained in oak, walnut or mahogany, and also in enamelled or plain white wood for nursery use. They are made with two or threc tiers or trays, and in some cases are so con structed as to be readily convertible into tables.

The small two-tiered kind is


Service Wagon. Two views of a two-tiered wagon which can be laid in the
kitcben, wheeled into the dining room and there converted into a rigid table and obviates the carrying of heavy trays. As such a wagon is table height it can be arranged and laid as an afternoon tea table, cakes, ctc. being placed on the lower tier.

The wagon illustrated can be converted inte a rigid table at which four pcople can be seated for luncheon or dinner. Slight pull on a small button enables anyone instantly to change the wagon while loaded into a table or vice-versa. When laid in the kitchen, the table is converted into the wagon shown on the left, wheeled into the garden or dining room, and converted into the table shown on the right. The cellulose finish resists damage to heat ; if hot liquids are spilt and removed at once they will not stain the surface. Wagons with three tiers are obtainable, which swing into position and form a table at which six people can sit.
Making a Trolley. The simplicity of this dinner or service wagon, made throughout in oak, commends it immediately. The overall height is $31 \mathrm{in} .$, length 26 in., and width 16 in ., 2 in. of the total height being accounted for
by the rubber-covered castors serewed to the four uprights. The uprights are of $1 \frac{1}{4}-\mathrm{in}$. square woorl, the fronts, backs, and sides of the trays or shelves being $1, \frac{1}{3}$ in by $\frac{3}{1} \mathrm{in}$. thick. The shelves or tray-bottoms are of 5 -ply oak, each $24 \frac{7}{8} \mathrm{in}$. long by $14 \frac{7}{2}$ in. wide.

Dowel joints are used throughout. The thee tray-fronts are first dowelled and ghed to the front uprights, the bottom trayfront being 4 in . up from the loottom, the middle one $1: 2$ in. higher, and the top one 12 in . above that. Proced in exactly the same manner with the back. When the glue has set perfeclly, join front and back together as shown at Fig. 1, the jointing heing shown in detail at l"ig. 2.
The 5-ply shelves or tray-bottoms (Fig. 4) rest and are glued upon $\frac{1}{4}$-in. square strips of oak glued to the inside lower edge of each tray-front and side and back (Fig. 3), the trayhottoms being notched out at each corner to


Service Wagon. Fig. 1. Wagon made in oak. Fig. 2. Detail of jointing. Figs. 3 and 4. Tray bottom and method of attachment
ensure : 2 neat fit. Fitting the rubber-covered castors completes the wagon, which may be polished or left in its natural colour. See Dining Room; Dowel.

## Serviette. See Napkin.

SETSCREW. This name is given to a small, usually headless screw used to aflix one part to another. Setscrews are employed for fixing a small pulley or gearwheel to a shaft, a knob to a spindle, and for like purposes. As the name suggests, the screw is used to set or fix the position of a movable part on another part.
SET SQUARE. This name is applicd to an instrument used for testing or marking out rectangles. Carpenters and engineers use squares when working in wood and metal, but the term set square is more correctly limited to the squares used by draughtsmen. In a simple form it may consist of a thin, flat picce of pear wood triangular in shape. Two of the sides form a right angle, and the third is at an angle of $45^{\circ}$ or $60^{\circ}$ to one of the other sides.

In almost all cases it is necessary that one of the edges of the instrument should rest upon a T-square or hatten, which is set in position parallel with the hase line or principal horizontal line. By sliding the set square along the batten or T to the desired spot and drawing a line against the edge of the square, the angle formed between this line and the horizontal or base line will be $90^{\circ}$.

As a test for accuracy of the square portion of the instrument, turn the square over without moving the batten. If the square is correct, a second line drawn from the same point as the first will exactly coincide ; but if the square is incorrect, the lines will be
tapered, and the amount of taper at the extremity of the squarc will be the amount of error in the instrument.
Squares should always be kept clean and in a dry place, preferably hung up on the wall. Celluloid or ivorine set squares are liest cleaned by washing them in soap and water. Wooden squares may be cleaned with a linen rag moistened with petrol, and then polished. See Drawing ; Mcasure nent; Rule; T-Square.

SETTEE. The settee is a long seat, usually upholstered, and having arms at either end. It thus differs from the sofa, being rather a development of the sectile. It

appeared in England about the end of the Hepplewhite becams famous owing to his 17 th eentury, and some splendid pieces, notable wheel-back settecs, made of satinwood and for their upholstery, were made at that time. painted. In general his settees have the The example illustrated is in walnut, with six crest rail in the form of a wave that flows cabriole legs, and high-backed seat covered in benutiful brocaderl silk. Later the uphol. stery was left out from the back and sides, and the settee hecame in ellect two or three chairs with a single back.

Chippendale designed settees with open backs, earved with riblion work and C serolls. Chinese frets occasionally form the backs, and the square legs are connected by rails.

## The Settee Bed and its Construction

## A Convenient Piece of Furniture for the Flat or Small House

Th's con ribution d scribes the making of an article that will serve as a seat by day and as a hed by night. To make it, the amateur needs a knnwiledge of the vari. us proccsses that are described under such entries as Dovetail; Joint; Mortisc. See also Chair; Chair Bed ; Divan; Üpholstery

A settee bed, as it is called, is a picee of making an allowance of $1 \frac{1}{2} \mathrm{in}$. in height when furniture that will serve as a settee during the setting out the working drawing.
day and as a bed during the night. Such beds have to a great extent been replaced by divans, but are suitable for bungalows and bed-sitting rooms. There is only one main type ol settec bed, but they are made in various sizes and patterns. and in various materials and qualities of material.
The setiez bed shown in Fig. I will be found comfortable and inviting, and the extrat cushion shown at the back can lie transferred to the seat for those who prefer it. As a bed the appearance of the settee will be as in Fig. 2, the opening out heing of the simplest descrip. tion and specdily effected. The main dimensions, excluding cushions, are : height of seat over framings, 9 in. ; height of arms, 1 it. $11 \frac{1}{2} \mathrm{in}$. height of back fraining from ground, when vertical, 3 ft ; length of seat over upright, 4 ft .2 in ; length orev arms, 4 ft .4 in. ; width of sides over uprights, 2 ft .4 in . ; length of armis, 2 ft .111 in . ; length of back, seat and foot frames, 3 ft 10 in ; width of back and seat frames, 2 ft .3 in ; wilth of foot frame, 1 ft .11 in net; and with stop extensions as required.

Probably the best wood to select for general purposes is oak, stained to a rich mut-brown colour and bright polished. The legs or uprights (A, Fig. 4) require 4 pieces of 2 in . by 2 in., the length given in the cutting list allowing a sharde for paring in tinishing to include it stub tenon at the lop end to enter the arm Mortises should be cut for the seat and lower rails, and the legs may be mounted on castors,

The arms (B) linish $3 \frac{1}{4} \mathrm{in}$. loy $\frac{7}{8} \mathrm{in}$., and have the edges slightly rounded away for comfort. When litted in position they project

|  | L. 011 g <br> it. in. | $\begin{gathered} \text { Winle } \\ \text { in. } \end{gathered}$ | Thいick 111 |
| :---: | :---: | :---: | :---: |
| $+\operatorname{lcgs}$ (A) | 20 | 2 |  |
| $\frac{2}{2}$ arils (B) | 30 | 31 | 1 |
| $\stackrel{2}{2}$ rails (C) | $\frac{2}{2}+$ | 1 | $\frac{1}{4}$ |
| 2 pianels (E) | 1 2 | ${ }^{1+}$ | 5 or ${ }^{3}$ |
| 4 uphichts ( ${ }^{4}$ ) | 1 $2!$ <br> 4  | ${ }_{2}^{2 \%}$ | ${ }_{8}^{3}$ or ${ }^{\text {a }}$ |
| 11 back rail (G) | 4 | 2t | $\stackrel{+}{4}$ |
| 1 front rail (H) | + - | 1 |  |
| 1 back rail | 42 | 11 | 2 |
| Back Framm. |  |  |  |
| 3 stiles (J) | $\stackrel{\square}{3}$ | $1{ }^{1}$ |  |
| 2 rails (K) | ${ }_{3}^{3} 10$ |  |  |
| 8 8lats or lathe (L) | $\begin{array}{ll}3 & 1 \\ 1 & 1 \\ 01\end{array}$ | ${ }^{15}$ or 3 |  |
| 1 strut rail | 39 | 1 | 8 |
| 1 clutch (N) | 22 | 13 | $\frac{1}{6}$ |
| 2 bolts and nuts |  |  |  |
| 1 adjustment rod | 4 3 | $1 \frac{1}{2}$ | $1 .+$ |
| Slat Fleame |  |  |  |
| 3 stiles | 23 | 12 | \% |
| 2 rails | 311 | 18 | \% |
| 8 slats | $\because 1$ | 13 | \% |
| Foot Frimis. |  |  |  |
| 3 stiles |  | , |  |
| 2 8 8 8 railiats | $\begin{array}{rrr}3 & 9 \\ 1 & 10\end{array}$ | $?$ |  |
| ${ }_{2}^{8}$ stiats stoul fillets | ${ }^{1} 10$ | 2 | $1 \frac{3}{4}$ |
| 2 strut lets | $13!$ | $1+$ | , |
| 1 strut rail | $\begin{array}{ll}3 & 9\end{array}$ | $1 \frac{18}{8}$ | 1 |
| $1{ }_{2}^{1}$ clatith | [1010 | 18 | 11 |



17 in. and 3 in. wide, and tinish $\frac{y}{8}$ in. thick. stubbed into the top and bottom rails and equally spaced.
This should result in a firm but light rectangular framing, when lowered to seat level it will be supported by strut feet which fold between the inner edges of the stiles in the manner indicated at Fig. 7. These strut supports (M, Figs. 5 and 7) take 2 pieces of hardwood $12 \frac{1}{2} \mathrm{in}$. by $1 \frac{1}{4} \mathrm{in}$. by $\frac{7}{8} \mathrm{in}$. and are bolted right through J and M with $\frac{3}{8}$ in. roundheaded bolts. The heads are sunk and the bolts are nutted on the inside so that they

1 in. on the outer side and $\frac{1}{4}$ in on the inner, and 1 in . in front. which would allow $6 \frac{1}{2}$ in net for adjustment projection off the arm at the back when finished. Just behind the back upright the arm is reduced to $2 \frac{1}{4}$ in. as in Fig. 6.
The seat rail (C) takes two pieces to finish $2 \frac{1}{2} \mathrm{in}$. by $\frac{7}{8} \mathrm{in}$., tenoned or dowelled to the legs, and similar rails (G, Fig. 3) are fitted to the legs at the same level front and back. A stretcher rail running between the front and back rails may be dovetailed in if desired. The underlraming pivot freely without play. A section at 0 rails (D) and corresponding rails (H, Fig. 3) (Fig. 5) shows how the bolt is entered. fitted to the sides and front respectively may finish $1 \frac{1}{4} \mathrm{in}$. by $\frac{7}{6}$ in. net.
The panels (E, Fig. 4) between the arms and seat rails have a visible height of $13 \frac{1}{2}$ in., and are fitted into position with $\frac{1}{2}$ in. stub tenons top and bottom, the net finished width being $4 \frac{1}{2}$ in., using $\frac{8}{8} \mathrm{in}$ or $\frac{3}{8} \mathrm{in}$. thickness as preferred. The panelled effect can be of applied mould glued and pinned on. If this main framing is carefully put together a substantial and lasting result will be obtained. The separate framings for the back. seat and foot ends forming the cushion rests may next be dealt with, and a nicely smoothed finish with the edges slightly rounded away will give the best effect.

Reference to Fig. 5 shows that the whole back frame is hinged to the back edge of the seat frame, and supported at a convenient angle by an adjustment rod behind in the slotted arm, as in Fig. 6 Two outer stiles (J) and one centre stile will be required to finish $1 \frac{7}{8}$ in. by $\frac{7}{8}$ in. and also 2 rails (K) to finish 3 ft .10 in . by $1 \frac{7}{8} \mathrm{in}$. by $\frac{7}{8} \mathrm{in}$. This allows for jointing and clearance between the arms so that the framing may fold down between for portability. The stiles and rails should be mortised and tenoned together and pinned. The slats or laths ( L ) may be anything between


The stretcher rail between may be of the same substance as the legs, tenoned and pinned in. When the strut support is lowered and bearing the frame it is held in position by means of a clutch (N, Figs. 5 and 7) which is of $\frac{7}{8} \mathrm{in}$. by $\frac{7}{8} \mathrm{in}$., or $1 \frac{1}{4} \mathrm{in}$. by $1 \frac{1}{4} \mathrm{in}$. thickness in the length and with a $1 \frac{1}{4} \mathrm{in}$. projection at the extremity to pass over the stretcher rail of the strut and grip it. This clutch is hinged to the lower rail of the framing and is of a length to butt closely between the rails. The position, approximately, for bolting the strut to the framing will leave a space between the framing and the top of the strut leg of $2 \frac{1}{2} \mathrm{in}$., or $4 \frac{3}{8}$ in from the outer edge of the framing; this indicates a position which should be suitable for allowing the clutch to overlap and grip the strut rail

The seat frame is of the eame dimensions as the back. It may be made with 3 in . by $\frac{3}{\frac{3}{6}} \mathrm{in}$. laths, which will be sufficiently thick to give a bearing, whilst wide enough to be comfortable. Seven laths are indicated in the illustration, and the centre and thicker stile is omitted, but the finished effect of the whole will be better if the frame is fitted with an equal number of laths to the back frame, with an extra one to replace the centre stile.

The foot-end frame itself is 1 ft .11 in wide only, but otherwise it is put together with stiles rails and laths in a similar manner to the back. This footend frame lies loosely under the seat frame, and when home is flush with the front of the seat frame
When extended it rlrops into position level with the seat rame. The latter rests upon two stonfillets 2 ft .3 in . by $l_{\frac{7}{8}}$ in. by $1 \frac{1}{4}$ in., screwed to the underside of the stiles (Fig. 5) and with a similar projection to that indicated for the
clutch, which will stop against the seat rail (G, Fig 3) and prevent the foot frame from dropping out of position. The frame is supported by a strut and locked with a clutch similarly to the back frame. The total length of the frames when let down horizontally will thus be 6 ft .5 in . In Fig. 7 the strut support is shown in action with the clutch indicated.

In lig 1 the foot-end frame is omitted to show more clearly the position of its entry. When being drawn out or pushed home it travels on fillets screwed to each of the side rails (C) in a similar manner to a drawer runner. A cutting list is given on the previous page, with the lengths slightly on the full side, in most instances, $t_{0}$ ) allow for finishing : widths and thicknesses are net.
The Cushions. Much of the comfort of a settee bed depends on the cushions, especially when they are used as mattresses. Unless they are well upholstered they will wear thin and provide little, if any, protection from the hard laths. The ordinary flock filling employed for mattresses can be used if it is properly packed in the inner casing, but as it is liable to wear limp and so become uncomfortable, the better plan is to use well curled horsehair
The most satisfactory method of making the cushions is to use springs, and in this case they should be about 6 in . thick and fitted with 4 in. springs set at close intervals. For the amateur the best method of making them is to cut out oblong pieces of stout canvas, and sew the springs to two pieces, each spring touching the other. The sides should be fitted in with narrow material, and then each in turn covered with flock or hair to a thickness of 2 in . or so, and then with tapestry or repp. The two sides should be buttoned together so as to give rigidity and also to keep the two surfaces parallel.

SETTER: The Dog. The English setter is one of the handsomest of dogs, but, unlike the retriever, he is not greatly kept for show


Setter. Young Engligh setter, a beautiful ailkycoated aporting dog
purposes. Several beautiful colours are recognized, such as black and white, lemon and white, liver and white, etc. The long silky coat is slightly wary.
The shoulders should be well sloped, the loins wide, slightly arched and muscular, the brisket deep, and the ribs widely sprung. The legs should be strong and muscular ; the feet close and compact. The head should be long and lean ; the skull oval from ear to ear, allowing plenty of room for the brain. The muzzle should be moderately deep and fairly square; the nostrils wide. The neck should be rather long, muscular and lean. The tail should be carried almost on a line with the back.
The colour of the Irish setter is a rich golden chestnut, entirely devoid of black. The Gordon, or black-and-tan, is the rarest of the three. He is somewhat more strongly built than his English cousin, and his head is much heavier. See Dog; Kennel.

## Settle: Antique and Reproduction Pieces

How to Construct a Useful and Decorative Hall Seat

The reader may also consult the articles on Ingle Nook: Jacobean Style; Tudor Style; while references for the constructive side of this contribution include Cabinet Making; Chest: Corner Seat; Halved Joint; Wood Carving

This word is used for a kind of wooden bench be nearer $\frac{7}{k}$ in. Two pieces are glued together or seat. Most settles have arms and a high for each upright. and the top curve is drawn back and will hold three or four persons. Marle of oak and heavy in style, settles appeared in England perliaps as early as the twelfth century. The high back was a protection against draughts, and some had in addition a canopy. Gradually they became more elahorate, and some examples of the Tudor and Stuart periods are beautifully carved. In some the fronts are divided into panels around which is finely


Beautifully carved old oak settle with box seat ; 17th century Courtesil of 'r. Eidwards. Ilarrogate to a radius of $7 \frac{1}{2}$ in., 2 in from the end. The curve should be reversed on one side to line is sawn with a bow-saw, and finished with a spokeshave, and the small piece cut olf, as shown at B, should be placed on one side for use on the under side of the top board.

The back may be in one piece, glued up with 3 or 4 lengths and finished to $2 \mathrm{ft} .11 \frac{1}{2} \mathrm{in}$. by 2) ft. 5 in., or formed with one $2 \mathrm{ft} .11 \frac{1}{2} \mathrm{in}$. by 1 ft .1 in., with a lower length, 1 ft . 5 in., of plywood. The back is fitted in r rebate cut in the upright sides, as shown. Two frames, $D$ and $E$, are prepared from 2 in by 1 in wood (deal will do for this) to 2 ft . 10 in . by 1 ft .1 in The ends may be screwed or halved together, and then screwed to the sides and back. The frame, D, is Hush with the bottom, and the top of E is 1 ft .5 in. up. The top of D frame shoold be covered with a piece of plywood measurexecuted carving. A number of settles were ing the samc outside-size as the frame. made in the 16th and 17 th centuries, but early in the 18th the piece went out of fashion. In the 19th, reproductions of the old settles made their appearance.

Strap work ornamentation is found on many British settles. They had inlaid chequer board decoration on the stiles and rails, and occasionally the arms were inlaid. In some, as shown in our illustration of a beautifully carved 17th century settle, the bottom of the piece was constructed as a chest.

Settles are made to-day in reproductions of the old styles, and are suitable in halls or living. rooms furnished in oak period styles. Loose velvet cushions, fringed or tassellerl, are permissible, but a settle is never upholstered.

Making a Monk's Bench. A type of settle with a movable back and box seat was made in Tudor and Jucobean times. The back was adjustable to form a table and the picce is often known as a monk's bench. Copied to-day for hall furnishing, this is and picturesque style of seat, whes not only a table, but also a rug chest.

The monk's bench provides suitable surfaces for incised carving. The suggestions given in Figs. 1 and 2 are taken from old English carvings, and they may he exccuted with a few simple tools without any previous experience of wood-carving. By the method of construction shown in Fig. 3 there are no mortise and tenon joints, the lapped halving joint only being used. Oak is the correct wood, but the carving will be easier if seasoned yellow pine is used, and finished by wax polishing only or by staining.

The upright sides, A , are 2 ft .5 in . by 1 ft .3 in by 1 in . But if machineplaned wood is used, the thickness will
the back on top of $E$, as indicated at $F$, but two end pieces, $G$, the same width and thickness, should be joined to it with the halving joint and project 1 in . in front, the ends being rounded as shown A 2 ft .10 in . by 1 ft . 5 in frame, shown at $H$, is made from 2 in . by $l \mathrm{in}$. wood, halved at the corners, and a rebate cut at the back to take a panel $K$, measuring 2 ft . $6 \frac{3}{3} \mathrm{in}$. ly $\mathrm{l} \mathrm{ft} .1 \frac{3}{4} \mathrm{in}$. by $\frac{1}{2}$ in. This framed panel should be fitted under the projections at $G$ and screwed up from the front


The binged seat Hap giving access to the locker at the bottom of the bench is 2 ft .6 in . by 1 ft .1 in . by 1 in . ; the front colge is rounded and two battens of 2 in . by 1 in . wood screwed under at the ends, so as to fit inside the rail $E$ and prevent the wood from warping. The top board, which forms a table whell resting on the arms is 3 ft .6 in . by 1 ft .6 in. by 1 in ., and is hinged $1 \frac{1}{2} \mathrm{in}$. away to the back $C$. In order to allow the hoard to tilt back slightly when upright, a chamfer should be plancd $1 \frac{1}{2}$ in. wide and $\frac{1}{k}$ down at the hinge side. The pieces $B$, neatly cleancd with a spokeshave. are screwed to the top board, as shown.

Carving the Panels. The carved decoration may be drawn direct, or on paper and transferred. The border lines, as well as the curves, are cut with a veiner and enlarged with a quick gouge as indicated at M. Slight recesses are worked with a flat gouge as shown at N , and finished as indicated at 0 . The tool cuts at $P$ are done in a similar manner. The effect gained by the simple incising of all lincs with a veiner is quite effective; but, if thought too difficult, the gouge work may be omitted.

SEVRES. The richly decorated porcelain characteristic of the famous French factory at Sèvres is rightly admired for its unique qualities of form and colour. Only the longest of purses could hope to acquire examples worth having, and the lover of antique china must usually be content to study old Sèvres in public galleries.

Started in 1756, Sèvres has always enjoyed royal or state patronage. For the first 13 ycar's it produced soft-paste porcelain of the St. Cloud type. In 1769 a now era opened with the introduction of hard-paste, similar to that of China and Dresden. Since then practically all French porcelain has been made with china-clay and felspar, and hard-paste Sevres is thercfore distinguishable from the English reproductions made in bonc porcelain at Coalport and elsewhere. It now became possible to turn out enormous vases, as well as plaques for painted scenes. During the Louis Seize period many of these plaques were set in ormolu mounts on rich marquetry, and a delightful corn-flower-bluc was introduced. The important class of biscuit figures, by great sculptors, is quite distinct from the homelier groups emanating


Sevres. Left, trembleuse cup, cover and saucer, painted with medallions of children and a wreath of flowers on cover. Centre,
fat-shaped gros-bleu vase and cover with white and gold scroll bandles. Right, large gros-bleu cup and saucer painted flat-shaped gros-bleu vase and cover with white and gold scroll handles. Right, large gros-bleu cup and saucer painted
with pastoral landscape and figures and with gilt scrolls and wreaths of fowers

Peat, which removes offensive odours effectually, may by its antiscptic effect interfere with the desired bacterial action. The excreta disappear as such in about a month, and with proper care the process can be carried out without being in the least degrec , ffensive. An arrangement of pails has been devised whereby the liquid excreta are strained into a lower pail and disposed of separately.

It has been pointed out by experts that urine diluted to $l$ in -20 with water, and carefully applicd to certain vegetables, promotes very vigorous growth, and that in the case of carrots it destroys one of their nost common trom Dresclen and Che!sea. Since the new consumed without causing diarrhoea, typhoid, pests. Slop water on such a system would have factory was erceted in 1876 there has been a or any other lilth disease. The earth which is to be disposed of separately, but could be revival of soft-paste porcelain, but it has not the delicacy and charm of the old Sevres.
The mark of the double L , established in 1753 at Chantilly, with A to represent the year, was continued at Sèvres from 1756 to 1777. That year was indicated by Z, W having been omitted. The sccond cycle began with AA, and reached 1795 with RP, when the dating was varicd for a time. Since 1818 the year has been expressed by its last two figures. From 1810 to 1848 imperfect pieces bore no mark, whereas since that date they have had a wheel-cut through the main mark. From 1854 to 1870 a crowned N stood for the emperor, and a $T$ meant that the piece was soft-pastc. After 1888 the mark became a potter at the wheel, with the word Sèvres and the two-figure date.

The fact that during the 19 th century white biscuit pieces were freely sold has been a fruitful source of mystification. Large quantities were bought for decoration either in Paris or in England, so that the only part of them which was of genuine Sevres origin was the body. It is estimated that of all the socalled soft-paste Sevres in collections ninetenths were decorated elsewhere. See China: St. Cloud Ware
SEWAGE. This describes the refuse from a house. In towns it is carried away through the drain pipes, in connexion with which an elahorate sewage system provides for its removal and disposal. In country districts residents have often to makt their own arrangements for its disposal, and one way of doing this is by means of a cesspool.
Some of the contents of sewage have a high manurial value. The processes carried out at sewage works in connexion with the water carriage systems of towns remove the grealer part of this value, as neither the solid part of the treated sewagn, the sludge, nor the watery affluent is of much use. Where a cesspool is used for a country house, the action of bacteria reduces the solid constituents of the sewage to a soluble condition and the liquid can be drawn out for distribution in a garden.

A cesspool should be lined with cement, otherwise the contents soak out into the surrounding soil at a depth where nitrification processes do not go on, and the sewage may make its way in the ground water and so into shallow or surface wells. In this way typhoid fever, diarrhoea, and other diseases may be propagated. Even if it has a cement lining, a cesspool should be at a lower level than a well used for drinking water, and at least 100 ft . from any woll, spring, or stream.
There is much to be said for the disposal of excreta by using an earth closet and burying the contents of the pails in the upper layers of the garden soil, where nitrification will go on and thereby promote plant growth. Where such a systen has been tried plentiful crops of vegetables have been obtained, and have been
used in the closets should preferably he garden soil, and it is important that it sloould be collected on a dry day and stored in a dry place. utilized for watering, either by irrigation or by spraying. See Cesspool; Drains; Earth Closet; Sanitation; Septic Tank; Water Closet.

## Sewing Machines and Their Care

## How the Busy Housewife can Save Time and Money

In connexion with this article that on Oiling should be read. See also entries on various neediework processes, e.g. Dressmaking; Scam

The earliest type of sewing machine, still used for children's machines, is that known as the chain-stitch, which uses only one thread. The machine in generial use is the lock-atitch. In this there are two threads, one attached to the needle and the other to a spool enclosed in a shuttle. The needle sarries the thread through the material, and, in rising, causes the thread to form a loop. The shuttle passes through the loop, which, in its passage to the top of the material, carries with it the thread from the shuttle. The tension caused by the thread attached to the needle forming the next stitch pulls up the lower thread tight (lig. I, A).

There are two methods of moving the shuttle in general use, one being known as the reciprocating and the other as the oscillating shuttle. The former will be found on some of the older machines, and it is therefore briefly described here. In the reciprocating shutile machine there are two shafts to convert the rotary motion from the wheel. One runs horizontally into the interior of the arm at the top of the machine, carrying at one end the heavy balance whecl, and at the other end the disk and roller for imparting the upward and downward motion to the needle-bar, together with a bevel gear wheel. The other spindle is vertical, with a similar bevel gear wheel at the top and the cam at the bottom for operating the feed lever and a balanced crank, this giving the reciprocating movement to the shuttle carrier, by means of a straight connecting rod.

The shuttle movement is at right angles to the direction of the sewing, and the shuttle slides in a shallow recess. The whole of the


Sewing Machine. Fig. 1. A, stitch correctly made. B and C, stitches which result from faulty tension
movement is directed towards obtaining an exactly corresponding movement of the needle and the shuttle, and the operation of adjusting these two disconnected parts is called timing. The timing is effected by adjusting the two bevel gear whecls, so that when the needlebar is at the bottom of its stroke the shuttle must be in such a position that it can pass through the loop formed by the thread directly the needle commences its upward stroke.

The action of the lock-stitch is assured by this adjustment, but there are other points to be considered in order to obtain a good stitch. It is necessary to have the thread in the shuttle correctly threaded and at a suitable tension, and the thread in the needle adjusted in connexion with the take-up lever, so that when the ncedle-bar descends it carries the lever with its attached thread and then allows it to spring upward with the ascending stroke to gather the surplus thread used to form the loop and not required for the stitch.

Leading Types. A vibrating shuttle machine is illustrated in Figs. 2, 3 and 4 . In this the top spindle is formed with a crank which produces a swerving movement in the vertical lever $A$. This lever is connected at $B$ to an arm $C$ attached to the crank $D$ of the shuttle carrier E . The feed movement is obtained through the cam at $F$ (lig. 2), which is attached to a crank at G (Fig. 4), operating the bar H , and imparting a backward and forward movement.

The needle-bar movement is shown at Fig. 3. The presser foot, indicated at $P$, presses the work down on the feed and also prevents the work being pulled up with the ascent of the needlc. The pressure produced by the spring can be regulated by a screw at the top of the bar. It is lifted up by a lever at 0 working on the principle of an eccentric.

The internal mechanism is the same for both hand and stand machines. the only dilference being in the method of turning the balance wheel. In the hand machinc a gear case is attached to the framework of the machine, and contains a large-toothed wheel provided with a handle which engages with a small-toothed whecl. The latter is connected with a movable arm, which can be attached to the balance wheel and easily removed to place the handle out of action. The stand machine has a driving wheel of large diameter, turned by a connecting rod attached to a treadle. A
belt from the driving wheel transmits the thread trom the shuttle loosely. If the tension power to the pulley, which forms part of the top balance wheel.
There is a type of machine in extensive use in which an oscillating hook-shaped shuttle carrics the lower thread in a circular bobhin. This shuttle may work in a horizontal planc, or in a vertical one. Therc are several other kinds of sewing mnchine in use, as, for example, those having a circular container for the lower thread in the form of a rotary hook. Instead of moving backward and forward, the hook continues to revolve and it is so arranged that when the needle is at the bottom of its stroke the point of the hook is a little behind it and carrips the thread with it to form the lock of the stitch.

Onc of the best methods of operating a sewing machine is by neans of an electric motor. This is attached to the back of the table. In some cases the motor is startcd and the specd regulated by means of a treadle or foot controller; in others a switch-lever is fitted on the tatle by the side of the drivingwheel and acts as a starter, regulator, brake and stop.

Care of the Machine. The machinc which is regularly used and frequently oiled will not, as a rule, go wrong; it is irregular use and improper oiling that usually cause trouble. There are certain oiling points in every machine in which the spout of the oilcan should ba placed, but from time to time the underneath mechanism and that portion covered hy the frame should be attended to. The main causes of stiffness in running, are clogged or gummed up oil and dust, small particles of fibre and grit. A machinc that is in regular usc is subject to trouble caused by dust and fibre, and it is necessary to examine the unexposed parts and clean them up occasionally. Only the finest mineral oil should be purchased and a very small quantity used at a time, all the oil holes being noted so that the oiling is thorough.

It is in the shuttle race that dust is likely to congregatc, and this portion of the mechanism must be kept quite clean; it can be wiped over with a soft rag soaked in paraffin, the connecting bars and other parts being wiped over at the same time. If the machine has been noglected and the oil has gummed up, it will be necessary to use a stiff brush with plenty of paraffin, which should be wiped off before the new oil is applied.

The regulation of the tension shonld be carefully attended to, for the success of the stitching mainly depends on it. Referring again to Fig 1, the correct stitch is shown at A; but if the tension is not enough, the thread from the needle will not do more than hold the is too tight, the shuttle may find a difficulty in passing through the loop, which is also liable to break, and, in addition, the shuttle thread, when it is pulled up, will be drawn through the material. The tension plates are fitted with a spring and an adjusting screw, so that different tensions can be given to the thrend when sewing different materials. When the machine makes a good stitch with both the upper and lower tensions fairly slack, there is nothing wrong with the other adjustments.

Using the Machine. Faults in sewing are morc generally the result of carelcss use than of defective mechanism. A bent or imperfect needlo, which is a frequent cause of missed stitches, may be due to the needle not being set straight in the needle-bar, or the needlebar being bent. Other reasons may be that the needle is incorrectly set or unsuitable for the size of the cotton. The take-up spring may be set ton long, or the hole in the needle-plate too large. All these faults can be adjusted, with the exception of the latter, when a new plate should be fitted. Special care should be given to the choice of the ncedle; makers usually give a table showing the size rcquired for various thicknesses of cotton. The correct position is generally marked by a fine cut on the needlebar, and when the eyc of the needle is centred on the needle. plate the mark on the bar should coincide with one on the frame. The casies run the point of it into the cyc of the machinc needle, and let it remain until the screw is tightened up on the bar. The alinement of the needle should be frequently noted, as the uareless handling of the material before the needle is entirely raised will often cause a bend, and if this is allowed to remain it may not only cause missed stitches, but also damage the needle hole or the shuttle.

As a rule, the hand machine is easily worked, but the treadle machine is found difficult at first. In order to become well accustomed to the movement of the treadle, the balance or hand wheel should be loosened by raising the small catch so that it will



Fig. 4. Underneath view of vibrating shuttle machine, showing the positions of the various parts and oiling points way of centring the needle is to place an The action of the stitch regulator should be ordinary necdle fiat on the needle-plate and tested, and in those machines fitted with a
turn without moving the other parts of the machinc. The presser-foot should be raised both feet placed on the treadle, and the balance or handwheel revolved towards the machinist, never in the opposite direction The fect are so placed that the tocs and heels can be used with equal power, and have so much control over the treadle that the tiy wheel can be used slowly or quickly.

Practice should next be gained in guiding. the material For this the needle is raised some material placed under it, and the presser-bar let down. The shuttle should not be used, and there should be no thread in the needle. The handwheel should bc turned forward and the material guided as the fecd carries it along. The presser-bat should be lifted to turn the material, which on no account must be pulled, as this action will bend and perhaps break the necdle : and on no account should the machine be worked unless there is some material between the foot of the presser-bar and the feed. tested, and in those machines fitted with a reversible feed this should be noted and its action practised.

The method of winding the cotton on the bobbin is more or less automatic, but if the winding is not perfectly even the adjustments should be noted and, if out of order, put right. The shuttlc should be fitted with a bobbin, and correctly threaded so that the cotton runs out freely. The necdle is threaded and the tension tested, and then the actua! sewing commences.

In all modern machines there are a number of attachments for use in various kinds of work. These include, a mongst others, a straight guide which serves to dircet the material in a straight line, and which can be adjusted in various distances from the stitch-holc. The quilter guide is used for quilting padded materials in straight lines and squares. It is attached to the presscr-bar and is casily adjusted. An automatic method of hemming can be arranged by the use of the hemmer. an attachment fitted to the presser-bar in place of the ordinary foot. The corder is a similar attachment, having a groove underneath to allow the cord to pass directly under the ncedle. The gatherer is a useful attachment adjusted by the length of stitch It allows the lower of two pieces of material to be pleated or frilled, while the upper is straight and firmly stitched.

SHAD: The Fish. The several salt water fish of the-herring tribe known as shad may be cooked in various ways, but perhaps the best methods arc to broil it, or else to stew it in white wine, as in lirance.

To broil shad, scale, clcan, and wash the tish, which should weigh from 2 lb . to $2 \frac{1}{2} \mathrm{lb}$., then cut off the head and score each side. Put it into a dish and sprinkle with salt and pepper, then pour over it enough oil to
steep it and let it soak all night. The next day broil the fish very gently for about $\frac{3}{4}$ hour, turning it over during the operation. It is important to score it before putting it to soak, so that the seasoning may work into the Hesh. Cook it each side about 20 to 35 min . Dish it very hot, and serve it with maitre d'hôtel sauce.

To stew shad, scale and cleanse the fish and dry thoroughly, then bind it together with tape to prevent it opening where it has been gutted. Put it into an oval stewpan with 3 shallots, a clove of garlic, 1 blade of mace, 15 black peppercorns, a bouquet garni and salt to taste. Cover the fish with $\frac{1}{2}$ pint white stock and $\frac{1}{2}$ pint white wine. Stew gently for 35 min., basting the fish occasionally, then dish it up and remove the tape. Strain off the liquor and add $\frac{1}{2}$ pint of it to the same quantity of béchamel sauce. Mix well over the fire and pour over the fish.

It is better to fillet the shad if it is to be fried. Dip each fillet into well-seasoned Hour and fry gently in boiling fat. Garnish with fried parsley. The roe of the fish may be separated from it, floured and fried at the same time as the fillets. and served with the fish. See Sauce.

Shaddock. This is an alternative name for grape fruit (q.v.).

SHADE: For the Eye. These shades may be classified under two headings. One type, generally for one eye only, is for holding in place boracic wool or other dressing which may be necessary. These shades are usually made of celluloid, being flesh colour on the outside and green on the inside, and are held in place by an clastic band which slips around the head.

A reading shade for both eyes is made from stiffened cloth or card with a brass wire, which fits around the outer edge of shade and above the ears. It is used for keeping oblique light off the eyes, and in cases of inflammation to protect them from bright light. See Eye.

SHAGREEN. The fine grained parchment made from the skin of the shark is termed shagreen. It was formerly used for the cases made to hold tea caddies and similar articles. The word is also used for untanned leather with an artificially grained surface, usually dyed pale green, with which various fancy leather goods are covered.

SHALLOT. The shallot is a very useful and easily grown vegetable of the onion family. The hulbs may be set during winter or early spring at about 6 in . apart in rows 10-12 in. from each other. Deeply dug and manured soil is necessary to ensure good results. Late in July, when the leaves have turned ycllow, the bulbs should be lifted, cleaned and stored for use. Old professional gardeners advise planting the bulbs on the


Shallot, an easily grown vegetable of the onion family which is
shortest day and lifting them on the longest day. If large bulbs are wanted the giant or Russian shallot should be grown. Shallots are cxcellent for pickling.

Use in Cookery. Shallots are used in cook ery for Havouring purposes, and also for pickling. They resemble garlic, but are milder, and are often used as a substitute for the latter when a strong llavour of onion is objected to. To store shallots, hang them up in strings, but do not keep them in the pantry. See Garlic Onion; Pickle.

SHAMPOO: For the Hair. Children's hair needs washing oftener than that of adults. Soap containing a little formalin makes a good cleansing shampoo. Very fair or white hair is best shampooed with shredded white Castile soap. A simple shampoo wash is made up from 1 oz . shredded soap, $\frac{1}{4}$ oz. carbonate of soda, 1 teaspoonful borax. Dissolve the soap in a pint of boiling water, then add the other ingredients. Use as much as is required, preferably warm. Ordinary washing soda should not be added to the rinsing water as it renders the hair brittle.

Several preparations are used for brightening the hair when it is shampooed. Camomile is the oldest and simplest. Put the flowers in a muslin bag and pour on boiling water. Rinse the hair with this infusion when the lather has been removed. Henna is often incorporated with shampoo powders, in order to tint the hair slightly. Medicated and brightening shampoo preparations should be allowed to remain on the hair in lather long enough for the chemical ingredients to operate, 5 to 10 min . being usually the time necessary. Coconut oil is the basis of various oil shampoos which produce a good lather.

Dry shampoos, though injurious to the hair if used too frequently, have advantages that give them a ready sale. They can be safely used by people suffering from colds, and their action is so rapid that they make excellent emergency shampoos. The powder should be applied to the hair with a pad of cotton wool, and removed later with a stiff brush. If the subsequent brushing is sufficiently thorough to remove all traces of powder ill effects rarely follow. See Egg Shampoo; Hair; Henna.


Shawl. Baby's head shawl knitted in Shetland wool a powder or a paste.

Plain shantungs in natural or dyed shades wash and wear well. They are therefore suitable for children's clothes. Shantung should be ironed while it is dry or it will lose its gloss
SHAVING. The requisites for shaving are a razor, a brush, some soap, and some water Most men use a razor of the safety type and a special brush. Ordinary soap can be used, but shaving soap is much better, as it makes lathering easier. It may be in stick form, in

Hot water is best for lathering the face, as it expands the skin and helps the lathering properties of the soap. Thoroughly moisten the brush and rub lightly on the soap, then commence to work up the lather by a circular movement. If a soap powder is used, sprinkle a little on the wet brush. If a paste is used, it is best to smear a little on the chin before applying the hot lather brush. A very stiff and stubborn beard requires longer lathering than when the growth to be removed is only moderate. Stiff beards shave more easily witl/ a moist rather than with a thick lather.
Shaving Soap. Soap employed for shaving generally coutains an emollient such as lano lin or spermaceti, which has a softening effect on the skin. The chief object of a shaving soap is to provide a good lather, and also to soften the skin and so facilitate the work of the razor See Chest of Drawers; Razor.

SHAWL. Shawls may bo divided into four classes : the knitted or crocheted, the woven woollen, the woven silk, and the lace variety. Those in the first class are mainly utilitarian. Good patterns for knitted or crocheted shawls with full instructions can be obtained from wool shops and fancywork departments in stores.
Three oz. of white Shet land wool, $\frac{1}{2}$ oz. of pinis or blue wool of a similar thickness, and a medium-sized bone crochet-hook ar needed to make the baby's head shawl shown in our illustration. Commence with the white wool in the centre of the shawl by making 8 chain and joining to form a ring. For the first round work 3 chain to form the first treble, 23 treble into the ring, and join with

SHAMROCK. The name is vaguely applied to all sorts of trefoils and clovers. The true shamrock is either the whiteflowered clover, Trifolium repens, or the yellow.flowered suckling clover, Trifolium minus.
SHANDYGAFF. This con sists of a mixture of bitter ale and ginger beer, half and half; "rich man's shandygaff" is a mixture of champagne and ale, served usually in a pewter tankard and regarded as a great restorative.
SHANTUNG: The Silk. The crisp, hard-wearing, pale fawn coloured silk stulfs known as shantung are made by hand from the cocoons of the uncultivated silkworm. The threads are somewhat irregular, thick threads here and there not being regarded as blemishes. This material dyes well and is much employed in printed designs fordressing wraps.
a slipstitch to the 3 chain at the beginning of
the round. The second round consists the round. The second round consists of
3 chain to stand for a treble, 1 more treble into the same place, 2 chain, 2 more treble into the same place, * miss 2 treble of the previous row, 2 treble into the next, 2 chain, 2 more treble into the same place, miss 2 treble of the previous row, 2 treble into the next, 2 chain, 2 more treble into the same place, 2 chain, 2 more treble into the same place; repeat from * all round and join with a slipstitch.

The third round is worked thus : Slipstitch into the space between the treble of the pre vious row, ${ }^{*} 3$ chain to stand for treble, 1 more treble into the same place, 2 chain, 2 more treble, 2 chain, 2 more treble, and into the next space between the treble of the previous row work 2 treble, 2 chain, 2 treble all into the same place. Into the next space between the treble work 2 treble, 2 chain, 2 treble all into the same space, and repeat from ${ }^{*}$ all round, joining with a slipstitch. Continuc in this manner, always making one extra pattern between each corner pattern, until the shawl is the right size.

Begin the edging by working 7 treble into each slace between the treble of the previous row. Then between each pattern work one
double chain; then another 7 treble into the next space between the treble of the previous row. With the coloured wool work all round the cdge of the treble in double chain and the shawl is done.

Woven Shawls. Many of the woven woollen shawls are also merely useful, being made in quict colours with horder of deeper tonc and plain fringe, or in checks and tartans; but there are, in addition, hand-woven shawls which arc carried out in brightly contrasted stripes or with Horal borders, while gaily embroidered woollen varicties are often picked up as souvenirs when abroad, and can be utilized in a number of way's.

The linest woven all-over patterned or embroidered shawls come from Kashmir, and are made of the soft under wool of the special shawl goat. These shawls are highly valuable possessions when made at the best period. Sinilar shawls of inferior quality were made in India and have been imitated in France, and the Paisley shawl was modelled on them.

Shawls of several different patterns, chiclly oriental, are made in Paisley. The best known design is the pine or cone, woven generally on a red ground, with yellow, blue, green and other threads. A black centre is a characteristic of some of thesc shawls.

The richness, harmony and brilliance of the colours are as remarkable as the permanence which leaves shawls 100 years old as beautiful as ever. Their soft wool is attractive to moths, and they should be protected by wrapping in newspaper in storage. They can be washed and cleaned, but it is advisable to keep them out of the way of dirt.

To the woven silk class belong the most beautiful of all shawls: Chinese varieties, hand embroillercd on heavy crêpe, some in sclf colour, others with Howers and birds in many brilliant hues on a black or coloured ground, fringed with knotted silk. Less expensive are plain silk and erêpe-de-Chine shawls, relying on beauty of colour and fringe for their decorative value. Such shawls can be made with four squares of crêpe-de-Chine, each a yard square, joined together with faggot-stitching, a hand-made tasselled fringe in stilf-coloured sill trimming the edge. Other evening shawls are of iinselled brocades with woven coloured borders.

Lace shawls are usually Spanish lace, black or white silk blonde, or Limerick needle-run or appliqué, and though more often square, are occasionally triangular in shape. There are also the Lggyptian shawls of tinselled net and the silk embroidered net Rumanian shawls.

SHEARER: The Style. The work of Thomas Shearer as a designer is largely associated with that of Hepplewhite. In general it was in the direction of simplicity, and a reaction from the more ornate designs of Chippendale. The two assisted in bringing about a revival in the use of turning, and are considered to have done more than any other designers to develop bedroom furniture.

Some of Shearer's pieces, notably his tables, of which new types were introduced under his influence, possess considerable distinction. Mention may also be made of his tea caddies. Square, oblong, or round in plan, these were delicately inlaid or painted with fans, ovals, or circles upon their tops.

SHEARS : For the Garden. An ordinary pattern of garden sliears is illust rated in Fig. 1, which is typical of a variety of similar imple ments ranging in size of blade from $4 \frac{1}{2}$ to 10 in . long. A convenient size for ordinary use has blades 7 to 8 in. long. The handles, which are usually longer than the blades, are made of hardivood and very securely fixed to the tangs or ends of the blades.
As a good cutting action depends upon the correct manner in which the two cutting edges close over one another, it is imperative that
the joint shall be a close one, and kecp the the whole length of the blade. Either type of faces of the blades in contact with each other shears may be uscd for grass cutting or for during the cut. In the better patterns contact trimming privet, yow, and similar hedges. is effected by tightening up the pivot pin,
 which takes the form of a bolt with a fly nut and spring washer. This may be correctly adjusted by tightening the nut as occasion requires. The joints should be lubricated with ordinary light machine oil.
'To clean the blades, the nut is unscrewed, also for trimming the edges of lawns, and to the spring washer removed, and the two keep the grass edge straight ; it is as well to parts of the shears scparated any dirt which stretch a garden line along the edge of the ber prevents the blades working frcely being cleaned away with a greasy rag or with one saturated in paraffin. This cleaning process should be followed by a liberal application of lubricating oil, and, if nccessary, the cutting cdges should be sharponed on an oilstone and the shears reassembled. The cutting edge forms an angle with the flat or under side. This angle must be maintaincd, and on no account should the flat side be touched with the stone.

Different types of shears are made with straight handles or with a cranked handle. The object of the latter is to enable the shears to be operated over a flat grass lawn without the necessity of knocking the knuckles on the ground, the crank enabling the blades to be kept parallel with the ground and to cut over


Shed. Fig. 1. Diagram showing a substantial lean-to workshop, built in the angle formed by two walls. Full particulars of construction, together with the quantities and material required, are given in the next page

For cutting round curved borders and in awkward corncrs, the grass shears illustrated in lig. 2 are useful. These are formed of a single picce of metal, the two ends forming the blades, with a U, or bend, more or less circular in shape, acting as a spring. This implement is operated with one hand by squeezing the blades together and then releasing them.

When any considerable length of grass ellging or border is to be trimmed, it is desirable to use a regulation pair of border shears. So far as the blades are concerned, these are shaped like and operate upon the same principle as ordinary garden shears, but the shanks of the blades are turned up nearly at right angles and in the same plane as the blades. They are provided with hardwood handles, about 3 ft . in length or more; they should be of such a height that they can casily be operated by the hands while the gardener carries on his work in an upright position.

There is a certain knack in handling thesc shears which can only be acquired by cxperience, but, in general, the left hand should grasp the handle that is attached to the bottom one of the pair of blades. Consequently, this handle should be kept more or less stationary, so that the bottom blade glides along the ground, while the right hand manipu lates the other handle.
Shears of all kinds should be smeared with petroleum jelly when putting them away, as this will prevent rusting and keep the edge in good condition. See Osicr.
SHED. A light struc ture, generally made of wood, the shed is seen in many shapes and sizes. Its main use is for the storage of materials and tools, but it is also used for potting plants or for a smaller amateur work shop. Diagrams and


Shed. Fig. 2. Principal joints used in building the lean-to shown in the previous paze. A, mortise and tenon. B, balved ioint and how it fis torether. C, mortise and tenon for top and bottom of uprights
instructions for building a bicycle shed are 5 in . by $\gamma^{5}$ in. conch holts and nuts. Secure given on page 95 of this work. Particulars of a larger and more substantial structure to house a motor cycle combination will be found in the article on Garage (q.v.). A light garden shed is described and illustrated on page 517. An excellent shed may be constructed along the lines indicated for a garage, varying the doors and lighting to suit individual needs.

Lean-to Building. A shed or outhouse intended as a permanent crection may quite conveniently take the form of a lean-to built into the angle formed by two walls, as shown in Fig. 1. The slied is $\mathbf{1 0} \mathrm{ft}$. long by 8 ft . wide, and the height to the eaves is 7 ft . The following material is required :

150 it. run 2 in. sq. deal
56 ft . run, 3 in Ly 2 in . deal, for framework.
1 ledged and braced door, 6 ft .6 in . by 3 it. 6 in wide.
1 pair 18 -in. cross garnets, lock and key.
80 sq . ft. 1 in. tongued and grooved llooring.
$98-\mathrm{ft}$. lengthe of 3 in . by 2 in for floor joists.
5 windows (casements) glazed, with butts, haudles and cascment stays.
110 -it. length batten, 2 in . by in . for the llashing. 5 shecta of corrugated galvanized iron, 9 ft . by 2 ft 2 in.
1 roll of roofling felt
15 yd of 2 -in. galvanized wire netting, 2 ft . wide or alternatively 1 square ( 100 sq . ft .) -in . 1 . G . and B. match lining.

86 sq. ft. 1 -in rebated weathertoard for the walls.
70 ft ., 1 in . by $\downarrow \mathrm{in}$. architrave for door and windows.
7 IL . paint
1 gall. creosote.
No allowance has been made for a foundation, as it is presumed the yard has already been cemented over or paved. If not, this will have to he done, either with cement, concrete or asphalte. In cither case the framework and joists should rest upon bricks, placed about 1 ft . apart, so as to allow free circulation of air and prevent damp rising. The ground being prepared, proceed by making up the front of the building in one section. Then make the end section. Fig. I shows the general idea of the work, while details of the different joints are given in a separate diagram (Fig. 2).
Having made the two frames, erect them on their site. and bolt the corners together with


5 in. by ${ }^{5} \sigma$ in. coach holts and nuts. Secure
the frainework to the wall of the house with staples and screws. The woatherhoarding can then be added, nailing it to each upright with 2 in . wire nails. The windows can either be made or purchased ready for use. Horticultural or "greenhouse" glass will be quite good enough for the glazing. 'The roof is most conveniently covered with corrugated iron, but it should be lined inside with tarred felt supported on galvanized wire netting or, alternatively, may be boarded with matchlining.

When walls and roof are complete, lay the floor joists, and securely nail the flooring with 2 in . floor brads. The joists and the underside of the flooring should be coated with creosote as a preservative. A strong and rigid floor is very necessary, especially beneath the legs of the work bench and any other heavy tools. A gutter and drain-pipe may be added if clesired. Make a good watcrtight connexion between the corrugated iron and the walls, by means of proper llashings litted as indicated in Fig. 1. A lean-to built in this way inight become a landlord's fixture, but if a framework is made for the end and back of the structure where they abut on the existing brick wall, and the roof is supported at its juncture with the walls by battens screwed to blocks let into the brickwork, the fixture will be a tenant's fixture, and therefore will be removable.

Sectional Building. We illustrate representative types of shed which are sold made $\mathrm{u} p$ in sections ready for erecting. The ends and sides are bolted together and the roof frames are tixed on top. There is a great deal of competition in this class of product, and some very cheap stuff is to bc met with. It is least cxpensive in the long rim to buy a good substantial building, since the first cost is

shed.
Fig. उ. Exterior view of a sectional span rool workanop or tool shed ed. Fig 4. The same partly erected, showing local authority. Courtesy of Alfred Turrell \& Sons method of asaembling the sections. Fig. 6. Useful lean-to shed made up on the same principle
then the only one, for some years at least. If the covering material is weatherboard, then the purchaser should specify that it be either the rehated or the tongued, grooved and moulded variety ( $\frac{3}{4} \mathrm{in}$. to 1 in .), which presents $n$ flat surface to the interior. If vertical boarding is employed the material should be T. G. and B. matchboard, not less than fin. and preferably thicker. Unless a bricked or concreted site has been prepared, a Hooring will he needed, laid on 3 in . by 2 in . joists, which in turn rest on sleeper plates supported preferably by low brick piers. The floor boards should be $\frac{3}{4} \mathrm{in}$. to 1 in . thick, and should be tongued and grooved.

Legal Points. If a tenant erects a shed on his premises for temporary use during his nccupation he will ordinarily he able to remove it at the end of his tenancy. If, however, the shed is in the nature of a permanent structure and cannot be removed without material injury to the property, the tenant must leave it as the landlord's property. Thus a conservatory entirely detached from the house could probably be renoved, but one fixed to and communicating with the rooms would belong to the landlord and be irremovable.

The ercetion of some sheds is controlled by regulations as to the position of the structure and the materials of which it may be built, and inquiry as to these should be nade of the

Where premises are insured against fire, a shed added later will not be covered by the policy unless on arrangement to that effect


Tri-
is made and an additional premium paid if required The presence of a wooden shed near to a house may increase the premium on the house itself. If the shed is of any particular value, or if it adds to the value of the house (as would probably be the case if $s$ garage were erected), the rates on the house will probably be increased

SHEEP. The main article of food that is obtained from the sheep is known as mutton, but other parts of the animal make nourishing and cconomical dishes.
Sheep's Head. To make a good broth procure a sheep's head ready dressed from the butcher. It must be soaked in warm water for an hour to finish the cleansing. The head should be split open and the tongue and hrains removed. Place the two halves of the head in a large saucepan with 3 qt. cold water, bring
to the boil and carefully remove all scum. Add $\frac{1}{2}$ oz. salt, 2 onions, 2 carrots, 2 turnips, $\frac{1}{2}$ a head of celery, and a bouquet garni. Simmer gently for 3 hours, then take up the head, cut off the flesh and shape in neat pieces. Strain the broth, return it to the saucepan with the pieces of meat, add a few freshly boiled vegetablce cut in shreds, and 3 oz. well-washed rice. Simmer it for half an hour and pour into a tureen in which two tablespoonfuls of chopped parsley have been scattcred.
The tongue and brains may be used for some other dish as a garnish, or they may be cooked and served covered with tomato or piquant sauce. Two ounces of pearl barley make a very good thickening for this broth in place of rice. Blanch the barley for 10 min ., then tie it loosely in a muslin bag and add it to the soup with the vegetables. When the soup is strained, untie the bag, and stir the barley into it. Sometimes the vegetables first added to Havour the soup are cut small and served with it ; if this is done the soup need not be strained, and the barley, after being blanched, may be added loose when the soup is half cooked. The meat from a boiled sheep's head niay be pressed into a inould and lilled up with jellied stock. Cover and press with a weight and turn out when cold.
Sheep's Heart. A shecp's heart is first washed in two or three successive lots of warm water, freed from pipes, etc., and then soaked for $\frac{1}{2}$ hour in cold, salted water. Dry it in a clean cloth, stuff it with sage and onion stuffing, and sew up the hole. Roast it in an iron pan in which a lump of dripping about twice the sizc of a hen's egg has been melted. Let the pan stand at the side of the fire, and baste the heart frequently with the fat. The cooking should take about $\frac{3}{3}$ hour. Serve the heart with red currant jelly and some sauce made by thickening some of the fat with a little flour, mixing them smoothly, and adding some stock.
Sheep's Tongue. This dish may be prepared in several ways. Frying is perhaps the simplest, and may be done in the following way: Soak 2 tongues in cold salted water for 3 hours, then wash then in clean water and put them into a pan containing enough stock to cover thein. Cook them very slowly until they are tender ; then skin and trim them and slice each lengthways into halves. Season the pieces to taste, coat them with flour, then brush them over with egg and roll them in fine breadcrumbs.
Fry them in a pan of smoking hot fat, and when they are golden brown on both sides lift them out and serve on a bed of mashed potatoes. A little gravy may be poured round them.

Sheep's Trotter. To fry, prepare 4 trotters by washing and scraping them, boil them up in a pan containing just enough cold water to cover them, and then strain off the water and rinse the pan. Wash the trotters for the second time, and put them back in the pan with enough white stock to cover them.

Cook them gently at the side of the fire until they are tender, then take them out and bone them, finally pressing them between two plates with a weight on top. When they are quite cold cut them into pieces of a convenient size, season to Laste, brush them over with egg, and coat with breadcrumbs. Fry them in a pan of smoking hot fat, and serve garnislıed with parsley and cut lemon. Any suitable sauce may be served separately.

For baking prepare the trotters as directed in the previous recipe, cooking them in stock until they are tender, and then cutting the meat into neat pieces. Put some of the latter into the bottom of a greased dish, cover them with some sliced tomato and scasoning to taste, and on the top put a layer of fine breadcrumbs. Continue in this way until the dish is full.
and on top of the last layer, which should be of breaderumbs, place a few small pieces of butter. Pour in about $\frac{1}{2}$ gill stock, and bake the whole in a warm oven until it is of a golden brown colour. See Brains; Brawn; Mutton.

SHEEPDOG. The old English sheepdog is a most attractive animal. His shaggy coat, in which there is no curl, coupled with a closely docked tail, gives him a quaint appearance, and at the rame time affords ample protection against the worst of weathers.


Sheepdor. Thoroughbred specimen of the attractive
breed known as the old English sheepdog
breed known as the old English sheepdog
If he is groomed every day there is no reason why the coat should become matted or untidy. The colour may be any shade of grey, grizzle, bluc or blue merled, with or without white miarkings. What is termed a pigeon-blue is much esteemed. The forclegs should be heavily boned and dead straight, and, as they are clothed with hair to the fcet, they look enormous. See Dog: Kennel : Lurcher.
Sheep Laurel. See Kalmia.
SHEEPSKIN. Sheepskin is used a great deal for bookbinding, but its wearing qualities are not of the hest, and its use is confined to the cheaper class of work. It is more suitable for ladies' handbags or hats, or such goods as are not glued or pasted on to a hard substance.

In covering books or other articies with sheepskin, care must be taken to preserve the artificial grain. Glue is generally used in preference to paste for this purpose. This applies more to split skins than to those of full thickness. To prepare the leather for gold tooling or lettering, it should be washed with paste water, which is thin paste about the consistency of milk, and afterwards with two coats of glair (white of egg), or, better still, with glue water and one coat of glair. See Bookbinding; Leather.

SHEET. There are two standard sizes of shcets, namely, for double beds and single beds. In cheaper makes single sheets are sometimes too small for comfortable use on a bed $3-\mathrm{ft}$. wide and of full leugth. All sheets are usually bought in pairs, and the length should be judged by the length of the bed, allowing for a good turn over at each end.

Materials vary according to the taste and means of the purchaser. A heavy linen sheet wears better than any other, and is preferred by most people, especially in the summer. As linen is colder than cotton because of its smooth surface, some people prefer not to use it in the winter. The cotton materials range from coarse twill to a smooth and strong union. A good union, while not as expensive as real linen, is satisfactory in wear, and fecls pleasant to the skin. Shects may be quite plain, embroidered at the tops, ornamented with hemstitching, or with wide crochet edging.
An embroidered initial in the right-hand top corner is almost essential to the housewife who prides herself on her house-linen. If the name is marked in ink, it should be at the extreme end of the top hem, and so arranged that when the sheet is turned down the name is hidden underneath. The initial, on the contrary should be arranged so that it is plainly visible. Some people like an claborately embroidered monogram in the very centre of the top, this serving instead of other embroidery.
Sheets should be aired when they come back from the laundry. If the house has a good hot cupboard, it will be enough to put them away in their places, and when they are used again they will be sufficiently aired. See Initial Linen ; Marking; Mending; Pillow Case.

## Sheffield Plate for the Collector

## With Particulars About its Marks and Decorations

Various articles in this Encyclopedia deal with the collection of articles for beautifying the home,
the aim of each being to indicate whal is possible to the average householder. Such include
Brass; Pewter; Silver See also Candelabrum; Gadroon; Jug; Taperholder; Wina Cooler, etc.

Much of the plated Sheffield ware of to-day is really B.M., i.e. Britannia metal, an alloy which was instrumental in killing the pewter trade, as the various articles made in it could be covered over with a deposit of silver. Much, too, is E.P.N.S., i.c. electro-platerl on nickel silver, a useful combination of decorative silver with a hard-wearing metal, the silver being deposited by the aid of electricity.
The credit for discovering a method of thinly coating a base metal with silver is due to Thoinas Bolsover, or Boulsover, presumably but not certainly a native of Sheffield; but the practical developing and perfecting of the new process is due to another Sheffield man, Joseph Hancock, a cutler, who died in 1791. Sheffield plate of value to collectors was made during the latter half of the 18th and the early half of the 19th century.

The manufacture of this plate consisted in the overlaying of an ingot of copper alloy with a thin sheet of silver, both absolutely, i.e. chemically, clean and level. By means of a borax flux, applied to the edges of the silver, adhesion at the edge was secured when the fusion of the silver began in the furnace. The ingot, when removed from the furnace and cleaned, was rolled out to the thickness required, or to that suggested by experience.

Later the process was extended to silverplating on both sides of the copper alloy. This necessitated much care in preparation of the ingot, as the sandwich of copper and two silver sheets required two outer protecting shents of silver, mochanically treated to prevent adhesion to the under sheets.
The branched candlestick illustrated in Fig. 1, which dates from about 1780, shows the popular gadroon ornament. This type of added elging was cither in fine silver, or clse copper alloy much more thickly cased with silver than the rest of the article; and in many cases the copper shows through the thinner plating while the ornamental borders remain unimpaired with repeated cleanings.

The ornament on Sheffield plate will be found to be chasing of the kind known as flat surface chasing, or clse what is now called repoussé work, and in some pieces both methods are combined. In flat surface chasing the design is carried out with a blunt punch, which is held vertically in one hand and hit by blows from a special hammer, Nothing is removed from the surface of the metal, as would be the case in engraving it with a burin or a scorper. In repoussé the raised portion is worked from the back. In the case of circular and oval articles, the border is


Sheffield Plate. Fig. 1. Branched candlestick, C. 1780, an example showing fluted decoration and gadroon edging. A holder for a third light is Gilled by a stopper
made separately and securcd by means of solder. An example of such a border is illustrated on the winc cooler shown in Fig. 2. Many articles are ornamented with a geometrical or strapwork pattern with the field or background punethed out in a press. It was found that better results were obtained in this way than by piercing, i.e. cutting with a saw and finishing with a file, as was done by silversmiths. The sugar basket illustrated in Fig. 3 is a beautiful example of such work.

The marks on Sheffield plate are many in number considering the short period, just over n century, during which the ware was being made. They generally consist of the maker's name and sometimes a device before and after it. The Sheffield plate makers do not seem to have followed the example of the pewterers and deliberately to have used marks which were colourable imitations of the silver hall-marks. Some ware has the name of the firm only, some has a device or devices only.

As the best styles in decoration of Shefficld plate coincide with the Robert Aclam period, the most desirable pieces to collect show classical influence and ornament. In addition such pieces are to be preferred because they


Sheffleld Plate. Fig. 2. Wine cooler, c. 1780, with decorated handles and border
All photographs l!! courtes!! of C'happle \& Mantell
are practical and more casily kept clean than the heavily chased and ambossed style of ornament which came into fashion later in the 19th century. Utility is the best guide as to which pieces to collect. The classical vase shape with very little? decuration beyond bead ing, is beautiful for a hot-water jug (Fig. 4), for coffec pot and milk jug. With such pieces and two pairs of candlesticks, a plain tea cadily. a cake basket, which is equally useful for fruit; and an oval teatray with a pisreed work rim, would inake a represcntative and useful collection. Sheffield plate is occasimally picked up at auction sales for comparatively small prices, but is worth obtaining in good shapes with restrained ornament.

Inkstands are useful of the simple type with decorated edge and look particularly well Hanked by candlesticks of Adam design, or in the company of $\Omega$ wax-jack taper holder such as that illustrated in Fig. 5, with ornamented border.

The best way to display Shcffield plate is to use it in the home. It must be carefully cleaned and handled, and if it should the cleaning of Sheld does not show through in places, good plate- and in cases where they are fitted against the powler is quitc safe. Wherc the copper is wall or in a recess they may be supported on exposed none of the polishes that contain the inner side by a long batten or fillet secured oxalic acid is to be used, as the acid cats to the wall. Shelves are preferably securcd slowly into the base metal. Pieces in this to the bearers with screws, as they can then state are unsuitable to hold food unless they are relined.

SHELF: How to Fix. In fitting up shelves it is gencrally preferable to use shelving board, which is simply good quality white or ycllow deal in a
prepared form.
One surface is machine planed to a good linish, the cdges and sides are clean and square, and the material is uniform in thickness and width.
Shelving board is obtainable in various si\%es; those chirfly used by the amateur are known as 6, 7, 9 . and 11 in. boards, and range from $\frac{1}{2}$ in thick up to about 1 in. These sizes are nominal, and the actual diametcr will measure somewhat less than those mentioned Wher to bear this in nin width of the proposed shelves appropriate to the stock widths of the shelving board, as this obviates the necessity of ripping scveral lengths of timber and planing the edges up to obtain the requisite width. Generally it is possible to provide most ordinary shelves by using a single-width
tongued and grooved
board, and the most handy width for an ordinary shelf is 9 in .

When it is desired to use a width of, say. 12 to 14 in . or thereabouts, 2 ordinary, straightedged boards can be used and the edges held together with cross battens screwed to the underside of the shelves, or the edges may be properly planed up and gluad together. Alternatives are to use tongued and grooved floorboard. When 2 or more pieces of board are placed edge to edge, the tonguc of one board fits into the groove of the next and so on. Consequently as one surface of the floorboard is prepared nicely finished up, it can conveniently be used for the wider varieties of shelves.

All that is necessary is to remove the tongue from one side by chiselling it off and, if necessary, cleaning up the edge with a small plane. If the boards are arranged so that the tongue is on the face or visible side of the shelf, there will he no need to remove the grooved portion of the board which adjoins the wall. For spans up to 3 ft . or 4 ft .,


Sheffleld Plate. Fig. 4. Hot-water jug of classical Adam design, c. 1784
 cithernoved When desired without dama cither to the hoards or to the wall. It is necessary that they should be fixed, otherwise the joints will scparate. Alternatively, the boards may be united with battens of wood screwed to the undersides of the shelves, as above described.

With regard to the thickness of material, it can be taken as a hasis that the ordinary 9 in . shelving, 1 in . thick, will be satisfactory for spans up to 3 ft . or 4 ft . From 3 ft . to 2 ft . $\AA \frac{3}{4}$ in shelf should be used, and for less than 2 ft ., $\frac{1}{2} \mathrm{in}$. shelving is generally satisfactory.
The method of supporting the shelves is determined by their location. If it is practicable to fit battens or bearers to the walls, this planis to bere commended. The battens may conveniently be securedwith fibre plugs and screws. When the shelves are not near a return wall on which the ends may be carried by


Fig. 5. Wax-jack, c. 1800, with ornamental border and handles
bearers, the best method is to fix vertical battens to the supporting wall at suitable intervals, and to carry the shelving on brackets screwed to these uprights. The shelves should be notched round the verticals to fit close to the wall.
When movable or adjustable shelving is wanted, the home worker can utilize slotted iron strips of the kind described in the article on Bookcase (q.v.). See Dresser.
SHELL : Collecting Specimens. Without going out of the British Isles, about 350 different kinds of shells may be found, the colour and pattern of each varying within wide limits. Every country walk or seaside ramble may therefore yield a new specimen for the collection.
The land shell which will be met with most frequently is the snail, since there are about 40 different types. They may be found all the year round, although the months from April to December yicld the largest harvest. The evening, and especially the evening of a damp day, is the best hour during which to search for snails, since this is their usual feeding time. At other times search may be made under rubbish beaps, among tree roots, under fallen logs, stones, and leaves.
The snails most frequently found are the following: the common snail, with dark brown bands on an olive shell; the shrub and garden snails, which are similar, but both classes vary in colour; the girdled snail, with a yellowish-green shell not unlike the prettier and more rare green snail. In addition to these there are the pale green heath snail and the greyish bristly snail, the gored snail, found where chalk and lime ahound, and the hlack-tipped snail, frequently mistaken for it.
As regards salt-water shells, any stretch of beach will prove a veritable treasure trove. Many of the shells will be broken, and therefore of no value, but any bunch of seaweed or small rock pool may be searched with profit. A pocket lens should be included in the shell hunter's outfit, since many shells, especially those found in sea-water, are extremely small, and only a lens can decide the difference between two shells which may look alike to the naked eye. If the shell is boiled in order to clean it, the inmate will be killed in the process. It may then be removed by means of a wire or pin. The boiling removes dirt, salt, etc., from the shell. Each shell should then be dried and painted over with white of egg, or a thin solution of gum arabic, before bring added to the museum.

The small white cardboard boxes used by jewellers make excellent cabinets in which to store the shells, although larger boxes will be required for larger shells, such as oysters, mussels, scallops and the like. First put in a layer of cotton wool and then arrange the shell on this, using white cotton wool in the case of dark-coloured shells, and vice versa. This done, label each box with the name of the specimen and the date and place of finding. If any of the specimens cannot be identificd, a visit to the nearest reference library, where the coloured plates of books on shells can be consulted, will soon solve the difficulty.
SHELLAC. Shellac is a fine resin, found in Indian trees, and is due to the action of the lac insect. The larva punctures the bark of the tree twigs, feeds on the gummy or resinous sap, and cxudes a secretion which embeds the insect. The female secretes a red fluid known as lac dye.
The lac includes the twigs 2 or 3 in . long, on which it is formed in nodules, and is known as stick lac. For export to England it may take the following forms: seed lac, shellac, button lac, or garnet lac. Sced lac consists of the small lumps of natural lac broken off the twigs and washed.
Shellac is melted out of sced lac in rough bags held near a charcoal fire, the bngs being
wrung to squeeze out the molten resin. It is spread on cylinders, allowed to cool, and scraped off in Hakes. The best quality of shellac is of a bright pale orange colour, quite transparent, and free from dirt and grit. Button lac only differs in that it is melted into larger pieces. Garnet lac is moulded into thick, flat pieces.
Shellac is soluble in methylated spirit and spirits of wine, and in this form is used as a french polish. It is also employed to make lacquers, or spirit varnishes, in various degrees of clearness. Although lacquers may be made up from the raw material, it is better to obtain prepared solutions from a reputable firm, specifying the colour or absence of tint required. See French Polishing; Lacquer; Polish; Resin; Varnish.
SHELLFISH. People with delicate diges tions can more often cat oysters than any other kind of shellfish. If tinned shellfish are used, the contents of the tin when opened should at once be turned out into an carthenware bowl and carefully examined.

Many people suffer from a peculiar idiosyncrasy which causes the development of a digestive upset of greater or less severity after eating shellfish of any kind. With others these symptoms only develop if the shellfish have not been perfectly fresh. The symptoms in these cases rescmble those of ptomaine poisoning. and the same treatment is to be carricd out. See Crab; Fish; Lobster; Mussel; out. See Crab; Fish; Lobster ; Mussel
Oyster ; Prawn: Ptomaine Poisoning Shrimp: Winkle.
SHELL STITCH: In Crochet. The shell stitch forms a solid or all-over pattern in crochet work. The original stitch is a cockleshell shape, as scen in the sample illustrated, hut there are many modern variations of it with spaces between the shells, and alternate rows of open stitches and solid shells. It is used where a close pattern is required.
The number of chain stitches on the foundation row should be divisible by 3 with 2 stitches over. To work the first row, put 1 treble in the fifth chain from the hook, then 3 more trebles in the same place; ${ }^{*}$ miss 2 stitches, 1 double crochet in the next stitch, miss 2 stitches, 5 trebles in the next stitch, and repeat from * to the end of the row, finishing with a shell of 5 trebles.
For the second row slip-stitch over the first 2 trebles of first shell, and work 1 double crochet into the centre treble of the same shell, putting the hook into the back loop of the stitch throughout the pattern. * 5 trebles in the next double crochet, 1 double crochet in the centre treble of the next shell and repeat from * to the end of the row, finishing with 1 double crochet in the centre of the last shell, turn with 4 chains.
For the third row put 4 trebles in the first double crochet over which the turning chains stand, then 1 double crochet in the centre of the next shell and repeat shells and double crochet alternately all along. Take noto that a shell is always worked over a double crochet, and a double crochet in the middle of a shell of the previous row. Repeat the last 2 rows for the amount of pattern required if a straight piece of the same width all the way up is wanted.

Where a sloped edge to narrow the piece is desired, the decreasing
is made on the shell by working 3 trebles only in the end shell, and also where the shell begins the row at the opposite sidc. Then, on the return row, this decreased shell is not worked into. By this method of working a gradual slope is given to the piece. See Crochet.
SHEPHERDS' PIE. Mash 2 lb . cooked potatocs, add to them 1 oz. melted butter, seasoning to taste, and a little milk if the mixture is too dry. Put a layer of these potatocs at the bottom of a greased pie-dish and a little round the sides, fill the dish to within an inch of the top with $1 \frac{1}{2} \mathrm{lb}$. diced cooked meat and one or two rashers of bacon also diced.

Pour over some gravy made by melting 1 oz butter in a pan, stirring in ? oz. flour, and cooking the latter, together with 3 tablespoonfuls finely chopped onion, until it is lightly browned. Add $\frac{3}{3}$ pint stock, stir the gravy until it boils, then scason it to taste. After pouring it over the meat, cover the pie with the remainder of the mashed potatoes, smoothing the top with a knife, brushing it over with beaten egg, and then sprinkling it with browned breadcrumbs. Bake the pie in a moderate oven until it is heated through and lightly browned on top. See Mince.
SHERATON : The Style. Thomas Shera. ton, one of the great cabinet makers of the 18th century, made a few remarkably beautiful pieces which are to day highly valucd. He is chielly, however, famous for his designs. His book, The Cabinet Maker's and Upholsterer's Drawing Book, published in 1791 contains several hundred designs for furniture. His style reflects the sedate influence of Robert Adam, and was a reaction from the scroll and rococo work associated with exaggerated French styles in vogue before the Empirc style and with some of the more ornate and less successful Chippendale designs. Sheraton was influenced to some extent by the new French style which developicd from the Directoire into the Empire with its olfshoot the English Regency style.
The Drawing Book, which gives a great number of his designs, reveals many instances of his skill, not only in fashioning beautiful pieces of furniture, but in introducing into them features that, without in any way mar ring their grace, add grently to their accommodation and allow them to be used for more than one purpose. It gives also designs for such articles as work tables, shaving tables, fire screens, and clock cases. The library received a good deal of attention from him Tables, suited to its special nceds, and steps are shown therein as well as bookcascs in considerable variety of design.
Satinwood, which came into use about this time, was greatly favoured by Sheraton. He had a special liking for the E. India varicty, with its delightful figure and fine straw colour.


Shell Stitch. The appearance of this crochet stitch when finished

Harewood and amboyna were also adopted designed by him gencrally had serpentinc or from Frenoh styles, and applied in vencers over bow fronts. That illustrated in Fig. 1 is typical cheaper and more casily worked woorls. of the plainer type of sideboard, and is a good
 example of the combination of that grace and utility for which his work is noted. Scere taires venecred with satinwood are cliarac teristic pieces.

He designed many tables after this style, including pier, card and sofa tahles. The latter had sometimes only two legs spreading out into yoked feet. Other tables were in satin wood with painted tops.
Sheraton's designs for chairs were particularly graccful. The high-water mark of English chair making was reached at the close of the 18th century and his Drawing Book excreised a powerful influence on contemporary chairs. The canc backed bergère chair, illustrated in Fig. 2, is an example of the beauty of line and

According to one authority, the chief characteristics of Sheraton furniture are the use of the straight line in design and a porfect com binntion of proportion and constructional bulk.

Dual Purpose Pieces. Sheraton's designs hare a very wide range, wider than that of any other of the great English cabinct makers. Many of his idcas find expression in space saving furniture of to-day. He was without a rival in the invention and construction of dual purpose picces. such as a table which could be opened out to serve as a writing table and a dressing table with concealed mirrors and other features. In his day the bedroom was used to some extent for entertaining, so his folding furniture was extremely uscful, an example being a dressing table which could serve also as a card table. Beds suitable for alcoves and sofa beds were also designed by him, and tho latter he developed into the sofa of the drawing room of his period with its white und gold effect. He also designed many graceful four poster and state beds.

His cabinets, which resembled bookeases, were very popular. In them the upper part formed the bookease proper, while the lower, which projected, contained drawers. Between the upper and the lower divisions he fixed a writing table. This was covered by a sloping lid that fitted down to enlarge the surface of the table. The lid also covered sets of small drawers, between which were the divisions known as secret drawers, which are frequently scen in the bureaux of to-day.

Use of Marquetry. Sheraton made cxcellent, because restrained, use of marquetry as a decoration. His designs for this were often scrolis of satinwood and festoons of drapery, or husks and shell ornaments with a fan pattern in the spandrils of his arches. This was usually upon a groundwork of mahogany, but if the piece itself was of satinwood the inlay would be in different coloured vencers to give a pleasing contrast. Sometimes he introduced trophies of musical instruments, wreaths of flowers. and figures with foliated scroll extremities. Another feature was inlaid lines of vencer.

Sheraton did not himself make a grent number of pieces, but many cabinct maliers carricd out his designs, and these laid the foundations of Sheraton furniture. In general its lines are very graceful. He favoured square, tapering legs for his pieces. The sidehoards
proportional value of his designs for this type.
One point worthy of notice is that the ornamental backs of his chairs do not rise direct from the seat as they do in Chippendale's designs, but rest on a narrow plinth or rail 1 or 2 in. above the back of the seat. See Antique Furniture : Chair: Marquetry.
SHERBET : The Drink. This cooling refreshing drink had its origin in the East. There are many different methods of preparing sherbet, but the most approved is a mixture of fruit juice, sugar, and water, cooled on ice A varicty of this drink is made from a bought powder, but prepared at home with fresh fruit as the main ingredient it is a far more whole some and refreshing summer beverage.
To make this drink with strawberries, red currants, etc., allow 1 lb . fruit, 10 oz . loaf sugar, 1 tablespoonful orange-llower water, the strained juice of a lemon, and 3 pints cold water. Let the fruit soak in the water for 6 hours, then strain it through muslin into a jug or basin in which has been placed the sugar, strained juice of lemon, and the orange-flower water. Cover the vessel over and let all stand one hour, stirring occasionally till the sugar is dissolved. Ice before serving.

Sherbet may bc made entirely with lemon juice. To each quart of water allow the thinly pared rinds of 4 and the strained juice of 9 lemons, also $1 \frac{1}{2} \mathrm{lb}$. loaf sugar. Put the lenion rind and sugar with 1 quart cold water into a stewpan, and bring it slowly to the boil. Thein strain it into a basin


Sheraton. Fig. 2. Cane-backed bergere chair with fine inlaid lines of veneer on the square tapering legs
and cool. Add the juice of the lemons and a little fruit essence and set it on ice before scrving.

SHERRY: The Wine. Sherry is mate from white grapes grown in the Jerce district in the province of Cadiz and other vincyards in the south of Spain. There are sereral types, ranging from the Fino, a light-coloured delicate wine of the Amoroso type, to the Oloroso, a rich, full-bodied winc. Very Old Solera and Fine Solera are conimonly used as descriptive terms. These if blended wines, have no right to the title. Soleras consist entirely of natural wines and are always paic. The word Solera means foundation, and applied to the winc it means an old wine kept in casks which are never moved so long as it cxists as a foundation on which younger wines are reared.
There are old golds, old browns such as the Old East India Brown, and pale straw-coloured Vino de Pasto. The name of the last, like that of Amontillado. is often takan in vain. Vino de pasto (wine for repast) is often applied in England to a superior dry sherry - in Spain it may mean a very cheap winc.
Good sherry has a well-developed bouquet and pale amber colour, and a fine delicate taste. It is not only the purest but also the most wholesome of wines, and can be taken by the gouty without ill effects. It has value as a restorative, and is prescribed by Spanish physicians instead of brandy. The alcoholic qualitics develop considerably by kecping. Sherry will improve in the decanter, and will keep its excellence unimpaired for several days.

Dry sherry alone or with vermouth is a good appetizer, and mixed with soda water or Perrier is a refreshing summer drink. The wine is served with soup and fish, and at the end of dinner with dessert, either instead of or as weli as port. See Wine.

SHETLAND WOOL. The strong but fincly spun natural-coloured wool obtained from the sheep of the Shetland Isles is made into shawls and underwear of a lace-like texture.
A substitute for Shetland wool, sold under the same name and obtainable in a varicty of colours, is now extensively used. It is considerably cheaper than real Shetland wool, and can be bought by the ounce from most

## wool shops.

SHIELD FERN.
This is the popular name of a group of hardy evergrecn ferns known botanically as aspidiunı or polystichum. They flourish in shady places in soil with which leaf - mould and thoroughly decayed inanure are mixed. Planting may be done in autumn or spring. Propagal ion is bv spores sown in boxes of soil ill a frame in spring or by division at that scason. There are numerons beautiful varicties of the hard shield fern(aculeatum) and the soft shicld fern (angulare).

SHIN : Of Beef. The lower portion of the forcleg of the bullock is known as the shin.

It makes excellent soup, but is not so satis. factory as steak or some portions of gravy beef for beef tea. See Beef; Stew.

SHINGLE : For Roofing. As a roofing matcrial shingles are thin strips of oak and other wood, about 12 in . by $4 \mathrm{in} .$, which are used in the same way as tiles on roofs of a fairly high pitch. Although quite common in America, their use in Great Britain has been practically confined to the S.E. counties, and then for church spires and such structures as lych gates.

Oak shingles are split or rent from the block, and are thus uneven in surface. In rooling they are laid to an ordinary tile gange, and generally fixed with copper nails to thin boarding covering the rafters. Hips and valleys are close cut and fitted with soakers, a varicty of lead tlashing. Hips may be close cut and mitred, or oak hip pieces may be cut out of the solid and used to course with the rest.

Shingles may be laid on laths where the roof is not open, but they should not be used to corer a roof laid with a pitch of less than $30^{\circ}$, as the rain is sure to work up between the courses and cause leaks. As shingles arc apt to curl up under the heat of the sun they should be laid with not more than 4 in . of their 12 in . length exposed, and in this connexion it is important to lay the shingles on the right side. This is cssentially a matter of direction of grain, the tendency of the wood being to curl towards the centre.

A shingled roof should be coated with a wood preservative if the separate picces are not first dipped in creosote or some other suitable preservative: where the supply of water is dependent on that from the roof, it is advisable to leave them plain. Shingles arc imitated in asbestos and cement, and although more expensive they are fireproof and easily laid, and form an excellent roofing for bungalows. Sce Bungalow; House; Roof.

SHINGLES: A Skin Disease. Shingles, or herpes zoster, is an affection in which small blebs or blisters, like those of herpes, form along the course of one of-the skin nerves; but while in simple herpes there is rarely more than slight tingling or burning, herpes zoster is often an extremely painful complaint Exposure to damp and chill, and injury to a nerve or nerves, as after an accident or operation, are the chicf causes.

Bcyond protccting the blisters by covering with some simple dusting powder and a pad of cotton wool, little local treatment is required. The following powder may be mixed and dusted lightly on the blisters :
Zine oxide
Boracic acid
Starch
2 parts will presorib pain is very severe, the doctor will prescribe other general sedatives ove the blisters.
Ship. Model vessels are described and illustrated in this Encyclopedia under the headings boat (́q.v.) and yacht (q.v.).
SHIRLEYPOPPY. This favourite hardy annual blooms in summer from sceds sown out of doors in autumn or spring. It was raised from the wild tield poppy by the Rev. W. Wilks, formerly vicar of Shirlcy. See Poppy.
SHOCK. After a severe injury or an operation, a condition of extreme prostration may result in which there is pallor, a suh-normal temperature, a rapid, fceble pulse, blunted mentality, and great muscular wealiness. This condition is spoken of as surgical shock.
The treatment of shock consists of warmth, quiet in a darkened


Shooting Board. Fig. 1. Shooting board ready ior use. Fig. 2. Planing the way of the grain
light brown. This will take about 35 min . It may be decorated with comfits, and with a thistle and leaves cut out of candied peel.
SHORT CIRCUIT. The term short circuit is employed to describe a direct path of very low resistance between the poles of a supply of clectromotive force. Short circuits are seldom met with in modern homes, the preventives being adequate insulation of the conductors and proper proportioning and disposition of any exposed metallic conductors of electricity.

When a short circuit occurs in an electric lighting circuit, the sudden rush of current Hows through the wircs or conductors of any apparatus in the circuit affected, and continues to do so either until some part of the conducting wire is fused or melted or the supply of clectricity is cut off. To obviate the danger of fire, a fuse of soft metal wire, or its cquivalent, is introduced into some part of the wiring. Its function is to melt at a low tcm peraturc and thus interrupt the circuit before the latter becomes dangerously overheated. In any well-designed house-lighting system sufficient fuses (q.v.) of proper value are incorporated for this purpose. See Electricity

## Short Sight. See Myopia.

SHORT WAVE : In Wireless. This is the name given to a band of wave-lengths below about 100 metres. Signals on this wave band can be received over great distances owing to reflection and refraction by the Heaviside layer, nn ionised layer which is thought to exist many miles above the earth's surface.

Broadcasting stations transmitting on such short wave-lengths can be received with simple apparatus (e.g. a detector valve with reaction followed by one or more stages of low-frequency magnification). It is desirable to employ a tuning condenser having a capacity not greater than 00025 mfd . and incorporat ing slow-motion gearing, otherwise the tuning in of stations becomes a matter of difficulty The detector grid condenser may have a value of $\cdot 0001 \mathrm{mfd}$., and the grid leak 4-5 megohms.
A short single wire aerial is an advantage, and the inscrtion of a very small condenser, e.g. a neutralizing condenser, in series with the aerial frequently assists in obtaining efficient reaction control. There is sometimes a tendency for sets employing a transformercoupled low-frequency stage, or stages, to "grunt" when the reaction control is adjusted near the point of oscillation One remedy is to connect a resistance (value -5-1 nicgohm) across the secondary winding of the first transformer.

Short-wave receivers are particularly susccptible to " hand-capacity" effects, i.e. a change in the tuning or reaction adjustments when the hand is placed near to or removed away from the vicinity of the panel. To obviate this trouble the moving vanes of the tuning condenser and, if possible, the reaction condenser should be joined to earth. An earthed shield of copper or aluminium may also be placed behind the pancl or, alternatively, the panel may be of netal.

When telephones are worn, these can be isolated from any stray high-frequency currents by connecting a 002 mfd . fixed condenser across the telephone terminals on the set and inserting a high-frequency cholic in series with one of the leads.

SHOULDER: Its Dislocation. The great renge and frcedom of movement at the shoulder joint necessary for the proper functooning of the upper limb is such that dislocation here is of great frequency as compared with other joints.
Dislocation of the shoulder joint commonly results from a fall on the hand or elbow, or a
violent twisting of the arm. First-aid treatment is to support the limb in a sling and apply cold applications. See Bandage ; Dislocation.
SHOVEL. A type of shovel that can be adapted to many uses in the home has a D-shaped end handle, but patterns may be obtained with a T-sbaped end. The blades in some patterns are placed at different angles to the handles, and have a greater depth with the sides formed higher above the level of the blade, to permit of a greater carrying capacity. As a general rule, however, for mov ing earth and the like, the sides are not raised to any great extent, and the tool has to cut into the earth to get the material. Too large a shovel should not be employed, as its con tinual use will soon tire anyone not accustomed to such work.

SHREWSBURY BISCUIT. This is a rich biscuit without aerating powder. The ingredients are 8 oz . soft flour, 4 oz . butter, and 4 oz . castor sugar. Dough is made firm with ons small egg and a little orange juice. Work the egg and sugar into a soft paste, then gradually incorporate the flour into which the butter has been already rubbed. It is rolled out to a sheet about $\frac{1}{1}$ in. thick, and baked in a hot oven. A few currants may be worked into the dough or the pieces mny be washed over with milk and variously dipped on to finely chopped almonds or grated chocolate.

SHRIMP. There are two kinds of shrimp the brown and the red, the latter being the best and most expensive. Shrimps are usually ready boiled when bought, but if boiled at home, they should be put into a pan of boiling salted water and cooled rapidly until they change colour. Freshly boiled shrimps are firm: of a bright colour, and have their tails turned stiffly inwards.

The dish known as creamed shrimps can be prepared in the following way: Stir together in a chafing dish $1 \frac{1}{2}$ gills milk, the yolk of an cgg, and a teaspoonful of anchovy sauce, then add $\frac{1}{2}$ pint shelled shrimps, and salt, pepper and cayenne to taste. Heat the mixture well, but do not let it boil, or the egg will curdle. Kcep stirring all the time, and serve the whole on buttered toast.
Shrimps in aspic make a good cold dish. To prepare it, line some small moulds with aspic jelly, putting a fairly thick layer at the bottom. When the jelly has set, put 2 or 3 shrimps in each mould, and fill it up with more jelly. If onc large mould is used, the shrimps and aspic may be used in layers. When set, turn out the jelly and garnish it with cress, chervil, slices of hard-boiled egg or beetroot.
A very good stuffing for baked sole is prepared by mixing $\frac{1}{4} \mathrm{lb}$ shirimps with 5 or 6 tablespoonfuls of breadcrumbs, a dessert spoonful of finely chopped parsley, and a little anchovy essence, binding the whole with some beaten egg, and then adding salt and pepper to taste.
SHRUB: The Drink. This drink can be made from the juice of lemons, currants, or rasplerries with the addition of spirits such as rum or brandy.

SHRUB: The Tree. So many beautifu Howering shrubs have bcen introduced that the shrubbery can now be made most attrac tive, and if a careful selection is made one or another will be in bloom throughout the year. These are some of the best now available Hamamelis mollis (Chinese witch hazel), yellow, fragrant, winter; laurustinus, pink buds and whitc flowers, winter ; crica darleyensis (Mediterrancan heather), 12 to 24 inches, reddish, winter; the almond, blush, early spring; forsythia spectabilis (golden bell), April; berberis Darwinii, orange yellow, and berberis stenophylla, vellow, April-May; ornamental cherries, plumis and crabs, April-May; rhododendron and azalea, May-June; Viburnum
plicatum (guclder rosc), .June-July; phila delphus or mock orange. June-July ; hardy fuchsia, August-September ; ceanothus Gloire de Versailles, blue, August-September.

Of the newer kinds special mention should be made of the barberries, which bear a profusion of brilliantly coloured fruits in autumn e.g. Wilsonae, aggregata, polyantha and subcaulialata; buddleia variabilis, mauve flowers in summer, a vigorous slurub; cytisus Dorothy Walpole, crimson, a showy broom, phil adelphus (mock orange) Virginale, double white; prunus cerasus Kanzan double pink cherry; pyracantha rogersiana with yellow fruits; pyrus Eleyi, crimson-flowered crab ; ribes King Edward VII, a crimson flowering currant; symphoricarpus laevigatus (snow berry), with unusually large white fruits and viburnum fragrans. white fragrant flowers in early spring.

Shrubs suitable for shady places are mahonia (berberis aquifolium), butcher's broom (ruscus), St. John's Wort (hypericum calycinum); laurustinus; laurel, box and aucuba.

Beautiful shrubs for house walls are wistaria, summer and winter jasmine, ceanothus Veitchianus, ccanothus Gloire de Versailles, pyrus japonica, pyracantha, cotoneaster horizontalis, chinonanthus fragrans, clematis in varicty, escallonin macrantha, forsythia suspensa, hydrangea scandens (climbing hydrangea), kerria japonica fl. pl., magnolia stellata and honeysuckle.

SHUTTER: For the House. Shutters for windows may be classed under three heads: louvered, lifting or sliding. and box shutters. Louvered shutters open outward on to the external walls. a half of the shutter folding on cither side of the window; if the window is a wicle one cach half shutter may again fold in halves by arranging rebates and butts. This type of shutter permits air to enter frcely although the shutters are closed.

Lifting or sliding shutters are arranged so as to slide vertically in front of the window on the inside. Their working is similar to a double hung sliding eash.

Box shutters are arranged to close across the winclow. They arc usually hung at right angles to the window, and sometimes the walle at the sides are splayed so as to provide for better light when the shutters are out of use Box shutters are so named because they fold and hinge back into a box or recess on either side of the window. See Blinds; Louvre.

SHUTTER: Of a Camera. A shutter is a device whereby the time of exposure of a photographic plate is controlled, from 1 sec . or more down to $\frac{1}{10}$ sec. or less. With the earlier cameras cxposure was regulated by removing a velvet lined cap from the lens by hand, time being estimated, the shortest being about $\frac{1}{4}$ scc.
The focal plane shutter (q.v.) consists of a blind with a number of openings of different width (Fig. 1), the width of the opening governing the length of the exposure. The blind in this case is placed close to the plate itself instead of in front of the lens. Except in the case of a few pinholes, no repairs should be attempted by the amatcur:
In magazine-plate cameras the shutter consists of a metal plate which is drawn across the lens by a spiral spring. Only one speed and time are usually available. If the shutter does not work properly remove the front of the camera by unscrewing it. The shutter will be found on the reverse side, and any defect will be at once visible. Do not stretch the spiral spring, or the shutter will not work properly or at the right speed. Any rust may be removed with a few drops of paraffiu on a mall brush
In other simple types of shutter, additional speeds are provided by means of a piston with an air leak. In these cases no oil of any kind
may be applied or the working of the shutter will be completely spoiled. In the simpler and cheaper types of variable speed shutters stiff working may perhaps be remedied by washing out with benzine, but it is generally best with all shutters working at more than onc speed to send them to a firm which specializes in shutter repairs. On no account attempt to force a shutter if it does not work properly.
The shutters described so far are of the before-lens or behind-lens type. Most modern hand and folding cameras of better quality are fitted with between-lens shutters. placed between the two components of the lens along with the iris diaphragm They arc constructed of metal alone, are complicated and delicate mechanisms, and repair should on no account be attempted by the amateur.

One of the simpler but thoroughly reliable types of this diaphragm shutter is shown, Fig. 2, as fitted to the Kodak Autographic Brownie. It provides three speeds, bulb, and time. When the shutter is set to bulb it remains open as long as the release is pressed. At time one pressure of the relcase uncovers the lens, and a second pressure is required to close the shutter. The speeds are $\frac{-1}{2 \xi}, 3^{2} \sigma$, and ${ }^{1} \frac{1}{6} \mathrm{f} \mathrm{sec}$.

The shutter will be seen in the photograph (the lens having been removed) to consist essentially of five thin metal plates or blades, which swing back together, as nearly' as possible instantaneously, when the rclease is pressed. The plates are shaped so that the full opening is obtained as quickly as possible. On this rests the efficiency of any shutter of this type. If in an exposure of, say, $\frac{1}{1} \frac{1}{2 e c}$., $\frac{1}{5}$ of the time is taken for the shutter to open to its full aperture and another $\frac{1}{5}$ for it to close, $\frac{2}{8}$ or 40 per cent of exposure time is not effective, and the shut ter's efficieucy is said to be 60 per cent.
In the more elaborate and more cxpensive types of between-lens shutter, greater efficiency and number of speeds are available.

Perhaps the finest type of shutter is the Multispeed, made by Ross, Ltd. It is highly efficient, and gives a great range of speeds from 2 sec . down


Shutter. Fig. 1. Focal plane shutter of great effeciency. Fig. 2. Simple type ot
diaphragm shutter which provides three apeed,
Courtes! of Kodak, Ltd.
to ฐ ${ }^{2} 0^{2}$ se sec., so that it is not inferior in speed o the best focal-plane shutter, while it is superior in that it gives several speeds slower than the focal plane, a matter of great importance in landscape and other branches of photography.

When a camera with a between-lens or any other type of shutter worked by springs is to be put away for a time, always see that it is released, i.e. closed.
The accuracy of a shutter is a matter of some importance to the photo. grapher. A simple way of testing any shutter is to fasten a piece of white paper on the edge of the baize-covered table of a gramophone which carries the record. The gramophone is wound up until it revolves at a regular rate of 1 revolution per sec., counted as 30 revolutions in $\frac{1}{2} \mathrm{~min}$. The gramophone is placed in a good light, and when the record table is revolving it is photographed. On the resulting photograph the paper strip will show movement according to the actual time of exposure. On either side of the image of the paper strip a line is drawn to the centre of the gramophone disk, making an angle.

Measure this angle with a protractor, and divide it by 360. The result is the exposure in a fraction of a sec. Thus, if the angle is $40^{\circ}$. $40 \div 360$ gives $\frac{2}{4}$, that is, the shutter gave an exposure, say, of $\frac{1}{6}$ of a sec. when set to r $^{1} \delta$ sec., not a serious error, but indicating that the shutter is a little slow.

With cameras whose shutters are not provided with the slow speeds so useful for short-time exposures, various pneumatic appliances are available which can be attached to work the ordinary release. One variety givea extra speeds from $\frac{1}{2}$ to 4 sec . by means of an adjustable air-valve. Others, such as the Kodak Self-Timer and the Ensign AutoTimer, give automatic exposures from $\frac{1}{2} \mathrm{sec}$. to 10 sec. The Kodak form of this release acts from $\frac{1}{2} \mathrm{sec}$. to 3 min . after it is set, so that the photographer may include himself in the picture or the group that is being photographed. See Camera; Exposure.
SHUTTLECOCK. A shuttlecock or shuttle is used in the child's game of shuttlecock and battledore, and also in badminton. It is very light in weight, being essentially a rounded cork, around the flat top of which a number of small quill feathers have been stuck. While a child's shuttlecock could easily be improvised in the home, the weight and
balance are of such importance to it in badminton that a home-made one would be of little use. For outdoor badminton, hcuvier shuttlecocks are provided, the bases being made of rubber instcad of cork. See Badminton : Battledore.

SIBERIAN CRAB. This is the popular name of a handsome hardy tree (Pyrus baccata). It is beautiful when in blossom in spring and again when in fruit in autumn. It Hourishes in ordinary soil. The fruits make excellent jelly.

## Sibthorpia. See Moneywort.

SICILIAN BUTTERCUP. This fowl is one of the light or non-sitting breeds, lays white eggs, which average 8 to the lb. but its record does not entitle it to be recommended on its laying properties only. The cockerel is red in colour, wing bows orange red. primaries black with the outer web bay; secondaries, outer web. reddish bay, innerblack and bay, tail a mixture of black and reddish bay; comb, face, wattles and lobes red, legs olive green. The pullet is buff on breast, free from inarking; back golden buff finely marked with black; tail black except two uppermost feathers, which are mottled with buff. In these birds the comb is the most distinctive feature in both sexes. It is like a buttercup, the two leaves of which it is formed meet, and the spikes stand up all round the comb, the centre forming a hollow or cup. See Fowl ; Poultry.

Sick Headache. See Migraine.
SICKLE. For cutting grass in odd corners of the garden or trimming hedges, a sickle is often useful where it is impossible to employ the scythe. It consists of a curved blade of steel, with either a sharp or serrated edge, and a round, wooden handle, the cutting edge being on the inside.

The cutting edge should be kept very keen by sharpening on a coarse stone, or carborundum scythe or hook stone, known in some districts as a rubber. The tip of the tool is sharpened first, then the rest of the blade is sharpened by placing the tip of the tool on the ground, holding the hook firmly with the left hand and manipulating the rubber with the right, rubbing on either side of the cutting edge alternately. See Grindstone; Scythe; Shears.

SICKNESS. In a particular sense the term sickness means nausea, with or without vomiting. It may indicate gastritis or some other stomach complaint, or may be due to other definite causes. The fact that an infant returns some of its milk after a feed is not necessarily vomiting, but usually means that it has taken too much Vomiting in a child may often be benefited by $\frac{1}{2}$ to 1 teaspoonful of castor oil, which is retained more often than might be expected. See Biliousness; Gastritis; Morning Sickness; Nausea; Sea Sickness ; Vomiting.

SIDALCEA. These beautiful hardy herbaceous plants are 3 or 4 feet high and bear mallow - like flowers in summer. They flourish in ordinary garden soil and are increased by division in autumn or by sowing seeds in spring in a frame. Of the older sorts Listeri, carmine rose, and candida, white, are the best; many new varieties with flowers of various shades of rose and crimson have been raiscd.

## Sideboards: Antique and Modern

## How to Choose Them and How to Make a Light Modern Type

A great number of articles in this Encyclopedia are connected with this subject. Suci, include those on allied pieces of furniture: e.g. Cupboard; Dresser; on the various furniture styles, e.g. Hepplewhite; Sheraton; and on the woods employed, c.g. Mahogany; Oak. See also
Dining Room: French Polishing: Furniture; Inlaying; Polishing. The maker of a sijcboard rench Polishing Furniture,

Sideboards may be broadly divided into two classes : those showing the original table construction of this piece of dining-room furniture, consisting of a board placed on trestles at the side of the room and used for service at meals, and those of threefold construction which incorporated the two pedestals often found as separate adjuncts to the sideboard proper early in the 18th century.
Cupboards were fitted into some of these pedestals, and others might perlaps have accommodation for bottles. In others drawers were fitted. and the tops were used as stands for knife urns or candelabra. When some furniture designer made these three pieces into one the second class of sideboards was evolved.

Our first illustration shows an example of the older pattern dating from Tudor times This style of sideloard, reproduced for periol furnishing in oak to-day, was the immediate successor of the board on trestles. Many beantifully carved examples of Jacobsan side. boards are still extant, some having backs and fitted with drawers under the table surface.
Some of the Quecn Anne period sideboards, made in oak or walnut, stoorl on turned legs connected by gracefully curved strctchers, while others (in walnut) had cabriole legs and were usually without backs, but fitted with drawers
The Threefold Pattern. Sheraton describes the sidebourd of his period as often made without drawers of any sort, having simply a rail a little ornamented, and pedestala, on which were rases, at each end Soine sideboards had loollowed fronts, and under them it was customary to place the wine cooler. Sheraton, however, soon improved on these existing pieces. His sideboards are in the main straight. but with curved or serpentine fronts, and most ol them designed without backs They were made in mahogany, and some were inlaid. One beautiful example typical of his work is illustrated in the article on Sheraton style.
Sheraton's Drawing Book shows designs for several sideboards. Three comparatively simple ones are each provided with $n$ rail at the back. One of the three is furnished with holdere for candles. A secret drawer, which opens by mans of a spring, is fitted into one of them, while another is flanked by pedestal cuphoards on which knife urns or other articles may stand

In another he introduced a rail at the back in which was framed a small round mirror, thus starting a style which developed into the huge niirror backing of the sideboards of the mid-Victorian period Sheraton's pedestals


Sideboard. Tudor example, dating from early in the 18 th century, and illustrating the first development of this piece from the board placed on trestles at the side of the dining hall Bu Dermission of the Director, Victoria \& Alvert Museum. South Kensington
were rounded in shape, and the knife urns were placed within them, while on the topls, where the urns stand in most sideboards, he placed something resembling a round, two-tiered stand, surmounted by a candelabrum. In another piece he replaced the rail at the back by a wooden strip.

In pieces designed by Hepplewhite the right hand drawer was fitted with partitions for bottles, and belind it was a place for cloths
the beautiful sideboards that bear their name Chippendale's Cabinet-Makers' Director, however, contains several designs for the pieces of furniture known as sideboard tables, one or two of which anticipate the modern sideboard.
Adam sideboards have usually two cup boards and a drawer between them, the space beneath leeing open. The front shows the graceful lines associated with this name, and the cupbeard doors are often beautifully ornamented with oval panels. The board proper is below the level of the cupboard tops, thus continuing the idea that they werc once separate pieces of furniture, and the lack is formed by a rail. Regency sideboards showed the same features associated with mounts of bronzed metal or brass. A development of these was the chiffonier.

Our second illustration is an cxample of a beautiful sideboard which shows the Adam influence and clearly displays the threefold construction. It is of mahogany veneered with Spanish mahogany and the pedestal cupboards have side doors at either end of the piece.
As the sideboard became morc popular, it was made in a greater variety of styles, but the threefold arrangement was retained in Victorian pieces. Some were made without legs, the space beneath the drawers being fitted with cupboards In many the centre cupboard was marle to hold a cellarette. Another change was the introduction of the large mirror into the back, flanked by bracket shelves and heavy carved and scrolled side pieces. The Victorian sideboard assumed vast dimensions in kecping with the great display of silver plate which was considered necessary in the dining room of the period.

Modern sideboards arc of light construction and usually of small size. Mahoginy, walnut and oak remain the fivourite woods, and some are beautifully inlaid (see page 626)
or napkins. In the left-hand drawer were two divisions; the back one was lined with green cloth to hold platc, and the front one lined with lead to hold water for washing purposes. His standard sidehoard was from $5 \mathrm{~J}_{3} \mathrm{ft}$ to 7 ft . long, about 3 ft . high, and from 28 to 32 in wide. Hepplewhite made good use of the serpentine line to give grace to his pieces.

Chippendale did not make sideboards, although he designed pedestals for the Adam brothers, and these were incorporated into


Beautiful mahogany sidenoard, vencered with Spanish mahogany, showing the influence of the Adamatyle and the threefold development of this piece accomplished by incorporating two pedestal cupboards Humplirely \& Vera Joel

They show the developurent of the thireefold idea by having cuploards at either side and a drawer or drawers in the middle, but many of the smaller pieces go back to the original type as far as the table top is concerned, adding merely a back rail. The piece for which constructional details are given also shows the modern use of the stretcher, a correct and pleasing feature in an oak sideboard of ot herwisc simple design.

Making an Oak Sideboard. In most modern houses a length of 4 ft . is ample for a sideboard. It gives reasonable accommodation without occupying too much space. A sideboard of this size in modern style is shown in. Fig. 1. It has two handy cutlery drawers and capacious cupboard space. In addition the doors have a useful sholf arrangement. The latter need not be followed exactly, but can be adapted to suit individual reguirements.

Although a somewhat massive item the construction is comparatively simple because use is made wherever practicable of readymade furniture parts, thus avoiding nost of the difficult worls. For instance, legs rearlyturned and grooved can be obtalined. The various rails. too, are grooved, and the same applies to the mouldings. Again, the doors. instead of being framed up, are formed of pieces of thicls venecred plywood. The virtue of this is that, apart from the climina-
tion of a good deal of work, the plywood will stand without danger of shrinkage.

The leading dimensions are indicated in Fig. 2, and Fig. 3 shows how the main carcass is put together. Deal first with the legs. These are usually sold in sets of four, two legs having a single groove, and two having two grooves each. The double-grooved ones are put at the back. Another leg with no grooves at all is needed for the centre.

To ensure the joints being all marlied out alike, the legs should be fixed together temporarily and the marks squared across the whole. All the rails are tenoned into the legs, with the exception of the top front rail, which is dovetailed. They all stand upright, except the first and sccond front rails, which lie flat (Fig. 3). If we except for the minute the stretcher rails, which are plain, all the back and side rails are grooved. A special grooved moulding can be obtained which requires simply to be cut to length and the tenons formed at the ends. The sccond back and side rails must be grooved at both edges. All the front rails are plain.

Those to whom simplicity is all-inuportant can omit many of the mortises in the legs. This is done by cutting short tenons on the rails to fit into the grooves in the legs. For a stronger job deep nortises must be cut, and corresponding tenons formed on the rails. In any case mortises aro necessary where the front rails and stretchers are fixed. When all the joints have been marked out the legs can be separated and the joints cut.

The same plan of fixing together the parts can be adopted in the case of the rails. The shoulders of all frout and back rails are the same length, so that it is an advantage to cramp thesc together and square the marks across. The same thing applies to the side rails. If it is decided to cut short tenons, the length of these is fixed automatically by the depth of the grooves. In any case

sideboard. Fig. 1. Uselul 4-it. sideboard in oak which can be constructed by following the directions given in the text and the working diagrams below
rule the grooves are $t$ in. deep. This means that $\frac{1}{2}$ in. must be added to the sight size in both length and breadth.

When assembling the main carcass the two sides shou'd be put together independently and the glue allowed to sct before the remaining rails are a!ded. This saves the necessity of dealing with many joints in onc operation. Lay one leg on the bench, glue in all the rails, and slide in the panels. When the other leg has been put on the whole can be cramped up. Test for squareness before pulting the unit aside to sct.
I.t is advisable to have assistance when
remember to allow for the tenons when cutting the rails to length.

A close-up view of the front joints is given in Fig. 4. Note specially the dovetnil joint at the top. The shoulder length of this is the same as that of the other rails. Notes on the actual culting of the various joints used are given under their respective headings in this work, and the article on Joint may uscfully be consulted. The centre leg joints are similar to those of the others except that there is no dovetail at the top. Instead, the rail here runs right through and a joint like that shown in Fig. 5 is formed.

The various panels are of $\frac{3}{16}$ in. plywood.
 Those at the sides are oak veneered. For the back a cheaper birch plywood is good enough. Allowance for the part projecting into the grooves must be made when cutting out. As a adding the front and back rails. The lack should be put together as far as possible first; that is, the centre uprights and the panels should be assembled. When this has been done the whole back should be fixed to the sides and the job stood upon its feet. If only one cramp is available nails can be driven into the joints to prevent their springing apart.

Next add one set of front rails to one leg. glue in the centre leg, and put in the remaining set of rails. This necessitates slightly st raining the sides outwards. The top front rail is glued in last. Test for squareness in both plan and elevation.

Drawer runners and guides are fixed as shown in Fig. 4. The groove in the runner is necessary when a dustboard is desired. Screws are used to fix the rumers. The guides, which prevent the drawers from rocking from side to side, are gluerl and nailed aborc. An extra wide runner is necded in the centre to support both drawers. Plain squares of wood are fixed to the rails to hold the cupboard bottom, which can be made of



Fig 2. Front and side elevations of the oak sideboard shown above. Fig 3. How the main carcass is put logether. Fig. 4. Close-up view of leg joints. Fig. 5 , Detail of top of centre leg. Fig. G. Useful shelf arrangement at back of doors; it is put together first and added to the door as a complete structure
plywood in. or $\frac{t}{2}$ in. thick. The sectional riew in Fig. 2 shows how the top is made. A special rebated top moulding is mitred together and a piece of veneered plywood glued in the rebate. This saves having to joint op several pieces to make the width.

It has already been mentioned that thick plywood is used for the doors. Fig. 6 shows how the hanging shelves are made up. The complete shelf structure is put together first, and this added as a whole to the back of the door. The middle shelf rests in grooves, and the bottom tits in rehates in the uprights. The small inset sketch shows how the whole is fixed to the door by pocket screwing. Onc important point is that the uprights of the shelves must stand in trom the door edges, otherwise the door will bind when opened. The decorative mouldings on the doors and drawers are simply glued and nailed. The corners are mitred. Use the usual dovetail or lap joints for making the drawers.

SIDECAR. It is possible, though not advisable, to fit a sidecar to any motor cycle of 175 cc . or over. The main objection to using a sidecas with small engines is that the average pace of such a combination is well below the speed of traffic streams on the open road. The presence of a comparatively slow vehicle in a fast traffic stream creates dangerous eddies, necessitating frequent overtaking, and is therefore to be discouraged on the ground of public safety.

Moreover, the occupants are uncomfortable. because they are forced on to the camber, and much larger vehicles constantly rush by them at higher speeds. An engine of 500 cc . should be regarded as the minimum from this point of view a larger engine being preferable, though a 350 cc . sidecar combination is ratisfactory on other grounds. Morcover, when a sidecar is drawn by an engine of 750 cc . or $1,000 \mathrm{cc}$. the running costs approach very closely to those of a small car, sio that the 500 cc . sidecar thus represents the best compromise. The maximuin regular load for a sidecar combination consists of two people and a quite small child. It is not economical to carry a woman and one or two children in the chair and a pillion passenger on the carricr behind the driver, as is often attempted at holiday times. The heavy load makes the machine slow, with the disadvantages described above, and imposes stresses on the mechanism which are reflected in the cost of upliecp.

The novice should not take a sidecar on the road without receiving instruction from a practised driver. When the peculiar steering is once mastered the machine is entirely controllable, and can be turned in a smaller space than any other vehicle, but the novice is extremely likely to upset it on left-hand corners until he has bcen instructed how to corner. He will also experience difliculty on cambered roads until he realizes that the front wheel is used solely to steer the machine and not to balance it, for he is probably accus. tomed to a bicycle, with which the front wheel is used to balance as well as to stecr.

Where storage space is limited, a folding sidecar chassis is recommended. The entire outfit when folded then occupies little more width than a motor cycle; when extended, the frame is as safe as a rigid pattern. It


Measurements at A.A.\&
B.B. must be ıdentical C. Forward position of sidecar wheel

Sidecar. Diagrams in plan and elevation, showing the correct method of lining up sidecar to motor cycle
is usually best to buy the sidecar chassis from the malier of the motor cycle, as it will then be designed to fit special lugs brazed into the frame; the sidecar can easily be set in proper alinement and the connexions will not shift, as might occur with bolted joints.

It is not possible to provide weather protection for the driver, though wind screens and leg shields are obtainable to keep off wind and rain in some degree: the sidecar. however, should always have a hood and screen. If ample engine power is available, a boot for luggage should be formed in the tail of the chair. It is clenner and more convenient than a grid. Sidecars are sold having brakes on the side wheel, but these are not recommended except to the expert driver. The standard motor cycle brakes are adequate for ordinary purposes, and on precipitous hills further retardation can be obtained by descending on bottom gear. The diagram indicates the proper method of adjusting the sidecar on the frame of the motor cycle.

Owing to the extra load punctures are more common with a sidecar than with a motor cycle. It is easy to store a spare wheel on the tail of the sidecar and it is unwise to buy such an outfit without detachable and interchangeable wheels. See Motor Cycle.
SIEVE: Its Uses. A sieve or sifter is really an appliance for separating the finer from the coarser particles of any loose material. It consists generally of a framework with a number of strands stretched across it; the diameter and distance apart of the strands determine the size of the particles which can pass through the sifter

The ordinary household sieve has a hardwood rim with a very fine gauze or mesh stretched over the lower part of it and sccured by a second or outer rim and is useful for sifting sugar and many other ingredients used in the kitchen. Fine sieves for culinary purposes have meahes of hair, muslin, and wire gauze.
Sieves for grain and chaff have wooden rims and cane bottoms and vary from 15 in . to 28 in diameter.

The potato sieve, with a diameter of about 24 in ., has an oak rim about $3 \frac{1}{2} \mathrm{in}$. decp and a very wide mesh, varying from $\frac{3}{4}$ in. to 2 in . It is employed to sort out the small potatoes from those of sufficient size to be suitable for seed purposes or for ordinary consumption. See Cinder Sifter.

Sifter. Wood uscd for a kind of sieve for sugar, etc. See Flour Sifter.

SIGHT. This word means, in one sense, the faculty of seeing. As a general rule persons whose sight is not normal suffer either from myopia or short sight, or from presbyopia or long sight, the latter being usually due to increasing age.

Sight Testing. It is quite impossible for anyone who is not an oculist or a qualified optician to test vision with any degree of accuracy, and to obtain spectacles except on an expert's prescription is fraught with danger

For example, hypermetropia, or long sight, and astig. matism may both be present, but may be concealed by muscular action; either of these conditions may be responsible for a large degrce of eye strain, and may be produstive of severo headache. An crror
of vision may always be suspected if headaches are frequent when the eyes are subjected to any strain, as in reading or writing, or especially when visiting a theatre or cinema

Persons over 40 ycars of age are very linble to suffer from presbyopia. In this condition, the distant vision may be normal, but glasses are required for all near work, and will need to be strengthened at inter vals of about five years. See Astigınatism: Eye; Myopia; Spectacles. Signal. The recognized traffic signals are illustrated in the article on Motoring (q.v.).

SIGNATURE : In Law. When the law requires a signature to bc affixed to any document, as a rule it is sufficient to sign with the ordinary signature, not necessarily with the full name, but anything which is intended for a signature is enough in law. It has even been held that a printed name at the top of a billhead, invoice, etc., is a sufficient signature. Except in the case of a will, where the signature must be placed at the foot or end of the will, the signature may be placed anywherc. It may also the made by initials or even by onc initial or by a typed or stamped signature. See Cheque; Will.

SILENE. This group of hardy perennials and annuals is known as the catchfly or campion The favourite annual kind is Sileno pendula, which is largely grown as a groundwork for flower beds; it becomes a mass of rose-pink blooms in late spring. It is raised from seeds sown out of doors in June, the seedlings being planted in the flower beds in October. The perennials are chietly rock garden plants. Silene schafta, 6 in., rose coloured Howers in July-August; alpestris, white, July; and maritima, 6 in., with clouble white flowers in summer, are some of the best Sileno acaulis is of moss-like growth, and needs very gritty soil. Propagation is by seeds sown in spring in a frame or by division.

SILICA. Many materials contain this substance; rock crystal quartz, and flint are practically pure silica. Chemically silica is an oxide of silicium with silicon as its base. Silica is the chief substance of which glass is made; in a pulverized state such as sand, it is an essential ingredient in strong mortar. Plate glass and window glass or, as it is sometimes called, crown glass, are silicntes of soda, and tlint glass is a similar compound with a considerable addition of lead silicate.

A proprietary brand of paints with a zinc oxide base is known as silicate paint. A preparation known as silicate petrifying liquid is sold for treating damp or porous brick or stone walls, cement and plaster surfaces, etc See Damp

SILK. The quality, texture and sheen of silk vary considerably, according to the kind of silkworm that produces it. The strong, natural coloured silks called tussore or shantong are obtained from a so-called wild silkworm. Finer silks, bright yellow and white in colour, are produced by the mulberry silkworm.

Chiffon, crépe-de-Chine, ninon, velvet, satin, taffeta, georgette, stockinette, and brocade are but a few of the fabrics that are composed chiefly of silk. It is very suitable for clothing, as it is a bad conductor of heat thus kecping in the heat of the body. Being light, and not bulky or clumsy, it is particularly useful for under-garments, as the surface is smooth and soft, and does not irritate delicate skins. Silk is very durable, and absorbs moisture, although not so readily as wool.

Plain silk, poplin, and velvet are still sometimes made into curtains, whilst silk damask and tapestry are employed for upholstery. Hand-woven materials in silli are particularly beautiful and give good wear. Fine silks are suitable for cushion covers, as feathers do not easily work through. The use of pure sill: for
furnishing fabrics has been largely superseded by artificial silk mixtures.

As silk is not a cheap fabric it is more adulterated than any other material, the object being to give weight and generally to improve the appearance of silks of poor quality and uneven texture. Coloured glace silks are frequently loaded with mineral salts. These weighted silks wear badly, splitting after being in use a short time. Other common fillings are clay, starch, ultramarine and size. Although it is beyond the power of the housewife to determine the actual quantity of such adulteration, some idea of it can be obtained by rubbing and shaking a small piece of silk over a sheet of paper, using black paper for bright-coloured silk, and white paper for dark silks. If the iabric is heavily loaded, a little of the filling will come out as dust, and the silk will 'ree thin and look poor after the treatment.

Another simple test is to soak a pattern of the silk in warm water for $\frac{2}{2}$ hour, and then wash it carefully, using ordinary soap If the character of the fabric is hardly changed, this proves that the silk has not been adulterated to any extent. A thread of pure silk when heated in a flame shrivels and forms a little bump or knob at the end; silk containing tin salts does not do this, but forms ash similar in length to the thread burnt.

Mending and Washing. As a rule it is not advisable to spend much time on monding silk garments that have commenced to wear. Unlike cotton materials, silk threads, when once they show serious signs of wear, rapidly break down and the fabric is of little use Should a perfectly sound garment become torn or burnt it can be mended by inserting a neat patch or by placing a piece of silk under the rent and darning it to the garment. Woven silk underwear and stockings can be darned in the ordinary way, but to avoid straining the fabric it is advisable to use silk thread similar in texture to that employed in manu facture. It is worth taking good articles to be mended invisibly by an expert.

The appearance of some of the more elaborate varieties, especially ribbons, corded and glace silk, is spoilt by washing with soap and water These can be dry cleaned at home (see Dry Cleaning), or sent to the cleaners.

Washing silks are strong, and require little skill in getting up, but the more delicate silks, such as crêpe-de-Chine, ninon, and foulards, need careful treatment. Alkalis, such as washing soda, strong soaps and soap powders, are actually harmful to any silk fabric, and aminonia should be used judiciously for dark-coloured silks only Silk, being an animal product, must not be boiled, nor must it be washed in very hot water.

## How to Wash Silk Articles

Before commencing to wash, sort all silk articles into three distinct lots, white silks coloured, and black. The white silks should be washed first, commencing with the least soiled and finest fabrics Prepare sufficient warm soapy water for the amount of washing to be done; the lather can be obtained by using soap jelly or soap flakes. Soap flakes are made by shredding yellow soap, and drying and storing it ready for use. When required, put about two tablespoonfuls of Hakes into the bath, and pour on a little boiling water, adding warn water or more soap as may be found necessary.

It must be remembered that no cleansing whatever takes place unless there is a lather on the water. The amount of soap that is necessary to do this entirely depends on the nature of the water, whether hard or soft. When dissolved soap is required quickly, place a cake of yellow soap in a wire cage soap-saver and pour boiling water over it.

Wash silk garments by kneading and squeezing. A little hard yellow soap can be
rubbed on to any specially soiled parts such as collars, cuffs or bands When the garments are quite clean on the right side turn them and wash them on the other side; it is gencrally advisable to have a second washing water. Hard rubbing should be avoided, especially lor loose!y woven sillis. When clean, rinse lirst in warm water, then in cold this removes the soap and clears the fabrics. The appearance of white silk is cuhanced by careful blueing which counteracts the yellow tinge that white silks invariably acquire after having been laundered several times.

Stiffening and Ironing. Silks that require stiffening should be immersed in gum water To make gum water, dissolve 2 oz. best white gum arabic crystals in $\frac{1}{2}$ pint of water: strain the solution through muslin and bottle. When required, 1 to 4 teaspoonfuls of this solution should be added to $\frac{1}{2}$ pint of cold water For large articles, such as dresses and curtains, the quantities must be increased proportionately. Thick silks, such as corded shantung and tussore, are better not stiffened. The appearance of glossy silks is improved by adding a dessertspoonful of methylated spirit to the stiffening water Small silk articles, after being wrung out, can be rolled down tightly in a clean cloth. On no account should silk be completely dried and damped down but should be ironed when half dried out.
The finished appearance of washed silk depends on the ironing. The object should be to iron it in such a way that the finished appearance resembles as closely as possible the material when new. Therefore, some silks should be ironed on the right side and some on the wrong. The following look better if ironed on the right side : Jap, glace, foulard, tussore and shantung.
Any patterned silks, embroidered or corded, should be ironed on the wrong side, also silk lace, crêpe-de-Chine, ninon, georgette and stockinette. Coloured silks can be success fully got up by following the same directions, but the colours are improved by adding 1 tablespoonful of both salt and vinegar to the last rinsing water. Salt sets, ind vinegar brightens, the colours that have been faded by the soap The colour of black silk is improved by steeping for a short time after rinsing in deep blue water.
Removing Stains. Stains are not so casily removed from silk as from cotton and linen, and some stain removers, such as chloride of lime or eau-de-javelle, must not be employed. When using a bought stain remover, notice carefully if it is suitable for silk fabrics. Use oxalic acid with care to remove rust and ink stains from silk. Turpentine should not be employed to remove paint from silken fabrics, but instead a mixture of one part benzine to two parts of methylated spirit should be used.
Silk for Needlework. Spun silk is used in knitting, crochet, and embroidery of all kinds It is divided into two main classes, real silk and artificial. Real silk washes and wears well, and can be re-dyed at home For knitting and crochet and all ncedlework purposes it is the more satisfactory to handle, as it is soft and the stitches stay in position, while artificial silk is springy, and requires careful handling, particularly in knitting when there are a lot of stitches on the needle. For'some decorative purposes the brilliant gloss of artilicial silk thread is valuable.

Knitting silks consist of very fine strands very loosely twisted, while crochet silks have a decided twist, to prevent the crochet hook from piercing the silk and dividing the strands. A tine artificial silk is also macle for crochet, which is about half the thickness of the standnrd twist. Crêpe twists are also made in both classes. These silks are usua!ly sold in hanks and balls of 2 oz . and 4 oz ., while embroirlery silks are made up in small skeins.

Tests for Silk. Though in dyeing propertics spun silk differs considerably from the artificial products, the housewife may find it difficult to differentiate between the fabrics in their bleached statc. The burning test may be helpful, though not always conclusive. Real silk fibre is practically non-inflammable. When ignited the flame does not run, and the ash forms a knob or globule, a smell as of burnt feathers or hair being given off. Some kinds of artificial silk do not flare, but the substance melts back into globules, and the characteristic smell of burnel animal feathers is absent. Another type of artilicial silk flares up and burns away, with an odour like that of burning paper. The tests are made more difficult by the practice of combining the different materials in the yarn See Bag; Candleshade; Curtain; Embroidery; Painting on Tertile Fabrics; Patchwork: Ribbon Work: Stockings: Weaving


Silkie Fowl. A curious and distinctive breed notable for its sense of maternal responsibility

SILKIE FOWL. Quite distinctive in the shape and colour of its comb, the colour of its lobes, facc, wattles, and legs, and in the texture of its plumage, the Silkie fowl is unique amongst poultry. It is not a great layer, nor is it a table bird, owing to the fact that it is so small; its bones are dark purple, the skin also is dark. The plumage is very soft, fine and without web, so that the bird appears to be clothed in a coat of down.
Silkies are bred in four colours-white, black, buff, and partridge. The only utility claim that can be put forward on their behalf is that they arc most trustworthy mothers, and no fowl can beat them as a broody. Some exhibitors use half-bred Silkie-Wyandottes for incubation purposes with good results. See Fowl; Poultry.

SILL: In Building Construction. A sill is the horizontal piece of stone, brickwork, concrete, or timber at the base of a framed opening, such as a door or window. Ground sills are the lowest pieces of timber which support the posts and superstructure of a timber building, while the term also refers to he lowest member of a studded partition
Sills for door frames should be formed of oak; they may be 4 in . by 3 in . or 6 in . by 3 in ., and weather on the external side. The sills of window frames may be of oak, but in many instances similar material to that with which the frame is made is uscd. External door sills arc formed with York stone, cement, bricks, ctc., the former being the most expensive. The first essential for any cxternal door sill is a good foundation of Portland cement concretc. External window sills arc
formed of stone, brick, cement, concrete or tiles bedded in cement.
Provision should always lee made to den with the water that is liable to be reccived during rainfall. With an ordinary window sill this is accomplished by cutting a throat or groove on the underncath side about $\frac{3}{3} \mathrm{in}$. from the front cige. In the casc of a door a picce of iron usually 1 in . by $\frac{1}{2} \mathrm{in}$., is placed on edge into a prepared groove between the wood sill and the brick or stone sill on which the formor rests. It is called a water-bar and should be bedded into place with red and white lead. A door sill is liable to wear hollow. especially if made of wood. To remedy this
a slot is cut to include the worn portion and a new piece of wood let in. See Door: Window

SILVER: Medical Uses. In the form of the nitrate or lunar caustic silver is often used in medicine as a caustic where a limited and superticial action is required. Lotions of silver are sometimes used on account of their astringent and styptic action.

A very weak solution 1 to 2 gr . of silver nitrate to the oz., dropped in the new-born infant's eycs, after they have been first thorougbly cleansed with weal warm boracic solution, is an efficient protection against ophthalmia neonatorum.

## SIlver Ware: British "Period" Styles

## Pieces that Lend Grace and Beauty to Domestic Life

The reader shou'd further consult the entries on the various silver articles, e.g. Cream Jug; Muflinecr; Porringer : Punch Bowl; Spoon; Tankard; Teapot. See also Cutlery; Glass Ware; Pcwter: P.erc:ng; Repousse ; Sheffie!d Plate and ihe subsequent article on Silver Work

Fino cramples survive of English silver work done during early Tudor times, especially piecer for church use in the form of stancling mazers or communion cups. In a prosperous household a large salt container of hour glass shape, and beautifully proportioned, might bc found in daily use with eilver cups and silver-mounted rrinking hoons, some odd spoons, a basin and ewer, onc or two dishes and candlesticks in silver. In the 16 th and 17 th centuries tankards, dishes, and other articles were often made in silver gilt or parcel (partly) gilt.
The discoveries of silver in Anserica and its importation in the 16 th century placed it well within reach of the affluent. The result was a great increase of domestic plate and the distinction between rich and poor at one time was marked by their uses of silver or pewter for eating and drinking vessels.
Much of interest can be learned about silver ware from the copics that were made by the pewterers. All through the history of the two crafts it is found that when the shape of a spoon was morlified by the silversmith, the hrass or latten spoon makers copied it and so did the pewterers. When the silversmiths cvolved a new candlestick for table use, the pewterers, ever on the watch for something new, copied it, making it a little thicker and sonetincs a little more clumy to tompensate for the greater softness of their alloy.

Later the silversmilhs were copied by the Sheflield plate workers, but the silversmiths themselies were affected artistically by any art inspiration that came to them from without. The influence of the work of such great designers as the brothers Adam, Chippendale, and . Iosiah Werlgwood upon the craft of the silversmith can be scen in countless little details which, not in use before their time, must therefo:c be attributed directly to these inthences. Much beautiful silver vare was made during the 17th and 18 th centurics in Scotland and Ircland, and bears the Edinburgh, Glasgow and Dublin marks, while some early pieces were marked at Cork.
Drinking Vessels. From church plate to evervday domestic ware, the silversmith's craft has been largely concerned with articles for the service of drink and food. Silver drinking vessels are known by various names, and the line of demarcation between one and another is not always precisely drawn. Prominent among them are the cups used for winc, which are represented to day by the wine glass, and the challenge cup, given to successful athletes. A main feature of these eups, except in the case of the loving cup type, with two handles, is the absence of that accessory.
Goblets are usually, but not always, bellied, and are supported on a straight sicm whith may be square, but is more commonly rounded. The vessel linown as a steeple cup, made in the reign of James I, is not unlike the goblet It has a cover which either tits like a cap or
does not rest directly on the brim, but is raised thercfrom by three or four slender balusters The cover terminates in a spilse which suggests a church stetple.

The beaker is another type of drinking vessel Like the cup and the goblet, it is without spout and a handle, but unlike them it has no foot, resembling in this rospect the modern tumbler. As a rule, beakers are severely plain, with straight sides and surfaces decorated with a chased design or a raised pattern. The sides taper and the diameter is nearly always larger at the top than at the bottom. The beaker dates from 'ludor times. Tho hanap was a large standing cup also of early date, and richly orna mented.

The silver mug was made in a varicty of styles, al. though in cssentials one differs very little from another. They may bequite plain or they may have a bulbous body. A scroll or a bow handle is seen on some examples, and the decoration includes reeding

Early tankards have straight sides, and are decorated elaborately with chasing and repousse work. In the middle of the lith century they were designed in plainer styles with flat lids, but in the 38th they were made with domed lids. Fig. 1 shows a typically shaped tankard of the time of Gcorge II. Nore ornamental picces of later date showed cliascd designs and raised patterns on the hellied bodies and decorative knohs on the licls. 'The flagon is very similar to the tanliard except that it is of even earlier date. Porringers, posset cups, and caudle cupa, all popular vessels from the collec. tor's point of view, may be linked with drinling vessels.
The porringer of the time of Charles II
possessed a cover and usually was of the shape illustrated on the left of Fig. 2, about $\dot{G}$ to 8 in. high being the size of these pieces. Later porringers were made without lids and with straighter sides, as seen in the example on the right of Fig. 2, dating from 1764. Caudle cups in the l8th century were made after the style of thic earlier covercd porringers.

Liquor Service Vessels. The silver jug has developed along more than one line, according to the use for which it was intended. The cream jug is one form of it, while the hot-water jug of to day is not unlite the wine jug of two centuries ago. The jug may also be regarded as the ancestor of the chocolate pot and the coffice pot, two pieces of some interest to the lover of old silver. Of these the chocolate pot, in use in high society in the time of Queen Anne, has its spout fixed almost at right angles to the handle. The latter is sometimes quite straight like the handle of a saucepan, not bored and fixed at top and bottom to the body, as is the handle of a teapot

The earlicst silver coffee pots resembled truncated cones with a straight spout and a wooden handle. Fig. 3 shows one of these dating from Charlcs II. They were next made with an octagonal body, and later with a bellied one and a curved spout, the decoration becoming gradually more elaborate. A vessel very like the coffee pot, and used for the same purpose, is the biggin The difference is that the latter had a very small spout, this being little more than a lip. Both chocolate pots and biggins are rare, but coffec pots of the carly 18 th century are more frequently seen The teapot came a little later than the vessels just mentioned. There exist a few in the Qucen Anne style, which has been much copied, but antique examples are mainly of Gcorgian date. The early onez were without feet, and for them stands to match were often made. Some George 1 teapots are of octagonal plan with domed covers and faceted tapering spouts.
The tea urn and the kettle may suitably be mentioned together. The kettle in silver with a lamp, under it was made early in the 18th eentury, the urn coming a little later The early kettles were usually spherical in shape, and a few of them were in a gimbal on a tripod frame, thus enabling the contents to be poured out by tilting the vessel. Others had a pair of snuffers attached to the stand and the spout of the kettle was fitted with a hinged lid. Shell work and scroll work are found on 18th century kettles. The most beautiful urns are those that show the Adam influence aud follow the classical model by having the body shaped like a Greek vase and add to this chasing and other graceful decoration
Of the other silver vessels that were used for holding liquor, two of the most coveted are the punch bowl and its near relative, the montcith. An example of a punch howl dating from the time of Ceorge II is illustrated in Fig. 4. The ladles which were made for these


Silver. Fig. 2. Left. beautiful example of large, covered norr.nger, dating design. Right, smaller porringer without cover, dating from the reign of George III


Silver. Fig. s. Contee rot, or conical shape, dating from Charles 11 ; London mark, date 1681-2
$B_{y}$ pernission ot the Director, Victoria \& Albert
bowls with handles often of whalebone or a hardwood, are also prized by collectors.

The best-known kind of sauceboat has a long lip, a scroll handle, and is supported on threc feet; but perhaps more prized is the oval one with both ends pinched to form lips. The feet, rims and handles lend themselves to graceful treatment which they received from the craftsmen of the $18 t h$ century Tureens are roind or oval, a gadroon border and scro.l feet being seen ol some fincexamples

Two ressels al lied to those men lioned are the pipkin and the argyle. The former s a kind of saucepan which was used for warming food in a living-room or bedroom when


Fig. 4. Punch Bowl with hollow flutes and straight gadroon edge ; Irish mark, maker Robert Calderwood, 1732 Courtesu of the Goldsmiths' and Silversmiths' Co., Ltd
so that the cover can, if necessary, be used as an extra dish.

Silver baskets, which were and are used for holding bread, cake and fruit, form a popular class of silverware. Bread baskets date from the 17 th century, the earliest being without fect or handles. In the 18th century occasionally handles were on either side. The example illustrated in Fig. 5 is on feet formed of satyr masks and terminating in scrolls. The handle luas caryatid supports, the sides of the basket are pierced and engraved with fruit and conrentional scrolls. It was made in London and dates from 1739. Later these baskets took the form of an oval tray on a short stem, and a shaped foot. For these piercing was a usual lind of decoration, and chasing was occasion ally combined with it.

Sugar basins, known at one time as sugar baskets, fall into the same category. The earliest were quite plain, but later they were embossed and fluted, and later still piercing and other decorative effects were introduced. A glass lining was essential for the pierced pieces, which have often a foot and a bale handle. Others have feet of the ball, lion's paw, or ball and claw pattern.

Castors and Condiment Sets. Sugar was also placed for use in castors or dredgers, of which there exist some charming examples of 18th century work. These castors were made in a variety of shapes. The body, for instance, may be straight or cylindrical, oval or octagonal. Others are shaped like a vase with a bulge just above a short stem. The top or dome was at irst quite small, butin time it became larger and was ornamented in a varicty of ways, some pieces very elaborately indced. This ornamentation took the form, in addition to grace ful and reg ular patterns for the holes, of chasing engraving and em . bossing.

Castors of this kind were not used for sugar only They are very often seen in sets of three, the largest being for sligar and the two smaller, which a formal meal was not required. They are are equal in size, for pepper, white and black. usually bellied at the base and diminish in diameter from the waist to the brim, where there is a small lip at right angles to the handle. The argyle was used for holding gravy at the table. It has a jacket, wall, or other contrivance for holding hot water, the idea being to keep the gravy warm. With a handle and a short spout, the argyle is not unlike a tea pot.
Silver Dishes and Baskets. A fruit or cake dish known as a tazza was originally used and described as a drinking vessel. The rimmed dish is supported on a short stem having a round or square foot.

Silver dishes and plates were frequently seen on the tables of the rich in the 17th and 18th centurics, and the former have popular representatives in the entréc and other dishes of to-day. Occasionally they were part of a silver dinner servise.

Dishes used for meat are generally oval, and some are provided with a cover. Those used for vegetables have sometimes three or four divisions, while others have a wooden handle straight out from the side. Of all dishes, the entrée or brealifast dish lencls itself most readily to graccful treatment, and good examples fetch high prices. Some are provided with a second tray for holding hot water, and many have detachable handles,

Vessels in which pepper was contained werc known not only as castors or dredgers, but as mullineers. Salt cellars succeeded the big trencher or bell-shaped salts which usually stood in the mitdle of the dining table. The bell salts which were made from 1590 to 1613 were made in 3 tiers, the 2 lower having the receptacle for salt and the top one being pierced for pepper. Early examples of salt cellars date from Willian III, when they were circular in shape and supported on feet, and also in the same shape from Queen Anne's day: Afterwards they became fashionable in oval, ostagonal, and, at the end of the 18 th century, in boat shapes.

Mustard pots in silver date from about the middle of the l8th cen tury. The majority of examples are glass lined and agrec in styles with


Fig. 5. Cake Basket with feet formed of satgr masks and terminating in scrolls, the sides of the basket being pierced and engraved; London mark, dating from 1739

But besides these there are many books dealing with the silversmith's craft and particularly with hall marks

Hall Marks. In the early days of the guilds, when pride in the work done was the rule and good work was insisted upon by the master, it became necessary to have a mark which was a ready means for the identification of the worker. To this was added a place mark to show the town of origin, a date mark to show the year of manufacture and a quality mark ns n guarantee of the quality of metal used.
Of all the old English silver still in existence nine-tenths at least bear the mark of the Goldsmiths' Hall in London. The symbols


London ball marks from
1300 to present day used in London for gold are : the carat mark, which is $22,18,15 \cdot 625$, 12.5 , or 9.375 . the standard marli, a crown. which is placed on the 22 or 18 carat standard only : the town mark, a leopard's head, crowned until 1823 , butun. crowned since: the date letter; and the makers' mark, usually their initials, and always impressed by themselves.
On silver the sterling standard of 925 parts, or 11 oz .2 dwt . out of 12 oz ., is denoted by a lion pessunt instead of the crown The higher standard of 958 parts, or $11 \frac{1}{2}$ oz out of 12 oz ., which was the compulsory minimum for plate from 1697 to 1720, and is still permissible, is distinguished by a figure of Britannia and a lion's head erased instead of the lion passant and the leopard's head This so-called new standard is not, hospever, marked in Ireland.
The standard marks at Birmingham and Chester, as well as for Sheffield silver, are the same as above. Edinburgh and Glasgow replace the crown and the silver marks by a thistle and a lion rampant reapectively. although since 1914 Glasgow also uses the thistle alternatively. The lower gold standards in Scotland arc 15, 12, and 9 . In Dublin the 22 -carat gold and the silver standard have a crowned harp, the 18-carat a unicorn's head. and there is an inter. mediate 20 carat Irish standard. with a plume of feathers
The present pro rincial town marks, and their carliest dates, are : Birming ham, anchor, 1773 Chester, sword and three sheaves, 1701 Sheffield, crown 1773 ; Edinburgh, castle, 1457: Glas gow, tree, fish, and bell, 1819; Dublin, Hibernia, 1638. The London date mark is indicated by the letters A to U, omitting J, each cycle of 20 years being distinguished by the style of the letter and the shape of the shield. l'rom 1438 to 1558 there were 7 cycles, during

Silver. Standard hall marks of the provincial offlces, both closed and active, are given, in addition to the London hall marks shown above

T



Courlesy of Herbert Jenlins. LId.
which the shields followed the outline of the letter. From 1558 to 1738 the shields resembled a rectangle on a triangular base. After 1738 the shieid's base was usually curved to a cusped point at the middle In the 1876-1895 cycle the shield's chief was a double concave line, and since 1896 the shields have had three lobes to the base. The cycle now in operation runs to the year 1935

The date-letters of the provincial offices are in different styles, shiclds, and cycles. They arc 25 -year cycles at Birmingham, Edinburgh, and Dublin, and 25-ycar alternating with 20 -year cycles at Chester and Sheflield, J being ing ball marks is at Glasgow.

Care of Silver. The best kinds of modern silver are simple in design and rely for beauty on graceful shape and fine workmanship. Most of the plain classical types of table silver are copied. but very highly decorated designs are considered unsuitable for two reasons : they are not strictly hygienic owing to the difficulty of removing particles of food from the interstices, and they take too long to clean The price of modern silver articles varics in a way out of all proportion to the intrinsic valuc of the metal used and is almost entirely dependent on quality of design and workmanship.

For cleaning purposes some housewives prefer rouge, which is used by jewcllers, and mixed with water containing ammonia it is a good cleanser. Others may prefer jeweller's soap, which gives most excellent results. Some, again, put their faith in plate powders, while others always use polishing fluids.

A good cleansing agent is precipitated chalk, and the finer the better, applicd with ammonia and water, or with sal volatile if expense is not to be considered. Do not use whiting as it is sold in the rough, but cither precipitate the chalk or buy it ready-made. After cleaning renove all traces of the rouge, paste, chalk, or other cleaning and polishing dium by means of a brush.
It is a popular fallacy that washing has an injurious eflect upon silver, causing it to become discoloured and destroying its polish. The truth is, however, that if silver is to be lept in good condition, it should be washed immediately after use, and then cleaned in the
nsual way. Warm soapy water, to which a little ammonia has been added, should be used. If rubbing is necessary, choose a soft sponge small enough to be passed inside the neckiz of jugs, etc

Filig'ec silver is sometimes difficult to clean because dust collects in the crevices and seldom yieldes to sponging. For this an old tooth brush will be found effective. The bristles should be fairly stiff, but not hard enough to produce scratches. Silver ware should be dried thoroughly after it is washed, and if it does not require cleaning rub it well with a chamois leather. This will restore its polish

Silver inkstands that are distigured by ink splashes of long standing are sometimes difficult to clean, though stains that receive early attention can always be washed away with hot soapy water. A paste made from water and chloride of lime is often effective in obstinate cases. It should be applied with a soft rag, and allowed to dry on the stains before being rubbed off.

The storing of food in silver utensils is never attended with risks, because silver, unlike copper and brass, is n metal that is not acted upon by food acids.

When not in use, silver cutlery is best stored in a large piece of baize. Each knife, fork, and spoon should be rolled up separately, and the baize then tied securely with string or tape. This method of storage keeps out the air and thus obviates the need for constant polishing.

If silver has to be repaired it must go to a working silversmith, not to an ironmonger Silver will stand a vast amount of hard usage, and in repairs it will stand the fire necessary for hard soldering. If silver has oncc been soft soldered and later on requires repair with hard solder, all traces of the previous soft solder repair must be removed Repair can be donc quite easily by a qualified silversmith, and good silver should on no account be entrusted to anyone else.

SILVER BEET. Also called seakale beet, this is a vegetable of striking appearance, grown for the sake of its edible stems and midribs, which are cooked in the same way as seakale, and for the leaves which are treated as spinach. It is raised from sceds sown out of doors in April and May. Sce Seakale: Spinach.

SILVER BELL TREE. The snowdrop or silver bell tree, of the family Halesin, is one of the most beautiful of summer-leafing trees when in bloom, its white Howers bearing a marked resemblance to snowdrops. It does not often attain a greater height than 15 ft . It is therefore suitable for a small shrubbery, or for a lawn. The best kind of this tree is Halcsia tetraptera.

SILVER FOX. Perbaps the nost expensive of all fox furs, silver fox derives its name from the long silvery white hairs that provide such an attractive contrast to its rich, glossy black coat. In firmness it is unequalled, yet it has a remarkable softness that gives it a foremost place among good furs. See Fur.

SILVERING: Of Mirrors. In the pro duction of mirrors one surface of the glass is coated with a mixture of silver, and this process is known as silvering.

A method that should give satislactory results is as follows: Prepare a solution of nitrate of silver in the proportions of 90 gr . of the silver to 4 oz . of distilled water. Prepare a solution of pure caustic potash in the proportions of 1 oz . of potash to 25 oz . of distilled water, and a third solution consisting of 1 oz of millis sugar in powder form to 11 oz . of distilled water.
The half of the first solution is placed in a clean tumbler or other glass vessel, and pure ammonia (sp.g. $0 \cdot 880$ ) added to it very slowly, drop by drop, until the precipitate is just dissolved. Twice the quantity of the second
solution is added, and ammonia again added to the solution until it just becomes clear. It is then further diluted with distilled water, the proportions being $1 \frac{1}{2}$ times that of the combined solution. The next step is to add gradually some of the first solution until a slight grey precipitate is formed which does not redissolve. It is then allowed to settle and after that some of the third solution is added and well stirred.

The plate glass to be silvered has now to be properly cleaned. This can be done by washing in a solution of ammonia water, following this by washing in a solution of hydrochloric acid, in the proportions of 1 part of the acid to 100 parts of distilled water. The glass is then rinsed, dried, and polished with a perfectly clean cloth. The plate must now be placed on a dish and carcfully levelled until the surface of the glass is perfectly flat and horizontal: when the solution is poured very gently on to the glass so that it will cover the whole plate.

The operation must be carried out in a warm room, which must be quite free from dust, and the glass allowed to remain for several hours. At the end of that time the solution is poured off the plate, the latter again set level, and a fresh supply of solution poured upon it, and left there until the silver has deposited. The plate is well rinsed in distilled water and set aside to dry. It is then given a coat of varnish, following this by $n$ coat of good paint made up from finely ground red lead and a little turpentine.
Every vessel used for the solutions for the separate steps in the various processes must be chemically clean, and the processes carried out in a cleanly manner.

SILVER LEAF: The Disease. This malady attacks plum trees chiefly, but several other fruit trees, as well as laurel and some other shrubs, are liable to it. There is no cure, and diseased branchcs should be cut off and burnt. Silver leaf is easily recognized by the silver-grey colour of the leaves. The Victoria plum is particularly liable to this discasc. The law requires all branches attacked by silver leaf discase to be cut off and burnt. The disease is believed to make more rapid head. way on heavy soils and in damp situations. Any improvement, therefore, in the drainage of an orchard will help the trees.

SIIVERSIDE : Of Beef. That portion of the round of beef which is known as the silverside is considered, when salted, to be a prime boiling joint; it is also economical, as there is little bone and practically no fat attached to it. The round is divided into two, cut downward, one part being called the topside and the other part the silverside; but the latter is most usually salted or pickled. Silverside also may be boiled, braized or stewed without salting, and sometimes it is roasted. It is usual to obtain it ready pickled from the butcher, but it may be prepared at home by directions given for salting, and will take about 10 days to pickle properly.

When about to cook, wash the meat frce from brinc, wipe and weigh it, but if it appenrs very salt when sent home it is better to soak it for an hour in cold or tepid water, changing the water several times. If too much salt is left in the meat it will be hard when cooked and the liquor from it will be unfit for culinary purposes. This lifuor, if strained off, makes very good stock for pea or lentil soup. The butcher should skewer the silverside together neatly, adding a small lump of fat. The slewers must be removed when dishing the meat. It must be carved in very thin slices, a small piece of fat being served with the lean. See Beef; Salting.

SILVER WEDDING. This term is used for the 25th anniversary of a wedding day. It has become a custon that the presents given on such occasions shall be of silver.

## Silver Work for the Amateur

Ornaments for the Home and for Personal Adornment
The metal worker who is interested in this subject should turn to the articles in this work under the general heading of Metal; also to Drilling: Riveting; Soldering; Wire. Those on Bowl; Spoon and other articles made may also he consulted, while kindred operations are described under Enamelling; Repousse, etc.

The working of silver, as dealt with in this The parts are cut apart with a pair of shears article, falls into three main divisions. The and the edges trued up with a file. The next first is confincd to the manipulation of the step is to bend up the sides on a hardwood flat metal and includes riveting, silver soldering, block, as in Fig. 2, A, fitted in the vice or repoussé, and chasing. The scond deals firmly attached to a table, using a mallet with beaten work, such as the shaping of and working very lightly so as not to bruise bowls and other round shapes worked from the the metal. The back is turned over on a piece Hat metal. Another form of silver work of stecl measuring $\frac{1}{8}$ in. thick, as at B, the comprises the use of the metal when it has top edge being rounded and made perfectly been drawn out in the form of wire in any section. It can also be cast and used with enamel, but these operations are beyond the scope of the present article.

Silver is generally sold by the oz. and measured by the metal gauge, but the thicknesses men. tioned will be in S.W.G., and itshould be obtained rolled ready for nse from a silversmith. or a
 smooth with emery cloth.

Having folded the metal on to the face of the stake, place a length of $\frac{1}{8} \mathrm{in}$. steel rod in the hollow and carry the metal around it to close it in, as in C. The corner pieces arc bent in the centre at right angles, as at D , and the holes for the rivets drilled. These pieces arc placed in position one at a time, the holes marked through and corresponding holes drilled in the sides. The lid is cut to the shape shown at $E$ and the edges first turned over at right angles and then folded over quite flat, as at F. The back projection is turned over on the narrow stake and the round completed as at $G$, in the same way as the bottom. The two rounded portions are placed together to mark out the cuts to form the hinge ; thesc are then made with a piercing saw, as at H and J , and trued up with a file. A length of brass or copper wire is then cut to the length of the side and fitted in.
If the hinge work has been neatly done there is no need to solder the round in a small piece of work, but in muking a larger casket on similar lines it is safer to solder the joint, especially with a heavy lid. Considerable variety is possible in the design of small boxes, and a pleasing effect is to use hinges (cither pierced or in repoussé) soldered or riveted to the lid and back. Hairpin boxes jewel caskets, and stamp boxes are suggestions for this type of work.
Hollow Work. The second division in silver working is that of forming bowl shapes from the Hat metal, and this can be done by three distinct methods. The commonest is that of forming the shape by beating it into a depression on a block of wood, or over the edge of a block. The simplest article to commence with is a pin bowl, as in Fig. 3, made from a piece of $18 \mathrm{~S} . W . G$. silver from 3 in. to 4 in. in diameter. With a compass draw the size of the base inside a 4 in circle; it should be about 2 in . in diameter.
A Cigarette Box. A simple piece of wor for the beginner might consist of a cigarettebox, with corner angleplates forming feet and a linged lid. Suitable gauge is 20 S.W.G., and a piece measuring $9 \frac{1}{2} \mathrm{in}$. by 7 in. will be sufficient for the whole of the box. Mark out the piece of metal as in Fig. 1. A forms the basc and sides, $B$ the top, and $C$ the angle-pieces. The small squares surrounding $A$ are waste, but they will be found useful for making various small articles.


Fig. 3. Two silver pin bowls which can be made by following the instructions given here. A shaping block is also shown


Fig. 4. Hiocking uammer deing used on a bollow block
aving 1 in. all round to form the sides. Next provide a stake of the necessary shape (Fig. 3). This is made from a piece of hard. wood about 3 in . square and 0 in . long. Place the block upright in the vice, mark a 2 in. diameter circle in the centre, and then with a gouge cut out a concave lepression to a depth of $\frac{1}{2}$ in., finishing the hollow as smoothly as possible.

Place the metal over the depression on the block, and, as shown in Fig. 4, beat down the metal into the hollow with the bail end of the hammor, or with a bossing mallet (A, Fig. 6). These tools are shown in Jig. 5. A series of blows should be struck all ronnd
plete the sides should be nearly upright, as at F, and it will be somewhat difficult to procced further with the hammer

The final stage calls for the use of a stake but as this is rather expensive, the beginner will find the round end of a poker quite as good for small work Before the final shaping is done the silver must he annealed by placing it on top of a shallow bowl filled witl, charcoal or small coke, and playing a blow pipe flame over it until it is red hot. The alternative is to place the bowl over a gas flame, but the greatest care must be taken not to overheat the metal. A good earthenware bowl should be provided to hold the picklc of equal parts of sulphuric acid and water, and the annealed metal is then dipped in it and left until it becomes frosty white, when it is washed and dried in sawdust.
The howl is now placed on an appropriatcly shaped stake and the edge beaten over. or the same process followed with the poker head, as


Silvet work. Fig. o. duats necessary tor makiag the gllver pla dowis shown in the previous dage, and for other hollow work at G, Pig. 6. and this will result in the shape as at H .

Planishing The bowl at this stage should be quite even in shape, but to rive it 1 he desired finish, the surface must be planished after being again annealed. A stakc is alinost a necessity if the planishing is to be done in a workmanlike manner, but if a conical shaped poker head can the metal, and the result will be as shown at be obtained and the end filed off, it will be J3, Fig. 6. The Lowl is tilted up a little as possible to get close to the inside corner. at C. and another round of blows is given; The rcgular and cven hammer marks on this will bring the sides up higher, as at D. handmade silver wotk give it a beauty and The next stage is similar with the bowl still charm that is impossible to produce in any higher, us at $E$, and when this round is com- other way: but the real effect of the


Silver Work. Fig. 6. Various necesges in making bowls : A, beating hollow in metal with bossing mallet ; $B$, result of striking a series of blows round the metal; C, bowl tilted for another round of blows; $D$, result of second round : E, third round of blows; F. Its result, sides nearly upright ; $G$, beating edge round a poker head; $H$, resulting shape; J, shape with out-turned edge; $K$, method ot turning edge; $L$, out-turned edge flattened; $M$ and $N$, methods of forming a fluted edge; 0 , notched block for fluted edge; $P$, panelled shape achieved by flattening rounded sides


Fig. 7. Ding the rassing hammer io coursing
planishing is to true up the surface and stiffen the shape. It is possible to spoil the work with careless planishing, the hammer blows must be evenly spaced and weighted, and if the hammering is heavier in one part than another the bowl will be uneven and difficult to true up.

Another method of forming a bowl requires no other tools than a hammer or mallet and an anvil, or very hard wooden block. It is done by placing the metal on the anvil and. commencing in the centre, hammering in concentric circles to the outside. The


Fig. 8. Shape 10 a vase, shown in section, waicn can be made from a circular piece of silver
suceess of this metlod depends on accurate hammer work. Full directions are given in the article on Bowl (q.v.), where the shaping of a copper one is illustrated.

Once having worked out a simple bowl shape by either of the above methods, it will not be difficult to form this into other shapes. It is just as casy to turn the edges out as in. For example, the shape at J, Fig. 6, can be worked on a stalke as at $K$, and the edge flattened out as at $L$ bv hammering the edge on a bick iron. Fluted forms can be formed by using a raising hammer as at $M$ and $N$, on a notched block as at $O$ and panelled shapes can be worked by flattening the round sides as at $P$.

Coursing. This process consists of hainmering the metal against a stake, as shown in lig. 7. The metal is held in contact with the stake about 1 in . below where the hammer is struck in order that the metal is hammered on to the stake. To make the shape shown in the section at Fig. 8, a piece of $16 \mathrm{~S} . \mathrm{IV} . \mathrm{G}$. silver should be cut in a circle a little larger than the contour of the section, as shown liy the dotted lines. Next draw a number of concentric circles commencing 1 in . from the centre, cach one increasing in radius to the outside, in order to guide the hammer blows. The metal is now beaten into a rough bowl shape with a mallet, by driving it into a hollow stake. The stake shown in Fig. 7 is then fixed in the rice, and the hammering commenced, the blows being carried completely round; a second course follows $\frac{1}{2}$ in. higher up, and each succeeding course is followed out in the same way as locfore.
The metal has a tendency to work into wrinkles. These must not be allowed to increase in size, but must be flattened out at
once; if these wrinkles are allowed to form it is probable that the work will split at that point. The advantage of this form of shaping is that all kinds of shapes can be beaten out, but owing to the initial difficulties and the expense of silver contpared with copper, the beginner will be well advised to undertake some preliminary rais ing with the latter metal. A selection of suitable tools is shown in Fig. 9. The necessity of frequent rehearsal, since the effect would be largely annealing must not bo forgotten.

Soldering. The worker cannot advance very far without silver soldering. This requires the use of a blow pipe and a spirit lamp. A small piece of work suitable for a first attempt is a naplin ring which has been made up from the fiat and has to be joined.

The method of using the mouth blow pipe is as follows. The portions surrounding the joins are freshly scraped or filed, fixed in place with binding wire, and touched with borax, which is rubbed down with a little water, and applied in the form of a thick cream. Small snippets of silver solder are placed close up to the joint, which is now ready for the application of the flame.

The lamp flame is directed around the work first to warm it, and presently the borax will boil up and then run into a fluid state, carrying with it the solder. The parts to be united must be kept in close contact till the work has cooled. S'ce Soldering.
SIMMERING. The cookery term sim mering consists in keeping any liquid in a heated condition just below and never actually reaching boiling point.

SIMNEL CAKE. 'This cake, eaten in Lent, is made by creaming 6 oz . each butter and sugar and then beating in four eggs, adding each one separately. Mix in 9 oz . Hour, 1 lb . cleaned currants, 5 oz. mixed chopped peel, 2 oz . shredded almonds, and $\frac{1}{2}$ teaspoonful mixed spice. Lastly, add 1 tablespoonful milk.

Turn the mixture into a tin lined with buttered paper, and bake it in a moderate oven for about 2 honrs. Leave it to tool on a sieve, and when it is cold cut it into two rounds. Divide ${ }_{1} . \mathrm{lb}$. of almond paste into two, roll it into two rounils of the sance size as the calic, put one round betwern the pieces of eake and lay the other on top. Mark a trellis pattern on the latter, brush it over with beaten egg, and put it into the oven so that it may become lightly browned. See Almond l'aste.

SINGEING: In Cookerý. Poultry and game are singed, after being plucked, in order to remove long hairs and down without risk of tearing the skin. Singeing is best done with a long, loose spill of white kitchen paper. The bird is held in the left hand by the scaly part of the legs, and the lighted paper is applied quickly and just long enough to burn off the hairs. The bird is then wiped free from any particles of paper. Pigs are singed after scalding to remove long lairs or bristles.

SINGING GAMES. The traditional sing. ing games are still popular among small children, and are hard to heat for charm and variety. They have also a distinct colucational value, combining singing, dancing, and rhythmic movement.
A pretty entertainment may be given by children of from four to ten years of age simply by the joyous performance of a dozen or so of these games. They involve littlo


Silver Work. Fig, y. Tools used in the process known as raising Courtesy of C. I. Pluclinctt is Co., LIA
spoiled by a lack of spontancity, but the organizer of the entertainment should be careful that the children know the correct tunes and that the games are played with the proper actions. If all the small plavers are dressed in similar costumes, such as the Kate Greenaway stylo, the effect will be doubly cliarming. Books can be obtained which offer a large choice of these games, giving the music and describing the actions. Some of these singing games will be found under their own headings in this work, e.g. Nuts in May.

SINK. In every house the sink is a necessary sanitary fitting, whether in the scullery or the kitchen, for the cleansing of and on a level with the garden. Such a room usually possessers a window with charming possibilities, and this can often be takell as a
domestic utensils and other purposes. One of the best and most serviceable sinks to use in the small housc is made of glazed stoneware. The deep pattern has many advantages over the shallow one, and is usually fitted with a washer and plug, so that the sink itself can be filled with water for washing up purposes. Should a stoppage occur in the drain pipe, directions for rectifying are given on page 381 .

Sink Brush. The brush used for cleaning a sink is usually flat with rounded end set with stiff hass linots and a short handle. The knots should be drawn in with wire as hot water would melt the pitch if they ware stuck in. Bass does not depreciate by use in water, and the open spread of this material in a sink brush enables it to be kept free from the waste which is prevented from going down the sink drain. See Brush; Draining Board; Drains; Gas; Kitchen; Scullery; Washing Up.
SIRLOIN : Of Beef. The sirloin is that portion of tho ribs which lies between the rump and the wing, or fore-ribs. It corresponds in position to the loin in a carcass of mutton. Sirloin is a prime roasting joint and should be cooked with the bone left in it If it is boned the flavour will be spoilt.

Attached to the rib bone underneath is a very delicate portion of tlesh called the under cut or fillet. This part is better eaten hot, and should always be carved off first. It should be cut down to the bone in slices; about $\frac{x}{4}$ in. thick, but the slices carved from the top portion of the joint must be as thin as possible. See Baling ; Beef ; Carving.

Sisyrinchium. See Satin Flower.

## Sititing-rooms and Their Furnishing

## Distinctive Ideas for the Odd Reception Room

Suggestions for the arrangement of family reception rooms are given in the articles on Dining Room: Drawing Room; Living-Room; Lounge. Readers are also referred to the entrics on Attic ; Colour ; Cottage ; Decoration ; Flat ; Fireplace ; Furniture; House ; Panelling; Rugs

In many houses there is a room which is pensive if carricd out with a sense of colour and furnished as an odd sitting-room with a jumble good taste. In other cases the room is upstairs of pieces which have seen better days and no and perhaps is chiefly used by one individual particular colour scheme to bring them into or by the younger members of the houschold. harmony. Sometimes this room is called a To begin with, take the basement or ground-morning- or breakfast-room, and is in the base- floor back room as an example. Even if there ment or semi-basement nest to tho kitchen is a pleasant view into the garden, such a and this can often he takell as a liecp walls and ceiling a pale colour and have starting-point for the housewife's plans for briglit accessorics such as a mirror over the redecoration. These plans call bequite inex- bireplace or opposite the window, one or two


Sitting-room. Fig. 1. Comiortably turnished sitting-room with charming tiled fireptace and built-in bookcases. The floral design of the loose covers unites the colour scheme of the room

Humphren \& Vera Joel
pieces of lacquered brass or copper, and some pale tinted or white glazed pottery to reflect or catch the light. In $n$ small room the plainer the wall surface the better, but distempered walls will not have the same durability of surfacc as a faintly marbled or patterned paper.

An incxpensive oriental carpet is a good choice for such a room, as it can be obtained in bright, light colourings which at the same time do not show marks. In a smill room a dark fawn shade of hair carpet and wool handworked rugs, designed in colours to match those in the cretonne selected for the window curtains, will prove a delightfu' scheme with beige or old ivory ground to the wallpaper and faint pink or ivory washed ceiling.

A window seat upholstered in the same cretonne as the curtains is attractive where there is a bow window. A boxpleatcd or gathered valance for both seat and curtains is the appropriate finish. Glass curtains are not always necessary, especially when the ground of the practical curtains is light in colour. If required, inner curtsins may be marle of a plain cream net with a border of stripes necdle-run with wools to match the colours of the patterned rugs and hangings. Such a border gives a distinctice note, which can be also picked up in the stencilled patterns on imitation vellum lampshades and on handpainted washable door plates of a cellulose composition. These latter items are obtainable for a few shillings cach. A still better idea is to paint designs copicd from those on the cretonne curtains, on the back of plain glass door plates. It is these small things which count so much in interior decoration.

With regard to the style of the furniture, having surrounded it with such an agreeable setting, it really does not matter vitally in a room of this type. Naturally it is nicer if of good simple design and excellent workmanship, but with the absence of drab accessories and in particular of nll ornaments which do not give or reflect light or enrich colour, and the resolute banning of rubbish, the room will be both homely and charming. Wicker or cane chairs should be enamelled the same colour that is chosen for the woodwork of the room, or, if this is stained brown then to match the ground of the carpet. Upholstered


Fig. 3. Sitting-room for a man, with thoraugnly comiortable chairs, charming brick freplace and attractive built-in cupboards flanked with bookshelves Humphrey \& Vera Jocl

Victorian chairs are best given loose covers. If new small chairs have to be bought, those with larlder backs and rush seats have much to commend them as they are neither old nor modern in style and harmonize with other furniture of odd periods and with cretonne, linen or chintz hangings.

In a typical upstairs town sitting-room of medium height and about 12 ft . square, perhaps a fenture which has to be reckoned with might be the sitting-room tiles. These may be, for example, leaf-green, the woodwork and mantelpiece being already enamelled the usual ivory sliade. In order to achieve brightness, height and warmth in a room with a cold aspect, the walls could be painted a pinky beige and the ceiling distempered the same colour.

The floorboards are best stained oak-brown and wax polished. The carpet might have a darker brown ground and be unobtrusively patterned in beige. Brown furnishing satin or velvet would be used for the curtains, lined green on a grey ground.


Sitting-room. Fig. 2. Restful country sitting-room blending the old world with the new by the use of a few unobtrusively modern pieces of furniture

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with fadeless grcen poplin while the glass curtains would be of string-coloured net. A printed linen or glazed chintz chosen for the loose covers should have a leaf-grcen ground and be patterned with dull pinks, lavender and soft yellow. Plain cushions should repeat the darker notes of colour.

Acharmingsittingroom of this type is shown in Fig. 1. Good use has been made of the recesscs on cither side of the chimney breast by litting them with bookshelves. The modern weathcred oak writing-table and chair have nothing eccentric about their style. They would accord perfectly with any other plain pieces suitable in such a room. An alternative to the settee would be a well-upholstered divan, covered in plain brown velvet or furnishing rep, measuring 6 ft . by 3 ft ., raised from the Hoor on $n$ strong frame and piled with cushions against the wall. The cushious would repcat the colours of the patterned material used for the loose covers of the chairs. Thrce-piece suites are not to be had cheaply; they are not wise investments unless the frames are strong and well upholstered. Single armchairs can sometimes be piclicd up in reliable qualities for a comparatively low price at an auction salo.

For the same kind of room, but with a sunny aspoct, the scheme could be worked out with pale green walls ivory-washed ceiling, and furnishing fabrics of different shades of grey with a printed linen having a brightly coloured conventional pattern in clear tones of lemon-yellow, coral, black light blue and

Individual Tastes. In some cases a sitting. room can be decorated and arranged according to individual requirements. A pleasant room for one musically inclined is illustrated in Fig. 2. This is in a country house, and the walls and ceiling are of parchment colour which enhances the overhead oak heams. There are two rounded niches which have been titted with bookshelves, a delightful window with sinuple curtains which could be of velvet to tone with the plain carpet. There is a thoroughly comfortable chair for a privileged listencr, an old oali chest and a modern oak writing-table, but otherwise the room is restfully empty of unnecessary furniture, and there are no pictures Colour is supplied by the books, flowers and the garden view. In such a room the mantelshelf should not be overcrowderl. A bit of coloured glass, an old spode or lustre dish or jug, or a pottery figure piece, to break the line against the wall, are a good choice; there should be no small ornaments or fussy details to the furnishing accessories.

Our third illustration is of a delightful sitting-room particularly suitable for a man. The walls havo a panelled effect obtained by applying moulded strips of wood on panel boards. The plain frieze and ceiling are cream washed. A specially good feature is the use made of a recess for a built-in bookcase and cupboard with mirror glass door, a smallev cupboard and spaces for gramophone, etc., being firted below. The brick fireplace with its pattern of mellow colour against the woodwork is enhanced by the white pottery book ends and jar. The fire is a gas one mado to
simulate glowing logs The low hook table suits the height of the chairs, which are most sensibly and attractivelv covered, one in velvet and the other in a furnishing oil baize. At the opposite end of the room (not seen in the photograph) is a beautifully made leathertopped writing-table designed on square, modern lines and an equally suitable modern cabinet with a drawer under the cupboard.

Such a room suggests a colour scheme completing the harmony of tones in the woodwork and brick fireplace. To carpet it all over in brown velvet pile would look most comfortable and suitable at dirst, but would not be good in wear owing to marks from cigaretto ash and footmarks. The oriental carpet, or wriven geometrically patterned rugs, would be again the best choice in subdued shades with a gond deal of rust, dull reds and browns in their colouring. A fine shade of red that is between rust and crimson. which is particularly good in velvet, might be used for the curtains, and one of the armehairs might be covered in this fabric, while brown would be used for the other chairs. Instead of velvet, quite an excellent furnishing material is a fairly closewoven tweed. A llecked brown, beiga and red mixture, piped with plain brown, would be most practical, comfortable and effective for covering the armchairs and for the window curtains. The last should bc lined with fadeless brown casement cloth.

If linen or cretonne curtains are preferred they should have conventional patterns; either a checked or geometrical design of reds, browns, greens and wine colour on a beige ground would be suitahle. Another good fabric for covering the chairs would he plain and checked mohair. An effective style with this material would be to use a plaid mixture of brown and tan for the seats of the chairs and a plain brown for the back and cushion. Alternatively a plaid mohair could be used entirely to cover one chair and a plain mohair to cover the other. The ground of the plaid must match the plain fabric in colour.

SIZE. Size is a glutinous substance commonly made from the parings of leather, hoofs, parchment, etc., after prolonged boiling in water, and purification by straining. It may also be made from common glue and potatoes. Painters use size in connexion with various kinds of work. Before a wood lloor is varnished it should be sized, the size stopping up the pores of the wood and thus allowing an casy and economical application of the varnish.

Size is generally a constituent of good distempers; it has an adhesive effect upon the distemper after it is applied to the walls or ceilings of a building. Size may be jurchased from any colour merchant in kegs; it is then in a jelly or viscous state; but it may also be obtained in a concentrated form in small packets. To render it fit for use it is dissolved by boiling water and applied hot with a brush Wallpapers are sometimes sized so as to obtain a smooth surface for the varnish. See Painting; Paperhanging.

SKATE : How to Cook. Skate should be kept at least one day, and should not be eaten directly after it is caught, but it must never be taken out of season, and is better in tho late autumn and winter. The time for it is from August to the following April. It is advisable to buy this fish reaily ciressed from the lishmonger, as it is a difficult process to crimp it, and even if the tish is to be boiled whole it will need to be skinnexd both sides. The liver is usually removed and made into sauce, or served with the fish as a garnish. The dieections given for crimping and cooking ray may be followed for skate.
The wings or fins of the skate may be made into a breakfast dish. Dry the wings of a large skate, skin them, and cut them into fingers, then blanch them. Put the pieces on
a tin and cook them in a moderate oven till skates used for figure skating. The Ice King is quite tender. Then draw out the bones and a good example, but there are others.

Boots and Accessories. The sliater's boots rub the flesh through a sieve. Melt 3 oz . butter in a stcwpan, add the fish, lemon juice, grated nutmeg, pepper and salt, mix well and dish on buttered toast cut into squares. Pour round it a thick egg sauce. Skate when crimped may be served with some piquant sauce. See Fish; Ray; Sauce.

SKATES : Their Care. For use on ice the skate is made with a steel blade securcd to metal plates or a wooden block for attaching
 are important. Spccial boots are made and sold for skating, but ordinary laced ones can also be worn. They should, however, fit perfectly and should be provided with a moderately thick sole, flat straight heels and fairly stout uppers. They should fit tightly, but when they are first put on the ice it is advisable not to lace them up too tightly; the laces can be tightened after the lirst few minutes on the ice.

The skater should provide himself with covers for the blades of the skates. These may be of leather or rubber. The blades should be kept quite clean and should bc covered with vascline when not in use. The vascline must be thoroughly well rubbed in, and a fairly thick coating left on. The screws and bolts must be taken out and
to the boot. The cheaper kinds are those with a wooden block, with straps in front and at the back, and a screw for the heel; they arc suitable for children and beginners.
To-day in Great Britain most of the skating is done on rink ice and takes the form of tigure skating. Skating on natural ice is only available as a rule for two or three days in the year and sometimes not at all, except perhaps in the north of
Scotland. Many persons, however, go to Switzerland or other countries where during the season there is natural ice in abundance, but therc, too, figure skating is the more popular form.
Types of Skates. Of figure skating there exist two main schools, called the international and the English, and for each there is a particular kind of skate. A good skate of the international type is the Salchow-Meyer, seen in Fig. 1. This has a serrated toe and a narrow blade, which is hollow ground, the depth of the grinding varying with the condition of the ice, as natural ice needs a sharper edge than does rink ice. The point of this skate should touch the boot; in some cases it is let into the boot, a V-shaped nick being made for it.
For the English school of skating a good type of skate is the Club (Fig. 2). This is a skate with a broad obtuse-angled blade slightly hollow ground to a radius of 7 ft . for sizes up to 11 in . and 8 ft . for anything larger. It is the official skate of the English school and is sold in sizes from $9 \frac{1}{2}$ in. to $12 \frac{1}{2}$ in. Another good skate of the same kind is the Mount Charles, which will stand a good deal of hard wear.
The Criterion (Fig. 3) is a good skate for skaters of the international school and it has the additional advantage of bcing made ontirely of Sheflield steel. Somewhat heavier than the Salchow-Meyer, its footplates are bronzed, a feature which adds to its appearance. The fourth skate shown in the illustra. tions is the Junior (Fig. 4), one made specially for juniors and beginners. This is very near the ground and has no serrations on the toe.

For speed racing a different kind of skate is necessary. This is usually quite straight, lacking the curved end seen in most of the


Skates. Four kinds in general use. 1. Salchow-Meyer. 2. Club, official skate of the English school. 3. Criterioa. 4. Junior, suitable for beginners Courles!! of Lill!!whites, Ltd.
thoroughly cleaned or they are liable to rust. Skates need grinding from time to time as the edges must be kept sharp. This can be done at home on an emery wheel or a grindstone, but many persons prefer to send ther. to the maker for this purpose. A skate sharpener that can be carried in the pocket is sold.

Skidding. See Motoring.
SKIMMER. This utensil is employed, as its name implies, to skim the fat from the top of soup, stews, etc. and also to remove the cram from milk when skimmed milk is required. It skims more quickly and thoroughly than a spoon.

SKIMMIA. This hardy evergreen shrul, is about 2 ft . high, and bears white flowers in summer and red fruits in autumn. Male and


Skimmia japonica, a busby plant hearing rreenishwhite flowers and. later. scarlet berries
female tlowers are on separate trees, and care must be talien to plant both kinds to ensure fruits. Fortunei, japonica and Foremannii are the best. These shrubs thrive in a mixture of loam and peat and should be planted in September or October or April. Propagation is most easily carried out by layering.
SKIM MILK. Milk from which the cream has been removed by skimming or separating is known as skim milk, and, although devoid of the natural fat possessed by new milk, it is used for many purposes in cookery. It makes good milk puddings if a small portion of finely chopped suet is added to enrich it, or it may be used in making batters, milk bread, biscuits, or calies.

Despite the absence of natural fat, skim milk is a wholesome and strength-giving food as it retains the casein, and a proportion of fat can always be added if clesired. The finest variety of pork is that obtainerl from pigs which have been fed on skimmed or separated milk. See Cream; Milk; Separator.

SKIN : Its Care. The skin is tough and very elastic, so that it stretches when fat accumulates underneath and returns to its former statc if the fat becomes reduced. As a person grows older this elastic property of the skin diminishes and causes wrinkles.

The skin consists of two layers, the cuticle without and the true skin within. The cuticle, also called the epidermis, or scarf skin, is sub. divided into layers; the outermost is the horny layer, while the innermost contains the pigment cells which give the skin its colour ; the accumulation of this pigment causes freckles, chloasma, etc. The cells of the outer surface are continually wearing out and falling off. Blisters are accumulations of tuid under the outer layers of the cuticle, which have no nerves, so that the puncturing of a blister does not causc pain. Thickening of the cuticle takics place in a large number of skin diseases. I'arts exposed to intermittent pressure may form callosities and corns. See Corn.
The cuticle, when undamaged, is impervious to water and microbes, but if abraderl it admits microbes; some microbes and other fungi can thrive in its gland ducts and on its surface, giving rise to skin eruptions. The cuticle allows certain drugs to pass through when they are nixed with oils or fats and well rubbed in.

The dermis, also called the cutis vera, true skin, or corium, is very much thicker than the cuticle. It consists chietly of interlacing fibres of connective tissue, together with bloodvessels, nerves, glands, etc. The glands are of two kinds, the sebaceous, or oil glands, and the sweat glands. The former manufacture an oily Huid which is poured out on the skin, and keeps it and the hairs soft and pliable.

The sweat glands consist of little tubes about $\}$ in long, coiled at the inner extremity and opening on the surface of the skin. The chief purpose of the sweat apparatus is to help to regulate body heat in the widely differing temperatures in which human beings live. The sweat glands are always active, pouring out water on the skin; this may evaporate at once, constituting what is called insensible perspiration; but when we go through exercise they become much more active, and the amount of sweat is greatly increased and forms sensible perspiration (q.v.). The same happens in hot weather or when one is in a warm room.

Certain conditions interfere with the function of the sweat glands. Thus on a damp, bot day the evaporation is checked, and we feel oppressed by the heat in consequence. Because it prevents evaporation, waterproof clothing is unhealthy. Alcohol increases both perspiration and the flow of blood to the skin. Consequently alcohol is a dangerous thing to take when one has to facc extreme cold.

It is very necessary for health to promote the normal action of the skin by cleanliness,
correct choice of clothing, and exercise. Many skin diseases arise partly from want of care of the skin. Coughs and colds, and diseases such as rheumatism, ctc., find an casier victim in the person whose blood-vessels have no acquaintance with the tonic properties of cold baths.

There is no better means of preserving the elasticity and bloom of the skin than daily brisk exercise in the open air. Even more important is scrupulous cleanliness, not of the exposed parts alone, but of the whole body surface. For those in vigorous health a cold bath every morning and a warm bath once or twice a week are to be recommended. It is often recommended after the bath to rub the skin vigorously with a rough towel. This mensure, howcver, may cause irritation and scratching of a tender skin, with a resulting crop of pimples.

Soft water should be uscd when available and cheap, harsh soaps should be avoided The skin of the borly requires a good quality soap as much as the face. For very irritable skins a superfatted soap may be used, or bran added to the water. The skin is irritated in many people by wool clothing. After a time in addition to the discomfort a crop of pimples breaks out owing to the constant irritation. In these cases the remcdy is to wear silk, or cotton, or very fine wool next the skin. While clothing should be sufficient, the healthy action of the skin will be greatly interfcred with if too much is worn. On the other hand, a person whose feet, or legs, or hands or arms are constantly cold cannot have a healthy skin.

In certain constitutional affections the skin is involved, e.g. in some of the fevers. In a large number of other instances, however, the skin itself is the original site of disease. For purposes of description, ailments which attack the skin directly may be classed as follows. 1. Inflammatory diseases, such as eczema, herpes, psoriasis, ctc. 2. Affections of the glands of the skin, such as seborrhoea, blackheads, etc. 3. Affections characterized by overgrowth or wasting of the skin, such as corns and warts, and types of haldness following on atrophy of the hair-roots. 4. Nervous affections, such as itching of the skin, pruritus. 5. Parasitic diseases, such as scabies. See Benuty Culture; Face.

SKIN EFFECT : In Electricity. This is the property of a high-frequency alternating current whereby the current tends to flow along the surface oi a conductor, in contrast to a direct current, which is evenly distributed throughout the mass of the conductor. The surface or "skin" effect increases with an increase of frequency.
SKIPPING. Skipping is admittedly one of the hest forms of exercise, especinlly in cold weather stimulating the circulation and keeping the muscles firm and supple.

For ordinary purposes the sliipping rope, when held in each hand, ahould be long enough to reach the ears of the skjpper while her feet are resting upon it. This means that when the handles are included the whole should reach to the top of the ears. Unless the rope is this length, the skipper will not be able to keep her knees straight.

For plain skipping the rope should be held so that it almost rests on the ground behind the feet, while the arms are extended to their full width on a lerel with the shoulders. At a given word, or at the commencement of the music, the rope is twisted backwards, while the skipper springs lightly over it with each revolution. Music is a great assistance to good skipping. The feet should be kept together and the knces straight, while the arms must remain fully extended and the head well up. The arms should be practically still, the rope being turned by movements of the wrist.

Cross Skipping. For the cross skip the arms are folded across the chest, while the rope goes
over as casily as if it were straightforward skipping. The arms, however, must not touch the body. It is generally interspersed with plain skipping. two plain and a cross, or three plain and a cross. The double cross is more difficult. For this the arnis a re reversed; that is, if the first cross is performed by crossing the right arm over the left, the second, which must follow immediately without any plain skipping in between, nust be formed by crossing the left over the right. In a yet more difficult form the double cross is the same cross repeated twice.

Another difficult excreise is the double through or double under. To achieve this, the rope has to pass twice under the feet to one spring. Two thinge are necessary for a successful performance. The rope must be worked up to as high a speed as possible and the skipper must spring very high in the air to allow the double passage of the rope. This is not hs a rule possible with atraight knecs. If the knces have to be bent the feet should be Hung backward, as though the performer were ahout oo kneel down, not forward as though she were about to sit. When well done the action should be a steady rhythm, with the double through performed every sixth step. but this can only be achieved with practice, and necds perfect balance as well as extreme agility.

Various dancing steps may be performed with a slipping rope, among which the ordinary gavotte step is popular. Some of the Scottish recl steps and the first of the Highland tling are also effective. The foregoing type of akipping should always be performed to music to ensure perfectly rhythmic movement, and with the rope going from front to back in order to keep the shoulders open and the chest expanded. This adds good breathing to the many other advantuges bestowed by the movements.

SKIRT : Of Beef. This is an inner portion of the buttock, sometimes called the midriff, and is part of the diaphragm. When the skin is removed and the skirt is trimmed, it is cut into pieces and used in place of steak for making puldings and pies Beef skirt is considered very suitable for this purpose because it is always tender.

The skirt is sometimes made into a stew. and if mixed with ox kidney an excellent dish is the result Equal parts of beef and ox kidney are used and the procedure is the same as that described for stewed becf.

SKIRTING BOARD. In house-building this is a thin deal board laid along the foot of a wall to give a neat finish to a room, and to protect the face of the wall from damage. It
 is stained or painted $t$ with the rest of the room. The usual width is 2 to 9 in., and thickness $\frac{1}{2}$ in. to 1 in.

Other forms are made in different sections, as, for example, triangular, $t$-round, and chamfered, these generally measur$b y 2$ in. Other pat.
terns include those with a $\frac{1}{4}$-round hollow, which gives a more
 wall and the floor.

In better-class construction, the skirting board is huilt up from several pieces or sections, properly jointed togather, as in the diagram, which also shows how the skirting is fixed to the wall and the floor. The skirting in this example is composed of two picces, the lower one being practically an ordinary board with a groove ploughed in its upper edge.
The upper part of the skirting is moulded at the top, the lower edge being tongued and fitted into grooves in the lown timbers. The akirting is attached to the wall by mieans of strips of rough wood known as grounds These are generally about $\frac{3}{4} \mathrm{in}$. thick and 2 or 3 in . wide. The grounds are nailed to brecze bricks, wood blocks, or plugs. or even by driving the nails into the mortar joints between the brirks.
The edges of the grounds which adjoin the plaster work are planed up to an angle. so that when the plaster is applied it acts as a key and assists in holding the grounds and the plaster in position. The grounds are carried right around the room about $\frac{1}{2} \mathrm{in}$. or so below the upper edge of the skirting. To support the lower edge a rectangular or other sectioned strip of wood may be nailed to the Hoor to provide a stop or abutment for the skirting, which is then nailed to this rough strip.
When fixing skirting boards, the heart side should lie used as the facc, in order that the lateral tendency of the timber to warp will only cause the top edge to be forced more tightly against the face of the plaster. When a single skirting board is used, it should only be nailed along the top edge; the lower edge should be tongued and fitted into a groove cut in the floorboards, so that the skirting looard is able to shrink and twist without splitting. The depth of the tongue should be sufficient to allow for shrinkage and expansion, without entirely coming away from the joint at the bottom.
Scribing a Skirting. Sometimes, in older houses, when it is desired to fit a new skirting board, it may be found that the floor has settled and is no longer flat. In such a case, the best procedure is to scribe the skirting board to the floor. To do this, it is placed in position and set with its upper edge horizontal. It will then be found to lie resting at one or more places on the Hoor. A pair of dividers is sct so that the distance between their two faces is exactly the same as that between the Hoor and the lower edge of the skirting board.
The dividers arc then used as a scriber by moving them along over the surface of the Hoor, with the upper leg pressing on the skirting board, and keeping the points vertically above each other. By doing this, a line will be scratched on the surface of the skirting looard, and its contour will exactly equal that of the foor. The board is then removed, accurately sawn, and finished, if necessary, with a spokeshave or plane to this scribed line, when, on placing it in position, it should fit the contours of the lloor exactly.

SKITTLES. For this game a slittle alley is necessary. This can bo marle ly laying down a number of planks to form a stretch of level flooring, which should be about I' yd . long and 3 or 4 yd . wide. The game can be played by two persons or by any other even number, provided there are not too many of
them. In the latter case they are divided into two sides.

The game is playerl with a wooden ball and ninepins. The former. called the cheese, is flatsided, and should weigh about 10 lb . The latter weigh from 7 to 9 lb . each, and are set up as shown in Fig. 2. The player stands about 6 or 8 yd . from the pins and his aim is to throw the ball so that it will knock down as many pins as possible. They must be knocked down by the ball itself, or by a pin that it has caused to fall. Any pin knocked down by a rebound is not reckoned as down. The player is allowed one step forward when throwing.
There are several ways of scoring. Onc is $t 0$ make exactly 31 points in the fewest possible throws, each pin knocked down scoring one. If 31 is exceeded the number scored in the last throw is not counted, and another throw is allowed. Another way of scoring is for the players, in turn, to throw at the pins and each one to knock over as many as
possible, the one with the highest score winning at the end of an agrced number winning at the end of an agreed number
of throws. A nother form of the game


Skye Terrier. An active long-coated little doz of affectionate and courageous disposition
dog, with a well-feathered tail, his other points are hidden by his long, hard upper coat, which is perfectly straight and falls to the ground or near it. The head is relatively large, but its form and the face are screcned by the long veil which parts only to reveal the black muzzle. The softly feathered cars may be either erect or drooping : the close-set hazel cyes are all but invisible under the veil. The colour should be either blue-grey-light or dark-or fawn with black points. The total length from muzzle to tip of tail is 40 in .; the height at shoulder is 9 in ., and the weight 18 lb . See Dog; Kennel.

SKYLIGHT. A window or sash fixed in a pitched roof for the purpose of lighting a
is to allow each player three successive throws, his aim being to knock down all the pins in as few throws as jossible. If he knocks down all the pins in one throw, he scores three points: if in two throws, he scores two points : and if in three throws, he scores one point. If the player fails to do this, he scores nothing. The scores are addled up at the end of the game, and the individual or the side with the most to his or their credit is the winner.

There are other skittle games. Some play with only four pins, one at each corner. In Dutch skittles, as it is called, the hall is bowled along the ground, not thrown, grooves being made in the floor for it to roll in. A round ball is used for this game, and the rule is that the centre pin must be knocked down first. This is sometimes known as the king pin, and is often distinguished from the others by its make or size.
SKULL CAP: The Plant. Thesc are uncommon plants of the sage family and hear somewhat helmet-shaped flowers in summer. They are 10 or $12 \mathrm{in}. \mathrm{high}$, for the rock garden or near the front of the flower borde:r. The botanical name is Scutellaria. Some of the chief hardy porennials are alpina, purple and yellow; albirla, white: and baicalensis, purple. Of the greenhouse kinds the best is Scutellaria mocciniana.

SKUNK: The Fur. The dark brown glossy fur known as skunk is obtained from an animal of the same name, closely allied to the otter and weascl. It is of remarkable durability, and is of a soft, thick texture. See Fur.
SKYETERRIER. Although it is naturally a sporting clog, the Skyc terrier as a domestic dog sliows strong affection, faithfulness and obedience. It has a quick ear and warlike readiness to mect anv intruder, large or small. A long-bodied, short-legged
room, passage, or space below is known as a skylight. It must not be confused with a lantern light, which is used chictly in conuexion with a flat roof. See Flashing.
SLAT. This is a name given to a long, narrow and thin piece of wood wider than a lath. The picces of wood forming a venetian blind are called slats, as well as the inovable or fixed strips of wood in an open window shutter. The name is given also to the picces of iron which are fitted from side to side and from end to end on the framework of a bedstead to support the mattress.


# Slates and Slating for Amateur Builders 

## A Practical and Economical Method of Roofing

Matters concerning the roofs of houses are dealt with under a variety of headings in this work, such including Corrugated Iron; Felt; Roof: Shingle; Thatching; Tile. See also Bungalow; Cottage; Girage; Housc; Scatrolding; and ihe articles on the various outbuildings

Slates are used extensively for covering the is used; if the slates are to be fixed on to roofs of buildings, and when properly laid they formi a gool covering, heing comparatively light in weight and ccorronical in use as compared with many other roofing materials, while their expansion is praçtically negligible. They resist fire well. and their power of absorption is not great, which is nn important consideration, because much wet absorbed on

a root means added weight. Good slates, as a rule, should not increase in weight more than $\frac{1}{2} 0$ during rainfall.

Slates are used more in towns than in rural areas, where tiles are often a local product. A roof covered with slates does not need such large timbers as one covered with tiles, and the roof need not be given such a steep pitch as $n$ tiled roof, which is an advantage economically. Slate used for roofing purposes is quarried principally in Wales, Lancashirc, or Cumberland, and is split into standard sizes.
The variet is most frequently used are Duchess, 24 ir . long and 12 in . wide : Countess, 20 in . long and 10 in . wide ; and Larlies, 16 in long and 8 in . wide. Allowing a 3 in . lap, it will talie approximately 122, 180,280 slates respcctively to cover one square, which consists of $100 \mathrm{sq} . \mathrm{ft}$. of roof area.

There are several nicthods of preparing a roof to receive the slates, the most inexpensive being to nail wood battens across the rafters to the required gange. as in Fig. 1. A better method is to cover the roof with boarding and then nail the slates direct on to the boards A more costly method is to board the rooi, cover it with tarred sheet felt, then nail the battens on to this, and fix the slates on to the battens.

Finding out the Gauge. It is first necessary to calculate the gauge, i.e. the width of slate exposed in the course. This depends to a certain extent on the kind of nailing that is to be used, that is, whether the slates are to be nailed at the top or in the centre. For example, if Duchess slates are to be used with head nailing, deduct from the length of the slate the lap (which is generally 3 in .) and 1 in . besides, divide the result by 2 , and that will be the gauge at which the slates are to bo laid, which in the above cxample will be 10 in. For centre nailing the length of the lap only will be deducted from the length of the slates so that the gauge would be $10 \frac{1}{2} \mathrm{in}$. Thus, a slightly bigger area is covercd when centre nailing

The slates may be fixed to the battens with copper, zinc, or composition nails; it is advisable not to use iron nails, hecause they will rust away and the slates wil! fall.

It is neces sary to board or batten the roof before slating is com menced. Bat tens are fixer at the gauge calculated, so that the centres of the battens are the gauge
is used; if the slates are to be fixed on to
battens, the latter, too, will be nailed to the rafters to suit the gauge.

The slates must have the holes punched into them, Fig. 2 The position of the nail hole has to be calculated as follows: Add to the gauge, previously ascertained, the cstimated lap, and to this add another $\frac{1}{2}$. making $13 \frac{1}{2}$ in. If the Duchess slate is used, that means the holes are punched $13 \frac{1}{2}$ in. from the bottom edge, or tail, of the slate. No matter what may be the size of slate, the method of cal-

## culation is the same

To facilitate the marking of the slates for ally to the holing, a simple gauge niay be made from a straight piece of batten to which a stop has been fixed at the proper distance from one end. The trimming of the slates when it becomes nccessary, and also the punching for nailing is carricd out by the use of very simple tools (Fig. 3). A cutting iron is fixed to a piece of timber on which to rest the slate. Another tool, the slater's axe, is like a chopper in appearance, but it has in addition to the chopping blade a spiked piece of metal. which is used for making the holes in the slates. In making the holes the slate should be struck from the under side. The top side, it will be noted, has the edges chamfered.
 proper length, which may be arrived at by adding the length of tho lap to that of the previously calculated gauge.

It is usual to fix under the first course of slates a tilting fillet, formed a piece of 3 in. by 1 in. stuff cut across the


Fig. 6. Slate rip. Fig. 7. How to remove old or broken slates with the tool shown above
forming one feather edge. This gives the slates a tilt so that their tails press on to it when they are securely nailed. Thus each successive course presses on to the former one, and the slates are kept firm and the roof sound.

The second course completely covers the slates that have been specially cut, the tails of the two courses keeping the same line. Great carc must be taken to see that the joints are broken, as in Fig. 5; straight joints will let the water in.

With the double caves courses fixed there need be no further difficulty. The slates have to be cut at the verge or outer edges of the roof, also to fit the hip or ralley should these occur in the roof to be covered. The successive courses of a simple job are illustrated in Fig. 5. It is good practice to put a tilting fillet against the side of any chimney or wall that the roof night butt up ngainst, as this helps to throw
distance apart. If boards arc used, the gauge is marked with a chalk line.

Laying the Slates. The most important point is to start the slating correctly. Slates are laid beginning at the caves, that is, the bottom colge of the roof. There must not be any straight joints, otherwise the rain will find its way througlı the roof. Experience has proved that it is necessary to have a double course at the caves, as in Fig. 4. The first course of caves tiles has to be cut speci-


Slating. Fig. 1. Beginning of slating. Fig. 2. Punching the holes. Fig. 3. Top, slater's axe, for trimming and making holes in the slate; bottom, cutting iron.
Fig. 4. Showing double eaves course. Fig. 5. Correct placing of slates, so that successive courses break joint
Iiig. 3, courtesy of Richard Melhuish, Ltd
the water on to the wain roof. The ridge, valleys, and hips of a roof may he finished with lead, or with slates epecially formed for that purpose. These are bedded on to their positions by the use of cement mortar.

When, owing to breakage, slates have to be removed the tool known as a ripper (Fig. 6) is used. It is thrust up beneath the broken slate and the sharp hook-shaped blade brought against the nail so as to sever it aud free the slate. (Fig. 7).
Sledge Hammer. See Hammer ; Forging.
SLEEP: Its Value. When the body is rowing rapidly more sleep is required. A newborn child should slumber almost continuously for the lirst 6 days of its life, and up to the age of 10 years not less than 12 or 14 hours of s'cep are necessary every 24 hours. From 10 to 15 years, an allowance of 12 to 10 hours should be given and up to the age of 25 it is best to sleep at least 8 hours. After that age the miatter becomes a personal one.
Owing to the growing complexity and strain of morlern life slceplessncss has become a very prevalent disorder. In many cases the remedy is simple, and the hints given under the heading Insomnia will be helpful.

A common form of slecplessucss consists in waking unduly early in the morning. In such cases the sufferer should get up directly he wakes; the hour of awakening will soon become later. The importance of darkness and quiet is well known but it is equally necessary that any cause of irritation, such as a decaycd tooth or a blistered heel, should receive attention. The commonest cause of insomnia is the stomach. Excessive tea-drinking, hurried feeding, and late meals of indigestiblc food account for many a bad night, although no discomfort is present. Finally, never, without medical advice, should drugs for inducing sleep be taken
Sleeping Out of Doors. Many people, especially those who work indoors in large towns, realize the advantages of sleeping out of cloors, not mercly for an occasional camping holiday, but as a regular thing. Those who build their houses can plan for one or more sleeping porches opening from the upper lloor; but there are many simpler ways in which outdoor sleeping may be satisfactorily arranged in an ordinary back garden.

Waterproof shelter is essential, and aspect is important. Outdoor beds should be protected from the east, whence come the bitterest winds and the morning sun, which is apt to wake the sleepers unreasonably early in summer. With a south-west or west aspect the roof must project several fect beyond the foot of the bed, or rain will drive in. A veranda opening out from one of the sitting-rooms makes an ideal improvized sleeping porch, though if exposed to the rainy winds it may need a roof extension. The east or north-east side of an outdoor bedroom, if open, should be filled with glass, wood, or removable screens of canvas, according to the nature of the structure.

For comfortable and regular sleeping out proper bedstcads are essential, and can be moved out from the house. Naturally, expensive ones should stay indoors, the cheaper wooden, iron and camp beds being placed in sleeping shelters. For a veranda which is wanted in the daytime for lounging and afternoon tea, the best equipment is a camp bedstead or light make of divan bed supported on legs with castors.
In clamp weather the person who makes the beds should throw right over them camping ground-sheets, waterproof covers, or a collection of old mackintoshes, to keep out the moisture. Particular care should be taken that the pillow is well protected, though experience has proved that even those who sleep out in winter as well as summer suffer in no way from damp bedclothes. Besides being extremcly
pleasant regular outdoor slumbers have been proved to be particularly beneficial to nervy and anaemic people. See Hammock. In somnia; Nightmare; Slecpwalking

SLEEPING BAG. A sleeping bag is a useful article of equipment for cainpers out, yachtsmen, or even for those who slcep out in the garden during the summer, while for small children in their perambulators it is invaluable. The first type can be procured from most athletic outfitters. It may be made of fur, camel hair, or some waterproof material, and usually has a Hap which can be fastened down over the head of the occupant. This arrangement also enables the bag to be used as a valise when packing up for the next stage of the journcy.

All aḍequate slceping bag may be made by the simple expedient of folding a blanket in two and stitching it up at the side and one end. It is not necessary to cut the blanket for this, which means that it may serve its purpose as a bag for as long as it is nceded, and may then be unstitched, washed, and returned to its normal use. For this purpose handstitching is recommended as being easicr to unpick. The bag should be long enough to come well up to the slecper's armpits, and, if required for really cold weather, only the head should extend beyond the bag. Some people prefer to have the top foot or foot and a half left unstitched, so that they can move their arms frecly, or can turn the top edges down and over if they get too hot in the night.

SLEEPING DRAUGHT. A slceping draught may be prescribed and obtained from the chemist made up ready for use, or the hypnotic ingredient may be prescribed and directions given regarding the preparation of the draught. It is often advised to give the draught in hot milk or gruel, except in the case of an evil-tasting substance like paraldehyde. No patient should make up his own sleeping draught, nor should hypnotics be within his reach, as a patient desperate from sleeplessness might easily take an overdose. See Hypnotic , Insomnia.
SLEEPING SICKNESS. The disordered condition known as sleeping sickness is the last stage of trypanosomiasis, or infection with some trypanosoma. This is a protozoal parasite which first exists in the blood but later finds its way into the cerebro-spinal Huid. The disease is found in West and Central Africa and in Brazil, and is transmitted by various species of tsctse flies.

African sleeping sickness must not bc confused with encephalitis lethargica, the so-called slcepy sickness, outbreaks of which have been noted in Great Britain since 1918. See Encephalitis.

SLEEPWALKING. This troublesome habit is more common among children, and a.s a rule a child grows out of it; but in some cases it lasts on into adult life.
Sleepwalking resembles the hypnotic state The somnambulist has no recollection of what he does when he walks in his sleep. The sleeper gets out of bed and moves about. In most cases he merely gropes around the room, and, partially awaking, returns to bed. Sometimes, however, he leaves the room, and, in rare cases, gets out of the window.

Among the most common causes of sleep walking in children are over-pressure at school, and going to bed in a state of anxiety from this or another cause. Attention should be paid to the diet and to the bowels. These persons should not eat a heavy mcal just before going to bed, nor go with an empty stomach. If there is any costiveness, a dose of aperient medicine should be given. Exercise in the open air is very necessary. The bedelothes should be light, and the room well ventilated.

When a person is found walking in his sleep it is better not to awaken him, but to lead him
quietly back to bed. Danger in awakening a sleepwalker is largely a matter of where the sleeper happens to be at the moment of awaking. The bedroom door should be fixed so that it will not open sufficiently to let the slecpwalker pass through : the windows should be sccured in such a way that they will not open wide. A good p'an is to put a picce of cold ni!cloth at the side of the bed, which may awalien the alceper as be steps on it. When a child is much given to the practice it is always best to takc him to a doctor. See Sleep.

SLICE. This word is used for the silver or silver-plated knife or scrver with a thin broad blade that is employed for serving fish. It is also frequently used to describe the kitchen implement employed to lift fish fricd cggs, rissoles, etc. from the frying pan without risk of their breaking. Such a slice is usually of aluminium or enamelled metal and has a broad, thin blade perforated in order to allow surplus grease to escape back into the pan.

SLIPPERS. 'This term is now chiefly einployed for bedroom slippers, includin" heelless '.eather, felt, quilted satin, woollen and raffia woven footwear and also the types of bedroom slippers known as mocassins, silk or satin boudoir slippers with heels, and the mule, which is simply a toe cap of material attached to a heeled and padded sole. The main thing about this class of footwear is that they should slip on and off easily and be held in place without fastenings. See Mocassin
Slipperwort. This is the popular name of calccolaria (q.v.).
SLOE. This is the fruit of the blackthorn (Prunus communis), the progenitor of the garden plum. A double-flowered kind named spinosa is worth growing as an ornamental shrub.
Sloe Gin. This cordial can easily be made at home from the following recipe : To 1 pint slocs add I lb. sugar. Half fill a bottle with the sugared fruit and fill up with gin. If the slocs have been previously pricked, the liqueur should stand for 2 or 3 months before drinking, otherwise for 12 months. Properly matured sloe gin should be the colour of full-bodied port wine. A cocktail known as sloe gin rickey is made from $\frac{3}{4}$ gill sloc gin with ice and the juice of half a lime squeezed into it. Fill up the glass with cold soda' yater.
The following is another recipel: Take 3 lb . sloes, $\frac{1}{2}$ gallon unswectened gin,, $1 \frac{1}{2} / \mathrm{lb}$. Demerara sugar, and $\frac{1}{2}$ oz. bitter alnouds. Wipe and stalk the sloes, prick them well with a necdle in several places, and put them into a large ston jar. Add the gin and sugar and then the blanched and skinned almonds, cork the jar tightly, and then shake it vigorously. Shake it once daily for about 14 weeks, at the end of which time it may be strained and bottled for use.
SLOP BASIN. This is a basin placed on the table at breakfast and tea to receive the dregs from the cups. Slop basins are usually part of a breakfast and tea service.

SLOP PAIL. In bedrooms not fitted for running water, and where the ordinary toilet service is used, this may include a pail to match. Enamelled pails are used for the pur. pose of emptying slops. These pails are easily kept clean and are less fragile than china ones.

SLUG. This is one of the chief garden pests, and may do immense damage, especially among seedlings and young plants. It is invariably most troublesome in ill-cultivated land; soil which is kept in a good state of cultivation by digging, forking, and hoeing is not, as a rule, badly infested. This pest is most harmful in wet weather. It can be trapped by means of orange peel, bran, picecs of potato or carrot laid down on the soil, and examined frequently.

Scatterings of lime, soot and aluin are useful Ashes placed round about plants when fresh growth is pushing through the ground will often keep away slugs. Zinc collars pressed into the soil are used to protect choice rock garden plants.

The best remedy is to dissolve one pound of commercial aluminium sulphate in one gallon of water and a double handful of lime in four gallons of water. The two solutions are then thoroughly mixed together and applied to the soil infested by the pests.

SLUG WORM. Often called the slimy grub, this larvae of a species of sawfly is destructive to leaves of the pear, and sometimes: attacks the plum, peach, and cherry. The saw Hy itself is shining black with dusky wings, and the larvac a quite small slimy black slug with a large head. Eggs are dejosited on the upper surface of leaves during Junc, hatching ont late in the month with grubs that are white, then yellow, and finally covered with black slime. As soon as grubs are scen they should be given a dusting of powdered lime.

There is also the rose slug worm which restroys the upper skin of leaves, and these may be recognized by their colouring pale yellowish green, orange head, and dark marking down the bacli. Tiwo broods are produced, one in June and another in September, or earlier. The bushes should bo sprayed with hellebore wash or a nicotine insecticide. See Insecticidc.

SMALLPOX. One of the most contagious of all disenses is smallpox, or variola. It is an acute infections disease accompanied by fever and an cruption of papules or pimples on the skin which change into pustules and then into ocahs. The great prevent:ve is vaccination.


Smilax. Greenhouse plant, the long pracelul tendrils of which are much used for table decoration

When the discase breaks out among people who have not been vaccinated it is always vers destructive.
A smallpox patient is infectious from the onset of fever and other symptoms until convalescence. The most dangerous period is from the outbreak of the eruption until the scabs have dried up. The infectious material exists in the blood and secretions, in the exhalations from the lungs and skin, but chictly in the pustules. which dry and fall off in tine particles. It is thus possible to become infected in a railuay
carriage or any public vehicle or place of public resort. Overcrowding favours the spread of the diseasc, and so does had sanitation.

Mistalics are made in dingnosing smallpox because at the outset it often closely resembles chickenpox. If an epidemic is raging, smallpox may be strongly suspected when there are sudden severc pains in the head and back, with vomiting and bigh fever, following a shivering fit.

When an epidemic breaks out it is advisable that everyone should be vaccinated or revaccinated. Smallpox patients should be removed to special hospitals. See Vaccination.

SMELLING SALTS. The inlalation of ammonia has a stimulating effect of much use in the relief of faintness and headachc. The ammonia is derived from ammonium carbonate or from strong solution of ammonia, and the preparation is made agreeable by the addition of perfumes. Sometimes carbolic acid or cucalyptus oil is added to obtain an antiscptic cffect in influenza, common colds, hay fever, etc.
When liquid ammonia is used in the preparation it should be thoroughly soaked up by a piece of sponge, asbestos, or some other absorbent material, as the liquid, if spilt on some coloured fabrics, will stain them. The pungency of strong acetic acid serves the same purposes as smelling salts. See Acctic Acid; Fainting.

SMELT : The Fish. A small, delicately Havoured fish, the smelt needs to be cooked as soon as possible after it is caught. otherwise the Hesh loses its firm. ness. 'To clean it press ont the inside. through a slit made just below the gills, cut off the latter and then wash the fish quickly.

Frying is the usual method of cooking smelts, but they may also be stewerl, and in this form make a good dish. To fry them, clean and dry the fish,

when only the stitches that conncet the pleats can be seen on the right side, the rest of the stitch being run inside.

This form of work is always useful, as well as decorative, on children's clothes, and its popularity never dies out. It is particularly uscful on the wrists nad at the necks of frocks and of small boys' suits, as it is elastic and will stretch easily over the head and hands. Smocks are also excecdingly serviceable as overalls, and for gardening work, when made in holland, linen or heavy Shantung silk.

Methods of Working. Mercerized cottons may be emploved for smocking casement cloth and similar goods, embroidery cottons for mainsook and other white goods, linen cmbroidery threads for soft linens o.nd twisted cmbroidery silk on washing silks.

Smocking transiers can be bought at almost any fancywork shop, and these consist of shcets of paper with dots marked in transfer ink, which are transferred to the material by means of a hot iron. Thesc dots are spaced evenly, about $\frac{3}{i 8}$ in. apart, along the row and the rows ahout! in. apart. If a transfer is not at hand, a card with holes at the correct intervals through which the point of the pencil is inserted makes a permmisent marker. Before using either the transfor or a marker the minter:al should be stretched on a drawing. board and sccured with drawing pins.

To gnther, begin nt the top right-hand corner, and put a good knot at the end of the cotton; make n little backstiteh here to prevent the linnt from going through. These, gathering threads are drawn out after wards, as they only serve to hold the pleats together. Put the needle down through the material again half-way between the first and sccond dots, and out ngain at the sccond dot. 'This will resull in a flat stitch lying over the lirst half of the space between the first and second then coat then lightly with seasoned tlour. Brush over them a little beaten egg, woll them in breadcrumbs, and then fry them in a pan of smolinghot fat until they arc of a golden brown colour. Drain them on paper and then serve them hot, garnished with parsley and accompanied by plain white sauce.

For stewing, cut the heads off the fish and then lay the latter in a small fireproof dish containing enough white stock to cover thent. Add scasoning to taste, put on the cover of the dish, and cook the fish in the oven for about $\&$ hour. See Fish.

SMILAX. These are hardy and greenhousc evergreen climbing shrubs and plants. The long slender trails of smilax (Asparagus medcoloides), so much in demand by florists for decorntive purposes, is a greenbouse plant. It is easily grown from seed, planted in a compost of loam, leaf-mould and sand and trained on string or wires. Of the hardy kinds the chief one is aspera, a vigorous climber suitable for covering a rough fence.

SMOCKING: In Needlework. Smocking is formed by gathers which are drawn into vertical pleats by running gathering threads at certain distances from each other. The latter depend on the design, and arc used as guides for spacing, when the decorative part is begun. The stitches on the surfaec of the pleats are the ordinary sewing and embroidery stitches. They all appear on the surface of the work, except in honeycomb smocking,


Smocking. Fig. 1. Running the gathering threads along dotted lines. Fig. 2. Four different stitches insed, all worked from left to right
dots. Contidue this to the end of the row. Fig. I shows two gathering thrcads completed and the third row with the needle in position. Repeat this gathering thread on all the rows of dots. When they are all finished clraw up the top thread and secure the latter round the pin at the left side ns for ordinary gathering. Fig. 3 shows three of the pins with the cotton twisted round. After drawing up the top row stroke the pleats into position. Draw up, secure and stroke each row, when the work will be ready for the smocking stitches. When the work is bogun the threads can be released a little but must still be fastened round the pins while working. It is necessary to draw the pleats up tight at first to set them in an even position. Fig. 2 shows specimens of four differnnt stitches, from which many pretty designscan be formed.
The top row shows ordinary stem stitch completed and the second row the same stitch in progress, taking up the stitch on the top of a pleat, and bringing the needle out under the cotton. If the work is held sideways the thread is thrown over to the left of the ncedle. Note that the work procecds from left to right. The third row shows crewel outline stitch pleated and the fourth row crewel stitch in progress. The only difference is that the loop of thread is thrown over to the right in working and the needle comes out above the thread. The fifth row of the same figure shows alternate stitch, that is, outline stitch for the first stitch and stem stitch for the second one, repeating these two movements alternately across the row. The last row on the same figure is herringbone stitch, taking the first and second pleats together for the lirst top stitch, and the second and third pleats together for the next lower stitch; for the top part of the next cross take the third and fourth pleats together and continue across the row. For each new stitch take the second pleat of the last pair, together with a new pleat.
In the same way all the feather-stitching patterns can be carricd out in this work, and the 3 stitches in Fig. 2 oan be worked in zig\%ags or waves to form new designs. In Fig. 2 the gathering threads are fastened off at the back of the work for the purpose of illustration, but when they are cut out entirely the smocking expands, causing the pleats to stand up evenly and giving a much prettier effect. The cathering threads should not, however, be removed entirely until the work is completed.
Honeycomb Design. Fig. 3 shows the honeycomb design. After setting the pleats as described a bove, join the thread to the top lefthand pleat, as the work proceeds from left to right, and take a stitch through the second and lirst pleats. Insert the needle in the scoond pleat just where the last stitch was macle, slip the needle down unter the pleat and bring it out on the second line of dots for the big honeycomb or halfway betwcen the two lines for the smaller honeycomb.
'I'be two sizes are illustrated on Fig. 3. This long stitch running through the pleat must be entirely hidden. Take a back-stitch through the third and second pleats, slip the needle under the third pleat and bring it out on the lirst running line again. Take a stitch through the fourth and third pleats, and slip the necdle down through the last pleat to the second line once again. Reference to Fig. 3


Fig. 3. Honeycomb design eige of a number of em
broidery stitches. See Embroidery; Feather Stitch Herring-bone Stitch
SMOKE TREE. Smoke tree is the common name for Rhus cotinoides, a hardy rleciduous shrub, otherwise called sumach. It is suitable for the mixed shrubbery or for the lawn, and bears foliage which assumes a rich orange-crimson shade in autumn. There is a similar species, cotinus, known as the smoke bush. and this is perhaps more beantiful. The smoke tree should be planted in good ordinary soil during autumn, and increased by layerings or cuttings of ripened shoots during the sainc period. See Rhus.
SMOKE WOOD. This is another name for Clematis vitalba, the Traveller's Joy of chalky lands and hedgerows. While it is uscful for covering old tree-stumps, banks, and trellises, and is popular on account of its feathery, smoke grey seed heads, its main use is as a stock on which can be grafted choicer kinds of clematis (q.v.).

SMOKING. There are no certain rules as to the quantity of tobacco that should be consumed in a day or a week, as this naturally depends on the individual smoker. Factors to be reckoned with are the condition of his heart, nerves, and digestive organs, the nature of his occupation and the amount of physical exercise, particularly open-air exercisc, which he or she is in the habit of taking. Generally speaking, a fair average for a pipe sinoker is 4 oz. a week: many are satisfied with less.

Where smoking is indulged in to excess, it is most frequently in the form of cigarettes, and if inhaling is practised at the same time the danger to health is very real. Those who suffer from anaemia should be very careful to smoke in moderation, and to avoid inhaling, and if there is any weakness of the heart unlimited cigarette smoking will cause trouble. Cigarettes oller the cheapest form of smoking to those who strictly limit the number they consume in a day, and it is a wise plan to do so.
Strong tobacco may contain as much as 9 per cent of nicotine, but the amount is usually less, and in a mild mixture it may be as low as 2 per cent A person can only judge whether he is smoking too much ly the effects produced. These are indigestion, generally acid indigestion with llatulence: reduced appetite, more or less mental depression, some reduction of the muscular strength and more fatigue than should be after exertion, and perhaps dimness of sight. Sore throat (smoker's throat.), with huskiness of voice and a short irritable cough, is not infrequent.

If the tongue becomes sorc, or the heart palpitates, cease smoking for a time. These are
danger signals that should not be disregarded, and any dimming of the sight is another. People who should not smoke at all are those whose heart or nerves are weak, sufferers from relaxed throat, or a tendency to bronchitis or consumption. Smoking is specially injurious to growing lads.

All smokers should be carcful to wash the tecth morning and night. The tobacco poison clings for a long time to the mouth, and if one goes to slecp without removing it he will swallow some portion of it in the night. The best mouth-cleanser for smokers is water in which bicarbonate of soda has been dissolved, the proportion being a teaspoonful to the pint.

Smoker's Heart. Nicotine in excessive quantities acts as a heart poison, and anyone who smokes immoderately may suffer from unpleasant symptoms.

In extreme cases the action of the heart becomes irregular, attacks of palpitation occur, there is giddiness, and in pronounced cases actually fainting. If the smoking be stopped the heart recovers very quickly, as a rule in a few weeks' time. No other treatment is required in the great majority of cases.

Smoker's Throat. A chronic state of inHam mation of the pharynx, though not very severe, caused by the excessive use of tobacco, is sometimes called smoker's throat. Some forms of tobacco are more irritating than others. Pipc smoking is thought to be chiefly liable to produce it.

The symptoms are a husky voice, frequent hawking, and very often a short cough. The only cure is a reduction of the amount of tobacco consumed. Before going to bed every smoker should gargle the mouth and throat with a solution of bicarbonate of soda in water $\frac{1}{2}$ teaspoonful to $\frac{1}{2}$ pint. See Nicotine; Pipe: Throat.
SMOKING: Of Meat. Whilst meat and fish may be cured by being nerely dried after salting, they possess a superior flavour if the drying is supplemented by smoking them in the fumes from a wood fire. The best results are obtained by burning green birch, beech, or oak wood, oak sawdust or broom tops. Occasionally juniper wood is employed to impart a special aromatic flavour to hams and bacon.

When meat is to be smoked it must be well dried after removal from the pickle, by hanging it in a cool, well-ventilated place; there should be plenty of air, but no direct draught on the food. Salmon is sometimes pickled with a mixture of saltpetre, bay salt and coarse brown sugar before bcing smoked, but after pickling it must be rubbed with common salt and then dried. Haddocks and herrings are merely salted and dried before being exposed to the smoke.

The smoking of butcher's meat or bacon is usually done in places constructed especially for the purpose, but it is possible to smoke sinall hams and portions of bacon at home if a wood fire inay safely be built on the stone or brick Hoor of an outhouse. The meat should be suspended sulficiently high above the fire to smoke without getting cooked. Ham and bacon take from 10 days to 1 month to be properly smoked.
Fish is easier to manage, as the curing may be accomplished in about 12 hours after exposure to the wood smoke. To sinoke small fish a tank or cask with both ends open may be turned on end on the brick floor of an out house and a good layer of sawdust placed inside. Into the sawclust a red-hot iron should be inserted. The fish should then be slung on an iron rod across the top of the cask and smoked in the fumes.

SMOKING ROOM. In many modern houses where smoking is allowed in every room there is no special smoking room.

Where a sitting-room is reserved for this purpose, the chief characteristics should bc cosiness.

Rugs may be preferred to carpets as they can he taken up and shaken frequently to rid then of tobacco ash. Suitable materials for upholstery would he leather, oil baize, or mohair. A wide, deeply padded angle seat covered with some dark material-narrow striped or plaid effects are good, the stripes toning with the colours in the rugs-and a few large, plainly piped cushions to match, make a cosy treatment for a warm corner.
Smokers' tables should be solidiy made: they stand more firmly, and are more useful if shelved after the fashion of a hook table fitted with small cupboard sections. cupboard or cabinet for drinks and glassesin a panelled room this cupboard might be built in-a card table Hat-topped writing desk, four small chairs of solid make and a bookcasc or shelves according to requirements would complete the necessary furnishing. Lights should be sharled, and reading lamps are essential. Pictures are usually confined to a few etchings, engravings and sporting prints.

SMOOTHING: In Wireless. This is the procese of converting pulsating unidirectional currents to pure D.C. suitable for applying to the anodes of wireless receiving valves.

In an A.C. mains eliminator the rectified currents although, unidirectional are not free from ripple. These currents are therefore passed through a smoothing circuit, comprising a combination of inductances and condensers, which eliminates the ripple.

Direct current mains supply has to be treated in a similar manner before the current can be used for high tension supply in a wireless recciver. See Eliminator.

SMOOTHING PLANE. The most usual type is about 8 in . long, which is enough for ordinary finishing purposes. The methorl of assembling and adjusting is much the same as for a jack plane, excejt that to loosen the plane iron the back of the plane is tapped with a hammer or mallet. No handle is required. The plane is graspel at tho back with the right hand: the left hand is placed on the front, and is used at the end of the stroke to pull out long shavings. See Plane.

SNAIL: In the Garden. As a rule snails like green diet, i.e. living plants of all kinds, and are therefore enemies to the gardener. They usually feed at night or at dusk, but in damp weather, or after heavy rain, they may be found in numbers in the duvtime.

Dry dressings of any irritant may be tried to kill them. Of these the hest is a mixture of lime and caustic soda, 4 parts of caustio soda to 96 of lime, well mixed. Other dressings are soot and lime. salt and lime, ant powdered coke. Two or three dress ings sliould be given, the second some 15 or 30 min . after the first. These dry dressings, except powdcred coke, should be applied atter sunset, or clse very early in the morning. Sep Jime; Slug.

SNAKE ROOT. The snake root is an attractive hardyherhaceous yerennial. It grows 3 ft . or so high, and in July and August hears small white Howers on long, graceful stems. They Hourish in ordinary well cultivated land, do not mind slight sharde, and are increased by division in autumn. The best are simplex, japonica and racemosa. The botanical name of snake root is Cimicifnga.


SNAKE'S HEAD. This is the popular the players are under contract to make name of one of the fritillaries (Fritillaria each other laugh, to which end they may meleagris), a charming spring bulh with do anything except speak. In this way the beautifully chequered Howers. Sce Fritillary. player with the most mobile face stands
SNAP: The Card Game. This popular indoor game is played with specially preparcd packs of cards. These are of various sizes, but the general principle is that they shall be in fours, each four bearing the same fig口
special number of players is necesspecial number of players is neces-
sary. Two can play, hut it is better to liave four, five, or six. The cards having heen dealt, the players, holding them face downward in their hands, play in turn. Each places his played cards face upward on a heap in front of him. When two
similar cards are exposed together any player can call smap, and the one who calls first obitains all the cards which lie beneath the two snapped ones. So the game continues until one plaver has secured all the cards.

In case a player calls snap when there is nothing to snap on the table, the cards in front of him go to a pool. There they lie until a card similar to the one on the top thereof is exposed, whereupon, if a player calls snap pool, he receives those in the pool. Special paclis of cards may be bought for this game, or it may be played


Snapshat. Fig. 1. Exposure meter for giving reliable indication whetber light is strong enough for a anapshot with ordinary playing

SNAPDRAGON: The Plant. This is the popular name of antirrhinum (q.v.), a the popular name of antirrhinum (q.v.), a
favourite garden fower grown in British gardens in quantities for summer bedding.
 SNAPSHOT : In Photography. Snapshots may be deacribed as amateur photographs of the more or less limited kind that are possible to the owner of an inexpensive hand camera with only one shutter speed. This is usually about 1-30th sec., though often marlied, if marked at all, as 1-25̃th sec. It is possible, of course, to take snapshots with any camera that has a shutter working at one or more speeds in addition to time exposures, but the beginner in photography is generally limited to snapshots.

So long as the light is strong enough to give a fully exposed film or plate with an exposure of 1-30th sec., the amateur will have little difticulty on this score, but it is essential that he should recognize clearly this limitation. Ony a proportion of subjects which the amateur usually wants to photograph are sufficicards. The former include cards made with ently well lighted to give good bright prints and are usually more popular with children with moderately good lenses, although the than ordinary packs. They have an added faster films available permit somewhat wider advantage in that they save a good pack of playing cards from the rough usage which is almost inevitable in this game. If an ordinary pack is used the snapping will be between cards of the same value; for instance, one two and another, one king and another, and so on. If a more complicated game is required the snapping may be from one to two, two to three, and so on.

The game can be played without any calling of snap. In this case a small object-say, a shell-is placed in the centre of the table and, instead of calling snap, the player places his hand on this. This prevents any doubt as to the winner. In calling it may be difficult to say who called tirst, but only one hand can touch the shelf at once.

Animal Grab. There are some amusing variants of the game, among which may be mentioned animal grab and grimace snap. In the former each player chooses to be some animal with a distinctive cry, e.g. a dog, cat, pig. When two players turn up similar cards, instead of saying smap, each has to make the noise of the other person, and the one who achieves it first wins the cards. As the tendency witl most people is to make their own noise, while scarching vainly in their memory for the one belonging to the other person, the effect is usually very ludicrous.
Grimace snap is extremely simple. Instead of snapping.
latitude in exposure.

With a camera whose lens worlss at about f/11, sunshine, or sunlight with very thin clouds, in the summer is essential to good results. Winter or carly spring sunshine is deceptively hright, as a test with an expozure meter will demonstrate. If the lens is marlied $\mathrm{f} / 8$, bright midday winter sunshine or slightly dulled summer light will give reasonably good results. As the strength of the light is the prime factor in snapshot photographs, the amateur will he well advised to purchase an exposure meter.

The Watkins Fall Meter (Fig. 1), for roll films and other cameras, is inexpensive, and indicates by a simple test whether the light is strong enough for a snapshot. It is supplied with special dials suitable for particular Korlak and other cameras. If the metar shows that the light is too weak, it is a waste of film to attempt a snapshot. The Fall exposure meter is a modification of the general Watkins' meter shown in page 440 . Full instructions for its use are given with the meter.

In snapshot work it is often of importance to know or he able to calculate the speed of moving objects in order to estimate the maximum exposure possible without showing move. ment or hlur in the negative.

Novement relative to the camera's focussing screen is the fundamental consideration. If the object is approaching the camera from the front the movement of the image on the screen will be small relative to the actual movement of the object, while the image movement will increase in proportion to the angle that the object makes with the camera, the maximum obviously being when the object is moving straight across the front of the camera.
Thus it will often be possible to secure a good snapshot of a moving object if the photographer can get into a position at a small

30 ft . per sec. The canmera being at $\mathrm{B}, 50 \mathrm{ft}$. away, the longest exposure possible with a V.P.K. if movement is not to show, is $1-100$ th sec . With the camera at C it would be, roughly about 1.50 th sec. while at $D$, an exposure of 1-251 1 sec. might give rood results

As a basis of calculations of this sort it is to be assumed that during the exposure the image must not move morethan 1-100th in. on the focussing screen if it is not to show blur in the negative. For a lens of in. focus which may be taken as the distance between lens and focussing screen an object 100 ft . from the camera is 200 times the distance from the lens that the image of it on the focussing screen is from the lens, 100 ft . being 200 times 6 in.
Therefore a movement of 1-100th in seen on the focussing screen is equal to an actual movement of the object of 2 in . and this is the maximum movement permissible during the time the shutter is open. Thus we can calculate maximum length of the exposure. At 20 miles per hour the object, say, a inotor car would move about 30 ft . in 1 sec ., or 360 in . As it must not move more than 2 in . during the exposure, the time is $2-360$ th or I-1s0th sec

As the onger the focal length of the lens the larger the image on the screen, and the greater its movement, a short focus lens such as is usually found on shapshot cameras will permit longer exposures. With a small camera of the vest pocket Kodak type where the distance between lens and film is about 3 in., the exposure in the example given will be doubled, i.e. 1-90th sec., or, to be safer, 1-100th scc. These calcu'ations assume that the object is moving across the line of vision, i.e. at right angles to the camera. If other positions can be taken up, as indicated in Fig. 2, the exposure times will be reluced accorlingly.
Mr. Walter Kilbey in his book "Advanced Hand Camera Work " gives the following exposures for certain types of moving objects. With a lens of 5 in . or 6 in . focus the objects being not less than 20 ft . from the camera, for groups standing in the street, childien at quiet play, ete. $1-50$ th sec.; for children actively at play, athletics and less rapid sports 1-200th to $1-600$ th sec.; for rapid games, cycling, racing, horse jumping, 1-500th to l-800th sec.; for divers, football, etc. $1-700$ th to $1-1000 \mathrm{th}$ sec.

The exposures given are of course the maximum possible if movement is not to show and have no relation at all to the aperture of the lens, the strength of the light or the speed of the plate or film. If the camera lens is not fast enough, i.e. of sufficiently large an aperture, for the strength of light on a particular occasion, or the speed of the plate, then a snapishot is hopeless, hecause exposure will be insufficient in order to give a properly exposed negative.

## Sneezewort. See Helcnium.

SNEEZING. The process of sneezing is a provision of nature by which irritating substances are expelled from the upper air passages. Ordinary causes are the presence of irritating matters, such as snutf, pepper,
$\qquad$

53 ft .

angle with it. ln the diagram (Fig. 2) the dust, etc., in the air passages. In hay fever moving object, A , is supposed to be a motor the pollen of grasses produces violent and car travelling at 20 miles per hour, or about distressing sneering.

Sneczing is one of the earliest symptoms of
a cold in the head, of influenza, incasles, and
 When the affection is troublesome and prolonged, it may often be stopped by smelling camphor, sniffing menthol snuff, or fine powder of bismuth carbonate. Pressing the tip of the longue against the back of the central upper teeth sometimes arrests sucezing. This smallish bird is in scason from October or November up to the following liebruary. bird is young, the fcet should be examined, and if these are not soft and tender the bird is old The long bill also will indicate whether the snipe has been liept too long, as it must not be moist. Like many small birds, snipe is best when dressed without removing the trails, but the gizzard should always be taken away before the bird is cooked. It is trussed with the head left on, and when it is plucked the head and neck feathers should be carefully removed, also the eyes must be picked out. The snipe is then singed and trussed.
'To truss snipe, cut off the claws and then twist the legs so as to force the fect behind the thighs. Then run the sharp bill through the thighs and body as if it were a skewer. Pasten a noose of string round the bend of the leg joints, across the lower part of the breast; then bring both ends up to the head, pass round that and the tip of the bill and tic at the back. Cross the fect. Cover each bird with a slice of fat bacon tied on with string, and roast as described under the general heading Game in this work.
Snipe Pie Prepare 4 to 6 snipe and cut them in halres. Chop very finc $\frac{3}{4} \mathrm{lb}$. rump steak and 6 oz . fat bacon, and pass twice through a mincer. Crcam 3 oz. butter, season it, add teaspoonful grated nutmeg, the juice of half a lemon, and the same of orange. Work in 3 oz . line breadcrumbs and 2 yolks of egg. Mix in with these the meat and bacon, and moisten to a paste with white wine. Make this forcemeat into balls. Lay at the bottom of a pie-dish $\frac{1}{2} \mathrm{Ib}$. rump steak and $\frac{1}{1} \mathrm{lb}$. bacon cut in strips and rolled; lay on these the portions of snipe, with the forcemeat balls arranged between. Season well, and threcparts till the dish with stock. Cover over with good rough puff pastry, glaze, and bake $1 \frac{1}{2}$ hours.

Snipe Pudding Make a good crust with kidney suct and tine llour well salted, then prepare 4 snipe and cut in halves. Reserve the livers and the trails. Sprinkle a little lemon juice over the birds and season them with salt and cayenne pepper. Peel and slice a Spanish onion, and try it a light fawn in 2 oz. butter: stir in 1 oz . Hour,
hay fever. If measures be taken against a cold in the head as soon as sneezing occurs, further development mav be prevented.

SNIPE : How to Cook.

To find out whether the
lb . prepared and chopped mushrooms, 1 teaspoonful sifted swect herbs, $\frac{1}{\frac{1}{2}}$ of a chive (chopped), a good pinch of grated nutmeg and seasoning to taste.

Stir all the ingredients in the pan for 2 min ., then add $\frac{1}{2}$ pint of well llavoured stock to which 2 wincglasses white wine have been added. Simmer over the fire for 10 min., then add the liver and the trails. Pass the contents of the pan through a wire sieve into a basin. Line a pudding-basin with the suet crust, add the snipe and the puree, and a !ittle more liquor if needed. Put a lid of paste over the pudding, tie it up and steam for $1 \frac{3}{4}$ hours. The paste for this pudding must not be very thick. The pudding can also be boiled. See Game ; Pastry ; Suet Crust.
SNOOKER POOL. This game is played on an ordinary billiard table. It can be played by two or more persons, either as sides or independently, and is a game consisting of winning hazards, cannons being ignored.

The game is played with 22 balls which are placed on the table in the following fashion: Fifteen red ones are in the form of a triangle, the ball at the apex being on the pyramid spot, and the base being purallel with, and nearest to, the top cushion. Black is on the billiard spot; pink on the centre line of the table, touching the apex ball of the pyramid; blue on the centre spot, brown on the middle of the baulk line; green on the left, and yellow on the right hand corner of the $D$. The remaining ball is the white or cue ball. The values of the balls are: red 1 , yellow 2, green 3, brown 4, blue 5, pink 6, and black 7 .
Having arranged what number of points shall make a game, the players must decide upon the order of play. The lirst player must play from hand with the cue ball. This must strike a red ball, and if one or more of the red balls are pocketed the player scores for each one, and continues his break until he fails to score. At his second turn he must strike one of the pool balls, these being the balls that are not red, and the game is continued by pocketing reds and pool balls alternately.

If the striker fails to score, the player next in turn plays from where the cue ball rests. If the cue ball is pocketed or forced off the table, the next player plays from hand. Each pool ball pocketed or forced off the table must be respotted before the next stroke. It should be noted that un!ike the reds, two pool balls must not be pocketed by the same stroke, nor must they be struck sitnultancously. See Billiards ; Pool.

SNORING. The usual cause of snoring is sleeping with the mouth open, particularly when lying on the back. It results from the Happing of the soft palate between two cur rents of air, one through
 position of snow guard ( 2 ) the mouth and the other cure is to lieep the mouth closed and to sleep on the right or left side ; perseverance is necessary.

In some cases the mouthbreathing which provokes snoring is due to an inflamed and thickened state of the mucous membrane lining the nose, due to chronic catarrh, which must of course be dealt with. Snoring in children is a very common result of adenoids. Sce Adenoids; Breathing.

SNOW. A fall of snow, especially if it should be heavy or continuous, will cause considerable damage to a house unless prompt measures are taken to deal with it. These include

clearing it away trom porch, steps, and paths; preventing it from stopping up gutters and falling on to low roofs and glass roofs. Newly fallon snow can gencrally be brushed away with a stilf broom, but if it has been allowed to get hard, use a spade or some form of scraper. A liberal application of salt is sometimes used to loosen hardened snow, but care must be taken to remove the whole, or a surface of icy smoothness may form instead.
Snow Guards For the protection of low roofs or glass structures adjoining high ones. it is usual to provide a rack, or snow guard. This consists of a wooden rack or wire guard fixed at the edge of the roof. The guard supports the snow and prevents the guttering on the eaves from becoming elogged. It is necessary to provide very strong supporting brackets. The iron brackets should be at least $1 \frac{1}{4} \mathrm{in}$. by $\frac{5}{16} \mathrm{in}$. in section, and although the single supjort, if placed at frequent intervals, will generally be sufficient, high roofs overhanging a greenhouse or a conser vatory should be strengthened with iron brackets as inclicated by dotted lines in the diagran..
The height of the snow guarll need not bemore than from 6 to 10 in ., but the latiens nust be securely bolted on the brackets and the whole structure prainted to prescrve it If the wooden guard is considered unsightly and wire guards are desired, they should be male from a stout gauge inaterial and sup. ported at more frequent intervals than in this case of wooden ones. If the wire is galvanizel after it is made up it will be more churable.
Snow Ball Tree. This is a nother name for the gucilder rose (q.v.).
SNOWBERRY TREE. This name is given to a vigorous bush which bears attractive white fruits in autumn (syinphoricarpus). It thrives in ordinary soil even in shady places. The locst liinds are racenosus and mollis.
SNOW BLINDNESS. Long exposure of the eyes to the glaring light of snow causes inflammation of the conjunctiva. There is a gritty fecling in the eyc, which begins to water, and there is difficulty in keeping the eyes open from the painful effect of light on them, more especially a bright light. The condition can be prevented by the use of smoked glasses.
SNOWDROP. This is onc of the carlicst spring tlower:ing bulbs. It looks best when planted freely in grass. The bulbs should be
set 3 or 4 in. deep in August-September, they flourish in ordinary soil, particularly that of a loamy character. The common snowdrop is Galanthus nivalis; others with la:ger hlooms are Elwesii, byzantinus and plicatus. Snowdrops may be grown in pots in the unheated greenhouse or in bowls of fibre indoors.

SNOWDROP TREE. This is a small family of hardy flowering trees belonging to the genus Ha!esia, and also known as the silver bell tree (!.v.).

SNOWFLAKE : The Flower. The snowllake is a beautiful spring and early summerllowering bult, with drooping, white, greenlipped flowers. It lhrives in ordinary soil and should be planted in September, 3 in. deep. preferably in the rock garden. The spring snowtlake, Lcucojum veruam, is 6 in . or so high; the summer snowflake (aestivum) reacher a height of 18 in . Onc named autumnale has white Howers slightly tinged with rose in early autumn. Snowllakes do not usually bloom freely until well established.

SNOW FLY. This tiny pest, often dexeribel as the ghost Hy, is destruetive to greenhouse plants, particularly tomatoes. The Hy multiplics with great rapidity, erippling folinge by sucking its sap. If dis turbed the tlies aseend in cloudlike swarnis. For aniateurs, the liest remedy is two or three fumigations with a good nicotinc pio. paration, thr first to kili mature flies. and others succersively about threeweeks later. White-fly vapour is и pro.
 prictary preparation that is also used. Sce Insceticide: Spraying.

SNUFF. l'irst said to have been used to ward olf infectious diseases, snuff came into fashion as a sternutatory in the 18th century, a pinch being taken or sulifed into the nose and causing sneezing. As tobacco smoking came more and more in to vogue, the practice
 Their shnpies are often very odd, resembling hoats, tiddles, books and animals. The snuli hoxes lecorated with plaiels in imitntion of the Highland tartans are freguently met with. An example of onc, lating from late ISth eentury, is shown in Fig. 3. Boxes of papier mâché were in common use in the late 18th and early 19th


Snuff Box. Fig. 1. Napoleonic example with embosses wedaution. Fig. 2. Georgian painted box. Fig. 3. Scottish snuff box of the Georgian period. Fig. 4. Box of chased and engraved silver : 19th century Figs 1.3. courlesy of Fribourg \& Treyer
century in England. They are often decorated with mother-of-pearl or Chinese characters in gold and black, or are made to imitate tortoiscshell.
Silver hoxes were fashioned in a variety of shapes and with different styles or ornamentation. The specimen illustrated in Fig. 4 shows a well known type in use through a great part of the 19th century.

SNUFFERS. A pair of snuffers consists of a pair of scissors with a closed box to hold the charred wiek which is cut off. Many of them have three small feet to enable then to stand on a specially shaped tray which often accomprnied the sulfers. They were made in silver, Sheffield plate, brass, and also in plated metal and iron.

Some beautiful examples of snuffers, with trays to match, the trays being piercerl and chascd, date from the early 18 th century. Snutfers are a useful accessory in a modern home if wax candles are employed to light the dining table. See Brass.

SOAKAWAY. A soakaway is a looscly filled cavity in the carth adapted to receive rain or surface water and allow it to percolate into the ground. It is useful in manv gardens and in the vicinity of houses and outbmildings. The water is lirst collected and delivered to the soakaway through pipes, a channel, or some similar systen, which may include the ordinary form of trapped gully. It is most conveniently located immediately bencath the delivering pipe. The size of the soakaway will depend upon the quantity

## Soap and ITs Various Grades

## For Household, Laundry and Toilet Purposes

Reference is suggested to the artic!es on Baby; Bcauty Culture; Face; Hair; Shampoo and also to the many entries that deal with cleansing processes, e.g. Laundry; Spring Cleaning: Washing Up

The quality of soap is an important matter,
whether for houschold or toilet use, and though whether for houschold or toilet use, and though ingredients vary in ditferent soaps, according
to the purpose for which they arc required, they should be free from adulteration.
A good scrubbing soap for household use is light in colour and has a fresh, pleasant odour when pure fat has been uscd in its manufacturc. Extra soda in its composition is an advantage, because it cuts and extracts dirt and grease. Resin is present in yellow bar soaps; a small quantity as an ingredient produces a good lather and gives the soap a clean scent. In large quantity it is an adulterant to weight cheap soaps, and its stickiness prevents the soap from being a good cleansing agent. The darker in colour a bar soap is the lower the grale.

Wrapper soaps sold in bar's of two stamped tablets are free lathuring with a small proportion of resin. Disinfectant houschold soaps to which tar acids are alded are strongly alkaline and only suitable for occasional floor scrubbing or for outhouses, etc.
It is economy to buy household bar soaps in quantity and stock them, as if thoroughly dry before use they last longer. Any scraps cain be saved and put into a large carthenware jar and covered with water. As the soap jelly which forms is used, more scraps and water are arlded. Where there is much scrubbing to do one tablet of household soap dissolved in three quarls of water makes a satisfactory soapsuds solution.
Soap powders make a good lather. They are uscful for washing down paint, and the result is good if care be taken to sponge the soap off at once with clean water. Soap powders are not economical when sold at the price of soap. They contain very little fat, which is the expensive ingredient, and a great deal of soda, which is comparatively cheap.
Laundry Soaps. Laundry soap should be
of water of which it has to dispose. A convenient size is an excavation in the earth to a deptl of about 6 ft ., making the aperture alout 3 ft . square.
In the case of good, solid carth the walls can be left in their natural state, but should preferably be cut or sided to a vertical face. The space is filled at the bottom with gravel, broken brick, clinker, or other hard core well rammed and consolidated. The whole of the cavity to a depth of about 4 ft . is filled with similar material, the top surface being covercd with gravel to the level of the inlet pipe, which should normally be some 12 to 15 in . below the level of the ground. Large pieces of stone, broken brick, or similar material should be placed on the top of the gravel to allow the water to discharge freely from the pipe. The filling is continued on the top of this layer and the whole covered with soil and turfed or otherwise finished.
In the case of very light soil it may be necessary to erect temporary shutlering, wooden supports, or even to line the walls with concrete. If this is done, apertures must be left to allow the water to comc through, especially in the lower part of the soakaway. Such holes can casily be cast by inserting short lengths of agricultural drain pipes prior to pouring the cement between the shuttering.
Where two or more soakaways are arranged in series, to handle a larger volume of water, the first should be filled with coarse material and the others with finer materials. See Drainage.
and terebene (turpentinc) soaps are also used in certain cases, as, for instance, after infectious fevers, for their antiseptic effects.

Soaps are also made containing resorcin, salicylic acid, ichthyol, and many other drugs. In acute eczema, or whenever the skin is greatly inflamed, soap of any kind is exceedingly irritating, and should not be used. The skin can be cleansed by rubbing olive oil on a soft cloth and wiping it off with a dry cloth. Special soaps for washing dogs contain either sulphur or creosote.

Toilet Soaps. As only the highest grades of fat and oil should be used in a supermilled toilet soap, it cannot be bought at a cheap price. Too much caustic soda added to the fats causes the soap to be too free in alkali, which has an irritating effect on delicate skin. On the other hand, soap is cleansing to the skin by virtue of the alkali it contains. When rubberl on the skin a little of the soda separates and unites with the grease of the skin; at the sainc time it softens the superficial waste layers of the skin and allows of their removal by water.
It is important, thercfore, that the fatty acids and alkali contained in a toilet soap, should neutralize each other. Too much alkali can be detected by a simple litmus test. Having anclted a small piece of soap in water and added a few drops of litmus, the colour should be mauve if the soap be properly neutralized; if free alkali be present the colour will be blue. Super-fatted soaps may contain glycerin or an excess of fat and oil, in which case they should not be stored for long as they may become rancid.

First-class toilet soaps are hard, highly polished, denoting the linest texture, and of a pale colour.

English soaps of this quality are unexcelled as complexion soaps. Strong perfumes are only desirable in the best quality of soap, as essential flower oils, balsams and animal scents such as ambergris. musk and civet are costly. Synthetic perfumes and substitutes are used in the cheaper qualitics. Dark colouring nifen disguises a poor grade of fint. The presence of too much coconut oil though a small amount is necessary to obtain a free lather, has an irritating effect on the skin and necessitates the use of a coarse perfume to disguise the strong odour.

The addition of resin in the composition of bath tablets increases their lathering quality, but these soaps should not be used for small children or for the face. Honey soap, which is ycllow soap of a good quality, coloured and perfumed, and curd soaps are suitable for the bath, but are too strong in alkali for complexion soaps. Palm oil is used as an ingredient for cheaper violet soaps as it has the odour of violets.

Soaps having a good proportion of pure olive oil in their composition are the best for a baby's skin. If a child's face is shiny or rough after washing, the soap is too harsh or has been rublied on in excess. Pure whit. Castile soap is usually a satisfactory choice.
Shaving soap should lather freely with a softening effect on the beard, and no irritating effect on the skin. Caustic alkali should not be present or any excess of coconut oil, though some is necessary for free lathering. A creamy lather may be induced by paraffin wax or gum tragacanth, and a considerable amount of superfalting makes it more emollient.
Soap Bubbles. Soap bubbles provide children with an amusement which seldom palls either in the nursery or out of doors. If played in the garden they are usially in even greater joy, because there is more room for the sport, and sun and foliage enhance the colouring of the bubbles. Clay pipes, with the ends well sealing-waxed, are the best implements for blowing bubbles, and the supply should be liberal, as they are very
brittie. The soapy water should be warm und the lather is best made with soap flakes or soft soap.

The pipe should be put into the water with the low downwards. If it is shaken gently up and down once or twice in this position cnough of the water will have been collected to form a goo! bubble without a lot of unnecessary tluid. Each player will have his own methods and fancies; one may set out to blow verv large bubbles without releasing them and letting them liont in the air; another may like 10 blow many small ones and allow them to form a fleet.

SOAPWORT. This group of hardy annual and peremial plants bears rose-coloured Howers in summer. Of the perennials Saponaria ocymoides is a charming trailing plant for the rock garden: another good rock garden plant is cuespitosa. Both flouriah in well-irained rockery soil. A taller kind, which grows from 18 to 20 in . high, and has double rose-coloured blooms in summer, is all attractive border plant. The best of


Soapwort. Prolusion of pink blossoms of the small
species boissieri, a useful rock garden plant
the annuals is calabrica, 6 in., with rosecoloured blooms, which is raised from seeds sown out of doors in spring.

# Socks for Adults and Children 

## Instructions for Knitting Standard Patterns

This article gives detailed instructions for knitting a pair of woollen socks for a man, a pair of woollen socks for a child, and a pair of bad so:ks. Other articles or knitted wear include Bootecs; Gaiters; Stockings. See also Darning; Knitting; Mending; Wool

With a heavy type of shoes or hoots in cold] weather machine or hand-knitted ribbed woolien socks for ment and boys are most suitable. A heavy shoe will quiclily wear holes in a thin sock. For ovening dress plain black sili. and for ordinary town wear, with shoes of medium weight, cashmere socks are worn by most men. These last should be guarantred pure wool and of a firm but soft and even texture.

When buying woollen socks, whether woven or Enitied, it is well to purchase a size too large. Even though guarantred unshrinkable, however carefully washed they will shrink a little. Measuring round the closed fist to ascertain the length of a sock is not infallible. It is better to ask for socks that will fit a size larger than the shoen worn.
lior country wear, well-knitted socks are the most comfortable for much excreisc. Hecls and toes may be strengthencd by double vool or by knitting silk of the same shade. Knitting should be loose enough for the needles to pass through easily, and success depends on an even appearance and upon the skill in turning the hrel and rounding the toe.

Babies' socks are usually made in the softest white wool, and may be knitted in a fancy stitch, or, if preferred, crocheted in a rib-stitch. This is ordinary double crochet, the ribbed effect being obtained by putting the hook into the back part of the foundation cach time a stitch is worked, instead of into the front. For children, best socks are knitted in silk. Mercerized or fine crochet cotton may be used and also fine wool. Boys' socks are usually of a heavier make.


Socks. Fig. 1. Man's sock in soft wool that can

Men's Knitted Socks. A pair of men's woolen socks is illustrated in Fig. 1. They are of average size, and since the leg is not shiped, they can be made cither longer or shorter without necessitating a chunge of pattern. The knitting is done at a tension to produce about 10 sticches to the inch in width: 4 oz of 4.ply Bechive Soft Ḱnitting wool and 4 No. 13 knitting needles are required to make a pair.

Begin by casting on 84 stitches, 28 on each of 3 needles. and work in rourds, in ribs of knit 2 and purl 2 until 4 in . have bcen worked.

Continue in plain knitting until the sock measures 11 in., and then commence the heel as follows: Knit the first 21 stitches of the round on to one needle, and slip the last 21 stitches of the round on to the other end of the same needlc. These 42 stitches are for the heel, and all the others, which make up the instep, should be divided on to two needles.
On the heel stitches purl and knit a row alternately until 4l more rows are worked The first stitch of each row should be slipped, and the last row should be a purl one. To turn the heel, knit 26 , knit 2 together, then turn, purl 11 and purl 2 together. Turn, knit 12, knit 2 together. Turn, purl 13, purl 2 together. Turn, knit 14, knit 2 together. Turn again, and continue in this way unti' all the heel stitehes are worked on to one row again. Then linit 13 stitehes and the heel is

Slip all the instep stitches on to one needle, and on to the first needle knit the remaining stitches of the heel. Knit up 21 stitches at the side of the heel and the first stitch from the instep needle, and with a second needle linit all the instep stitehes but the last one. With a third needle knit the last instep stitch; then linit up $2 l$ stikehes at the other side of the heel, and the other 13 heel stitches. Knit one round without shaping, and then decrease thus for the instep in the next round Knit to the last four stitches of the first needle; knit 2 together, knit 2. Knit the stitches on the second needle without shaping, but on the third, knit 2, knit 2 together, and through the back of the loops knit to the end of the necdle. Repeat
the last 2 rounds until only 20 stitches remain on each of the first and third needles. If a 10 in . foot is required, work without shaping until the sock measures $6 \frac{1}{2}$ in. from the side of the heel where the stitches were linitted up; for a $10 \frac{1}{2}$ in foot, work 7 in . from the side of the heel, and $7 \frac{1}{2}$ in. for a foot measuring 11 in.
Shape the toe thus: * Knit to the last three stitches on the first needle, then linit 2 together and linit 1 . On the second needle, knit J, knit 2 together, and then linit to the last 3 stitehes; then linit 2 together, and linit l. On the third needle, knit 1, knit 2 together through the back of the loops, and knit to the end of the row. Knit 1 round without shaping, and then repeat from * until only 24 stitches remain on the round. Knit the stitches on the first ncedle on to the third, and close the toc. by the procedure kinown as grafting.

To do this, place the two needles logether, and having threaded the wool into the bodkin, work in the following way. Place the bodkin in the first stitch of the front row, as for knitting, slip the stitch off the needle, and draw the wool through. Then put the borkin in the second stitch of the front nerulle as for purling, and draw the wool through, but do not slif the stitch off the needle. Pass the bodkin under the front needle, put it in the first stitch of the back row, as for purling. draw the wool through and slip the stitch off the needle. Then place the bodkin. in the sceond stitch of the back row, this time as for knitting, and draw the wool through, but do not slip the stitch off the needle. By this it will be seen that the action of the bodkin is reversel on the back needle. Reperat until all the stitches are worked off, and take care not to draw up the wool too tightly. When the last stitch is reached, pass the woot through it and fasten it off securcly on the wrong side.

Child's Socks. Woollen socks with striped coloured tops, Fig. 2, for a child of about 6 years of age, can be made accorting to the following directions. The socks incasure $8 \frac{1}{2}$ in. from the top to the ankle an: 7 in from the back of the heel to the point of the toe, and the work is done al a tension to produce about 10 stitches to the inch in width. The materials required are $1 \frac{1}{2}$ oz. of Beehive 3 -ply Scotch fingering wool in white or grev. and $\frac{1}{2} 0 \%$ of the same kind of wool in any other colour for the turnover or striped tops, with four No. 14 sted kinitting needles.

With the coloured wool east 24 stitches on each of 3 needles, and working the top in a rib of knit I and purl 1 , do 4 rounds in the coloured wool and 4 rounds in white. then 1 round in colour. 4 rounds in white, 4 rounds in colour. 4 rounds in white. This completes the top, and as both sides are the same it doces not require turning if the socks are to be worn with a turnover top.
Knit the next round in plain knitting and increase one stitch at the beginning of the round by picking up a loop of t!ic previous round and knitting it as an ordinary stitch. Now begin the shaping for the leg in the next round. * Kinit 1 etitch, knit 2 together, knit to the last 3 stitches of the round, slip 1 . knit l, pass the slipped stitch over the knitted, linit l. Knit 4 rounds withour any shaping. Repeat from * 3 more tinses, then do another decrease round, making 5 decrease rounds and 10 stitches decreased away all together. Work 54 more rounls to reach the anlile. Extra rounds are worked here for longer sock.

Now begin the heel. Kinit the first 16 stitches of the round on to one needle, slip the last 16 stitches of the same round on the other end of the same necrlle; these 32 stitohes are for the heel flap. Divide the remaining 31 stitches on 2 necdles and leave them for the instep. Now work on the heel stitches, always slipping the first stitch, purl 32, turn, finit 31, turn, purl 30, turn, knit 29, turn. Continue
in this manner until 9 stitches are left at each side of the heel, the last now being purl 14.
Turn and knit 14, lift up the right-hand side of the loop just before the 15th stitch and knit the 2 stitches together to prevent a hole. Turn, purl 15, lift up the oop just be fore the 16th stitch and purl the 2 to gether. Coninue in this manner working one extra stitel on to each rowtillall the 32 stitches are on the ne row The last row will be a purl row. Knit back 16 stitches and so complete the heel. Slip the instep titches on to one needle
Now on


Socks. Fig. 2. Cbild's sock hand-knitted in wool, with coloured tornover top
needle knit the remaining 16 stitches of the hecl, knit up 2 stitches at the side of the heel, and knit the first stitch from off the instep needle. With the second needle knit the instep stitches: with the third needle knit up 3 stitches from the side of the heel and the other 16 stitches. Knit one round plain, then decrease for the instep in the next round as follows: Knit to the last 3 stitches of the lirst needle, then knit 2 together, knit l, linit the second needle without any shaping, on the third needle knit 1, slip 1, knit 1, pass the slipred stitch over the knitted one, then knit to the end of the needle. Repeat the last 2 rounds 3 times. Now work 56 rounds without any shaping for the length of foot required before shaping the toe, allowing for the latter to add another $1 \frac{3}{4} \mathrm{in}$.
Shape the toc as follows: * Knit to the last 3 stitches of the first needle, knit 2 together, knit 1 ; on the second necdle knit 1, slip 1, knit l, pass the slipped stitch over the knitted, knit to the last 3 stitches of the same needle, then kiit 2 together, knit 1: on the third need!e knit 1, slip 1, knit 1, pass the slipped stitch over the knitted one, knit to the end of the needle. Knit 2 rounds without shaping. Repeat from * until there are only 28 stitches in the round, then knit the stitches of the first needle on to the third needle.
Place the two needles together, and knit a stitch from each needle at a time, and when 2 stitches are on the right-hand necdle slip the first one over the second stitch, and so on
until there is only one stitch left, then cut the wool, draw it through the last stitch, thread the end in a darning needle, and fasten of verv sccurely on the iprong side of the sock. Casting off the toe nan also he done by grafting which is a much neater method and more comfortable in wear (sce page 669)

Bed Socks. To make a pair of hed socks of average size for a woman, 24 oz . of some such soft wool as Baldwin \& Walker's 3-ply Lady ship Flossella Wool will be required and also $1 \frac{1}{2}$ yards of ribbon, and three No. 7 needles Commence at the top by casting on 53 stitches, and work the first 24 rows in ribs of 2 plain and 2 purl, always knitting the first two stitches at the coinmencement of every row and purling the last three stitches of every row.

Now cbange and work in moss-stitch (l stitch plain and the next stitch purl, alternately to the end of the row, then on the return row reverse the order of the stitches so that a plain stitch comes over a purl stitch of last row) for 4 inches, increasing 1 stitch at the beginning of the first row in order to bring the stitches up to 54 .

To make the holes for the ribbon. work 2 moss-stitches," make l, take 2 tog., 4 moss stitches ; repent from * to the end of the work, ending with 2 moss-stitches. Now work again in moss-stitch for 12 rows. then the stitches will be divided for the foot.

Work in moss-stitch over the first 16 stitches, on the next 22 stitches work backwards and forwnids in moss-stitch for 40 rows (always slipping the first stitch), then break off the wool and join to where the 16 stitches were left and with the same needle pick up 20 stitches along the side of the instep flap and also 11 stitches across the toe. With the spare necdle work across the remaining 11 toe stitches and pick up 20 stitches along the other side of the instep flap, also the 16 remaining stitches on to the same needle. Work across all the stitches for 10 rows; then decrease 1 stitch at both ends of both needles for 5 rows. Then cast off or leave the stitches for grafting. Join up the scams and through the holes at the ankle thread the ribbon

SODA. Soda is a valuable agent for quickly and thoroughly removing grease and dirt from pots, pans, and other kitchen uten sils, accessorics, and cloths. These should be thoroughly rinsed in clean hot water before they are dricd. Soda should not be used for cleaning aluminium and enamelled vessels.

Household Uses. If the houschold water is very hard, common soda is frequently added to it when boiling green vegetables, or it is used for the purpose of restoring the colour of the regetables when they have been closely packed and curriod to market. It is, however, preferable to sacrifice appearance and omit it altogether, for on some constitutions it has a deleterious effect, particularly the common or washing soda. At all times the quantity should be strictly limited, und bicarbonate of soda should be substituted for the washing soda, as much as will lie on a sixpence being quite sulficient to soften each gallon of water.

Bicarbonate of soda is used as a raising agont in the making of bread, cakes, and scones, and for cakes it has almost-superseded yeast. Sometimes cream of tartar is added to the soda in order to prevent it from darkening the llour. Bicarbonate of soda is the most important ingredient of baking powder.
Uses in Medicine. Soda is largely employed for medical purposes in the form of various salts of sodium

Sodium bicarbonate, 2 drams to the pint of water, is a useful lotion to apply to the skin in cases of mild itching. Made into a paste with a little water and applied to insect bites and stinge, it often gives immediate telief, as also in burns and scalds before blisters have formed.

Internally sodium bicarbonate is constantly prescribed in various kinds of indigestion
The phosphate and sulphate of soda and tartarated soda are widely used purgative salts. Most of the natural purgative mineral waters such as Apenta, Rubinat, Hunyadi Jànos, Carlsbad, ctc., derive their characteristic action from one or more of these sadium salts
Sodium chloride or common salt is one of the natural ingredients of the tissues, and thercfore is an essential article of our dietary. In large doses it acts as an emetic.
Sodium citrate is often added to the milk of babies bottles to make it more readily digest. ible. One grain of sodium citrate dissolved in a teaspoonful of water is added for each ounce of cow's milk in the bottle. The effect is to render the curds of the milk which form in the infant's stomach less tough. See Salinc.
SODA CAKE. For making this cconomical cake the ingredients are 1 lb . flour, $\frac{3}{2} \mathrm{lb}$. sultanas, $\frac{1}{4} \mathrm{lb}$. chopped peel, 6 oz . butter ol margarine, $\frac{1}{4} \mathrm{lb}$. granulated sugar, a little grated nutmeg, 2 eggs, 1 tcaspoonfui bicarbonate of sodn, $1 \frac{1}{2}$ gills milk, pinch of salt. Sift Hour and salt together, rub in the butter, add the sugar and dried fruit. Put the bicarbonate of soda in the milk and add it to the eggs, which have been beaten. Pour this on to the dry ingredients and leat all thoroughly before putting the misture into a baking tin lined with paper and baking it in a moderate oven for about $2 \frac{1}{2}$ hours.
SODA WATER. The name soda water is rather misleading, for commercial soda water consists usually of water charged with carbonic acid gas. Occasionally soda is present in small quantities, about 5 gr . of bicarbonate of soda to the bottle. It should properly contain 30 gr . to the pint of acrated water. Soda water can be made at home, the acrating process being accomplished with sparklets. See Sparklet.

SOFA. Through its predccessors the day bed, courting scat, settee, and the couch of the Regeney period, the sofa has a very long pedigree. As seen to-day it has a head at one end and sometimes a back. The frame is of vood, which may be mahogany, deal, or one of intermediate valuc. Many sofas are fitter with a loose cushion and a bolster for the head.
In Vietorian days a sof:a was made and sold is part of a suite of furniture. and these suites were seen in dining rooms, drawing rooms, and other living-rooms. To-day the sofa is less popular, its place having been taken to a large extent by the divan, modern versions of the settee, or the Chesterlield.
It may be remembred that, in common with many other pieces dating from the first half of the 19th century, well-made sofas increase in value and interest as people begin to collect furniture of this period.

Repairing a Sofa. The back of a sofa is composed of a shaped top rail as at A, F:g. l. two ends $B$, a centre picce $C$, and a bottom rail D. These parts are generally secured together with dowels, as shown, and if loose they can be replaced and the joint glucd ip again. An alternative method of strengthening the frame is to screw on angle brackets at the corners as at E . This method should not be employed in the case of a badly damaged frame.

The frame itself is usually dowelled to the seat frame and screwed to the scroll ends. The seat frame shown at Fig. 2 is sufficiently strong to resist the strain of wear, but it is possible that the cross or end rails may have become loose or broken; in this case the method of repair is to fit a new rail across, as at $F$ or $G$, the latter being additional, to strengthen the frame or remove a twist cansed by a warped length.
The legs are usually secured with doweis, the repairing being generally a matter of fitting new dowels. It will be scen from Fig. 3, which
shows a plan of the framing directly over one of the legs, that two of the dowels are fitted in the outer rail and one in the oross rail. In renewing them, a larger diameter dowel should be providod, and the old ones bored qut: in addition the two flat surfaces should be scraped quite clean so that tbe glue will hold up tight. The leg with dowelş is shown in Fig. 4.

Castors may have heen replaned two or three times and worked loose again, or the wood may have split. In the former case it is adviseble to fit a slout dowel in the leg as in Fig. 5 ; the end can be shaped so as to fit in the castor. If the leg has been split at the bottom, it will he as well to hind it with wire, suitable grooves being cut as in Fig. 6i. By using an ondinary wood filler the wire binding can be entirely covered and wil! not bo noticed. The scroll ends are !iable to work loose or break off at the tenon joints, as at H, Fig. 2, alid K in Fig. 7. Allhough they can be glued up again, it is gencrally more satisfactory to cut the tenons off, fill up the mortises with suitable blocks of wood, and replace with a dowelled joint, as in Fig, 8. The dowels should enter both pieces for at least 11 in .

If the ends are not very loose, the joint ean be strengthened by blocks of wond screwed to the inside of the frame. as at L, Fig. 9, but it will prohably be necessary to fit in thin blocks cach side, as at $M$, to bring the inside of the scroll upright to the same distance as the seat rai!. Further strengthening may be necessary in dealing with the scroll ends by renewing the rails $P, R$, and $T$. These are placed there as much for upholstery purposes as for strengthening the construction. As a rule, they are secured by glued blocks, as at N, but in better class work they are housed in the sides.

Breakages in the short grain of the wood are not unusual, cither at the bottom, as at $W$, Fig. 7, or as in Fig. 10. In dealing with a break as at $W$ ', the best way is to screw on a suitable strip of hardwood, as shown. Breakages at the top are repaired with a narrow strip screwed on as in Fig. 10, but the hroken edgea, particularly if they are of long standing, must be thoroughly cleaned and glued together. Re-glued joints should have newly planed surfaces, but if this is impracticable, the surfaces must be scraped to remove old glue ; where it is impossible to use a scraper, the wond should be cleaned with hot water and a


Fig,!

518.5


SQia: how to repair, Fig. 1. Pieces forming back framework. Fig. 2. Seat trame witb new. cross raila. Fig, 3. Plan of framing above leg. Fig. 4. New dowels ftted in leg. Fig. 5. Worn leg
 easily worked, the opof the softwoods are the coniferous trees such heavy soils. as the pine, fir, larch and ycw. They abound in resin and yield turpentine and pitch. Sce Deal ; Hardwood; Larch; Pine; Wood,

SOIL : The Varieties. The chief kinds of garden soil are heavy, loamy, peaty and light. or sandy soil. The nature of each can be modified by artificial treatment to suit the conditions of the garden and the requirements of the plants that are to be grown therein.

Of the four chief kinds of soil, a heavy soil consists almost entirely of stifi clay, and nust be lightened by decp digging and throwing

stiff hrush, See Castor ; Chesterfield ; Divan; Dowclling; Settee.
SOFFIT: In Building, There are numerous applications of the soffit in domestic architecture. Externally it is the covering applied to the underside of the eaves of a house ; on internal parts of the building the term soffit refers to exposed ccilings such as those found beneath some forms of staircase.
The term is applied to the inner face of an arch and to some forms of ceiling formed into panela and otherwise treated, and often found on projecting or bow windows. Soffit lining is the covering on the underside of lintcls for a window or door, or arch opening, or the linings covering the undersicle of an exposed Hight of stairs. See Ceibing; Eaves: Rafter; Roof.

## Soft Water. See

 Water Softener.SOFTWOOD. The timbers that are classed as softwoods are those that are light in testure and are

the subsoil open to disintegration by the action of frost during the winter months. It may also he further lightenod by the admixture of sand, wood astbes, burnt weeds, grass, and other bonfire material. Road sweopings, where they can be obtained free from the taint


Soil. 1. Soil stack : turves interlaid with lime (a) and manure (b). 2. Lightening beavy soil : $a$, bottonn spit well dug; $l$, manure $; c$, top siol with lime and sand lorked in (d). 3. Improving light soil : $a$, subsoil: b, menure ing, pig, loam. 4. How to hurn clay a coal and coke are' b, soil. $d$. coal dust ; $e$, leaves ; $f$ soil $; ~ g$, dranhbt bricks. 5. Base for same: $A$, fire ; $b$, draught passages; $c$ bricks; $d$, soil, etc.
$B_{u}$ special arrangement witl Amateur Gardeninu posite kinds being the hardwoods. The chief of petrol refuse, are excellent for lightening

A loamy soil is the best for all general purposes, and is the one in which clay and sand are found naturally mixed. A peat soil is very dark in colour, due to the preponderance of decayed lenves in its composition. It is invariably found in the neighbouthood of woods and forests, and should be mixed with other soils to obtain the best results.
Sandy soil is casily recognized by its dry and powdery nature. It is composed chictly of silica, and alone is unsatisfactory and unproduotive. It is best improved by the addition of clay, animal manure, decayed vegetation, and anything that helps to bind the particles of sand together.
If the soil is sicli, and grows moss and sorrel, it contains too much acid, and requires a good dressing of lime. In making a new garden liming is always necessary. About 10 lb . to a square rod will he sufficient.

Health and the Soil. The nature of the soil on which $n$ house is built may have a great dea! of influence on the health of the inhabitants. It often happens that a person who suffers from rheumatism, neuralgia, lung troubles, etc., finds himself much better on changing his residence to another neighbourhood. There may be other reasons, of course, for the improvement, but in many cases the chief cause is removal from a damp soil or low location to porous, dry, and warm ground.
The most porous or permeable soils are gravel and sand. Through theso the rainfall percolates frcely, passing down until it meets an impermeable stratum, puch as clay or rock. The next most porous is a chalk soil. Any of these furnishes a dry site for a house provided it is situated on a slope. Limestone is only slightly porous; the water will How away over it if the site is on a slope, but otherwise it is apt to keep the surface wet.
Hard rocks and clay soil are almost impervious to water. A rock site on a slope forms a very healthy foundation, as the water flows away quickly. Clay is nearly always cold, and on a dead leve!, or in a hollow, it forms a
recy wet, bad site, both the ground and the exterior of the building uir being damp. When sandstone or chalk is present in a mixture with clay, it is likely to be damp unless the slope is stecp enough to allow the water to run away frecly
Two important points have to be considered in connexion with soil, namely, ground water and ground air. All soils, except those that are quite impervious, contain water and air. The water consists of the rain which bas passed through the upper porous layers, and at a greater or leas depth, is prevented from sinking further by an underlying impervious stratum. Thus if we dig down we always reach water. In some low-lying, wet places this ground or subsoil water comes up close to the surface in rainy seasons; in marshy districts it may be level with the surface; in other places it may be hundreds of fect down.

Ahove the !evel of the ground water the interstices of the soil are filled with air, the ground air. When the water level is close to the surface a great deal of it goce off into the outer air liy evaporation, making the air around the house damp. The level is constantly varying, and each time the ground water riscs it forces out the air contained in the soil abovo it.
If the soil is pure this air is harnless. If the soil is contaminated, the air will be impure, and when foreed into the basement of a house it may cause injury to health. The soil may be contaminated by its contents of decaying vegetable matter, or by drainage from manure hraps. cesspools, middens, farm buildings, leaking drains, graveyards, etc. Not only does a rise of ground water force gases into a house unless there is a thick concrete foundation, but it may contaminate wells.
The points to consider in connexion with this matter are the nearness to the surface of the ground water and the greater or less Huctuations of level which take place. If the ground water is not more than ten feet below the surface, the site is not a good one for a dwelling-house; probably the level should be fifteen or twenty. Likewisc, if there are great and frequent changes in the level of the water, danger arises from the gases forced out.

In Great Britain the building by laws of most local authorities now require the provision of a ground layer. This usually consists of six inches of concretc over the site of the rooms, and effectually prevents any movernent of ground air inside the bouse irrespective of the !evel of the ground water. It also protects the immates of the house from contaminated ground air which is detrimental to their health See Housc : Ventilation

SOIL PIPE. This name is given to an impervious pipe connceting the w.c. with the manhole in a drainage system. The requirements of the local authorities must be strictly observed when putting in, repairing, or in any way dealing with soil pipes.
In most districts it is a requirement that these pipes be of good grade cast iron treated on the interior with Dr. Angus Smith's solution to render then immune from the attack of acirls, water, and foul matter gencrally. All joints must be properly mado and absolutcly airtight. Customarily an air vent is provided from the highest point reached by the soil pipe and taken from that some distance above the roof.

The lower end of the soil pipe discharges into the first manhole adjacent to the house. This manhole has also to be ventilated with fresh air in conmon with other parts of the sewage system. The result in a properly devised system is that the soil pipe is normally empty and is ventilated throughout by a steally current of air. The exterior of the pipe should be kept in good condition by the frequent application of paint, and all cars, lugs, straps, etc., used to fix the pipe to the
extcrior of the building
should be examined from time to timc. See Drains; Sani. tation.

SOLANUM. This is the botanical name of a group of shrubs and plants which inc!udes the potato and several linds of ornamental value. The bitter swcet of the hedgerows, of which the rod berries are poisonous, is Solanum dul. camara. Solanum melongena is the egg fruit or aubergine whieh is raised from seeds under glass in spring and grown in large Hower pots or on a sumny horder. The winter cherry (Solanum capsicastrum) is a favourite window and grcenhouse plant which bears orange-red fruits in winter and is raised from sceds or cuttings under glass in opring. Sola. num crispum, mauve and jasminoidfes, white, are vigorous climbing plants suitable for a wall in mild districts, or for the greenhouse elsewhere. Solanum Wendlandi, which must be grown under glass, is a climbing plant with large mauve blooms.
SOLAR FLOWER. A Hlower that opens and shuts cluring the day about certain hours is known as a solar Hower. 'Thus the goatsbeard is open from 3 to $\overline{5}$; the dandelion from 5 to 6 ; the pimpernel ahout 8 ; day lily from 10 to 11 : and the tiger lily robout 12. low temperature is known as soldering.

The requirments for amateur work consist of a soldering iron or copper bit (Fig. 1), some solder, Hux, emery paper, an old file or two and an odd knife for scraping the metal clean. In addition there must be some means for heating the iron, and preferably some sacking or rough cloth with which to wipe it clean

The size of the iron and its type will depend on the nature of the work For domestic use a plain bit weighing about $\frac{3}{3}$ to 1 lb . will suffice, and this may be the ordinary adjustable type of iron with a wooden handle. The term "iron" is misleading, for the actual beating element is a pointed or hatchetshaped piece of copper. The most useful form of solder is timman's solder in bars about

## SOLDERING FOR THE METAL WORKER

## Enabling the Handyman to Undertake his own Repairs

This prccess is recessary for a numter of mending and constructional operations described in
our work. The reader should therefore consult Aluminium ; Bent Iron Work; Copper ; I caded Lights; Napkin; Piercing; Silver Work. See also Blow Pipe; Flux; Pumbing

The process of joining metals together by $\frac{1}{2}$ in wide and $y_{n}$ in. thick, sold by weight. means of another metal that melts at a relatively Blow-pipe solder, which is harder, is oold in long, thin strips; this is best used with a large copper bit or a blow pipe. Tinman's solder also can be purchased in narrow strips

The soldering acid or flux may be powdered resin, killed spirits, that is, hydrochloric acid in which a number of small pieces of zinc plate have bcen dissolved, or one of the proprietary brands. A combined solder and flux in paste form is useful for small jobs, as the surfaces can be coated with the paste, held or wired together, and united by sweating, using a blow pipe or lamp, as later described. In an awkward corne the point of the soldering iron can be introduced to heat the joint.

The heating medium for the soldering iron


Solanum. The winter cherry (Solanum capsicastrum), a greenhouse Closing times vary with particular plants. Solar towers are sometimes used to compose a oral clock.
SOLAR PLEXUS. Lying behind the stomach and in front of the norta, or chicf blood vessel of the ahdomen. is that part of the sympathetic nervous system known as the solar plexus. It consists of two large ganglia, and of interlacing nerve fibres. It reccives branches from the right vagus nerve and supplies branches to the liver, stomach and other abdominal organs. The disabling effects of a blow over the solar plexus are well known

[^9]

Soldering. Fig. 1. Top, ordinary type of soldering iron, showing well-tinned bit. Centre, self-heating petrol blow lamp type of soldering iron. Bottom, iron antomatically presses down the bracket and reduces the current consumed
is preferably a gas heatet of some kind. a regular soldering stove, or a powerful blow. lamp when gas heating is not available Irons arc made that are self-hcating (Fig. 1) Some derive their heat from a self-contained gas burnct, and others fron in electric heating device, or a petrol blow lamp forming a part of the soldering iron itself
Mending a Kettle As in example of the methods of soft soldeling, suppose a leak is to be mended in a tin liettle. The lirst step is to clean the surface to be repaired. The best method is to scrape or polish the metal with an old file or knife, as in Fig 2, and finish with rough emery paper. Then wipe the metal clean with a piece of clean cloth to remove the dust and chips.

The iron is heated over a gas ring or any clear, hot, bright fire until the copper is almost. but not quite red hot. Now talie the bit from the firc and wipe it quickly with a cloth to remove any surface dust. Next rub the tip of the copper with in file, as in Fig. 3, resting the iron on an orld bit of wood or metal to prevent scorching the bench.
The next step is to tin the bit, that is, to cause a film of solder to run on to and adhere to the point of the bit. If the bit has cooled in tho cleaning process it must be reheated. Place a spot of flux on the centre of the clean piece of tinplate and dip the point of the hot iron into the fux for a moment. Then, holding the iron in the right hand and the strip of solder in the left, place the point of the iron on the tinplate and apply the solder to the edge of the iron.
The worker turns the iron over as the solder melts (Fig. 4), moving it about and rubbing it into the little pool of molten metal until the solder adheres to all the four sides near the point of the iron. The appearance of a well-
timed bit is shown in Fig. 5, and it is in this state that the iron is fit to use. The iron need not be reheated until it fails to melt the solder freely. When this point is reached, take care not to overheat the iron and melt off the tinning, as if this is done it will have to be clcaned and retinned as alreaciy described If carefully used the iron should not need tinning except at long intervals.

Presuming the iron to be stil! hot. the next step is to talie a small dist of tinplate and place it over the hole on the cleaned part of the work in hand, to which flux will previously have been applied, adding a touch of flux to the edges. Press the iron on the edges of the tinplate disk and apply the colcier to the side of the soldering bit, nelting oll a few lumps or blobs as shown in Fig. 6, and proceed to flow the solder all round the edges of the disk At the ame time press the soldrong iron on the centre of the disk to assist in lieating it, and also to draw the solder we!l under the metal and ensure a sound joint Finish by running the iron around the joint to make the surface of the solder neat and tidy, as shown in Fig. 7

It is well, when the solder has been run round the patch, to press on the latter with the point of an old file or some similar object, so as to hold the patch firm until the solder cools. If the file is held upright on the centre of the patch the soldering iroll can be worked round the edges of the patch 10 miake a neat andeven joint. The kettle should be firmly supported so that both hands are free.

Exactly the same processos are followed in soldering any tinplate article, the steps being to clein the surfaces, apply llux, see that the iron is well tinned and sufficiently hot, flow the solder round and undel the joint, and finish by smoothing with the point of the iron. Any small lumps of solder aie removed by the iron

or can be filed away, the use of the soldering iron being preferable.

Tinning a Joint. For brass or copper the same procedure is adopted, except that it is necessary first to tin the surfaces to be united This is accomplished by rubbing with the point of the tinned copper soldering bit and at the salne time flowing on a further supply of solder. The surface is gencrally made smooth and bright by wiping it over with a clean rag while the solder is still hot and molten. This ensures a better ultimate joint, as the two faces can then be brought into more intimate contact
Wrought iron and steel can be soft soldered by first tinning the surfaces: they are, however, more often brazed together, as there are few occasions for the use of soft solder when steel has to he employed, since this metal is used on the grounds of strength. A soft soldered joint is not naturally strong unless the parts to be joined are fitted into one another, or otherwise made secure against external stresses
Sweated Joints. Another mothod of soft soldering is known as sweating, and this does not call for the use of a soldering iron The typical procedure can be illustrated by the case of a brass ferrule forming part of a pipe union for attachment to a gas fitting. The first steps in this case are to clean the surfaces thoroughly and then to tin thein by holding the parts in the flame of a blow lamp; as soon as the metal is hot, apply a trace of flux and press the end of the stick of solder on to the metal It should then flow over the surface and partly adhere. The tinning is completed by wiping the surface with a clean rag

The parts are then placed in position, the flame of the blow lamp directed on to the joint, and the solder melted into place. The end of the joint should be pressed against some suitable object, the heat being concentrated on the outer pait of the joint, remote from the lip, as the solder will always run towards the heat. If the greatest heat is at the inner end where the joint begins, the solder will be more difticult to flow into place. Small jobs can be carried out by using paste solder combined with Hux. Sometimes the objects to be united can be held over the flame of a gas ring, spirit lamp, or Bunsen burner.

Zinc is soldered in the usual way, but with the use of killed spirit as a flux. Aluminium can be soldered, but only with specially prepared solders and a suitable flus There are several proprietary brands on the marliet, and they should be employed exactly as the makers direct Methods of soldering lead are dealt with in this Encyclopcilin under the heading of plumbing.

Hard Soldering To carry out hard soldering, or silver soldering, a blow lamp or blow pipe (Fig. 8) is essential, or some other form of easily controllable heat giving a long clean blue flame. The soldering is effected with silver, the metal being alloyed with a small proportion of brass, to lower the inelting point. Articles made of silver can thus be united with the solder without danger of fusing them This method is used by silversmiths and jewellers, and has the advantage that the joints are particularly strong and durable for small work, being in many respects superior to brazing. There are several tinds of Hus that may be used, but probably the best is borax in lump form, which is reduced to a paste with water by rubling the borax on the surface of a slate. The solder is obtainable in several grades, melting at different temperatures. To use it, the netal is cut into strips of suitable size and fed up to the job while playing on it with the blow-pipe flame or the jet of a blow lamp.

As an example, suppose it is desired to solder in a boiler end to a model boiler, the barrel being formed of seamless tube, as


Soldering. Fig. 8. Implements used in bard soldering. A, bench gas burner. $\mathbf{B}$, holder ior small objects. C, gas blow pipe. D, mouth blow pipe. E, charcoal block
Courlesy of H. W. Hurn d. Co.
described in the article on Enginc. After the The methot of silver soldering jewelry and surfaces of barrel end and disk have been similar objects is somewhat different. The cleaned the boras paste is applied to the joint worker places the articles to be united on a with the point of a small camel-hair brush. charcoal block (Fig. 8, E), or a soldering "wig," One or more of the strips of solder are bent and after applying the borax plays on the around and placed on the borax flux. After this the flame of a blow lampor gas blow pipe is directed on to the work. The clean part of the Hime must be liept on the joint. This is generally a little distance from the tip, at a spot where the inner cone of flame is visible as a slightly different coloured cone. If the dirty part of the Hame is used the work may be oxidized and the result prove a failure. As the metal is heated the borax will froth and turn white and finally melt. Soon the metal will appear to be red hot and the strip of silver will melt and flow around the joint.

The crus of the operation is to make the silver flow properly, and only experience can give the requisite skill to accomplish this. It is largely a matter of correct temperature and correct iosition of the Hame : the metal will always follow the heat of the flame, and can be diawn, as it were, to the desired spot. If the work is at all delayed the flux may all be burned, but this can be remedied by application of a further supply from a spoon made from a piece of thick iron wire beaten to a spoon-like end. If this is placed nenr the Hiame of the blow lamp it will keep hot. and when dipped into the boras some of the latter will adhere, and it can then be conveyed to the desired spot.
When properly made, a silver-soldered joint is nearly as strong as the metal to which it is applied, and for all small work it is preferable to soft solder. 'The resulting scale on the work can the removed by filing and finishing with emery paper.
Should it be desirable to unsolder an article, the sweating process is perhaps the best when it can be carried out, the metal being heated, a small amount of Hux applied, and the parts pulled asunder while the solder is molten. After any soldering process all traces of the flux or soldering acid must he removed by scouring the article in hot soda water or by the use of emery paper.

Some of the appropriate implements for hard soldering are illustrated in Fig. 8. The gas blow pipe ( C ) is used in conjunction with a small bellows of the kind shown on page 502. The gas burner (A) has a swivelling tube: when this is turned at right angles the fiame is reduced to a tiny jet.
oint with a small blow pipe (D). The solder is cut into small picces and placed in position


Solitaire Board, showing the thirty-three boles, arranged in the form of a cross, for the marbles
with a pair of twee\%ers. The jobs are small, of course. and the heating source can be a spirit lamp or a Bunsen burner. The parts to be soldered arc fastened together with binding wire. For quite tiny objects one can use a holding device (Fig. 8, B) consisting of a pait of clips mounted on a rod which is held in the hand or a vice. The clips have universal joints, so that the parts, when gripped by them, can be brought into contact and ire held fast while being soldered.

SOLE : The Fish. A llat fish with firm, white tlesh and an excellent llavour, the sole should be cooliced as soon as possible after it is canght, but in cold weather may be kept for a few days without harm. There are two kinds of sole, known respectively as the lemon and the real sole. The latter is superior in flavour and thercfore dearer. Steaming between two p!ates over a saucepanful of water is the best way of preserving the delicate llavour of fillets of sole. The fillets of the fish should be seasoned with pepper and salt and lemon juice.

Fillet of Sole. To bake fillets of sole, wash them well, removing the white skin, and roll each one into a round. Stand them in a greased pic-dish, add $\frac{1}{2}$ gill mill, and salt and pepper to taste, and place a small piece of butter on each fillet, using about 1 oz in all. Cover the dish with a plate, and bake the fish in a moderately hot oven for about 18 min . In the meantime prepare $1 \frac{1}{2}$ gills white sauce and brown some breadcrumbs. When the fillets are cooked, take them from the oven, roll them in the breaderumbs, and then stand them in a line on a dish. Pour the sauce round and garnish the top of each fillet with a thinly cut slice of lemon.

A nother method of baking sole is described in the following recipe: Skin and fillet a small fish, season it and then fold each fillet in two, doubling the thin end over towards the thick. Lay thein on a baking-tin greased with butter, add a tomato, cut into quirters, then cover the whole with a piece of greasell paper, and bake it for about 8 min . Serve the fish on $a$ hot dish with the picces of tomato placed round it.

Baked fillet of sole may also be served with white sauce to which two hea ped tablespoonfuls of grated cheese have been adderl. Some more grated checse should be sprinkled over the fish after it is cooked and then browned under a gas griller.

Either whole or tilleted, sole may be fried as directed in the article on Fish.

Sole may also be grilled, and a pat of maítre d'hôtel butter is a good garnish. Finely chop 1 teaspoonful parsley, add a squeeze of lemon juice and incorporate with sufficient butter to make a round pat. Place one on cach portion of grilled sole when ready to serve. See Carving; Fish; Lemon Sole: Sauce.

SOLIDAGO. These vigorous herbaceous perennials bear yellow Howers in September and October. They flourish in ordinary soil and are casily increased by divisiou in autumn and spring. The best kinds are Golden Wings, Shortii and canadensis, all about 5 ft . high. Onc, Canadensis nana, is only $2 \frac{1}{2} \mathrm{ft}$. high.

SOLITAIRE. This game for one is played on a circular board containing 33 holes, each made to hold a marble. They are arranged in the form of a cross, each line containing 7, as shown in the illustration. Marbles are placed in the holes, except the centre one, and the object of the player is to remove them one by one until only one is left, and that one in the centre hole. The removing is done by taking one oft the board when another is moved over it into an empty hole beyond, as in draughts. Moves can only be made in a straight line, not diagonally. It is by no means easy for the beginner to succeed in his task, as one false move will leave him with three or more marbles in such positions that they cannot be taken.

SOLOMON'S SEAL. This is an excellent hardy plant for shady places. It grows 3 ft . high and has arching leafy stems bearing


Solomon's Seal. Showing the rows of greenishwhite bell-like flowers which hang from the undersides of the stems
numerous greenish white flowers in May. It sproads rapidly and thrives in ordinary soil. Roots may be potted in autumn and placed in the greenhouse for spring blooming.

SOLO WHIST. This card game, generally known as solo, is played by three or four players with an ordinary pack of 52 cards. If only three play, either one suit entircly is omitted or only three hands are dealt, as the players agrce. The cards are dealt three at a time to each player in turn, and the last round consists of a single card to each player, the final card, the dealer's, heing turned up for trumps.

Each player cither says " I pass " or makes a call. The lowest call is proposal, usually contracted to "prop." A player who props docs so in the belief that his hand is good enough, if backed by a reasonably good ono by annther player, to make 8 tricks in the partnership. Any other player may tako the proposal, pass, or make his own call

The next highest call is solo. This is a call by a player when he undertakes to make at least 5 tricks, playing a lone band against the other three. Above the solo call is misère. When a player makes this call he undertakes to lose every trick, despite every effort on the part of the other three players to make him take $n$ trick. There is no trump suit in the misère call. Above misère comes abundance in any suit except trumps. A player declaring abundance undertakes to take at least 9 tricks, playing a lone hand against the other three. Abundance in trumps calls over abundance in a plain suit.

Above the last call comes open misère. When this call is made a player undertakes to lose every trick, his hand being exposed upon the table after the first trick has been played. The highest call of all is abundance declared, when the player, naming his own trumps, undertakes to win all 13 tricks against the other three players. A player making such a call has the right to lead.

When players are playing prop and take, or prop and cop, as it is more generally known, they may be sitting together or opposite one another, and in those positions they remain. No player may bid after once passing with the exception of eldest hand, who has the privilege of accepting a proposal.

In three-handed solo a player is sometimes allowed to bid a 6-trick solo, in which he names his own trumps and must talie at least 6 tricks. Except in abundance declared eldest hand leads and players should follow suit. If not, a player may discard or truinp. The winner of each trick leads for the next. See Whist

## Somnambulism. See Sleepwalking.

SOOT. In summer, when fires are infre quent, soot accumulates only in small quantitics, but in winter it forms a thick coating inside the chimney and it is most important to have it thoroughly swept and to arrange for the periodical visits of a sweep.
Garden Uses. Soot which has been exposed to the air for a few weeks is an excellent fertilizer for plants and may be scattered on the soil round about them. If placed in a bag suspended in a barrel of water soot makes a useful liquid manure for ferns, chrysanthemums and other pot plants. Fresh soot cither alone or mixed with lime is a good soil insecticide; it should be forked in the ground, not left on the surface.
SOOTHING SYRUP. The practice of dosing fractious and restless children with soothing syrups, soothing powders, and similar preparations is strongly to be deprecatited. It may malie things easier for the nother or nurse, but this may be at the expense of the child's welfire. If a dose of castor oil, or some other simple purgative, does not improve the child's temper, consplt a doctor. See Aperient; Child; Teeth


Sorrel. Hardy evergreen shrub ranch used in
SOPHRO-CATTLEYA. This name is given to a bigeneric orchid raised by crossbrceding hetween Sophronitis granditlora and cattleya. It Howers during winter, and may be grown in well-drained pots, or hang. ing baskets. The cultural requirements of sophro-cattleya aro very much the same as for cattleyas. See Orchid.
SOPHRONITIS. This is a small group of dwarf-growing evergreen orchids. The favourite is grandiflora with orange-scarlet blooms: it should be grown in pans or baskets suspended frow the roof of the intermediate house. Sophronitis needs a mixture of peat, moss, and charcoal, and flourishes in a temperature which may vary from $55^{\circ}$ to $70^{\circ}$, according to the season of the ycar. See Orchid.

SORBET. This is a water ice flavoured with fruit and liqueur. General dircetions for the making of water ices and the serving of sorbets will be found in the article on ices (q.v.).

Sore Throat. Sce Laryngitis: Pharyng. itis; Throat: Tonsillitis.

SORREL : The Herb. The leaves of this herb are used as an ingredient of salars and soups. Seed should be sown in March in drills 6 in . apart, and the rows thinned out during the following month. The name sorrel is frequently applied to species of the genus Oxnlis. See Oralis; Spinach

Use in Cookery. Sorrel is used in cookery chiefly for a soup and a purée, the purée being employed as a means of dishing and also as a garnish for entrées. It is especially suitable for serving with lamb, veal, or swectbreads, and also as a garnish for poached eggs in place of spinach.

Sorrel must always he thoroughly cleansed, and it is better to use a hair sieve for making it into purée. Soda should never be put with sorrel when cooking it, on account of the acid contained in tho leaves.
Sorrel Purée. To make the purée, pick and wash 2 lb . of sorrel and boil it in about $\frac{1}{2}$ pint of water until quite soft, then drain it on a hair sieve until all the water is out of it. Clean the stewpan in which it was cooked, dry it and melt in it $1 \frac{1}{2} \mathrm{oz}$. of butter. In this
fry to a light brown 1 pecled and sliced onion, then add 1 oz. of Hour, 1 dessertspoonfui of brown sugar, and $\frac{1}{}$ tesspoonful of grated nutmeg. Stir all together for 2 or 3 min ., then put in the sorrel and $1 \frac{1}{2}$ gills of brown sauce. Season well and pass through a hair aicve.

Sorrel Soup. Sorrel soup may be made as a clear vegetable soup or it may be thickened by mixing in the yolks of 2 or 3 eggs to each quart of soup. If it is to be serred as a vegetarian soup water must be substituted for stock. For the thin soup clean and shred line 2 lb . sorrel, the best part of a large lettuce, 12 sprigs chervil, and 4 or 5 sprigs parsley. Sauté these in 2 oz. butter in a stewpan, then add 2 pints well flavoured rich clar stock, : lumps sugar, and scasoning to taste. Boil up and simnice for 20 min ., then clear the soup of fat, pour it into a soup tureen and serve with dice of fried bread.

For the thickencd soup proceed as for thin soup, but when the whole is boiling, whisk up 2 or 3 yolks of eggs and add to them by degrees about pint of the liquor of the soup. Stir theso till all is just ready to serve, then draw the pan back from the fire and stir in the thick. ening. Cook for 2 or 3 min . without allowing the soup to come to the hoil, then add a good s)ice of fresh butter, stir this in and serve.

Souchong Tea. Souchong is a black China tea of a fine flavour suitable for everyday consumption or for blending. See Tea.

SOUFFLE. The meaning of this word is something puffed or blown up, and in cookery this condition is obtained through using the stiffly whipped whites of coggs and preparing the ingredients in such a manner that they rise upward nas soon as the heat penctrates them. Baking powder is never aclded to give lightnces, success depending on skill in preparation and the beating of the eggs. The delicacy of a soufflé renders it a most wholesome and favourite dish, and one which may be safely offered to invalids.

A souffé is cooked directly it is mixed and served immediately before it has time to sink, It may be baked, in which case the oven must be cxactly of the right moderate heat and kept at a steady temperature during the process of cooking; or it may be stcamed, in which case the water must be boiling in the saucepan before the souffé tin is placed in it. Bakerl souftés are served in the dishes in which they are cooked.

Befors: serving a steancel souffé it is usually turned out on to a dish from the tin mould with straight sides in which it has been cooked. Tbe mould is prepared by brushing it over with pure salad oil or clarificl butter. A double band of white kitchen paper deep enough to stand 3 or 4 inches above the lop of the mould arid long enough to fold right round and overlap should be also greased and tied round the outside of the mould. A round of paper is then greased ready to cover the top. The soufté mixture should only fill three parts of the mould to allow for rising. The mould is then put in a pan of boiling water. Sce that the water only reaches half-way up tin.

For baked souftlés lireproof earthenware chinn or glass souffé dishes are used. Oven table glass ware is an aid when making a soufflé, as the process of baking can be clearly seen. When serving, lireproof dishes are placed on another dish covered with a paper duily, unless the souffle dish is provided with a plated or silver frame. Individual soufflés are balied and served in small paper or china cases. Any dishes or cases used must be first well greased. When threc piarts tilled with a soufté mixture, they are placed on a baking-tin and cooked until well risen and firni. Aroid any unnecessary opening of the oven door, as a sudden draught of air inight cause the souffé to sink. It should never be
left in either steamer or Laking dish after jt has finished cooking.

Swect fla vourings are added for light souffie puddings, while cheese or fish, game and white meats make this quickly cooked disb into a savoury, a light luncheon course, or entréc. The main ingredients consist of four, milk or stock, and new-lnid eggs. Any fish or meat used should be firsit pourided and passed through a sicve. Checse should be grated. Fruit is not very suitable for sweet souffé making, the best flavours being chocolate, vanilla, colfee, almond or a dclicate essenoc. Swoet souffés may be steamed or baked, cheesc souffés are baked, while fish and meat souffćs are steamed.

Cheese Souffé Melt 1 oz . butter in a saucopan over the fire, stir in $\frac{1}{2}$ oz. flour, and when the mixture is smooth add 1 gill milk, stirring the whole over a gentle heat until it thickens. Then take the pan from The fire and mix in $2 \frac{1}{2}$ oz. grated cheese. When the mixture is slightly cooled stir in, one at a time, the yolks of 2 cggs . Season the mixture to taste, afterwards folding in lightly the stiffly whipped whites of 3 eggs. Hall fill a greased and fireproof soufflé dish with the mixture, and bake it in a quick oven for 10 or 12 min . Sprinkle about 2 teaspoonfuls grated checse over the top of the souffle, and serve it immediateiy.

Chicken Souffle. Make this by laking the Hesh from a chicken and, after removing the skin and gristle, cutting it into amal| pieces and pounding them well in a mortar. Season them with salt, pepper, and a grating of nutmeg, and add $1 \frac{t}{2}$ gills good white sauce and the yolls of an egg before passing the mixţure through a fine wire sieve into a clean basin. Then work in lightly, but thoroughly, $1 \frac{1}{2}$ gills cream, partially whipped, and the stiffly whisked whites of 2 eggs, pour into a preparod souffé tin, and steam gently for about 50 min . Let the souffle stand for a minute to shrink slightly, then remove the paper from the tin and turn out on to a hot dish. Serve at once with béchamel sauce. Game or rabbit can be used for this souffé in place of chicken.

Chocolate Souffle. This souffé can be made from $\ddagger \mathrm{lb}$. breadcrumbs 2 oz . sugar, 1 oz . grated chocolate, 1 pint milk, $\frac{1}{2}$ oz. butter, and 2 eggs. Boil the milk, chocolate and sugar together, then add the breadcrumbs and butter and stand the mixture in a cool place. When it is cool, add a few drops of vanilla essence and the yolks of the eggs, afterwards stirring in the whites, whipped to a stiff froth. Pour the whole into a well-greased glass or other fireproof souffé dish, and bake it for 20 min . in a moderate oven until it is of a golden brown tint.

Fish Souffle. To make this soufflé melt 2 oz. butter in a saucepan, stir in the same quantity of flour, and mix them together over the fife for a few minutes. Then add 1 gill milk or fish stock and stir until the sauce thickens. Put it into a nortar with $\frac{1}{2} \mathrm{lb}$, of any white fish and pound them well together, adding 3 eggs, one by one. Scason the inixture carcfully, rub it through a sieve, and mix it with 1 gill whipped cream. Put it into a prepared souffé tin and stearm for


Fish Souffé. Dish made from any white fish
$\$$ hour, then ccat it with some good white sauoe and decorate top with chopped parsley.

Lemon Soufflé. This sweet soufflé may be stenmed. It is made by rubbing together a heaped tablespoonful of castor sugar and the grated rind of a lemon. Nolt a lump of butler about the size of a len's egg in a small pan over the fire, add a heaped tablespoonful of llour, and mix the two smoothly. Cool them for a few minutes, taking care that they do not brown; then pour in a gill of milk and stir the whole over the fire until it leaves the sides of the pan. Move the lattor to the side of the fire, add the sugar and rind, and a little lemon juice, and then beat in separately the yolks of 3 cgge. Whisk the whites of 4 eggs , together with a pinch of salt, to a stiff fpoth and stir them into the mixture, blending the two well together.

Have ready a prepared souffic tin, and decorate the bottom of it with halved glace cherries. Pour the mixture in and cover it with anotber picce of greased paper. Plaoe the tin in a pan of boiling water and steam the souffé for about $\frac{1}{2}$ hour, or until it is wel! risen and firm to the louch; then turn it on to a hot dish and serve it with lemon sauce. Orange may be used to flavour the souffé and sauce instead of lemon.
Liqueur Souffé. Any kind of liqueur can be used to Havour this souffé. Mako it by melting a lump of butter rather smaller than a hen's cgg and then mixing in a wellheaped tablespoonful of flour. Stir the two over the fire until they are smooth, but do not let them brown. Pour in 1 gill milk; continue stirring for a fow minutes, and draw the pan to the side of the fire before beating in separately the yolks of 2 eggs.

Add 1 tablespoonful castor sugar, a pinch of salt, and enough liqueur to flavour the whole to taste. Just before turning the mixture into a greased soufflé dish, stir in the stiffly beaten whites of egg. Place the dish in a tin of hot water in the oven and cook the souffle until it is frm and risen. If a sweet sauce is served, it may be Havoured with the same liqueur as that used for the souffle itself,

Oyster Souffé. To make this souffé, blanch and beard a dozen oysters and cut ench into threc or four pieces. Melt 1 qz . butter in a stewpan, stir in smoothly 2 oz. flour, and mix then well together over the fire. Pour in 1 gill ovster liquor, and stir the whole until the Hour loses its raw flavour and the sauce thickens. Talse the skin and bones from $\frac{1}{2} \mathrm{lb}$. whiting, then put it into a mortar with the sauce and pound the two together, adding


Oyster Souftle, coated with white sauce, and decorated with half slices of lemon
the yolks of 3 eggs, one by one, and salt, pepper, and cayenne to taste.
lub the mixture through a hair sieve, then stir into it the oysters and the stiffly whipped whites of 4 eggs. Pour the mixture into the prepared souffé tin, and steam it gently for about $\frac{1}{2}$ hour, or until it feels firm. Serye it with a good white sauce poured over it, and garnish it with lines of finely chopped parsley or slices of lemon.
Potato Souffé. To make this dish, rub $1 \frac{1}{2} \mathrm{Jb}$. cooked potatoes through a sieve, add to them loz. butter, previously inelted in a pan, and put in also 2 tablespoonfuls milk, the yolks of 2 eggs, and scasoning to taste. Mix these well, then take the pan from the fire and stir in lightly the stiffly whisked whites.
Turn the whole into a prepared soufflé mould and steam the soufflé for about 40 min. in a saucepan containing enough hoiling water to reach half-way up the mould. Turn it on to a hot dish, pour some white sauce over it, and garnish it with chopped parsley or the yolls of a hard-boiled egg rubbed through a sieve. If preferred, the soufflé can be baked in a china souffle dish in a moderate oven for about $\frac{1}{2}$ hour.

Rice Souffé. An excellent rice soufflé can be made by washing $\frac{1}{4}$ b. rice and boiling it in 1 pint milk to which has been added 6 oz. butter, and the same quantity of sugar. When these are cool, stir in the yolks of 4 eggs and add a little vanilla essence. Whisk the whites of the eggs very stiffly, then fold lightly into the rice, and pour the whole into a well-buttered mould decorated with angelica and cherries. Steam the souffle gently for about $\frac{3}{4}$ hour, and serve it with jam sauce. See Eggs; Egg Whisk; Entrée; Fireproof Ware; Ham ; Mould; Omelette; Sauce.

Sound Box. See Gramophune.

## Soups: Clear and THICK KINDS

## Many Recipes for the Staple Itcm of the Dinner Menu

This contribution, which describes the making of various kinds of soup, may be read in connexiopn with the articles on Dinncr; Luncheon; Supper. See also the entries on Artichoke Soup; Beef Tea; Browning; Clarifying; Croûton ; Menu; Mutton ; Sauces; Scotch Broth; Stozk, etc.

Soup is prepared by boiling meat or vegetables with water. It may be thickened by the aid of starchy substances or the admixture of beaten eggs. It precedes the fish and meat courses at meals.

To make nourishing soups good stock is essential and directions for preparing the various kinds are given in the artiole on stock, Directions for browning or caramel used for colouring soups are given in page 155, and for making roux to thicken brown and white soup in the article on Sauces. Soups may be divided into five classes: Clear Soups, Broths, Thick Soups, Purées, Vegetarian Soups.

Clear Soups. Clear soup or consommé is prepared from first stock, and if that is ready and made according to the rules laid down, all that is necessary is to provide extra seasoning, and a garnish.

The foundation of clear soup is always the same, the various names given to it on a menu
being merely dictated by the garnish. Spring soup, for instance, is clear brown stock gar-
nished with delicate spring vegetables, in cluding asparagus points, green peas, forced French beans, or new carrots, the two latte cut small.
A good clear soup is made by the addition to any clear stock of minced beef and vege. tables. An onion and a carrot, cut into small pieces, should be allowed to $\frac{1}{2} \mathrm{lb}$. beef and 4 pints stock. These should all be put into a saucepan, with 1 or 2 peppercorns, a sprig of mixed herbs (parsley, marjoram, and thyme), and the white of 1 egg. The soup should be whisked over the fire until frothy. After it has boiled it is left to simmer for about 30 min ., then strained through a scalded teacloth.

Consommé royal is made from brown stock with the addition of a savoury custard, cut into fancy shapes. To make the custard, 1 egg is allowed to 1 tablespoonful milk or white
slock 'The egg is beaten with satt and pepper to taste, and stirred into the hot milk or stock The custard is then stenmed in a small greased basin for about 15 min . and allowed to cool When it is cold the custard should be sliced with a knife which has been dipped in hot "ater, and then atamped into fancy shapes. These should be placed in the soup turcen and the boiling consommé poured over

Clear soup can be garnished with cooked regetables, shredded very finely, or with cooked vermicelli or macaroni, or small force ment balls fried and well drained
Julienne Soup. This favourite clear soup is made by the addition to 3 pints of clear brown stock of 1 carrot, 1 onion, $\frac{1}{2}$ large turnip, 1 strip celery, 1 tablespoonful green peas (cooked), pep per, salt, $\frac{1}{2}$ oz. butter. The prepared vegetables are cut into fine strips like matches. Melt the butter in a saucepan and fry the vegetables in this with the seasoning for a few minutes shaking thein to prevent them from scorching Drain them from the butter, add them to the hot stock, simmer for 30 min . keep wel skimmed. The vegetables may be parboiled in salted water instead of frying in butter if preferred before simmering in the stock till quite tender. French beans, cooked and cut into thin strips, may be added instead of or with the peas.

Paysanne Soup. This clear vegetable soup is made by cutting into thin rounds about the size of a sixpenny-picce a carrot, a turnip; 2 leeks and a stick of celery. Fry these lightly in a saucepan containing a little butter; then add a pint of chicken or veal consonmé, and let the whole cook gently until the vegetables are tender. Just before serving, remove any scum that may have risen to the surface, and add a little chervil.

Broths. For this class of soups the stock is usually made by saving the liquor from meats boiled whole for table. The liquor should be strained through a hair or tammy sieve, akimmed frec from fat and well seasoned. It is generally thickened with rice or pearl barley and a few fresh vegetables cut small and cooked in it. At the finish a small quantity of chopped parsley may be added. Sheep's head broth, mutton broth, Scotch broth or veal or chicken broth are some of the varieties of this description of soup or bouillon. Boil some vegetables in the liquor while cooking the meat to flavour the broth.
Pot au Feu. Pot au feu is the name given to the French national broth. To prepare it, put 1 lb . brisket of beef in a large saucepan with 2 quarts water, bring the latter to the boil, reniove all scum from the top, and add salt to taste. Simmer all for $\frac{1}{2}$ hour, and in the meantime prepare 2 carrots, 2 leeks, 3 sticks of celery, a cabbage, 2 turnips, and a parsnip

Cut the cabbage into tivo, tying the halves together, and peel and slice an onion. Cut up the carrots, turnips, parsnips, lecks, and celery, using only the white portion of the two lastnamed, and at the end of the $\frac{1}{2}$ hour add them to the soup, together with the onion, cabbage, 10 peppercorns, and a bunch of herbs. Simmer the whole with the lid on the pan for $1 \frac{1}{2}$ hours, then strain the soup and slim off the fat from the top. The soup should then be served in a hot tureen. This broth is often termed Croutte-au-pot when French bread is cut into thin slices and placed in the tureen just before serving, the meat and vegetables being served as a separate course at another meal.
Veal Bouillon. Take 2 lb . scrag of veal and cut it into small pieces. Then put them into a saucepan with 1 quart boiling water and $1 \frac{1}{2}$ oz. of well-washed rice, boil up, and simmer gently for an hour Add an onion, carrot, and 3 sticks celery cut in neat pieces. Cook until these are soft, and just before serving sprinkle in two tablespoonfuls of picked ehervil. Skim and remove all fat before adding the chervil to it.

Thick Soups. These may be cither white or brown according to the white or brown roux employed to thicken them, or to the nature of the stock used. Thick brown soups should be made with good stock and Hlavoured with vege table They may be thickencd either with a brown roux, or with rice. If rice is used as a thickening it should be cooked previously and boiled up in the soup.

All brown soups should possess a rich deep brown colour, whether made thick or thin To improve the appearance of the soup it may be necessary to add a little browning, but this should be done with discretion.

In making either white or brown thick soups the quantities required for thickening are im portant, and the following may be noted From 1 to $1 \frac{1}{2}$ oz. flour will thicken 1 quart liquor About 2 tablespoonfuls rice, etc., should be allowed to 1 quart stock and 2 to 3 eggs and 1 gill cream will make a sufficient thickening for about 2 or 3 pints of white soup. When eggs are addcd as a thickening, the soup must only be simmered and not allowed to boil up again, or the eggs will curdle.

The garnish for thick soups should not be neglected. If vegetables are to be used they must be neatly cut and freshly boiled. If no vegetable cutter is available the roots may be shred or shaped evenly in dice. Small picces of carrot take about 7 min . to boil. turnip 5 min .

Chicken Soup. A nourishing thickened white soup is made by cutting up an old chicken into small picces, and putting the whole, together with the bones, into a suucepan containing enough cold water to cover it. Bring the bird slowly to the boil, skim the stock well, and add a carrot, a leek, two small sticks of celery all cut into small picces, a bunch of mixed herbs, and $\frac{1}{2}$ teaspoonful salt. Simmer the soup for about 5 hours, remove all traces of scum, and then strain through a fine sieve. Let the liquor stand in a hasin till it becomes cold, then pound some of the chicken meat in a mortar, moisten it with a little stock, and rub it through a sieve. Make a smooth white roux by melting a small lump of butter in a saucepan and mixing with it $\frac{1}{2}$ oz. flour, then add the liquor and pounded meat, and boil up the whole. Finally add $1 \frac{1}{2}$ gills boiled milk and seasoning, and serve.

Giblet Soup. To make this thickened brown soup the giblets of a goose or turkey, or of a couple of clickens or ducks, are needed Cleanse and cut them into small pieces; then melt 1 oz. butter in a saucepan, add the giblets. together with 1 lb . lean beef, and a small onion $\frac{1}{2}$ a carrot, and a stick of celery, all cut into small pieces. Fry all these a pale brown, then add 3 pints stock or water, a bunch of parsley and mixed herbs, and salt and pepper to taste. Bring the soup to the boil, skim it well, then put the lid on the pan and let its contents cook gently for about 2 hours.

The giblets, etc., may then be strained out and the liquid poured into a clean sauccpan. Mix $\frac{1}{2}$ oz. flour smoothly with the butter in which the vegetables were fricd, brown and add half a glass of sherry or a little cold brown stock, ald it to the soup, and hoil up the whole. Put in 2 or 3 in . of coolied macaroni cut into thin rings, and stir it over the fire for a few minutes. Before serving the soup add more seasoning if desired.

Macaroni Soup. Boil 1 quart white stock, then add to it 2 oz. cooked nuacaroni and simmer for $5^{5} \mathrm{inin}$. Mix together the yoll: of an egg and 1 gill unsweetencd condensed milk, and add 2 tablespoonfuls grated cheesc. Take the pan containing the macaroni away from the fire before adding the egg mixture, and then stir all over a gentle heat until the soup thickens. Season to taste, add 1 dessertspoonful of chopped parsley, serve with sippets of toast and then hand round grated cheese.

Mulligatawny Soup. To make this thick brown soup, fry 1 carrot, 3 onions, cut small, with a head of celery cut into dice, in 4 oz . fat or butter until the onion begins to look clear then add 2 tablespoonfuls curry powder and the same of flour. Fry all till the onions brown then stir in by degrees 2 quarts good stock. Let all simmer till the scum has risen well and the vegetables are quite soft.

Pass the soup through a hair sieve, return it to the saucepan, adding a dessertspoonful of curry pastc and scasoning to taste. Squecze in a little lemon juice. The curry paste should be rubbed smooth with some of the liquor and dissolved before being added to the soup. Rice should be handed round with it

Mushroom Soup. A quart of bone stock and lb . each of ox lidney and mushrooms are needed to make this brown soup. Cut the kidney into small pieces and roll them in Hour, mixed with a little pepper and salt. Melt 1 oz butter in a saucepan and fry the mushrooms, pecled and cut into small pieces. Add the kidney and the stock, and simmer for about 2 hours. Make a brown roux from a tablespoonful of Hour stirred into a tablespoontul of melted butter and thicken the soup with this. Bring it just to the boil and serve it very hot.
Tripe Soup. For this white soup take $\frac{1}{2} \mathrm{lb}$. tripe, a turnip, a carrot, 3 onions, 2 table spoonfuls cornflour, $\frac{1}{2}$ pint milk, 3 pints water and a little sweet herbs, parsley, salt and pepper. Scald the tripe in boiling water and then cut it intosmall pieces. Having prepared and sliced the vegetables, put them in a saucepan with the tripe and water and simmer them for $1 \frac{1}{2}$ hours. Mix the cornflour to a paste with a little cold milk, add to the soup, and stir all well together. Just before serving add the rest of the milk, the herbs. parsley, salt and pepper, and serve the soup hot with croûtons of fried bread.
Turkey Soup. This soup provides an excellent method of using up any cold cooked turkey. To make it, cut up the remains into small pieces and put these, together with the chopped bones, into a stewpan. Add a bouquet garni and a small blade of mace, a sinall pecled onion, 2 quarts white stock or milk and water mised in equal proportions, and scasoning to taste. Put the lid on the pan, simmer its contents gently for about 3 hours, then strain the soup, and after rinsing out the pan pour it back again. Mix $1 \frac{1}{2}$ oz. ground rice smoothly with a little cold milk, stir it gradually into the soup, then bring the latter to the boil and let it boil gently for about 10 min . Have ready 2 oz. fieshly boiled macaroni or spaghetti, cut it into short lengths, and heat it up in the soup before serving.

Purées. This class of soups is made by rubbing the meat, fish, vegetables, etc., through a sieve after cooking. For vegetable purées, beans, carrots, pens, artichokes, potatocs, chestnuts, tomatocs, or celery are used. These are prepared and, if necessary, cut in small pieces. They are then tossed in butter for a few minutes and cooked in boiling stock. When done they are passcd with the liquor through a sieve, then returned to the stewpan, boiled up, seasoncd, and scrved in a tureen, with dice of fried bread handed round
Vegetable purces are often white no when potatocs or artichokes are used. White stock must then be added instead of second brown stock and a small quantity of milk or creain must be boiled with them when finishing the soup in order to blanch it. White soup.s usually are scasoned still further with a dash of mace or nutineg.

Carrot purce should be an orange colour and only the red pirts of the carrot be used for it. Green pea soup nay be made with second stock, and an economical version of it can be prepared by cutting up the pea shucks and adding them with the peas to the liquor, increasing the amount of stock in proportion to
the quantity of shucks. The shucks will hoil quite tender if the peas are young, and the flavour after the vegetables have been passed through the sieve will be found excellent. A bout 2 lb . fresh vegetables to 3 pints liquor is the arerage.

Dricd pulse vegetables make good and nourishing soups, and water may in all cases be substituted for stock. The pulse is soaked overnight, then washed and picked. It should be stirred. with a few fresh vegetables to give it flavour, notably onions, in butter or fat for a fow minutes over the fire; the water is then added cold, and the whole boiled up together and cooked until the pulse is perfectly soft. The soup should be passed through a wire sieve or colander, and afterwards returned to the saucepan in which it was boiled, well seasoned and thoroughly heated ready for serving.
A bacon bone or one or two rashers are often added to lentil soup. The bone is removed before the soup is sieved, but the rashers, if minced small. will pass through the sieve with the lentils. To pea soup ham or bacon bones are sometimes added and boiled with the peas; they must be removed as soon as the peas are soft enough to sieve. For soup made from split peas it is better to use the liquor from salt beef after it has been boiled, but first ascertain that it is not over-salted. The liquor from any boiled nieat may be used, or a weak stock. Plenty of fresh vegetables must in. variably be cooked with dried pulse to give the right Havour.

Haricot beans make an excellent white soup, but only celery and onions are suitable for adding as a vegetable flavouring. This soup should be finished with a small quantity of milk. The amount of pulse required for each quart of water is about $\frac{1}{2}$ pint ; $\frac{1}{2}$ pint milk is the usual quantity for finishing 1 quart white soup. Fish puree is made with fish stock, thickened with white roux, seasoned and linished with milk or cream. The fish is cut up and flaked, all bones and skin removed. cooked in stock till tender, and then passed through a sieve before adding the cream.

Parmentier Soup. A good creamy potato purée can be made by slicing 3 large potatoes and the white part of 3 medium sized lecks, frying them lightly in a saucepan containing 1 oz. butter, and then adding 1 pint veal or chicken stock. Cook the whole gently until the potato is tender; then rub it through a fine sieve. Reboil it, and before serving add scasoning to taste, 1 gill cream, 1 oz . butter, and a little chervil.

Parsnip Purée. The ingredients consist of 1 pint milk, 1 quart bone stock, 4 parsnips. 1 onion, 2 sticks celery, Hour and scasoning. Clean and slice the vegetables, fry them in dripping, and then add the stock: Let the whole simmer until the vegetables are tender, then rub them through a wire sieve and return the pure to the stewpan. Add the milk, seasoning, and the flour mixed smoothly with a little nilk, and cook the soup for about 5 min Serve it with croutors of fried bread.

Sp:nach Soup Cook the spinach, make it into a purce, then stir it in butter for $\mathbf{i} \mathrm{m}$ min and add boiling white stock and a little cream The quantities required are 2 lb . spinach, 13 pints stock, 2 oz. butter, it gills cream. Fla vour with lemon and nutmeg, and add the stock to the purce by degrees.

Tomato Purée. Trim and wash three !ceks, holding them under running water so as to rid the inner leaves of grit, then cut them into small pieces, and fry them gently without browning them for a fow minutes in a pan containing loz. fat.

Add to them $\frac{3}{4} \mathrm{lb}$. tomatoes previously wiped and cut into quarters: fry these also until they are tender, and then pour over them $1!$ pints stock. A bunch of mixed herbs should
a lso be added, and the whole boiled up rapidly Then season it to taste, and after cooking it slowly for abour $\frac{3}{4}$ hour rub it through a fine sieve.
In the meantime rinse out the saucepan, then pour the soup back, add a teaspoonful milk, and reheat the whole. Just before serving the soup add a lump of butter a bout: the size of a hen's egg, and, if necessary, a little more seasoning.

Vegetarian Soups. The recipes for the pulse soups given may be adapted for vegetarian soups by using vegetable stock, milk and water or milk in place of meat stock. For other vegetable soups the vegetables are cut thin, fried in butter as for a purée, before adding the liquor Onion soup and leek soup should he thickencd with white roux. For white soups the vegetables must only be stirred long enough for the butter to be absorbed if the soup is to be brown they must be well fried. After they have been cooked in the butter, they are boiled and passed through a sicve. Onions, leeks, and a touch of garlic are necessary for these soups to increase the flavour. They are seldoin thickened except with dried or baked pieces of bread.

Another class of white vegetable soup is made by shredding lettuce, the hearts of spring cabbages, cucumber, spring onions, and various salad herbs. These shreds are stirred in butter for 8 min . without colouring them They are then moistened with regetable stock, a little nutmeg is added, also seasoning, boiled up and simmered for 15 min . Just before serving the soup is thickened with a liaison of eggs and cream. Bomne femme soup is made much like the foregoing; 4 lettuces, 1 cabbage. and a good handful of salad herbs being required. and about 3 pints vegetable stock and 2 oz . butter.

Vegetable Bouillon. A purely vegetarian broth is made from the following vegetables prepared, cut up into small pieces and placed in 4 quarts boiling water to make 2 quarts soup after simmering for 4 hours: 8 oz . carrots, $1_{2}^{\frac{1}{2}} \mathrm{oz}$. haricot beans, $\frac{1}{2} \mathrm{oz}$. lentils, 4 oz potatocs, 4 oz . turnips, 3 oz . leeks or onions. Add salt to taste.

SOUR MILK : Medical Uses. Poisonous substances resulting from the putrefaction of protein food in the bowe! have been blamed for eausing or aggravating various disorders, such as acne, boils, cczenia, enteritis, neurasthenia, and arterio-sclerosis. It is often attempted by the use of soured milk to diminish or prevent this auto-intoxication. The lactic acid bacilli contained in sour milk multiply in the bowel at the expense of the putrefactive bacteria. A pint of soured milk is taken daily, in two or three portions, at meals, or preferably between meals. Thi soured milk is taken for threc wecks at a time, and should be persevered with even if constipation ensucs, which it frequently does.

Ordinary buttermill: is sometimes used, but milk artificially soured by the Bulgarian bacil lus is better, as this bacillus appears to be more active and more resistant than the ordinary lactic acid bacillus found in but termilk. Solid and liquid preparations containing the Bulgarian bacillus are on
the market, but it is better to use the products of a good dairy, when these can be had. It is very important, when undergoing the treatment, to avoid meat extracts of all kinds, white of egg, fat meat, and high game, as these form a good food for the putrefactive bacteria which it is desired to destroy.
 flour, $\frac{1}{2}$ teaspoonful cream of tartar, $\&$ pint sour milk, $\frac{1}{2}$ teaspoonful bicarbonate sodn, 1 teaspoonful golden syrup. Add salt to flour, then mix in all dry ingredients. Add the syrup to the sour milk, pour into flour, etc., and mix lightly. Turn on to a floured board, and knead quickly until smooth. Roll out into a round $\frac{1}{4} \mathrm{in}$. thick, divide into four or six pieces, and cook in a hot oven or on a girdle until well risen and browned. The cones should be scrved hot.
Sour Milk Cheese. Allow the milk to become very thick and curdled, then put the solid curds in a piece of clean muslin. Tie this up and suspend it on a hook in a cool place wherc all the moisture can drip from it When it is dry and crumbly take the bag and dip it quickly into boiling water. Do not let it stay in the water more than a minute or so. Let it dry again, then put the curds in a basin and beat up with salt and pepper to taste. Press into a mould or make into a pat, and cover with greaseproof paper. The cheese will keep several days in a cool place. See Milk.
SOUTHDOWN MUTTON. A fine special breed of sheep fed on the Sussex downs is noted for the quality of its meat, which is known as Southdown mutton. A leg of this mutton, in particular, is considered a delicacy, but the chops and cutlets are also estcemed. See Mutton.

SOUTHERNWOOD. This is a shrubby plant. Artemisia abrotanum, which grows 3 ft . high and bears fragrant greyish leaves and yellow flowers in late summer. It flourishes best in light or well-drained soil and is increased by cuttings in a frame in August. Other names for this plant arc lad's love and old man.

SOWING: Of Garden Seeds. The commonest crrors made in sowing sced are to sow too thickly or too deeply, and to allow insuffi cient drainage to sceds sown in pots, pans, and other receptacles. As to depth of sowing. it is a good practice to cover seeds about twice their own depth

Vegetables as a general rule are best sown in drills shaped like a $V$ to the desired depth by means of a hoc, but in the case of beans and


Sowing. 1. Home-made drill rake. 2. Drills drawn and labelled. 3. Triangular drill. 4. Flat drill for beans, peas, etc. 5. Economical group sowing. G. Seedbox with klass covering. 7. Drainage holes for same. 8, Seed-bozes and pots in frame. 8. Pot prepared for sowing : $a$, crocks ; $b$, soil flbre $; c$, chopped turi : $d$. good soil ; $e$, fine soil and sand. io. Soot sprinkiler
pens it should be fint or saucer-shnped, as pictured. Always use $n$ tnut garden line when chopping out or drawing drills, to cnaure straightness. Sufficient seed should be placed to provide good rows, an old garden maxim being one for pests, one for the weather, and one for the harvest crop.
The following quantitics, in portions of ounces or pints, will be found ample for goorl rows of vegetables 100 ft . long: Broad bcans, French beans, and scarlet runners, $\frac{1}{2}$ pint; broccoli, Brussels sprouts, cabbage, cauli. llower, leek, kale lettuce, onion, savoy and turnip, $\ddagger$ oz. ; carrot, parsnip, radish, and swede, $\frac{1}{2} \mathrm{oz}$; beet chervil, and spinach, 1 oz ; peas, 1 pint

Hardy annuals are usually sown out of doors in March and April where they are to bloom in summer; many may be sown in August-September to provide late spring and early sumner flowers. Biennials, e.g. sweet william and Canterbury hell, are sown in May; hardy perennials under glass in spring or out of doors in early summer. See Frame; Hotbed; Propagation; Seed.

SOY. This sauce is usually bought ready prepared. Its chicf ingredient is the soya bean, which is imported from China, Jnpan and Manchuria. Japanese soy, made from soya beans, coarsc barley meal and salt in equal weight, is usually the most popular. It should be brown in colour, of a thick consistency and clear. Chinese soy contains varying amounts of sugar, mace, ginger and pepper, and has a sweet. treacly flavour. Japanese soy is largely used in the mnking of store sauces. See Sauce.
SPADE. There are several varieties of spade, and many fancy shapes, but the one with the simple, broad, straight edge is the


Spade. Correct position in which to hold the spade before thrasting it into the earth
best for general purposes in the garden. The handle grip usually fitted is of the type known as the eye handle, and is strengthened with a rivet through the gripped part. Another type (illustrated in use) is T-shaped, having a short length of rounded wood attached at its centre to the end of the handle.
Much labour is wasted in digging if the spade is not properly used. The spade should be held nearly vertically over the ground where it is slesired to dig, the left hand being a good way down the handle. The right hand grips the end of the handle. A sudden downward
motion follows this. Having pushed the spade as far as possible into the soil with this downward thrust, the right foot is planted on the blade on the right side of the handle. The


Spaniel. Field spaniel, the well-known sporting dog. Above, silky-coated Blenheim toy spaniel
sink the blade still lower into the ground. Using the unbroken ground at the back of the opade as a fulcrum, the carth is prized up on to the blade of the spade by a downward and backward movement of the right hand. If this operation is found very difficult the earth may be loosened by noving the spade backward nnd forward before attempting to prize the mass. To turn the carth over or to thirow it to any desired place, the left hand is used for raising the blade end of the spade. The last operation consists of turning over the earth, the spade being tilted over to the left to frec it from the earth. See Dibler ; Digging.

SPAGHETTI. A particularly fine make of macaroni, spaghetti is casily digested and can be given with safety to invalids.
Savoury Spaghetti. To prepare savoury spaghetti melt 1 oz . butter in a sauccpan, nnd fry in it for a few minutes 1 lb . sliced tomatoce and a peeled and sliced onion. Then add $\frac{1}{2}$ pint stock and $\ddagger$ teaspoonful of mixed herbs tied in muslin; bring the whole to the boil, adding seasoning to taste, and then simmer it until the vegetables are tender. Break $\ddagger \mathrm{lb}$. spaghetti into small pieces, wash it well and cook it in boiling salted water until it is tender. Take out the herbs from the tomato sauce, rub the latter through a sieve and then put it back into the saucepan, thickening it with $\frac{1}{2}$ oz. cornflour previously mixed with a little cold water.

Boil the whole for a few minutes, kecping it sell stirred, nnd then mix in the cooked and drained spaghetti. Grease a pie-dish, cover the bottom of it with 2 oz . grated checse, then pour in the tomato and spaghetti mixturc and over the top sprinkle another 2 o7. grated cheese. Heat the whole in the oven, and then brown the top beneath a griller before sending it to the table. See Macaroni.

SPAN. As a measure of distance this is 9 in., which is approximately the distance between the tip of a man's tliumb nnd little finger when his hand is outspread. In architecture it is the spread of an arch between its a butments.

SPANDREL. A spandrel is the corner space between an arch and its surrounding frame. If the arch is in a colonnadel oak bedhead, therc are two spandrcls, one on cach side of the arch. If a circular panel is used in a door, there are four spandrels, each roughly triangular, occupying the space between the ring and the enclosing frame. Spandrels are found in inlaid sideboards of the Sheraton and other styles.

SPANIEL. The generic name of spaniel is applicd to seven of the most useful varieties of gun-dogs. 'They are the clumber, cocker, English and Welsh springers, ficld, Irish water,
and Sussex. The cockers and springers are most used, per. forming the dual function of springing and retrieving the game. They are generally docile and friendly of disposition, the exception being the clumber, who does not readily lavish his faroure upon strangers. Another spaniel, the Blenhein!, was used in the fiedd, but he is mainly a toy dog. See Clumber; Cocker; Dog; Japancese Spaniel; Kennel; King Charles; Mange, etc.

SPANISH BROOM. This beautiful hardy shrub (Spartium junceum) bears slender, rushlike branches. and yellow flowers in summer. Spanish broom will thrive in ordinary garden soil, especially if light and sandy. It does not care for stiff, heavy soil. Propagation is by sceds, sown in the open in autumn or spring, or by cuttings of young shoots raised in frames in the summer-time.

SPANISH CHESTNUT. This is a bardy, suinmer-leafing tree (Castanea sativa), 20 ft . to 50 ft . in height, which flourishes in ordinary soil and a sunny position. The nuts are ripe in late autumn. Propagation is by sowing the nuts in early spring, and transplanțing the secdlings when they arc one ycar old. The timber is of value to the woodworker, as it is hard and hcavy and js sometimes used as a substitute for oak, See Chestnut.

## Spanish Fly. See Cantharides.

SPANISH FOWL. One of the oldest brceds of poultry known to British breeders is the Spanish fowl, which is an excellent layer of large white eggs averaging $2 \frac{1}{2} \mathrm{oz}$. and in some strains even more. It is a moderately large bird, with a fair quantity of white flesh, and nlthough it is a black plumaged bird its skin is delicately white.
A single-combed breed, the Spanish fowl carries large white lobes that spread over its face until they meet bencath the wattles. The comb and wattles are red, the plumage rich, glossy. green-black, legs and feet slate blue. See Fowl; Poultry.
SPANISH IRIS. The common name for Iris xiphium is Spanish iris. It is one of the most useful bulb plants for display in the


Spanish Iris, popularly known as the poor man's orchid and invaluable for providing cut blooms
garden, and for nroviding cut flowers of many shades of colour. It has been called the poor man's orchid. Spanish irises should be planted 3 in . deep and 6 in . apari in carly autumn. See Bulb; Iris; Planting.

SPANISE OMELETTE. To make this, fincly ohop a shallot and a clove of garlic, fry them to a pale brown colour in 1 oz butter, and then add 4 stoned olives cut into small dice. Beat up 4 eggs, add 2 tablespoon fuls sherry, and seasoning to taste, and pour them on to the mixture.
Stir the whole over a good fire until the eggs begin to set, then tip up the pan and shape the omelette to an oval form. Tho upper side inay be lightly browned cither by turning the omelette or holding it before a clenr fire. Serve it with a little hot Espagnole sauce. See Omelette ; Sauce.

SPANISH ONION. This is the name of $n$ large variety of onion. Spanish onions are consiclered to be better than British ones for serving as a vegetable, but not for flavouring. They are also very uscful as a cure for certain complaints. See Onion.
SPANNER: For Nuts and Bolts. There are two main kinds of spanner in general use. Within its limits the adjustable type can be made to fit alinost any nut as occasion deınands; the fixed or key pattern is rigid but can be obtained in various sizes.
Cycle spanners, or wrenches, are perhaps the most common of the first type. Theso can be adjusted by menns of a nut, which is generally in the handle of the tool. The fixed size spanner is often double ended, the two ends differing in size by about $\frac{1}{8}$ inch. In box-type spanners the recess is capable of taking the whole thickness of the nut to bc unserewerl. reducing considerably the risk of the spanner slipping off the nut. Some are tubular in form, with a T-hnndle, a cranked arm, or just a hole through which a loose "tominy" bar can be put to give leverage. The tubular type is usually supplied in seta, the smaller sizes nesting inside the largest one. Since they are often double ended, a complete set takes up quite a small space.
Ratchet spanners arc handy and take two main forms. In onc sort the spanner itself is box shaped, fitting into a holder to which is attached a ratchet handle. In the other kind the spanner resembles the ordinary Hat double raded type, but the jaws are disk shaped, interchangeable, and formed with ratchet tecth on the periphery. There is a pawl in the handle which engages with $n$ tooth of the jaw and forces it round as the handle is moved forward and backward.
The cone spanner is for tightening up cones, as on an ordinary bicycle, without removing the wheel. Being made of thin material the spanner can be placed on the cone, and the latter turned the required amount, if the spindle nut is slackened sufficiently. Another handy type for a cycle is the spoke spanner. It fits over the nut on the rim ends of the spokes, and can bo turned without taking the spanner off the nut, thus adjusting the tension of the spoke.
In using an adjustable spanner the open end of the jaws should face in the direction of the turn. There is then less tendency for the spanner to ulip over the nut. If the nut is exceptionally tight, it should bo remembered that a sharptap, or series of sharp taps, on the end of the handle of the spanner is more likely to effect a movement than prolonged pressurc. In some casces it may even be necessary to heat tho nut before it can be unscrewed. See Wrench.

SPAN ROOF. The common form of roof for a dwelling-house is the span roof. It is formed by roof plates fixed to the walls, common rafters and a ridge board, all framed
ogether to cover thi spaco between two walls. Such a roof can take a span of 12 ft .; if a greater span is to be covered, purlins will have to be introduced, or principal rafters in the form of a truss. See Purlin; Roof,

SPARAXIS. These bulbs, which hear brilliantly-coloured flowers on slender stems 15 in. high in carly summer, may be potted


Sparaxis, a gaily fowering bulbous pot plant
in autumn or carly apring and grown in the greenhouse, or they may be planted out of doors in well drained compost of loam, leaf-mould and sand, in a sunny sheltered position. In wet weather in winter a temporary glass covering is beneficial. The bulbs may be left undisturbed for soveral years. There are many named varieties,

SPARKING PLUG. In nll internal comlustion engines the high tension spark from tho nagneto is convoyed to the inside of the cylinder by means of a sparking plug and caused to jump across a gap, thereby firing the mixture

Plugs can be purchased for long, short, or medium reach, the distance from the point of the central electrode to the seating of the plug varying according to the type of engine to which it is to be fitted. The end of the plag should be approximately level with the inside surface of the combustion head or the face of the valve cap, as shown in the diagram.
The sparking plug consists of a stcel shell screwed into the borly of the cylinder or the inlet valve cap. Inside this shell is fitted the contral electrode, which is surrounded by a stoutcasing of some in-
sulating material, such as porcelain, mica or steatite, and thus insulated from the outer shell. At the bottom of the outer shell is a small projection so placed as to be close up to, but not touching, the central electrorle. The high tension current that flows from the nagneto via the high tension lead and the central electrodo
Sparking Plag used in an Internal combustion engine
 jumps across this gap.
returning to the magneto vis the outer shell of the plug and the metal work of the engine.
In order to ensure a gas-tight joint between the insulation and the outer shell, a brass gland nut is generally employed. When a plug has been in use a considerable time it is often possible to tighten the gland nut down a little owing to the fact that the gland packing will havc contracted. This adjustment should only be made while the pluga are warm, and it will necessitate also the checking or resetting of the gap or amount of space between the points of the plug.

The proper setting is highly important, especially in regard to the starting up of an engine, because the wider the points arc apart, the stronger is the current required to jump across. In other words, a greater initial speed will have to be given to the engine before a high tension spark of sufficient intensity can be reveloped. The correct gap) for magneto systems is 0.020 in . ( $\mathrm{s}^{2} \mathrm{~s} \mathrm{in}$.) ; for coil ignition it is $0-025 \mathrm{in}$. ( $\frac{1}{6} \mathrm{in}$ ).

Testing Ignition. Sometimes a fault in the ignition is put down to the magneto, becausc a test of the plugs has been made by turning the engine over very slowly, while placing n finger on the terminal of the plugs and noticing whether a slight ahock is felt. This procedure is wrong, because it in no way proves that a current is passing across the points. Further, it is possible for a plug to function properly at a low voltage, and yot to ahort badly on n high voltage through insula. tion failure, such as a cracked porcelain body.
Onc way to test for insulation failure is to take the plug out of the enginc and lay it on some metal part with the high-tension lead attached. The motal shell must be touching some mctal engine part, but care must be taken that the plug terminal is not in contact with, or too close to, any metal. Then, by revolving the enginc at a good speed by hand or by the self-starter, the sequenco of sparks at the points can be noted. The spark should be regular and of $n$ uniform intensity, otherwisc the insulation is at fault, assuming the plug is perfectly clean.
better niethod is to use : neon tester, consisting of a smalltuhc containing hcon gas. With this dovice the plug need not be removed. The tester is suitably protected, nnd

Spark Tester. Tube containing neon Ras, a device for testing isnition which obriates removal of plug has a terminal
 has a ternuinal which is placed in contact with the lerminnal the plug to be tested. If the plug is sparking characteristic red glow is seen in the tulse.
For other details about sparking plug troubles and their romedy the reader should refer to the article on Motor Car, especially. pars. 1 and 2 of the section dealing with the parc of the car. Sce Internal Combustion Engine; Magneto.

SF'ARKLET. Plain water can be converted into sode water by the use of metallio
capsules known as sparklets. They are sold by glasses, which may chemists, and acrate the water or charge it with carbonic acid gas. See Aerated Waters; Carbonic Acid; Soda Water.
Sparling. The name is sometimes given to the smelt (q.v.). Occasionally a young or very diminutive herring is called a sparling.

SPATCECOCK : In Cookery. Spatchcock chicken is prepared by splitting a young bird down the back, brushing it over with some warmed and melted butter, and then coating it with a mixture prepared from a little madc inustard mixed with 2 tablespoonfuls Worcester sauce, a lump of butter about the size of an cgg (previously melted), and sensoning to taste. Sprinkle the chicken with breadcrumbs, then coat it with some more melted butter, and grill it over a slow fire. Serve the bird with piquant saucc. The neat appearance of spatchcock chicken is gained by breaking the legs and wings at the first joints and fixing them in a flat position with skewers. See Chioken; Sauce.

SPAVIPI. This is a discase alfecting one or both of the hocks of horses, cobs and ponies, and it is exceodingly common. A swollen condition of the hock, especially after the animal has been standing in the stable, following upon active work, is spoken of as bog-spavin. The hock is swollen and puffy, imparting a soft or boggy sensation to the lingers when these are prcsscd upon it, particularly at the front and sides. This conditio.. does not actually constitute discase, unless it amounts to a considerable degree of distension, thus interfering with feecdom of movement of the hock. Apart from this, it does not render the nnimal in any way unsound. Bonc apavin is regarded as constituting unsoundness. No one should purchase a horse without having it examined previously by a veterinary surgeon. See Horse.

SPEAR GRASS. Spcar grass, which is sometimes called the bayonet plant, is the hardy rock perennial Aciphylla. There are threc species in cultivation, lyallii, colensoi, and squarrosn, all about 6 in . high. Spear grass is best planted in rich sand loam, during spring or autumn, in an open part of the rockery. See Rock Garden.

SPEARMINT. The fragrant herb ealled spearmint is sometimes known as lamb mint, and has lance-shapol leaves of pungent odour. Other familiar kinds are peppermint and pennyroyal. Of the several kinds of garden mint, spenrmint has the finest flavour.
Spearmint is sonictimes used as a flavouring for milk or batter puddings, and can be regariled as suitable either for sweet or savoury dishes. Sec Mint.

SPECLAL LICENCE. This term is used for a marriage licence issued by the arch. bishop of Canterbury. It permits n marriage to be celebraterl at any place, with or without previous residence in the district, and at any time, hut the reasons given on nppliention must be regarded as eatisfactory by the archbishop's advisers. The fee for a special licence is $£ \sum 5$, and application for one must be made to the Faculty Office, 23, Knightrider Street, Doctors' Conmons, London, E.C. See Marriage; Wedding.

SPECTACLES. The principal usg of spectacles is to corroct errors of vision. The particular type which should be worn is highly important. Much harm results from wearing spectacles or glasses of any kind which do not fit properly, or arc not accurately suited to the purpose in view and the sight of the wearer.

The type of spectacles required can only be detormined after slilled examination by an oculist or a sight testing optician. It is always falsc economy to obtain glasses without-having the eyes properly examined, or to buy cheap
glasses, which may even more serious and lasting trouble. The shape of the bridge of the nose ofton decides whether spectaoles or cyeglasses should be worn.

Nothing but spectacles should be worn by children, and the framc should be of steel nickel plated, or solid nickel, with curl sides which hook behind the ears. The bridge of the frome should not bear directly upon the bridge of the nose; the weight should be bornc by attachments which bear only on the sides of the nose. The lenses should be of such a shape that the child cannot easily look over or under them.

For adults the irame may bc of platinum, gold. rolled gold, tortoiseshell, or other material, or oven without any frames around the glasues. Speccontinuously. protect the cyes. straightened by an optician. Lonking Glass (q.v.).
tacles with curl sides are beat adapted for object of speculation. those who require to wear their glasses
Whene bright light irritates the eycs, spectacles made of Crookes' glass may be worn. It is made in four tints, the two paler ones leing most beneficial for absorbing the ultra.violet rays; the two darker tints are suitable for bright sunlight and tropical climates. Decply tinted glasses are also largely used in factories where there is a very bright light. These glasses are usually fitted up in the form of gogglos, with fine gauze around the edges, to protect the eycs from flying particles of metal. Goggles of various forms are also used in strong winds and in sandy districta to

Spectacles require great caro in handling. They should not be put on or taken off roughly, and the greatest care should be exercised in closing down the sides lest the joints be damaged or the frames bent; when not in use they should always to placed in a casc. When the fraincs become bent, the defective vision is not properly correcterl. therefore it is essential that they should be

Glasses should be wiped with a piece of clean old linen, or with special cleaners, which provent the glasses from stcaming, and give a bright, clean polish. If they are much soiled, they ahould be washed in warm water with soap, to which a little ammonia may bo added. See Eye; Eyeglass; Sight Testing.
Specularia. This hardy annual with purple, bell-shaped flowers is called Venus'

SPECULATION : A Card Gance. This is a cand game for any number of perwons, and is played with the full pack of 52 cards, each player contributing an agread number of counters to the pool. The dicaler puts in twice as many counters as other players. He dealay
threc cards face downord to cach player and
highest trump for the time loing is excopted from turning up any more of his cards. If all carda are turned up without it being beaten he takes the pool. If his card is benten he continues with the other players to turn over his cards one at a time in his turn. Any player turning up the acc of trumps at once takes tho pool.

Any player may buy any of the unexposed cards from another player, in the hope that they contain the winning trump. If any card ii) his hand is accidentally looked at by a player, save the actual cand ho is turning up, all his cards arc immediately thrown face upward in the middle of the table, and the player must then pay a penalty into the pool.

SPEECE: Its Defects. Human speech may le nffected more or less scriously by a large number of complaints. When there is any blocking of the air passages, as by chironic catarrh of the nose, adenoils, nasal polypi, etc., the patient pronounces the letter Mi as EB, and N like ED. Treatment is to clear out the obstruction so that the child may breathe properly. After this, lessons in correct pronunciation should be carried out. Lisping mosy be duc to carcleasness in tenching the child to talk; the defect is well within his power to control.

Deafness coming on after diserse in childhood, liefore speech has been solidly acquired, may end in deaf mutism. Paralysis of nerves may be the cause of the defect. Another rerious defect is aphasin, which is interference with the thought processes of speech and is due to some injury or discase of the brain.

Stammering and stuttering are not due to actual defect in the epeech mechanism but to inability to control it on account of emotional disturbance. It is an expreasion of anxiety hysteria, and an attempt should be made to cure it by finding out the enotional disturhance that underlics the hysteria. Voice exercises, as in declaiming, and Lreathing
exercises may be bencficial by giving the patient confidence. See Deafness; Larynx Tongue: Voice.

## Speedboat. See Boat

SPEEDWELL. This name covers a group of evergreen shrubs and hardy herbaceous plants of great garden value, known botanically as veronica. They flourish in ordinary soil. The hardiest shrub is Veronica Traversii. 4 ft . high with white flowers in summer Veronica speciosa, of which there are varieties with purple, erimson, rose or white flowers. 3 to 5 ft ., is less hardy: it does well in seaside gardens and in mild districts or may be grown in pots in the greenhouse.

Among the herhaceous border plants the best are gentianoides, 18 in., with palc blue fowers in May: longifolia and subsessilis, 2 or 3 ft ., blue, in August, and spicata, 12 in ., blue, in June. Veronica rupestris is a lovely low-growing blue-flowered rock garden plant. The shrubby kinds are increased by cuttings in a frame in July, the others by division, or sceds in spring
SPERMACETI. The fatty substance obtained from the sperm whale, and called spermaceti or cetaceum, is quite a common basis of ointments. The ointment of spermaceti is made up of spermaceti 10 parts, white beeswax 4 parts, benzoin 1 part, and almond oil 36 parts. These ingredients are heated for 2 hours. Spermaceti may be applied alone to inflamed, irritated surfaces for its emollient action. Pron. Sper-ma-see-te.

SPHAGNUM. Sphagnum moss, which is commonly found on peat bogs, is used extensively in the potting of orchids. Being extremely retentive of moisture, it keeps the Heshy roots of plants in sound condition, whilst its open, spongy character allows air to be admitted freely. Sphagnum does not decuy like other mosses, a peculiarity that adds a good deal to its usefulness. See Orchid.

SPICE. Aromatic seasonings obtained from plants of tropical growth are used in cookery and as foorl preservatives, and some have certain medical properties. They are known as spices, those chiefly employed in cookery being cinnamon, cloves, ginger, mace, nutmeg, and pepper. Allspice or Jamaica pepper conbines the flavours of cinnamon, cloves, and nutnicg.

In addition to their use in cookery, cloves are employed to Havour wine, cough mixtures, and confectionery, while cinnamon is a popular Havouring for liqueurs, and has certain properties that justify its inclusion in many tablets and mixtures sold to cure colds. Grated nut meg is added to junkets and puddings, and ginger is a valuable stimulant. Various spines, such as turmeric, coriander, and ginger are contained in curry powders and pastes. Condiments such as pickles and sauces owe some of their piquancy to spices.

Spices shou!d be bought in small quantities as they deterioratc rapidly if exposed to the air. They are best stored in special spice boxes. S'e.e Allspice: Cinnaınon: Clove: Curry : Flavouring, etc.

Spice Bush This is an alternative name for the plant known as lindera.

SPIDER: A Crochet Pattern. This all-over pattern derives its name from the solid centre-picce of double crochet, from which long chains branch out in different dircetions. The foundation chain on which the work begins should be a multiple of 14 with 5 stitches orer. In the small piece illustrated there are 47 chain stitches, worked as follows
lst row: 1 double crochet in the llth chain from the hook, 1 double crochet in each of the next 2 stitches, * 5 chains, miss 5 stitches, 1 double treble in the next stitch, 5 chains, miss 5 stitches. 1 double crochet in cach of the


Spider. The crochet stitcb which goes by the name of the spider pattern
next 3 stitches. Repeat from * until only 6 stitches are left, then make 5 chains, miss 5 stitches, 1 treble in the end stitch, 7 chains Turn

2nd row : * 3 double crochet on 3 double crochet, 5 chains, 1 double treble on double treble 5 chains. Repeat from * across the row ending with 3 double crochets, then 5 chains, 1 treble in the 6th chain of the loop at the end, l chain. Turn.
3rd row : * 1 double crochet on double crochet below, * 5 chains, 1 double treble in the centre double crochet, 5 chains, 1 double crochet in the chain before the double treble 1 double crochet on double treble, 1 double crochet in the chain after the double treble. Repeat from * across the row, then 5 chain, 1 double treble on the centre double crochet, 5 chains, 1 treble in the 6 th chain of the end loop, 1 chain. Turn.

4th row: 1 double crochet on the first chain, ${ }^{*} 5$ chains, 1 double treble on double treble, 5 chains, 3 double crochet on 3 double crochet. Repeat from * across the row, ending with 5 chains, 1 double treble on double treble 5 chains, 1 treble on double crochet at the end 7 chains. Turn.

5th row : * 1 double crochet on the chain before the double treble, 1 double crochet on double treble, 1 double crochet on chain, 5 chains. 1 double treble on the centre double crochet, 5 chains. Repeat from * across the row, 1 double crochet on chain, 1 double crochet on double treble, 1 double crochet on chain, 5 chains, 1 treble in double crochet at the end, 7 chains. Turn. Reprat from the ?nd to the 5th rows inclusive, according to the lengtl of pattern required, finishing the last pattern at the end of the $4 t h$ row to give a straight edge. See Crochet.
SPIDER WEB: In Embroidery. This pattern is used in two different forms of work. one as a solid whitc or coloured linen embroi. dery for decorative purposes: and the other to fill in an empty corner where threads have been drawn

In the lirst case fancy canvases and coarse linens are used, where the threads can be casily counted to form sections. In the illustration coarse linen is scen. worlied with coarse sylko cotton giving bold relief to the pattern. Here 40 threads are counted each


Spider Web, a pattern which is much used in solid embroidery, and also for flling up a corner in drawn thread work
under and over as in ordinary darning, missing 2 threads at the beginning of each new round, so that the thread that was passed over in the previous round will be passed under in the sccond.

The change of round can be seen easily in the working, when the ncedle passes a sccond time ounder the same thread. To ensure an even weave, it is best to put the matcrial in an ordinary round embroidery frame when working the corner picces, that is, when the remainder of the work is being done over the fingers. See Drawn Thread Work; Embroidery.

SPIDERWORT. This is the popular name of tradescantia, a group of hardly and greenhouse plants. The best of the hardy kinds is Tradescantia virginica, called Flower of a day, which thrives in shady places and bears purple-bluc blooms in summer Those suitable for a warm greenhouse are quick growing trailing plants with green and colourd leares. They :are useful for planting bencath the staging, or if grown in pots make a suit able edging; they look well also in suspended baskets. They are easily increased oby cuttings and thrive in a compost of loam, leaf-mould and sand.
SPILLIKINS: The Game. This game is played with a number of thin pieces of bone or ivory. These pieces, the spillikins, are cut into queer shapes and each has a number, the numbers usually running from õ to 40.
The spillikins are taken in the hand of one of the players and dropped in a heap on the table. The players then take turns at trying to remove one of them from the heap without disturbing the others. This is sometimes done with the fingers and sometimes by means of two small hooks provided for the purpose.
When the game is over each player adds up the numbers on the spillikins he has taken, and the one with the largest number wins. Sometimes, instead of the players taking turns to remove on spillikin, one player continues to remove them until he disturbs another one, when he loses his :turn.
SPINACH. There are four chief kinds of this useful leaf regetable. Summer spinach is sown at intervals from February to April in drills . 1 in . deep and 12 in apart; rich deep soil is necessary to ensure quick growth. Winter spinach is sown in August-September in a similar way: the seedlings of both crops should be thinned to 6 in. apart. The round spinach is commonly sown in spring and the prickly spinach in August and September
New Zealand spinach is a vigorous tender plant which should be sown out of doors in May, or raised in pots in a frame. The plants must he 3 ft apart. The tips of the shoots


Spinach. Leaves of the round variety, the best summer spinach
are gathered for cooking. Perpetual spinaoh or vegetable which should be sown in spring and again at the end of July to provide a long cession of proluce
How io Cook. Spinach is one of the most wholesome and readily digestcd of vegetables. It is scrved cither as a vegetable or as an entréc. Spinach sometimes accompanies fried

Spinach. L. Soil preparation : $a$, manured soil ; $b$, fine soil. 2. Rows separated by rain channels (a). 3.,Catch. crops between peas or beans 4. Winter spinach sheltered by beaps of bracken or straw. 5. Spinach beet between shrubs or under trees. 8. New Zealand spinach in pots: $a$, crocks and rough stuff ; $b_{0}$ decayed
manure ive fine rich soil. 7. Box similarly prepared. 8. Pots and boxes sheltered in cold frame or covered box

and 2 tablespoonfuls white sauce, also 1 teaspoonful castor sugar. Serve it on round crouttes of buttercd toast with a garnish of fried half-moons of pulf pasiry or of bread.

A savoury dish of spinach miay be prepared in the following manner: Boil 3 lb . spinach as dirceted in the second recipe. Chop it slightly, and fry it in 2 oz . butter, with 4 anchovies, washed, boned, and chopped fine.
or grilled ham, and a favourite dish is poached eggs on spinach.

The leaves require very thorough and careful clansing, as they are always gritty. They should be well pickerl over after heing washed, and the stalks removed. Salt is required in varying quantitics according to taste. No soda must be added to it while cooking, and no water is required save that which clings to the leaves after washing. One of the simplest methods of preparing a plain dish of spinach is to put about 4 l . of the leaves in a large saucepan. sprinkle over them a tablespoonful of salt and a teaspoonful of white sugar. Bring slowly to the boil and boil them for about 12 min ., or until they are soft, stirring them in case they cling to the bottom of the pan. When cooked, strain and press out the water until the spinach appears dry, then turn it on to a board, chop it, and return it to the sauccpan. with a litle butter, lemon juice, pepper and salt. Dish it on toast.

For an entré, prepare 4 lb . spinach, then boil it in the drippings from the lcaves, adding salt. Stir frequently, and when it is cooked strain and press it free from moisture. Now immerse it in cold water and leave to cool but do not separate it. When quite cold, drain, and once more squceze out all water. Chop it fine, and pass it through a wire sieve. Melt in a stewpan 2 oz. butter, add the spinach, and stir it round, then season it with salt, cayenne, and $\ddagger$ teaspoonful of grated nutmeg. Pour in 1 gill thick cream cloth. Pour all people hold the ends of the a small saucepan, place it on the fire, and, as it curdles, scrape the curds out on to a sieve to drain off the water. After draining put the greening into a covered jar in a cool larder till the sance is ready. Hone-prepared greening is best for sauce or mayonnaise, but for colouring sweets it is more convenient to purchase liquid spinach green colouring. See Kitchen Garden. Pron. Spin-aje.

SPINDLE TREE. This is a small British tree (Euonymus europaeus) valued for its highly coloured ornamental fruits in autumn. It thrives in ordinary soil

SPINE. The spine, or backbone, makes it possible for the body to assume and maintain an upright position and at the same time act as a protective covering for the spinal cord, which, with the brain, forms the main part of the central nervous system. It is made up of 24 vertebrae, which allow a certain amount of movement one on the other, and two terminal bones, the sacrum and the coccyx. The bodics of the vertebrac are separated by thin layers or disks of cartilage. These not only allow the bones to move without grating, but also act as shock absorbers.

When standing in the erect posture, the spinal column forms a series of natural curves from before backward. Thesc curves balance each other, with the result that the general line of the spine is practically vertical

Curvalure of the spine is dealt with under that hcading. Injurics to the spine by blows, twists, and other forms of violence may result in sprains or strains. There is local pain and tenderness, and perhaps slight swelling. Cold applications may relieve suffering, but it is often necessary to-rest for some weeks. The result of an injury niay, however, be much more severe than this See Curvature; Fracture.

SPINET. Being smaller than the harpsichord, the spinet dors not possess a double keyboard, and the tone was usually a fifth


Spinet ol wood and jory ornamented with jasper and other stones, made in Milan $\ln 1577$ Bu permission of the Director. Victoria \& Albert Museum. Soyth Kensington
closed at each end and almost filled with liquid. A small air bubble, however, remains visible in it, and when the tulve is in a horizontal position, the bubble will always be exactly in the middle of the length of the tube, and at the top of it. A spiri level is calibrated and tested at the time of embedding the bubble tube in the frame, and thereafter should not be disturbed otherwise the instrument may be thrown out of truth. To facilitate the reading and to increase the accuracy of the result, two lincs are generally marked on the top of the tube, in such a position that when the ait bubble is exactly between then, the instrument is perfectly horizontal.
whecls made in the late 17 th and 18th centuries were copied in most European countries, and the spinsters of England, Scotland, Wales, and Ireland used wheels which in design were very similar to those of Flanders. What is still known as the Dutch wheel is collected assidu. ously by interested people, though the name is used to designate one of Irish manufacture.

The whecls employed in English cottages for the purpose of spinning
for a living were fre. quently of elm, ash, or birch. The lly-wheel of these was heavier, and the turning of the spokes, spindles, and legs much coarser in detail than was the case in the walnut and mahogany spinning wheels of more expensive make. Round the distafl, which is secn on the left above the wheel in the illustration, the treadle, which is also clearly shown.

A unique collection of spinning wheels is that of Mr. John Horner, of Belfast, where theso old machines are housed in the Municipal Art Gallery and Museum. Various museums in Yorkshire, notably Hull, also possess examples showing local characteristics, and a few specimens are preserved in the Victoria and Albert Museum, South Kensington.

SPIRAEA. Both shrubs and herbaceous plants of decorative value in the garden are included in this group. Some of the shrubs are very handsome when in full bloom: they thrive in ordinary well-tilled soil. The best aro Thunbergi, arguta and canescens, which bear white flowers in spring and early summer, and grow 4 ft . or so high ; Lindleyana, Aitchisoni and discolor, which bear plume-like clusters of white or cream-coloured flowers in late summer and reach a height of 10 ft . or more ; and japonica, bumalda, and Anthony Waterer, which have red flowers in JulyAugust, and are from 2 ft . to 4 ft . high. Propagation is by cuttings or sceds.

Of the hardy herbaceous spiracas the noblest is aruncus, a vigorous plant 5 ft. or so high, with cream-white flower plumes in summer. Filipendula and ulmaria (the common meadowsweet), with whitish flowers, and palmata, red, are other useful kinds. They are all good waterside plants, for they thrive best in moist soil. Propagation is by division in autumn and spring. Spiraca japonica, white, is a favourite plant for the greenhouse. Pron. Spi-ree-i.

SPIRIT LEVEL. A spirit level is an instru. ment for ascertaining the level or adjusting the level of an object in relation to the horizontal

Essentially, the instrument comprises a wooden or metal frame containing a glass tube
is loosely wound the raw fibre. This is spun Fig. 1, will suffice. It is here seen- in use off by the spindle. The fly-wheel is driven by to level two adjacent planks. These levels


Spirit Level. Fig. 1. Testing level between two pieces of material As an example of its nse, suppose that a floor joist has to be set in a horizontal position. All that has to be done is to place the joist approximately in position, rest the spirit level upon it, and raise or lower the ends of the joist until the air bubble is exactly between the two lines marlied on the tube. The joist will then be level. For ordinary purposes the regular carpenter's level, shown in are available in various sizes, but one about 10 in long is very convenient. Practically all levels with a woolen body, or frame, have a brass plate at the top and brass tips at the bottoni, to strengthen the wood and increase the durability of the instrument. For carpentry or building purposes a longer level measuring about 24 in . will be found to be preferable. A useful type has two tubes, one at right angles to the other. The second


Spiraea. Spray ol S. astilboides, a Joly blooming plant with long teathery spikes of white flowers
tube is set near the end ol the frame in a vertical position, so that the instrument can be used for plumbing uprights. When the bubble is in the middle of the tube it indicates that the object which is being tested is perfectly upright, as shown in Fig. 2. See Plumb Bob; Plumb Rule.

SPIRITOFSALT. This strong acid, known alternatively as hydrochloric acid, has valuable cleansing propertics. It may be used to take stains from lavatory pans and washing basins, and when diluted with 20 times its volume of water, it removes rust marks from clothes without danaging the material. Thorough rinsing is essential, otherwise the acid may canse the fabric to rot. See Hydrochloric Acid.

SPIRITS. This term is used for certain liquids used for drinking purposes that are obtained by distillation. Such include brandy, gin. and whisky. See Alcohol: Brandy; Gin; Rum. Whisky.

SPIT : For Roasting. A spit is a pointed rod with a handle at the end, and mounted so that the meat


Spirit Level. Fig. 2. Use ol spirit
level in testing lor the vertical

Splints are most conmonly made of wood, but a great variety of other materials are also used, such as poroplastic, gutta-percha, netal, celluloid, and cotton. linen, or Hanuel, stiffened with plaster of Paris, starch, or gum. Straw matting rolled up and cut to a suitable length forms an excellent splint in an emergency. Other materials with which, in an emergency, splints may be made are laths. a broom-handle, a walking. stick or umbrella, a small straight branch of a trec, a few folded newspapers, a rifle, and a scabbard.

Padding must be donc carefully, so that there shall be no lumps and that the splint shall fit evenly against the limb; extra padding should he placed over bony prominences, e.g. at the ankle. Probably the beat material to use is sheep's wool, but cotton wool or tow serve very well. In emergency some old flannel, or a number of handkerchiefs, may be used. A splint should fit the limb nccurately: for a broken thigh bone it should reach from the armpit to below the ankle. For other broken hones it should extend far cran supported on the spit and rotated cnough on cach side of the fracture to afford from time to time in front of the fire good support and secure perfect rest. See Roasting.

Spitchcock. This is a method of cooking ecla. They arc salted, then fricd in batter and breadcrumbed. See Eel.

## Spitting. See Expectoration

Splat. This term is used for the broad, Hat, upright portion of n chair back. See Chair.

SPLEENWORT. This is the common name of an extensive genus of ferns, hardy, greenhouse, and stove, botanically classified as Asplenium. Amongat hardy kinds the scale, maidenhair spleenwort, and wallrue are suit-
 able for growing on old walls ; the lady fern in moist shady corners or bordors; whilst othera are uscful for planting in the rock garilen. The bird's nest fern is exten. sively grown for market purposes. See liern. SPLINT. More or less rigid materials used as sup. ports for a broken or otherwise injured limb form splints. Their purpose in cases of fracture is to keep the ends of the bone together and to keep the $\operatorname{limb}$ in a natural position to prevent deformity.

When first aid is being rendered one person should hold the broken limb in an extended position while the other ties on the splint. First tic above the fracture, then helow. If a leg is liroken, tie both legs together after the aplint has hicen applied. Handkerchiefa may he used for tying if handages are not available. The splint should he tied on firmly, but not too tightly, lest the circulation of the blood be interfered with. Make the knots over the outer splint. See Bandage: First Aid.

SPLINTER: How to Extract. Thorns. necdles, and splinters of wood which penctrate the skin should he removed as sooll as possible, for if allowed to remain until intlammation begins, they become more firmly fixed in the swollen tissucs; needles also sometimes wander far from their point of entry. If the splinter is visible, the opening through which it entered should be enlarged with a carefully sterilized needle or a sharp-pointed knife. The sterilization can be done by passing several times through a spirit lamp llame. The splinter should then he worked out by pressure with the tips of the lingers. If the splinter lics deeply, it is better to consult a doctor at oncc.
SPLIT BALUSTER. This is the name of a form of decoration used on simple styles of oak furniture especially towards the end of the 17th century. It consists of a spindle which, having been turned between two points on a lathe, was cut lengthways into


Spokeshare. Right pattern with wooden stock and tanged ateet cutter.
Left. type with malleable iron atock and a fat blade clamped to the and Left, type with malleable iron stock and a fat blade clamped to the atock off by solidly gilded handlea and rims. The production of old Japan pat. terns, and also of lustre ware, was in the front rank. The carlicst mark was 'pode, stone-china beneath. China: Potterp.
iwo or more parts and applied to ornament a frieze or horder on a chest or dresser.

SPLIT PEAS: In Cookery. Split peny are amongst the cheapest and the most nutritious of vegetables. Their principal use is for soup-making, nind they can be cooked in the same way as lentils. To be quite digestible they need long cooking after being soaked in cold water for 12 hours. See Lentil; Soup.

SPODE : The Ware. Josiah Spode was the founder of this firm of Stalfordshire potters, which was one of the leading houses in the trade. After an apprenticeship to Whieldon and Josiah Wedgwood, Josiah Sporde started a factory in 1770 . His services rank next to Wedgwood's, and his black hasaltes and jasjer wares are in high esteem. He was the first to apply transfer-printing to the willow pattern. and his printed waie was ofterl finished by hand with enamel colours. The improvements made by his son helped to establish the supremacy of English boneporcelain and opaque china.
Siode porcclain is a translucent paste with a soft glaze and good print. ing. Dinner services wereat first made with a medium.blue decoration, set


Spode. Beaker painted in colours and decorated with gilding in imitation of Japaneae Imari ware B" permixsion of the Director. perinixsion of the Murector
Victoria \& Albert Muxelt S Kensington stamped in the paste or pencilled on the glaze. The name was afterwards placed within a seroll, or across a square seal with the worla

Partnership hetween the younger Sporle and William Copeland led to the factory pasaing ultimately into the family of the latter. For a time the mark was Spode \& Copeland, then Copeland \& Garrett late Spode, and afterwarda Copeland late Sporle, a mark which atill survives. The present factory continues to produce many of the old Spode designs hecause of their popularity, but the modern ware is alvays distinguishable by the mark. See

SPOKESHAVE : How to Use. A spoke. shave is a two-handed wood-working implement. consisting esesentially of a stock or holder and a cast steel hlade or cutter. Tiwo $t$ ypical examples are illustrated. The origimal and astill extensively used spokeshave has a wooden stock. Into the middle portion is litted a stcel cutter having two tangs at right angley to the plane of the blade and located at eachend of it.

The prongs of the spokeshave arc presserl into holes cut in the wood, and as both hole and tange are tapered. the blade holds firmly when tapped hoinc. The other
type has a nalleable iron stock and a flat blade something like a plane iron. This is held to the stock by means of a clamped plate and a thumbscrew which goes through a slot in the blade. The cutter can be adjusted by pushing it in or out, and when in its correct position it is secured by twisting the thumbscrew. In the case of the wooden stocked spokeshave, the cut is regulated by tapping the cutter closer to or farther away from the working face of the stock.
The essential purpose of the spokeshave is to work curved surfaces, either externally or internally, so as to bring them to a correct and uniform curve. The work should be firmly held cither in the vice or supported by blocks temporarily screwed to the work bench. The operator stands facing the work, and grasping the spokeshave in both hands, his thumbs pressed across the back part of the cutter, but clear of the work. The implement is presscd firmly on to the wood and pushed forward. The cutter must never be worked against the grain, or the wood fibres will be torn.
Some spokeshaves arc provided with an adjustable fence or guide, and with variously shaped blades, so that some form of moulding and reedings can be produced. See Plane; Router Plane; Rustic Work.

SPONGE. The soft, porous article known as a sponge is a form of animal life brought up from the bottom of the sea by divers. For toilet use it is indispensable, and, on account of its absorbent properties, it is also employed to bathe cuts and other wounds. Sponges vary in quality and price, the cheaper kinds being liable to tear after a few weeks' use.
The finest sponges are the Turkish, which are much favoured for babies and facial use because of their softness. All sponges should be soaked in cold water for 24 hours before being taken into use. This gets rid of any sand and enlarges the sponge, by about onethird, to its working size.
Sponges may be kept clean by occasiona ${ }^{1}$ washing in strong, hot soda water. If allowed to hang in a sunny window, where the air has free access to them, they will last longer and require less washing. Old sponges are useful for washing paint work.

If sponges are used for washing wounds, or mopping up blood in operations, they should be sterilized by soaking then in corrosive sublimate before use. After use they should be washed in borax soap powder, and then kept in a 5 per cent solution of carbolic acid A sponge should not be boiled. Sterilized gauze, it may be said, is a much safer and better material to use than a sponge for wiping wounds. See Bathroom; Toilet.
SPONGE CAKE. To make, break 3 eggs into a basin, whisk them with 6 oz. castor sugar for about 15 min ., and then lightly fold in $\frac{1}{4} \mathrm{lb}$. sieved flour. Grease the inside of some small sponge cake tins, coat them with a mixture of sugar and flour, shaking out any that does not adhere, and then put in the


Sponge Fingers fitted together in pairs and served for afternoon tea. See article above
sponge cake mixturc. Shake a little castor charlottes, can be made from the same mixture sugar over the cakes and bake them in a hot oven for $10-15 \mathrm{~min}$. Sponge cakes are used extensively in the making of trifles and other sweets.

Sponge Finger. Sponge cakes shaped like brown, and when they have been cooled on a fingers, such as are used in making fruit jam to stick them together pee illus. bclow.

## SpOONS FOR COLlecting AND FOR USE

## Their Development from Antique to Modern Shapes Illustrated

The reader is referred to the article on Dessert Spoon; Electro-Plate: Fiddle Pattern: Ladle; Pewter: Rat Tail: Silver:' Table Laying

The earlicst form of spoon was a shell hand held up in the act of blessing. A with a cleft stick as handle. The cleft was 14 th spoon was added to the collection represlipped over the edge of the shell and tightly senting St. Paul. A specimen is illustrated bound behind the join. Wood, bone and in Fig. 4 carrying his emblem, the sword. horn spoons followed, and these materials are Complete sets of these spoons are extremely still in use to-day for salad, salt and kitchen rare, and when a set comes into the market it spoons, while mother-of-pearl shell is also still usually fetches a high price. employed for condiment spoons.
Fig. 1 shows a Roman spoon of about the 4 th century, which was found in England. Fig. 2 shows the coronation spoon, which can be seen with the regalia in the Tower of London.

The transition from the knops to plain ends occurred after the reign of James I. In Commonwealth days the stump end (Fig. 5) was introduced, to be followed by the cleft-end and ornamented lobe ends in the reign of The date of this gold spoon has been a subject Charles II. In this new variety the stem end is more or less cleft into three parts, and the ower part of the stem is continued to a length which extends more than half-way down the back of the bowl. This continuation of the stem at the back of the bowl is the commence
pous. ris. 1. komal spuon, the ceatuay, wuen was ound in England. Fig. 2. Coronation spoon in gold, an example of 12 th century work ; it is part of the English repalia Fig. 1, courtesu of Spinte \& Son, Ltd ment of the rat tail form. Fig. 6 shows a for discussion; in general, however, it is spoon of this style bearing the London hall accepted as an example of l2th century work. mark for 1680 , and the back of the bowl Silver spoons were made in this country in bears the characteristic scroll decoration, also early Tudor times and designs were copied in found on the front end of the spoon. base metals.

The chicf source of information concerning spoors is gathered from inventories, wills, and other old documents. That spoons of silver must have been somewhat scarce is proved by the careful way in which they are described, and the probability is that among the lower classes of society they werc practically unknown, spoons made of pewter, wood, or latten, a nixture of brass and tin, being in general use.
In Tudor times the bowls of spoons were fig-shaped. The handles terminated in various fantastic shapes, such as a whirled knob, a diamond point, an acorn, a kind of fir-cone knob, or knop, while some were made with a seal top end, as illus. trated in Fig. 3. Others had a figure on the end, a representation of the Virgin Mary being one of the earliest, known as the Maiden Head knop, followed by what are called Apostlc spoons. These spoons bore at their ends representations of the twelve Apostles, each figure having its distinctive emblem, by which it can be recognized. Accompanying a set of 12 spoons was the Master spoon holding an orb in the left hand and with the right


Fig. 3. Seal top end and flg-shaped bowl ol a spoon of the Tudor period. Fig. 4. Apostle spoon, the figure bearing a distinctive emblem; Tudor period Courtesy of Spink \& Son, Itd.


Spoon. Fig. 5. Puritan spoon with stump end, made in London, 1653. Fig. 6. Charles flan apoon with ornamented cleft handle and ovate-shaped bowl. Fig. 7. Silver apoon and fork with contemporary case ; William and Mary period. Fig. 8. Early Queen Anne silver spoon. Fig. 9. Silver spoon, George II period, showing scroll instead of rat tail

Courtesk of Spink \& Son Ltd
tried; these include leaving the eentre of the blocked window open and moving sitter and reflector about. An arrangement which may be tried in an ordinary spuare room with two windows is shown in Fig 2. This a!so will afford basis for experiment which may conveniently be carried out on an inanimate object.

A more convenient and adaptable metliod of spot-lighting, such as is used on a large scale by professional portrait photographers, is the lantern form of light (Fig. 3) tor use with elcetric lamps. It is fitted with a condenser lens mounted on a spring bracket which enables the light to be directed at any angle. The lamp-holder is ad justable to permit focussing with the con denser, and the light is controlled by means of a movable ditfusing screen, and also a hlue lavourite ornament at the end of reign of terized by fine workmanship and artistic form. lilter, used separately or together. The light George II was the bead-edged handle, while Kitchen spoons include the ever uscful wooden a little later many handles were engraved. ones in various sizes, perforated aluminium After the accession of George III new patterns spoons for lifting eggs, etc.. from boiling water of spoons were introduced, but these differed only in the manner of ornament, the main design remaining the same, until the fiddle pattern appeared in the Victorian cra.

Modern Spoons. To-day, unlike our ancestors, who were often content with one single spoon, which was carricd about wherever they went, we have in common use a wealth of spoons for particular needs. Table service contains table: goup, dessert, tea, coffce caddy, sugar, egg, salad, fruit, orange, and ice cream spoons.

The orange or grape fruit spoon illustrated in Fig. 10 shows the bowl conveniently shaped and the handle of conventional Old English pattern, as seen in Fig. 9. Designs for spoons and forks are usually based on the old patterns. Bead or reeded edges are seen on some handles, on others ornamentation takes the form of shells and fluting. Plainer Puritan designs are liked, and the fig-shaped and ovate bowls are reproduced in modern soup spoons, and in fruit and salad service spoons with Hat-shaped handles.

The knop ends are often adapted to collee spoons and to jam spoons. Salt spoons and mustard spoons usually match in style the containers they accompany. Egg apoons

Fig. 10. Modern orange apoon may be attached to a silver or plated stand or be bought separately to match the tea and other service spoons in use. Silver or plated ladles for sauce or soup generally match the tablespoons. Very ornainental spoons arc seldom used, but fruit servers are designed in which there is a decorative connexion between the plain silver handle and spoon bowl charac.
poons for lifting eggs, etc.. from boiling water, sets of attached measuring spoons, of live
different sizes, and teaspoon infusers for making single cups of tea

SPORE. This is the name given to those cells or bodies which are found on the backs of fern fronds and other flowerless plants and by means of which propagation is effected. The spores are gathered when ripe by shaking the fronds over a sheet of paper ; they are sown in flower pots or pans of sterilized soil in a propagating case under glass and kept moist and shaded.

Spot: On the Skin. See Blackhead Pimple; Rash; Skin.

SPOT-LIGHT. In many modern professional portraits attractive and artistic results are obtained by use of a spot-light, an arrangement by which a beam of light, natural or artificial, is projected on to a face or profile or other part of the sitter, in addition to the ordinary illumination. By this means striking high-lights arc obtained, or parts which would be without detail in the photograph are given pleasing tone and balance.
In taking portrait photographs by natural light spot-lighting effects can be obtained in a room lighted by two windows, especially if a bay window is available. One arrange. ment is shown in Fig. 1. Ordinary lighting is given by window A and the reflector. Spot lighting from above, or top-lighting, is given by window B , all but the top part about lo in. or 18 in. square. being blocked up. This will give a soft and not too obvious lighting of the face from above. Otber arrangements can be

Fig. 2. Arrangement in a square room, with one of the windows partly covered

must not be placed too neal the sitter. Experiment will slow the best positions for the light and the exposure to be givell. As a basis the amateur should try the spot-light about 6 ft . or 7 ft . from the sitter. The lamp is also useful in getting effects with daylight portraits, in addition to or in place of a reflector. See Portraiture.

SPOTTED FEVER. This is the popular name of cerebro-spinal meningitis, an inflamniation of the covering membranes of the brain and spinal cord caused by a germ. These germs invade the thront in the first place, and are often found in the throats of people who have had the disease and also of others who do not themselves suffer from it,


Spot-light. Fig. 1. Arrangement in a room in wich the spot-light is given by the window $B$
but who can communicate it to others. In any community there are a'ways "carricrs" of spotted ?cver, and this danger increases in a marked degree when people are crowded together. Epidemics of the disease are therefore liable to break out in barracks, camps, ctc. Dirt and bad sanitation play a contributory part.

Children are most frequently affected. Severe headache and


Spot-ight. sis. S. Spot-ngat connected up and alight. ready for making an exposure. See page 1190 Courtesy of Ensign. Litd
vomiting, followed by a painful rigidity of the muscles at the back of the neck, are carly symptoms. The doctor should be called at once. This is a notifiable disease and the patient must be isolated. Those who have been in close contact with the patient should use antiseptic gargles.

SPOTTING: Of Negatives. Negatives frequently require spotting because of the presence of small holes in the film, called pinholes, due to dust on the plate before exposure or somewhat larger holes due to hubbles of air adhering to the plate during development. T!ese holes are iransparent, and therefore print black. They are most noticealile in the high lights, i.e. the dense parts of the negative, and may spoil the appearance of the print or the enlargement.
Prevention is, of course, the best remedy and will be achieved by taking great care to keep the interior of both camera and dark slides free from dust. Do not attempt to brush off possible dust with a camel-hair brush from the negative prior to develop. ment. In a dry atnosphere the brushing will slightly electrify the film of the negative, and attract much more dust than it removes. Glass negatives may be sharply tapped on the hack with the thumbnail, or the edge tapperl on the table.
When pinholes appear they must be filled by spotting with Indian ink or other pigment. The secrets of neat spotting are to use the pigment nearly dry and not to attempt to work it on the film. One touch in the right place is all that is required. More will only spoil the result. Spotting is a simple and effective process if a little care is talien. Lamp black or ivory black, mixed with water containing a little gum arabic or Indian ink, may be employed. Use a finc brush, preferably a No. 1 cames hair. Give it a good point by twisting on paper or hetween the lips, and take a very small quantity of pigment, mixed with sufficient water to make it of the consistency of cream.
Try the brush on paper, twirling it as when giving it a point until it hardly seems to mark. Then immediately touch the pinhole once, making a line dot, and leave it. If the hole is a large one, a scries of dots may be required, but they must not be allowed to run into one another. Allow the first to dry, if necessary, before making another By this ineans, if care is used, spots in the prints will be entirely avoided. and with a little practice it will be found that a number of pinholes in a negative can quickly be spotted out. When a negative which is to be enlarged contains a number of very small pinholes, it
will be found that by throwing the negative slightly out of focus the holes will be practically unnoticeable in the enlargement without reducing its quality.
To spot prints, a pigment or water colour to match the colour of the print is chosen, mixed with gun water, and spotting carried out as for negatives. Large black spots may he removed with a touch of Farmer's bleacher as used for intensifying (potassium ferricyanide with plain hypo). A spot of the bleacher is applied with a canel-hair brush, eft for a minute or two to set, and then sponged off. The resulting white spot is touched with pigment to match See Negative.

SPRAIN. Whenever a joint is wrenehed the bones may be displaced or fractured, but when the injury stops short of this and consists merely of stretching or tearing of the ligaments and tendons it is called a sprain. Even this may do damage, cause pain, and hamper movements of the joint.

Blceding takes place from torn blood vessels, and this is quickly followed by inflammatory reaction in the injured tissues. These things combined lead to more or less swc!ling and discoloration, and when in the course of a few days the shed blood breaks down, the familar changes of colour from red or black to green and yellow occur.
Cold compresses should be applied at once. They relieve pain and help to diminish bleeding. Later hot applications may be used for the pain and to promote absorption. Rest at first is necessary, and splints may be used to this end, but early massage and passive movements are necessary to prevent stiffness. See Ankle; Bandage; First Aid: Joint.

SPRAT : How to Cook. The sprat is seasonable from November to March, and should be caten very fresh. After being cleaned it should be rubbed in a cloth to remove the scalcs. The condition of this tish is easily ascertained by the appearance of the eycs; if these are bright it is fresh, also the skin of the fish should have a silvery look when washed. Dried sprats may be bought in bundles. As nuch as possible of the dried skin should be removed by placing the tish in boiling water and then wiping them dry on a clean cloth. The sprats are then heated in the oven in a greased baling tin.

After being cleaned and rubbed sprats may be dressed by being dipped in scasoned flour and fried in boiling fat, a frying basket being used to kcep the fish together. The fat should be smoking hot or the fish will be sodden. If no frying basket is at hand the sprats must be lried in a frying pan, using plenty of fat. The fat cannot be used again for anything except lish. Another method is to dip the fish in seasoned flour and egg and crumb them, using very line white breaderumbs

Pickled Sprats. Sprats may be pickled to keep. Clean the fish and boil them, just covered with water. When cooked drain off the liquor and pack them tightly but evenly in jars. Fill up the jars with equal quantitics of strained fish liyuor and vinegar. Set them by for a few days, and if the vinegar has become reduced fill up the jars. Tie down closely.

Sprats au Gratin. l'repare 2 lb . sprats and arrange them in a well. buttered lireproof clish. Scason them with salt and cayeme pepper, and pour
over them the following mixture $\frac{1}{2} \mathrm{lb}$ mushrooms, prepared. cut in strips and blanched in $1 \frac{1}{2}$ gills stock, 2 good wineglasses sherry or white burgundy 2 peeled and chopped shallots, and a grate of nutmeg. Pour this, including the liquor in which the mush. rooms were blanched, over the lish. then place at intervals about 1 oz. butter in small pieces. Scatter over 1 tablespoonful chopped parsley and coat with browned breaderumbs. Bake for about 20 min . See Fish . Sardine.

SPRAY: Medical Üses. In affections o the nose and throat the use of a spray is often preferable to other methods of applying medicaments. The liquid is converted into a fine cloud by means of a rubber ball which. when compressed, sends a current of ait across the inouth of a tube that dips into the liquid. The spray is sater than the nasal douche for a cold in the head, and more effective than gargles for a sore throat. Cocainc, menthol, carbolic acid, iodine and other sedative and antiscptic drugs are used and the vehicle may be water or !iquid paraffin. See Douche.

SPRAYER. For domestic purposes a sprayer can be used for scent and for fixing charcoal, pencil, and other drawings by covering them with a tinely distributed film of varnish. Larger forms of the same appliance are employed for spreading whitewash, distemper, and paint, and in the garden disinfectant and insecticide are sprayed on potatocs and on fruit and rose trces. The principle is quite simple, and consists in passing a current of air over the top of a tube which is immersed in a liquid.

The simplest form of sprayer consists of two lengths of glass tube fastened together with a hinged elip, so that they can be set at right angles. One tube passes through a cork and reaches almost to the bottom of a bottle containing the liquid to be atomized. When air is blown through the horizontal tube the liquid is drawn up from the bottle and projected as a fine spray. The essential feature of the appliance is in the relative positions of the ends of the tubes, for the end of the horizontal or air tube must be so put that it directs the air across the top of the liquid tube. In the scent spray for the dressing table the air is sup. plied either by a rubber bail or a piston, the former producing a continuous spray.

The com-



Courtesy of Richard Mclhuish, Ltd.
sprayer for insecticides has an action similar to that of the tubular sprayer described above. It consists of an air tube in the form of a pump, and similar in action to a syringe. A nozzle at the end is directly over the liquid tube. which is attached to and fits in a receptacle holding the liquid, this container being filled through an opening covered by a screw cap. This type is used also for spraying rose trees and fruit bushes.
The spraying of distemper, paints, cellulose finishes, etc.. requires a more powerful air pressurc. In commercial work a power driven air compressor is used, but a substitute for bome use is available in the form of a foot pump in combination with an air reservoir. A portable sprayer is shown on page 1191. Machines suitable for garden purposes are described in the succecding article.
SPRAYING: In the Garden. Various iiquid mixtures which are administered by spraying are widely uséd for destroying insect and fungus pests on fruit trees, rose trees, and other flowers, as well as on certain vegetables; for instance, potatocs. Spraying is most effective in dry weather. If it is followed quickly by heavy rain it must be repeated as soon as the weather clears. Early morning and cvening are the best times of the day for spraying.
A hand syringe with a spraying nozzle is usually sufficient for treating potato plants, small fruit trees, rose trees and flowers, but for large trees and stretches of potatocs a mechanical sprayer is advisable.

Sprayıng Machine. Where there are a good many trees concerned a machine sprayer is used. One of the best is known as the knapsack being so called because it is carried on the back. This is suitable for spraying all kinds of fruit trees, as well as potatoes and other vegetables.
In these machines the containcr, which holds about $3 \frac{3}{4}$ gallons of the spray, is usually made of plain or tinned copper. The former is less expensive. but it cannot be used for a lime sulphur wash, for which either a tiuned copper one must be used, or onc with a container made of an alloy that is chemically resistant. Fitted to the container is a short length of hose, and attached to this is a brass lance about 3 ft . long, the nozzle being fitted to the end of the lance. For spraying large trees a lance, 5 or 6 ft . long.. can. if necessary be fitted. All spraying machines are fitted with strainers. When it is necessary to spray an orchard of large standard trees, a type of small wheel manual machine is recommended

Winter Spraying. For spraying fruit trees in winter the tar-oil washes are recommended ; they not only cleanse the trees of moss, lichen and other impurities, but help to destroy hibernating pests among the branches. Limesulphur. nicotine and Bordeaux mixture are commonly used in early spring before the blossom buds open, and again at summer strength later on if necessary. Arsenate of lead paste in solution, if sprayed on the trees as soon as the blossom has fallen poisons the food of caterpillars. During the summer months one of the concentrated insecticides sold under various patent names will keep down aphis and other common pests. See Apple; Bordeaux Mixture: Fruit; Insec ticide ; Potato. etc.

SPRIG: In Lace. In lacemaking this word refers to one of the separate pieces of lace fastened on a ground in appliqué lace. Material embroidered with sprigs, or which has sprigs in the pattern, is known as sprig embroidery or sprig muslin. See Lace.

Spring. See Door; Lock.
SPRING: In the Garden. For the amateur gardener spring is the most delightful scason of all, particularly in the open garden, and it is also a busy time. The results of hard
work during the dark, cold, wet and frosty days show themselves by the arrival at perfection of many beautiful subjects, particularly Howering bulbs. First of all come the snowdrops, which are closely fcllowed by crocuses, scillas, anemones, hyacinths, narcissi daffodils, and tulips. later on flowering cherries and almonds put forth their beautiful pink and white blossom. fresh young buds and foliage begin to appear upon trees, shrub.s and perennial plants.

Strenuous work must be done out of doors in order to obtain the best results later on. This necessitates care in the sowing of seeds of hardy annual flowers, which, in snall gardens, may be done safely in between the clumps of spring flowering bulbs already in bloom and the groups of established perennial plants which begin to indicate their presence for the season. Many questions of pruning, propagating, dividing, and other technicalities arise at this time of the year.

As the official period of spring is from March 21 to June 21, information regarding the constructional part of gardening work will be best derived from the tabulated information given in this work under the headings of the different months. See April ; Autumin; June : March; May; Summer.

SPRING CABBAGE. This is a valuable vegetable which supplies produce in spring and early summer. Seeds are sown on a reserve bed during the third week in July and early in August in southern districts, and carly in July in northern countries. In September the plants are put out where they are to remain at 15 to 18 in . apart. Some of the best varieties of spring cabbage are Harbinger, April, Ellam's Early, l'lower of Spring, Mein's No. 1, and Emperor.

SPRING-CLEANING. The housewife who starts to spring-clean with a definite plan of action generally manages to renovate the home with the least possible amount of fuss or disturbance of its other inmates, and with the best and most economically accomplished results. The plan includes arrangements for essential repairs outside (in the case of the owner's house) and inside ; also getting rid of rubbish, storing away winter things, inaking at home anything in the way of new covers, lampshades, curtains or cushions that are required, or getting them madc, and sending away carpets and other soft furnishings which need professional cleaning or dyeing.

It is wise to make out the plan a good fort. night before the cleaning begins. Obviously any external repairs needed to roof, gutters, windows, etc., should be done first; then when the carpets are up any repairs to gas fires or other installations which may be required indoors. Should any room or rooms have to be redecorated it is advisable to remove everything portable, and have that work finished before proceeding with the other general spring cleaning. In the meantime small things can be attended to ; cup boards can be thoroughly turned out, winter goods protected from moth by ccdar chips, naphtha or lavender, stored away safcly wrapped in newspapers, and rubbish disposed of : china can be mended and also rugs and carpets which need fresh binding or darning with rug wool. Any odd jobs of carpentry or putting up shelves, etc., should be done before cleaning starts. Mattresses or pillows which require re-making should be sent away, and stock can be taken of the linen, glass, china and kitchen utensils.
Method of Procedure. In the case of a house it is best to start from the top downwards. The sweep should be engaged to clean in turn any chimneys in rooms where there have - been coal fires. Having decided the rotation of cleaning, prepare a room for the
hangings, ctc., and covering the rest of the furnishings with dust sheets and newspapers.

An electric vacuum cleaner is a great aid to the housewife where electricity is installed; it is not only useful for cleaning ceiling, trieze, picture rail and walls, but also for mattresses, stuffed chairs, divans, settees and soft furnishings generally. Once the sweep has finished, the special attachment to the vacuum cleaner should be used for ceiling and walls, or, failing this aid, a long-handled soft ceiling broom. After this the floor is dealt with, scrubbed or washed over with soda water and repolished, if parquet, or if of stained boards which are worn, restained with equal quantities of Brunswick black and turpentine, giving as many coats as are required, leaving them to dry in turn and then treating with floor polish.

When linoleum, rubber or cork carpet is the floor covering, use a little disinfectant in hot, soapy water with a clean Hoor cloth, afterwards dry thoroughly and wax polish. Japanese or fibre matting can be scrubbed, using a little soap and water, and working the way of the weave. The matting should be dried with a soft cloth immediately. Paintwork is best lightly treated with a tepid solution of borax and water, dried and polished with a soft rag on which a few drops of paraffin are sprinkled. Windows should be thoroughly cleaned and blinds, if any, scrubbed with a brush wrung out so that it is merely damped with soapy water and afterwards the blinds must be well dried. All furniture and fittings are next cleaned. Polished wood that requires particular attention should be washed in tepid vinegar and water and then rubbed over thoroughly with linseed oil and left for a few days; after this it should be well polished with furniture cream. Other furniture should have the woodwork washed over with a damp cloth and polished, and any upholstery well brushed or treated with the correct vacuum cleaner attachment.

## Cleaning Firepiace and Mantelpiece

All pictures and mirrors should be cleaned, all drawers and cupboard shelves washed over with a damp cloth wrung out of hot water with a little disinfectant added to it and, when dry, relined with clean paper. Brick fireplaces, which should be rubbed down weekly with warm water to which a little paraffin has been added, may be further cleaned with a preparation sold for cleansing unglazed bricks. White marble curbs and mantelpieces which arc stained should be rubbed with half a lemon dipped in salt. Leave the application on for a few minutes, wash off and dry the marble thoroughly.

China and glass, ornamental or useful, should be washed in soapy water with a little ammonia in it, using a hoghair paint brush for finely-modelled pieces and for getting the dirt out of crevices. Fittings of brass, copper, etc., and ornamental pieces should be cleaned and the opportunity taken to apply a trans. parent lacquer to any suitable pieces, which will save further cleaning for a considerable time. Piano keys and other ivory can be best treated with a paste made from sal volatile and olive oil, rubbing it on with a wash leather and leaving till dry, when the paste is polished off with a clean soft cloth. All books should be, thoroughly dusted and old papers and magazines discarded if uscless. See Brushes; Carpets, Clothes Moth: Labour Saving; Paint: Polishing: Vacuum Cleaner.

SPRINGER: The Dog. The breed of sporting spaniel known as the English springer is a very symmetrical dog, weighing on the average from 40 to 50 lb . He is possessed of a long head, square muzzle, longish Hat coat, long ears, straight front legs, good strong feet. and a general look of activity.


The colours are various. Among sporting dogs the springer's extra size gives him greater pace than the cocker, and he is able to retrieve a hare. See Dog.
Spring Mattress. See Divan: Mattress
SPRING ONION. To prepare these for table, wash them well in cold salted water, so as to draw out any insects from the leaves, cut off the roots, and trim the green tops The outside leaves, if withered, may he peeled off. Serve the onions either whole with salt, or cut them up and add them to a mixed salad.

Spring onions are sold in small bunches. The leaves should be upright; any tendency to droop being an indication that the onions are not fresh. See Onion; Salarl.

SPRINKLER : For Clothes. Any vessel which has a perforated top that will serve ns a sprinkler may be used to damp clothes hefore they are ironed. The large enamelled tins, with handle and detachable tops, sometimes used as tlour dredgers, make good sprinklers, and enable the dainping process to be done more evenly and thoroughly than would otherwise be possible. See Ironing.

SPROCKET : The Wheel. A toothed wheel of any diameter suitably designed for chain drive as distinct from gear drive is a sprocket. The shape, width, and pitch of the teeth will vary in accordance with the pitch and width of the chain to be used.

In its true form the sprocket wheel is always employed for pedal cycle work in conjunction with the block or roller type of chain, the roller chain being the most popular. A sprocket used with the silent chain is in appearance identical with the ordinary pinion, the teeth being much the same in shape. This pattern is always employed where chain drive is incorporated in the design of a motor vehicle. See Bicycle; Internal Combustion Engine; Motor Cycle.

SPRUCE : The Tree. 'This is the common name of a group of conifers among which are valuable timber and ornamental trees. Deal is the wood of the common spruce or Christmas tree (Picea excelsa). The blue spruce (Picea pungens glauca) is a beautiful lawn tree, and others of decorative value are the Hinalayan spruce (Picea morinda); Engelmanni, the Servian spruce (Picea omorica); and the Sitka spruce (Picea sitchensis); the lastnamed is an excellent tree for wet land. Propagation is by seeds.

Uses of the Timber. Spruce or white deal is one of the cheapest and commonest woods, imported into Great Britain from N. Europe and N. America. It has a white, clean appearance, with distinct annual rings and with numerous small hard knots, the latter making it rather difficult to work, as they dull the cutting tools, otherwise the wood is fairly soft. It is light, elastic and resonant, the
latter quality making it a suitable wood for sounding-boarls and for violins.

As a-tree spruce is tall and straight, yielding poles which are suitable for masts, spars, scaffold and telegraph poles, and for ladders when split. Builder's planks and temporary constructions are generally of spruce, and it is used for piles, packing cases, and similar rough work, and also for making paper pulp.

Its cheapness and clean appearance are reasons why spruce is employed for flooring, matchboarding, kitchen dressers and tables, and much other interior joinery. It is used also in bnat-building and for oars. The Christmas tree is a small spruce. See Wood.

SPRUCE BEER. This is a beer flavoured with $\pi$ decoction of the young shoots of the spruce fir. 'To make it, dissolve 4 lb . treacle in 2 gallons water by heating them in a large pan over the fire, then strain the liquor into a cask and add to it 2 gallons cold water and about 2 tablespoonfuls spruce esscnce.

Let the whole stand until it is just lukewarm, and then stir in $\frac{1}{2}$ gill fresh yeast. Place the cask in a warm place, and when fermentation ccases bung it closely and leave it until the following day, when its contents may be hottled. Sprucc beer made in this way is ready for drinking in a week's time. Essence of spruce is made by boiling the tops of the hlack spruce in water, then taking them out and boiling the water again so as to concentrate the lecoction

SPUD : For the Garden. This is a long handled tool with a sharp, straight, narrow hlade which is used for digging out hardrooted weeds such as thistles or burdock. Smaller types are convenient for cradicating lesser weeds on lawns, paths and between cultivated crops. See Spade: Weeds.

SPUR : For Horses. Nickel or electroplnted spurs are those in general use. Each spur consists of the branches for the heel, neck, and rowel, blunt or sharp, with a strap to go below the boot and one to fasten around the instep, with a leather pad to keep it in position on the boot and to prevent undue pressure on the foot. Spurs are used for


Spur Valerian. Rose-red flowers of a bardy plan for a sunny or shady border. See article above
enlivening a jaded horse or as an aid to guiding the animal in crowded thoroughfares, or to force a horse up to its bit when necessary. When applied with riscrimination they are considered essential for breaking and making good hacks and liunters. After use the straps should be removed and the leathers carefully sponged. See Horse ; Riding.
SPURGE. This is a large genus or group of plants, but few of them are of much value to the gardener; the botanical name is Euphorbia (q.v.).

SPUR VALERIAN. This is a uscful plant (Centranthus ruber), suitable for sunny or shady borders, walls and the wild garden. It grows about 2 ft . high and bears rose-red Howers in summer. It spreads rapidly by means of self sown seeds. The variety coccineus is a better colour and the white variety is attractive. See illus. below
Sputum. See Cough: Expectoration.
SQUAB PIE. To malic, fill a pie-dish with alternate layers of fairly thin pieces of uncooked mutton, sliced onions, and sliced apples. Over each layer of meat and onions sprinkle salt and pepper and a pinch of chopped herbs, over the apple a little white sugar. If the mutton is very lean, a few small pieces of bacon fat should be added. When the dish is full pour over it about $\frac{1}{2}$ gill water. then cover it with a good thick short crust and bake the pie slowly. It should be served hot. See Pastry.
SQUARE MEASURE. This is employed for measuring land, walls, floors, and surfaces of all kinds, being essential in all building operations. It is as follows

| 144 square inches | $=1$ square 1oot |
| ---: | :--- |
| 9 square fret | $=1$ square yard |
| 304 square yards | $=1$ square rod, pole, or |
| 40 square rods | $=1$ perch |
| 4 roods | $=1$ acre |
|  | $=1$ |
| 640 acres | $=1$ square mile |
| See Arehitecture : Bungalow : Measure- |  | Architecture

Bungalow
Measurement; Rule, etc
SQUEEGEE. The simplest form of squeegee is the flat type, consisting of a strip of thick india-rubber mounted in a wooden holder. When passed over a wet sheet it drives out excess of water from both upper and under surfaces of the shect.

Large flat squccgees mounted on broom handles are much more effective than a broom or mop for sweeping water off concrete or cement floors and paved courtyards.
Squill: The Bulb. Squill is an oldfashioned popular name for the spring-flowering bulb scilla (q.v.). See Bluebell; Hyacinth
SQUINT : How to Treat. Strabismusor squinting is mostly due to errors of refraction, hut may also be the result of paralysis of a muscle of the eve. Squinting from long sight or hypermetropia may apjcar at a verv carly age. When a child makes a strong effort to bring near objects to a focus there is undue contraction of the muscle, and a squint is produced. In short-sighted squint there is weakness in turning the eye. An inward squint is commonly due to paralysis of the muscle, which turns the eye outward.

For the squint caused by paralysis the treatment will vary according to the disease on which the paralysis depends. In the forms of squint arising from errors of refraction, the child should be at once taken to an oculist, who will prescribe suitable glasses. If this is done in time the squint may he cured in many cases. But if one eye is weaker than the other, efforts must be made to strengthen it. The usual measure is to cover the stronger eye with a shade, so that the weaker one may bo strengthened by exercise. The same object is obtained if some atropine ointment is applied daily to the better eye. The treat ment should be given a full trial for at least a year. See Eye; Sight Testing ; Spectacles.

SQUIRREL: The Fur. Squirrel fur is grey in colour, the clear paler shades being most valued for making up into coats and wraps. It dyes well and the darker skins can be treated to imitate Kolinski or sable. Squirrel is also dycd to match mole and flat brown furs as a trinıming. Unfortunately, it is not a durable fur. See Fur.

SQUIRREL PAINT BRUSH. To a great extent brushes of squirrel hair have taken the place of the camel hair brush for oil and water colour painting. They are made in a variety of sizes and are obtainable at artist's colour shops.

SQUIRREL'S FOOT FERN. This is the common name of davallia, a greenhouse fern. Its rhizomes are often trained round objects of various shapes and sold as fern balls. The most popular kind are the squirrel's foot fern (hullata) and the hare's foot fern (canariensis). Davallias are well suited to cultivation in suspended baskets. They like moist, warm, shady conditions. A suitable potting compost is two parts of fibrous loam with one part each of sand, peat, and charcoal, potting being performed in spring.

SQUIRREL TAIL GRASS. The ornamental grase known as maned barley or squirrel tail grass belongs to the genus Hordeum, and the only noteworthy species is H. jubatum. This is an annual growing about 2 ft . high, the bearded awns of which form a kind of mane. It may he sown in spring or autumn and will thrive in any open space.

SQUIRTING CUCUMBER. This is a curious half-hardy annual climbing plant with oblong, cylindrical fruit somewhat resembling small cucumbers. When ripe these fruits open and discharge their pollen. They should be grown in a heated glasshouse in a mixture of loam and leaf-mould and may be trained up the sides of a sunny greenhouse and on to the roof. Potting up must be done in early spring in large pots.

Propagation is by sceds sown in pots parly in the year, in a temperature of from $60^{\circ}$ to $70^{\circ}$. The flowers of the squirting cucumber are yellow in colour. The botanical name of the family is Momordica, while other popular names are balsam apple and apple of Jerusalem.

STABLE. In building a stable the points that must be principally borne in mind are that the horses should have plenty of light, plenty of air, and that the floor upon which they stand should be dry and well drained. A stable may be built of any material convenient, either stone, cement, bricks, or timber.

The stable walls should be 8 or 9 ft . high, so as to give plenty of hearl room, and the floor
should be raised at least 9 in . above the sur. rounding soil. The common practice of building the hay loft above the stable is not a good one. It leads to bad ventilation and to dust and clirt in the stable beneath, while at the same time the ammoniacal vapours rising from the stalile tlo not improve the hay.
Ventilation should he provided in the ridge of the roof and also in the walls, but the ventilators in the walls must be set above the lieight of the horse or horses' heads. If set iower, draughts will be cansed and the horse will suffer. Stalls are frequently made too narrow ; 6 ft . is the ininimum width to be allowed for an ordinary horse. The slope of the floor should not exceed 1 in 50. There is nothing worse for a horse than to be compelled to stand on a stcep slope with the greater part of its weight upon its hind legs.

## Points about the Floor

The floor of the stall or loose box is generally made of cement concrete slabs, which are roughened so as to give firm standing. Blue bricks grouted in cement make an excellent floor, but it is more costly than cement. Stone setts can be used if laid on cement and grouted with cement mortar. Cement alone will not stand the hoofs of heavy horses and nsphalte is too slippery, while wood absorbs moisture and cannot be kept clean. Good Irainage is allimportant, for if a horse is allowed to stand on foul and wet bedding its feet will certainly suffer. Under-floor drains, like stone causewayed floors, are now out of date, the drainage to-day being usually carried out of the stall.

The modern hay rack is usually of iron, and set at a much lower level than the old wooden rack. The feeding trough is either of cast iron or of fire clay, and is set not more than 3 ft from the floor of the stall. Water is usually provided in the stall, the water pot being set at a little distance from the manger, and providcel with a supply pipe and tap. It should be of a shape easily kept clean, and water should not be left in it. The woodworl: of the stall should be clean dressed and varnished, and all iron work painted three coats.

The stall should be provided with suitable windows. It is cruel as well as foolish to keep a horse in a dark stable, and particularly when it is opposite a blank wall. The windows should be of the sash varicty, and made to open and shut. The best for stable purposes are made with iron frames. A window in the wall must be protected with iron bars on the inside. It is well to remember that an ordinary 15 -hand horse can reach up to a height of quite 7 ft .

The hamess room is usually part of the same building as the stable, and is provided with tittings for holding harness and saddlery. These, as a rule, are made of iron, but wood is a preferable material. The harness room is provided with some method of hrating it, cither a stove or an open tireplace, for although there is no necessity to warm the stable itself, it is essential to have mcans at hand for drying wet harucss, and for maling hot gruel or bran mash for the horses.
Shelves are required for holding harness soap, oil, and polishes, and a few veterinary medicines can be kept
in a smali cupboard. In a small establishment the corn chests may be kept in the harness room. These are made of galvanized iron, and they are usmally separated into two or more compartments, to hoid oats, beans. maize, bran, etc.

It is necessury that water be laid on to the stable, and the tap must be one that will takc a hose pipe. The manure pit should in no circumatances adjoin the stable. All inanure should be removed cacb day to a pit in the garden, or at some convenient distance from the house and stablc. See Drainage; Groom; Harness; Horse; Manure; Roof.

STAFFORDSHIRE CHINAWARE. The qualities which characterize this china, both in its usefu! and in its ornamental forms, are durability, whiteness, and translucency. It has had as much to do as the coarser pottery and stoneware with spreading the renown of the Five Towns, Burslem. 'lunstall, Hanley, Longton, and Stoke, whose activity was greatly enhanced by their amalgamation into the county borough of Stohe-upon-Trent, which possesses five great public museums. Among outstanding names are Sjode, Davenport, Min!ton, Neale, Mason, Ridgway of Cauldon Place, Adans, Copeland, Treen, and Browntield.

Collectors of old china regard the immature and uneven productions of Wiliiam Littler, of Longton Hall, for a few yours after the middle of the listh century, as the beginning of Stafforilshire china. The mark was nade up of two L's crossed, and examples are now rare. But it was Josiah Wedgwood who intro!uced into the manufacture of fine earthenware those new methods of potting, firing, and decoration which revolutionized the industry.

Somewhere about the year 1800, Josiah Spode, the younger, adopted at Stoke-uponTrent a mixture of china clay, felspathic rock, and bone ash, with a lead glaze, which resulted in a true porcelain. His example was followed not only in his own neighbourhood, but ultimately also in the great rival factories found elsewhere.

The result was to abolish the old 18th century distinction between hard paste, as represented by Dresclen, and soft paste, as wrought at Sèvres, and virtually to establish a standard composition for English hone-china throughout the kingdom. As the proportion of bone-ash may be as much as $\frac{2}{5}$, the resulting body differs radically from that of the Chineso porcelain, and has become the chief model for modern china manufacture in all countries.

In the early years Spodo and Davenport turned out tea and other services in old Japan patterns, sometimes on rose or celadongreen grounds, with gilt feet. Davenport also made at Longport vases and other picces with raised floral ornaments enclosing delicate landscape panels.

After the mid-Victorian art revival, Mintons did some outstanding work, and the Crown Staffordshire Porcelain Co., Ltd., successfully rivalled the enamel tints used by Chinese potters in the famille verte, famille rose and powder-blue groups. Perhaps the highest achievements in this diroction are the flambe glazes wrought by Bernard Moore. See China; Davenport Ware; Minton Ware: Pottery: Spode; Wedgwood.
STAG BEETLE, The visits of stag beetles to the garden on summer evenings often gives rise to unnecessary alarm. They are perfectly harmless, in spite of the formidable appearance presented by the antler-like development of the male beetle's jaws. These are neither offensive nor defensive in their function, being, in fact, mere ornaments. The smaller, inconspicuons jaws of the female are of a far more practical character; but they are used only for crushing soft shoots in order to suck up the sap. As the attack is made chietly on oak trees, no appreciable harm is done. The grubs


Stag Beetle. Male and female of this harmless garden insect
is to sew rings on a tape running diagonally across each curtain on the side away from the audience. For a stage with a $12 . \mathrm{ft}$. opening the rings would start from the upper right and left inner corners respectively, and be continued down to a point on the edge of the curtains, where they
spend the full period of their existence feeding in the decayed wood of old stumps, and are in no sense garden pests.
STAGE. When a stage is required for amatcur thentricals or concert in house or carden, it may either be hired from an entertainment caterer with its accessories of proscenium, curtains, and lighting arrangements; or else it can be made at home in a simple but satisfactory way.

Presuming that the performance is to bc in the house, the size of the available room must be considered first, as the smallest stage requires a room not less than 14 ft . high: 20 ft . wide, and 30 ft . long. Of the last measurement 14 ft . is required for the depth of the stage and the remaining 16 ft . for the accommodation of the andience, who are too near the players unless 4 ft . be left between the stage and the first row of seats.

The bare stage floor measuring 20 ft . by 14 ft . scems a good size, but when the marginal space of 4 ft . has been allowed at cach side, and at the back for standing room, cxits, and entrances of the actors, the passing bchind the scenes required during the performance, and the necessary support for scencry by stage braces, the acting portion of the stage is reduced to a $12-\mathrm{ft}$. wide opening and a depth of 10 ft . Though workable, it will be seen that this size somewhat limits the scope of the productions. If the entertaininent be given with screens or Irapery as a bacliground instead of scenery, the same amount of marginal space would not be reguired on the stage, and a smaller room could be used.
Making the Cortains. The curtains may be made of dark coloured Bolton sheeting, and should part and fall easily. A simple plan
ome together in the middle, 6 ft . from the top.
A line is threaded through these rings and over a pulley at cach top corner, which will draw the curtains up into a festoon. Weights should be sewn along the bottom hem. This method requires a person on either side to raise or lower the curtains.
The Scenery. The scenery is usually hired from one of the scenic studios, where a speciality is made of small scenes for home entertainments to suit the size of stage described. Exterior scenes are usually formed by a back-cloth, wings, or side pieces, and borders of top picces of trees or sliy. Interior sets are, as a rule, made up of tlats and ceiling borders. Flats are straight pieces fastened edge to edge by means of cleats and lines and held up by wood or iron braces heavily weighted with counter-weights.

A few details as to simple stage effects may be found useful, though most of them require practice, because if badly done they may spoil a serious scene. Horse-hoofs are imitated by two half coconut shells tapped against the wall. For wind, a special wind machine can be hired at a theatrical store. The effect of steain from a railway engine can be obtained by rubbing two pieces of sandpaper together in imitation of short or long escapes.

For lightning on a darkened stage a mag. nesium flash may be used. Thunder is suggested by blows on an iron sheet suspended by two ropes; the roll of thunder is suggested by holding the iron sheet at the bottom and shaking it. Rain effects are worked by pouring dried peas through a long wooden tube studded inside with nails; the slight or the marked tilt produces a shower or heavy rain. See Theatricals.

## Stains and THE STAINING OF WOODWORK

## Rules for the Application of this Decorative Finish

Useful both to the householder and the woodworker, this article deals not only with methods
of staining but with the preparation of the varied surfaces so reated See also Floor;
Graining; Oak; Paint; Pokerwork; Varnish, etc.

The object of staining generally is purely decorative, but certain stains have preservative qualities and thus answer a double purpose. By the use of a stain inferior woods may be made to resemble those of a finer quality, and hardwoods may be darkened to any shade for the purpose of enhancing their appearance.

While painting forms a completely new surface upon the wood, thus hiding the grain, a stain percolates into the grain, changing its colour without forming a fresh surface. There are many different varieties of stains, the chief difference being in the medium with which the colouring properties are mixed. This may be water, spirit, oil, wax, or varnish.

A useful wax stain is sold under the name of Sitainax. It is applicd with a brush, dries in a fcw hours, and results in a durable wax finish, which can lee polished with a brush. It is ohtainable in a number of shades.

Anotler method of staining is by the use of chemicals such as permanganate of potash, ammonia, and bichromate of potash. There is another class of chemical stain, the use of which involves two procerses, a priming and a colouring coat. The solution combines with the wood to form pigments which are fast, and the colour may take a couple of days to develop.

Stains may be either purchased ready naade in liquid form, or obtained in the form of paste powder and crystals. They are usually named according to the woods they represent, as light and dark oak, mahogany, walnut, and ebony, or in direct colours, as blue or green
For outdoor work it is neccssary to obtain stains which are weatherproof, as ordinary types are apt to fade quickly and develop a
patchy appearance. For cabinct work or indoor fitments the wood should be first planed smooth and llat, and then well glass-papered with, first, No. Middle 2, and finished off with No. $1 \frac{1}{2}$, using a cork rubber on which to hold the glass paper, and working it always in the same direction as the grain of the wood. If the glass paper is rubbed transversely to the grain, this will roughen the surface and cause any such parts to become darker than the remainder when the stain is applied.

Where it is desired to stain existing woodwork, care should be taken to ensure its being clean and free from grease marks, as thesc parts will be lighter than the remainder when the stain is applied, and will give a spotted and patchy appearance. Such places should be treated by rubbing them with a rag soaked in benzine. Any dirty marks can be removed by the use of glass paper.

When staining wood of poor quality, it is sometimes advisable to dress the surface so that the stain may lic evenly. The clressing consists of a coating of size applied fairly thin and left to harden thoroughly before staining. Sizing is necessary before the application of varnish stains to new woodwork, as otherwise the porous nature of the grain will soak up the quick-drying liquid before it is possible to work it.

All nail holes and other indentations must be filled in before staining. If water stain is to be used, the stopping is made up of plaster of Paris, or of wax mixed with suitable colours. Ordinary oil putty is used if the work is to be treated with oil or varnish stains. Care must be taken to avoid marking the surrounding woodwork with the putty, as this may leave such places lighter than the rest when the stain is applied. The holes are rubbed down level with glass paper afterwards.

The brushes required vary according to the nature of the work. For intricate parts of the work, such as mouldings and carvings, a narrow flat brush is the most suitable. A toofully charged brush is apt to give a streaky appearance to the wood, and there is the danger of the stain dropping from the brush on to the work.
The stain should be kept in airtight bottles, sufficient being made up to finish the whole of the work in hand, so that the colour will be uniform throughout. When required for use, it may be pourcd into a shallow vessel. Before applying the stain to the wood, it is advisable to test the colour on a spare piece of similar wood.
How to Use the Stain. The stain is applied by drawing the brush from one end of the work to the other in the same direction as the grain, working across from one side. It is essential that the edge of the colour should not be allowed to dry before the adjacent portion is stained, as this would result in a series of streaks ; hence it it is necessary to procecd smartly, cspecially when working on a large surface. A hot, dry atmosphere should be avoided, as one brushful will dry before the application of the next. It is a mistake to begin at the centre and work outward, as this necessi. tates working two edges of colour.

Having covered the whole surface, the brush should be pressed out to remove all surplus stain and lightly drawn to and fro over the work in a series of parallel strokes in the same direction as the grain. This will have the effect of removing any excess of stain in any one part. Some
workers prefer to finish off with a piece of enough to require special treatment may be muslin folded into a rubber, which gives a more even finish and removes all brush marks. Rub evenly and with only a moderate pressure, as otherwise the stain will be rubbed off in patches.

When staining a piece of panelling or a door, the panels are first attended to, working across from one side to the other in parallel strokes, taking the brush well into the corners and into the quirks. Any inner members of the framework are stained and then the rails, finishing off with the stiles. By this means the treatment of each successive portion of the work will clean off any stain inadvertently overlapping at the joints, as the brush can be drawn cleanly in a line with the joints in the same direction as the grain. The mouldings are finally stained, using a small brush and being careful to avoid touching the panels, especially when working on mouldings running transversely with the grain of the panels. The brush should be sparingly charged to prevent the accumulation of stain in the quirks and corners.
If a particularly dark colour is to be applied to a light wood, it is generally advisable to give two or more coats of a weaker stain rather than one heavy coat, as the latter is apt to dry
rubbed with a cloth ball. The latter, being partly composed of fuller's carth, acts as an absorbent and is therefore specially effective in removing grease spots. Various patent preparations are sold for removing either acid or grease stains, but before using them on delicate materials they should be tested on an odd piece of the same colour and texture.

Preparations of benzine, though labelled improved ' or ' non-inflammable,' still require care in use, and should not be applied near a naked light. The article treated should be aired by an open window until the smell of the cleansing has disappeared.

Stains on alabaster ornaments can be removed with a pastc made from whitening, soap and water. The paste is left on till quite dry and then removed with a soft cloth. A little powdered pumice is sometimes effective for the removal of obstinate stains. Stains on marble slabs, chimney pieces, etc., are best treated with half a lemon, dipped in salt. Wash of thoroughly and polish with a soft cloth.

Grease Stains. Stains on clothing caused by the spilling of gravy, oil, etc., should be sponged iminediately with hot water, or rubbed

Ink Stains. An ink stain on a white fabric should be sprinkled with salt at once, and then rubbed with a cut lemon. Rinse and warh off both cleansers at once. This method should not be used for coloured things as it may shift the tint; instead, try the following method:
Soak the stained part immediately in slightly warm milk, This should remove the mark if it is a fresh one, and the marked area can be rinsed, dried, and smoothed with a warm iron. Another method is to rub the stain with half a ripe tomato. then soak it in cold water, and the remains of the mark will disappear entirely after the next laundering. Tomato juice is satisfactory on dark woollen material if afterwards well sponged with cold water.

Old ink-stains which have dried in can only be removed from white fabrics with care, as the strong remedies necessary will spoil coloured goods. There is also always a risk of the cleanser eating a hole through delicate fabrics. Spread the stained part over a shallow dish or bowl half full of boiling water. Moisten the mark with water, and place a tiny pinch of salts of lemon over the stain. The latter must be carefully handled, as they are very poisonous. Leave the salts about a minute, then pour a thin stream of boiling water through them and the stuff. Repeat if necessary, rinsing off all trace of the acid immediately.
When ink is spilt on a carpet, take up the moisture immediately with blotting paper, then rub the place with a rag dipped in milk, preferably boiled, and dry with a dry cloth, rubbing hard. Or salt may be sprinkled on the stain, and rubbed with a cloth moistened in warm water.
Tea and Coffee Stains. For obstinate coffee stains on linen or cotton, a bleaching liquid made from $\frac{1}{2} \mathrm{lb}$. chlorinated lime, $\frac{1}{2}$ gallon boiling water, and 2 tablespoonfuls ordinary washing soda is effective. Turn the lime into a clean basin, pour the boiling water over it and then add the soda. Stir the whole with a wooden spoon, breaking up any lumps, and working vigorously to help the water to draw out the chlorine. Careful straining is then necessary to remove all the powder and leave the liquid clear.

The latter should on no account be used stronger than one part of bleaching liquid to 4 parts of hot water, and in the case of old or fragile materials, one part of liquid to 6 parts of hot water, or an even weaker solution, is advised. The article should be soaked in this for a short time, and taken out as soon as the stains disappear. A soaking in cold water and a thorough washing to remove all trace of the chemical are then necessary.

This bleaching liquid should never be used on silk or wool. Tea stains may be removed in the same way.

Grass Stains. Grass stains on fabrics which are too delicate to be washed should be treated with methylated spirit dabbed on with a clean cloth. If the material can be laundered, however, the stained part should be soaked in cold water, then covered with a little cream of tartar and left in the sun. Finally rinse with more cold water, and if the marks have not disappeared, repeat the treatment. For grass stains on linen or cotton goods, javelle water (q.v.) will be found effective. See Cloth Ball; Clothes; Dry Cleaning; Floor; Irons; Mildew; Paint; Petrol.

STAINED GLASS. The introduction of stained glass in a window for hall or landing depends for success on architectural features, the design and shape of the window and ita useful purpose. When there is an ugly outlook, or one on to a blank wall, a well-chosen stained glass window may be a charming piece of decoration, which screens without seriously obstructing the light. The best effects are usually obtained by concentrating the design to a border and a top panel or central motif, and using rippled or muffled white glass for the rest of the window. This is a successful


Stained Glass : its decorative use in the home. Fig. 1. Two examples of rouadels and reproductions of 15 th century quarries introduced into the leaded light panels of a living room window
to be specially designed for the style of furnishing in use. Lighting effects can often be improved by tinting white glass pancls in fittings with amber or red glass stain. See Glass Lead Art Craft; Leaded Lights; Window.

STAIR CARPET. Whatever the indiv:dual choice of colouring and pattern may be, it is poor ceonomy not to put down a type of stair carpet that will yield lasting wear. Goo! qualitics of relvet pile and hair carpet are always suitable, and for the country cottage coconut matting has much to be said in its favour, as besides its durability it does not retain the dust. Thick felt pads should be placed under the carpet on each tread and an extra yard of carpet should lee allowed for each flight to enable the carpet to lee shifted at least two or threc times a year.
Stair carpet is usually stocked in three widths, 18 in ., $22 \frac{1}{2}$ in., and 27 in . In a few nakes, colours and patterns it is obtainable in 36 in . width. When deciding on colour, and whether the carpet is to be plain or patterned, the width and lighting of the staircase, the wallpaper and the hall should be talien into consideration. Where a number of persons use a stairense it is often considered better to have a patterncd carpet.
Where an oriental rug is placed in the hall the pattern of the stair carpet should blend in tone and be of the same type of design a a small conventional pattern is satisfactory with a tiled hall, the ground of the carpet repeating a note of colour in the tiles. Where it can be used, the patternless carpet is easier to bring into an cllective decorative scheme. It may The decorative use of quarrics and roundel for the home window is seen in Fig. 1. In this instance the shapes of the patterned picces be all of one colour, possess a plain contrasting do not correspond to those of the plain glass, border, or show a narrow line of colour a few but break the uniformity of the leadel light inches from each edge. The last two varieties panel by the pleasing namner of their inscrtion. are usually to be found in hair carpet. Hints Fig. 2 shows a lozenge-shaped quarry with on the economical laying of stair carpets will the initials of Henry VIII and Katherine be found in the article on Carpet (q.v.). llanking the Tudor rose surmounted by the crown. In Fig. 3 the charining effect is scen of two rectangular quarrics set in panels made up of glasses of similar shape. Again royal emblems arc chosen of the lion, unicorn, rose and standard. The heraldic shicld which is seen in the lozenge-paned light on the left of the picture is another pleasing example of the discrect use of coloured glass. Reproductions of quarries and roundels can be obtained to order at the Victoria and Albert Museum. They can also be sometimes picked up in antique shops. While large panels of old stained glass are expensive, small quarrics have been bought for a few shillings, and finely reproduced roundels are obtainable for about thirty shillings. Panels and roundels with good geometrical or conrentionalized pat terns have been introduced successfully into sash windows, but require


Stained Glass. Fig. 3. Discrest use of stained glass by the inclusion in a charmingly designed window of two rectangular quarries and an heraldic shield

## Staircase: Planning and Decoration

## With a Survey of its Architecture at Various Periods

This contribution deals with one of the essential features of the house, and is therefore dis cussed to some extent under such headings as Cothaze; Hall; House; Landing. See also Baluster; Colour; Dado; Floor; Panclling; Stain, etc.
Few parts of a house require more careful horizontal members which rest upon the risers planning than the staircase, which provides a and receive the wear and tear of the stairs means of access from the ground lloor to the The nosing is the front of the tread. As a floory above, and at the same time offers rule it is rounded off or moulded, and projects great scope for decorative effect. It will almost always be found that a house with a well-designed staircase is easier to manage from the housewife's point of view than one in which the stairs are badly lighted, too narrow, or in some way out of keeping with the style of the house.
Economy of space is another leading consideration, and the location is very important. The severcly geometrical designs essential to the construction of staircases admit of little variety in form, but in the materials used and in decorative details there is scope for original treatment. Some of the principal types of staircase are dealt with in this article. which also describes the conuponent prarts and constructional details of a simple form.
The materials used in stairmaking are generally either wood, brick, concrete, stonc or iron. The stairs are made up of the following parts : strings, risers, treads, nosings, winders, landing, newel, handrail, balusters. The strings are the side members that receive the ends of the treads and risers, the latter two being housed and wedged into the former. If the stains are fired against a wall, that nearest to it is called the wall string, the other the outer string.
The risers are the vertical members which are placed across the stairs to receive and support the treads. They are housed into the immediate lower tread. The treads are the


Staircase. Fig. 1. Diagram showing positions of the various parts that malke up a fight of stairs

## beyond the riser about $\frac{3}{3} \mathrm{in}$.

Winders are those steps or treads that form an angle, if such exists, on a staircase. Their shape on plan is similar to that of a kite Winders should be avoided if possible, and be substituted by a quarter landing, that is, a rectangular space the same width as the stairs both ways. The rise of the stairs is the vertical height from the surface of one tread to the other, and the going is the name given to the horizontal distance between the faces of the risers.

The newels are picces of timber generally $\ddagger$ by 4 in . in section. They are placed at the botton, top, and at any change of direction of the stairs. The head and the pedestal of the newel are generally worked. The newels eccive the handrail, the latter being tenoned into the former and pegged. The handrail is the member that spans between the various newels. It is ronnded or moulded. If lixed over the outer string, balusters are placed between them, tenoned into the string and handrail respectively. They arc placed about 4 in. apart, two balusters being gencrally allotted to each tread. The handrail is fixed about 2 ft . ! in . above the string.

In addition to the strings, thic treads and riscrs should be supported by carriers; 4 by 3 in . stuff is generally used for these, and they are so arranged that each slep is supported by either onc or two carriers.

## Rules to Determine the Pitch

The pitch of the stair is governed by the available space and height. It should generally be arranged so that the rise multiplied by the tread will produce 66 or thereabouts, e.g. 11 by 6 , or 9 by 7. These proportions give very good results in practice. The former would be used in the best class of work, while the latter would be applicable to the ordinary dwelling-house.

When the amount of rise and going bas been determined, a gauge or pitch-board is made. This is a triangular piece of wood, the two sides forming the right angle being the gauge of the rise and tread respectively. By the assistance of the piteh-board and the plan of the stairs the newels and the strings are set out.
The housings for the treads and the risers are cut on the tajer, in order that wedges may be driven to complete the fixing together of the stringe, ticads, and risers. The tenons and nortises are prepared on the newels, these latter being pinned to the strings during the lixing of the stairs. The width of the stains should not be less than 3 ft . outside measurement. Stairs are often narrower than this, but it is undesitable, and in many instances very inconvenient.

Although in some of the newer small houses metal and concrete are utilized for staircases having steps of white or coloured composition, with rail and supports of metal tubing, the most common type is the timber staircasc. Of these the two forms most used are the well and the dog-leg staircase. The latter consists of two or more Hights so arranged that the outer string of each successive llight is immediately above that of the preceding one, the bottom newel of the upper flight acting as the top newel of the lower one. This form is chiefly used to economize space, and is seen in many terrace town houses. It is also the cheapest form of simple staircasing. Fig. 2 shows an elementary type of such a staircase.

Fig. 3 is an example of a well staircase. This type of stairy is probably the most dignified in appearance and consists of two or more flights built so as to cnclose a space. The example given is constructed round three sides of a well, each of the flights being straight and having two quarter space landings, thus obviating the necessity of using winders. The handrail is of heavy proportion, but being in combination with the hold newcls it docs not appear out of place. The upward curve to be seen at the head of cach rail is known as a ramp and is used to bring the rail up to the required height for the beginning of the succeeding member.
Tudor and Jacobean Staircases. In the early Tudor buildings the most used type was known as the solid newel, and consisted of a central upright or newel from which the treads and risers radiated in a spiral fashion. These werc usually of stone and of crude construction, and were dangerous, owing to the treads necessarily tapering to a point towarls the central newel. With the advent of the Renaissance, although stone. stair; were still constructed, wood stairs arranged in straight Hights came into use, these being the forerunner of those in use in modern times. The carlier specimens were often composed of a series of solid blocks huit into strings of similar heavy formation, but these were later superseded by a lighter form of separate treads and risers housed into the stringe. A


Fig. 2. Open type of dog-leg staircase, simple form chiefly used to economize space
notable feature of Elizabethan staircases is the treatment of the newel, which was carried above the handrail and was usually surmounted by a capping or carved finial. This treatment is found in many later oak stairways and in adaptations of Tudor and Jacobean styles. An example may be seen in Fig. 2, page 574 , while in its simplest form such a newel post is shown in page 608.

A variation from the usual balustrading of turned spindles was that consisting of a series of pierced pancls carved in scroll and leaf work in the charicteristic style of the time.

The later Jacobean staircases were of similar formation to the Elizabethan, except


Staircase. Fig. 3. Well staircase of modern construction; a simple and dianified arrangement
that they were rather lighter. The turnings, ir place of the heavy bulbous type, were slighter, the handrailing of smaller proportions, and during the lirst half of the lifh century the newel was still carried above the handrail. This feature is probally a development of an earlier form, when the newel was continued from floor to Hoor in one continuous line, a style also found partially adapted to the modern stairway, as may be scen in Fig. 6.
Our next illustration, Fig. 4, shows a 17th century Loudon stairease of unrivalled beauty. This is situated in Ashburnhan House, now part of Westminster School, the building of which has been assigned to Inigo Jones, between 1633-1640, or to his pupil Welbl in the period between 1660-1670. This staicease is considered to have been planned and designed with consummateingenuity and art. Its wide, shallow treads, carved talusters, Huted Ionic columns, and its elliptical dome (not seen in the illustration) supported hy a series of twel ve columns, give an effect of great dignity and spaciousmess. The lovely 17th century panelling should be noled.

Staircases of the 18th Century. For the more intimate and cosy type of house which camo into firshion in the reign of Qucen Anne staircascs were planned of much lighter construction. The heavy balusters and massive handrails disappeared in favour of a lighter and more elegant style. Thee finely twisted balusters were sometimes found on each wide tread, and carving "as discreetly limited to a delicate nersel at the bottom of the staircase, and sometimes to brackets helow the treads on the outer side which enriched the appearance of the flight when seen from the hall. In other 18th century staircases a railing of scroll work in hent iron "as utilized in place of wooden balusters. This is yet another stylo adopted to day, in some cases all


Fig. 4. Beautiful 17th century staircase in Ashburnbam House, Westminster School, with Ionic columns, carved balusters and panelled walls. Fig. 5. Georgian staircase with gracefully turned balusters and carved mahogany rail courles!! of Countr!! liire

Wallpapers and carpets with very pronounced patterris are, therefore, not a good cho:ce The modern liking for varnished paint and riarnished marbled papers in pale tones oi yellow. beige. green or grey for hall and staircase is to be recommended fortwo reasons The lirst s that a pale, shiny surface reflects the light, and the yecond that such surfacus especially when mottled, do not show dirt or marks, a considera tion on a family stainway

Sometimes the balust tade is accentuated by being painted in a daiker colour to stand out against light walls, as in F?g. 7; in other cases, as in Fig 6, the woodwork is of the


Staircase. Fig. 8. The cupboard under the stgirs in some houses is a dark biding-place lor unwanted things. Not so in this case, where an electric light reveals its useful contents at a glance same colour as the walls In the latter example the dark rich little to maintain in good order. For the tones of the stair carpet are particularly type of staircase shown in Fig. 3, brown valuable A good effect has been also woodwork has an excellent effect, and renders obtained by painting the treads and hand- carpeting unnecessary if the treads and risers rail black, while the risers and rest of are of oak. Deal docs not stain very well the woodwork were painted white. A grey- for this purpose, but British Columbian pine green carpet with a decper toned border and has a beautiful grain and, though dearer than pattern, and the green marbled wallpaper deal, is worth the extra cost, which is com t.eatment, with the applied landseape motif, illustrated in page 575, completed an inexpensive scheme for a town house. Another staircase was decorated in shades of grey The walls had a dark grey dado with dove-grey paper above, and allother woodwork, including stairease doors, was in two medium shades of grey 'Thestair carpet was also grey, but colour was introduced by rugs, window curtains, and a set of llower prints framed in lead (see Lead Art Cra!t).

While paint is most usual on a staircase, stained woodwork has much to recommend it. It is permanent, neutral in colour, and costs


Fig. Painted staircase planned for a labour-
saving house. The solid construction of the wooden saving house. The solid construction of the wooden balustrade does not barbour dust "lunphre," of Vera Joel paratively little for the staircase and accompanying woodwork in a small house. The hatural colour of the wood combines with a preservative stain to give a beautiful effect when wax polished A scheme which included a dado of this wood, boney coloured walls and ivory ceilings would place no restrictions on the decora tions of the rest of the house, and yet would be warm and inviting in itself. Sucha scheme is, however, only possible for new "oodwork when the choice of decorations rests with owner or leascholder. Stains, especially those of a preservative kind, which give the best effect besides preserv. ing the timber. not only penetrate the wood \{unlike paint, which merely coats the surface) and are diff. cult to remove, but also have a destructive effect on paint should it be wished afterwards
to make a change in the decorative scheme.
Stair Cupboard. In many houses there is a cupboard under the stairs which ean be most convenient if its contents are easily seen and properly arranged. When used as a housemaid's cupboard and not as a hiding place for unwanted things it can be fitted with ehelves, a broon rack and apace left for the vacuum cleaner, etc It is also a good housing place for gas and electric meters. Where electricity
is installed a light which reveals the content.s of the cupboard at a glance is well worth the extra point Fig 8 shows a stair cuploard fitted in this way. Note the wall socket at the foot of the stairs for radiator or vacuum cleaner.
STAIR ROD. The long, thin rod placed in the angle between the tread and riser of stairs to secure the carpet or linolcum is generally made of wood or metal In selecting stair rods, it is well to bear in mind that those which are niade of polished metal call for conslant attention to keep them bright and in good condition, whereas only an occasional polish with furniture polish is needed for wooden rods The good effect of oak stair rods is illustrated in Fig. 6 of the previous artic!e. An oak rod with an oxidized metal eye or bracket is a useful fitting The brackets are simply screwed to the tread and riser respectively.

To kicep any type of brackets used at a uniform distance apart, it is a good plan to cut a stick or piece of wood of sulficient length to lit neatly between the two sides of the staircase or stringers of the stairs, and to cut two notches in one edge of the stick exactly where the metal brackets are to go. By using this stick se a guide and placing the brackets according to the notches, uniformity in line is ensured.

Instead of rods, clips or holders are often now used A simple switching of the holders is all that is neccesary to relcase or fix the carpet. There are no loose parts to be taken away and replaced. Such holders are tinished in oxidized brass, copper or silver.

STAKING: In a Garden. This is all important detail in the cultivation of trees and plants. Standard trees must be supported by strong stalies or the head of branches may cause the stems to break. Suitable ways of supporting herbaceous border and other plants are shown in the accompanying diagrams. llant supports ought to be as unobtrusive as


Staking. 1 Good knot tor garden work: a, details of tying 2 Same knot incorrectly tied at $b$. 3 and 4. Two useful' supports of wood and string. 5. How to stake a tree securely: $a$, stakes ; $b$, twisted ligature: $c$, knot as shown above. 6. Stake farred or creosoted above and below ground 7. Method tollowed in staking a pot plant 8. General utility stake for border purposes
By special arrangement with Amateur Gardening
possible, and they must be inserted in good time, for if the stems become bent the flower display will be spoilt. The metal coil stakes are commonly used for carnations; they are of spiral shape and tying is unnecessary. See Beans: Carnation; Fruit; Pcas: Swect Pea.

## Stammering. See Specch.

STAMP : On Documents. Certail docu ments, in order to be valid, need stamps, the value of which varies with the value of the
trausaction for which the document serves. is $1 /$ - for every $£ 100$ or part of $£ 100$ above that have been supplied originally to collectors

For instance, a contract note for the sale or purchase of any stock or marlietable security must bear a stamp. This is 6 d . for contracts between $\mathfrak{f} 5$ and $£ 10$ in value: $1 /$ - for those between $£ 100$ and $£ 500$; 2/- for those between $£ 500$ and $£ 1000$, and so on, until a stamp of $£ 1$ is needed for sums in excess of $£ 20,000$.
Stamp duties are also payable when land or houses or other property of that kind is conveyed or is sold. These are at the rate of one per cent. When the value of the transaction does not exceed $£ .50$ ), the rate is one half per cont. The stamp duty on a mortgage is $2 / 6$ for every $£ 100$. or fractional part of $£ 100$, with smaller amounts for those below $£ 100$.

A promissory note must bear a stamp. it is for less than $£ 10$ the stamp is 2d. It rises to $1 /$ - for a note between $£ 75$ and $£ 100$, and
amount. Stamps must also be put upon all life insurance policies. This is Id. if the sum does not excecl $£ 10$. From this the scale rises by (id. for every $£ 50$ or part thereof until on policies exceeding $£ 10(1)$ in value it becomes $10 /$ - for every $£ 1000$, or part of that amount. All agreements except (1) an agrecment in some matter under $\mathfrak{£ 5}$; (2) an agreement for the sale of goorls: (3) an agreement for the hire of any serrant, and (4) certain agreements relating to hire of sailors on board ship, must bear a 6d. stamp. An adhesive stamp may be used if it is allixed and concelled at the time of the agreement, or a stamp may bc impressed at Somerset House without penalty within 14 days of the agreement. An agreement may be after-stamped at any time on payment of a penalty. Sce Land; Mortgage.

## Stamp Collecting

## Practical Advice on a Popular and Educative Hobby

Devotees of other collecting hobbics will find in this work articles on the various subiects in which they are interested, e.g. Brass Collecting; Buttertly; China; Coins; Pewter Collecting
Whether he intends ultimately to specialize should be handled carefully and, after retain or not, the beginner should make himself thoroughly acquainted with the willer aspects of the hobby in the realms of geography and portraiture, cartography and industry, transport and navigation, history, currencies, languages, and many other subjects. A collection comprising one or more of these groups will be a source of constant interest to its owner and to his friends, whether they are stamp collectors or not.
Whether the tiro intends to be a philatelist or to remain a stainp collector only, he should start on general lines, laying the foundation of his collection either by means o! the gift of specimens, by the exchange of duplicates with other collectors, or by purchase from dealers.

Except in the casc of the commonest examples, stamps have a recognized "catalogue" value. that is, the price at which they are quoted for in the dealers' annual lists; hut it is not necessary for the beginner to buy then separ atcly. Many lirms make a speciality of packets ranging in price from a fow penco to $£ 50$ or more, according to quantity and quality. Whole scries of these art available, the contents so graded that no stamp is duplicated, the whole forming a nucleus for a general collection.

Each stainp, no matter how common, should be studied carefully, both as to its design and philatelic components and its status and value according to the catalogue. The purchase of mixed variety packets from different firms will, of course, result in the accumulation of duplicates; these will be useful for exchange purposes.

After a groundwork has been achicved by the packet system, the beginner is recommended to build up his collection by means of the sets of various countries. These sets may be representative of the whole output of the country in question, or they may be of one series only, and are sold in great variety from a few pence upward. The next step is to write to dealers for selections on approval. These are the speciality of many firms, who invariably offer a discount off the catalogue prices. Approval selections are mounted on sheets or in small books, with the price for each stamp clearly indicated. Such selections

ing any specimens required, should be returned for those that are retained.

A standing order may bo left with a dealer for selections to be submitted from time to time, according to one's specific requirements, clearly stated on what is technically known as a "want list."

If the collector intends to concentrate on the stamps of a certain country or issue, he should keep his eyes on dealers' announcements in the philatelic press, wherein special. ized collections are occasionally offered for sale intact. If, on the other hand, he prefers to collect on general lines, and $w$-ishes to keep his album up to date, he cannot do better than join one or other of the several new issue services which exist for his convenience. Through their agences, and
in this way
Stamp auctions by reputable firms are a familiar feature of the trade: they are held every week from early September to the and of the following July. Many bargains can be picked up in this way, and when the collector has gained a working knowledge of market values, etc., it would be worth while applying to one or other of the auctioneers for a sale catalogue, in which the lots to be disposed of arc listed in single stamps, sets, or collections according to scarcity.

Exchange Clubs. These provide another means for the economical extension of the collection, while also being a useful channel for the disposal of one's unwanted duplicates. Numerous clubs are in existence, their primary object being the circulation of a monthly packet containing sheets of stamps submitted for sale by members, each of whom has the opportunity of seeing the preket in rotation in accordance with a postal list supplied by the club secretary, who is charged with the settlement of the sales and the return, in due course, of unsold stamps to the owners.
The stamip collector must learn to buy wisely if he hopes to sell to advantage. Condition is of vital importance. Each specimen inust be examined to see that it is not damaged or defective, that its colour is true. If it is a used stamp, it should be refused if the postnoark is very heavy, unless it is a really rare example. If it is a perforated stamp the perforations must be intact, unless it is a bona-lide variety such as that termed partly perf. On no account should a damaged stamp be mounted in an album unless it is a very rare specimen.

In the ordinary way the collection should be limited to adhesive postage stamps. Nonadhesive stamps printed on postcards, envelopes, letter-cards, and wrappers are seldom included, nor fiscal or revenuc labels, unless they have been used for postal purposes. Stamps available for both postage and revenue fiscally cancelled should be rejected alto-


Stamp Collecting : some of the requisites. Below, star perforation gauge with sixteen variations, each in a space of 2 cm . Above, left to right: tweezers with rounded ends; same with pointed ends; pocket magnifler
should also not be mixed $u_{p}$, with the ordinary postal issucs in the album.

Necessary Accessories. Apart from the album there are three essential accessories which the collector should obtain at the outset, viz a box of mounts (small strips of thin, transparent paper, gummed on one side for folding in the form of a hinge), a pair of tweezers, and an up-to-date catalogue. As he progresses with the study of stamps he will need a magnifying glass, a perforation gauge, and a watermark detector. Several sorts of magniliers are made expressly for stamp collect ors, with specially powerful lenses.
A watermark detector is a small black tile or japanned tray, on which a stamp, the watermark of which is undecipherable when held up to the light, is placed face downward, and a spot or two of pure benzine applied to its back. Used in this way, benzine is quite harmless for all ordinary philatelic purposes, but it is advisable to procure the rectified brand A few issues do not lend themselves to this treatment, being printed
in lugitive colours, some of which disappear when plunged in the benzine bath.
In cases such as this, where the watermark is not apparent on ordinary scrutiny, risk of danage can be avoided by recourse to a simple photographic process, in which the stamp is used as the negative
Other Requirements. Less important acces. sories include a surcharge measurer, which is a device like a pair of dividers, opening and closing with a screw adjustment, a chalky paper tester, and a mount damper or fountainbrush for moistening stamp hinges. The testers consist of a fine silver point held pencil. wise, which, if the paper be chatky, will leave a slight black mark. The determination of the question of a slamp's surface, as to whether or not it is on chally paper, frequently affects its value. Any piece of clean silver will serve as a lest, which should be carried out in the margin of the stamp, if possible, rather than on the stamp itself.
Peroxide of hydrogen is useful for restoring the original freshness to oxidized colours. but
no attempt should be made to expunge postmarks by means of chemicals. A pocket collecting-book and a supply of transparent envelopes are practically indispensable components of the outfit of even the most humble 1,hilatelist.

Varieties in the perforation of such stamps as were not issued imperforate must be represented by separate specimens in a specialized collection, but they need not concern the general collector. One of the principal objects in the philatelist's outfit is a perforation gauge. This is a printed card bearing a scale of clots of various sizes, ranging from 7 in the space of 2 centimetres ( 20 millimetres) to 17 in that width. By passing the edge of the stamp over the dots, it will be found that one or other of the 20 lines of holes will fit these, the figures at the side of the row indicating the gauge of perforation

A stamp which has more than one gauge of perforation is said to be compound perforate, and in classifying such a combination the measurement of the top row of holes is placed first. Thus the current postage stamps of Great Britain will be found to be perf. 15 ly 14 . If the perforation varies on all sides, which seldom happens, the sequence of naming is top, right, bottom, left-that is, the direction of the hands of the clock.

Apart from measurements, therc are a good many kinds of perforation, as well as of roulette, all of which are separately classified by the specialist, but need not concern the general collector. The main diflerence between perforation and roulette is that, whereas the former punches out the holes, the latter merely cuts the paper but does not remove any portion of it.

Mounting the Stamps. Before mounting stamps in an ilbum, any pieces of paper or old hinges adhering to their backs should be carefully removed. This can be done by floating the stamps face upward on tepid water, or by moistening between damp shicets of clean, white blotting paper, a dry sheet heing laid out ready to receive them, face lownward on removing them from the water: Stamps printed in aniline inks should not be inmersed in water, nor should those on enamelled or challsurfaced papers, which would quickly sulter if damped. Stamps should not be kept in a very warm place, as they are apt to curl up.

In the early days of the hobby it was the practice to fasten unused stamps into all album by means of their own original gum, and 10 gum or paste on the used ones. This has robbed the world of specimens which would have been well-nigh priceless to-day had they been mounted by the method now in usc. The modern method is as follows: Take one of the special hinges referred to a bove, fold back about $\frac{1}{4}$ in. of one end, gum side outward, lay the stamp face downward, slightly moisten the turned back portion of the hinge, and fix it to the back of the stamp just below the top edge. Then moisten the other
fold of the mount and attach it to the album in the place chosen for it. Do not use stamp edging or ordinary gunmed paper for the purpose, as this will probably ruin the stamps.
l'eelable mounts are easily obtainable, the advantage of these being that they can be readily renoved from the stamp or the album, or both, without damage 10 either. It should be borne in mind that occaaion may arise, from time to time, to examinc the back of the stamp as well as the front, and the use of the special hinges makes this a simple matter. There is no need to wet the mount all over; a mere touch on both the folds is sufficient to make it adhere safely and to simplify its instant removal when required.

In mounting or unmounting, sorting or classifying, always use the twcezers; there is never any necessity for the collector to touch his stamps with his fingers.

Arrangement and Annotation. If using a printed album, the stamps should be arranged in catalogue order, that is, chronologically, spaces being left for specimens which it is hoped to acquire later, If a blank album is used, due regard should be had to the artistic arrangement of the collection. Single slamps look well when arranged in straight, horizontal rows, varying in length in order to obviate monotony, as shown in p. 1202.

The stamps should be equidistant one from the other. This is facilitated by the faint ruled squares of the blank album pages. Each row should have the tops of the stamps level. Where blocks, pairs or strips are being mounted, a different plan must be adoptcd. A block of four or more look best at the top.

Completing the Album. Whether the colJection is a general or specialized one, the pages of a blank album should be embellished by brief, neatly written, historical notes appertaining to the various issues displayed, showing the date of their appearance, the artist responsible for their designs, the engravers, printers, mode of production, kind of paper, water-mark and perforation, if any, and any other relcvant. notes of special interest. "Writing up" is an art in itself, and in highly specialized collections it may be elaborated considerably.

In such collections each issue, perhaps even one value of an issue, occupies several pages of the album, illustrating various stages of its career, shades, varieties, etc., a nd including examples of original sketches, essays, proofs and colour trials, and so forth. Used copies should not be mounted on the same page as unused ones, and separate pages should be reserved for those on entire, i.e. the original letter.

As a safeguard against damage by friction 1 ransparent envelopes, made of mica, may be had from many stamp dealers. These envelopes are as clear as glass, and atd to, rather than detract from, the beauty of an artistically arranged album page. They are made in various sizes, for the accommodation of a single stamp, small or large, a pair


Enlarged reproduction of penny red stamp of 1858-1879, showing plate number 177 at sides. This plate is journals, one to keep him least to date stamp the philatelic news of the day, and the other as an aid to the extension of his scientilic knowledgc. In any event, a current catalogue should be his constant companion.
Advanced Specialization. Specialization may be extreme, that is, calling for every possible variety in all colours, shades, papers and perforations, or it may be modest, in which the very minor trivialities are rejected.
It is open to every specialist to introduce individuality into his collection, and this is often done by the process of "graingerizing," in which the collection is enriched by a variety of evidential matter and extensive notes such as postal decrees, originals of and essays for stamp designs, etc. The practically unlimited scope of the hobby is one of its chief charms. Plating, that is, reconstructing a sheet of engraved or lithographed stamps in the form in which it was originally issued, is the most advanced phase.

A knowledge of the various processes involved in the production of stamps is very desirable: indeed it is essential if the hobby is to be pursued on scientific lines. Gencrally speaking, stamps are produced cither by line engraving (intaglio), lithography or surface printing, the last-named being by far the most commonly used. When the philatelist has mastered the rudiments and technicalities of his hobby, it should be comparatively easy for him to separate line-engraved stamps from lithographed or surface printed specimens.

A Useful Test. The following is submitted as a test for determining an engraved stamp. Take a thin sheet of tinfoil and place it over the stamp.


Standard Lamp. Fig. 1. Floor lamp fitted for gas. The supply is obtained from the plug point in the skirting through the flexible metal tubing. Fig. 2. Handsome standard lamp of gilded wood fitted for electric light.
The carved decoration is of eastern design
provided with a solid, well-balanced base. Ahout 5 ft .6 in . is a good average height.
(has standard lamps with flexible metallic tube connexions are ohtainable in good designs. An example is shown in Fig. 1 of a wooden floor standard with a fringed and dome-shaped silk shade. The wood is painted with brush cellulose lacquer picked out with silver metallic paint. Placed in the position indicated in the illustration there is little likulihood of a sudden pull on the lamp by anyone tripping over the flexible connexion.
Electric floor standards may be either severely plain in construction or highly decorated like the example seen in Fig. 2, a handsome gilded wooden lamp carved in an Eastern design and carrying a bcautiful shade correspondingly ornamental. Equally beautiful lamps can be decorated in lacquer work.
l'olished wooden standards in oak, walnut, or mahogany either suggest enlarged wooden candlesticks with twisted, fluted or baluster stems and heavy round or square bases, or are frankly modern in design, with base and sten formed of cubes, or of oval and square shapes combined. Metal is often utilized, either oxidized brass or copper, chromium steel or untarnishable white metal, or older styles are reproduced in iron work. See Bent Iron Work; Lacquer Work; Lampshade.
STANDARD ROSE. There are three types of roses usually included under this heading, the half-standard, standard, and weeping standard. They are budded on the common wild briar or dog rose, or on the Japanese briar (Rosa rugosa); the latter is being used increasingly as a stock for standurd roses. The stem of the half-standard is about 2 ft . high, that of the standard 4 ft ., and of the weeping standard from 5 to 7 ft . high. Ranıbling and climbing roses are used to form weeping standards, and tea roses do exceptionally well as half standards.. See Rose; Rose Garden : Stock.

STANLEY PLANE. This is a combina tion plane extensively used by practical workmen, and it has many differ rent uses. It is sup). plied with a large number of cutters. By using tho various parts and adjustments, the plane can be used for rebating, ploughing grooves, beading, reeding, and fluting, for rounds and hollows, for making all shapes of moulding, for matching, chamfering, sash and dado, as a fillister, and a slitting cutter. See Plane.
STAPELIA. Possessed of quaint, fleshy flowers, which emit a strong, disagreeable odour, the stapelia, in its native halitat in S . Africa, attracts carrion Hies, hence its alternative name of carrion tlower. The stapelia is suitable for culture in the greenhouse, the species grandiflora, shown in the illustration, being probably the finest. It should he potted in sandy loam.
STAPRYLEA. This is a hardy summer-leafing and Howoring shrub, from 4 ft . to 10 ft . in height. Staphyleas are suitable for sunny borders or shrubberies, in any ordinary soil. The flowers are white and are borne early in summer. The best is S. colchica, an early Howering sort, which may also


Stapelia. Curiously shaped flower of this greenhouse plant, sometimes known as the carrion flower


Staphylea. White blooms and pointed leaves of
bc forced for greenhouse purposes. Propagation is by cuttings in autumn.
STAPLE. This name is applied to a U. shaped fastening device. Another application is to the loop shaped fastener used in conjunction with a hasp and padlock. The small staples in common use, which are known as nctting staples, are made of tinned or galvanized iron wire, and may be purchased for household use in tho form of packets rontaining about a gross. Various sizes are available, ranging from $\frac{1}{2} \mathrm{in}$. to $1 \frac{1}{4}$ in. long. The gauge of wire generally employed in their manufacture is No. 17 to No. 14.

A stronger lind is the fencing staple used for attaching wires to fence poles. These staples are generally from 1 in. to 2 in . long, and are made from bright wire of No. 10 to No. 6 gauge. Very strong staples are made with a pair of long thin points. Usually a thick gauge of wire is used, and such staples are handy for attaching a chain to a wall. Flectric or telephone staples are made from llat wire,
and when protected by a thin piece of fibre are know $n$ as insulating staples. See Gate; Latch; Padlock.

STARCH. Laundry starch is made from potatoes or, in better qualities, from rice. The potatoes are pulped and water run over them to carry off the starch, which is then washed and dried. Rice is treated with caustic soda to burst the starch cells, and when the starch is freed it is washed, dried and ground, washed again with soda, and finaily with clean water. Starch is in soluble in
cold water. It inmproves the appearance of certain fabrics by making them smooth surfaced, the better to resist dirt, and stiff to avoid a limp, untidy look. It is used with hot water for muslins, linens and cotton materials which require slight stiffening, and with cold water for collars, cuffs and shirt fronts which are to be hervily starched. For the former purpose $\frac{1}{2}$ teaspoonful of borax and a few shreds of wax are added to 2 tablespoonfuls of starch, which has first been smoothly mixed to liquid form with cold water, and boiling water is stirred in untilthe starch and other ingredients become semi-transparent. If boiling water is added to dry starch the result is lumpy.

For cold water starch 1 teaspoonful of borax is dissolved in a little boiling water and added to 2 tablespoonfuls of starch, already mixed with cold water, and a few drops of turpentinc. The last named improves the gloss and the iron runs more smoothly on the fabric. The mixture is strained. left for a few hours and well stirred before it is used.

In laundry work the process of starching follows blucing. The strength of starch varies with the article and its reçuired stiffness. For laces, muslins and cottons, boiling water starch is used of about equal parts of the made starch and water. For slight glazing rather than stiffening, about l part of starch to 15 parts of water is required and for table linen about 1 to 8. Cretonnes and coloured prints should be starched in equal quantities of starch and cold water used to dreserve the colour. A slighter stiffening for lace or muslin can be obtained by using water in which rice has been nooked. .

Collars and cuffs are steeped in cold water starch, and then it is well worked into the fabric, wrung out and rubbed from the surface.


Staple. Left to right : Type for the support of straps around a box ; strong wire staple with finely pointed ends ; lencing staple for attaching wire to poles

The articles are rolled in a clean cloth and left for about an hour before being ironed; they are then spread wrong side up on the ironing sheet and any loose starch is removed before a hot iron is passed lightly on the wrong side to set the starch. When starching a shirt, the starch must be well rubbed into the front, neckband and cuffs, while care is taken not to starch the body of the shirt, which should be ironed first.

Medicinal Uses. As a food starch belongs to the group known as carbohydrates. Its value lies in the fact that it is easily converted into a readily digestible form of sugar. The starchy foods are digested by the ferments contained in the saliva and in the pancreatic and intestinal juices. Any sfarchy food should be cooked thoroughly to swell and rupture the granules and should be well chewed.

In medicine starch is largely employed as a basis for dusting powders and insufflations. Mucilage of starch is also employed to suspend insoluble oils or powders. For inflamed skin surfaces the following powder is suitable: Zinc oxide powder, 1 dram; boracic acid powder. 1 dram ; starch powder, 1 oz . To be thoroughly mixed. The powder should be placed in a cardboard or metal box, over the mouth of which a piece of gauze is stretched as a dredger.
The making of a starch poultice is described under the heading Eczema. See Diet; Food; Ironing; Laundry.

STAR OF BETHLEHEM. This is the result in the handle being pulled out of the popular name of a spring thowering hardy bulb operator's hand
(Ornithogalum umbellatum). It shovid be It is a dance
(Ornithogalum umbellatum). It shouild be It is a dangerous practice to attempt to revolve the starting handle barrel-organ fashion, unless one is abnormally strong or the engine is easily turned over on compression. Unless the speed is fairly high, there is always the likelihood of a backife, and should this occur during the down stroke of the handle the consequences might be very scrious.
As all inodern cars are equipped with some form of self-starter, the starting handle is detachable and is carried on the car as a unit of the tool lit. This frequently means that the self-starter is employed as the starting medium for the engine from cold, which is a bad practice. The proper method is first to give the engine a few turns by hand, before switchplanted in autumn, will thrive in shady places ing on, thus overcoming the resistance caused and bears greenish white Howers. Other kinds by the cold oil and allowing a charge of gas to bloom in summer and should be planted in enter the cylinders. Then the starting motor sandy loany soil in autumn in a sumn place. Some of the best are nutans, greyish green; pramidale, white: and pyrenaicum, greenish yellow. Thicse bulbs may also be potted in autumn for spring Howering in the greenhouse.
STARTER: For the Motor Car. With all types of internal combustion engine some form of starting device is required to transinit the initial novement to the crankshaft. In motor car design the starting handle is litted for this purpose. It consists of a cranked handle, with about a 10 in . leverage, nounted below the radiator in front of the car, and engages with a short extension of the engine crankshaft. A compression spring liecps the starting handle normally out of engagement as shown at A in Fig. $]$
There are three points to bear in mind when using the starting handle. The first is to sec that the ignition is not too far advanced. The second is to let the handle lie snugly in the hand, as at $B$ in the illustration; the third point is to sec that all the control levers are corrcetly set and the petrol turned on.

On no account should the startin! handle be gripped tightly with the thumb, over the top, as shown at C. T'o hold the handle incorrestly is 10 courl disaster should the engine baclifire. A brohen wrist or a dislocated ellow is an acicident by no means unlikely to occur.
Befure switching on the ignition, revolve the engine three or four times slowly. Switch on the ignition, engage the starting handle. and turn it slowly until the compression is felt just hefore bottom dead centre is reached. Then swing the handle past the bottom dead contre and finish with a very smart pull up. If the engine fails to start. engage the handle again and repeat the process. The greatest effort should be applied during the pull-up period only, because should a buckfire occur it will only


Starter Fip. 1. A, principle of design: and $B$ and $C$, right and wrong ways of holding the handle

Electric Starters. These are of two main types. In the first the apparatus serves a dual purpose, functioning as a dynamo to generate current for the batteries, or as a motor to supply the initial impetus to the engine for starting, current being taken from the batteries in the latter case. In the second type of apparatus, shown in Figs. 2 and :3, an independent starting molor is used and brought into engagement with the crankshaft when necessary.

The type of starter motor that is a combination of charging dynamo and motor is called a dynamotor. The unit is permanently driven off the engine crankshaft or somewhere else in the engine line, usually by silent chain gear, and is controlled by two switches, charging and starting. With the charging switch on, the unit works as an ordinary dynamo, but with the charging switch off and the starter switch on, the unit becomes a starter motor, thus rotating the crankshaft. A very notable advantage of the dynamotor is silence in operation.

Of the independent starter motor little need be said. Current is supplied from the accumulators to the windings of the armature, thus causing it to rotate. The chief point of interest lics with the automatic means by which the pinion mounted on the armature is caused to engage and disengage itself with the toothed ring on the llywheel of the engine. This is carried out as follows : Cut on an extension of the armature shaft is a quickpitch square thread, on which the pinion is loosely screwed, and retained when out of use at a definite position against a coiled spring. When the armature is caused to rotate, the pinion, being a free menber, is drawn along the threaded portion of the shaft. thus bringing it into
engagement w'th the toothed ring of the flywheel. The duration of time between the commencement of rotation of the armature and that of the pinion is just sufficient to cause the pinion to screw itself along the shaft far enough to engage the teeth of the toothed ring. The moment this occurs, the pinion by being held stationary, is readily drawn into full engagement.

To disengage the pinion the order is reversed Current is switched off from the armature. causing it to stop, and the toothed ring on the rotating Hywheel, now being turned by the engine, drives the pinion, thus unscretving it off the armature shaft and out of engagement. Owing to the large gear reduction that must be used to avoid the necessity of employing a big, heavy starter motor, the pinion is thrown out of engagement with considerable force, and brought to rest without damage by the buffer spring.

With the ordinary electric starter motor the rapid acceleration causes considerable noise as the pinion teeth come into engagement. Moreover, the fu!l power is applied on the teeth before they are right home. To overcome these drawbacks some types of starter motor effect the engagement of the pinion before it is causer to revoive, or while it is rotating slowly, the full current being switched on by a further movement of the control.

Faults with
 electric starters are very rare, and for this reason the carbon brushes, the commutator, and the varions connexions ale liable to be


Starter. Fig. 2. Typical method of mounting an electric starter motor. Fig. 3. Showing quickpitch screw, pinion and buffer spring
Courlesty of C. A., Vandervell dit Co . L/d., and of
neglected. All these should be looked to occasionally and kept perfectly clean. What is of most importance is to see that the carbon brushes are clean and working freely, and that the commutator is perfectly smooth and free from any deposit of carbon and oil. A breakdown from any other cause in the nıajority of cases will be a job to be dealt with by the makers or an experienced man.
Starting Difficulties. Although, when the engine is warm, there is no harnı in $\breve{a}$ limited use of the starter, such is by no means the case when starting from cold, because the gummy nature of the oil renders the engine very stiff, thus calling for considerable effort from the starter motor to turn the crankshalt at a sufficient speed. First of all, before switching on, revolve the crankshaft by means of the starting handle. A few turns, given slowly, will very considerably reduce the amount of current drawn from the accumulators during the starting process. If this precaution is not taken, it is probable that the efficiency of the accumulators will sutfer Serions daınge, such as a buckling' of the plates and loosening of
the paste from the grids, can of ten be traced to inconsiderate use of the starter
Should the engine be properly warmed up and yet refuse to start, do not persist in the use of the starter, but make sure all is in order, petrol turned on, ignition switched on, carburetter flooding properly, and extra air shutter closed, if one is in use

Trouble experienced in starting the engine in cold weather is generally attributable to faulty carburation, assuming of course that the ignition is in order and that there is nothing wrong with the engine mechanically

The proper grade of lubricating oil recommended for winter use should be employed, the sump being emptied of the summer grade and recharged on the approach of cold weather. Other likely sources of trouble are neorrect tappet clearances, worn valve stems or guides, and anything producing an air leakage into the induction system. Thus a leakage may be brought about by wear on the throttle valve bearings. The sequence of tests given in the fault-finding chart in page 812 should be carried out.

When starting from cold the throttle should first be opened a little more than is necded with a warm engine If, however, the carburetter is fooded to access and the engine raced, the surplus petrol washes away the oil film from th- piston, cylinder walls, and other parts, and impoverishes the oil supply by dilution. When the engine starts from cold the oil, owing to its viscosity and the resistance it offers to movement, is not circulating properly, so that the working parts are almost dry. It is not until the oil gets warmed up that it can reach and effectively lubricate the different parts of the engine. It is cleap, therefore, that for the first few minutes at least the engine should be run slowly, until it warms up. See Carburetter ; Motor Car: Tappet; Valve.

Starwort. This is another name for the Michaelmas daisy (q.v.) or perennial aster.

Statics. See Atmospherics: Valve.
Statys. Name sometimes used for the plant popularly known as the sea lavender (q.v.).

STEAK: How to Cook. The term steak usually implies beefsteak, but in a general sense it may be applied to any thick slice of fish or meat. Beefsteak, which is boneless, is cut from the best parts of the animal, and includes rump steak, fillet steak, buttock steak. For grilling the steak should be of the finest quality.

The largest steaks are cut from the round, but are less likely to be well Havoured and tender; therefore they are best stewed in a casserole. Fillet or tender loin steaks are from the undercut of a sirloin.

A steak which looks like a large chop, about $1 \frac{3}{4} \mathrm{in}$. thick, taken from a sirloin of
beef with an undercut, is known as a Porter house steak. It should be Hattened with a cutlet bat, trimmed, brushed over with melted butter, and seasoncd with pepper, and then allowed to stand for half an hour before being grilled over a clear firc. The grilling should take about 15 min .
Rump Steak. This is a thick slice cut from a large three-cornered joint of beef known as the rump. The latter is that portion which lies behind the sirloin at the end of the back and reaches a short way down the leg in a slanting direction. It is seldom cooked whole, being usually cut into small joints.

Rump steaks are generally grilled, but may also be included in meat pics and puddings. For grilling, they should be at least $1 \frac{1}{2}$ in. thick. The middle and end cuts are best.
Stewing is a popular method of cooking steak. The directions given for stewed beef under the heading Beef should be followed.
Steak is also cxcellent when minced, made into rissoles, or, with the addition of kidney, into a beef stcak pudding.

Grilled Steak. Stcak à la Française provides a good dish, but before the stcak is grilled the garnish of carrots should be prepared. To do this, scrape and wash a carrot, cut it into small squares, and cover it in a pan of boiling salted water until it is tender. Then strain off the water, melt 1 oz . butter in a saucepan, and toss the carrot in it.
Split 1 lb . thick fillet steak into 2 or 3 slices, each about $\frac{3}{4} \mathrm{in}$. in thickness. Make the slices into neat rounds, trimming off the fat, Hatten them with a cutlet bat or a large knife, sprinkle them with pepper and salt, and pour over half teaspoonful of salad oil and 2 teaspoonfuls of vinegar. Let them soak for about 15 min . Press 1 oz . butter out on a plate, work into it $1 \frac{1}{2}$ teaspoonfuls chopped parsley, and 2 teaspoonfuls chutney, cut into small dice and leave in a cool place.

Grill the steak for about 10 min ., turning it frequently, and at the same time grill some of the fat that was trimmed off, first cutting it into small rounds. Arrange the fillets down the centre of a hot dish, with some of the grilled fat between each, and garnish them with small heaps of carrot and a few dice of the prepared butter.

A simpler way of grilling a rump or fillet steak about $1 \frac{1}{2} \mathrm{in}$. thick is first to trim it and beat it a little to make it more tender; then rub each side with a little butter. Grill it on a well-heated gridiron, allowing 5 min . to each side of the steak; then turn it again and give it 5 min . more. Put a small pat of maitre d'hôtel butter on the top, just before serving. Scrve it garnished with small baked tomatoes or a little watercress.
Beef steak is less digestible when fried, though this particular method of cooking is
often more convenient than grilling. To fry, heat a little butter in a frying-pan so that the bottom is just covercd, and put the steak in this, frying both sides as rapidly as possible. When brown, continue the cooking more slowly, and turn the meat frequently. Serve the steak either with a little butter spread over the surface, or with gravy. Jried onions, cut into rings and cooked in butter or dripping, are a favourite accompaniment. See Beef; Becf Stcak Pudding : Casserole : Diet : Food; Mince.
STEAK AND KIDNEY PIE. To make this very popular dish, take $1 \frac{1}{2} \mathrm{lb}$. buttock steak or topside of bcef, also about $\frac{3}{4} \mathrm{lb}$. bullock's kidney. Remove any skin from the meat and cut the lean into neat slices about $\frac{1}{3} \mathrm{in}$. thick; cut the fat into dice and lay on one side. Trim the kidney, removing skin and hard part, and cut into neat pieces. Mix on a plate some pepper, salt. and flour, dip each slice of steak into this, and roll it up with a portion of kidney inside. Arrange these pieces in a pie-dish and scatter over them a chopped shallot and parsley, also add the pieces of fat. Almost fill the dish with water or stock, and then cover with a rich short crust rolled thick. Make a hole in the centre of the lid to allow the stcam to escape, brush over with egg, and bake from $1 \frac{1}{2}$ to 2 hours in a good oven. See Pastry.
STEAMER : For Cooking. The most satisfactory way of steaming food is to cook it in a patent steam cooker, but if this is not available, a plate placed on top of a pan of boiling water, or a double cooker, such as that used for porridge making, can be utilized instead. Steamed puddings are usually cooked in a basin or mould placed in enough boiling water to reach about two-thirds of the way up the sides.

A special steam cooker is obtainable in which a pudding can be mixed and cooked at once without a pudding cloth. Fruit can be cooked in this way without water and thus the juices are retained.

Another sniall steamer which is on the market is divided in half by an adjustable compartment so that two vcgetables can be cooked in it at once. The compartment can be removed should it be desired only to stcam one vegetable or other article of food.
Steamers can be bought in several sizes, but for family use the larger kinds with three or four containers are the best. The lowest container holds boiling water, and from it a pipe conveys stcam to the vessels above. The stcam can be regulated by means of a controlling valvc. The strongest steamers are of tinned sheet steel with copper bottoms, but cheaper kinds can be had in aluminium. The illustration shows an electric steamer in which four dishes can be cooked at once. Steamers are cspecially useful in flats and small houses, since a whole dinner can be cooked over one pan of boiling water. See Pressure Cooker.
STEEL: Grades and Uses. Made from iron in a variety of ways, steel is used in many forms in the house, and it is employed in nearly every craft. Stcel is classified into three grades, mild, medium and hard, depending on the amount of carbon, which varies from 0.15 per cent to 1.5 per cent. It is made by melting the iron, driving from it by various processes its contained carbon and impurities, and then adding pure carbon. The softer steel contains less carbon than the harder varieties.

Soft steel is used for the manufacture of articles requiring a ductile metal, which may be beaten or pressed to a desired shape ; medium steel for constructional purposes where comparative hardness is required ; hard steel is employed for all cutting tools, for fire irons, and every purpose where great strength is needed. Chrome steel contains a
sinall percentage of chromium ; it is intensely hard and is used for safes. Nickel stcel contains a small percentage of nickel, which renders it very ductile. Manganesc steel, containing a large parcentage of manganesc and carbon, is very hard but ductile, and cannot be softened by heat.

Steel can be hardened by heating it to a red heat in a clear fire, and then dipping it into cold water or oil. Steel is tempered loy first hardening it and then polishing the surface quite bright with emery cloth. It is then heated up again until it assumes a certain colour and again cooled. Methods of hardening and tempering are fully dealt with in the articles Case Hardening and Hardening.
The difference between iron and steel is not readily apparent without some knowleclge of their propertics. The easiest test is to drop the metal on a stone floor. Cast iron has a dull, dead sound; wrought iron has a higher tone and a dull ring. Mild stecl is similar, but it has a slightly higher tone. Tool steel has a much higher tone and a well-toned ring, and the harder the sted the higher the tonc. The best tool or high speed steel cannot be filed, and ordinary carbon stecl is not in any way affected by the file when it has been hardened

The difference between mild steel and wrought iron can be seen if a strip is bent over on itself and hammered; the steel will not breali, but the iron will. If fractured, the grain of wrought iron is of a fibrous nature, the outside being of a dull black with a reddish scale. Cast iron has a dull grey granular appearance. Mild steel is somewhat granular in appearance, but it is a greyish white intermixed with bright sparkling grains. The outside is brightish black in colour. Tool steel is similar in appearance, but the grain is finer and the outside is a bright blue black.

Oil and soapy water are used as a lubricant in turning or shaping steel, and also to prevent the cutting edges of lathe tools from getting too hot; the lubricant is also used when cutting threads by hand.
Stainless Steel. Containing a percentage of chromium, this is used not only for table catlery, but for many purposes where a hard cutting cdge is not required. Saucepans and other kitchen utensils, dish covers, trays, hot-water jugs, spoons and forks are all ohtainable in chromium steel, while excellent use is made of this stainless metal for door furniture and bathroom fittings. Tungsten stecl is hard, and is employed for metal cutting tools. Mild stecl can be hardencd by the process known as case hardening, which leaves a hard outer surface with a soft interior. See Brazing; Forge: Hardening: Labour Saving; Lathe; Metal Turning; Metal Work.
STEEL: For Sharpening. This name is given to an instrument used for sharpening knives, especially carving knives. A stcel is usually sold with carving knife and fork, the handles and finishings being alike. See Carving.

## Steering Gear on Motor Vehicles Principles of Operation and Method of Handling

Other articles that deal with allied subjects will be found under the headings Differential Gear ; Front Axle; Gear; Live Axle. Sec also Motor Car; Motoring

From the joint of safety, apart from the brakes, the steering gear is the most important mechanical part of a motor vehicle, and the primciple of its operation should be thoroughly understood.
There are two classes of steering gear, namely the adjustable and the lixed. The former ter:n denotes that the stecring wheel is adjustable for height, usually carried out by mounting the stcering hox on a swivelling bracket. The locking device consists of either a quadrant plate with nut and washer or a elip lug. With the lixed type steering, a specially shaped bracket is cast as a part of the steering box and bolted to the chassis side member.

In the majority of cases the steering gear is designed on the irreversible principle, which means that, although the front whecls may be casily turned by the steering wheel, a reversal of movement from the wheels to the stcering wheel is not possible. In actual practice this is only carried out up to a point, and n most cases, if considerable effort is applied against the front wheels, the stcering wheel is caused to rotate. This is as it should be, other wise the castor action of the wheels that tends to straighten out the course of the car after a turn has been made would be lost; also the slightest movement of the steering wheel would definitely deflect the car's direction.

Apart from stcering gear design the castor action of the front wheels is of great importance to easy steering, as it tends towards kecping the car on a straight course. Castor action is provided by cither setting the stub axle bchind the centre of the steering head, or by very slightly canting the stcering head backwards. The result is to bring the projected point of contact of the stcering head slightly in advance of the wheel's point of contact with the ground, as shown in Fig. l.

For the 4 -wheel motor vehicle the stecring gear lay-out is commonly on the Ackermann principle, shown in F'igs. 1 and 2, a rigid axle being litted with a swivelling stcering head at each end. These heads carry the stub axtes on which the wheels revolve, and are connceted to each other by a track rod, usually adjustable for length. The stecring wheel controls the movement of the stecring hearls via the steering box and tho steering arin. Movement of the steering arm must be


Fig. 1. Diagrammatic lay-out of the Ackermann steering Rear. On the left two methods of suppling casto action for the front wheels
provided for in all directions. Therefore ball and socket joints are always litted, and in the case of stcering heads that are set outward at the bottom, i.c. are not parallel to each other, it is necessary to employ some form of universal joint at each end of the track iod as well.

Owing to the fact that when the car is turning through part of a circle the outside whecl will be moving through a larger radius than the inside wheel, it is necessary to set the steering arms so that the correct angle is given to each whecl at all points between their limit of movement. This is carried out by setting the steering arms so that their ends cross imaginary lines drawn from the centre of the stcering heads approximatcly to the centre of the back axle, as shown by the dotted lines in Fig. 1. The same rule applies whether the steering arms are fitted in front or are fitted behind the axle.
The steering box is very strongly constructed, as the whole of the road shocki imparted to the wheels have to be withstood by this unit. Fig. 3 shows the type in common use. It consists of a worm, mounted on the end of the stecring column, that engages a worm wheel on the shaft on which is mounted the drop arm. The latter, by means of the stcering arm, controls the direction of the wheels. Reference to the diagram shown in Fig. 2 will make this clear.

Although some makers still fit a worm segment, it is common practice to fit a full wheel as shown. As wear takes place the whee can be turned a quarter revolution, thus bringing fresh teeth into engagement, it being understood that only one quarter of the worm wheel is ever engaged for a full movement of the stecring gear. Plain bearings are cm ployed for the worm, and single thrust bearings at each end, the latter lieing adjustable to take the load.

The screw and nut type of gear is characterised by simplicity of construction and saving of weight. A screw on the lower end of the stecring column worlis in a nut. the latter engaging two levers attached to the operating shaft. As the nut moves along the screw the shaft oscillates and so operates the drop arm fastened to its outer end

In the cam type of steering gear the specially cut worm engages and moves a pin set in the end of a short arm commected to the operating


Steering Gear Fig. 2. General arrangement of steering mechanism on the Ackermann principle. Fig. 3. Worm gear employing complete worm wheel. Fig. 4. Another type of gear in which the worm on the steering column swingsa rotating ring mounted on an arm fastened to the operating shaft
shaft and thus to the drop arm. causing the latter to oscillate in accordance with the movement of the steering wheel. Another type is shown in Fig. 4 Here the worm on the steering columm engages and swings a rotating ring mounted on the forked end of an arm fastened to the operating shaft. In order that the ring throughout its swing shall be properly engaged by the worm, the diameter of the latter increases towards its ends.
Care of the Steering Gear. A periodical overhaul should be given to all parts of the steering mechanism. It cannot be too much emphasized that all the hearings must receive regular and sulficient lubrication. The steering box and its attachinents should be looked to tirst in the case of noticeable slackness, because it may be found that the fixings have worked slack owing to vibration and shocks transmitted from the wheels. The ball joints connecting the drag link to drop arm and steering head respectively should be examined, as they are equally affected by any strains imposed The joints should be well packed with greasc and the same applies to the joints connecting track rod and steering levers. The track rod can be adjusted if it becomes necessary to correct the

## Stencilling and its Possibilities

A Decorative Medium Affording Scope for Originality
This article belongs to a group that describes various ornamental handicrafts. Others are Lacquer Work; Painting on Textile Fabrics; Pattern Printing; Pokcrwork; Raffia Work. See also Fricze; Lampshade : Lettering; Monogram; Screen

A stencil is a plate made either of metal or cardboard on which a design has been traced and cut out for the purpose of transferring it to linen, cloth, or other material. The transfer is accomplished by brushing over the stencil with oils, water-colours, waterproof inks, or stain
Almost any material can be stencilled. The best fabrics are probably casement cloth. velvet, satin, Arras cloth, and hessian Chiffon muslin, and similar thin fabrics can be treated successfully, but they must be stippled and not rubbed Glass, china, wood, leather, imitation vellum, and cardboard all lend themselves to stencilling. The process is also employed in house decoration for friezes and panels, and other forms of ornament The outfit required consists simply of the colours and brushes together with a piece of plate glass or marble for cutting plates, oiled manilla papcr, a stencil knife, and a drawing board or table. Any good oil-colours may be used, but there are special stencil watercolours, and liquid oil-colours are sold in small bottles. No medium is required with watercolours, but for cils a stencilling medium is used Inexpensive outfits are obtainable in any good art department.

When working in reveral colours on a oneplate stencil, it is advisable to use a piece of blotting paper or oiled manilla to cover up the design where the colour is not to go. This is called masking 'The piece of paper is moved about to form a screen as the work proceeds. In doing very large quantities of any design
P-

a plate is generally cut for each colour, as one can work quicker, but for ordinary use a small mask is sufficient.

A separate brush should be liept for each colour, if possible. In working, the brush should be of a size suita ble to the design that is to be transferred. If it is too small it makes the surface streaky, while too large a brush is apt to cover more of the design than is desired, and to necessitate masking. In Fig. I, a boghair brush, a knife, and (lowest) a Japanese stencil brush are illustrated. Before using a new brush soak it in cold water After the work is finished clean the brushes with a little turpentine on a rag and then wash them with soap and water.
Cutting a Stencil Plate. Many people prefer to buy stencil plates, but it is not dilficult to cut out the designs at home, and in this way original work can be designed or attractive patterns copied. The beginner should choose a simple design first If a copy is desircd. make a tracing or rubbing of the design on a suitable piece of oiled manilla, which is the best paper for the purpose. leaving at least 1 in margin al! round for small things, and 2 or 3 in for large plates, or finely cut ones.
Place the plate on a piece of martle nr glass, and, holding a well-sharpened stencil knife at an angle of about $45^{\circ}$, cut out the clesign, working from the weak part of the plate towasds the stout (Fig. 2). Never cut towards any part of the work if there is risk of breaking the ties, which are the portions of the plate left in to hold the clesign together.

In cutting a flower the centre should be cut out first, then the petals cut from the centre outwards. Always cut the side of the petal next to the one already cut. Do not cut the opposite side and then attempt to cut the petal after both sides are weakened. When a corner is eached, cut across it both ways, so that the piece comes out ; never pull the pieces out, as this will make the edges
alinement of the wheels. Instructions for ensuring proper alinement and lints on the correction of steering effects are given in parathe article on Motor Car, P. 814

Wheel wobble is a condition in which the wheels get into a state of side to side vibration; in shimmy, another similar trouble, rapid vibrations are set up in the steering gear. and so transmitted to the driver's hands. Wheel wobble occurs at fairly low speeds whercas shimmy arises when the car is travelling at high speed. Both conditions are a source of danger, as even a small dellection of the wheels from the straight-ahead position may bring about a disaster when running at high or even moderate speed
The cause of the troubles mentioned is obscure. Attention should be directed to lubrication and alinement, and any excessive slackness in the mechanism must be corrected. In some cases the fitting of a steering dampcr, which introduces a certain amount of frictional resistance to the movement, will afford a remedy. Wheel wobble can sonnctimes be stopped temporarily by a sharp turn of the stopped ten
hand wheel ed is rou flower round and round, gradually working in this way until all the petals are coloured in

The prettiest effects in stencilling are ohtained by working one colour over the other For leaves, use yellow on the tips, green from the base, and draw the two together with a little brown, blue, or red according to the leaf that is being coloured. When stencilling on a woven fabric is finished, allow it to dry, then place a slightly damp cloth on the right side, and iron on the wrong side of the material. Remove the cloth and press well. This is only necessary for lixing the coiours. and need not be done otherwise

Velvet nust not be ironed. If necessary, cover the iron with a damp cloth, and pull the velvet over it. When working on a dark material it is necessary to kill it first, otherwise light colours will not show on it. It is possible to remove colour from the background with a preparation called Jarello. The design is stencilled in the ordinary way, with this and then put aside and washed. 'The design will then be bleached and pale colours may be stencilled on top of it For a malerial which is unwashable. paint the whole design in white or a very pale shade of the colour to be used. When this foundation tint is dry, the stencilling is done over it in the ordinary way.

When stencilling on thin materials, do not work up and down, but stipple and gently pat the designs, holding the brush upright. as in Fig. 4. Use blotting paper underncath, and work with the brush as dry as possible. Lift the matcrial off the blotting paper now and again, and it may be found that most of the colour is on the blotting paper, and very little left on the fabric. This usually means that the brush is either too wet or too hard. A Japanese brush, such as that illustrated, is best for very thin materials.

Stencilling on China. When stencilling on china, place the vase, bowl, or other article in a large pan of cold water, and the latter must be brought slowly to the boil. This process serves not only to temper the china and
render it less likely to break, but also removes In working stencils on any stains that might disfigure the result. curtains or covers the Once the water has boiled, talic the pan from corners must always be the fire and leave the china in it until it is cold : taken into account. If then dry it thoroughly, and, in order to guard possiblo work all the against the possihility of a greasy surface, corners first, and then wipe it with a rag dipped in methylated spirit. The presence of grease will not only make the application of colour very difficult, but will also affect its permanency.
In working round any curved article it will be found necessary to snip the stencil plate top and bottom. Use the brush very dry and the colours sufficiently thick to prevent any white patches from showing throingh. Stippling is the best method, as the plate is difficult to fix and will be inclined to slip. When the design is finished, take off the plate, and with a clean rag wipe off any surplus colour. Begin drying the worls in the arrange the centres of the sides. The other way is to place the centre of a design in the exact centre of one side and then arrange the corner. Never work up to a corner or the centre without find ing out whether the plate will fit. If not, it will be necessary to find some portion of the design which can be repeated to fill in oren, and when it almost dry hold it in stencil work for a the steam of a fast-boiling kettle This fixes the colours so that washing does not affect them

When stencilling on glass use oil tube colours with quick drying medium or special coloure for painting on glass (see pages 53!, 540). The article to be decorated must be polished with methylated spirit to remove all grease. Hard surfaces such as wood, metal, china, or glass re. quire a dry brush as all the colour remains on the surface Wood stnins may be used for stencilling unpainted wooden articles. When finished and dry. the work may be varnished or wax-polished

Florescan Stencilling. A very attractive form of stencilling which resembles the Florentine work of the 17th century is known as Florescan stencilling. Handsome cushions, and has a matt appearance when tinished medallion in the corner


Stencilling. Fig. 2. When cutting a stencil, hold the plate firmly with the left band, which should be above the knite to avoid any rigk of cutting the band should the knife slip

Courlestl ol Winsor \& Newton

Hanters, fans, curtains, etc., can be made by curtain is seen in Fig. 5 . In this particular stencilling suitable designs on velvet, satin, case the corner was stencilled firstand made to leather, suede, gauze, or georgette. Florescan lie well inside the hem. The latter may bc colours are sold in tubes and used with a used as a guide, provided that the edges of the medium. If required to wash or when paint- stencil-plate are true The use of a skirting on leather, the washable medium must be board is an advantage, because it allows a used. Japnnese brushes shonld be employed good deal of the curtain to be pinned down at Stencilling Curtains, Casement cloth for once. Stencil up the whole length of one short curtains takes the colours very well, side and along the bottom, arranging tbe

To get the best resulta the stencilling sloould be done before the top is gathered. The material will then lie fintter, and can be more easily ironed Any colour scheme can be used so long as it tones with the room in which the curtaine are to be hung. As soon as the stencilling is finished, cover it with a slightly damp cloth and iron first on the right side and then on the wrong side. This makes the curtains washable, and also fixes the colours. Thick stencil. ling should be avoided, for thin material hangs badly if much colour is used.

Decorating Cork Mats. Cork table mats may be successfully stencilled. The three examples shown in


Fig. 3 (below). Showing the correct way to hold the brash lor stencilling. with oil colour on thick material. Fig. 4 (ahove). When stencilling on thin materials use a Japanese stencil brush and stipple the colour Courlasy ol Winsor \& Newton
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Fig. 5. Part of a curtain ornamented wiln a stencilled desigut around the bem and a stencilled medallion in the corner


Stencilling. Fig. 8. Three stencilled designs on cork mats for table use Colouring should match the dinner service Courtes॥ of Winsor \& Aewton
stencil plates should be cleaned as soon after use as possible. Rub them with a piece of paper or rag, then clean them with turpentine. Hang them up to dry. or lay them between piects of newspaper.

STENODE. This is a system of wireless rcception for obtaining an extremely high degrec of selectivity. Use is made of the superheterodyne principle and the intermediate amplifying stages are sharply tuned to provide a degree of selectivity sufficient to separate stations working $4 \frac{1}{2}$ kilocycles apart.
In one version of the Stcnode a "crystal gate " is employed, the output from the intermediate amplifice being passed through a piezo-quartz crystal, a device which will not respond to frequencies more than a few hundred cycles above or below its natural frequency of vibration. This method enables an even greater degrec of station separation to be obtained.
The output from the second detector of the Stenode gives a preponderance of low notes the high notes being weak. A corrected lowfrequency magnifier is, therefore, usell to restore the balance of tonc, the corrector circuit being so designed that its amplification increases with the frequency. See Superheterodyne.

STEPHANOTIS. The hothouse evergieen climbing plant called stephanotis hears fragrant and beautiful white flowers nearly all the year round. Steplan not is can be growil in pots, or it may be planted out in a well-drained hed consisting of turfy loam, one-third cach of decayed manure and peat, and sand.
Very little water is needed in winter. An average temperature of ahout $70^{\circ}$ is the most suitablc. Weak growths should be thinned out from time to time. A limited number of strong, thinly-disposed shoots are best. Propagation is by cuttings of the previous year's shoots in the propagator in spring. See illus above.
STEP LADDER. The difference between a step ladder, often referred to as a pair of steps, and an ordinary ladder is that in the former the feet rest upon Hat pieces of wood, or treads, and in the latter upon rounded ones, or rungs. Another difference is that the step ladder is made in two pieces, a front and a back, which are hinged together so that when opened out it will


Step Ladder tor nousenold purposes, proviaed with a trey for a bucket, etc. He treads all flat automatically when the ladder is closed, as shown on the right Courtesy of J. H. Healhman \& Co.. Ltd.
especially if it has not been very well made or has been left outdoors exposed to the weather. The joints may become loose, the ropes may rot, and the hinges get rusty and breali. Frequently, too, the top step is knocked off or loosened.

To repair a laslder that has reached the state described the steps should be extra nailed with


Stephanotis. The rragrant watte nowers of an evergreen greenhouse climber. See article below
$2 \frac{1}{2} \mathrm{in}$. oval wire nails, and, if possible, gluc should be run into the trenched joints. There will usually be roon for two new nails at each joint. The heads should be punched down and the holes filled up with putty. The top step should also be extra nailed, as should the hack hinged board. Care should be taken when nailing into the elge or straight grain of top and bottom. Chain is preferable to rope, when nailing into the elge or straight grain of
as it is not liable to stretch and lasts longer. the wood, which is likely to split ; holes should as it is not liable to stretch and make sure that the legs are firmly
placed on the ground before it is make sure that the legs are firmly
placed on the ground before it is ascended. Now and again the rope
that connects front and back ascended. Now and again the rope
that connects front and back should be examined, as this may become frayed and so give way.

Repairing a Ladder. The step ladder occasionally needs repair, *
 when they are put vidual steps will fold up hand pole at the top. Some are double, having steps on both sides, while others have a special platform on which a bucket may stand while cleaning operations are in progress. Other steps, again, are so made that the worker can sit thereon in comfort.

The steps most commonly used are those with a hinged back and rope stays. They are made of deal, and are obtainable at a low price. When purchasing, it is advisable to exanainc the woorl, particularly in the treads, to see that the grain is fairly straight and free from large knots. The treads shoulll be set well in the knots. The treads slould be set well in the
sides, and if possible provided with iron bolts first be pierced with a bit. If one of the treads is damaged, it can be rencwed without disturbing the others. Saw the old tread in two places with a tenon saw well away from the nails, and then pull the end portions away from the groove. Tap the points of the nails and withdraw them with pincers. The new tread should be planed up from a piece of straight grained sound wood, and cut to the exact length between the two grooves. The groove and the ends of the tread should be coated with glue, and the piece pushed into its placc. In nailing, use new positions on the outer piece.

The mortise and tenon joints of the back strut frame should, if loose, be reglued and wedged. If the tenons are broken it is best to make a new rail. A less satisfactory way is to glue the pieces together and fix a new rail across both joints with glue and line nails on the outside. The hinges can be replaced by a new pair. The rope should be of strong window sash cord, and care should be taken that it is the correct length to give the right spread to the ladder, making it stand firm and level on the floor. The knots should be on the outer side of the wood. A step ladder should be painted to keep it in good condition. See Ladder.

## Steps as a Garden Feature

## Viewed from both Practical and Ornamental Standpoints

The construction of a flight of steps is by no means a diificult task for the amateur worker. For
further information he should consult the articles on the various materials, e.g. Brick; Cement;
Concrete; $S$ one. See also Crazy Paving; Garden; Path; Paving; Pier; Rock Garden
Where the garden slopes gently a very bricks used. Commonly, the dimensions for pleasing arrangenient of steps, as illustrated in measuring purposes can be taken as 9 in . Iong, Fig. 1, can be adopted, which combines the $4 \frac{1}{2}$ in. wide, and 3 in. thick. When the plan has function of a path and that of a llight of steps. been settled satisfactorily the ground shoult! The whole is constructed of crazy paving, and be marked out with pegs and lines, and a the steps arc comparatively low and the trench excavated on cach side to reccive the breadth considerable. Fig. 2 shows a method foundations for the wing walls. The excavauseful in small garclens and positions where tion need not be carried down beyond the there is a drop from the garden level to that point at which the ground is tirm and solid, of the ground floor or sub-basement. The so long as a depth of about 4 in . of concrete steps here illustrated are made partly with crazy paving, but the nosing or edge of the treads is finished with hewn flagstonc.
When it is possible to use rough-hewn stone of the type generally known as rubble masonry, a very handsome type of steps can he constructed somewhat as shown in Fig. 3. Retaining walls are built at the sides, and the steps are formed of roughly hewn llagstones set in rough masonry and emberlded in cement mortar on foundations of broken brick.

Flight of Brick Steps. Fig. 4 shows a flight of six steps with brick wing walls and brick piers. The path from the top step to the doorstep is laid with brick. The doorstep is llanked on cither side by low piers of brickwork, those at the entrance being topped with capping stones.
The difference in level between the approach to the house and the carriage drive is 27 in . This height or its equivalent on any other job has to be divided between any number of steps that can conveniently be built with bricks, plus the difference in level duc to the fall of the path. In this case a fall of 2 in . is allowed from the door to the uppermost step. Each of the five treads of the steps has a fall of $1 . \mathrm{in}$. the five brick courses of bricks set on erlge are cach $4 \frac{1}{2} \mathrm{in}$. high, thus making up the required total, namely 27 in.

When details of this kind have been settled for any particular job a drawing of the steps should be worked out, such as that shown in Fig. 4. taking particular care to dimension the courses properly. according to the number of
best be achicred, by the amateur worker, in first preparing the foundations for the lower part of the wall at a reasonable level, placing a couple of briclis on end on the concrete, and laying in a bed of concrete to the level of the top of the top brick. This forms the stepped foundation, the height of the step being proportional to the height of the bricks, thus avoiding much cutting and making up with mortar.

Care should be taken to plumb up the piers and the walls as the work proceceds, and to drive up the bricks by tapping them with the end of the trowel. The second step should then be laid with bricks as before, well embedding them in cement mortar. The ground between the wa!ls is cleared away leve!, some hard core rammed into it, and the foundations for the next step made by filling in with concrete to placerl on another foundation of broken brick or stone. A trench sliould be dug to reccive the foundations for the bottom step This should also be filled with concrete and roughly levelled off with a shovel, as in Fig. 5.
The first proceeding is to lay a bed of mortar on the foundations for the front step and the two entrance piers, and commence by laying three courses of bricks at each pier. The bricks which are to form the step are embedded in mortar and should exactly fill the space between the two piers; ihey should fit tightly and mav be driven home with the handle of a heavy haminer, as in Fig. 6. Six nore courses of bricks are set on cach of the piers, and the side walls built up. These may be laid in the ordinary Flemish bond, the arrangement the level of the previous step, as is visible in of the bricks by this method being clearly shown Fig. 8. The work then proceeds in a similar in Fig. 7, where the headers and stretchers manner as before, ly laying another step in are clearly distinguished. The worker should brickwork, giving the bricks a gradual fall to refer to the article Brick for further details of ensure that water does not lic on them, and the method of bonding.

It should be noted that as the normal surface of the ground rises, the trench, with the levelled concrete in it for the foundations of the side walls, need not be kept in one main level, but may be stepped up. This result can


Fig. 3. showing tae cnarm of a đugat or shallow steps made of hag stone and rubble masonry flanked by retaining walls


Steps. Fig. 1. Picturesque effect achieved by the use of crazy paving for a path which rises rradually in shallow steps. Fig. 2. Steps connecting different levels in a small garden ; they are of crazy paving finished on the edges of the treads with hewn flagstone


Steys. Fig. 4. Sectional view showing method of construction of a flight of six steps with brick wing walls and brick piers
body e.g. the noise produced by broath. ing and by the action of the heart. In disease these sounds are modified or added to, each change having a diagnostic significance.

## STEW. A stew

 can lie made with either becf mutton, or veal as the main ingredient, and lirections for making such be set on the side walls as shown in Fig. 9. This stews will be found under the respective gives a tinish to the work. headings. The ingredients needed for a The last remaining steps are then !aid, and mixed stew are $\frac{1}{2} \mathrm{ll}$. becf kidnev, $\frac{1}{2} \mathrm{lb}$. pork if the work has been properly done the top (not too fat), $\frac{1}{2} \mathrm{lb}$. mutton, $1 \frac{1}{2} 1 \mathrm{w}$. veal, $1 \frac{1}{2} \mathrm{lb}$. Hight of steps will be exactly the same level potatocs, $1 \frac{1}{2} \mathrm{lb}$. onions, and ! lb . carrots. as the top of the hender course on the two side Green peas might be userl instead of thecovered vesse!, generally with very little alded liquor. By this method tough portions of meat are rendored catable, and very little heat is reguired to maintain the proper tomperature after the food has been boiled. Nonc of the juices of the meat are lost, and the fool can be kept hot without deteriorating.
A stewpan, a casserole, or an earthenware jar may be used, and it is placed in the oven or on the top of the stove. Before starting the slow process, meat to be stewed must be well boilen up, or it will soir. A stew is nearly always thickened, and meat stews should be made with fresh, not cooked, meat. The stew may be white, as in the case of Irish stew, or brown, as in stewed ox-tail or skirt of beef. Vegetables are usually stewed and served with meat. Fish may also be stewed; trout or eels make excellent stews.
Stewed Fruit. Stone fruits are much more digestible when stewed, and if served with some accompaniment of a milliy nature they are less likely to disagrec with children or those persons whose digestions are weak or impaired. For this reason it is the custom to serve cream or custard with stewed or cooked fruit, and sometimes milky puddings or blanemange. One advantage of strwing fruit consists in being able to cook any that is not actually ripe or is in the green stage. Gooselurries, for instance, when quite unripe, are excellent for stewing, hut are not fit for this purpose
walls. This result is only accom. plished by the constant checking of the level between the two side walls, by resting a batten across them aud then testing with a spirit level.

The brick path is laid in the usual way, two smal! piers built by tho doorstep, and the entrance picrs completed in readiness for the capstones. These can lie obtained from a mason's yard, or may be moulded in concrete.

STERILIZATION. The process of making certain substances free from germs of all kinds is usually called sterilization. A large number of different methods are used, the choice depending in any case on the materials of which an ohject is composed and also upon
 the uses to which it is to be put, etc.

One of the simplest means is to raise the carrots when in season. material to a high temperature at which no The vegetables are first germ life can exist. For example, the hoiling sliced and the meat cut of milk is the most thorough and reliab!e up into neat picces, method of destroying any germs which may then all should be put be contained in it. Pasteurising is a useful in layers, in a stewpan. method which will destroy almost all the germs vigetables making up likely to be found in milk. It has an alvantage both top and botton, over boiling in that it has a less marked effect layers. Season plention the taste of the milk. The process consists fully with salt and of raising the milk to a temperature of $145^{\circ}$ to $150^{\circ}$ and keeping it there for not less than half an hour. See Antiseptic; Bottling; Disinfectant; Milk; Pasteurisation.

STERNBERGLA. These hardy bulbs hear yellow, crocus-like Howers. They are suitable for planting in sunny places in the rock garden or at the foot of a house wa!l. The winter daffoclil, or lily of the field (lutea), which blooms in September, should be planted in July, and Fischeriana, which is in Hower in April, ought to be planted in October.

STETHOSCOPE. An instrument known by the name of stethoscope is used by doctors for listening to sounds producel within the in slow boiling in a


STEWING: In Cookery. One of the most economical methods of cooking is wing, which consists
 How side walls are bonded together. Fig. 8. First two steps completed. Fig. 9. Heading course set on side wall and steps nearing completion
when ripe. Certain kinds of plums stew well, also apples and a hard sort of pear

The simplest method for stewing fruit is to put it in a stewpan with sugar and a little water, and cook it gently over the fire or in the oven until it is quite soft, and the sugar and water have thickened. The fruit must be in sound condition; before stewing it should be picked over, and all damaged portions rejected, then it should be rinsed with cold water in a colander.
The amount of sugar necessary is about the same quantity that would be required for making the fruit into a pie. Fruit must always be amply sweetened while cooking, as no amount of sugar alded afterwards will arail to remove the tart taste. The quantity of water to be added also varies with the kind of fruit ; for very juicy fruits the drippings of water after washing should create sufficient liquor for the stew.

A secondmethod is to prepare a syrup, and, after heating it to boiling point, drain the fruit until no moisture is left, and turn it carefully into the syrup. About 1 gill syrup should be enough for each lb. fruit, and it must be strong, as it will be thinned considerably when the juice boils out of the fruit. Cook all until the fruit is tender, shaking the pan occasionally to prevent the contents from burning. The heat employed must only be moderate.

Another method is to lay cach piece separately in the stewpan in a single layer, pour a strong syrup over it, and cook gently on top of stove or in oven until soft. Each portion or whole fruit will then be found entire, and can be properly arranged in a dish. The syrup when cool should be ladled over and round.

Rhubarb, if possible, should be treated by this method, and will make a superior dish, especially if a little syrup from a jar of preserved ginger is added while stewing. Strawberries are not suitable for stewing by any mothod, although they may be heated and softened in syrup for the purpose of filling tartlets and flans. The same applies to oranges, all pips and pith heing removed, and also to fresh pincapples and bananas, and tinned fruits, such as cherries, peaches, pears, etc. One dessertspoonful of lemon juice should be added to the syrup made with a 2 lb . tin of peaches or apricots. Many varietics of dried fruit are excellent when stewed, and full directions arc given in page 391.

Stewpans. Except for size, stewpans are in most instances identical with ordinary saucepans, and in the avcrage household the latter are used as substitutes. Pans used for stewing should have tightly fitting lids and the power to retain heat. Casseroles and other earthenware utensils have this latter property, and are therefore specially well adapted to this method of cookery.

Tinned copper, tinned irou, and enamel pans are also excellent for stewing, but care should be taken to see that the lining of copper pans is undamaged, otherwise poisoning may result. Double saucepans, such as those used in making porridge, are also suited to stewing, for they minimize the danger of burning. See Beef; Casserole; Dried Fruit; Pressure Cooker; Saucepan; Steamer.

## Sticking Plaster. See Adhesive Plaster.

STIFF NECK. Muscular rheumatism, or fibrositis, may result in a stiff nech. It is more common among children than adults. Generally the stiffness is confined to one side, the muscles in front and at the side of the neck being most often affected. Persons subject to this painful affection should take the greatest possible care to avoid draughts and exposure to cold.
Usually the only treatment required is the rubling in of some warning, stimulating liniment, and then covering warmly with a pad of cotton wool to prevent chilling. The
following are two prescriptions for liniments that are suitable for external use in cases of stiff neck:


## See Fibrositis; Rheumatism.

STIFFNESS: Of Muscles. The painful stiffness in over-used muscles may be removed by a hot bath and sufficient massage; stiffness remaining after a night's rest is generally dissipated by brisk exercise.
Painful stiffness is a feature of muscular rhcumatism or fibrositis, and here, also, heat and massage are good remedies. Stiffness and rigidity of the muscles of the abdominal wall are found when there is underlying inllanimatory mischief, as, for cxample, appendicitis. See Fibrositis; Massage.
STILE : In Carpentry. This is the term used for the outer upright pieces of a frame into which the rails are tenoned. In cabinet and other double doors, the two inner stiles arc known as meeting stiles, and the meeting edges are cither rebated or one stile provided with a projecting beading to cover the space. See Cabinet Making; Door.
STILETTO : For Needlework. This is a small, sharp-pointed instrument used for piercing eyelet-holes. Stilettos can be bought cheaply from all art needlework shops. Carc should be taken to keep them free from rust. See Eyelct.

STILL BIRTH. When a child is born dead the occurrence is spoken of as a still birth. It is important to remember that still births, as well as others, must be notified to the medical officer of health within 36 hours in districts where the Notification of Births Act has been adopted.

Sometimes a child is born very pale or blue in the face, making no attempt to breathe or move, but with the heart beating faintly. The nurse should sprinkle the child's face and chest with cold water; this stimulates it to breathe. If that does not succeed, she should raise the child by its heels and tap its body smartly. Should this be unsuccessful, artificial respiration sliould immediately be practised.
STILL ROOM. In large houses there is often a housekeeper's pantry or still room, as it is called. Though apart in its uses from the butler's pantry, it is furnished in much the same way with cupboards, shelves, and sink, and there is usually a gas stove or range and large kitchen or cook's table. Where a great deal of confectionery is made in the house a special still room maid often assists in this branch of cookery.

STILTON CHEESE. In the true stilton the milk with which it is marle is enriched by a certain proportion of creain, alded when making the curd. The cream is first scalded by a small quantity of boiling water being poured upon it. The best season for making stilton is from July to October, giving the cheese time to ripen for Christmas fare. Although the outer crust has a rough, pitted appearance, the interior is milky white with sireaks of dark green.


Stippling. Fig. 1. Stippler for paint. Fig. 2. Larger brush for use with distemper
cheese scoop, and in the hollows which are made wine or ale should be poured. By degrees, if this process is carried out, the cheese will acquire a morc matured flavour, while it will be kept sufficiently moist inside. See Cheese.

STIMULANT. A stimulant means any drug or agent which increases the activity of any organ or tissue; thus there are heart stimulants, brain stimulants, skin stimulants, and so on. Popularly, the word is used for something which invigorates the body, generally alcohol.

As a matter of fact, the stimulating effects of alcohol are transitory, and the main effect is narcotic. Small doses of alcohol, repeated if necessary, ought to be given instead of large ones in the treatment of collapse.

Ammonia is a good general stimulant, and may be given in the form of the aromatic spirit or sal volatile, in doses of a tcaspoonful in a wineglassful of water. Tea and coffee are also good general stimulants.
STING: How to Treat. The poison introduced by an insect sting is usually formic acid. A solution of ammonia is the best remedial application, but solutions of bicarbonate of soda or of potassium permanganate are also useful.

Fresh tobacco ash is a simple remedy for stings. It should be applied to the affected part with moisture to form a paste, and then rubbed in gently.

A few drops of oil of geranium rubbed behind the ears and over the neck and ankles will generally afford protection against the stings of midges and other summer pests. Babies and children should be especially protected, as insect stings are not only painful, but may be dangerous when they occur on the lips or eyelids. If the oil is not rubbed on the skin, it may be used to soak small pads of cotton wool sewn to the clothing

## See Bee Sting.

Stipa. This is the botanical name of the ornamental grass known as feather grass (q.v.).

STIPPLING. A flat effect is obtained with ordinary paint or distemper by the method known as stippling. The stippler used for paint is shown in Fig. 1, and Fig. 2 shows a larger brush for use with distemper. Both are made from hog-hair, and after use should be washed in lukewarm water if used with distemper, or with turpentine in the case of paint.
Stippling should be done while the paint is wet. The methor is to apply the paint or distemper evenly; the direction docs not matter as long as the surface is cvenly covered. The stippler is then dabbed on the wet surface. The surface to he stippled should not be more than 1 sq . yd. at a time. Broken surfaces require considerable care, and it is ofteu necessary to use a small sash tool as a stippler.
It is more difficult to use the stippler in applying a Hatting paint. Only the tips of the hair should be used, and the brush must be kept clean by dipping it from time to time in turpentine and cleaning it on a piece of paper. Care should be taken not to drag the stippler over the surface, but to apply it with the hairs at right angles to the surface, and with a light touch. See Brush; Paint.

STIRRUP. Steel or nickel-plated stirrups are a necessary part of the rider's equipment, though not essential when learning the rudiments of horsemanship.

The use of stirrups is to assist balance and to form a support. Some riders drive their feet right home into the stirrups, but the
disadvantage of doing this is counterbalanced by a lighter grip with the sole about its middle. The adjustment of stirrup leathers is always a matter of prime importance. If they are too long the rider does not get the requisite support, and sore back may result. The best method is for the rider to sit in the saddle and test the length by putting his feet into the stirrups.
There is another use for the stirrup, and that is the left stirrup iron serves to receive the left foot during mounting, aided by the grip of the hands of the pommel and cantle of the saddle.
Cleaning Stirrups and stirrup leathers require clcaning after use : the former with metal polish and the latter with saddle soap. As the leathers are liable to perish with use it is necessary to examine them frequently, and replace worn portions. See Horse.

## STITCH: In Needlework. Of the

 various kinds of stitches used in necdlework, running is cmployed for gathering, and also for joining materials, and hemming for turning down raw edges, while tacking, whichis a temporary stitch, holds the fabric in position while the permanent stitches are put in. There are also fancy stitches, such as cross-stitch and herringboning, which are employed for decorative purposes. See Appliqué ; Basting: Cross Stitch; Dressmaking. Embroidery ; Feather Stitch; Hem ; Hemstitch; Herring-bone; Laill Work; Necdlework: Overcasting : Running ; Scam : Sewing Machine ; Smocking ; Tapestry Needlework.

STITCH: In the Side. The sharp, stabling pain felt sometimes at the side of the chest, and popularly referred to as a stitch in the side, may result from running or any violent exertion after a meal, or from prolonged laughing, coughing, or sneezing. It may be due in these cases to a cramp-like spasm of muscle fibres in the midriff or the chest wall. and no treatment is neccssary, as the pain passes off almost at once on resting.
Sometimes, however, this form of pain is a symptom of a broken ril), or lobar pneumonia, of pleurisy or of some disorder of the liver. The application of a hot bag is a useful temporary nieasure.

## Stock for Soups and Sauces

## Recipes tor Clear. White, Bone and Vegetable Varieties

## This article is in close connexion with those in Sauce and Soup. See also Beef; Bouquet

 Garni; Gravy; Mutton; Veal, etc.The foundation of most soups, sauces, and Mutton is difficult to clear on account of its also of gravies used for made up dishes is stock. Impoverished stock will make a very poor soup, and no added Havour of vegetables or herbs will successfully disguise its original weakness.
Scraps of food, trimmings of meat and boncs, which would otherwise be thrown away, can be added to the stockpot and turned into useful material. Almost any oddment provided that it is suitable to augment or clear the stock, may lie added from time to time. Egg-shells assist in clearing the liquor, and even hard crusts have their use in helping the scum to rise. Stock requires careful skimming when it boils up and whenever scum collects.
The more continuously the stocl: is allowed to sinmer the better and richer it will be, but it is advisable to strain it out at night into an earthenware pan to prevent souring, especially in summer. Vegetables, particularly turnips, if left in the stockpot are liable to sour the liquor. Potatoes should not be put into the stockpot Meat bones can be loiled again for a second and third stock, but vegetables should not be used a second time. Stock should not be left in the larder after the second day without being boiled up, and in stormy weather it should be boiled daily. A thundery condition of the atmosphere is alone sullicient to spoil the stock entirely.

If fresh meat is added to the pot, skimming must take place as soon as the scum rises, for if the scum is allowed to boil down in the liquor it will be impossible to clear it properly, and a thick and cloudy appearance will result. Never place a pan of liot stoc! on a slate or stone slab, or it will cool too rapidly ; if obliged to set it away hot, place under the pan 2 or 3 pieces of wood to support it.

Chickens, rabbits, or meat intended to be served as a boiled dish may be cooked in the stockpot and will add to the strength of the stock, and they will be flavoured and enriched by it. Chickens should be wrapped in buttered paper or a loose cloth, which will prevent sediment or small pieces clinging to them.
lish stock is made from lish or the bones and trimmings of fish. boiled with or without vegetables. A recipe is given in the general article on Fish.

First Stock. Clear soup is always mhde from first stock. This is composed of fresh meat or bones and flavoured with vegetables.
allowy fat, and pork is too fat for any stock Beef, veal, calf's head, ox-tail and ox-cheek make the best. lirst stock. Vegetable and bone atocks can also tie used, but must be carefu!ly strained, and clarilied with white of egg if necessary. Peppercorns should be used for first stock, as ground pepper would make it cloudy. The salt should be added to the water when cold, as it helps the scum to rise, and care should be taken to remove the scum just as the stock is on the point, of boiling. to prevent it sinking into the liquor. Before the vegetables are added all scum must be removed, and the vegetables should te put in by degrees to prevent dropping the temperature of the etock too suddenly. Never add marrow bones to stock intended for clear soup, as marrow fat cannot be entirely skimmed away
There is no occasion for concern if stock made principally with beef docs not make a strong jelly. For clear soup a meaty flavoured stnck is more nocessary than one which is very gelatinous, and the meaty stock will be bright as well as clear.

White Stock. White stock for white soups and sauces is always made with white meats. Knuckle of veal, carcasses of chicken, or an old hen are the most usual meats for this purpose. The llesh of the hen need nol be wasted, as it can be worked up into some side dish.
The ingredients for a good white stock are a knuckle of veal weighing about $2 \mathrm{lb} ., \frac{1}{4} \mathrm{lb}$.

stock pot maye in atunimum. The tap ahow, the liquid to be drawn oft quickiy after the stock has been heated up
lean ham, 2 onions, 2 sticks celery or $\frac{1}{4}$ tea spoonfu! celery salt. $\frac{1}{2}$ turnip, 18 peppercorns, 1 blade mace bunch of herbs, 4 in . lemon tind, 2 teaspoonfuls salt, 3 quarts water

Chop bones and meat small and put into stockpot with sal! and cold water bring to boiling point, skim carefully, then boil for three hours, skimming frequently. Add vegetables, carefully cleaned and peeled and chopped small, together with the flavourings, and simmer for two hours. Strain through a hair sieve, and remove fat when cold Use bones and meat for second and third stock.

Brown Stock. For this use 2 lb . shin beef, 1 lb knuckle of veal, \& lb raw ham, 1 oz. dripping, I teaspoonful salt, " onions, $\frac{1}{2}$ turnip, 2 sticts celery. or $\frac{1}{4}$ teaspoontul celery salt, a bouquet garni, 2 quarts water.

Put prepared meat and !ones in the stoclipot with cold water and salt. bring slowly to the boil, being careful to remove all scuin in the process. Simmer. gently for threc hours. Slice onions tinely and fry in the dripping until brown. Drain well, add to stock with remainder of ingredients and simmer for two hours. Strain through a hair sieve and remove all fat when cold. Reserve meat and bones for second and third stock.

Bone Stock. A good recipe for bone stock requires the following ingredients: 4 lb . raw or cooked bones, 1 carrot, 2 onions, $\}$ of a large turnip, 2 stalks celery or $\frac{1}{4}$ teasponnful celery salt, $1 \frac{1}{2}$ teaspoonfuls salt, bouquet garni, 3 quarts water

Chop bones small, place in stockpot with cold water and salt and bring to boiling point, skimming carefully all the time Boil for threc hours, skimming frequently. Clean and cut up vegetables, and add to stock with the herbs, boil gently for 3 hours, then strain. Remove fat when cold.

Vegetable Stock. Vegetable stock is made from mixed vegetables. To 1 quart water allow 1 lb . mixed vegetables. Carrots, turnips and onions are the most used, and, if liked, celery, tomato, leek, and a little parsley can also be added. Four peppercorns are used for seasoning, and 1 or 2 cloves can also be aclded. The vegetables are washed and cut into small pieces, and then fried gently in about 2 oz . fat for about 15 min . in a covered pan. The water, herbs, and a sprinkling of salt and the peppercorns are added to the vegetables, and the whole brought to the boil. The stock is then left 10 sinmer for about 2 hours in a covered pan and straincd. Variety can be given to any of these stocks by the addition of other vegetables, sma! $p^{i}$ ece of cooked meat. poultry, game, or macaroni, vermicelli boiled rice, sago, or semolina

Vegetarian stock is sometimes made by boiling bran with water for $1 \frac{1}{2}$ hours. then straining off the liquor and letting it settle. Oatmeal also is used for this purpose.
Straining Stock. When straining stock remember that pressure should not be resorted to if the stock is desired to be clear. The liquor should be allowed to drain until all is through. then the sieve is lifted off with the solid portions. By straining liquid stock it can be rendered free from grease, although it is usually more difficult to clear this stock from fat than that which is in a jelly. When perfectly cold pass the stock through a hair sieve or piece of muslin stratched over a basin, after removing solid fat with a broad flat knife. The hair or material will effectually retain any particles of fat, but the stock must be rea!ly cold; if merely lukewarm the fat will be liquid enough to pass through very fine meshes. Jellied stock may be cleared by the fat being taken off in a cake and the top washed with warm water.
Stockpot Any pan or vessel reserved for the preparation of stock may he described as a stockpot. In the home, a large saucepan is
generally reserved for this purpose. but pots specially designed for stock-making can also be bought in a variety of metals. Some of the larger kinds are fitted with taps. An example is illustrated in the opposite page, which is made in alumin. ium. When its contents have been heated, the tap allows the stock to be drawn off quickly.

Unless the stock. pot is of earthenware, stock should never be allowed to remain in it overnight, neither should it be left standing at the side of the fire for an indefinite time. Stockpots should be scoured and dried thoroughly immediately after they have been in use.
STOCK : The Flower. The stock is a delightful fragrant garden flower of which there are several types. By cultivating a suitable selection the plants will supply flowers during the greater part of the year. Ten week stocks are raised from seeds sown under glass in March, the seedlings being planted out of doors in May; they bloom in summer and autumn, and bear flowers in many beautiful colours. The Brompton stock is grown as a biennial, seeds being sown in June to provide plants that will flower early the following summer. If the garden soil is clayey and becomes sodden in winter it is wise to pot the plants in autumn, keep them in a frame and plant out in spring.

Intermediate stocks raised from seeds in summer are very useful for greenhouse decoration in spring. If raised in a warm greenhouse in January they will bloom out of doors in late summer and early autumn. The East Lothian is a favourite strain of the Intermediate stock. Winter flowering stocks are splendid plants for the greenhouse. Seeds are sown in a frame in August. The secdlings are potted in small pots and subsequently into others 5 or 6 in . wide and brought into a slightly heated greenhouse in autumn.


Stock. Queen stock, a bushy variety with white, crimson or purple ${ }^{\text {flowers }}$


Stock Cultivation. 1. Seedlings sown in box ready for transplanting. 2. Suitable transplanting. 3. Brompton stocks sown in pot $: a$, drainage; $b$, braken turves : $c$, fine rich soil 4. tood type of seedling potted in small pots. 5. Type of seedling which often produces single flowers. 6. Plants pushed on in frame : $a$, ashes ; $b$, decayed manure or leaf-soil: $c$, ordinary soil ; $d$, fne rich loam: $e$, block for ventilating

Favourite varieties are Christmas Pink, Beauty of Nice, All the Year Round, and Empress Elizabeth. The night-scented stock (Mathiola bicornis) is a hardy annual raised from seeds sown out of doors in April ; the
flowers are very fragrant in the evening. See Night-Scented Stock.

STOCK : For Trees. The named varieties of fruits and roses are invariably budded or grafted on stocks, i.e. closely related trees or shrubs. Well developed trees are obtained more quickly in this way and in some cases the growth of the tree is controlled by the stock. For instance, standard apple trees are budded on the crab stock; they come slowly to maturity, but eventually form large trees. Apples budded on the broad-leaved paradise stock make less vigorous growth and bear fruits earlier. Thus the choice of stock on which a tree is budded is one of importance.

Similarly, pear trees on the pear stock grow more vigorously and come to fruit bearing later than others on the quince stock. Those whose gardens are restricted in size should plant apple trees budded on the broad-leaved paradise or other dwarfing stock and pear trees on the quince stock. Rose trees are budded chiefly on wild briar and the Japanese briar. The first named is considered the best for dwarf or bush roses, and is also used for standard roses, but, owing to the difficulty of obtaining suitable briar stems, the Japanese briar, Rosa rugosa, is now often used instead. Stocks for roses and fruit trees are raised by nurserymen or imported annually in large numbers. They are planted in autumn and budded the following summer.
As stocks for plums, the most popular are the Mussel, the Brompton, the St. Julien. For the cherry the most popular stocks are the

## Stocks and Dies for Screw Cutting

## How to Form External and Internal Threads on Metal

This contrib ttion explains the method of cutting an external screw threal by the use of a die, and also the tappin: of holes. The mechanical process of screw cutting in the lathe is dealt with in an earlier artic.e on Screw Cuting. See also Lathe; Metal Turnirg; Screw Plate
In choosing stocks for serewing purposes adjusted to cut to the desired diameter. Screw the first consideration should be the nature it on to a clean piece of metal that has already of the work. For small diameter screws, a been threaded to the proper size, then adjust stock for use with circular dies is suitable. the die until it is stiff to move by hand. Such a stock would measure about 8 in. in For steel set the dies a shade closer, and for length, and contain a circular socket or aperture for the small size die measuring $\frac{1}{1}{ }^{3} \mathrm{in}$ in. diameter. This is suitable for screwing in brass up to $\frac{3}{8} \mathrm{in}$. diameter or thereabouts. and rather less on steel
For work from about $\frac{1}{4} \mathrm{in}$. to $\frac{1}{2} \mathrm{in}$. diameter one of the engineer's type of stocks should be used, with a pair of adjustable (two-part) dies. For gas-fitting purposes, larger stocks employing separate dies are generally used.
External Threads. The function of a screwing die being to cut a screw thread upon the outside of a circular piece of metal, the interior of the die is fashioned in the form of the screw thread. Parts of the diameter are cut or ground away to form a cutting edge, and the threads themselves are ground away at the front or entering edge, to facilitate starting the screw thread.

Most circular dies have a small set screw which, when screwed in, expands the die slightly and thus increases its effective diameter. Two-part dies are adjusted for diameter by means of a set screw or screws in the body of the die stock. It is important that the die be


Stocks and Dies. Fig. 1. Small circular die stock used in cutting a screw thread. Fig. 2. Adjustable circular dies. Fig. 3. How large die in atock is employed for screwing gas barrel
 on the tap, cutting away portions of thescrew thread. The shape of the
flutes is designed so that one of its walls forms a cutting edge. The opposite end of the tap is usually left plain, and finished with a square-shaped portion. The tap is turned by a lever or bar, known as a tap wrench, which may consist of a piece of metal with a square hole through it of a size to lit the square on the tap. A more convenient pattern is adjustable, having a pinching screw which clamps the shank of the tap.
The cutting part of the tap is shaped in various ways apart from the ordinary fluting. A set of taps for any particular size includes a taper, second, and plug or bottoining tap. In the case of the taper tap the screw thread portion is ground away for about ${ }_{3}$ of the length of the screwed part, so that it becomes tapered. In the second tap the tapering is restricted to a very slight amount at the end,

| Whitworth |  | Gas |  | B.A. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Size | Drilit | SIzE | Drilut | Size | Dille |
| - | No 38 | $\stackrel{1}{8}$ | 11/3: | 0 | 9-11 |
| if | No. ${ }^{2} 5$ | $t$ | 29/64 | 1 | 15-17 |
| \% | No. ${ }_{j}$ | $\frac{1}{6}$ | 19/3\% | $\stackrel{2}{3}$ | -4-25 |
| ${ }^{20}$ | 19/64 | $\frac{8}{4}$ | 61164 | 4 | 31-33 |
| ${ }^{\frac{7}{16}}$ | $11 / 32$ | 1 | $1{ }^{1}$ | 5 | 38-39 |
| 1 | 27/64 | 13 | 17732 | ${ }^{6}$ | 42-43 |
| ${ }_{4}$ | 33/64 | $1{ }_{2}$ | ${ }_{1}^{1} 45 / 64$ | 7 | 45-48 |
| $\frac{4}{2}$ | 41,64 $47 / 64$ | $\stackrel{2}{2}$ | $\begin{array}{ll}\mathbf{2} & 5 / 32 \\ \mathbf{2} & 25 / 32\end{array}$ | 8 | 48-51 |
| 1 | 27/32 | $2{ }^{2}$ | 3 9/39 | 10 | 53-55 |

the bulk of the screwed portion being of full diameter. In the plug, or bottoming tap, no part of the thread is ground off.

Before the hole can be tapped it must bo drilled out to a certain size, dependent upon that of the screw thread which is to be formed within it. Suppose, for instance, the screw which is to be inserted into the tapped hole is $f$ in. diameter. The hole will then have to be drilled out about $I^{3}$ in diameter. The correct size of drill to use is most quickly determined with the aid of a drill and tapping gauge, an instrument consisting of a metal plate with a series of numbered holes through it. The hole marked $\frac{1}{4} \mathrm{in}$. (tapping size) will actually measure less than $\frac{1}{4}$ in., and denotes the correct size of drill to employ to prepare the tapping.
Gauges are generally based on the assumption that the Whitworth system of screw
hole, or by jamming it on the bottom of the hoie. When tapping iron or steel the tap should be well lubricated with light machine oil.

It is important that the tap should be rotated about its own centre line; if allowed to swing from side to side in even the slightest. degree the hole or the threaded portion will be enlarged or distorted. Special care is needed when starting the tap.

Whatever size of tap is used. the same method is followed in all cases likely to be met with by the amatcur. It is exceedingly important to use a tap of the correct dianneter and thread form for the screw which is to be fitted into the holc. This, however, presents very little difficulty in practice, as bolts and screws mostly used in the home, for such work as the repair of a stove, mangle. garden implements and the like, are generally screwed on the Whitworth system. Small work, such as that in wireless receiving apparatus, scientific instruments. and the like, is generally screwed on the B.A. system, as regards the small size, up to about $\frac{3}{4}$ in. Larger sizes are often cut in a lathe.

Threads used in the home for screwing iron pipe, either for gas or hot water purposes, are always screwed on one of two systems. Iron pipes are screwed with gas threads, while copper and brass pipes are usually screwed with brass gas threads. Taps and dies for this work are obtainable at most tool shops. The size of the tap wrench varies according to the size of the tap.

As taps can be purchased separately, the anateur will be well advised to buy those needed for any particular job, and gradually accumulate a stock as circumstances necessitate. To prevent them becoming rusty they should be wiped over with a greasy rag.

STOCKFISH. Large fish, such as cod or hake, were at one time extensively cured by being split open and dried in the air until very hard, no salt being used. The fish before being cooked was beaten with sticks in order to soften it. The name is now often applied to salt cod, ling, hake, etc., and is a term of commerce. See Cod; Fish.

STOCKINETTE. A wool or silk knitted fabric of elastic texture, stockinette is employed to make frocks, cardigans, and other sports wear, and underwear.

Stockinette needs the samc care in laundering as other knitted inaterials. No wringing or rubbing should be done, the dirt being removed by squeezing the garment in warm soapy water. It should be pullerl gently into shape while still damp. left to dry on a that surface and ironed with a cool iron. When holes appear in stockinette they should be darned at once, otherwise they will form ladders.

## Stockings of Several Textures

## With Directions for Knitting Two Standard Types

Other articles in this work that describe the variolus items of footwcar include Boorees; Boot; Mocassin; Sock. See also Artificial Silk; Knitting; Silk; Wool

The correct choice of stockings for women and girls depends chiefly on footwear and costume, silk being worn with light shoes and silk and wool, lisle thread or all wool textures being selected for sports or country wear with a heavier type of shoe.

In choosing silk stockings the hand should be run through inside from top to toe to see that the fabric is clear of Haws. Stone rings should be removed before doing this, or they may ladder the silk. Attention should also be paid to the fashioning, whether full or slight, of the leg and the width round the top. A top which is too narrow cuts in an uncomfortable way, and if not full enough the stocking will split or ladder at the back seam. In some makes the heel piece runs up to a
fine point or twin points at the back of the ankle, insuring a better fit.
Stockings of a lighter shade than the shoes worn make the feet appear smaller, but they are not helpful to thick ankles. Very dark brown or gunmetal grey silk stockinge have the most slimming effect. With gold and silver shoes the silk stocking should match as nearly as possible in tone. Grey shoes and stockings should match exactly. Sports stockings for winter wear are smartest when handknit in thick silk or fine wool. Some display patterns of contrasting shade up the leg instead of ribs. Such patterns gencrally have a thickening effect on the ankles.

The usual sizes for women's stockings are $8 \frac{1}{2} \mathrm{in}$. and 9 in . for sizes 3 and 4 in shoes, $9 \frac{1}{2} \mathrm{in}$.
for sizes 5 and 6, and 10 in. for sizes $6 \frac{1}{2}$ and 7. Some people reinforce the toes and hcels of new silk stockings by cutting out pieces of fine mesh of silk veiling to fit the required size and invisibly catching them on the wrong side of the stocking foot. Woollen stockings can be lightly darned in the same places with fine wool of the exact shade before being worn. Hand-knitted stockings can be strengthened by using a finer wool, in addition to that used for the rest of the stocking, linitting the two together for heel and toe.
No stockings can equal in durability those that are made by hand, whether they are knitted with wool, coarse or fine, or with silk. There are many patterns and styles, one of the most popular being the plainest of all.
For closer fit there are the ribbed hose, which are even stronger than the plain, and are specially suitable for sports wear. By way of a standard, a plainly knit stocking has been illustrated and fully described so that when once the making is thoroughly understood others can be modelled in a different style and with slight variations in size.

Plain Knitted Stockings. To make the stocking shown in Fig. 3, 8 oz. of 4 -ply fingering are required and four steel needles, No. 14. Some workers will like to rib the top of the stocking with needles No. 16, as the finer knitting affords a closer grip. The model is planned for wear with suspenders. Should garters be worn, the leg should be about 3 in. longer to allow for rolling over.
The wool must be wound very loosely, 2 or 3 fingers being taken in with every 16 or 18 windings round the ball. A quick knitter will like to have several yards of the wool pulled off the ball at once to lessen the number of unwindings.

For this stocking, cast on 80 , arranging 26 on one needle and 27 stitches on each of the other two needles. Make the welt by knitting 2 and purling 2 alternately all round for 30 rounds.

An excellent and durable top for a stocking to be worn with suspenders takes the form of an ornamental hem. After casting on, knit 11 plain rounds. 12 th round: Make 1 by bringing the wool round the needle, knit 2 together. Work thus all round. Work 11 plain rounds. Take an extra needle and with it pick up the cast-on stitches opposite those on the working needle. Fold the work so that this needle is at the back and those last knitted are in front. Knit a plain round, taking up a stitch from each needle, and work them off together as one stitch. Continue thus all round.
Take care that the stitches are exactly opposite one another, or the hem will be twisted. The 12 th round forms a series of tiny scallops at the edge of the stocking. The 25 th and 26 th rounds are purled. For the 27th round make 1 and knit 2 together all round. Purl the 28th and 29 th rounds.
Now begin the leg. In the next round raise an extra stitch in the middle, and purl this as a seam-stitch in every row till further notice. Knit plain for 80 rounds-that is, as many rounds as there were stitches cast on.
In the next round, begin to decrease to
> knit 2 together, knit the rest of the round plain. Knit 8 rounds without decreasing. Repeat from * 8 times, thus reducing the number of stitches to 63. Knit 63 rounds plain for the ankle, that is, as many rounds as there are stitches on the needles.
> Divide the stitches ready for the heel.

3 stitches of the on to the needle with which the loops up the seam-stitch, ${ }^{*}$ slip l, second edge of the heel-flap are to be picked knit l, and draw the up exactly as before. Knit with this needle slipped stitch over to the centre of the heel where now future it, knit 1, purl the rounds are to be begun. Knit all round to seam-stitch, knit l, get the stitches arranged in their places.


Place 31 stitches on one needle with the seam-stitch in the middle. Put 15 stitches on to each of the remaining 2 needles. Leave these stitches for the present, as later on they will be wanted for the instep. Work in rows backward and forward (purl at the back and knit in front), always slipping the first stitch of a row. When 24 rows are done, decrease exactly as in the leg, and purl back. Repeat this row twice.

Knitting the Heel. The heel is now ready to be worked off thus: Knit to the seam-stitch. knit that and the next together, knit l. Turn, slip 1 . purl 2 together, purl 1. Turn slip 1, knit till the little hole is reached that was made by the decreasing of the preceding row, knit 2 together (the stitches on each side of the hole), knit 1. Return in the same way, purling instead of knitting. Continue thus till all the stitches are worked off.

The following directions make an excellent heel, with rather more spring in it than the former. When the flap is finished, knit to the seamstitch, then purl 1, knit 5, knit 2 together. Turn. Slip 1, purl 11, purl 2 together. * Turn. Slip stitches are left, knit 2 knit 11, knit 2 together. Turn. Sip Sip 1, together, knit l. On the last needle, knit l, 11, purl 2 together. Repeat ${ }^{2}$. , purl slip 1, knit 1, draw the slipped stitch over till all and knit to the end of the needle.

Next, the stitches must be arranged for the instep. Pick up and draw the wool through the double loops that run down the side of the heel flap. After every third stitch increase by knitting and purling 2 in the edge of the work. When all have been picked up, slip 3 stitches on to this needle from the instep pin. Work across, and slip the last 3 stitches

Knit one plain round. Repeat from ** till about 20 stitches remain. Keep 10 of these on the one needle, and slip the other 10 on to a single needle. Close the opening by turning the stocking wrong side out, take the stitches alternately from the 2 needles with the end of wool and a rug.needle. Fasten off by darning the wool on the wrong side. f grafting is preferred, proceed thus with


Stocking. Fig. 4. Pattern ior a boy of 14 years. The turn-over top can also be knitted in three different colours, as shown in Fig. 5

3 cardinal, 1 grey, and 1 cardinal, and fasten off the latter colour. From this point 3 rows of check are worked in grey and Lovat mixture.
For the 1 st row of checks do 4 stitches in one colour and 4 stitches in the second nolour alternately. Do 3 more rounds as the last one. For the next $t$ rows reverse the colours, then do 4 more rounds as the lst 4 . Join on the cardinal wool again and do 1 plain round, then 1 grey, 2 sardinal, 1 grey, and l cardinal. Fasten off the cardinal securely. as this is not required again. and complete the turn over with 2 rounds of Lovat mixture. Fasten off the latter the end of wool threaded on a large rug needle. colour and resume with the grey for the rest Put the two needles logether: for the front pass the needle as if to knit through the tirst stitch and slip it off the needles, put needles into the second stitch, as if to purl, but only draw the thread through without slipping it off. For the back purl and slip off, then put the needle into the next stitch as if to knit, but keep it on and draw the thread through. As the stitches are slipped on to the wool, draw this up closely, to make the seam invisible.
When tinished the woollen stockings should be laid wrong side out on an ironing board covered with a thick blanket. A damp cloth should be spread over them, and pressed with a moderately hot iron till diy. The stockings will then look like well-finished woven hosiery.

Boys' Stockings. A popular type of stockings for men and boys are those with turn-over tope. A pair of ribled stockings of this kind suitable for a boy of 10 to 14 years of age can be knitted from the following directions. These inchude a turn-over top in three colours, as shown in Jig. 5, as well as a turn-over in a different ribbing from the stocking, but in the same colour of wool, as in Fig. 4

The stocking measures $24 \frac{1}{2}$ in. from the top to the bottom of the heel flap, including $3!2$ in. on the turn over. The foot is 9 in . long from the back of the heel to the point of the toe, but the length of the latter can be varied in the centre of the foot before shaping the toc. The length of the leg can be altered in tivo places, either between the welt and the first decrease, or between the last decrease and the heel Hap. The materials required to knit a pair are 6 oz of 4 -ply White Heather Scotch fingering wool in grey, with a set of 4 No. 12 steel knitting needles. For the 3 -volour top 1 oz . of Lovat mixture and 1 oz . of green or cardinal wool will be required as well as the grey.

To begin the work tast 26 stitches on each of 2 needles and 28 on the 3 rd needle, to make 80) stitches in the round, and if making the turn-over in one colour do $3 \frac{1}{2} \mathrm{in}$. of single rib, that is, knitting and purling a stitch alternately all round. For tho 3-colour turn-over begin with the grey wool, cast on the same number of stitches, and work 12 rounds in rib of knit 4 and purl 4 alternately. Here take the Lovat mixture, and, leaving the grey wool hanging, work 2 rounds in the new wool

In the next round do 2 stitches in grey and 2 stitches in Lovat mixture, letting the wool not in use pass behind loosely so as not to contract the work. Work another round the same as last round, keeping the respective colours over each other so that a dark square is formed, then work 2 more plain rounds of Lovat mixture. Take the cardinal wool, and work 1 plain round, then 1 grey round,

## of the stocking. <br> Now turn this top insice out so that when

 the stocking is completed the right side of the turn-over will be uppermost.Knit the next round plain, as this will form the turning-edge of the top, and in that round increase 7 stitches by knitting in the front and back of a stitch at equal distances in the round to make 87 stitches. Having fewer stitches on the stocking top will give a firm grip and keep the stocking in place.

Decreasing the Leg. The stitches should now be arranged 30 on cach of 2 needles and 27 on the 3rd, so that each needle ends with a completed rib. as the rib continues in the pattern of knit 2 and purl 1 alternately all round. Continue in this pattern for $14 \frac{1}{2} \mathrm{in}$. from the lst round, when the work will be long enough to begin the leg decreases, thus: * linit tho lst 2 stitches together, continue in the rib up to within 3 stitches of the end of the round, then linit 2 together through the back of the stitches, and purl the last stitch. Knit 6 rounds without shaping, but taking care to keep the continuity of the rib after the decreasings. Repeat from * until 9 stitches are decreased at each sicle and 18 stitches less in the round.

Continue ribbing on these stitches until the stocking measures $21 \frac{1}{2} \mathrm{in}$. from the top,


Stocking. Fig. 5. Turn-over top for a bos's stocking, which can be knitted in three different colours by following the directions in the text
counting the turn-over. This brings the work to the top of the hecl-flap, so more rounds can be worked here for a longer stocking before begimning the heel. In the last round knit together the last 2 stitches.

To work the hecl knit the first 17 stitches of the round on to one needle, slip the last 17 stitches of the same round on to the other end of the same necdle, making 34 stitches for the heel. Divide the other stitches equally on 2 needles, and leave them for the instep. On the heel stitches purl and knit a row alternately until 33 more rows are worked, always slipping the first stiteh; the last row will be a purl row.
To turn the heel knit 20 , knit 2 together, tum. Always slip the lat stitch after the turn. Purl 7, purl 2 together, turn; knit 8, knit 2 together, turn ; purl 9, purl 2 together, turn: knit 10, knit 2 together, turn. Continue in this manner until all the heel stitches arc knitted on to one row again, then knit back 10 stitches and leave the heel stitches on 2 necdles. Slip) all the instep stitches on one needle, so releasing one as a working needle.

For the Ist needle knit the remaining 10 stitches of the heel, and knit up 17 stitches at the side of the heel. For the 2nd needle knit the instep stitches, and on the 3rd needle pick up and knit 17 stitches on the other side of the heel and the remaining 10 heel stitches. Knit one round plain, then decrease for the instep in the next round thus: Knit to the last 3 stitches of the lst needle, knit 2 together, knit l. Knit the and needle without shaping. On the third noedle, knit l, knit 2 together, through the back of the loops, knit to the end of the needle. Repeat the last 2 rounds until only 17 stitches relnain on each of the lst and 3rd needles, working the rib pattern on the znd needle only.
ffer the instep shaping is finished, work one more round, increasing 2 stitches on the 2nd needle to bring the stitches up to 70. Then continuc on these stitches, ribbing only the 2nd needle, for 58 rounds, or until the toe is reached. The heel, sole, and toe will be in plain knitting. Extra rounds can be worked here before shaping the toe if a longer foot be desired, allowing for nearly 2 in . more to finish the toc.

The toe proceeds in plain knitting, and in the lst round the 9 th and 10 th stitches are knitted together, then 2 rounds are worked without any decreasing, and these 2 plain rounds ara worked after every decrease round. In the 4 th round knit every 8 th and 9 th stitch together; in the 7th round every 7th and 8th stiteh ; in the 10th round, every (ith and th stitch ; in the 13th round, every Jth end (jth stitch; in the 16th round, every 4th and 5th stitch.

Runa double thread through all the remaining stitches, and darn in the end very sceurely. An alterna tive method for finish ing a toe is by the processknown as grafting

## STOKESIA. This

 is a hardy perennial, 18 in . high, with large nster-like blue flowers in late summer. It should he planted in well-drained or light soil on a sunny border. I'ropagation of stokcsia is loy dirision in spring or by seeds in the spring or summer.STOLE. To make a fur scarf or stole from on suddenly with a troublesome hiccough. several skins, first arrange the latter so that all the fur lics in one direction, and number each slin in order on the back before starting to join them. The careful matching of the skins, not only in colour, but also in both texture and length of fur, is most inportant.

Having matched the skins, cut a paper pattern as large as the largest oblong that can be contrived from the smallest of the pelts. Cut them all out by that, placing each pelt fur downward on a deal table and marking round the pattern in pencil or ink upon the lather side before procceding to cut through the lines. Holding the skin taut between the tingers, cut it with a very sharp penknife. To join them, place the cut edges back to back, fur inside, and threading a special 3 -sided fursewing needle with stout No. 30 cotton, overcast them together, firmly and strongly enough to hold the skins side by side, but not no closcly or tightly as to draw the cut edges up into a ridge. In sewing smooth the fur doirn and away from the cut edges which are being joined by means of passing the needle betwcen them.

When the skins have all been joincd line the stole with silk or satin or brocade that inatches or tones with the fur, with or without an inter lining of domet or llamel, or a thin layer of wadding. Any interlining should reach harely to the erlges of the fur, while the lining proper should be cut at least 1 in . wider all round, to allow for a good turning. The interlining should be attached with a few invisible stitches to the fur, before starting to line it.

STOMACH. The shape of the stomach varies according to the degrec of distension, but is somewhat like a pear, with the large end to the left just below the heart. Hence, when the stomach is distended by gases in indigestion, the action of the heart is often interfered with, and there may be difficulty in breathing.

The capacity of the stomach in an adult is roughly from 3 to 5 pints. In the fceding of children it is important to know how much the infantile stomach can comfortably hold. At birth the quantity is very small, and even when at the age of 12 months a child will be made uncomfortable if it gets more than $\frac{1}{2}$ pint of milk at one time

The duty of the stomach is to digest protein matter and to help in pulping the starchy material of bread and vegetahles. It contains a variety of glands, which manufacture pepsin, the ferment which digests meat, eggs, cheese, etc.; a Huid that clots milk immediately it is swallowed; and hydrochloric acid. This last substance serves to prevent fermentation of the food, and is necessary for the action of the pepsin. The muscles keep the stomach in constant movement after a meal so as to ohurn up the food and mix it with the digestive juices. When the mass is ready for discharge into the intestine, the muscular wall contracts and forces it through the communicating valve in little spurts, repeated until the whole meal is passed through. The spasm of dyspepsia is a violent contraction of these stomach inuacles.
Diseases of the Stomach. One of the commonest of the disorders and diseases of the stomach is atony, or loss of power in the muscular wall. The food remains too long and fermentation occurs, causing flatulence

Inflammation of the stomach lining, or gastritis, and gastric uleer are treated under their own headings.
Cancorr of the stomach occurs mostly between the ages of 41 ) and 70, and is sometimes preceded by a chronic ukeer. It has heen pointed out that its most frequent site is the spot likely to be affected by hot liquids, and by alcohol when this is swallowed raw.
The size of the stomach is increased by dilatation, which in an acute form may eome

Chronic dilatation is of two kinds. In one the outflow of the stomach's contents is obstructed; the cause of the other is atony, often the result of cating very large meals or drinking a great deal of fluid habitually, such as beer. The chicf symptoms are flatulence, constipation, vomiting, sleeplessness, and occasionally cramp in the calf of the lcg. In the atonic cases rest in bed improves the condition, but the cure is slow. Efforts should be made to improve the general health and so restore the tone of the stomach muscles. In the cases arising from ohstruction an operation is necessary for complete relief. See Acidity; Digestion ; Gastric Ulecr ; Gastritis; Indigestion.

STOMATITIS. Inllammation of the mouth, or stomatitis, is of scveral varieties. Simple stomatitis may arise from smoking hot tobacco, drinking raw spirits, and other causes. Aphthous stomatitis, in which small whito blisters form, chiclly attacks ill-fed children.

In thrush patches of white membrane form on the soft palate, tongue. and elsewhere in the mouth. In the ulcerative form sores form on the gums about the tecth. Gangrenous stomatitis is practically limited to children who are underfed and live in squalor
The diet must be contined to bland liguids, which must not be given hot. Kicep the mouth clean by washing it out with solutions of boracic, potassinm chlorate, ctc

## Stone as a Building Material

## Durability and Grace in Domestic Architecture

Related information will be found under such headings as Crazy Paving; Steps; Sundial; Wall. Sce also Building; Conerete; House; Path; Paving; and other entries that deal with contructional matters

The stones used in building are sandstone, limestone, slate, and granitc. All stones are porous, some to such an cxtent as to render them unfit for domestic purposes. A very porous stone absorls much rainwater, cspecially when the face of the building is cxposed to the prevailing wind and weather. Granites should not absorb much more than about 1 per cent. of their volume of water, limestones 17, and sandstonc 10 , after 24 hours' immorsion. The weight of the stone has also to be considered. Heavy stones may be used for buttresses or quoins, but lighter stones are cquired for vaulting and similar work.
In selecting stone for building, the colour is often attractive, but some highly coloured stoncs are not so durable as those of a duller colour. The hest stones are those: which are free from hands or spots of colour, and are of a uniform colour in structure. This, of course, cloes not apply to marble. Stone when freshly quarried contains a certain quantity of moisture, known as quarry sap. The stone is preferably cut to size and shape as soon as possible after quarrying, as it is more easily worked, but it is then set aside to scason,
gaining considerably in hardncss and clurability. Artificial stone is a term applied to slabs of concrete, with differing forms of aggregate, often sold under proprictary names.

The stone employed in building work may be one of the many freestones that can be tooled readily, but generally the choice is governed by the material available locally. On this material will depend to a great cxtent the style of the work and the nature of the ornament. For cxample, in certain districts a soft and easily worked stone is associated with tine tracery and delicate carving, whereas when a hard and intractable stone is a vailable the nature of the building is quite different. When a coarse sandsione hias to be used, the mouldings are bold and large, but on granite the style is broad and simple

In the article on Loggia, p. 742 is illustrated the sto ne-built loggia of a Wiltshire house. This is carried out in local stonc. We show in this and the following pages other pictures of typical stonework, indicating different methods of surface finishing.

The amateur constructor should ascertain the kind of stone a vailable in his district. the


Stone. Beautiful 17th century stone-built house at Broadway, Worcestersbire, showing the steep pabled roof and mullioned windows which are typical fealures of the Tudor style of architecture


The lacing course of bricks adds longitudinal and transverse strength to the wall. When this is done, the stones are preferably set in mortar, and the wall is often composed of smaller stones worked with the smoothest and straightest faces sct outward. The spaces between the two sets of stones are filled in with small pieces and grouted with mortar.

Another method, particularly applicable to buildings, is to set rubble stones in front of a backing wall of brickwork. This has the effect of providing a smooth and durable inner face. Jiach course is set in mortar, and the stones arc arranged to break joint. Usually only the face stones are sct in mortar, the spaces between the irregular stones and the brickwork being filled in with hearting or small stones, and grouted in with liquid mortar poured from a pail. The mortar should not be allowed to run on to the face of the stones.
All the forcgoing wallings can be put up by the amatcur if reasonable care be taken to bed the stones well and to work a bonder or through stone about every yard square of the wall surfacc. The bonder is a stone of sufficient proportions to pass through the wall from face to face, and act as a stiffener to tie the whole together.
Cutting Stone. The preparation of bonders will probably necessitate cutting the stone, which is by no means easy until the knack has been acquired. One way is to score a shallow groove along all four faces of the stone by chipping a line, with a cold chisel nnd hammer, as shown in Fig. 3, afterwards striking it a few blows with the mallet, delivering the blows through a board set vertically over the groove. A stone severed in this way would be sulliciently smooth and straight for random rubble work. The working or tooling of stone and the arts of the mason are hardly to be acquired by the amatcur, but a few simple exercises in trueing a stone will aid in the completion of such work as the cutting and shaping of capstoncs for walls, ctc.

In order to produce a llat surface on a block of soft sandstone, the inethod slown in Figs. 4 and 5 may be followed. The lirst step is to cut the stone roughly to shape and size, and to select the llattest surface or bed. The corners of this part of the stone arc chipped away with a chisel
cost of transport, and the amount of work in a more or less that will have to be expended on the stones before they are fit to use. Some of the extensively used grades of stone are stocked by merchants, such as York stone for paving, and some of the West of England stone for general work in rock gardens and the like, otherwise the supplies have to come direct from a stone quarry. Should it have to be drawn by road, the cost per ton, inclusive of handling, should be agreed at the outset with a contractor equipped for the work.
As turned out by a country quarry, the stone is split into thin slabs or sawn to shape in pieces suitable for building. It is possible to obtain stone in $n$ rough form, comparatively small in size, but thick and solid, such being suitable as regards size for walls and constructional work of an elementary character. Thinner pieces generally of larger size are used for paving purposes, and also for some walls and roofs, and the stonc can also be obtained cut to any reasonable shape and size.

York stone is largely used for crazy paving in pieces about 2 in . thick and of random shape. It is quite admirable for paths, steps, and the floors of outbuildings. When the material is delivered, the best plan is to sort out roughly those pieces which have at least one edge straight or nearly so, and to set these pieces aside for the edges of the steps or for other similar work.

Methods of Walling. The chief structural difference between one class of stonework and another lies in the arrangement of the stones, which is known as walling. This is cither carried out in courses like brickwork, or
indefinite manner known as randon rubble. Walls of rubble are built of thinly bedded stones of irregular shape, generally 9 in . deep or less. Varieties of rubble include coursed and squared $r u b b l e$. Block stone masonry is composed of squared blocks set in regular courses, or random formed of different shaped blocks.
The easiest walls for a novice to build are those of random rubble set dry, as seen in Fig. 1, where the wall is composed of substantial blocks of rough stone set without mortar. The foundations may be of concrete, or a course of stout stones set with the greatest width across the wall and bedded to the solid earth. For the sake of sccurity two courses breaking joint should be employed, and the walls erected upon them. The stones are roughly selected for height and width, and arranged to tit into each other as tightly as possible. They are kept in line by setting them by a cord stretched from end to end of the wall. The top is finished with stont stones set upright, and often bedded on earth to keep out rainwater.

Another type of wall consists of several courses of stonework and then a few courses of brick, as shown in Fig. 2, finishing with other stoncs and upright pieces on the top.
 to form two flat surfaces at the front side; one such place is formed similarly at the back. blocks of wood of uniform height are placed on the front flats and a batten rested on them. The purpose is to raise the batten above the level of the rough parts of the stone. A block is also placed on the one flat at the back, and another on the untouched back corner. The second batten, as shown in Fig. 4, is rested on the blocks at the back, and the last corner is cut away as much as necessary until the tops of both battens appear level or parallel when viewed by looking across them. The same test is applied after the front and back edges of the block have been chiselled in order to make them level (Fig. 5).

There are thus two level surfaces along the front and back edges respectively, which are known as chisel drafts. The intermediate stone betwcen these drafts may be cut away with the chisel and hammer, or the stone may be finished with chisel-drafted margins. The method is applied to the preparation of


Stone. Fig. 6. Part of an old Sussex house with a picturesque roof consisting of thin slabs of Horsham stone
good weathering qualities, and is set on massive oak roof rafters. The stones are laid ill random courses, decreasing in size from the eaves upward. The slabs are hung on oak pegs driven into holes in the head or narrow part of the stones In modern work the stones are often set on a boarded and felted roof cover. ing, and secured with brass na!!s or screws. Another plan is to cover the rafters with expanded metal lathing, covering this with a bed of mortar, setting the stones thercon and pointing the joints as the work procceds.

Any attempt at rigid regularity of shape robs the stone roof of much of its charm Roughness and unevenness in the stones also assists the lrying out of moisture, which is important, as any dampness in the roof, by admitting frost, accelerates splitting of the stones. The valleys are generally swept, and the ridges finished with a half-round ridge tile or by sawn stones A hipped roof is rare, and calls for great skill in cutting and fitting the stones
capstones for the top of a low garden wall. Capstones may be used for decorative effect as well as for protection of the brickwork or other walling material, such capstones being set preferably in cement mortar.
When stone is used for building purpose the walls have to be much thicker than they would be if made of brickwork, and, unless built in random rubble set in mortar, will have to be well fitted together, and secured where necessary by means of dowels, cramps. or other fasteners.
Stone has been largely used for rooling purposes. and a roof covered with Horsham shalo is illustrated in Fig. 6 . This is a thin stone of


Stone. Wing of stone-built house showing both tooled and rough surfaces. Windows are stone

STONE: The Weight. This useful measure of weight consists usually of 14 lb . avoirdupois, although there are stones of other kinds. The Smithlichl stone for dead meat is only 8 lb . ; that of wool is 24 lb ., and of hay 22 lb . See Avoirdupois Weight.

Stone: The Disease. Seє Calculus; Gall Stone.
STONECROP. These hardy Howering plants are chicfly suitable for the rock garden and the wall. One, however, the Japanesc stonecrop (Sedum spectabile), is a valuable border plant, 15 in . high, with grey succulent leaves and large flat bunches of carminerose blooms in Scptember which attract the buttertlies and bees. It thrives in ordinary border soil, and is casily increased by division in spring. Low growing stonecrops suitable for the rock garden flourish in sunny places in soil with which sand and old mortar rubble have been mixed
They are increased by division in early autumn or spring. The common yellow stonecrop is Sedum acre ; it is a creeping plant with yellow flowers in summer. Choicer kinds are Ewersii, rose purple ; kaintschaticum, yellow; lydium, pink: middlendorfianum, yellow, and spatulaefolium, yellow.
STONE MARTEN. This fine fur is obtainel from a species of marten (a genus of carnivorous mammals of the weasel tribe) which derives its name from its liking for rocky places. The best skins come from Asia, ancl are of a soft, fine texture, the underfur being almost white and the tips resembling sab!e in colour. In some respects stone marten bearsa great likcness to the latter fur, and is sometimes dyed to imitate it. It has the arlvantage of being both hard wearing and attrac tive. See Fur; Marten.


Stool. Walnut atool with carved cabriole legs and splay feet, covered with woolwork. Early 18th century
B", permission of the Director, Victoria \& Alvert Museum

STONEWARE. This term is used for a cortain kind of pottery. It is less fine than chinaware, and is widely used for domestic croclicry. Stoneware was first made in Germany, and later in England, where certain districts, e.g. Staffordshire, earned a reputation for it. After a period of decay its mannfacture was revived, chiefly by the firm of loulton, whose artistic stoneware was a notable contribution to English pottery. Ser China; Doulton Ware Nottingham Stoneware ; Pottery.
STONING: Of Fruit. Many varieties of stone fruit when made into jam or marmalade are stoned. To do this the fruit should be split in half and the stone removed without tearing the fruit. Special cherry stoning devices for domestic use can now be: obtained, which may also be userl for olives and damsons. The sceds of raisins should be extracted brfore this fruit is added to puddings or cakes. When large quantities are to bo stoned the operation is done by menne of a


Stone. Circular window, an interesting combination of tooled stone with rock-faced stonework
machine, but for smaller numbers the secds are removed by hand
It is well to have a small basin of warm water on the table when starting to stone raisins, but recourse should be had to this as little as possible, as the added moisture detracts from the flavour and richness of the fruit. To stone, split the raisin in half lengthways with a sharp cook's knife, but do not actually divide it. By pressing the knife against the stones which are exposed they will rise, and can be removed without wasting the pulp. If the fingers become sticky, dip them lightly in the water and wipe them on a damp dish cloth before again commencing operations.

When using sections of oranges for jellies or pastries the seeds should be removed. This is best done by feeling for the pip and pressing it out with a quill, in order to avoid injuring the appearance of the fruit or allowing the escape of the juice

STOOL. A stool is almost the oldest form of seat. Early examples are of the milkmaid's stool type on three legs, but in the l6th century they were made with four, and a certain amount of decora tion was intro. duced into the simple design. Sometimes they possessed a box seat with hinged top. In
the late 17th century they were upholstered, but about the same time they began to lose popularity owing to the greater comfort afforded by the chair. Specimens, however, continued to be made, and the legs of these were cabriole, and showed the carved knees and the claw, lion's paw and claw and ball terminations of the period. Qucen Anne stools were often covered with petit-point embroidery. An example of one with a tapestry needlework covering is illustrated in the previous page.
The stool most valued by collectors is one of the joint stools, as they are called, of the 16 th century. They are of oak and rest on four legs, which are joincd together by stretchers. The legs are turned, and in some examples there is carving on the sides of the seat. Many of them are inlaid with box and ebony in alternating triangular pieces, placed in the rails just below the seat. Sce Camp Stool; Chair; Dressing Table; Jacobean Style, etc

STOOL OF REPENTANCE. To play this round game one person is sent out of the room and the others then decide what shall be said about him or her, these criticisms being noted down by the leader. A stool is set for him in the centre of the players, and he is called in to occupy it. When he is seated the game proceeds.

The leader reads out each criticism in turn, thus: Somebody says you are irritable, or conceited, or good-natured, and the victim has to guess the name of the critic. If he guesses a sufficient number correctly he is released from the stool of repentance and allowed to take his place in the circle, while another player goes out to endure the ordeal; but as the game would cease to be amusing if the same person were dealt with twice running, he is usually considered to have earned his relcase whether he guesses correctly or whether he does not. See Children's Party.

STOP: In a Camera. The amount of light which passes through the lens of a camera is controlled by a stop or diaphragm placed behind a single lens or between the components of a compound lens. On the size of the stop used depend both the length of the exposure required and the degree to which sharp definition of detail can be obtained throughout the picture.

The most usual form of diaphragm or stop in the modern camera, known as the iris diaphragm, consists of a series of thin metal tongues working on points in a ring in the lens mount. Each tongue has a curved slot. cut in it, so that as the ring is rotated the metal tongues move uniformly towards or from the centre, making an adjustable circular aperture as seen in the photograph. The apertures at which the stop or diaphragm works are indicated on the lens mount and are known as $\mathrm{F} /$ numbers.

The larger the stop which can be used with any particular lens the shorter the exposure, while the smaller the stop the greater is the effective depth of focus of the lens, and the sharpness of detail. The process of using a smaller stop, which is known as stopping down, is used far too frequently by the amateur photographer. In doing so, he not only lengthens the exposure unnecessarily and thereby destroys the principal quality which makes a lens both good and expensive, but also produces photographs that are lacking in artistic quality.
The whole tendency in modern photography, and this is particularly the case in landscape,
figure study, and portrait work, is so to increase the aperture of the lens, and therefore the size of the stop which may be used with it, as to shorten more and more the period of exposure. while producing softer and more artistic photographs in which the different planes of vision are separated.

Many of the better quality modern roll film cameras are fitted with $f / 4 \cdot 5$ lenses, and full advantage should be taken of the opportunities they offer. It is chiefly a matter of knowing what stops to use and when to use them.
The amateur should not be misled by instructions which he may find on inexpensive fixed-focus cameras as to using different stops for different subjects. These instructions are a necessary compromise, due to the lack of focussing adjustment, and also to the fact that the shutter has only onc speed. With a fixedfocus, single-speed shutter camera it $=$ will be necessary to stop down to get foreground subjects into focus (since stopping down deepens the field of focus), and also to cut down the light passing through the lens when shorter exposures are required, since the shutter speed cannot be increascd.

The larger the aperture of the lens the shallower is the field of focus. This means that while objects in the foreground may be sharply defined those in the middle distance will be softened, while those in the background may be so far out of focus as to be unrecognizable. This gives the photographer considerable opportunities for artistic work, especially when differential focussing is employed. by which the object that is of principal importance in the picture is more sharply defined.
For portraits and similar studies the largest stop available should be used, but with landscapes, which include a wide field of view, a medium stop, such as $f / 6 \cdot 8$ or $f / 8$, may be required. At the other extreme the smallest stops are required when copying prints or in photographing specific objects. such as furniture.
The effect of using different stops is best studied carefully on the focussing screen before rather than after cxposure. For this purposc it is essential that the screen should be well shaded. In general it may be said that the proper use of lens stops indicates the skill of the photographer. Always bear in mind that the exposure varies according to the square of the stop used, f/ll requiring twice the exposure of $\mathrm{f} / 8$, and $\mathrm{f} / 16$ four times. See Camera; F/Number ; Focus; Lens.
STOP COCK. In its most general application a stop cock is any principal tap used to cut off the supply of liquids or gas to a build ing or to some section thereof. In the home the term is restricted to the main water or gas tap that is fitted in the run of the main supply pipe.

The water company generally fits a stop cock of substantial pattern at the nearest point to the main water pipe where the branch is taken to the huilding, and generally it is operated by a long-handled metal rod or key. It is an advantage to have another stop cock fitted inside the house on the rising main, c.g. beneath the sink in the kitchen. See Pipe.

STORAGE BATTERY. This is an appliance which acts as a reservoir for electrical energy: Usually it consists of a series of cells or accumulators, and is intended to yield a higher voltage or greater volume of energy than is feasible from a small portable accumulator.

For house-lighting. purposes the units are usually fitted with open-top glasis cells, and,
instead of having the ordinary type of terminals, the lugs terminate with a bolt and nut, and are connected by means of lead strips which are bolted to the lugs on the plates. The cells are usually arranged on a wooden stand so as to raise them from the ground and permit of inspection and necessary attention.
Any unit or cell composing a storage battery holds nominally not more than 2 volts. Actually, however, this figure rises slightly when the cells are fully charged, and may drop slightly below 2 volts when they are almost discharged. Consequently, if it is required to provide a nominal voltage of 25 volts, it is necessary to have at least 13 and preferably 14 cells, with some means of controlling the voltage, such as by a resistance or by temporarily disconnecting one of the end cells. In other words, to find the number of cells required the voltage is divided by two and one extra cell added to the total.

In arranging for the erection of a storage battery it is desirable to choose a cool, dry place, well ventilated, and situated where the fumes given off by the cells cannot affect the surroundings. A small brick-built outbuilding with a ventilated roof, and used only for the storage battery, is the best, but if the battery has to be housed indoors it should be located away from the foodstuffs and as far from the living-rooms as possible. It must be partitioned off from the rest of the room and provided with some independent and direct ventilation to the open air.
Charging and maintenance instructions are issucd by the makers of the battery, and the information contained therein should be carefully followed. See Accumulator.

STORAX. The white-flowered, deciduous and hardy shrub storax requires a dry position in light ordinary soil, preferably under the shelter of a south wall. It is worth some attention, and will benefit by incorporation of peat in its root run. The most suitable planting. period is from October to February. It is propagated by layering of shoots. Two good species are japonica and obassia, natives of Japan.

STORE ROOM. In some larger households, the accommodation provided for holding food stores, ctc., in the larder, kitchen and pantry is supplemented by a special store room.
This room should have a north or eastern aspect, and the nearer it is to the kitchen the better. It is essential that it should be thoroughly dry and airy, and have at least one window covered with perforated zinc or wire gauze, the walls and ceilings being whitcwashed or coated with sanitary paint. The floor can be left with plain, well-scoured boards or covered with linoleum. Every little crack in flooring or walls should be carefully filled to prevent the entrance of mice, beetles or other vermin.
The store room must be well fitted with shelves, preferably of graduated sizes. If all are very wide, there will be a tendency to pack each with several rows of articles instead of a single row, and so small objects may easily be hidden behind large ones and overlooked. Each shelf should bc neatly covered with oilcloth held in position by drawing-pins. The stores must be grouped according to their character, i.e. all the jams together, all the seasonings in another group, different kinds of sugar together, etc. Cercals are best kept on one shelf, each stored in a separate tin. There should be a few shelves set apart for soaps and cleansing materials, not too near foods such as flour. Soap can be kept in bulk, as it hardens with keeping and is thus rendered more economical. Certain stores such as cheese, coffee, etc., impart their flavour to other foods, and therefore should be stored in airtight tins. Tea also
tends to lose its aroma unless kept in an airtight container.

A slate and pencil or writing tablet is generally liept hanging in the store room for noting down any supplies that need replenish. ing. If preferred a store indicator can be bought for a few shillings. This gives a printed list of stores and a system of removable pegs to indicate which are needed.

STORING : Of Vegetables, Fruits, etc. Beetroot, carrot and turnip should be lifted in autumn when growth is complete and stored at the foot of a wall or fence. A covering of earth, sand or old ashes will provide protection from frost. Or they may be stored in boves containing one of thase materials and placed in a shed. Potatoes are lifted when the tops have died down, and after having heen exposed to the air for two or three hours to dry the skins they are placed in boxes or tubs or in heaps in a frost-proof shed. Care should be taken to store only sound tubers, and it is wise to scatter a little lime on them.

Parsnip, salsify and scorzonera are dug as required. To enable the roots to be lifted in severe weather the soil should be covered with bracken or straw to prevent its being frozen. Onions when fully ripened should be tied in bunches, as in lig. 4, or made up into "ropes" in an airy shed or even on a sunny wall. Savoy and other cabbages, kale and Brussels sprouts are very hardy, but broccoli, when fully developed, should be lifted and hung, heads downwards, in $n$ shed.

Roots and Bulbs. Flower roots of a tuberous nature which rannot be left in the open ground during winter should he lifted as soon as the first frost has touched their foliage. Their stems should be cut down. After they have been in a cool place under cover for excess sap to drain away, they should be stored in boxes of sand, as in Fig. 7, in the shelter of a frost-proof shed. Bulbs such as dattodils and tulips should be left in the soil until their foliage has become yellow, drying them slowly in a shaded, airy place, and storing in boxes away from frost : the foliage must be thoroughly ripened before storing.

Gladioli corms and others should be lifted before winter sets in, tied in bunches, and suspended in a cool place until their foliage has withered, when they may be stored in boxes of sand. Geraniums and other bedding plants must be taken indoors in autumn, potting then up after trimming. A simple and common method of dealing with geraniums in the winter months is illustrated in Fig. 5.


Stove. Fig. 1. Slow combustion coke-burning stove, with piping passed through roof Courtesu of Smilh \& Wellstond. Lld.
Apples and Pears. Apples and pears should be graded according to size and quality, storing them, if possible, in a rack of trays, as shown in the diagram. Where the quantity is small, scparate fruits may be suspended to beams or rafters in a cool and airy place, as in Fig. 2. Grapes will kecp in bottles of water containing a few pieces of charcoal, the bottles being fixed at a slight angle in a dark and cool place. Nuts must be gathered when fully ripe and should be stored in boxes of sand which are set in a cool, dry place. A cool shed with an earth floor is the most suitable store for apples and pears.

Storage cupboards constructed as explained below are probably the best solution of the problem, since the fruit is stored on single shelves and can easily be examined, any which show signs of deterioration heing removed for immediate use.

Ordinary packing cases or Tate's sugar boxes may, for the sake of cheapness, be used, hut it is better to make the boxes a certain standard size. so that all shelves are interchangeable. Ordinary cheap whitewood may be used 4 ft . by 2 ft .6 in . by 2 ft .6 in . The boxes themselves are made from 1 in. by 8 in . tongued and grooved
wood, and the sides may be joined together by a simple dovetail. At suitable distances inside each box, six $\frac{1}{2} \mathrm{in}$. grooves are cut, into which $1 \frac{1}{2} \mathrm{in}$. strips of wood are screwed. The inch which projects into the box forms convenient runners along which the trays slide.

Stork's Bill. See Pelargonium.
STOUT. A dark brown malt liquor. stimulating and nourishing, stont is a superior kind of porter. It is brewed in much the same manner as ale, with roasted malt to give it colour. Oatmeal stout is also made.
Stout is a drink which blends very well with cheese or a cheese savoury. It is also good with oysters. On account of its somewhat heavy qualities some people prefer it mixed with bitter beer, half and half. It should be served in a pewter or silver tankard.
lirom a medical standpoint really good pure stout, like other good beers, is certainly the most nourishing of all alcoholic drinks, but still it contains only a very small quantity of mutritions material. With some people flatulent indigestion is a very common rosult of drinking it, and when nursing mothers take it their babies may have their digestions upset. See Beer; Diet.

STOVE : For Solid Fuel. A stove differs from a fire because the fuel and heat are enclosed in an iron or some other kind of ensing.

The principle on which many stoves work is that known as slow combustion. There is nn enclosed furnace in which the rate of fuel consumption can be controlled by regulating the quantity of air supplied to the fire.

A stove of useful and simple type is shown in Fig. 1. It consists of a cylindrical iron casing lined with fireclay, and the fire is laid on the solid clay bottom at the base, there being no fire bars. Though sometimes a little troublesome to light, stoves of this type are efficient and economical in use. The kindling wood and other lighting material should be dry, and the stove should not be filled until the fire has taken hold. Coke or anthracite is suitable fuel. Stoves of this kind are commonly fixed in school-rooms, halls, or workshops. It is best to kecp the stove pipe inside the building, if a brick flue is not available, as condensation sometimes causes trouble when the pipe is taken through the wall and carricd up outside.
Of the many patterns of coal stove, the varieties that burn anthracite or similar fuel have many advantages, and are readily fitted to a fireplace in place of $n$ existing grate.


Stove. Fir. 2. Stove flted to an existing Hrepace. It burns anthracite nuts or coke, and is ftted with automatic ventilating check valve and gas tube Courtesy of inilh \& Wellstood. Itd

Storing crops and plants. 1. Potato clamp. 2. Suspended pears. 3. Parsnips or carrots in box of sand. 4. Suspended onions. 5. Geranium in winter. 6. Winter radishes in sand : $a$, turves, grass uppermost ; $b$, soil. 7. Storing dablias. 8. Apple or pear rack in section: $a$, fruit ; $b$, trays; $c$, tray supports



Stove. Fig. 3. Slow combustion atove which fits into a fireplace recess. It has an ashpan regulator, and a slide damper in the flue at the back

To take full advantage of this class of stove it should be kept burning continuously during the cold weather, so that the room is always at a comfortable and cquable temperature. Figs. 2 and 3 show representative patterns.

Fuel Consumption. The fuel consumption of a stove suitable for use in a room 20 ft . by 12 ft . would be approximately 1 cwt. anthracite per week (continuous burning). This is based on the maintenance of an average indoor temperature of $62^{\circ}$ to $64^{\circ} \mathrm{F}$., with a minimum outdoor temperature of $32^{\circ} \mathrm{F}$. Coke can be used, the kind known as washed nuts No. 2 being suitable. Owing, however, to its tendency to choke and hang up in the stove, and its greater ash deposit, coke is not so good for continuous service as anthracite.

Stove Brush. For cleaning the fireplace in the home a strongly made brush is required, with stout grip-handle screwed on to the back. and there is a varied selection of oval and oblong shapes. The chief consideration should be a well-flled bristle surface with the knots securely drawn into the stock with wire.

The hair is trimmed level, which with a curved stock means longer knots at the ends than in the middle; some have distinct wings or tufts at the ends to facilitate getting into corners, and negotiating uneven surfaces. Very stiff bristle is not necessary, but a brush of pure bristle, or a good mixture of fair length, will outlast several inferior articles. See Anthracite Stove; Boiler; Brush; Burner ; Cooker; Oil ; Range.

STOVE HOUSE. A stove house or hothouse is a glazed structure in which a high temperature can be maintained, thus permitting the forcing of fruits and the cultivation of plants native to tropical climates. Such .structures require skilled attention and maintenance, and are only suitable for market growers, specialists in exotic plants and ferns, and amateur gardeners of ample means. For the average gardener a cold or warm greenhouse will be found more economical, and, within limits, will be of greater all-round
utility. The construction of a stove house for amateur purposes can follow very largely on the lines described for greenhouse and conservatory building. Usually the temperature is kept at $60^{\circ}$ to $65^{\circ}$ at night. Consequently the arrangements for heating the stove house must be fully adequate to the demands made on the system.
The section of a simple stove house is shown in Fig. 1, partly cut away to reveal details of construction. The lower part of the walls is built in 9 in. brickwork with ventilating or air bricks at intervals. There are skylights or openings in the roof, and by control of the inlet and outlet the desired temperature and ventilation are maintained. The air bricks can have shutters to close them, and these are controlled by a long handle or rod, the end reaching to the front of the tiers of hot-water pipes.
The pipes will have to be of adequate capacity to maintain the heat, and may be in one continuous system, or in two or more distinct sets, each controlled by separate valves. The average size of these cast-iron pipes is about 4 in. diameter. The heating surface of such a pipe can be reckoned roughly as 1 sq . ft. per foot of length.

Heating Capacity. Thus, if a stove house were to be, say, 18 ft . wide and 50 ft . long, with 6 pipes a side, there would be roughly $1,344 \mathrm{sq}$. ft. of pipe area if the pipes were set on the three sides of the house, leaving one end free for the door and entrance. The boiler would therefore need a heating capacity equal to about $1,300 \mathrm{ft}$. run of pipe 4 in . diameter, and would probably measure about 5 ft . long, 2 ft . wide, and 3 ft . high. These sizes are approximate and vary with the make and type of boiler.
The side staging can be made of wood or preferably of stone or slate, which may be set into brickwork as shown in section in Fig. 2. The stages or tables can be covered with a layer of coarse sand or other material to a depth of 2 or 3 in . whereon to stand the pots. The purpose is to absorb moisture and give it out again for the proper development of the plants. See Conservatory; Greenhouse: Orchid.

STRAIN. Muscular strain is particularly common in people who go in
for games and exercises without the necessary
preliminary training, as may be noted at the preliminary training, as may be noted at the sports seasons. In most cases of severe strain some of the muscular fibres are torn, and unless proper care be taken the muscle may remain weakencd for a long time. Rest is the cure, while cold, heat, or other anodyne applications will be useful at first. Slings, bandages and strapping help to secure absolute rest.

Heart strain is a popular name for dilatation of the heart, usually caused by excessive muscular exertion. It may come on suddenly from a single great effort, as in lifting a heavy weight, or the heart may dilate more gradually in consequence of repeated efforts beyond the person's strength. Cycling up hills is a common cause, being especially injurious to growing boys and girls. Week-enders who lead a sedentary life from Monday to Friday, and then start on a long walking tour, hillclimbing, rowing, etc., are frequent sufferers from heart strain.

When this occurs the patient may feel considerable pain in the region of the heart, he suffers from palpitation, may faint from slight causes, and is liable to sleeplessness. For sudden or acute heart strain absolute rest is necessary. In more severe cases, rest in bed with mustard plasters to the feet and legs, anc ice over the heart, will usually give relief. A very important factor in predisposing the heart to strain is some temporary weakness due to recent influenza or some other infection. A day's rest in bed is the best means of allowing an overworked heart to recuperate. People who have difficulty in getting through the week should therefore make a habit of taking such a rest periodically, and this applies not only to those with damaged hearts but to the aged. See Exercise; Heart; Sprain.

STRAINER. The shape of a strainer for culinary purposcs may be round or conical.

The round strainer in appearance is somewhat similar to a metal pan with slightly sloping sides, the kase being perforated or composed of metal wire. The conical pattern is perforated all round the sides with the exception of a broad band of plain metal encircling the top. A handle extends from one part of the edge, in both shapes. by means of which the strainer can be held in place over the receptacle into which the liquor falls. In larger round strainers two short handles, one on either side, replace the one in the smaller.
An excellent strainer may be devised by using a piece of muslin. The material should be held or fastened over a bowl and the liquor poured through it. Hair or wire sieves and colanders may be used as strainers. A very small strainer shaped like a tiny bowl and perforated or fitted with fine silvered woven wire is often used to retain the leaves when pouring out tea. Some lemon squeezers art fitted with strainers which keep back the pips and portions of pulp, leaving the juice clear. Gravy strainers are convenient for small quantities of soup, for finishing sauces or for coating purposes, and also for pouring sauce or custard round a dish. For this purpose the conical form of strainer should be used. When larger quantities of stock have to be dealt with a sieve is inverted on a bowl on which it will rest firmly and the stock is poured through
quickly. A hair sieve should be used for the more delicate varieties of stock, but a wire sieve is suital,le for any ordinary kind. For straining completed soups, if only a small quantity has been made, a conical strainer is best, but larger quantities must be strained through a sieve into a bowl and then re-heated.

To strain sauces, use a hair sieve and pass through as much of the solid matter as will he absorbed by the liquid. No acid satuce should be passed through a sieve fittel with brass wire.

There are many liquid or semi-liquid cookery ingredients which require straining. Milk is better strained before bcing used and sometimes it is necessary to strain it after it is hoiled. Liggs when beaten should be strained to remove the thead. This hard piece will be quite apparent in a pudding or custard if not strained out. Strain the eggs when sufficiently mixed but before they are entirely beaten, and continue the whipping after straining. When using yeast and after the liquid has been added to it, let it be strained, using a finc conical strainer. See Fish Kettle; Jelly Bag: Labour Saving; Soup; Stock; Vegetables.

STRAINING POST. A particular type of post is adapted to take the strain of fencing material. In a wire fence, for example, the wire must be at a good tension, and this is ensured by specially braced posts being placed at intervals in the fence so that the slack of the wire may be drawn up tightly. See Fence ; Post.

STRAMONIUIM. The dried ripe secds and the dried leaves of the thorn apple furnish the preparations of stramonium, which has an action closely resembling that of belladonna. Stramonium is chietly used to relas the spasm of the bronchial tubes occurring in asthma.

For this purpose the drug may be given internally in the form of the tincture, or cigarettes made of the leaves may be smoked, or the fumes of a burning powder containing the dried leaves mixed with powdered nitie, ctc., may be inhaled. Tincture of stramonium is given in doses of 5 to 15 minims. Stramonium sometimes has a slight effect on the beart, rendering its beating less ragular and cven producing palpitation. See Asthma.

STRAP. Odd straps may be bought from leather stores, and it is worth while buying a goorl one, for cheap leather wears rapidly and sometimes stretches. When it becomes necessary to make new holes in a strap, use a sharp skewer, holding the leather over it and pressing the point through. This is nore satisfactory than cutting the strap with a penkinife.

When straps have been laid aside for some time, and are to be used again, make certain that the buckic is firm. If the leather has become hard, soak it in hot soapy water for $n$ few hours, and then hang it up in an airy place to clry. Finis' by rubbing it vigorously with a soft rag dipped in linseed oil. See Harness; Leather.

STRAPPING. A few strips of adhesire plaster may be applied to an injured or dis. cased part for the purpose of giving support and securing rest. In some cases ordinary allhesive plaster suffices, in others something stronger will be required and calico plasters are employed. See Arlhesive Plaster.

STRAPWORK. This is the name of an ornament used on furniture and metalwork. It is formed by narrow strips of wood or metal, as the case may be, crossed to form a lace-like pattern. See Guilloche; Jacobean Style Tudor Style.
STRATHSPEY: The Dance. This Scottish dance is a type of reel, the difference lying more in the time than in the actual steps.


In common with the reels the Strathspey tunes are clivided into two parts of 4 bars cach, but Strathspey music is played more slowly, the steps being energetically rendered and with jerky effect, in contrast to the more
gliding movements of the true reed. The jerkiness is due to the fact that the notes of most Strathspey tunesarealternately a clot ted quaver and semicjuaver, the bar frequently terminating irt a crochet. In the modern Scottish reel pari of the dance is often in Strathspey time.

Typical steps include the setting step, in which the right foot is placed behind the left; the daneer sinks and hops on it and then the same morement is repeated with the left foot behind the right. Another step is known as cross passes. The dancer springs to one side with the right foot, immediately passing the left across it, hopping, and crossing again, which finishes one step. It is repeated, beginning the spring with the left foot.

A constantly recurring step is the open step ; beginning with the feet in the sccond position and then with straight knees the dancer makes a smart spring upon the toes to the fifth position and docs a like spring, being careful to let the foot which was before in the first spring be behind in the sccond. See Reel.
STRAW. Consisting of the dried stalks of wheat and other grain, the uses to which straw is put are manifold. In building it is employed for thatehing roofs; in the loome it is scen in the form of baskets, bags, and matting; and it is made into hats of all colours and shapes, as it dyes and bleaches well in both fine and coarse varieties.

# Strawberries and Their Culture <br> <br> And Various Ways to Cook and Serve Them 

 <br> <br> And Various Ways to Cook and Serve Them}

The directions given here on growing this fruit are followed by information about serving it,
after which come recipes for various strawberry dishes. See Layering; Netting
This fruit is grown most successfully on grown nowadays; they have been super-well-tilled land which does not dry out in seded by others of less delicious fiavour but summer; it is not satisfactory on very light better constitution. Royal Sovercign, Bedforit sandy soil unless old turf and manure are dug Champion, Fillbasket, Sir Joseph Paxton, in freely. The best time to plant is in August The Duke, Givon's Late Prolific and King or early September, using sinall plants which George are favourite sorts. Viscomtess de werc layered in pots of soil in Junc and July. Thury, which bears heavy crops of rather If this practice is followed there will be a small fruits, is an excellent strawberry for fair crop of first-rate fruits the following jam-making. The perpetual-fruiting strawsummer, an abundant crop of good fruits berries St. Fiacre and St. Antoine de Padoue the sccond year, and a heavy crop of smaller bear fruits both in summer and autumn.
fruits the third year. It is the usual practice To obtain an early crop of strawberries to destroy the strawberry bed after it has under glass in May, runners layered in small borne threc crops and plant a fresh one, but pots of soil in June should be repotted in the old plants may be left for another year 6 -in. pots in August, in a compost of loan or two if desired, though they will produce with which a little decayed manure and sand only sinall fruits. Strawberry plants should be set from 18 to 24 in . apart according to the vigour of the varicty.

In late summer dead and discased leaves should be removed together with all weeds, and a dressing of manure put on the soil. strawery Before the blossoms open in spring, straw should be spread among the plants; it will kecp the fruits clean and frec from soil splashed up during rain. The mats specially sold for this purpose are now used in many gardens instead of straw. The plants must be covered with fish netting to prevent the fruits bcing damaged by birds.

The best Havoured strawberries are Dr. Hogg, Countcss, 13ritish (Queen, and The P'resident. British Queen needs to be layered every year, the bed being replanted each autumn. These varictics are rarely

both old and young fruit, covering it with a of lemon jelly in $\frac{3}{4}$ pint hot water, then pour white mildew, and causing the older fruit to decay. Though often observed only on the fruit, it develops first on the under surface of the leaves, a point which should be noted, as it is only in the early stages that remedial measures can be satisfactorily applicd. The mildew usually appears in May.
As soon as it has been discovered the plants should be dusted with flowers of sulphur or black sulphur, and the treatment repeated if necessary. A small pair of bellows, called a sulphurator. may be used for this purpose, but if one is not available the sulphur may be shaken out of a loosely woven bag attached to a stick.
Leaf blight, in the form of red spots which run and spread on the leaves, also occurs, usually after the fruiting period is over, but with a weakening effect upon the subsequent health of the plant. Another pest, which can be dealt with in the orthodox way, is green fly. The fruit may also be attacked by slugs, which are best combated with soot or lime or with traps of brewers' grains. Red spiders may attack plants grown under glass if the air is allowed to get dry, but proper syringing will keep this under.

An insect known as the strawberry tortrix moth is at times very destructive. The damage is done by tho caterpillar, which eats the foliage in May and June. The only satisfactory treatment is to pick over the plantation by hand on the first appearance of the pest. To keep the plant clear of another destructive insect, the strawberry blossom weevil, all dead leaves, wastc straw, and the like, should be removed from the vicinity of the beds, as the adult weevils dwell therein in the winter, whence they issue forth when the strawberry blossoms are beginning to open.
How to Cook. Freshly picked strawberries may be served with cream or included in fruit salads, compotes, trifles, and other sweet dishes. They are also made into jam, wine, ices, flans, and pies. If fresh berries are not obtainable, the bottled or tinned kinds may be uscd instead. Those preserved in tins are sometimes lacking in flavour and almost always lose their bright, attractive colour. For the latter reason they are unsuited for garnishing, but for other purposes the colour may usually be restored with a little cochineal. Strawberries combine well with raspberries and several other kinds of soft fruit, and make an excellent filling for fruit shortcakes.
Strawberry Charlotte. Either fresh or tinned fruit can be successfully used to make this sweet. Prepare "it by dissolving a pint packet
of lemon jelly in $\frac{3}{4}$ pint hot water, then pour
a little of it into the bottom of a mould and leave it to set. Stalk and wipe a few small strawberries, dip them in jelly, arrange them in a ring in the mould, and in the centre put a


Strawberry Charlotte, made with iresh or tinned fruit, lemon jelly and sponge fingers
few diamond-shaped pieces of angelica, also previously dipped in melted jelly. Leave these to set, then cover them with a little more jelly.

While this layer is setting, cut the ends from a few sponge fingers so that they will stand upright, then place them round the sides of the mould, standing them on the jelly. They should reach just to the top of the mould, and if they are too long they should be cut. Mix a few biscuit crumbs with 2 table. spoonfuls of melted jelly, and if there are any cracks between the sponge fingers, fill them up with this paste. Set the whole aside in a cool place.
Make $\frac{1}{2}$ pint of strawberry puréc by rubbing some fruit through a hair sieve. Add 3 oz . castor sugar and 1 teaspoonful lemon juice to the puree and mix them $w \in$ ll. Whisk 1 gill French leaf gelatine dissolved in $\frac{1}{2}$ gill hot be served with it.
water or strawberry syrup. Stir the mixture Strawberry Pie.
water or strawberry syrup. Stir the mixture over ice until it begins to thicken, then turn it into the mould and leave it to set.

When ready, turn it out on to a dish and garnish it with a few strawberries. If tinned fruit is used, the garnish should consist of strips of angelica, and glacé cherries.

Strawberry Fool. Wipe and stalk 1 lb . strawberries and then rub them through a hair sieve, adding to the purce 3 oz . castor sugar and 2 teaspoonfuls
cream until it thickens, then add the fruit until all the fruit and jelly are used; then purce to it gradually, and lastly strain in $\frac{1}{2}$ oz. leave the whole to set. Whipped cream may lemon juice. Mix with a pint of rich custard and whisk well.

Strawberry Fritter. Only the large, firm strawberries are suitable for fritter making. Dredge them well with sugar, sprinkle them with kirsch and leave them in a cool place for about $\frac{1}{2}$ hour. Then dip them in batter and fry them for a few minutes in a dcep pan of smoking hot fat. Drain them thoroughly, dish them on lace. paper and serve them sprinkled with more castor sugar.

Strawberry Jam. In making strawberry jam, $\frac{3}{4} \mathrm{lb}$. to 1 lb . sugar should be allowed to every lb. of fruit. Stalk and wipe the
strawberries, put them into a preserving pan and cook themslowly until some of the juice has been extracted. Then add the sugar and continue cooking slowly until it has dissolved. The jam should then be boiled steadily for an hour, when it may be put into pots and tied down.
Strawberries and gooseberries together make an excellent jam. To prepare it, top and tail 6 lb . gooseberries and pick over an equal quantity of strawberries. Put them into a preserving-pan with $1 \frac{1}{2}$ pints water, add 10 lb . sugar and cook the jam slowly until the sugar has dissolved. Then bring it to the boil, boil it for about 1 hour, and turn it into pots.

Strawberry Jelly. A tin of strawberries in syrup, $\frac{3}{4}$ pint hot water, a pint packet of strawberry jelly, and a few pieces of angelica are needed to make this sweet. Dissolve the jelly in the hot water and add to it a gill of strained syrup from the tin of strawberries. Rinse out a mould with cold water, set a little of the jelly in it, and then decorate it with the angelica dipped in jelly.

When these are set, pour over a little more jelly, let it set, and then add a layer of strawberries. Continue with these strawberry layers


Strawberry Jelly, made with tinned strawberries, and decorated with small

Strawberry Pie. To make this, line a greased pie-dish with some short-crust pastry, then fill it with strawberries, strewing these thickly with castor sugar. Put on a top crust, make two or three slits in it with a knife, so that the steam may escape, and bake it in a hot oven till it is lightly browned. When it is done, dredge the top of the pie with some more castor sugar. It should be served quite cold, accompanied by whipped cream.
Strawberry Pudding. A cold strawberry pudding can be made by lining a puddingbasin with sponge cakes, filling up the centre with strawberries, gently heated in syrup, and then covering then with more sponge cakes. Cover the pudding with a weighted dish, and leave it to get cold before turning it out and serving with cream.

STRAWBERRY - RASPBERRY. This plant is often wrongly described as a hybrid between the two fruits, but it is a bramble or rubus. The plant is very attractive with its bright green leaves, white blossoms, and red fruits, but the latter are most palatable in a cooked state. See Raspberry.

STRAWBERRY TREE.
The hardy evergreen strawberry tree produces white or blush-coloured flowers in spring and summer, followed by globular reddish fruits somewhat resembling strawberrics. See Arbutus.

STRAWBOARD. Strawboard is a form of cardboard commonly brown in colour which is chiefly used in the home for packing purposes, as, for instance, in sending pictures or other articles through the post.

STRELITZIA. This striking plant is suitable only for a large heated greenhousc. It has broad leaves and the blue and yellow flowers are on stems 5 ft . or more high. Owing


Strelitzia. Curiously shaped blossom of the greenhouse perennial plant that is sometimes given the name of Bird of Paradise flower
the botton corners, or coats buttoned up and with the sleeves turned in could be used in the same way. Where it is available a light door or gate, which can be taken off its hinges easily, makes a good stretcher in an emergency.
In carrying a sick or wounded person on a stretcher, certain rules should be observed. The bearers do not keep step, the front man stepping off with the left foot and the rear with the right. The object of this is should be 5 or 6 in. long and about $\frac{1}{2}$ or $\frac{3}{4} \mathrm{in}$. to diminish the swing wide. It is forked at boith ends so that the of the stretcher. The string can be wound upon it. This shoukd patient is carried feet he tied very tightly and only a little at a time foremost cxcept when so that the needle will slip casily through going up a hill or up the loops.

The work consists of netting, which is a series of loops linotted cvenly. To begin with, the worker should make a foundation loop with a separate piece of string. This should be about 10 in . long, and its curls knotted together. It should then be slipped
cup), for example, string or tape is irequently tied around it to keep the pieces together until the cement sets. The same use is made of string in glueing together $\Omega$ box, the leg of a table, etc. For mending or for making sacks, string threaded through the cye of a specially large needle is used. See Macramé ; Netting; Parcel.

STRING BAG : How to Make. A string bag is fairly casy to make. To make one that will hold six tennis balls, the only requisites are a ball of string, white string, strong but not too thick, being the most suitable, a netting necdle (see pagc 846), and a piece of woorl, rescmbling an ordinary rule. i.c., about 12 in . long and 1 in . wide.

The netling needle should bo of woorl or bone. The needle, or mesh, as it is called,
to their brilliant colouring the strelitzia is stairs. If, however, a . Hower. It may be grown in large pots or in a trunk. A stretcher must never be carried bed of soil; a suitable compost consists of loan with sand and decayed manure or leaf-mould. Propagation is hy division.
STREPTOCARPUS. This is the name of a family of dwarf, greenhouse perennial plants that bear comparatively large Howers of many colours-blush, crimson, purple, rose and so on. They are raised from seed sown in early spring in pots or boxes of loam, leaf-mould and sand, and kept in an average temperature of $50^{\circ}$ with plenty of inoisture during the months of summer and autumm. Young plants may be placed in a cold frame during the summer. As soon as the seedlings are large enough they should loe shifted into 3 in . pots, and a further shift may be made later on, if the young plants thrive and are sturdy. Flowers are produced, as a rulc, about 6 months after sowing. See Greenhouse ; also illus. below.
STRETCHER: How to Make. stretcher may be improvized by taking two poles, broom-handles, or something of the sort, and rolling each up in a side of a blanket till they arc about 2 ft . apart. The blanket is fixed in this position, and two pieces of wood are tied across the poles, one at the head and the other at the feet, to prevent the poles coming together. Instead of a blanket two sackis will serve if the poles are pushed through


Streptocarpus. Greenhouse plant with petunia-like flowers in pink, white or blue. See article above
on the shoulders or over a high wall, as one of person thrown off. See Bandage ; First Airl

## STRETCHER

## In Woodwork. In

 woodwork stretcher is a piece of wood joining two rails which is used for st rengthen ing the framework of cabincts, tables, chairs, and other forms of construction. See Cabinet Making; Chair: Sidehoard.STRING. There are so many uses for string in every household that it is generally a good plan to keep a ball of medium thick twine in a box, or in a canister with a hole in the lid. Many housewives keep a string bag, often hanging it on the back of a hall or kitchen cupboard door, in which they
lengths of string removed from parcels.

If parcels of some weight have to loc carried any distance it is a convenience when tying them up to make a handle. The string is passed twice round the longest side and scveral inches apart, and around these two a length of string is passed across and across three or four times. The loose end of the string is then twisted round the strands, and between them and itself to form a handle, closely covered with buttonhole stitch.

With a heavy parcel it is best to start as above, but to twist the string round a number of times. A piece of intout, pliable cardhoard as wide as the handle should be wound over the strands and made fast with gum.

Kitchen Uses. In the kitchen fine string is most needed for tying down jam jars, trussing fowls and preparing joints for the oven. For tying down the cloth over a pudding basin a stouter string will be required, also for tying to gether the feet of a turkey, goose, ctc., that it may hang in the larcler. Snall ends of string can be utilized to make loops with which to hang up litchen utensils to hooks, etc. A picce of fine string will cut a bar of soap.
The use of string in mending is usually


Stretcher : how it may be improvised. Two poles about 8 ft . Iong are rolled into the sides of a rug or blanket till they are about 2 ft . apart. The cornera of the rug are then tied to the poles and cross-pieces of wood are fixed on to prevent the poles being drawn together by the patient's weight
over the knob of the chair, or on a nail, or any thing else that will allow it to be pulled at a height convenient to the worker. Having arranged the foundation loop with an ordinary knot, the worker should fasten it to the end of the string that has bcen wound on to the needle.

Then, taking hold of the mesh with the left hand, he should wind the string, marked A in the diagram, from the needle once round the mesh and pass it through the foundation loop. He next draws the mesh up to the foundation loop, and places the first finger of the left liand upon the string $B$, at the point $C$. He next casts a loop of the working thread and passes the neerlle to the right of the foundation loop, hetween it and the mesh and through the loop which has just been east. This enables the worker to form a knot which he can then draw tight against the first finger, which sloould be kept on the string $B$ until this is done. It is important to bear in mind that the string is drawn towards the worker, not upward.
Fifteen stitehes or loops should be cast in this way on to the foundation loop. The mesh may then be slipped out and removed, while a complete turn is given to the foundation loop on the nail. The work is turned over so merely temporary. In mending a broken that the work is begun on the left-hand side
finished off on the right. This strip, ready turned for the first stitch on a new row, will be seen on the bottom of the diagram. The next row is continued in the same way, but a
again, but at the same point at which it was gathering, thus giving a much neater effect. surface. At the present day it is mainly Before stroking can be dune, the gathering thread must be drawn up tairly tight and wound round a pin inserted in the material at the left end of the gathering. The cotton restricted to cal

## mixture of sand.

Stucco was once used extensively for internal decorative plastering, such as for forming cornices or mouldings, and de-
 coration of ccilings. It was composed of pulverized narble and gypsum, mixed with fine sand and clean water, and it hardened gradually, thus giving opportunity to work it into the design, which the plasterer did with the aid of small sted tools.

This kind of stucco has been superseded in Great Britain by stick and rag work. Mouldings are cast into the shape required and kept rigid with the aid of canvas; after these are placed in position, the joints are made
scparate loop instead of the foundation thread should be taken up.
The whole bag is made in this way, row after row of knotted loops being worked from left to right. The work must be turned on the nail after cach row. After about $2 \overline{5}$ rows it will be found that the strip of netting, when it has been doubled in half and joined up at the sides, will be long enough to make the bag required. To finish it off slip the mesh out of the last row and neatly cut off the necdle string. Then take out the foundation loop and join up the sides as though they were being sewn, using the fingers as the needle, poking the string through the loop, and joining with a knot top and bottom. The bag is then complete except for the draw-string at the top. This should be threaded through the loops which form the moutll of the bag. It should be about 20 in . long and of stouter string than the bag itself. The ends should be knotted after it has been threaded through the loops at the neck of the bag. See Netting.

STRING BOX. For holding string, boxcs are obtainable in wood and netal. The wooden box is turned from hardwood, generally provided with a cutter. Metal boxes are composed of two half-spheres hinged together: some are provided with a ring for hanging and others have a metal base to stand upon. Boxes in wood pulp and papier mâché are obtainable which can be decorated by stencilling or other forms of painting. See Italian Renaissance Work: Lacquer Work; Pattern Printing, etc.

STRINGING. Stringings mean very thin lines of inlaid wood put round panels and the edges of constructional parts of furniture. Satinwood stringing on mahogany is used to give a light line on dark wood, and cbony to give the opposite effect. Stringing was much used by Sheraton and other makers - at the end of the 18th century. See Inlaying; Parquet; Sheraton.

STRIPPING KNIFE. The knife used for stripping off old wallpaper and paint consists of a broad blade with a straight handle, the blacle being so tempered as to give slightly when pressure is brought to bear upon it. After first wetting the wallpaper the linife is inserted under it and the paper peeled off in strips. With old paint this knife can only bo used on large areas, when a good deal of ground can be covered in a short time. The paint is scraped off with the knife after it has been burnt with the blow iamp. The stripping knife must be used in the direction of the grain of the wood. See [ainting; Paperhanging.

Stroke. See Apoplexy ; Paralysis.
STROKING : In Needlework. This process consists in placing side by side, in even folds, the little Hutes made in material by
must not be broken off, as the gathers are afterwards released to the size required.
Take the material in the left hand, with the right side of the fabric towards you; then take a needle in the right hand, with the point upward. Beginning at the left hand end of the work, raise each gather gently with the point of the needle, and stroke down into the little ruck which lies between, moving it gently to the left, so that it is placed under the thumb. Repeat this process until all the gathers are stroked under the thumb; then release the cotton at the left end, to make the gathering the desired size, and fasten off.

Care must be taken to stroke the portion of the material above the gathering thread, as well as below it, and

to use a blunt-pointed tapestry embroidery needle for the stroking. See Gathering.

STRYCHNINE. The action and the medical value of nux vomica, the dried seed of an East Indian plant, depend almost entirely upon the strychnine which it contains.

Strychnine is one of the ingredients of Easton's syrup, and is valuable in many tonic digestive mixtures, acting as a stomachic and carminative. It is largely employed in the treatment of chronic heart disease and is an ingredient of expectorant mixtures in inflammation of the lungs or bronchial tubes. Strychnine should never be taken except under a doctor's immediate supervision.

STUARTIA. Growing up to 10 ft . in height, the beautiful shrub stuartia has nearly oval, toothed, pointed leaves and large white flowers in summer. It thrives out of doors, but should be planted in a sheltered sunny position. Ordinary soil can be made suitable by adding leade-mould and peat. Propagation is most casily carried out by sowing sceds, but layering may be done in late summer. The best kind is Stuartia pentagyna, which bears large white flowers stained slightly with red.

STUCCO. This term has been applied in a general scnse to the plastcring of walls with any material designed to produce a finished
good with plaster of Paris, in a mastic state.
The materials used for trowelled stucco, that is, the kind that is used as a finishing for 3 -coat plastering, are lime-putty mixed with clean washed sand. 'Such materials form a setting coat, having a smooth and hard surface, and should always be used in the case of ceilings that are to be treated with distempers. Where a rough surface is desired, the stucco may be brushed over with a wet distemper brush just before it sets. It is not advisable to use this kind of stucco externally. See Cement; Plaster.

STUD : In Engineering. A stud or studbolt is a headless bolt with a screw thread formed at each end and an unscrewed portion between. It is screwed tightly into some fixed member, and the projecting end, in conjunction with a nut, serves to hold in position some other part, e.g. the detachable cylinder head in an internal combustion engine. See Bolt ; Nut.

STUDY: Its Fittings. When it is possible a light, airy room on the quiet side of the house should be chosen for the study. There should be a good heating arrangement and convenient artificial lighting, as it is difficult to do the best mental work when handicapped by any degree of discomfort.

With regard to the treatment of decoration and furniture most people would wish to aim at harmonious repose for the former and comfortable efficiency for the latter. Some would feel keyed up to work in a bright but austerely furnished study, while others would prefer the more conventional style illustrated in Fig. 1.

A restful room of this type could be treated with dove-grey walls and ivory woodwork and ceiling, a deeper grey carpet with purple border, and the windows curtained with purple velours and ivory net. Touches of dull pink and yellow could be introduced in the cretonne covers.

A brighter room might have walls of duck egg green and furnishing fabrics in autumn leaf tints. A cretonne in old English needlework design would then be a good choice for curtains and any loose covers.

Some people prefer the bureau type of writing desk because of its more charming appearance in a room, but the flat-topped desk is more comfortable to work at than a bureau.

In many cases the owner of a study requires more than one or two small shelves for the accommodation of his books, and a bookcase with glass doors, which keep out the dust, is added to the furniture.

The second illustration shows the very business-like study of Mr. Edgar Wallace. Comfort and colour are supplied by the rich tones of carpet and rug, the floor cushion, and the velvet furnishing fabrics. The modern note is well emphasized in the two chairs with


Study. Fig. 1. Spacious and well-lighted study with conveniently placed desk, roomy bookshelves and comfortable chairs for moments of relaxation
tubular steel frames, in the writing table and in the severely plain bookshelves.
There are wull-designed tables and ornamenal covers for typewriters to be had which will harmonize with most furnishing schemes. A filing cabinet is often required and a cupboard with shelves in which to stow away stationery. The desk chair is $n$ matter of individual taste, but a comfortable armchair in which to sit while reading, a fair-sized, solidly made table, and a good reading lamp may be considered essential.
Over a desk or low bureau, placed to the right of a window, near a corner of the room, an angle arrangement composed of two shelves which allow the requisite depth between them for reference books makes a useful corner treatment and a pleasing one if an attractive piece of china is placed on the top shelf. A small c:uphoard let into the wall near the desk is convenient for the telephonc. See Bookcasc Library; Writing Table.
STUFFING: In Cookery. Stuffing is a savoury compound which is combined with meat, game, or lish in order to impart a rich or special Havour. Stuffing may be used to fill hollows, it may be laid between two Hat portions of food, or, on the other hand, it may be converted into a coating.
If meat is boned it is often stulled, while if made into a galantine a certain quantity of stulling is mixed with the other ingredients which help to form the filling. Stulting also is added to meat and poultry served whole. Veal is accompanied hy what is known as veal stufting, or forcemeat, and pork by sage and onion stufling; poultry and game may be stuffed with a lage variety of forcenkats, flavoured and seasoned in a suitable manner, but always made very savoury.
In meat the stuffing is inserted by raising up the skin covering a hollow or convenient place for pressing in a sulficient quantity; the position varies according to the nature of the joint, but the stufting must be so placed that there is a possibility of equal distribution when carving takes place. It must be entirely corered when in the joint and fastened in place serurely, or it will escape in the dripping pan.
In poultry or game the stufting is pressed under the breast from the neck end of the bird. Sometimes a portion of it is inserted through
the vent under the lower part of the breast Hares and rabbits are stuffed where the internal organs have been removed, and the hole should then be sewn up.

The practice of cooking stuffing apart from the food it is intended to flavour cannot be rccommended, as the meat is prevented from absorbing the savoury ingredients while it is cooking. Stuffing made up into balls is added to meat pies to enhance the flavour.

Most varictics of fish may be stufferl. If the fish is whole the stuffing is inserted where it has been gutted, the opening is sewn up, and usually the fish is trussed round or in the shape of an S. Sometimes the stufting is used as a lilling for fillets, and often two small fish may


Fig. 2. This dignifed study with its solid mahogany desk and modern furnishing, exemplified by the two chairs in chromium plated metal tubing, belongs to Mr. Edgar Wallace

Humphrell \& Vera Joel
$1 \mathrm{Y}^{*}$ *
they are soft, in enough water to cover them. They are then rubbed through a sieve and mixed with a lump of butter about the size of an egg, and a sprinkling of seasoning. Sec Forcemeat; Goose; Turkey; Veal; etc.

STUPOR. In coma the patient cannot be roused by any means, but in stupor bo may be roused by speaking londly to him, or by some other form of stimulation.

A large number of causes may give rise to this condition, c.g. concussion of the brain, as a result of a blow or a fall; compression of the brain, by a fracture or a tumour ; epilepsy, abscess of the brain, meningitis. asphyxia; poisoning by opium, chloral, alcohol, and other narcotic drugs.
One of the most difficult cases to diagnose is that in which a man is found in a state of stupor, and smells of alcohol. The tendency is to suppose that the man is very drunk, but he may have taken only a little alcohol, while his condition is due to some one of the causes enumerated above. Mistakes are sometimes made with serious consequences to the patient. When there is the least doubt the person should always be assumed to be ill, and be treated accordingly. See Coma.

STURGEON : How to Cook. The flesh of the sturgeon is solid, white, and not unlike veal. When fresh the veins and gristle have $a$ blue appearance, and the grain of the ilesh is even ; if the veins are brown or dingy in colour the fish is not good. The roe is preserved, and in the form of caviare it is highly valued as hors d'oeuvres. The isinglass manufactured from the air bladder is superior to gelatine for the purpose of stiffening jellies and creams.

After cleansing, the skin of the sturgeon should be loosened with a sharp knife, starting from the backbone and dealing first with one side and then with the other. The skin is then laid over the fish again and fastened with string or tape. It is better thus to loosen the skin before cooking the fish, as it is uot good served with it, and loosening facilitates dishing.
To boil sturgeon, take half a small fish and put it into a fish kettle, just cover it with water, add the rind of half a lemon, 20 black peppercorns, a small stick of horse-radish, and 1 gill of vinegar to each quart of water. Cook from $1 \frac{1}{2}$ to 2 hours very gently, then drain the fish, remove the skin and serve with a good piquant sauce.
A favourite method of cooking sturgeon is to roast it. Cleanse 3 lb . of fish and remove the skin, but do not replace it. Dust each side of the flesh with salt and pepper and then lard it closely or cover it with thin slices of fat bacon, which should be tied on. Butter a thick sheet of white kitchen paper and lay over it 2 prepared and sliced onions and 2 carrots, also prepared and sliced, 1 dessertspoonful sifted dried sweet herbs, and 1 tablespoonful chopped parsley.

Wrap the fish completely in the paper and secure it. If the paper is not very thick it would be best to use it double. Melt 3 oz . butter or good beef dripping in a baking tin, lay the fish in the tin, and balse it from 1 to it hours, basting frequently. It must cook rather slowly. To serve the fish remove the fastenings and paper, and if it is not well coloured return it to the oven to brown, then brush over the top with glaze and serve it very hot. A well-flavoured brown sauce may be handed round.

Sturgeon may be roasted like veal, stuffed with a good veal forcemeat. Let it be well basted with butter and served with thick brown gravy. One way of dishing it is to pour over it when dished a good brown sauce. Garnish with cut lemon and little rolls of bacon.
Sturgeon is sometimes cut in small steaks, and these should he broiled. Prepare and
cut the steaks, which should be about $1 \frac{1}{4} \mathrm{in}$. thick. Cover each with egg and fine seasoned crumbs, wrap them in buttered paper and broil them over a slow, clear fire. Serve them with anchovy sauce. A little chopped parsley may be added to the breadcrumbs.
For fillets of sturgeon prepare about 2 lh . of the fish and cut it into fillets. Melt 2 oz . hutter in a saute pan. put in the fillets and cook them very slowly. When done on one side turn them and cook the other side: they will take about 20 min ., but much depends on how thick they are cut. When tender, take them up and serve hot with a good brown sauce or Genevoise sauce. See Caviare; Forcemeat; Isinglass; Sauce: Veal.
STYE: In the Eye. Inflammation of a little gland at the root of an eyelash results in a hordeolum or stye. This is a painful swelling which soon suppurates, the matter, if it bc left to itself, finding its way out, usually through the inner lining of the lid. It will shorten suffering, however, if the affected lash is pulled out and the little abscess opencd as soon as matter has distinctly formed. Until then hot applications, for example boracic fomentations, should be made.
Not uncommonly one stye is followed by a succession of others. The eye should be washed regularly with boracic lotion for some time after a stye. A lotion or drops of sulphate of zinc is also sometimes required. The general health may be depressed and require tonic treatment, and constipation if present must be corrected, as a habit of this kind may be responsible for styes. See Conjunctivitis; Eye.

STYPTIC. A drug or other agent used to stop capillary bleeding by contracting the blood vessels and furthering clotting of the blood is called a styptic. Very hot water has the same effect. Amongst the drugs used in this way are perchloride of iron, tannic acid, the salts of copper and lead, calcium chloride, hazeline and adrenalin. Cobwebs applied directly to a wound act as an effective styptic, but should never be used in view of the danger of poisoning the wound. See Bleeding.
STYRAX. This hardy shrub thrives in well drained loany soil with which leaf-mould has been mixed, and in a sunny sheltered place. One of the best kinds is styrax japonicum, 15 ft . or more high, with white flowers in summer. Styrax Obassia, a japanese white-flowered shrub, is also beautiful. The gum resin called storax is obtained from styrax officinale.

SUCKER. To the gardener a sucker is a shoot rising from the subterranean stem of a trec or bush. Such can be used for propagation purposes, as in the case of the raspherry. The suckers which develop on the stocks on which roses, fruit trees and certain shrubs are grafted or budded ought to be pulled up and destroyed. See Apple Sucker; Plum; Propagation; Pruning; Raspberry.

SUCKING PIG. Usually the pig can be purchased ready for dressing, but, if not, it must be thoroughly cleansed, particularly the nostrils and ears, as the head is served at table. Cut off the feet at the first joint, loosening the skin and leaving enough to turn under. The pig should then be stuffed with sage and onion stuffing as for roast pork. Scw the stuffing up inside the body of tho pig, then roast it as for roast pork.

To cook this dish to perfection the Hesh should be basted first of a!l with brine, then pour it away, and baste thoroughly and frequently with butter. Serve with rich gravy well flavoured with lemon juice, and hand round apple sauce.

The sucking pig should not be more than 3 weeks old, and it will take about 2 hours to cook. It is served split in half. And the snout and jaws should be trimmed off, leaving
only the cheek and cars and the outline of the snout and jaw. Sucking pig is sometimes stuffed with the chestnut stuffing used for turkey. See Pork; Stuffing.

SUEDE. Obtaincd from shcepskin dressed soft and finished on the flesh side with a very fine nap, suède can be sewn and worked for all purposes just as easily as velvet. Suède is utilized largely in the manufacture of gloves, shocs, handbags, belts, hats and sports coats. Artificial Howers are made from it, and it is dyed to many different shades.

Care of Suède Shoes. Wet suède shoes should be placed on shoe trees or stuffed tightly with paper and left to dry. They should not be dried in front of the fire, as this causes the leather to split. If they are mudstained, they should not be brushed until they are thoroughly dry. Like all other suede goods, they may be cleaned with petrol (see page 935 ), the latter being applied with an old toothbrush. The pilc or nap may be restored with sandpaper or with a small wire brush which is sold for the purpose.

The best micans of cleaning coloured suèdes that have become soiled in wear is by the use of the many coloured dry cleaners marketed for the purpose. Grease and other stains are best removed by rubbing briskly with a piece of suèle, or a piece of chanois leather, used dry without any lubricant at all. Glass paper is also useful for removing obstinate stains. The employment of petrol, benzine, and other spirits is not advised for red and otller brightly coloured suèdes. They will remove the stain, but may also cause the dye to fade and so give the leather a patchy appearance. Suède so treated will need to be redycd in order to restore its original colour. sce Cloth Pall; Glass Paper; Gloves; Leather.

SUET: In Cookery. The fat which lines the loins and kidneys of sheep and bullocks furnishes the suet which is indispensable in cookery for making puddings and for other purposes. The best is that which surrounds the kidneys, and is commonly called kidney suet.

When suet is received from the butcher it should be examined to see that it is frce from taint, as the slightest defect of that kind will probably spoil a whole dish. To prepare it, the skin is first removed and the suet is sliced up into flakes. It has then to be chopped finely. The success of the cooking depends to a groat extent on the skill and thoroughness with which the chopping is done. Suet graters can be bought and do the work more quickly than it can be clone with a knife.

Suet should be firm enough to chop without the necessity of adding flour during the process, but if the weather is close and the fat scems unduly soft, flake it, then add the whole quantity of flour needed for the pudding and finish chopping. By adding small quantities of flour, as is often done when chopping suet, the fat is merely worked into a paste and cannot be successfully mixed. It should be remembered that extra flour added for chopping purposes destroys the proper proportions and takes away from the quality of the dish.

To keep suet for a few days the best plan is to remove the skin, chop the suet and put it into a dish, covering it with flour. The fat must be entirely covered, and an account must be kept of the amount of flour used. The practice of burying a lump of suet in the flour tub, unskinned, is not good. The skin quickly becomes tainted and it then contaminates the flour.

SUET CRTST. For making dumplings and roly-poly, and also for covering meat or fruit puddings, a suet crust is made as follows: Chop finely 10 oz . suet, and mix it lightly with 1 lb . household flour which has been sifted, with $\frac{1}{4}$ teaspoonful of salt. Work these
ingredients into a tairly stiff paste, using about $\frac{1}{2}$ pint cold water. Some housewives add baking powder to suct crust (see Apple Pudding), others considor that any raising agent should be avoided in the niaking of this crust.
The pudding should be perfectly light if the suet is properly ehopped, the dough skilfully handled and not made too moist. A pudding may either be cooked in a greased pudding basin, covered with a greased paper, or as in the case of a roly-poly, tied up in a floured pudding cloth. The pudding is plunged into fast lioiling water and kept boiling the whole time of cooking. When inixing, pour the water

## Sugar: Its Uses in the Home

## Consideration and Comparison of Kinds and Qualities

This coneribution is connested with a great number of other entries in this Ensyclopedia, nolably the cakc, preserve and sweet making recipes in which sugar is used. See Chocolate; and sweet making recipes in which sugar
Diet: Food; Jam; Sweets; Toffee, etc.

For home consumption sugar generally consints of loaf or lump sugar, granulated, castor, icing, and the varied forms of yellow or brown sugars. The very first consideration when buying any of these should be to ensure quality ; the purchasc of an inferior article is no economy in housekeeping, as inoist, sticky sugars, ceven if slightly cheaper in price, are heavier in proportion to the pure crystals, while their swectening power is considerably lower. The white crystalline sugars are the purest, and usually are frec from the impurities frequently found in loose or brown sugar. Loaf sugar is not often adulterated, and the quality is easy to detect from the appearance. It should lee clean looking and sparkling.

One or two rulcs for distinguishing good sugar from inferior may be useful. A gond white sugar should look very dry and highly crystallinc, also when rubbed lietween the finger and the thumb it should be free from any feeling of stickiness, and should never appear clammy. Good cane sugar should be casily soluble, and may be tested with water. If dissolved in half its weight of cold water, and found to be free from sediment of dirt or pieces of foreign matter, it is absolutely pure.

White Sugar. Lump or loaf sugar may with advantage be employed not only for table use. but for a! the most delicate kinds of calies and sweets. For use in cookery it needs, unless it can be dissolved in liquid, to be pounded in a mortar and passed through a finc sieve, and the rougher portions which remain must be pounded again and sifted until the whole is a finc powder.

White sugar should always be used for making jams and marmalade; not only is a greater degree of sweetening principle obtained from it, but the jans will be clearer and a hetter and brighter colour. In some country districts moist sugar is used for jam making, but the preserve then has a rough taste as well as looking cloudy. Of course, something depends on the quality of the sugar. Summer and invalid drinks, also home-made wines, should be sweetened with loaf sugar. The more delicate kinds of toffees should be made with this sugar, and jellies should be sweetened with it.

Granulated sugar is a purer variety of white sugar than inferior castor sugar, but for some cookery purposes, also for table use, it is rather coarse, and not so easily or so completely soluble as loaf sugar. It may be employed for swectening fruit in pies, in puddings, for large cakes, and it is often used for making jams and marmalade. A large white crystal sugar is specia!ly sold for use with coffec.

Castor sugar, which is a pounded form of lump or loaf sugar, should have a bright, dry appearance, and the tiny crystals should also be well defined and even, as in granulated sugar. It is most suitable for table use, and also for swectening delicate cakes where a spongy consistency is needed. It is likewise
into the centre of the basin and work in the four round the sides as quickly as possible till all is mixed, but take care that the whole is smooth and the ingredients properly incorporated. The paste should he firm and no moisture should appear when it is cut or rolled. If a richer crust is desired the quantity of suct may be slightly increased.
The time required to cook plain suet or rolypoly puddings varies from $1 \frac{1}{2}$ to 2 hours, according to size. Fruit puddings take aloout the same time. See Apple Roly-Poly ; Dumplings; Plum Duff, etc.

Suffocation. See Artificial Respiration; Asphyxia; Drowning.
sugar, but is readily digestible by infants, and has a slight diuretic and laxative effect.

Malt sugar, or maltose, is obtained by treating the starch of barley with the ferment diastase. It readily undergoes alcoholic fermentation. It is impossible to lay down any general law as to the amount of sugnr which should be includerl in any particular individual's diet. A point to be remembered is that sugar has a cloying or satislying effect, and therefore it should be caten at the end of a meal.

A proportion of sugar must be maintained in the blood and, as neccssary, glycogen is changed back into glucose and added to the blood stream. The proportion in animal blood is from 0.08 to 0.04 per cent. If the amount in the blood is too high sugar appears in the urine; but in the condition known as kidney diabetes sugar is apparently able to pass into the urine although the proportion of blood sugar is not raised. Sugar appears to take
the place of alcohol and to diminish the tendency to build up a taste for the latter.

The handling of sugar sometimes produces dermatitis of the hands and forearms, a condition which among grocers is called groeer's itch. When unrefined sugar is being handled it is thought the irritation may be due to the sugar mite, an insect which resembles the itch mite, and which occurs in such sugar. Fat children who take an excess of sugar nay suffer from cezema, and symptoms of rheumatism are also sometimes a result of excessive use of this food.

SUGAR BASIN. The receptacle for sugar may be an ordinary basin, but it is usually more claborate when sold separately or as part of a tea service. Sugar basins are made in glass, china, pottery, plated metal, or silver, in old and modern styles.

Often they are made in plated metal or in silver to match a milk jug and teapot in reproductions of Queen Anne and other classic styles. An carly form of the sugar hasin is the glass bowl sometimes found in a tea caddy. Sugar basins in antique silver and Sheffield plate are valued by collectors. Some early picces are embossed. Others of a somewhat later date are adorned with pierced and fretted trellis work, a decoration which necessitated a glass lining. This was usually blue in colour, but occasionally crystal. An example of such a basin, or basket, is illustrated in Fig. 1. It has a swing handle and a head erlge. In page 1144 a round basket of the same period, but made in Shefficld plate, is shown. Some fine examples are supported on conomy in buying it, as the sactharine principle is very deficient and the quality altogether inferior. Foots sugar is the moist syrupy sugar which lies at the bottom of the hogsheads of raw sugar. It was at one time used for toflee. At yellow crystal sugar, not unlike sugar candy, is preferred by some people to the white crystal sugar for swectening coffec.

Food Value. From the medical standpoint sugar is one of the most valuable foods, because it is a source of body hent and energy. Canc and grape sugar are composed of carbon, hydrogen and oxygen. Cane sugar, although ohtained chiefly from the sugar cane, is also manufactured from bectroot, carrots, and the sugar maple. Glucose, grape, and starch sugar are found in various fruits; they are prepared artificially from cane sugar, starch, and dextrin. Glucose has not the same rlryness as canc sugar, and will attract and absorb moisture. When cane sugar is moist it is often due to the presence of grape sugar.

Milk sugar, or lactose, which is found in nilk, and nay be separated from it as a tine white powder, is much less sweet than ordinary
used in making meringucs, custard and whipped cream mixtures, whips, some glazes, and is

A nother form of white refinell sugar is icing sugar. This is white sugar pulverized until it resembles a fine powder, and the greater the extent to which it is pulverized, and the finer the powder, the higher the quality of the icing sugar will be, and the better the use which can be made of it for cooking cakes and for decorative icing. However good the sugar, it must always be treated by further sifting before it is used for cake icing. A fine hair, tammy, or silk sieve should be used for the purpose.
Brown Sugars Of all brown sugars Demerara ranks the bighest. It should be a golden brown colour, and the erystals should be dry and separate. It makes a good porridge sugar, and is sometimes used for coffec. It is useful for sweetening lunch, rich large calies, and many varieties of puddings. Demerara is occasionally adulterated, a kind of yellow crystal sugar being sold as a substitute for it which is made from bect sugar and dyed.

Barbados is a rich moist sugar, hrown in colour. It is, when pure, very good for mixing in with dark coloured puddings, or any description of gingerbread : it is also used for clark toffees, in the pickle made for snlted and spiced meats, and in chutneys. It is not suitable for sweetening fruit when cooked, as it imparts an unplcasant syrupy taste, and also spoils the colour of the juice.

A cheap sugar called white moist is sometimes sold, but there


Sugar Basin. Fig. 1. Example in pierced silver work, lined with blue glass, 1785. Fig. 2. Fluted sugar basin on ball feet Courlesy of Chapple \& Muntell
ball and claw feet, or on lion's paw or ball ammonia, lime, and potash, are of great value fect. Sometimes the basins were made with covers. Fig. 2 shows a fluted sugar basin, with gadroon border, scroll handles, and ball fect. dating from early in the 19th century.
SUGAR CANDY. Being a pure and wholesome sweetmeat, sugar candy consists of sugar crystallized and dried in an even, hot temperature. The crystals are formed on strings, but as special vessels are necessary 10 do this, it is scarcely possible for an amateur to attempt making it.
SUGAR CASTOR. A sugar castor or sugar dredger is employed to sprinkle castor sugar over fruit tarts, stewed fruits, etc., after they are brought to the table. It is usually very similar in shape to a muffineer (q.v.) or pepper pot, though larger, and, like a inuffineer, is provided with a conical or round, screwed-on, and perforated lid.

Sugar castors are frequently made entircly of silver or silver plate. Sometimes the lid alone is of silver, the rest of the castor being cut glass or china. Collectors' examples in silver date from the end of the 17 th century. Queen Anne shaped castors were often octagonal, the picrced top surmounted by an octagonal knob.

SUGAR SIFTER. This is a spoon used for scrving sugar. The distinctive point about the article is the pierced bowl which enables the sugar to be sifted as it is put on to the food. Sifters, which are usually of silver or electroplate, can bo purchased either separately or with a sugar basin.
SUGAR SOAP. This is the name given to a soap in powder form used for washing down paintwork before repainting. It can be had from an oil and colourman. See Paint.

SUGAR STICK. This sweetmeat can be varied by changing the colour and flavour, and needs to be stored in airtight bottles. l'repare the sticks by dissolving ${ }^{\text {a }} \mathrm{lb}$. granulated sugar in a little more than $\frac{1}{2}$ gill water, and then adding 3 oz . glucose. Stir the whole in a pan over the fire until the glucose has melted; then boil it up to $300^{\circ} \mathrm{F}$. and pour it on to an oiled slab. Flavour with cinnamon, add a little saffron for colouring purposes, and fold the hot candy over and over with a flat wooden spoon, afterwards pulling it out with the hands until it begins to harden. It is then ready to be cut into sticks.
SUGAR TONGS. The pair of tongs which often accompanies a sugar basin is usually of metal, silver and electro-plate being freely used. They arc made with a slight amount of spring, so as to grip the sugar when pressed. A shape often scen is one resembling two spoons fastened together.
SUIT CASE. The lighter types of suit cases consist of a p!ain frame covered with morocco cloth, vulcanized fibre, brown canvas, green drill or some other material of that kind. The licavier ones arc of leather.
A very light weight case has a soft top. Such suit cases are lined with a fnncy material or cotton moirette and are made of leather grained cloth or black or coloured oil baize. Expanding cases are serviceable in reliable and stouter makes. Another type is here illustrated. It is covered with vulcanized fibre, lined with strong material, and the top is fitted to hold six dresses. The bars come forward, for hanging them. The lower portion of the case is deep enough for shoes and other nsticles of clothing.

Suit cases are fastened by snaps or loclis or both. They are made in a variety of sizes. simall ones are 18 in . long, $13 \frac{1}{2} \mathrm{in}$. wide, and $5 \frac{1}{2}$ in. deep, and they can bo bought as large as 30 in . long, 17 in . wide, and 8 in . deep.
SULPHATE: The Fertilizer. Salts that are formed with sulphuric acid are termed sulphates. In the garden, three sulphates,
ammonia, lime, and potush, are of great value
in fertilizing crops. Ammonia can be ayplicd to all kinds of soil, except those containing chalk. It is particularly uscful on cold, heavy ground. It should be applied to the soil before planting, but may be used as an after stimulant in liquid form in the proportion of $\frac{1}{2} \mathrm{oz}$. to a gallon of water.

Sulphate of lime, sometimes called gypsum, is an excellent fertilizer, its action being to liberate silicate of potash for the feeding of crops ; it has the power of fixing ammonia, and is used on manure heaps for that purpose. Sulphate of potash is very soluble, and this quality, in conjunction witl its feeding value, makes ít invaluable for pot plants, flowers, etc.
One of the poisonous winter washes for the cure of black spot, mildew. scorch, and rust, is made with sulphate of copper, also called blue stone. It is mixed with water, in the proportion of 1 oz . to 2 gallons, and carefully applied with a syringe or pneumatic sprayer when growth is dormant. See Bordeaux Mixture ; Lime; Potash.
SULPHIDE. Amongst the sulphides the one known as sulphide of potassium, or liver of sulphur, provides an excellent remedy for mildews in garden and greenhouse. It is simply prepared by mixing 3 oz . sulphide of potassium with 4 oz . soft soap, dizsolving both separately in water, and adding further water to make up to 10 gallons. The solution must always be used when perfectly fresh. It is applied to mildewed plants during summer. See Mildew; Spraying.
SULPHUR: Medicinal Uses. Sulphur is widely used in medicine as a parasiticide. In scabies or itch sulphur ointment is a very valuable remerly; or the drug may be applied in the form of Vleminckx's solution. In the treatment of other skin discases, notably acne and dandruff, it is also a valuable merlicament. Internally, sulphur acts as a gentle laxative, and is often prescribed for children.
Compound liquorice powder, a useful and reliable laxative, owes its action partly to sulphur, which it contains. Sulphur lozenges, containing 5 gr . of precipitated sulphur, one to two at bedtime, are often taken in order to correct constipation, or by the subjects of chronic rheumatism.
The sulphur waters of the natural springs in various parts of the world are used inwardly and as baths for the cure of chronic rheuma tism, skin diseases, and a large number oi other conditions. A su!phur hath at home is made by dissolving 6 oz . potassa sulphurata in boiling water and adding to a full bath, that is to say, about 30 gallons of water.


Suit Case in vulcanized fibre, lined and fitted with bar attachment, over which drasses and akirta may be hung and held in place

SULPHURIC ACID. Oil of vitriol or sulphuric acid is a heavy, oily, lighly corrosive liquid which will destroy any animal tissues and many other substances with which it comes in contact.
Sulphuric acid as used medicinally is always very greatly diluted. Externally dilute sulphuric acid is sometimes used to check slight bleeding. Internally dilute or aromatic sulphuric acid may be used to check acute diarrhoea. It is often given as a daily dose, well diluted for those who work in lead, painters, colour grinders, ctc., as the acid combines with any lead which has been taken into the system, forming sulphate of lead, which is insoluble and harmless. In general debility, diluted sulphuric acid, either alone or with other tonic duggs, sometimes acts as an effective alterative, improving the appetite and generally bracing up the system. It should not be allowed to come in contact with the teeth.
On account of its violently corrosive effect. poisoning by sulphuric acid is a most painful as well as high!y dangerous condition. Violent burning pain, from the lips down to the stomach. with vomiting of bloorl and corroded shreds of tissuc, and collapse, are the chicf symptoms.
While awaiting the doctor, inagnesia, chalk, or soda should be given at once, if obtainable, in water, milk, or olive oil. If these substances are not at hand, crumbled-up plaster from a wall, soapsuds, or mortar, mixed with water or milk, should be given. An emetic should not be given. For the pain, poultices or fomentations are applied to the abdomen. If breathing is difficult put cloths wrung out of hot water round the throat and moisten the air with steam by means of a bronchitis kettle.

Afterwards demulcents, such as white of egg, or olive oil, should be given to soothe the inflamed stomach.

SULPHUROUS ACID. On account of its strong deoxidizing action, sulphurous acid is used as an antiseptic, a deodorant, and a disinfectant. The acid is sometimes applied locally in parasitic skin diseases, e.g. ringworm. Sulphurous acid is sometimes given internally to prevent gastric fermentation. The dose is $\frac{1}{2}$ to 1 Huid dram.

SULTANA. A small scedless raisin with a thin rather light-coloured skin, the sultana is much used in cookery for adding to puddings, cakes and scones. It is considered to possess a delicate Havour, although it lacks some of the full rich taste of the larger secded raisin. Sultanas give better results when mixed with other dried fruits except when a plain fruit cake is desired.

Sultana Bread. This is made by sieving together $1 \frac{3}{4} \mathrm{lb}$. flour and a pinch of salt, rubbing into them 1 lb . margarinc or butter, and then adding and mixing in 5 oz. picked and cleaned sultanas and $\ddagger \mathrm{lb}$. sugar.
Put 1 oz. yeast into a small warmed basin, mix it with 1 teaspoonful castor sugar until it is reduced to liquid and then add $\frac{3}{4}$ pint warm milk. Strain these into a well made in the centre of the four, etc., mix in a little of the latter from the sides, then cover the basin with a cloth and let it stand in a warm place for 20 min .
When this is done, mix in all the flour, adding more warm milk if required. Turn the dough on to a slightly floured board, knead it for about 8 min., then put it back into the basin, cover it and leave it to rise in a warm place for about $1 \frac{1}{2}$ hours. Turn it out and knead it again for a few minutes, then put the loaf of dough into a greased and floured bread tin.

For the third time, let it rise in a warm place for $20-30 \mathrm{~min}$., then bake it in a hot oven for about $\frac{3}{4}-1$ hour. When cooked, brush the loaf over with a glaze made from castor sugar and
milk, putting it back into the oven for a few sceonds in order to dry

Another recipe, in which yeast is omitted, is as follows: Sieve together $1 \frac{1}{4} \mathrm{lb}$. flour, $\frac{1}{2}$ teaspoonful each carbonate of soda and cream of lartar, and $\frac{1}{}$ teaspoonful salt, then add 2 oz . cleaned sultanas and mix the whole with enough water to make a fairly soft dough. Turn this into a greased tin and bake it in a fairly hot oven for $\frac{3}{}$ hour. The bread is improved if buttermilk can be substituted for the water

Sultana Pudding. To make this pudding take 6 oz . sultanas, 5 oz . each of margarine or hutter and of sugar, a lemon, an egg, $\frac{1}{2} \mathrm{lh}$. breaderumbs and some milk. Grate the rind of the lemon and stir this into the breadcrumbs. Wash, pick over and dry the sultanas and beat the sugar and the margarine or butter to a cream ; to these add the cgg. which should be stirred in quickly and beaten for a few minutes. Mix the breadcrumbs and sultanas, adding a little milk as required, and stir the whole well logether.

Put this misture into a greased pudding basin, cover it securely with a well-greased paper, steam it for about 2 hours, and turn it on to a dish. This pudding should be served with syrup sauce. To make this, take 3 tablespoonfuls golden syrup and one tablespoonful each of strained lemon juice and water. Place these three ingredients into a saucepan and boil them together for a few minutes. See Bread; Cake; Scone.

SULTAN FOWL. This is a quaint looking white-crested fowl with cheek mufflings and a beard. It is heavily feathered on the shanks, the feathering being carried right down to the toes, and is vulture hocked like the Brahma: it possesses five tocs, and thus may be akin to the Houdan. The comb is horned The Sultan is not a large fowl, the males when full grown weighing 5 lb . to 6 lb . and the hens $3 \frac{1}{2} \mathrm{lb}$. to $4 \frac{1}{2} \mathrm{lb}$. The hens lay a white egg which weighs slightly under 2 oz . The chiclis, which are creamy white, are very hardy, and show the leg and foot feathering immediately they le we the shell. See Fowl ; Poultry.
Sumach. This is the popular name of a group of ornamental hardy shrubs, linown botanically as rhus (c.v.).
SUMATRA GAME FOWL. No fow approaches the black Sumatra game fowl in the richness of its colour, which is dense black. with a glossy beetle-green sheen. The head is sinall and rather short, the eye large and bold, the somb small aud pea shaped. The booly is broad, with a full-round chest.
The body feather is close fitting, but the bird has long llowing saddle hackles, nud the cockerels have a very long drooping tail, with immense side hangers and sickles, which almost sweep the ground. The hens have a large fan-shaped tail. The eye should be red, but is often brown or black, the face comb and lobes are black, the beak and legs olive green. The hird often shows double spurs. The hens are layers of tinted eggs which woigh $1 \frac{7}{8} 0 \%$. to $\mathbf{2} \mathrm{oz}$. The Sumatra is a fairly good table bird, the tlesh being delicate and having the Havour of game. It thrives best on free range. See fowl: Game Fowl ; Poultry.
SUMMER : In the Garden. Summertime for the gardener officially extends from Junc 21 to Sept. 29. It is cluring this period of the year that the fairest llowers, roses, carnations, and lilies, to mention only a few, are in bloom; turf is at its greenest, summer beds are at their brightest, the trees are at their leatiest, and many of the most delicious fruits and choicest vegetables are available.
The summer is also a period for observation. birrors in the lay-out of beds and borders, mistakes in colour schemes, and incongruities in the arrangement of plants should be care-
fully noted, and plans made for alteration or improvement when autumin comes. l'lants, the Howers of which show any outstanding qualities in the way of size or beauty of colour or perfume, should be carefully noted for special care and attention when the season for propagation arrives. Indoors the chief troublc is with insect pests, various methods of battling with which are given under many headings throughout this work. See August: Border Garlen; Insecticide; July : June.
SUMMER CHAFER. This pest of the rose is similar to the common chafer or May bug, and it feeds in the evening, attacking both the foliage and petals of Howers. The on!y way of dealing with chafers is to seek the pests, during dull days and evenings, amongst


Summer Chafer slightly reduced
the petals of blooms, im. mediately destroying all that may be found.

Scek also in the ground for their fat white grubs that feed on fibrous rootlets, as well as on the skin of large roots, apply. ing a little sulphate of iron to the soil during late autumn and carly spring. If beetles are sern in light around trees, give a spraying with arsenate of lead wash. Regular warfare must be waged against all garden chafers and their white larva. See Rose: Spraying

## RUSTIC AND FORMAL

## Points to Remember in their Construction and Situation

The amateur is herein told how to construct a summer house, a choice of styles being offered. Other useful information will be found under such heıdings as Arch; Garden Furniture; Rustic Work; Steps; Thatching; frellis
In a variable climate a well planned and of the garden Fig. ] illustrates the charming built summer house provides the necessary shelter for long hours to be spent in the garden. Many days, even in winter, can be thus enjoyed, especialiy if the summer house is of the garden-room type, with easement windows and glass panclled door: Where there are children the summer house forms a delightful playroom or nursery, in which they can have the henctit of fresh air in safoty, and in hot weather the shelter may be litted up as a sleeping room or serve as a dining room. Such in summer house to be practical should measure from 8 to 10 ft . square.

The furnishing of summer houses should be plain or rustic in character, according to the nature of their structure. Painted wood or cane, or natural teak wood furniture, fabrics which will not fade or deteriorate with damp, and cottage earthenware or rough pottery meal scrvices are always suitable. while wicker and rustic wood benches, tables and seats arc appropriate for the simple type of structure illustrated in l'igs. 1 and 6.
The placing of the summer house in the garden is of great importance, not only from the point of view of getting shelter from north and east winds, but also because a pleasing structure of this kind can enhance the design
of the garden Fig. I illustrates the charming
placing of a thatched slielter on a southern slope with a background of trees and a foreground of stone steps. The summer house is covered with wavy-edired elm boarding, is rustic in appearance, and in perfect accord with the rock garden which surrounds it

Delightfully chosen for its surroundings is the summer house pictured in Fig. 2. This is of serviceable size and solid construction. particularly suitable to the formal Dutch garden which it enhances The tiled roof is supported on stucco-covered brick pillars, the side windows are glazed and the floor is bricked A charmingly designed garden seat furnishes the interior, but there is plenty of room for other chairs and a table Such a dignified type of shelter is suited for a town garden.

For a more open setting Fig. 3 shows another type of equally picturesque summer house, also of quite substantial construction, thatched with straw. The opening is framed by the rough hewn posts which support the front. The sides and back are filled in with rustic work. There is a brick floor, and the semicircular space in front is paved with rough hewn timbers.

Another summer house with an open front is shown in Fig. 4. It is built with a reloated


Summer House. Fig. 1. Thatched summer house of rustic appearance, well suited to the rock garden which surrounds it and to the stone steps which approach it

Huniphre! \& Vera Joel


Summer House. Fig. 2. Set in a Dutch garden, this formal aummer bouse with its red-tiled roof. brick foor and stucco-covered pillars is an admirably chosen shelter for a town garden lumphrey \& Vera Jopl
framework to allow the weatherboarding to be nailed flush with the outer corners of the uprights, and is supported on a suitable brick or concrete foundation. Hinged casement windows are fitted in front and at the sides. The roof is boarded to overhang in front and at the back and sides, and is supported by rafters fitted against a small ridge hoard and finished with a capping planed on both sides to the roof angle.

The Hoor is boarded with 1 in . tongued and grooved boards, suitable joists being placed at intervals of not less than 18 in . The construction can be arranged in sections with a separate Hoor, to which the front, back, and the two ends, as complete sections, can be bolted. The roof in this case is made in two halves, and bolted to the top framing and joined on top with a cepping.

Stock Models. Fig. it shows a house which is huilt up on a square floor supported on a stout foundation providerl with a revolving gear The newest form of this is similar to that employed for locomotive turntables and does not stick through rust or wear. The whole building can be casily turned to catch the sun or to avoid bitter winds. The revolving gear is to be found in the less expensive types of summer house, as well as in the larger structures. The roof of this example is thatched, but though this material is coolest and most picturesque to use, weatherboarding or oak shingles could be substituted. The front of the summer house is provided with two windows (shown shuttered) and a door with glazed upper pane!s. There are also windows at either side.

Stock models can be obtained of shelters which will suit most gardens. Walls are made of deal or of wavy-edged elm hoarding, or for a. lighter type of shelter are of woven reeds. Some houses are made on a multiple unit system. IJy this means it is possible to order a shelter which will be of the exact size required when constructed. The units are obtainable in 4 -ft. and $6 \cdot f \mathrm{ft}$. lengthes and in two heights Each unit can be used as a plain wall, or with a window or door, and multiples or combinations of the units permit. of putting up a structure to meet any requirement. Roofs also admit of a variety of treatment. Existing structures may be afterwards extended at small expense and with very little trouble by means of this unit system.

Rustic Summer House. A rustic shelter can be constructed with ordinary poles, such as may be purchased at small cost in most country districts. A simple structure is shown in lig. 6 . It measures some 7 ft . in wilth and 6 fft . in breadth, the height of the corner posts being 6 ft .6 in . clear ahove the ground. It is roofed with thatching employing faggots made up from young willow. Alternatively the roof may lie covered with straw or thaiched with heather.

Rough drawings giving the leading dimensions are prepared and used as a guide while the work is in progress. The plan of the building is marked out on the ground with the aid of pegs and lines, after which seven upright poles are ciected. These should be well embedded in the ground, and the tops linished off level. C'ross-pictes are nailed to the tops of the three uprights on either side
of the shelter. The cross-picces should project about ! in . heyond the corner posts. They are fitted by making little llats on the undersides of the cross-pieces, chipping away the round part and sccuring the cross-pieces with 4 in. or ${ }^{6}$ in. nails.

Rafters for the roof can be fixed by first setting uptie liars across the back and front pairs of uprights, and erecting a temporary upright in the middle of them to support the ridge pole, afterwards nailing the rafters to the ridge. The horizontal members are nailed, one near the ends of the rafters, and one in the middle of their length. The work is completed by fixing short uprighis from the crosshar to the rafters at cach end of the building.

The rool may be covered next. The faggots are most casily fixed with soft galvanized iron wire, wiring the bundles of faggots to the cross-pieces on the roof. The exact method of covering the ronf will have to be modified according to the material employed, but if ordinary brushwood is used it can be laid with two layers of faggots. Each faggot is separately wired to the roof, and the whole secured with a further turn of wire. The end of the faggots should be trimmed ofl with shears or a bill hook.

The cross-picces between the uprights are fixed at ahout the middle of their height, and pieces should be nailed from post to post on all three sides, leaving the front open. A crosspiece is titted near the ground to act as a support for the lattice work which forms the walls or sides. This may consist of poles about 1 in. diameter, niled to the uprights and cross pieces with $2 \frac{1}{2} \mathrm{in}$. wire nails. They are set diagonally, each panel running in opposite directions, as shown.
Seats are provided on three sides by making gallows brackets. These are spilied to the uprights, one being tixed to each. The brackets in the angles of the building should be set at an angle of $45^{\circ}$ to the side walls to form a support for the poles used for the seats. The top of these seats should be about 18 in . off the ground. The poles are nailed to the tops of the gallows brackets and overlapperl slightly at the angles or corners to give the effect of a mitre.
The back and sides of the summer house can be completed in trellis work, set diagonally. The whole may be treated with wood preservative stain or varnished. In the latter case


Fig. 3. Summer house with thatched roof and heavy rourh-hewn surports averooking aunk rarden in Sugsex. The sides and back are of rustic work and there is a brick floor Humphrey \& Vera Joel


Summer House. Fig. 4. Attractive structure of stained weatherboarding, open at the front and with casement windows at front and sides
the registrar of the blind roller as described for indoor blinds county court. It is Japanese rush blinds, in some shade of greon, procured by going to can be fitted in exactly the same fashion. the office and filling in a form which will be thore supplied, which states what the sum. mons is to be in respect of. There are two kinds of these, ordinary and default. The ordinary summons is issucd merely on request and is served by the bailiff of the court. If the bailiff says he is unable to find the defendant, the plaintiff himself, or his solicitor, may ask to be allowed to serve it. See Debt.
SUN BLIND. Sun hinds a re blinds fixed to the outside of a window and brought into use cluring days when there is a good deal of sun. They are the bark will have to be stripped off the timuer also used for the same purpose to protect before it is erected. Some of the harder woods doors and in conservatories and greenhouses are quite satisfactory if the hark is left on generally. Rooms, especially those that are them; with others it is desirable to remove it ; exposed to an abundance of summer sun, need but there is no hard and fast rule for this the protection of sun blinds, hoth to keep them part of the work, and it is largely a question cool and to protect their wallpapers, curtains, of appearance. Useful hints will be found in the articles Arch and Rustic Work. The same method of construction can be used for a more claborate structure, taking care that the principal supports have the requisite strength.
SUMMER PUDDING. This is a pudding made from bread and stewed fruit. It is a good way of using up stale hread, and any fruit in season miay be used. It is advised specially for those who arc unable to eat pastry with fruit. To make it, cut some stale bread into slices rather more than 1 in. thick. 'Trim off the crusts. Cut one of the pieces of bread inth a round to fit the bottom of a greased hasin. Measure the depth of the basin and cut pieces of bread to fit. Odd bits can he fitted into any spaces as may be necessary. Cut a second round to fit the top of the basin.

When the hasin is lined with bread, pour in sulticient hot stewed fruit to fill it. Any kind will do, but it must be nicely sweetened nand not too much of the juice used. Lay the second round of bread over as a lid and put a on it to press the bread down. Leave it until is strong and durable. It is attached to the it is cold, then turn it out on to a dish and serve it plain, or with custard or cream.

SUMMONS. The usual method of compelling a defendant to appear in court is to issue a summons, which he if lound to answer. It is usually issued by the magistrates courts and county courte. Anyone who wishes a summons to he served upon another person to answer n charge should go before the magistrate and make a complaint, which may or may not he taken down in writing and required to be signed loy the somplainent.
The summons is scrved by a warrant ofticer, who is usually a policeman. It orders the defendant to be at the court on such a day at such an hour to answer the chargo preferted against him.
A county court sumimons must be issued nt the oflice of


Fir. 5. Revolving summer house that can be turned round so that the front windows, bere shown shuttered, may face the sun Courtesy of Boulton \& Paul, Lld

A sun! porch or entrance door is easily shaded, either with a plain or a spring roller blind attached to the top of the framework over the fanlight. The blind should be long enough to reach at an angle from the fanlight to the front of the porch, where it is secured by a crossbar of wood or metal. inserted through a pocket formed in the material. This rod slides into two eyes or staples let into the brickwork when the width inside the porch is greater than at the entrance. Otherwise it is secured with short lengths of light brase chain. The blind may hang down beyond this rod as much as desired. The rod must be at least 6 ft . above the ground so as not to inconvenience passers-by.
The term sun blind is also used for a rectangular piece of material that is hung in front


Fig. 8. Summer house constructed with ordinary poles roofed with a thatching of willow faggots
of a door during hours of sunshine to protect the paint. For this a strong fabric should be selected, prefcrably onc with green stripes, and the colour should be guaranteed not to fade in the sun. Having beel cut and hemmerl to the required size, it can be hung by fastening a ring at each of the top corners and placing these upoil two hooks put in position above the door. See Awning; Blinds; Window
SUNBURN. It is not the heat of the sun, but the chemical action of the violet and ultra-violct rays which causes sunburn. It has been found that the condition is mozt likely to result from the early morning sunlight or from the rellected liglit from water or snow-covered ground. A dry wind also favours its occurrence, as it deprives the skim of its natural moisture. l'air-haired people are affected more readily than darls people.
In the most common form there is nothing worse than browning of the slin, which acts as a protective from the heat of the sun. In scverer forms the face becomes red, painful and perhaps swollen. There is tingling and itching, nid $n$ few days after exposure the skin peels off. In sunburn of a still greater degree blisters are formed. When people are daily exposed to the powerful rays of the hot sun for a long time the skin is likely to become dry and wrinkled.

For the redness and irritation cooling and soothing lotions should be applied. In the slighter cases a little eau-de-Cologne mixed with three times its quantity of water is ver: effectual Rosewater and elderflower water
are also used. Sometimes an astringent lotion, such as Goulard's water, dabbed on the face and allowed to dry is most serviceable.

The following will be found an admirable cooling application for the skin after returning from an outing in the sun. It should be dabbed on the face with a piece of lint or very clean rag :


Almond mixture
Rosewater, enough to make
1 dram.
1 oz
2 oz.
2 oz.
8 oz.

A simple but very efficacious cooling application for sunburn is freshly-sliced cucumber lightly rubbed on. See Complexion ; Dermatitis: Face: Freckles.

## Sundials: How to Erect and Set

## A Picturesque Feature for Gardens Large and Small

The earlier part of this article descrites the building of a sundial, while in the latter our readers are told how one should he set. See Brick; Cement: Concrete; Stone; and other entries that deal with the tools an's materia's used by the amateur worker; also Flower Garden; Garden

A sundial may be fixed vertically on a wall, ' as Fig. 7, but it is generally found in a horizontal position, mounted on a pillar or some form of pedestal like that illustrated in Fig 1. This is set up in a sunny spot in the garden, in such a position that at midday the shadow of the gnomon falls exactly on the 12 o'clock mark on the dial.
Making a Brick Pillar. Brick is perhaps the best inaterial for the amateur to use. First of all the foundation has to be prepared. If the site selected is in a grass plot, the top soil must be removed until firm ground is reached. This is made up with broken brick or hard core, and coated with concrete floated off to a level surface. The centre panel may be made up with crazy, or random flagstones laid in cement mortar, or the whole of the area can


Fig. 1. Skilful placing of a pedestal sundial in a long and terraced path be covered with brick. work.
The crazy paving can be surrounded by a brick border. The centre of the site is ascertained $h y$ driving four pegs, one at each corner. and stretch. ing a line tightly between them, the point of intersection of the two lines exactiy marking the centre. A scale drawing should bc made of the pillar showing the number of courses, the positions for the tile creases, and any other structural details. Tho drawing given in Fig. 2 is that from which the pillar shown in the accompanying illustrations was constructed.

The worker should refer to the article on bricks for details of the making up of mortar, method of laying the courses, etc. The first course is laid and levelled, and the second course is then set upon the first, half a brick's width less in size, so as to form a stepping.

Sundae. See Glassware Ice
SUNDEW. There are three native species of sundew, which is an insect-eating plant and a hardy perennial. Of these the best linown is Drosera rotundifolia, a low plant with roundish, reddish, radical leaves covered with sticky, shining, glandular hairs, which glisten in the sun. It is found in parts of Great Britain, Ireland and the Channel Islands in boggy places.

Although hardy, it is sometimes grown in pots as an interesting greenhouse object. A compost of peat and sphagnum moss is suitable. Propagation is by sced or division. There are several other species.

The buik of the pillar measures 14 in . square, and is easily built up by arranging the bricks alternately, one brick lengthways and the next at right angles to it. This operation is repeated for three courses, and then the tile creasing is laid in a similar manner. consisting of two courses.

A further three courses of bricks are laid on the tiles, and another tile creasing course. The tiles should be tapped up level to the sides of the shaft by striking them lightly with the handle part of the trowel They should be well bedded in mortar and pressed down firmly, as indicated in Fig 3. Two courses of bricks are then laid, to complete this part.

The over-sailing course of bricks remains to be laid on the top of the pillar so that they project over 1 in . beyond the face of the shaft; for this purpose it is necessary to cut a closer, that is, a short piece of brick, to fill the gaps between the whole bricks. The overhang can be measured with a rule or gauged with a sinall wocden gauge having a notch cut in one edge to represent the amount of overhang. The bricks should be bedded in a thick bed of mortar and well tapped home with the end of the trowel, as shown in Fig. 4.

The capstone can be a piece of thick, flat stone or paving stone, 18 in . square and about 2 in deep. or in its absence an excellent suhstitute is obtained by first preparing a rough wooden mould and casting a capping piece in concrete. To provide a means of attachment for the plate of the dial four rectangular pieces of wood are arranged in the centre of the mould before the concrete is filled in. The mixture is poured into the mould box in a moist condition, and the surface should be trowelled off large, so that there is room for adjustment.

Setting a Sundial. The dial is attached to the top of the pillar by screwing it down with four screws to the wooden blocks embedded in the concrete capping The gnomon should point north and south, with the highest part pointing towards the north.

A sundial made for one particular place is quite useless for another place in a different latitude. Before setting a sumdial it is essential to know whether the sun is fast or slow of the clock. Sundials show apparent time, whilst clocks measure equal or mean time, so that if a perfectly regulated clock were set to apparent solar time it would agree with the sundial only on four days of the year. Fig. 2. Showing aumber of four days of the year.
brick courses and position of
tile creases in sundial pillar dar is the
illustrated below between two succes$s$ ve returns of the sun to the meridian. The moment the sun reaches its highest point in the heavens, that is, the highest point above the horizon, it is true noon. Sonetimes the sun is as much as 14 min .28 sec . after the clock. and at others 16 min .18 sec . before the


Fig. 2. Showing vumber of brick courses and position illustrated below

smooth. Instructions for moulding concrete are given in the article Concrete.

The concrete must remain in the box for a week or more until it has set thoroughly hard, after which it may be removed and placed upon the top of the column, first covering the latter with a thick bed of mortar. When placing the slab, it is important to get a uniform overhang on all sides of the shaft, and to lay the slab flat on top of the brickwork The slab should immediately be levelled up, by laying a large spirit level diagonally across it., first from one side and then the other. as depicted in Fig. 5, tapping the upper surface of the slab and gradually working it home until it is quite level. It is highly important that the capstone should be perfectly level. The dial itself should be procured before dealing with the capstone, so that the correct position of the wooden fixing blocks can be determined. In the case of a brick or stone capping, lead or hardwood plugs are inserted for the fixing screws Leave the plugs full
.


Pig; 6. courlesy of Francis Barlier \& Sons, Ltd
clock, at XII o'clock noon. Mean time is that shown by clocks generally, the day of 24 hours being obtained by taking the average of all the solar days of the year. Place the dial upon the platform and move it about until the shadow cast by the gnomon on the dial shows the correct time within a few minutes.
To read the time by sundial, stand on its north side. The forenoon or morning hours will then be on the right-hand side of the dial, whilst the afternoon hours will be on the left. At noon the shadow of the gnomon will fall within the space between the two lines at XII o'clock.

When the dial is in the correct position mark the platform or capstone through the holes in the dial for the fixing screws. Finally adjust and fix the dial at XII o'clock noon. Of course it can be fixed at other times, but XII is the best As before mentioned, the sundial and clorek coincide only four times in a year, about April lis, June i4, Aug. 31, and Dec. 25, and it will be found convenient to lix the dial on or near one of these days. provided that the sun is shining
Set a watch to the mean time of the place where the sundial is to be tived, and ascertain on the day the sundia! is lixed the difference between mean and solar time. Say the dial is to be fixed on April 10-the watch having previously been set to the correct mean time of the place, by adding the difference fast or slow of Greenwish-it will be seen that the watch is faster than the time shown on the sundial by 1 min Move the dial about on its platform until the space between the two lines at XII o'clock is filled with the shadow cast by the gnomon and the watch shows exactly 1 min . past XII o'clook. When correct, firmly serew the dia! to its platform.

If the dia! is lixed during the period in which summer time is in force. it must be remem bered to make the necessary allowance

SUNFLOWER. There are both annual and perennial sunflowers of considerable value in the garden. The latter plants llourish in ordinary soil and spread rapidly. They ought to be lifted, separated into small pieces, and replanted every autumin to keep them under control. Some of the best are multiflorus, 4 ft .; rigidus and its variety, Miss Mcllish, 6 ft . ; Golden Monarch, (i-8 ft.; and Solcil d'Or, double, 4 ft .
The annual suntlower (Helianthus annuus), which bears enormous circular flowers on stems, 6 to 8 ft . high, is a familiar plant in

cottage gardens, but the newer sorts, 3 or 4 ft high, with smaller yellow and reddish flowers which are morc valuable, are less grown. The annual sunflowers are raised from seeds sown in spring. See Prairic Sunflower.

Sunlight: In Medicine. See Heat Stroke Light; Rickets; Tuberculosis.

SUNROSE. This is the popular name of a group of low-growing, hardy flowering slirubs known as helianthemum. The Howers are white, yellow, red, pink or crimson, throughout spring and summer. They like sunny banks, borders, or rock gardens, and are raised from seed sown in springtime or by cuttings in summer.

Sunstroke. Sec Heat Stroke.

## SUPERHETERODYNE RECEIVER

This is a wireless recciver based upon the principle of beat reception. The oscillations fromi a local oscillating valve are superimposed upon the carrier-wave frequency to which the receiver is tuncd, and the beat
frequency so formed is then rectified and passed through an intermediate frequency amplifier. The frequency to which the intermediate amplifier is adjusted is constant and is always equal to the beat frequency The amplified signals are then rectified by a second detector and either applied directly to a pair of telephones or further amplified by a low-frequency magnifier to a strength sufficient to operate a loud speaker.
Superheterodyne receivers are normally used in conjunction with a frame aeria!. and are highly sensitive and selective. When the local oscillations are applied to the grid circuit of the first detector, a superheterodyne should not be connected to an outdoor or indoor aerial of conventional type, because of the danger of interference with neighbouring sets. For each frequency (wave-length) to which the frame aerial tuning condenser is adjusted there are two settings on the oscillator condenser which give the desired beat frequency. In practice either of these settings may be used.

One of the difficulties in the design of a superheterodyne receiver is in the choice of an intermediate frequency or wave-length which will ensure frecdon from continuous-wave and other transmissions that may cause inter ference. It is usual to screen the intermediate frequency transformers in order to prevent the direct pick-up of long-wave transmissions

A high-frequency amplifier operating at the fundamental frequency may precede the lirst detector and will give still greater selectivity and sensitivity, but this complicates the design and increases the number of valves. The conventional arrangement, comprising first detector, oscillator, screen-grid intermediate frequency amplifier, second detector and low-frequency magnifier provides all the amplification necessary for normal broad cast reception. Sec Heterodync.

SUPERPHOSPHATE. In garden parlance this is the valuable manurial preparation superphosphate of lime. It is obtainable in three qualities, viz., ordinary, containing about 25 per cent soluble phosphates concentrated, embodying up to 45 per cent. of the same essential plant food; and double. a grade in which soluble phosphates as high as 80 per cent often appear. For ordinary


Sunflower. Left, dark-centred blooms of the common annual sunflower. Right, double perennial variety
suitable. The concentrated may be used for more exacting culture, but for special classes or specimen plants the double grade is best.

As superphosphate contains only phosphoric acid, other essential plant foods must be supplied by using potash and nitrogenous manures, and when used in suitable quantities the mixture gives the best results on general crops in most soils. A good average quantity to use is 2 to 3 oz . per sq. yd. Unless required for immediate use superphosphate should not be combined with nitrate of soda; and it is not advisable to apply it to acid soil. See Manure.
SUPPER. In many households where a hot dinner is cooked in the middle of the day, and usually on Sundays, supper is served in the evening in place of a more formal meal. Except in warm weather, when all cold food may be preferred, soup and a hot fish or savoury dish are generally liked, with a cold joint, meat pic or galantine and a salad on a table or sideboard for those who want a more solid meal. Any cold sweet, such as a jelly, stewed fruit and custard, blancmange or pastry, is suitable for supper, with cheese and biscuits to follow, unless the savoury chosen contains cheese. Coffce is sometimes liked, or the usual cold family beverages.
Entertainment suppers are nearly always cold, unless hot soup in cups is served, or there are facilities for cooking special hot dishes as required. Mayonnaises, game, poultry, galantines and terrines, salads, cold savouries such as stuffed olives or caviare prawn croûtons (see page 208), creams, fruit jellies and other sweets, all kinds of ices and every variety of dessert are suitable refreshments. When served at a big party, the dishes are placed down the length of the tables in the dining room in order that the guests may help themselves, servants, or waiters engaged for the occasion, standing behind the table to assist as required. Cocktails may be a feature at the opening of the party. Champagne and other wines are provided at a smart supper, and various cups, other iced drinks, and hot coffec.

Where a number of guests are entertained and the staff is small, the buffets and tables should be well arranged so that many people can help themselves at the same time without a scramble. A good idea is to have all the cutlery laid out on a first table with plates piled in their respective sizes. The guests take what they require and proceed to the buffet where the food is laid out within easy reach. J)rinks and glasses are placed on another table, and service is further facilitated if there are a number of small tables and chairs placed well apart from the buffet to which people may retire to eat what they have chosen.
Small Suppers. More ințimatȩ, sit-down suppers for a small number of guests may be given after a theatre or on a Sunday evening. A prettily decorated table is an important factor. A summer supper for such a party might consist of grape fruit, salmon mayonnaise, galantine of chicken, cold veal and ham pie, strawberry trifle, meringues filled with ice cream, hock or cider cup. A winter menu could consist of soup, oyster patties, hot cutlets and vcgetables, or salmis of game or chicken en casserole, with some cold meat dish and celery salad, little fruit jellies and cheese straws. Any cold savoury or sweet should be prettily decorated and arranged on a suitable dish.

A chafing dish is an admirable aid at such a party, as it enables the hostess to cook a varicty of appetizing little dishes at the table. Omelettes of any kind, various fricassées, scrambled eggs with anchovies laid across the top, and other savouries can be ready in a few minutes. If food has been prepared and cooked beforehand it can be kept hot on a food warmer, the necessary heat being supplied
through a flexible tube connected to a gas point. An electrical contrivance is a table cooker which can be put over a large plate on which has been previously placed the sausages, cutlets or anything else of the kind which it is desired to cook. The current is then switched on to cook the food. When done, the food can be left under the cooker to keep hot for some time after the current has been switched off. The cooker can afterwards be inverted to stand on its insulated feet and the hostess can then boil a kettle on it for coffee.

Every evening suppers for children should be light. Party suppers-except for quite small children, when the simplest of the suitable dishes are usually selected-are served on the same lines, without the wines but with claret cup and iced drinks, as are those at grown-up entertainments. See Chafing Dish; Cocktail; Salad; Sandwich; Table Laying.

SURNAME. A surname is the name which a person has or adopts in addition to his Christian name which was given to him at his christening or which he was registered as possessing. Anybody may adopt any surname he pleases without permission, except an alien, who may not change his surname without the leave of the Home Office.
Nobody has any right to adopt a surname with intent to deceive. If he does, the true owner of the name, if able to prove damage or likelihood of damage to himself or his busi ness, may obtain an injunction. See Name: Naturalization.
SURTAX. This is an additional income tax, and in Great Britain is levied on all incomes, whether carned or unearned, that are in excess of $£ 2,000$ a year. In estimating the total income of an individual for purposes of surtax, the amount taken is the full gross amount of the income without any deductions for earned income and other abatements, and before deduction of income tax proper. This means that a man with an income of $£ 2,100$ must pay surtax, although, owing to allowances, he is only liable to pay income tax proper on perhaps $£ 1,700$.
The rates of tax as revised in 1930 arc given below. To obtain the total amount due 10 per cent must be added, this being the increase levied in the budget of Sept., 1931.


Thus a man with $£ 7,500$ a
ycar pays £859 7s. 6d., made up as follows


See Income Tax
SUSSEX FOWL. The most popular fowl among British poultry breeders is the Sussex, and it has gained its position by sheer merit. Sussex fowls have secured the chief awards in the dead table-fowl classes at the Dairy and Smithfield shows and in the principal laying competitions. There are four colours in this breed-light, red, speckled, and brown. The first-named are the most popular among both utility breeders and exhibitors. The browns
are the largest of all, and with the speckleds are held in great esteem by those who breed and fatten for the market.
Sussex are large-bodied birds, broad in back and deep in breast, very white in skin and flesh, and carry an abundance of fine quality white meat. The hens are good winter layers and careful mothers; the chicks are hardy and grow quickly. Full-grown males weigh from 8 lb . to $10 \mathrm{lb} .$, hens 6 lb . to 8 lb. , the browns generally going 1 lb . or 2 lb . hcavier. The eggs are brown and average 8 or 9 to I lb . See Fowl ; Poultry.

SUSSEX PIE. To make this, take 2 oz. sultanas, 2 oz . currants, 3 oz sugar, 8 oz . cooked apples, and a pinch each of cinnamon and mixed spices. Make a little short-crust pastry and line a pie-dish with it. Having washed the sultanas and currants, put them, with the apples, sugar, cinnamon, and spice, into the dish, cover it with pastry, and bake it in a moderate oven for an hour. See Pastry.

SUSSEX WARE. The mellow charm of the hand made roofing tiles and flower-pots of unglazed red earthenware for which Sussex is famed is due to centuries of traditional skill working with good material. There can be no doubt that, since at least as far back as the coming of the Huguenot refugees, domestic utensils also were produced in the neighbourhood of the coast ports. These were wrought with mixtures of the fine, light, local clays. and 18th-century examples may be found here and there, although they arc not easy to identify, because they are generally undated and unmarked.

A ware of a semi-faience type, which has a red body covered with tiny stamped ornaments embedded in a white slip and leadglazed, was made at Chailey and Rye in various small potteries for about half a century after 1793, and comprised pipkins, pitchers, flasks, stands and other useful forms. More than 100 years ago a factory was established at Crowborough for the production of glazed and unglazed brown crockery, including the Sussex pig used for rural wedding toasts.
After the mid-Victorian art revival attention was turned, both here and in Rye, to more ambitious forms, such as jugs and vases, candlesticks, and other decorative objects. Upon these foliage was moulded in simple, natural designs and covered with a brilliant brown or green glaze, not unlike that of some Devon ware, and sometimes rivalling old Rockingham in effect. Cream-coloured clạ!s


Sussex Fowl. A typical speckled cockerel Courtesy of the roultry World
were uscd for basketwork and other styles of greater delicacy, and out of this industry has arisen a distinctive type of art pottery known as rustic wasc. See Pottery.

SWAG. In fur. niture a swag is a garland or fostoon suspended between two points. It was used liy the Arlam brothers and thoir successors on carvel, inlaid, and painted pieces of furniture, and is scen a great deal in all kinds of decorations of the latter part of the 18th century. Many chair backs by Hepplewhite and Sheraton have sw time. See Adlam Style; Queen Anne Style.
SWAGE. When linishing iron while it is hot blacksmiths use $\Omega$ tool known as a swage. There are several forms, but essentiplly they all consist of $\Omega$ form of hammer head or some other face which has a $\frac{1}{2}$-round groove across it. Swages are gencrally used in pairs. Onc, known as the botiom tool, has a shank which fits into a hole made for that purpose in the anvil. The uppler tool is held with an iron rod handle, which is grasped by the smith in the right hand while the work to be swaged or rounded is held in the left hand
The metal is brought up to its proper heat, and roughly rounded by hammering in the ordinary way, somewhat as described in the article on forging (q.v.). After this treatment it is reheatel. if necessary, and rested in the groove in the bottom tool. The top tool is then placed into position on the upper side of the worl:, and an assistant strikes the top too a heavy blow with a sleclge or other hammer, according to the size of the work. At the same time the smith partially revolves the metal between each hammer blow, thus ultimately rounding off the metal and work. ing it up to a smooth surface. If carefully done, tolerably good rods can be obtained.

Instead of using the botton tool, a large rectangular block is often utilized which has grooves across its cdges. It is lonown as a swage block.
SWALLOW WORT. The colan. dine (Chelidonium majus) has been given this name because its Howers open about the time when the swallow arrives, and the drying-up of the plant takes place vhen the bird is departing for warmer climes. It is useful for shady garden comers.

It has an old reputa. tion as a cure for warts, and as a remedy for scorbutic eruptions.

SWANSDOWN. Because of its extreme softness the down or under plumage of the

Sheraton have swags, and swags are also a the water until it is clean, and requent ornament on painted tables of that the fire, shaking it all the time to

Swansea Ware. Bough-pot of "apaque porcelain," a species of white earthenware. with a painted design of birds and foliage

swan is the most popular minterial for powder pulls. but it is also used for trimnling purposes on dressing gowns and jackets and on babies honnets. It can be hought in white and pale colours and is obtainable in picces of a suitable size for puffs or as a trimming by the yard in narrow strips.

Swansdown should be washed in warm soapy water. The lather is hest produced with soap iclly; for, like many other delicate materials, swansdown suffers if rubled with soap. Squecze it gently in the firc, shaking it all the time to restore its original Iluffiness.

SWANSEA WARE. All linds of pottery and soft paste porcelain fabrics were produced at Swansea for more than a century down to 1870. During the 18 th century the styles included salt-glaze, cream ware, black basaltes, gold and ruby lustre, and printed ware, which was done both in dark and in light bluc, and also in both black and brown.

A so-called opaque porcelain or china decorated with tine bird and flower paintings is highly prized by collectors. This opaque china is not true porcelain but a fine whitc carthenware fabric. An example is illustrated of a bough-pot with a beautifully painted floral pattern. A bough pot was $\Omega$ vase originally intended to hold llowering hougha, and the term is also speit bow-pot and used for a pot on which a floral design was painted.
For a few years a translucent porcclain was made. The decorations resemble those of contemporary Staffordshire fabrics, but the body contained no felspar, and was consequently very soft. Later on the paste used was llarker, at first with a grcenish tinge, and afterwards a dead-white glaze.
Some of the pieces decorated at Swansea by Nantgariv painters were marked Nantgarw. At a second factory, established at the same time, cow milk-jugs and milkmaid figures were
$\square$
turned out and exported in large quantitics to France. Etruscan ware, so marked, was minde of a local red clay, with classical figures in enamel colours. Another factory turned out useful services in pure white.

It was at Siwansea that the Cambrian ware was produced. The usual mark, stamped or stencilled, comprised one or two tridents, with the place-name and sometimes the potter's name, such as Dillwyn \& Co., or Bevington \& Co. Pottery is still made in the neighbour hood of Swansea. See Cambrian Ware.

Sweat. S'ee Perspiration.
SWEATER. This heavy type of jersey is made in various sizes both for men and boys, the chest measurement being the usual standard. Sweaters are made as a rule of white wool, but sometimes colour is introduced at the neck and as a border. Sweaters in variegated colours are occasionally seen and they are made with club or regimental colours at neck, wrists and waist. These are worn by members of cricket and football clubs. As regards pattern, some are made with a collar and some without. The collar may be of the roll or turn-down variety.

The knitted garment known as the pullover is a kind of sweater. This is worn by men and boys and is sold in a variety of coloars. Most of them have two pockets, some have a decoration around the neck and elsewhere, while others are quite plain. They are also made in check patterns in two colour mixtures, in three colour stripes, and in other patterns. Stockings to match may be knitted, or are sold with many of these garments.

How to Knit. To knit a useful, standard type sweater with a V-shaped neck the requisites are 18 oz . of Beehive fleecy wool, two No. 7 and four No. 10 bone knitting needles, pointerl at both ends. The garment should be worlied at a tension to produce about 5 stitches and $7!$ rows to the inch measured over the plain portion. lior the back, cast 96 stitches on the No. 7 necdles. lst row: Knit 4, * purl 2 . knit $\because$. Repeat from * to the end of the row, always slipping the first stitch through out. Repieat this row 20 times. 22nd row Knit plain. 23rd row : Knit 2, purl to the last 2 stitches and knit 2 . Repeat these last 2 rows until the work measures 30 in . from the beginning. Cast off $\geq 6$ stitches at each end and leave the 44 stitches at the centre on p No. 10 needle.

The front should be worked exactly like the back until it measures 22 in ., finishing with a purl row. Then begin to shape the neck as follows: lst row: Knit 45 and then turn. Leave the remaining stitches for the sccond half of the neek. Continue in the pattern, decreasing once at the neck end of the needle in every third row until only 36 stitches remain; then cast off. Taking the needln where the stitchos are left, slip the first 6 stitches, at the centre of the front, on to a No. 10 needle, and, on the remaining stitches, knit the second half of the neck to correspond with the first.

To make the sleeves, cast on 76 stitches. 1st row : Knit 4,* purl 2, and knit 2. Repeat from * to the end of the row. Repeat this row 30 times. 32nd row: K nit plain. 33rd row : Kinit 2, pur! for the last $\underline{(2}$ stitches and knit 2. Repeat these last two rows throughout the sleeve and increase at the beginning and end of the 7th, then every following (ith row until there are 7 increasings at each side of the work. Then knit without shaping until the underarm seam measures 18 in . without the cuff and cast off loosely. To make up the sweater, press each of the pieces carcfully. Sew up the shoulder and side seams, leaving 9 in . for the armiholes. Sew up the seams of the sleeves and then fix these latter in the armiholes, placing seam to seam.

To make the collar, with the No. 10 needles knit the 44 stitches that were left at the back


Swede. 1. Soil preparation : bottom apit broken and manured (a). 2. Raised drills (a) for sowing. 3. First thinning. 4. Second thinning. 5. Final thinning 6. Swedes prepared for storing by wrenching off tops (a) and cutting of tap-roots (b). 7. Properly prepared clamp: a, sand: b, soil: c. straw : 8. 8 wedes covered with fine ashes ( $a$ ), through which green tops sprout "!/ special arrangement with Amateur ciardeming
with melted butter sauce.

To serve swedes mashed, boil them in the same way, then rub them through a sieve. Empty the saucepan of water and put into it a piece of butter the size of a walnut. When this is melted stir in a little flour then, before it browns, add the mashed swede, well seasoned with salt and pepper. Stir this a minute or two, and it is then ready to serve. See Sauce Turnip.

SWEEP. When chimneys require sweeping the sweep should be notified some days beforehand, especially in the spring, when he is in much demand.
of the neck. Follow on with a second needle. It is usually found most convenient to select and knit up 29 stitehes at the side of the an early hour, and to make the necessary neck and 3 stitches off the extra needlc. With preparations overnight. The sweep often a third needle knit the next 3 stitches and knit up 29 stitches at the other side of the neck. Knit 16 rounds in rib of knit 2 and purl 2, increasing 4 stitches in the first round at the centre of each of the second and third ncedles. Cast off loosely. The collar can be made to look very effective by introducing stripes of a scond colour. See Knitting; Wool.

Sweating : Of Metals. See Soldering.
SWEATING POWDER. In commencing colds and other feverish disorders 5 or 10 gr . of Dover's powder may cause more or less profuse perspiration, and thus diminish the fever. This may sometimes bring the malady to an end. The best time to take such a powder for a cold is at bedtime, and great care should be excrcised next day to avoid exposure. Other drugs, such as phenacetin, antipyrin, and antifebrin, also act as sweating powders and reduce temperature, but they are not safe remedies for this purpose, on account of their deprcssing action on the heart. See Fever.

SWEDE. The Swcdish turnip has been generally accepted as a farm crop, but its value as a winter vegetable is now recognized, and seedsmen offer selected strains suitable for srowing in the vegetable plot. Its cul. ture is the same as for turnips, but owing to stronger growth rows should be 18 in. apart, keeping the soil well hoed and free from weeds rluring summer.

How to Cook. As a vegetable the swede is usually boiled in the same way as ordinary turnips, after being peeled and cut into quarters or smaller pieces. These are put into a saucepan of hot salted water and allowed to boil until tender, which may take anything from 30-60 min. Serve in a tureen, covered


Swede. Fine roots of this variety of turnip, a useful winter vegetable

They must now be wiped and pressed between two plates, as pressing them will improve the shape and give greater facilities for neat dishing.
To roast sweetbreads, take a pair of calf's sweetbreads and prepare them according to the foregoing directions, then brush them over with beaten egg and roll them in seasoned breadcrumbs. Have ready melted in a sauce pan 1 oz. butter, and sprinkle this over the coating of crumbs, then roll the sweetbreads in breadcrumbs a second time. Put them into a baking tin in which 2 oz . butter have bcen melted, and place them to roast in a moderate oven. They will take 30 min . to cook, and must be basted frequently with the butter in the pan. Jish them up garnished with fried parsley, and serve with them a good white or béchamel sauce.
Another entrée may be made by the follow ing recipe : Prepare a pair of calf's swectbread and cut them in rather thick slices. Put these in a stewpan and just cover them with white stock. Add scasoning of salt and cayenne and sprinkle in a little powdered mace. Add 2 oz . butter and a wineglass of sherry, also l teaspoonful lemon juice. Stew very gently till the slices are cooked, then beat up the yolks of 4 cggs with a nother glas of sherry or $\frac{1}{2}$ gill cream. Add these to the contents of the saucepan and stir over the fire till the whole thickens without letting it boil. Serve very hot garnished with a border of cooked green peas, and just before sending to table squeeze over the strained juice of an orange.

Sweetbread Fricassée. A very good fricasséc can be made with either calf's or lamb's sweetbread. If calf's breads are used procure 1 pair; if lamb's breads, buy fron $\frac{3}{4} \mathrm{lb}$. to 1 lb . Prepare the breads by soaking parboiling, and pressing, then cut them into neat slices. Have ready 1 pint white stock, add 1 onion, 1 carrot, and a bouquet garni The onion and carrot must have been prepared and cut up small. Stew the swcetbread in this for 20 min
Meanwhile melt 2 oz. butter, add $1 \frac{1}{2}$ oz. Hour, and cook together without browning for 4 min . Remove the slices of sweetbreads from the stock in which they were cooked, then strain it, and add it by degrees to the white roux in the pan. Make it into a smooth sauce, then whiten it with a liaison of 1 gill cream, or milk and cream mixed, and the yolks of 3 eggs beaten together. The sauce must not be allowed to come to the boil after the eggs are added. Mix in the slices of sweet bread, scason to taste, add a pinch of powdered mace and 1 teaspoonful lemon juice, and serve garnished with croûtons of fine bread and small rolls of fried bacon.

If no stock is available, cook the pieces of swectbread in water, and in another pan put I pint milk with a prepared and sliced onion and carrot, a bouquet garni, and scasoning Stew these gently while the sweetbreads are cooking, and then strain the milk and use it for making the sauce in place of stock.
Sweetbread Fritters. Lamb's sweetbreads make excellent fritters. First prepare them as already directed, then cook them in a little stock or milk, well Havoured with vegetable and seasoned. Then cut them in slices about $\frac{3}{4}$ in. thick, dip each piece in a very light batter, and fry them a golden brown in deep fat 1)rain well, and garnish with fried parsley.

Sweetbread Omelette. To prepare this. make a plain omelette according to the directions given under the heading omelette, and before folding it over put some sweetbread, broken into small pieces and reheated in a little béchamel sauce, in the centre. Serve at once in a hot dish. See Sauce.

SWEET BRIAR. Flowering in June, rose pink in colour, with brilliant red berries in winter, the sweet briar or eglantine is


Sweet Briar. Beautitul delicate pink single blossoms of the fragrant Penzance briar
noted for the spicy fragrance of its leaves. The perfume emanates from the glandular hairs on the underside of the serrate leaflets and is particularly fragrant after rain. Botanically the plant is Rosa rubiginosa,
The sweet briar grows wild in the challs hills and heaths of S. England as well ns in scotland and Ireland. It forms a delightful herlge for an inner garden. The beautiful large-llowered Penzance briars were raised by cross-breeding between the sweet briar aid other roses. See Rose.

SWEET CHESTNUT. This is an altermative description for the Spanish chestnut. The chestnut wool used for furniture and other articles is obtained from this tree, not from the horse chestnut, and the same tree produces the nuts which are the chestnuts used for food. See Chestnut; Spanish Chestnut.

SWEET CICELY. This plant is a species of myrrh native to England, known botanically as Myrrhis odorata. It is a fragrant perennial herb, with graceful feathery foliage and large umbels of creamy Howers. Ordinary soil in any position suits it, and if planted during spring or autumn it will thrive in the shrubbery or wild garden.

SWEET GUM. The hardy, summerleafing tree that is known as swect gum or liyuirlambar has handsome, lobed, maple-like leares that assume a brilliant colour in autumn. The kind best suited to gardens in this rountry is Liquidambar styraciflua. It thrives in ordi.
nary soil and is increased by seeds or layers. The swect gum tree attains a height of 50 ft .

SWEET HERB. Parsley, bay leaves, marjoram, thyme, sage, savory, mint, and basil are the sweet herbs most frequently used in cookery. When, as in recipes for stews, etc., the use of a bunch of sweet herbs is recommended, only the first four, tied together with the parsley on the outside, are usually chosen. Sweet lerbs can be used fresh from the garden, dried and stored at lome, or purchased in packets and bottles. See Mint; Sage ; Thyme.

SWEET MARJORAM. This is the culinary herb botanically known as Origanum majorana. The common marjoram, Origanum vulgare, is correspondingly fragrant, and is greatly favoured as a bee flower. Swcet marjoram thrives in rach soil where the position is sunny. Shoots for drying may be gathered just when they are a modern frilled variety they are coming into flowe dictamnus, which bears pink hop. Origanum sary to protect them from birds by means and is known as pink phow號, is a very pretty through the soil.
SWEET PEA. This is the See Marjoram. Some of the most beautiful modern varieties
SWEET PEA. This is the loveliest of all are the following: Model, white; What Joy, hardy annual flowers and a great favourite for cream; Valentine, blush; Pinkie pink: cutting. It is grown in immense quantities Mrs. A. Scarles, cerise; Youth, white with for market, and is an ideal Hower for amateur pink edge; Magnet, cream-pink; Blue Bird, gardeners. If well grown it will yicld four- purplish-bluc; Warrior, maroon; Huntsman, bloom stems throughout many weeks. In scarlet; Mammoth, orange scarlet; Sextet recent years numerous beautiful varictics Queen, white; Gleneagles, lavender; Wemwith frilled Howers of delightful colouring have been raised.

Seeds are sown in pots or hoxes in a frame during October, or in a slightly heated greenhouse in January. Juring the cold weather the seedlings need only to be kept safe from


Sweet Peas. 1. Sowing in matchbox: end removed at a. 2. Inner box with seedling ready for planting out. 3. Large boz with removable divisions ( $a$. a) for sowing. 4. Strips of turf (grass downward) for use in same, showing seedlings lifted and ready for planting. 5. Seed grown in eggshell : drainage bole at $a$. 6. Sowing seed in large pot. 7. How to place supports. 8. Ideal compost for sweet-pea seedlings

off; this causes fresh basal shoots to develop which will produce fincr flowers than the original stem would have done.
After having been well hardened the plants are set out late in March or early April in soil that was dug deeply and manured in winter. To ensure longstemmed blooms and four on each stem the plants must be set at 8 or 9 in . apart and restricted to one stem (unusually vigorous sorts to two stems), all side shoots being rubbed off. Each plant is ticd to a tall bamboo cane.
For ordinary garden decoration seeds are sown out of doors in late February or March at 2 to 3 in. apart, and the seedlings should be thinned out to 4 to 6 in . from each other. The seedlings must be supported by twiggy stick. as soon as they are well through the soil, and subsequently by ordinary pea sticks. It is usually neces-
outer skin, slice and toss in butter or mash and fry in doat hot fag and breadcrumbs with butter, season and serve hot. They can be boiled as ordinary potatoes.

Sweet Potato Fritters Pecl, boil and mash 1 lb . potatoes, add to them 2 oz . warmed butter, 2 tablespoonfuls flour, 3 eggs, and a little salt. Mix stiffly and form into round,
sprinkle with castor sugar and powdered cinnamon. Serve hot as a sweet.
SWEET ROCKET. The o!d-fashioned hardy perennial plant Hesperis is also known as rocket, dame's rocket, double rocket ans dame's violet. See Rocket.

## Sweets and Sweet Making

## Recipes for Some of the Most Popular and Wholesome Kinds

In connexion with this general article on candied sweets are those on the two important confectionery sections of Chocolate Making and Toffee. There are as well supplementary articles in our work, e.g. Almond Rock; Fondant; Fudge; Marsh Mallow; Nougat, etc. See also Browning; Crystallized Fruit; Essence ; Icing; Sugar ; Syrup; Vanilla

The word sweets, or candies, is used to In boiling sugar strict cleanliness is essential describe a great variety of small confections in which boiled sugar is the main ingredient. The materials include flavouring agents such as almond, peppermint lemon, and coconut, while use is also made of fruit juices and nuts. Colouring matter, which in the case of the cheaper swects may be injurious, is employed. One large group of confections falls into the class known as chocolates (dealt with under the heading Chocolate Making) ; others may be classed in a number of ways, such as toffees, fudges, nougats, fondants, fruit jellies, etc.
Sweets should not be given just before meals, or they may spoil the appetite for plainer, but very necessary, forms of food. It is not a good plan to give children sweets just before going to sleep, for the reason that the sugar clings to the mouth throughout the night and encourages the growth of bacteria which may damage the teeth.
It is necessary to add that there is one type of child from which sweets should be withheld, or at most given very sparingly, and that is the fat, flabby child showing a tendency to eczema. Again, if a child exhibits a capricious appetite or suffers from indigestion, a doctor's advice should be obtained as to the propriety of allowing sweets. The sweets given to any child should be of the purest quality.
Outfit for Sweet Making. Very little initial outlay is involved in making sweets at home. All that is required to start with is 2 or 3 pans sufficiently deep to boil the requisite amount of sugar, a stirrer or spatula (these may be had in various sizes in wood and metal, and are flat-shaped without a spoon-bowl), a few shallow dishes or tins into which to pour the finished confection, a sugar-boiling thermometer graduated to 400 deg ., a small marble slab, and a pulling hook for rock making.
In the trade, copper pans are mostly used, owing to their high conductivity of heat, but quite good results can be got with aluminium pans. Do not use enamelled ware, as the high temperature at which sweets are boiled may crack the enamel. Tin-lined copper pans should not be used as the tin may be melted during the process. A tin or aluminium scraper for cleaning the slab, an extra spatula or two, and a large pair of scissors will complete a good working outfit. For making moulded fondants it is a good plan to invest in a rubber fondant mat. Small rings can also be obtained for peppermint creams, and a dropper made of tin. The latter is shaped like a funnel with a band of copper round the nozzle end, and a stick to fit it, which is lifted for a fondant mixture to drop out in the quantity required to form each sweet. The stick is replaced and the dropper quickly moved to fill the next mould or ring.
Sugar Boiling. Only the best-grade sugar, gianulated or loaf, should be used. If inferior sugar is employed, there will be much scum during boiling, and a tendency for the batch to grain, i.e., to come back to its original state of crystallization. Any scum must be removed. Good sugar should show next to no scum, and should boil clear and sparkling.

In boiling sugar strict cleanliness is essential. The pan should be well scoured, and all utensils carefully washed. Place sugar in the pan at the rate of 4 lb . to every pint of water. This will be found thick enough in consistency for most sweets, but a rather larger proportion of sugar is allowed for fondant mixtures by some sweet makers who use 4 lb . sugar to $\frac{3}{4}$ pint of water.

Wash down the sides of the pan with a small brush to remove all adhering sugar, and set the pan and its contents over a very low fire so that the sugar will melt slowly and com. pletely. Now bring it quickly to boiling-point. remove it from the fire, carefully stir in cream of tartar or glucose, as in the recipes, wash down the sides as before, and place the pan once more with the lid on over a quick fire or gas-ring. The lid should be kept on for about 10 min ., so that the steam may thoroughly wash down any adhering crystals. Remove the lid, insert the thermometer gently. Too much importance cannot be attached to the necessity of removing any scum during the boiling process, but there must be no movement of the pan after boiling point has been reached. The more rapid the boiling after the sugar has dissolved the better will be the quality of the sweets.

Before inserting the thermometer, it should be warmed in hot water and not put directly into the boiling syrup; then leave the thermometer undisturbed in the syrup until the temperature reaches 240 deg ., if the sugar is required for fondants or similar sweets. A slightly higher degree is necessary for tablets. At 310 deg. if a little sugar is withdrawn and dipped into cold water it turns quite hard, and cracks between the teeth with a snap without sticking. This is the highest degree advisable to attempt. It is known as the crack. the degree for all hard sweets and rocks.

When the sugar has reached the desired degree, take the pan carefully off the fire. The thermometer should be removed and gently

placed in a jug of hot water. The syrup is left to become per fectly still and the air bubbles must cease before proceeding with the sweet making.
Flavouring and Colouring. Next after sugar in importance come flavour and colour. These must be carefully chosen, for,


Sweets. Fig. 1. Coconut Iee, made with a fordint mixture and desiocated coconut. Fig. 2. Coconnt
other things being equal, they determine the quality and attractiveness of the sweets. Both colour and flavour should be very delicate for creams and bonbons. It gives them an unprofessional appearance to be over-coloured, and too much flavour is out of character. Essences and essential oils are the chief flavouring ingredients. The former are not satisfactory unless highly concentrated, so that those specially prepared for sweet making must be used.

Essential oils are most suitable for highboiled candies, but there are many inferior makes on the market, and only the more expensive brands should be used. Cheap essen tial oils are very impure, require a larger quantity than the better grades to flavour the sugar, and leave a harsh, unpleasant taste in the mouth. Special colours in all shades are prepared and, like the flavours, can be purchased from any bakers' sundriesmen, or in a good grocery department.
Sweets with a Fondant Basis. In a large class of swects the basis is fondant. Take 2 lb . best granulated sugar, put it in a clean aluminium saucepan and add $\frac{1}{2}$ pint cold water. Proceed as directed for sugar boiling, adding 1 dessertspoonful warm liquid glucose to the boiling syrup, stirring it well, and replace over the fire. Do not allow the flames to come up the side of the pan, but keep the heat well below. When the syrup has reached the temperature 240 deg . remove the pan from the fire, take out the thermometer and allow the syrup to settle, and then gently pour it in a thin sheet on to the marble slab, previously wetted with cold water. Sprinkle the fondant with a little cold water and allow it to cool slightly. In hot weather this takes several minutes; in cold the mass will require creaming almost at once.

Scrape it into the middle with the scraper and then take a wooden spatula and work the sugar backwards and forwards. Hold the scraper in the left hand and the spatula in the right so that as the spatula works the scraper collects the spreading mixture. The syrup will gradually turn into a thick cream and then suddenly to a solid white mass. Experience is needed to get the exactly correct temperature at which to start creaming the syrup. If worked too hot it will cream easily, but the resultant fondant will be coarse If too cold, or with excess of glucose added to the syrup, it will be difficult to cream.

When required for immediate use, the fondant should be further kneaded on the slab with the hands until quite free from lumps and a smooth, creamy mass. Fondant made in this way will keep for weeks if placed in an airtight jar and stood in a cool larder. The fondant should be left on the slab for 15 min . covered with a clean cloth before being put into the jar. It is really better when allowed to mellow for a day or two before being moulded or used as a basis for other sweets.

Where fondant has been stored it some times requires to be thinned down with boiled sugar syrup, and it is well to have some in stock if sweets are to be made often. To 2 lb . granulated sugar in a saucepan, add 1 pint cold water, $\frac{1}{2}$ teaspoonful cream of lartar and 1 dessertspoonful glucose. Boil as directed before but re move from the fire when the syrup reache; 220 deg. Pour it into an airtight jar and store for use.

Coconut Ice. For this sweet (Fig. 1), take 1 lb . fondant mixture and put it into a saucepan. Stand this in a larger pan of hot water and stir the fondant with a wooden
spatula. A few drops of the thinning syrup may be added, butcare must be taken not to get the fondant too thin. Continue stirring until it is the consistency of thick cream, divide it into two equal portions, and colour one pink by adding a few drops of cochincal and kneading well in. Work into both portions on the slab enough desiccated coconut to make them fairly stiff. Avoid excess of coconut. Press out each piece to $\frac{1}{2}$ in thickness, and place pink over white. Place a weight on top and allow the cream to sit till firm, then cut it up into bars. For variety, lemon colour and flavour might be used instead of the pink. 'To make coconut kisses (Fig. 2) the mixture is rolled into little balls and left to cool.
Peppermint Creams. Care must be taken in melting the fondant for peppermint and other areams with this basis. It should be made just so hot that the linger cannot be kept in it for more than a second or two. If underheated, the sweets will not set properly; overheated. they will turn quite hard. When adding thinning syrup be guided by the condition of the fondant. In hot weather it will te inore creamy and easier to stir while being reheated; in winter a few extra drops of syrup will be required. Add favouring (colouring also when necessary) when the fondant is warmed through and the syrup has been thotoughly stirred into the mass with a wooden spatula For pepperinint creams add a fow drops essential oil of peppermint to $\frac{3}{4} \mathrm{lb}$. warm fondant mixture. This will be sufficient to fill 24 peppermint cream rings. (luickly pour the fondant into a "armed dropper, and till the rings one-third full. When cold turn each ring upside down and gently tap it and the cream will drop out.
Bonbons and Creams. The basis of a number of fancy bonbons is almond cream, which can be made thus: To 1 lb . warmed fondant Havoured with vanilla add 4 oz . ground almonds, working the latter in thoroughly. Variations are produced from this basis by adding chopped fruits, figs, dates, glaué cherries, or nuts, Barcelona, pistachio, etc.
Neapolitan creams are made by taking four equal portions of almond cream and colouzing one pink with cochineal. another with saffron,


Sweet 3. Fig. 3. Walnut creams, consisting of balls
of almond cream surmounted by balf walnuts
another with pale green or coffee colour. and leaving the fourth white. On to a piece of wased paper on a board press out a piece of the pink fondant to a square 1 in. thick, and then procced to place a square of the same size and thickness of each of the other coloured fondants on the top. Gently press them together. Take a sharp knife and cut the mass into strips. Use a sawing movement while cutting. The strips should be further cut into cubes. Almond cream may be used to stuff French plums or dates. The stone is removed, a roll of the cream neatly inserted, and the fruit pressed together. The almond cream may also be shaped into balls and half a shelled walnut placed on top, as illustrated in Fig. 3. Bonbons (Fig. 4) are made by dipping almond cream contres in fondant using a dipping fork. The tops may be decorated with lines, twirls, etc., or with split pistachios, angelica, or coloured sugar. The article on Chocolate may be consulted for further ideas on suitable centres for bonbons.

Moulded Fondants. To make prettily shaped fondants a rubber fondant mat is a good investment. The mats arc obtainable in several sizes. They must be used quite dry The slightest damp or remains of former fondants will prevent the new hatch of sweets from turning out properly. When the fondant has been reheated, thoroughly stirred, Havoured and coloured, as already described, pour it gently but quickly into the warmed dropper and till each impression or mould just level in the fondant mat. When cold the sweets come out easily if the mat is very slightly bent upwards. Should a sweet stick, remove it with a tiny spatula, but do not use that impression in the mat again if refilling the mat for the rest of the batch. The mat should be quite clean and diy to refill several times without washing if the fondant is of the right consistency and each sweet has come out of its impression cleanly After use the mat should be washed in warm water with a small brush, rinsed in several clean waters and dried on a rack over a low fire before putting a way. By means of the ends of two teaspoons fondants can be shaped. Take small portions of the hot fondant and drop them on the slab, quickly pressing the portions into shapes.

Tablets. Tablets may be made as follows : Boil 2 lb . sugar with $\frac{1}{2}$ pint water to $245^{\circ}$, stirring in a pinch of cream of tartar just when it reaches the boiling point. Allow it to settle for a minute or two after removal from the fire, add flavour and colour, and, with a meta spatula, vigorously rub sinall portions of the syrup against the sides of the pan, and stir these in till the whole becomes cloudy. This is called graining. Add desiccated coconut, almonds, walnuts, etc., as desired, then quickly pour into frames, previousl y lined with wased paper. An unlimited variety of tablets may le produced in this way (Fig. 5). Colours and flavours should harmonize.
For ginger tablet add finely chopped ginger, flavour with gingerine, and colour a light brown with kitchen browning (burnt sugar). For raspberry tablet flavour with raspberry essence and colour with carmine. For chocolate ta blet Ilavour with vanilla, colour with melted chocolate or with chocolate powder well stirred in. Chocolate macaroons are easily made. Cut up plain white coconut tablet into bars, dip these into melted chocolate, well thinned down with co:o-butter, and roll the bar in line desiccated coconut.

Mexican Kisses. The candy known as Mexican kissas is made from 3 breakfastcupfuls best Demerara sugar, 1 cupful milk, 1 lb . chopped walnuts, a piece of butter about the size of a hen's cgg, and I teaspoonful vanilla essence. Boil the milk and sugar together, then add the butter, and continue boiling until the mixture hardens slightly when tested in cold water. Reat the whole well for 3 min ., add the walnuts and ranilla, and beat the mixture again before turning it into a buttered tin. Mark it into squares before it cools.
Sweetmeat Jellies. The sweets that are known as jellies can be made at home and without the aid of special confectioner's tools if a plain cube shape is not objacted to. Two recipes are given, one for making them with gelatine and one in which agar agar or Japanese gelatine is used. This can be purchased at any of the large stores or at a chemist's.

in. 4. Honbons, tor wnicn various centres are dipped in fondant and the tops decorated with coloured surar, etc.

To make the jellies with plain gelatine take lb. any stoneless jam, I gill water, $\frac{1}{2} \mathrm{lb}$. loaf sugar, and $3 \frac{1}{4}$ oz. best leaf gelatine. ${ }^{2}$ Boil the jam with the sugar and water for a few minutes, then strain through a hair sieve. Return the mixture to the saucepan and add the gelatine, which should have been previously dissolved in 2 tablespoonfuls warm water. Boil up and skim, and if desired add colouring or extra flavouring. Pour the mixture into bright, shallow tins lined with wased paper and leave them all night. In the morning reverse the tins to release the jelly, and remove the paper by wetting it. Cut the jellies into small pieces. They look more attractive if rolled in granulated sugar.

To make jellies with the variety of gelatine known as agar agar soak $\frac{3}{4}$ oz. overnight, using 2 pints cold water. In the morning dissolve it over the fire by gentle heat and keep it warm while the syrup is being made. Put the sugar into a strong unlined pan with 1 pint cold water, let it melt, and then boil it till, on a little being dropped into cold water, it will break in a brittle manner, but it must not be coloured. Remove the pan from the fire and pour the gelatine into the sugar. Mix it well.
The jelly can now be flavoured and coloured as desired, or it can be divided and the flavour and the colouring can be varied. Procecd as


Fig. 5. Tablets, made from a boiled sugar ayrup. variously flavoured and coloured, and desiccated nuts
in the former recipe to mould. A large pinch of cream of tartar should be added to the sugarwhen at boiling-point.

Pulled Sugar. Sugar boiled beyond 250 d dg. and allowed to cool turns into a hard crystal. line mass. The addition of some acid substance, as cream of tartar, or of some non-crystallizable substance, like glucose, causes it to be very pliable while hot, and quite transparent when cold. The pliability of hot sugar is a very important point in the making of rocks, and the transparency is essential to appetizing boiled swects.
In pulling sugar for rock maling, a large metal hook, about ( 6 in . across, is used. It is fixed on a wall, level with the chin. The marble slab must be well greased with butter. The hook and a metal scraper or knife used to work the sugar should also be thoroughly greased. With the scraper gently fold over the edges of the inass, raise it a little at a time, and continue folding over towards the centre until the sugar mass is sausage-shaped and just cool enough to be held in the fingers. Before doing this, grease the hands or the sugar will stick. Keep the sugar as much as possible on the fingers and not on the palms of the hands. Fling it on the hook so that the sugar mass is suspended in the middle and drawn by its two ends towards the operator.

When pulled out several feet, the ends are placed together and held by the right hand. while the left is moved till only a foot or two below the hook and laid over the sugar. The left hand is then drawn downward so that the sugar forms an S , and almost simultaneously both are thrown towards the hook, so that the sugar is doubled over on itself. This is repeated over and over again until the requisite amount of pulling has been accomplished. The sugar will probably take about 15 min . to pull. During this process air is enfolded in the hot
sugar, which increases in volume and very perceptibly changes in colour, colourless sugar becoming snow-white, red changing to pink. and black-brown to cinnamon

Rock Making. The beginner must remember that in all rock making quick handling of the sugar is essential. If it cools too much and is difficult to work, heat it over a gas-ring. To make Edinburgh rock, take 2 lb . granulated sugar, $\frac{3}{4}$ pint water, and a good pinch of cream of tartar. Boil to 260 deg. and pour sugar on to the oiled slab. As it sets round the sides, turn these right over into the centre with the greased scraper or a palette knife, so that it will all cool evenly. Add colour and fla vour, fold the sugar over on itself once or twice, and pull it on the hook as already explained. When removed from the hook place it on a board well dusted with icing sugar, roll it into sausage shape, then pull it out to the thickness required and cut the strip into suitable lengths, and let them lie for a day or two to granulate.

Peppermint Rock. Plain peppermint rock may be made with $3 \frac{1}{2} \mathrm{lb}$. white sugar, $\frac{3}{3} \mathrm{lb}$. glucose, 1 pint water, a few drops of oil of peppermint. Boil to 310 deg., the crack degree. Pour sugar on the oiled slab and turn in the edges as it cools. Sprinkle over it 2 or 3 drops of peppermint. When fairly firm, but still very hot, pull the sugar over the hook till it has a white satin-like appearance. Knead it up a little on the slab, make it into a thick sausage, then set it on end and pull it out into rope-like strands. Keep rolling these till they firm up, or cut them with a pair of scissors into short lengths.
For striped peppermint rock (Fig 6), boil up the sugar as before. Have a little red colour powder made up with water into a thick paste,


Sweets. Fig. 6. Striped peppermint rock, a
favourite and wholesome sweetmeat for children
and well stir a little of this into a corner of the hot sugar on the slab. While turning in the edges take care that the coloured portion is kept apart. The other portion, which should be the bulk of the sugar, is pulled as before, and rolled into sausage shape. The coloured sugar is well kneaded, then drawn out into long ropes, which are laid along the white in twos or threes, at wide intervals apart. The sugar is then made into a cone, and the narrow end drawn out as before into a thin rope. The result is a peppermint rock with very thin stripes of red, the artistic effect depending almost entirely on the good taste of the maker.
Cough rock is made from the same recipe as that for peppermint rock, but with oil of aniseed as the flavouring. Here about onequarter of the whole is pulled on the hook, the rest being coloured black and strongly flavoured with aniseed. This latter is rolled into sausage shape, while the white is flattened out and made to enclose the black completely. A cone is formed as before, and drawn out, giving a rock with black centre and thin white case.

Some candy makers do not use a hook, but simply take the two ends of the sugar (when cool enough to handle on the greased slab), pull the strip evenly, then putting the end in the right hand into the left, fold the roll over and pull. Continue in this way until the sugar is firm enough to cut up.

Boiled Sweets. The various rocks, while still pliable, may be cut with scissors into


Sweet Sultan, a hardy annual with fragrant flowers in white, rose, purple or yellow
lengths of about $\frac{1}{2} \mathrm{in}$., and rolled between the palms of the hands to form balls, striped or plain. These balls are known as boiled sweets.
Acid balls are made by boiling 3 lb . white sugar, with $\frac{1}{2} \mathrm{lb}$. glucose and 1 pint water, to 310 deg . l'our the sugar on oiled slab, turn in the edges as it cools, and add a good pinch of tartaric acid and a few drops of oil of lemon. Knead it well. Draw it out as for rock, cut it with scissors, and roll it into balls. Ingredients for making cinnamon balls are the same as for peppermint rock, but the flavouring is cinnamon. Pull the sugar on the hook till it is of the proper colour. Draw it out, cut it with scissors, and roll it into balls. To make cushions, cut the strip across and give it a half-right turn, which brings the point, of a cushion up. Clip it off and then give the strip a quick half-turn left and cut off. Each time the half turn is reversed so that the strip is not twisted. Any pulled sugar sweets may be thus formed into cushions and wrapped in waxed papers to make them look quite professional.

Crystallizing Sweets. Even high-boiled sweets rapidly deteriorate when kept in con tact with the atmosphere. It is customary to crystallize many of the finer varieties, so that they may be immune from atmospheric influence. Sweets. treated in this way arc greatly improved in appearance.

The sweets to be crystallized are set on little wire stands, similar to those used in baking, but on a smaller scale, and these are placed in shallow tins. A deep tin is often used, and the trays, with their rows of sweets, are set one upon another inside it. These trays should have legs about $\frac{3}{4}$ in. long. The sweets on top are covered with another flat wire tray, to keep them from floating in the syrup. The trays thus arranged, the crystallizing syrup, made from the recipe given below, is gently poured in, and the whole allowed to remain untouched for 8 hours, by which time a coating of crystals will have formed. If the coating is not heavy enough, a little longer immersion will be effective.

When removed from the syrup, the sweets are set out on wire trays in a warm, dry room to dry thoroughly. Sweets crystallized in this way will keep for many weeks, even
when exposed to the air. The spent syrup can be boiled up again for tablets or rocks.
The recipe for crystallizing syrup is as follows: Boil 4 lb . sugar with $1 \frac{1}{2}$ pints water, using no cream of tartar or glucose, to 218 deg . Cut out of soft brown paper a piece to fit exactly the top surface of the syrup. leaving a small hole in the centre of it, The syrup should be set aside to cool, and disturbed as little as possible.

SWEET SCABIOUS. This hardy and useful garden plant is also known as the pincushion flower, the species including perennial and annual kinds. The former includes the very beautiful Caucasian scabious. See I'incushion Flower; Scabious.

SWEET SPIRIT OF NITRE. Spirit of nitrous ether, popularly called sweet spirit of nitre, is commonly prescribed in slight feverish attacts, colds, etc.. on account of its diaphoretic action on the skin. It thus tends slightly to reduce the temperature. The drug also has a marked diuretic effect on the kidneys, and is therefore often an ingredient in mixtures prescribed in kidney, heart, and lung troubles, where it is desired to increase the flow of urinc.

SWEET SULTAN. This is a heautiful hardy annual (Centaurea noschata) with fragrant flowers in white, rose, purple, yellow. The modern named varieties have large handsome blooms, and the plants are from 18 to 24 in. high. Seeds may be sown out of doors in spring or in September. Sweet Sultans nced well dug friable soil and a sunny situation.

SWEET WILLIAM. This is a charming old-fashioned garden flower (Dianthus barbatus) of which splendid new varietics have been raised. Two of the most striking arc Scarlet Beauty and link Beauty. The auricula-cyed varieties of mixed colouring are also attractive. These plants are grown as biennials, secds being sown in boxes of soil in May; the seedlings are planted on a


Sweet William. Four varieties of this richly coloured flower, familiar in cottage gardens
reserve border for the summer, and in October are set out where they are to bloom the following year. They should be destroyed after flowering: and a fresh stock of plants raised from seeds. Sweet Williams can also be grown from cuttings in summer.

SWELLING. In inflammation swelling is accompanied by redness, heat, and pain. A dropsical swelling of the skin has the peculiarity
that firm pressure with the point of the finger leaves a depression or pit which takes some time to fill up. Tumours form fairly welldefinel swellings as a rule, at any rate at the beginning. A swelling in the groin or elsewhere on the abdominal wall may be due to $n$ rupture or hernia.
The nature of a swelling should be determined before treatment is undertaken as poultices or rubbing, which have their uscs in appropriate cases, in others may do damage. See Abscess; Sprain.

SWIFT MOTH. Being a nocturmal moth that tlies after dusk, the swift moth is seldom scen, except by the entomologist, gencrally during the month of June. Its grubs, however, are more familiar, and may be recognized by their brown heads and bristly creany-white bodies, about ld in. long. These are some- must do to combat the disease.

## SWINGS FOR NURSERY AND PLAYGROUND

## How to Construct an Outdoor Type

This is one of the entrics in this work that deal with the recreatiors of children. Sce also
Nurscry. The .builder of a swing will find other valuable information in the articles that describe the various tools and woodworking processes

Siwings that are in the form of a chair to may be erected in a garden or courtyard. which ropes are attached are sold for indoor Fig. 2 shows a front elevation of the framework, usc. These can be fastencd to the top of a a side view being given in Fig. 3. The parts are door, so that the child can swing through the marked with a distinguishing letter, those opening. This arrangement is suitable only marked with the same letter being similar in for a small child. The hooks by which it is size and shape. suspended from the door lintel should be Any kind of sound timber which is neither securely lixed. Another lighter type which liable to split nor warp may be used. Well. can be bought has netted sides, tho chair scasoned pine, larch, ash, or clm planks are all being enclosed except at the front, making suitable, and can be obtained planed and it safe and comfortable even for an infant. trimued to size. The quantitics and sizes of
Fig. 1 illustrates a type of swing such as timber reguired are given in the following


Swift Molb. Natural size roots of potatoes, beans, reference.
as paragus, dalilias, peonies, alll other crops. A good remody is effected by the digging in of naphthalene and lime during the autumn or winter months.

SWINE FEVER. This disease is often very destructive to pigs. It is also very contagious and is therefore one of the diseases that are notiliable. This means that in case of an outbreak the ollicials of the Ministry of Agriculture must be informed at once. They will then tell the owner what he
times found derouring list, each piece being named and lettered for


[^10] letter are of similar size and shape. Fig. 4. Front and side views of top of upright, showing position of slots and holes. Fig. 5. Details of shape of upright top
nailed to the upper side of the cross-beam, as in Fig. 2. The spar is shown in Fig. 9.
Stays D D D D are cut as in Fig. 8, a $\frac{1}{2}$ in. diameter hole being bored through the thickness of each stay. The tic-beanis E E have three $\frac{1}{3}$ in. diameter holes bored through them as in Fig. 9. The corners and edges of the seat-board G are rounded as shown in Fig. 10, the positions of the seat-irons being marked out. The bars for the seat-irons P P P P are bent to shape, as in Fig. 12. The centres for three $\frac{1}{4}$ in. bolt holes are marked with a centre punch on each bar, at the point given in diagram A, then the lines from which the bars are bent to shape are marked off from the measurements in B. These lines should be slightly incised with a cold chisel, so that they may show clearly when the irons are heated.
After the bends have been marked, the corners of the bars are cut off with the chisel and the ends filed to the semicircular shape in C. The bars must be heated before they can be bent to shape. Some trouble can be saved if the irons are taken to the local blacksmith to be bent. If the worker prefers to do the
work himself he can procced as set out in the article on Forging.
Three $\frac{1}{4}$ in. diameter holes are drilled through each seat-iron from the points previously marked with a centre punch. The irons are then placed in position on the seat and tested. The plates $Q$ Q, which are fixed beneath the seat-board, are prepared as shown in lig. 13. Four $\ddagger \mathrm{in}$. diameter holes are drilled through each plate from the points given in the diagram, then both ends of each plate are rounded in the same manner as those of the seat irons. Both pairs of seat-irons are now placed exactly in their positions, as in Fig. 14. The positions for the holes for the bolts $R$ are marked on the seal, then the irons are removed, and a $\frac{1}{4} \mathrm{in}$. diameter hole bored through the seat from each point.

After the irons are replaced, the small bolts R are fitted into the holes in the lower angies of the irons and partly into those in the scat, then the 2 plates $Q Q$ are placed in position on the underside of the seat, and the holes brought in line with the bolts. The bolts are driven in until their ends project throagh the holes in the plates, a nut being fitted to each


Sections, showing Recess \& fitting of Eye-bolt


Swing. Fig. 6 ${ }_{\text {Sase }}$ Swing. of ${ }^{\text {Fig. }}{ }^{6}{ }^{6}$ showing checks cut to receive the stays. Fig. 7 Measurements and details of crossbeam and eye-bolt Gxing s. Fig. 8. Dimensions of stays, and details of chain and fastenings. Fig. 9. Position of holes in tiePlan and side view of seat-board

Plan and side view of seat-toard$\stackrel{\pi}{\text { in }}$ in.
projecting bo!t and tightly screwed up with a spanner.

The woodwork of the swing is assembled by first fitting aud bolting the tic-beams and stays to the uprights, then bolting the crossbeain in position, and finally attaching the ground plank F (Fig. 11) to the lower ends of the uprights. Lay the two uprights A A on the ground and place a tic-bcam E across each of their lower cuds. Bring the hole in the centre of each tic-beam in line with the hole at the lower end of each upright. Next insert a 5 in . bolt L (Figs. 2 and 3) into the hole in each tie-beam, and pass it through that in each upright. A washer is placed on the projecting end of each bolt, and a nut fitted and tightencd up.

The stays D D D D are fitted to the ticbeams and uprights in the following order. A stay is bolted to the right end of each ticbeam, then the upper end of each stay is placed in the check in the right side of cach upright. The upper end of each left stay is fitted into the check in the left side of cach upright, and the lower ends of the stays are bolted to the left ends of the tic-beams. The 5 in . bolts should be fitted with washers, and the nuts screwed firmly home. The upper ends of the stays are sceured in thie checks by means of the 6 in. screw bolts $M$ Each screw bolt is fitted as follows: The centre of the thickness of each stay is found and marked, at a point 2 in. from the upriglit. A $\frac{3}{8}$ in diameter hole is then bored from each centre point at right angles through the stay, and into the upright to a depth of 4 in . The holes are slightly enlarged with a $\frac{1}{2} \mathrm{in}$. rose-bit for a depth of about $1 \frac{1}{2}$ in. Each serew bolt is fitted with a washer and inserted into the hole, and screwed in with a spanner until each stay is firmly bolted in position.

The cross-beam B is placed in the mortises in the uprights, and the 2 holes at its right side brought in line with those in the right upright. A 7 in . bolt K is driven through each alinement of holes, then a washer is placed on the projecting end of each bolt, and a nut fitted and tightencd up. The left end of the cross-heam is bolted to the left upright in the same mannor The ground plank F (Fig. 11) is attached to the tic-beams and lower ends of the uprights by large nails. Care must be taken to sec that the uprights are the correct distance apart before the ground plank is fitted.

The cross-beam and those parts of the uprights and stays which will be above ground when the framework is erected are given se veral coats of varnish paint. The seat may be given a varnish finish or painted Creosote oil or hot tar is applied to the lower portions of the uprights and stays and to the tic-bcams and ground plank.
After the framing and scat have become thoroughly dry, the chains S S are attached to the cye-bolts in the cross-beam. The pins are unscrewerl and partly withdrawn from 2 of the shackles T, then the shackles arc placed on the cye-bo!ts. The upper end link of the right chain is placed on the pin in the right shackle, and the pin screwed home. The left chain is fitted to the left shackle in the same manner. Jetails of the chain, eyc-bolts and shackles are given in Fig. 8. Thesc should be of the dimensions specified.
The ground where the swing is to be situated is dug out to a depth of 2 ft .6 in ., Fig. 15 showing the measurements and shape of the excavation. After the earth has been remored, the bottoms of the trenches should be well rammed. The framework is then lowered into the excavation and uprighted. If the uprights are not perpendicular, the
ground beneath the tie beams and ground plink whole of a building must be removed until they become so. on to the focussing
The framework has to be tested with a screcn; but this plumb line and the spirit level, and any crors causes distortion, unof position rectificd. When all is corrert, a less means can be layer of enith about 1 ft . deep is shovelled into adopted to keep the cach trench and rammed down. Large slones negative itself vertior old bricks should be arranged round cal. If the camera is both uprights and firmly driven into the soil. tilted upward, buildThe chains are attached to the seat-irons inge will appear to
 seat-irons, and the pin fitted through the sliackle and holes in the irons and firmly screwed up. The shackle on the left chain is then fitted to the left pair of seat-irons and the pin tightened up, and the swing is complete.

The seat will be about 14 in . from the ground, that height lucing conrenient for general usc. but it may be raised if necessary by moving the shackles to higher links on the chains. Onc-inch diameter ropes can be substituted for the chains, but they rannot be compared with the latter for strength or durability.

SWING-BACK: In a Camera. When photographing buildinge, strect scenes, and other subjects where it is not possible or convenient to get sufficiently far away to include the top of the subject, a rising front gives a useful means of adjustment.
The amateur in surb circumstances is empted to tilt his camera in order to get the


Swing-back. Fig. 1. Field camera in which both hack and front can be swung in order to tilt camers without distorting vertical lines in the photograph Courtesy of Ensign, Ltd.


Swing. Fig. 11. Ground plank. Fig. 12. Diagrams showing bow the bars for the seat-irons are bent to shape. Fig. 13. Plates for securing seat-irons. Fig. 14. Method of securing seat-board. Fig. 15. Shape and dimensions

P P by placing be falling backward in the photograph, and the top of the building, the plate holder, C D, a slackle in the to be falling forward if the camera is will be tilted as well, so that the vertical lines end link of each tilted downward. of the building will converge together in the chain. then the The rising front is the simplest adjustment photograph, giving it the appcarance of falling shacklo on the and is one fitted to most hand cameras. At backward. right chain is the top of the U-shaped lens front a milled The remedy is shown in Fig. 3. The camera placed on the screw will be found on many patterns of is tilted, but by the use of the swing-back the right pair of cameras. When this is rotatod the whole of plate holder is still vertical. The whole of
 the lens mount rises or falls. As it rises it will the building is included, but the axis of the be found that the amount of foreground is reduced on the focussing
reen.
This adjustment should not be used more than is absolutely lens, $A$, to the plate, as shown by the lines C D. This means that the top of the building is slightly nearer the plate, while the bottom is farther away. The lens therefore must be stopped down until all parts of the image are seen sharply in focus on the screen. It is impossible to use either swing. back or swing-front without using a focussing screen.

The same results can be obtained more conveniently by the use of the swing. front, as shown in Fig. 4. Here the front of the camera less the lens lia good covering power i.e. Will cover evenly a plate a good deal larger than that used in the camera, there is a risk of uneven lighling, since the optical axis of the lens is moved from the centre of the plate.
The swing front or swing back adjust. ments, either or both of which are fitted in good fifld and other cameras designed for architectural and landscape work, permit the camera to be tilted while leeping the plate vertical.

Fig. I illustrates an ordinary field camera whose adjustments permit back or front to be swung with a wide range

Fig. 4. Same result as that shown in Fig. 3 achieved by use of swing-front of variation, while the baseboard can be
tilted and the front raisol a considerable is tilted, while the back and the plate holder amount. In the smaller varieties of folding remain vertical. As before, it is essential to pocket or hand cameras the swing front alone stop down the lens until sharp focus is olis usually fitted.
In Fig. 2 the camera is so placed that it i impossible to inclucle the whole building on the power considerably exceeding the minumum lines. If the camera be tilted so as to include the ordinary central and vertical position. A
reference to the diagrams will show the neces. sity for this.
The practical advantages of the swing-back are demonst rated in the photographs Figs. 5 and 6, which show the Bush Building in Kingsway, London, photographed with and without this adjustment. It was impossible to include the whole of the building on the plate without


Swing-back. Fig. 5. Showing distortion of vertical lines due to tilting the camera without use of swing back. Fig. 6. By use of swing-back or awing-front. the camera is tilted but distortion is avoided
tilting the camera. In Fig. 5 this was done switches are made for various purposes, without the swing-back, and bad distortion resulted. Bringing a swing-back into play, as in Fig. 6, the distortion was aroided, but longer exposure was needed owing to necessary stopping down. See Camera; Stop.
SWISS CREAM. This sweet is made by heating up 2 brcakfastcupfuls of fresh milk with the thinly peeled rind of a lemon, placing the pan at the side of the fire so that the process may be slow enough to let the milk absorb the fiavour of the peel. Add $\frac{3}{4} \mathrm{oz}$. isinglass, 1 gill cream ; boil up the whole, strain, and leave to cool at the side of the fire. Stir in the well-beaten yolks of 3 cggs and sugar to taste, put the pan back on the fire and continue stirring until its contents thicken Then let the mixture cool again, and add to it a few blanched and split. almonds and some small pieces of preserved ginger before turning it into a mould to set.

Swiss Roll. See Chocolate Roll ; Jam Roll.
SWISS TART. These small sugar-covered tarts can easily be made from 6 oz . Hour, $\frac{1 \mathrm{lb}}{} \mathrm{lb}$ margarine, 2 oz . castor sugar, water to mix, and a little jam. Sicve the flour into a basin, rub in the margarine, and then add the sugar, mixing them well. Add about a tablespoonful of water, mix it in, and then divide the mixture into six equal portions, forming each into a ball.

Grease 6 small cake tins, put a ball into each, and in the centre of each ball press the little finger, making a hole almost to the bottom. Drop a little jam into the hole, and decorate the top with a knife, making sharp cuts from the centre round the tart.

Bake the tarts in a moderately hot oven for 20 min ., or until they are of a light brown colour, then leave to cool on a sjeve, and, before serving, sprinkle the top with icing sugar.

SWITCH: For Electric Light. The purpose of $a$ switch is to interrupt an electric
circuit, or to close it at will. Switches are made in a great variety of patterns.
In the tumbler switch the centrally placed lever, when depressed, forces the contact blades into contact with the copper brushes connected by set screws to the conductors. Turn switches have a knob or button which is partially rotated to effect contact. Two-way
of purpurcum are purplish. Propagation is by seeds sown out of doors in autumn.
Uses of the Wood. The timber obtained from the sycamore is close, compact, and easily worked, and it takes a smooth, glossy surface from a finely set planc. If it is properly scasoned and sawn on the quarter it will not shrink or twist to any extent. It is nearly white in colour with a yellowish tinge. Owing to the method of conversion the surface shows a pretty figuring, particularly when the wood is cut nearly parallel to the medullary rays.

The wood is much in demand for general turnery. It is used for rollers of mangles and washing machincs, (lairy utensils, and bread boards; it is also employerl for violin backs. Owing to its close grain it is adapted for inaking wooden bowls, and for the same reason it is suitable for wood-carving and particularly for chip-carving. It takes stain well, and can be used as a substitute for cbony. It can be obtained in boards over 12 in . wide, and is also procurable as plywood.

SYLLABUB. A very old-fashioned country dish, syllabubs formerly were made with new milk drawn straight from the cow on to the spiced and sweetened wine in the syllabub bowl. To-day they may prove a highly successfu! addition to thie refreshments at an evening party if made according to one of the following modern recipes.

For a " Farmhouse" sy!labub dissolve in a bowl 3 oz . castor sugar by stirring it with $1 \frac{1}{2}$ gills sweet home-niade winc and $1 \frac{1}{2}$ gills sherry. Add the grated rind of a lemon and $\ddagger$ of a grated nutneg. Put into a large carthenware teapot l pint new milk warmed to the degree of freshly drawn milk, and hold the pot ligh above the contents of the howl and pour with a circular movement on to the wine. Strew over the top a little grated nutmeg. Let the whole stand for some houra, then cover the top with clotted cream.
A Staffordshire recipe is to put 1 pint cider with a wineglass of brandy into a bowl, add about 6 oz . pounded lump sugar and $\frac{1}{2}$ teaspoonful grated nutmeg, then stir until the sugar is quite dissolved. Warm 1 quart new milk, and put it into a jug with a sharf spont, or, better still, an carthenware teapot. Pour it round and round on to the cider; grate more nutmeg on the top, and let it stand for some hours. Serve with whipped cream.

A lemon syllabub has an excellent flavour. Grate the rinds of 2 lemons and stir them into $1 \frac{1}{2}$ pints sherry or Madcira; also dissolve in the wine llb. lump sugar. Strain the juice of 6 lemons and 1 full-flavoured orange, and arld these to 1 pint pure thick cream. Now put both wine and cream into a decp but not very large basin, and beat with a whisk for $\frac{1}{2}$ an hour. Let nll stand for 2 or 3 days, and the night before it is required for table arrange it in sundac glasses or custard cups.

A very cconomical syllabub may be made by dissolving 2 oz. lump sugar in $\frac{8}{3}$ pint homemade raisin wine, then add the grated half of a nutmeg, and pour on to the wine 1 quart of warm new milk from an carthenware teapot.
To make good syllabubs it is most important to use pure fresh cream or nilk and the finest white sugar. Lump sugar is the best. When beating, work evenly and in one direc. tion. It is a mistake to start in a hurry ; begin and continue with slow, steady strokes.

SYNOVITIS. Inflammation of the synovial membrane of the joints, or synovitis, may follow sprains or other injuries.
The reute condition is usually accompanied by pronounced swelling, heat, and pain. It is treated by rest and cold applications. Later the joint is massaged, and a woven clastic bandage is put on to maintain pressure and assist in the absorption of the fluid in the joint. In chronic cases iodine or som? other
counter-irritant is used to reduce the swelling, and a bandage is worn during the day. See Bandage: Joint.

SYPHILIS. Syphilis is due to the entrance of a minute organism beneath the skin or mucous membrane through an injury to the surface, which may be excecdingly small. In the great majority of instances the infection is conveved by sexual intercourse.

The discase begins with a sore, which develops most frequently upon some part of the organs of generation, usually about 4 weeks after infection. During the next 6 wecks to 6 montlis there may be fover for a few days, headaches, and rheumatic pains in the joints. Rashes of various sorts appear on the skin, and the throat and inside of the mouth become ulcerated. In the later stages tumours known as guminata may appear in ally organ or tissue of the body, extensive ulceration of the tissues may take place, the bones may be croded, the arteries thickencd, and aneurism may develop.

Locomotor ataxia and other forms of paralysis may occur, and mental changes such as general paralysis of the insane. In women iniscarriage and abortion are common. A particularly sad form is seen in infants when one or other parent has the discase.

Great efforts are now being made to eradicate syphilis and other forms of venereal discase from the community. In the United Kingdom methods for prevention and treatinent are advocated by the Society for the Prevention of Venereal Diseases, 6, Holborn Viaduct, London, E.C.I.

Parents can assist by giving their children sound, healthy teaching in matters pertaining to sex, and by impressing upon young adults the langer of promiscuous intercourse. The provision of carly and efficacious treatment is also of great importance, and centres have been established in all large towns where those who have acquired the disease can obtain treatment with the assurance that strict privacy will be maintained.

In its primary stage syphilis can be cradicated by treatment with arsenical compounds combined with mercury or bisinuth. Treatment should last for at least two years.

SYPHON: For Mineral Waters. Soda and other mineral waters may be obtained in syphons which consist of a glass container with a metal top. A glass tube fixed at one end in the top passes down inside the container, extending almost to the bottom; it must not touch the hottoni, otherwise the action of the syphon will be obstructed. The top is fitted with a spout or tap and a small spring lever in the form of a handle which operates a valve. When the lever is pressed down the valve opens and the mineral water in the syphon is forced up through the tube by the pressure of the gas which it contains, and discharged through the spout. The quantity is regulated at will instantaneously by depressing or releasing the handle.

Freshness of Contents. The advantage of the syphon over the ordinary bottle therefore, is that small quantities can be drawn at any time without detracting from the freshness of what remains in the container. Syphons are filled through the spout by a mechanical process which cannot be carried out at home. They can be obtained from any chemist or dealer in mineral waters.

In warm weather syphons should not be kept in a living-room, but should occupy the coolest position in the larder or cellar. For table use they may be cooled by the aid of ice. but should not be placed in direct contact with it. Some refrigerators are so constructed that a syphon may be placed on a shelf right above the ice, or it may be cooled in an ice cave. If the house does not contain these means of cooling food it is best to put the syphon into a wooden vessel and pack the outside of
the wood with ice, placing a tray on the top with ice on it. It is not safe to im. mersc a syphon in ice as it might burst.
Syphon Stand. This is an ornamental container for the ordinary mineral water syphon. The pattern illustrated is made throughout in silver, and comprises a tube-like body ornamented with a band of piercing in a simple design, and provided with handles. See Piercing.
SYPHON : For Transferring Liquids. A syphon which can be made at home consists of a glass or metal tube bent to a $U$ shape, with the limbs of differing length. It provides a simple means of transferring tiquid from onc vessel to another. The difference in the lengths of the tube is essential to the action of the syphon, the shorter length being placed in the liquid that is to be drawn off.
If suction is applied to the long leg of the tuhe the liquid is raised in the syphon and flows out until the level drops below the end of the short leg, or, if the long leg dips into a vessel, until the level of liquid in both vessels is the same. As sucking by the mouth may be inconvenient when the syphon is not fitted with a suction pipe, the same effect can be obtained by inverting it and filling it with the liquid. Then, stopping both ends with the fingers, or corks. the short tube is placed into the liquid and the ends unstopped, when the liquid will flow steadily until it falls to the lavel of the lower end.
Syringa. This is the botanical name of the lilac, but it is often wrongly used to describe the mock orange or philadelphus.
SYRINGE : For the Garden. A syringe is invaluable in garden and greenhousc. but it must be of a good type, provided with spare nozzles and roses capable of impelling water in volume or fine spray. It should be kept properly packed to prevent leakage ; for pacling, use tow and grease if available, otherwise substitute darning wool. As a general rule plants with hairy leaves or ripening fruit should not be syringed. See Insecticide ; Spraying.

SYRINGE: In Medicine. Various kinds of syringe arc used in the treatment of different disorclers. Direction for syringing the ear are given in the article on Deafness (q.v.). Syringing the nose is often dangerous and should be left to a doctor. See Douche; Ear.
SYRUP : In Cookery. Syrup is a solution of sugar in water heated until, when poured from a spoon, it drops like oil, or by the sugar thermometer to $220^{\circ} \mathrm{F}$. It is used for sweetening various foods, as a means of preserving them, and also as an article of diet in itself When properly prepared it can be stored in bottles, and will keep in perfect condition for a considerable period.

The syrup may be merely a simple thick liquid, it may be flavoured, or it may be medicated; but the process is the same: Only the purest refined sugar and distilled or filtered water should be employed; if there is any doubt as to its purity it should be clarified.

To clarify, have ready a perfectly clean, thick steel or aluminium pan. Dissolve the sugar in the water, placing both together in the pan, and allowing $\frac{1}{2}$ pint water to evary lb . sugar. The water must be accurately measured. Whip up the white of half an egg with 2 or 3 tablespoonfuls of water until light. then pour it into the syrup and place the pan over slow heat. Beat until a good froth forms, then skim the surface carefully and brush the sides
 when taken out of store. Use loaf sugar in preference to granulated sugar, as it will be found to be cleaner. To test the syrup, if no sugar thermometer is at hand, pour it slowly from a spoon or drop a little on a plate, and if it lifts with a thread it is boiled enough.
If syrup is bottled when alinost boiling, and at once tied down with portions of bladder or some covering equally in pervious, it will keep better and appear brighter. If fermentation should take place, put the bottle into a pan of boiling water; this will usually clear it.

Fruit Syrups. Any flavour added to syrups must be perfectly clear; if at all cloudy it should be clarified. When making a syrup with a fruit juice, either fresh or taken from a tin of fruit. no clarification is necessary. The juice should be strained through a hair sieve, the sugar added, also a little lemon juice, and then the whole should be simmered in a bright saucepan to the required consistency.
Sweet jellies are brighter and clearer if syrup is used in place of raw sugar. but the proper proportions of liquid must be adhered to. Many excellent summer drinks may be made with syrup and flavouring if aerated water is added For stewed fruit, flans, and pastry fillings, syrup is both useful and necessary as a sweetener, and the housewife will find it a great help always to keep a few bottles of different fruit syrups in the store cupboard.

Another kind of syrup much used in cookery is golden syrup, which can be substituted for treacle in any of the recipes given under that hearing. It can also be used instead of jam in the making of roly-poly puddings, tarts, etc. Golden syrup used for tart-making is usually thickened with breadcrumbs. This syrup is also much used instead of sugar for sweetening porridge and similar foods.
Syrup Cake. To make a good syrup cake, sieve together 1 lb . flour and $\frac{1}{4}$ teaspoonful bicarbonate of soda, rub into them 7 oz . margarine, and add 6 oz . sugar, and ? lh . ground almonds, mixing all well. Beat up 2 eggs in another basin, add to them 1 teacupful golden syrup, and whisk the mixture well before stirring it into the dry ingredients. If necessary, the syrup may be warmed slightly. Add also about 1 gill milk, then beat the whole for a few minutes before turning it into a greased cake tin lined with greased paper. Bake it in a moderately hot oven for about $1 \frac{1}{2}$ hours.

Medical Uses. Certain drugs are dissolved in syrup for the sake of making the medicine palatable to the patient. Various tonic mix tures are prescribed in this form, including syrup of the phosphate of iron; Easton's syrup, or syrup of the phosphate of iron with quinine and strychnine, and compound syrup of phosphate of iron, or chemical food. See Compôte; Flan; Treacle.

TABLE. One of the oldest pieces of fur- ornamental nature. Reference may be made niture and one of the most common. From the original table that was but a square or oblong piece of wood, standing upon trestles, was evolved, the one supported by a leg at each corner, and from the latter a greal variety of styles has developed.
In England, at a later date, were made the massive oak tables, with legs supported by a stout frame. To the Jacobean age belongs the draw table, which, with improvements, has come into favour again as a dining table in the 20th century. The dressing table and also the work table developed on their own lines, and special tables, suited for specia! purposes, were produced, as the wine table, now a valued antique, and the card table, with its mor. abie top. Folding tables are of considerable age and from thesc were developed, in Cromwellian days, the gatc-leg tables still so popular and, later, Pembroke tables. Many beautiful examples of walnut tables were made in the reign of Queen Anne, with cabriole legs oftc n having shell ornaments carved on the knees. Later Chippendale made many tables, including varieties fo specific uses.

Fig. 1 shows an artist's table with square legs and a typical Chippendale design in the strapwork carving. Hepplewhite and Sheraton also made and designed a variety of tables, and readers are referred to the entries on the styles of these great English designers. During the period of the Regency style (q.v.) sofa tables were developed from those of Sheraton on the lines of the example illustrated in Fig. 2, which shows the yoked fect and brass inlay so characteristic of the early 19th century pieces.

Articles on how to make the principal types of table will be found under the headings Afternoon Tea Table; Bed Table; Card Table; Dining Table; Dressing Table; Folding Table; Gate-Leg Table; Kitchen Table; Trestle Table; and Writing Table. These contain working drawings and full instructions showing how the home worker with a little skill in earpentry can construct tables of a useful or


Table. Fig. 1. Chippendale artist's table in mahogany with strapwork carving ; late 18th century
Ry permission of the Director, Victoria \& Albert
to some of the primary woodworking con tributions, such as Cabinet Making; Dovetail : Joint: and to the articles on Leg and Moulding. See Antique Furniture; Billiard Table; Cane; Davenport Table; Furniture; Jacobean Style; Lacquer Work; Occasional Table; Ormolu; Pier Table.
TABLEAUX VIVANTS. This form of entertainment may be given in a some. what ambitious or in an extremely simple manner; but there are certain general rules which should be observed in either case.

The tableaux should be in charge of three persons: a producer, to sclect, cast, and rehearse the pictures; a stage manager, to attend to the lighting, any scencry or furniture, and the curtain or scieens; someonc to supcrintend and assist with the dresses, to inspect the performers before they go on the stage, and to help generally with difficulties in both makicup and costume.
The succession of pictures must be carefully worked out. Pcople who are appearing in more than onc picture must be given time to get ready for the next character while pictures in which
they do not appear are being shown. Copies of this progranme should be pinned up in any dressing-rooms, behind the scene, and in the stage manager's corner at the left side of the stage. He should have a bell as a signal for the commencement and close of each tableau.

The pictures remain before the audience for two or three minutes. It is difficult to preserve absolute stillness in some poses, and it is better to display the tahleaux for a shorter time than to spoil the illusion by movement. Where there are a number of people in the picture the most brilliant and striking dresses are placed in the foreground and those in neutral tones at the back. Good colour schemes are a great help towards success. In selecting subjects, those with strongly marked dramatic contrasts will be the most successful.
Use of a Stage. More elaborate presentation requires a stage a bout 12 ft . square, with a proscenium screen painted to represent a picture frame, across which a close black gauze, 8 ft . wide by $7 \mathrm{ft} . \mathrm{high}$, is stretched and nailed hehind the frame. Behind this gauze, which is stationary, curtains which can be drawn or closed are fixed on a roll, and there is a complete frame of electric light, hidden by the proscenium screen, round the tableaux. The black gauze has a softening effect and keeps the whole picture remote from the audience; otherwise, it is not seen when the lights hehind it are full on.

At the beginning of each tableau the stage manager rings a hell and the lights in that part of the room where the audience sits are switched off. The stage curtain would have been down while the tableau was arranged with the lights up behind; when the setting is complete he switches off the stage lights and the curtains are raised in the darkness. Then these lights are switched on and the picture is disclosed behind the gauze screen.
The frame of light is not required for all tableaux. A well-known painting may be copied in which there is a glow of firelight, or a sunlight effect from an open door in a darkened interior. In that casc the lighting wonld be supplied from the side with the hclp of a lime box and coloured slides. Any special lighting effects would have to he tried beforehand. The whole background may be black; it may be of black velvet, or any light absorbent material; the stage cloth should also be black. Sometimes the sides of the stage are draped with dark curtains, and different back cloths are used for different pictures.

A simpler method, with or without stage, in a large room is to manage with curtains only. or with sereens plain!y covered in a dark colourSome of the picture illusion is lost withont the framed gauze, but the tableaux, if well arranged, can be quite effective. The lighting in this case is from the top and sides, or from the sides only. When screens are used, twe people in fancy costume, as pages or theatre attendants. draw back the front screens at a signa' from the stage manager.

Garden Tableaux. Tableaux vivants may be given in a garden. A raised terrace with wall or shrubbery background, or at the top of a shallow flight of steps, below which there is a space which can be utilized for the audicnce, is a good place to choose for the entertaiument. Screens can again be utilized for the change of picture. Sometimes children are rehearsed to form up in a senicircle in Iront of each picture after it has been sloown, holding big branches of foliage to mask the stage, parting when the next picture is ready : or grown-ups with stencilled banners, which they unroll to form a complete screen. These last methods are particularly good when the curtain makers act as a chorus for nursery rhyme tableaux or for illustrations of old songs. In selecting a series of tableaux the question of costumes inust be carefully thought out. Simple dresses can be made at home and special or historical costumes can be hired, but this last expense may be considerabic if many elaborate dresses and wigs are nceded in the pictures.
A fairy story such as Little Snow-White and the Seven Dwarfs or The Slecping Beanty, illustrated by a dozen tableaux, with someone to tell the story as it is shown, is a good item on a programme. Tableaux introducing famous characters from Shakespeare, Dickens Jane Austen, and other writers, topical cartoons, well known advcrtisements, -and dramatic ballet groups, in poses which cam be held, are all effective.

A man and woman dressed in fancy costume may be stationed in front on each side of the tableau stage to introduce the pictures, or for the children's entertainment a fairy godmother may tell the story and appear to control the picture with her wand. See Make-up: Theatricals.

TABLE CENTRE. This style of mat especially designed for the centre of the table, and formerly either placed on the dining table when not laid for meals, or as a decoration. over the white cloth, is now usual only as the centre piece of a luncheon or dessert set of table mats. On festive occasions, such as a Christmas party, a special centre is sometimes devised to enhance the decorations. For instance, a gold or silver tirsel square or circle might be outlined with artificial holly leares
nad berries, or a square of ivory gauze stencilled with red Howers and silver leaves might form a table centre, to be surrounded with fancy swect rlishes and cruckers.

TABLE CLOTH. For the dinner table it pays to huy good damask, not only because of its apprarance, but also because it wears well and launders better than the cheaper kinds. For family use such a table eloth should be on the large side. There is no objection to its hanging down nearly to the Hoor at sides and ends, and if an extra leaf has to be put in the table the cloth will still be large enough. Some people favour table
cloths with drawn-thread borders or a hem stitched or lace elge. It may be said that a fine damask necis no further ornament than an embroidered initial or monogram, but a less valuable one is sometimes improved by a little ornamentation, not too clahorate, and lace crochet introduced into a linen dinner table cloth gives it a handsome appearance.
Table cloths for use at other than meal times are not often seen, owing to the liking for polished or painted surfaces and the hygienic dislike for anything that accumulates dust. See Appliqué Work; Breakfast; Drawn Thread Work; Embroidery: Jinen.

## TABLE LAYING AND Decorating

## Attractive Settings for both Everyday and Formal Meals

Other useful information on this subject will be found in the articles on Breakfast; Dinner; Luncheon; Supper. See also Christmas; Cocktails; Dining-Room ; Flowers; Glass Ware ; Hors d'Oeuvres; Napkin; Silver Ware; Sfoon

The art of good table-laying is one which enhances the reputation of the houscwife and hostess. Fond can only be enjoyed when nicely served and with pleasing surroundings. More attention than ever is paid to the im portance of colour, freshness and ordered arrangement of the table appointmenta, since it has been recognized that these things in themselves create a sense of personal har mony which is helpful to good appetite and digestion. On the decorative side it is easy to give either a charming, amusing or festive air to the table with inexpensive accessories and flowers to suit the season and occasion.
A few preparations have first to be made in the kitchen or pantry. The knives are wiped, the silver polished and special attention paid to the condiment containers, as an attractive table is impossible unless salt cellars are evenly filled, pepper pots are showing no trace of pepper dust, and mustard pots are supplied with freshly-made mustard. Any glasses on the table should be quickly polished with a clean cloth, and water jugs, etc., require the aame attention before being filled. For the breakfast table it is most important that the butter and jam or marmalade dishes ahould ook inviting.
The housewife decides whether she prefers a table cloth, table mats, or a sort of combination of the two by means of a linen runner and mata to correspond. The last arrangement is a favourite one for breakfast or luncheon and looks particularly well in coloured linens to harmonize with the table ware. All-over striped linen cloths are a good choice for the family breakfast table with napkins to match. There is great beauty about a plain danask cloth for the dinner table, but lace-edged mats will look more festive if the china ware and other appointments are simple. When a cloth is used the table should be protected by underlying baize, serge or felt: protective mate must be-provided under linen or lace table mats. These protections can be dispensed with when a cold supper or luncheon is served.

An example of a wise choice of plain damask cloth is shown in Fig. 1. Here the table is laid for a small formal dinner party. Unity is achieved by the plain background to the ornamental glass, silver candlesticks, sweetmeat and salted almond dishes, the patterned dinner service and the central llower arrangement of roses and gypsophila. Lace mats would make so much detail fussy and the appearance of the table less dignified. The possessor of Sheffield plate candlesticks, and a cake basket in which a glass bowl could be placed to hold the Howers, conld use these appointments with equal success in such a setting.

A complete change of surroundings and ware makes Fig. : an equally striking and successful example. On a table with polished wooden top and netal lega, the soup bowls
are of the square shape that some English makers are favouring, and the mats are of glass. The centre-picce is of glass and stecl and the two ibises on either side of it are of silvered glass, while a tiny cactus is placed in a silvered pot at each corner. The inenu cards arc on heavy glass stands, the table silver and gold-rimmed drinking glasses are slightly less severe in design than the rest of the appointments, but the whole effect is bright, a musing and sparkling.

In a Queen Anne or Georgian style of room with a fine mahogany table surface, nothing conld be in better taste than the setting illustrated in Fig. 3. Cut crystal glasses and llower bowl are the features; the condiment holders are of pierced silver with glass liners, and the mats of beautiful linen Madeira work. The simple luncheon tahle shown in Fig. 4 is
quite as charming with its oblong linen place mats, covered soup howls, pot of hyacinths and silver wire bread hasket

Laying for Dinner. Where the carving and serving are done at table, a carving cloth should be spread at the end. This may be an embroidered affair or a plain dinner napkin of good size. The sideboard is covered with a cloth, and also the dinner wagon or butler's tray.

In setting the table for dinner the place for each person can be marked out by a napkin. The necessary supply of cutlery, silver, etc., is placed on a small tray, which is carried round the room, so as to arrange each place correctly. Each person should have a large knife on the right hand, a large fork on the left hand for use with the meat course, with space left between to take the plate. A dessertspoon and fork may be placed horizontally in front, the spoon on the outside with the handle towards the right and the fork on the inside with the handle towards the left. Alternately, and more usually when etcertaining, the dessertspoon and fork are placed with the other cutlery on either side of the plate. If a fruit salad or ice is to be served in individual glasses, a small spoon is often put beside the glass on the plate when handed to each person, and no dessertspoon and fork are laid.

If fish is to be served, the fish linife and fork are placed outside the large knife and fork. For soup a tablespoon, or special soup-spoon, is placed on the extreme right of the knives; a cheese knife is placed inside the other knives, or on the checse plate, as shown in Fig. 1. When grape fruit is served a grapefruit spoon or a teaspoon is provided and a small fork or knife and fork for a savoury.


Table Laging. Fig. 1. Table laid for a formal dinner party, with a white damask cloth to set of the beauty of the patterned china, the glass and the flowers.


Table Laging. Fig. 2, A polished table surface is further enhanced by plass mats, steel and glass centrepiece surrounded by cacti in small pots and a pair of silvered glass ibises

Eaci person is given a tumbler for water and clear water, a fruit knife, and a forli and spoon. one or more wine glasses if wine is offered. A sugar bowl lilled with castor sugar should Jach ferson may be given a small slice of be in readiness whenever fruit such as oranges, bread or a roll placed on the left hand, or the strawberries, etc., are being offered. Before bread may be cut and placed on a salver or dessert is laid on the table the used glasses, basket. Somctimes toast is served in one or tivo sinall racks.

Carvers and kilife rests are placed at one end of the table in front of the persoll who does the caring and outside his own complement of knives and forks. Spoons and forks for serving the sweets, etc., are usually laid at the opposite end of the table Fish slice and fork are placed outside the meat carvers and the soup ladle next to these. A sufficient number of salt cellars, etc., should be provided and placed at the corners of the table, as illustruted in ligs. 1, 4, or in the ease of a small round or square table may flank the centre piece.

Cbecse, butter, biscuits may be
placed in readiness on the sidehoard and cheesc: plates. etc., are removed and the also fruit dishes. etc:, if dessert is to be offered, and in this cuse there should also be put ready a dessert plate for each person, with a fingerbowl containing aboul, one-third of its depth of


Fig. 4. Luncheon table, with small individual cloths, covered soup basins, and heavy cut-glass tumblers
cheon table, with small individual cloths, covered soup basins, and heavy cut-8
crumbs are taken ofl the cloth with a crumb scoop, kept in readiness on the sideboard. Coflce making equipment may also be placed there, as indicated in Fig i.

Table Decoration. The choice of effective table decorations is almost limilless, and can therefore alwavs be regulated by individual taste and means. For those who possess flower gardens, the problem of expense is practically non-existent except during a few winter months.

Any scheme for decorating a dining tiable should be inlluenced by the colouring of the room in general, and of the dinner service, lamp or candleshades in particular. When only two or three people are dining at a long table, and onc ched is not occupied, an im-portant-looking decoration is a pleasant change when placed at this end instead of in the middle; otherwise a long or oval table is best with all extended treatment, a round or square table with a more compact one not too high to obscure the view across the table.

For luncheon or breakfast table pale yellows and blues are charming, but they are apt to lose their effect by artificial light. Violets, purples, and deep blues. also, are not good night colours. When shaded candles are used to light the table, Howers of somewhat more deciled tones ill harmony with the shades should be chosen for the decoration. Very large blooms are difficult to arrange, except when the size of the table allows of a somewhat massive decoration. Even then they are better when some lighter flower or fcathery folinge is mingled with them in order to avoid a heavy or crowded appearance.


Fig. 3. A simple old-world atmosphere is suggested by water lilies in a faintly tinted glass bowl, gleaming silver and cut glass reflected in the polished table; graceful period chairs complete the harmonious effect

Coloured glass is often a deciding factor in a successful scheme. Cherry or ruby red glass on a white lace-trimmed cloth is enhanced by flowers of the same shade; while amber or pale green glass is beautiful with mauve. In early spring, on a mahogany table, with mats instead of a cloth, so that the polished wood is seen, a bowl of yellow tulips Hecked with orange and arranged with red-brown berberis is a simple and harmonious decoration.

Shirley poppies, daisies, and grasses are attractive for a luncheon table, and vellow roses in a sapphire bluc bowl, lightly arranged with plenty of leaves, are a good choice with a dinner service which is patterned with green. For a hot night, coolness is suggested by pink roses in small cut crystal vases set round a block of ice in a large bowl, the table lit by pinkshaded candles in silver or glass candlesticks.
In winter, when flowers are expensive, a dish of fruit in contrasting colours is a good centre-picce for small vases of llowers or trails of autumn foliage. On a polished table, a pair of brightly coloured china birds or Chelsea figures are sometimes used at either end of a dish of fruit. Glass birds or animals set on a piece of mirror glass form a bright decoration round a vase of glass flowers or a little green glass tree. Old silver-gilt em bossed spoons and small glass or silver dishes for sweets and salted almonds can also help towards the decorative scheme.

A miniature Japanese garden (see page 646). sct in round or oblong pottery, with lacquered
candlesticks and corresponding shades, is a change from flowers or fruit. A good Christmastide decoration has for centre-piece a black Wedgwood bowl containing flowering bulbs of scarlet tulips and white Roman hyacinths, surrounded by holly leaves and berries, and groups of searlet and silver crackers.

TABLE MAT. Protective table mats for meal service on polished tables are miade of rubber, rush, raffia, linoleum, asbestos, cork, composition, glass and wood. Otnamental mats to be uscd over these are of embroidered linen, either white or coloured, wholly of lace or crochet, or linen trimmed with lace or crochet. In some cases the protective mat is also decorative, as for example when made of iaffia dyed in bright colours, of cork stencilled with a pattern, of painted glass, or of wood treated with bronzes and brush lacquer colours.

With transparent lace the colour of the protective mat underneath is important. Gilded composition or cork is used with good effect, otherwise the under-mats are best when unobtrusively matching the colour of the table. For ordinary use rubber mats afford excellent protection: also they have the advantage of bcing thin, and the linen mats over

## Table Tennis: The Rules of the Game

## A Popular Indoor Pastime for Winter Evenings

A number of articles in this work describe various indoor and outdoor games that are suitible for the home. Such include Billiard; ; Lawn Tennis
Table tennis is a development of ping-pong, these halves being known as courts. The one which became popular in Great Britain about 1900. An association was formed, but after 1905 the popularity of the game waned and this ceased to exist, although there were pingpong leagues in various parts of the country, including Plymouth and Exeter. Each of these leagues, however, had its own rules. In 1921 the Ping Pong Association was revived and under its auspices national championship matches were held. In 1924 the term ping-pong, as it was a trade name, was abandoned and table tennis was sub. stituted. The Ping Pong Association was dissolved and its place taken by the Table Tennis Association.

Table and Implements. Tables specially made for the game of table tennis can be purchased. A useful type is a light table, coloured green, that can be laid on the top of an ordinary table.
The table should be rectangular, 9 ft . by 5 ft . in size, of solid hardwood, or of such material as will yield a uniform bounce over its entire surface of at least 8 in . when a ball of standard size is dropped from a height of 12 in . The net must be $6 \frac{3}{4} \mathrm{in}$. high, and should be dark green in colour, with a white band along the top. It must fit close to the table and to its supports. and must be exactly in the midd!e of the table's length.

The average weight of the celluloid balls that are used in this game is 13 to the oz. ; they must not be heavier than 121 1 to the oz. nor lighter than $13 \frac{1}{2}$. They should measure between $4 \frac{1}{2} \mathrm{in}$. and $4 \frac{3}{4} \mathrm{in}$. in circumference.

Almost any kind of light racquet may bo uscd, the surface being of any material. To day the best players use rubber racquets, with which they can get an astounding amount of speed on the ball.
Scoring. The method of scoring is by games, 21 points making a game. Each player in turn serves until five points have been scored by the two players together. If the score reaches 20 all, it continues to 25,30 or more points, on the principle of lawn tennis that one side must be two points ahead of the other before game is called.
Rules for Serving. The game is usually played by two persons, but it can be played by four, two against two. In the former case each player deiends one half of the table.
them do not slip when plates are removed. his court and then touches any object apart A set of protective table mats usually from his racquet or the hand holding it.

The ball is dead or no longer in play and the point counts against the player who made the stroke in the following circumstances: when the returned ball strikes any object, apart from the net or its supports, prior to dropping on to the opposing court; when the ball, having been played, touches the player's court before going over the net (this does not apply to the service): when the ball, after passing over the net, goes beyond the limits of the table without dropping on it.

If either player touches any part of the net or its supports with the racquet or any part of his body while the ball is in play, the ball becomes dead, and he loses the point: when a ball drops on the proper court and screws back over the net, the player whose turn it is to strike may reach over the net and play the ball, so long as he otherwise makes a good return. If he fails to play the ball, his opponent scores the point notwithstanding the fact that the ball has returned over the net. A player loses a point if he touches the table with his free hand while the ball is in play.
The phrase table surface is to be interpreted as including the top edges and corners of the table top, and a ball in play which strikes these latter is therefore good and still in play; though if it strikes evidently the side of the table top below the edge. it becomes dead and counts against the last striker.

Finger spin may be imparted to the ball in service by projecting it by hand into the air and then striking it; it may not be imparterl by holding the ball and rubbing the racquot surface against it before it leaves the hand.
The Game for Four Players. These rules are also applicable to the game in which four persons play, but for this there are certain other regulations. The table must be divided down the centre at right angles to the net by a line or tape, ${ }_{4}^{3} \mathrm{in}$. wide, so that the table is divided inco four courts. Wach of the four players defends one court.
The pair who have the right to serve the first five services in any game shall decide which partner shall do so, and the opposing pair shall then decide similarly which shall first be striker-out.

The first five services shall be delivered by the selected partner of the pair who havo the right to do so, and shall be received by the selected partner of the opposing pair. The second five services shall be delivered by the striker-out of the first five services and received by the partner of the server of the first five services. The third five services shall be delivered by the partner of the server of the first five services and received by the partner of the striker-out of the first five services. The fourth five services shall be delivercd by the partner of the striker-out of the first five services and received by the scrver of the first five services. The fifth five services shall be delivered as the first five services, and so on, in sequence, until the end of the game or the score is 20 all. Then the sequence of serving and striking-out shall be uninterrupted, but each player shall serve only one service in turn until the end of the game.

TABOURET. A tabouret is a seat or stool with neither arms nor back, the top being stuffed and upholstered. Tabourets are chiefly stools of the period of William and Mary and Queen Anne, 1688-1714.

TACKING. The stitch known as tacking is a temporary one, being used to hold a hem, seam, or other part of a garment in position while the permanent stitches are put in Coloured cotton should be used for tacking white materials and whitc cotton for dark matcrials, so that the stitches can be easily distinguished.

Begin the tacking by knotting the cotton at one end and pushing the needle straight
through the material. Work from right to bear large, round, lemon or orange-coloured left, and make the tacking stitches about $\frac{1}{2} \mathrm{in}$. flowers which make a striking display in the long and to lic a little above the line where herbaceous border. There are both tall and the permanent stitches are to be made. After pushing the needle through to the wrong side, bring it out again $\frac{1}{4} \mathrm{in}$. further on in a line horizontal to that where it was put in, and continue to the end of the work in this way.

Tacking should be finished with a backstitch. When removing tacking stitches, care should be taken to see that the material is not torn or puckered. See Basting.

TACSONIA. These climbing plants are suitable for the hothouse or moderately heated greenhouse. It is of vigorous growth and is suitable for training on a trellis beneath the roof glass. They belong to the passion flower family and bloom chiefly in summer and autumn. The plants may be set in large tubs or flower-pots or in a well-drained border ; a compost of loam, leaf-mould and sand is suitable. A minimum winter temperature of 55 degrees is necessary. The finest sorts are insignis, reddish-violet; manicata, scarlet,and Van Volxemii, scarlet.
TAFFETA. The most popular variety of this cloth is silk taffeta, which is crisp, with a peculiar dull lustrc. Silk taffetas, because of the methods used in making them. are, however, inclined to split in wear, and for this reason they cannot be regarded as hard-wearing. Wool taffeta makes an excellent shirting, and is a superior fine flannel inade in tasteful patterns. Cotton taffetas are especially good as shirtings, and are generally dependable in colour and wear.

TAGETES. This is the botanical name of the French and African marigolds, two valuable summer and autumn flowering plants. They are grown as half hardy annuals and raised from sceds sown in a heated glasshouse in February. The secdlings are transplanted into boxes of soil to give them room for development and are hardened off and planted out of doors early in June. The African marigolds grow 2 ft . or so high and


Tallboy. Queen Anne tallboy in beautifully grained walnut with inlays in the botlom drawer representing riys of the sun. Height 6 ft .2 in . Courtesu of Gill \& Reigate, Ltd.
dwarf French marigolds, the latter being very useful as edging plants; the double and single flowers are various shades of ycllow, or yellow marked with reddish brown. Legion of Honour, yellow and brown, is a favourite dwarf varicty.

TAIL PIECE: On Chairs. This term is used for the continuation of the seat backward seen in Windsor chairs. It forms a necessary attachment to the diagonal spars in a stick-backed type of chair. It is usually quite short and of the thickncss of the seat. The diagonal spars fixed to it are useful for stiffening the piece. See Chair.
TALCUIM. There are a number of uses for talcum or talc, which is a soft, greasy mineral, varying in colour from silvery white to yellow and green; it is a magnesium silicate. The name is also applied to mica, and it is used as chimneys for gas burners and for windows in some kinds of heating stoves. Another use for tale in the home is in the crushed or powdered form as toilet powder. Powdered talc is employed as a lubricant, and, mixed with varnish, makes a shiny coating for wallpapers.

When crushed, talc has the property of reflecting light, and when spread over a comparatively large area it imparts a certain lustre to the material. This effect is made use of in the preparation of a number of fabrics with a shiny surface, the result being obtained in some cases by the use of a special talc preparation. Talc is also employed under the name of French or Spanish chalk.

Medical Uses. Talc has also certain medical uses. On account of its smoothness, prepared talc is often used as a dusting powder for babies; boracic acid powder is generally added and a trace of perfume. Venetian talc, which comes from Tirol, is especially soft and smooth. Lassar's paste, a protective and soothing application for irritable and inflamed skin disorders, may be made with talc as follows : Zinc oxide powder and powdered Venetian talc, of each 2 drams : vaseline or soft paraffin, $\frac{1}{2}$ oz.; salicylic acid powder, 10 gr . Mix into a paste and spread on soft linen or surgeon's lint.

TALLBOY. A tallboy is made up of a double set of drawers, one upon the other. This piece of furniture was first made in England in the latter half of the 17 th century. The carly ones are of walnut, beautifully grained wood being sclected to veneer the picces. A finc example is illustrated, which shows the characteristic Queen Anne features of burr walnut vencer, brass handles and discrect use of marquetry, the bottom drawer alone being ornamented in this manner.

The tallboy belongs to the walnut period of furniture at its best, but at a later date was made in mahogany. The typical piece has 3 or 4 long drawers in the lower part, and 3 in the upper. In the upper there are also usually 2 smaller drawers. The piece rests on 4 short club legs, and beneath the drawers is an arched shaping. The upper part is usually narrower than the lower, from which it is separated by a simple moulding. The decoration is not elaborate, taking only the form of deep moulding at the top and chamfering or reeding on the front angles. See Chest of Drawers; Queen Anne Style.

TALLOW. Tallow is an animal fat largely consisting of stearin, palmitin and olein. The highest grades are used commercially for the making of candles and the lower grades in the manufacture of soap and dressing leather. Tallow can be used to some extent as a lubricant in cases where rope or cord runs over a pulley. Jishing and other lines are rendered
more or less waterprooi when rubbed with tallow.
Tow impregnated with tallow can be ent ployed for the making of joints in the stuffing box or gland of pumps, etc. See Tow.

TAMARIND: The Fruit. The fruit of the Tamarindus indica is imported from the E. and W. Indies in the form of a reddish brown pulp mixed with sugar. It has an agreeable taste, contains a large quantity of citric and tartaric acids, is a refreshing drink for fever patients, and is slightly purgative.

For children tamarind spread on bread and butter is a good laxative medicine. A refreshing beverage for the sick may be made by boiling 1 oz . in a pint of water. Tamarind whey is made by boiling 1 oz . in $1 \frac{1}{2}$ pints of milk, or stirring it into boiling milk. The dose of tamarind is 2 to 8 drams. It is usually used with other purgatives ; for example, in confection of senna.

TAMARISK. This is a hardy flowering shrub with slender, graceful, leafy stems and rose-pink flowers in early or late summer. It


Tamarisk. The feathery heads of small rose-pink fowers of the Tamarix pentandra
reaches a height of from 4 to 8 ft . or more The tamarisks are particularly suitable for planting in seaside gardens, where they are often used as hedges. The common taniarisk is Taınarix gallica. It bears pale rose-pink Howers in May. Tetranda, which Howers at the same time, is more beautiful ; both should be pruned after flowering if necessary. Pentandra (Hispida aestivalis) is a charming shrub with rose-coloured inflorescences in late sum mer; the shoots should be pruned in spring. Tamarisks thrive in ordinary soil and are increased by cuttings inserted in sandy soil out of doors in autumn.

TAMBOUR. This is a method of constructing a lid or shutter to a writing-table or bureau. It was used among others by Hepple white and Sheraton. The sliding lid of a rolltop desk is an elaboration of it. Sheraton made bookcases in this style. The lower part is enclosed in a sliding shutter composed of beads made to slip in grooves.

TAMMY CLOTH. Sauces and soups that depend for success upon their smoothness are usually passed through a tammy cloth made of
fine woollen muslin. The cloth is spread over a basin or other receptacle, its edges gathered in the hands to form a well in the centre and the mixture poured in. The two ends of the cloth are then twisted in opposite directions intil all the mixture has been forced through. If the latter is especially thick and cannot be tammied in this way, it may be rubbed through the cloth with the aid of wooden spoons.

Immediately after use the tammy cloths should be washed in warm water to which a little soda has been added, rinsed well, wrung out, and dried in the open air. See Jelly.

TANGERINE: The Fruit. The amall Tangerine orange is used as a dessert fruit, and also for various forms of swects. It makes an excellent marmalade, and the juice is used to flavour fondants, icing, sweets, and a delicate filling for cakes.

The filling for cakes may be made from the following recipe: Boil 3 egge hard, then pound the yolks fine with 3 oz . butter, 4 oz . icing sugar, the grated rinds of 2 tangerine oranges, and sufficient of the strained juice to form a soft cream. Spread this filling between two sponge sand wiches and dust the top with icing sugar. This cream spread between shortbread biscuits is delicious.
Meringues may be flavoured with tangerines. Gratc the rind of one or two tangerines and add them to the sugar which is used to sweeten the whipped cream for the filling.

Tangerine Chips. These make an excellent garnish for cakes, biscuits or fondant sweets. To preparc them, remove the peel from several Tangerine oranges and shred it in long, narrow pieces, then place these in a basin, cover them with water and lay them aside till the next day. In the morning strain and weigh them, and take an equal weight in castor sugar.

Put the chips into an unlined, bright metal saucepan and strew the sugar over them as they warm, shaking and tossing them about over a moderate heat until they appear perfectly dry. Store in a dry place and keep the chips covered up tight. The pulp of the oranges should not be thrown away : it may be used for other sweets.

Tangerine Drop Cake. Tangerine peel may bc used to flavour light drop cakes. Rub $\frac{1}{2}$ lb. lump sugar, lump by lump, on the outside of 3 Tangerine oranges until the sugar has absorbed the zest, then pound the sugar in a mortar until it is a fine powder. Separate the yolks and whites of 4 egge, beating both by themselves and then together, then by degrees beat these into the flavoured sugar until spongy.


Tango. Fig. 1. Showing the six ateps of the reverse turn. See text for full description

Mix in very lightly $0^{\frac{1}{2}}$ oz. fine sifted flour, to which has been added a pinch of salt. Drop this mixture with a teaspoon on to a tin lined with grease proof paper. Bake in a fairly quick oven, decorate each cake with a Tangerine chip attached with a little marmalade jelly, then cool on a wirc, and store in a covered tin. See Fondant: Marmalade.

TANGO. The tango differs from other modern dances in that the dancers walk the steps instead of gliding them, the knees consequently being more relaxed, although they should not be bent; also the man holds his partner a little farther to one side (on his right hip), his left forearm being bent in more. Both dance with the right side of body alightly in advance of the left, consequently the right foot is turned in a little and the left turned out to the same degree.

There are two rhythms to be followed in this dance, the slow (S.), in which each step occupies one beat of the music, and the quick, pies one beat of the music, and the quick,
quick, slow (Q.Q.S.), in which the quick steps
take balf a heat each and the slow step one beat. The basic steps are as follows: (1) The Walk: (2) Progressive side step (Fig. 2): (3) Reverse turn (Fig. 1) ; (4) Side promenade (Fig. 3) : (5) Back corté (Fig. 4).
The Walk (S.). The walk forward consists of natural length, ordinary walking steps, the weight of the body being kept over the front foot. The back foot is left behind until the last possible moment before stepping forward with it. The step is counted "slow" and takes one beat of music. The body being held with the right side a little in advance of left, contrary body movement (C.B.M.) is consequently used when stepping forward with the L.F. For the walk backward swing leg well back from the hip, going on to ball of foot and keeping weight on front foot. As step continues weight is carried between the feet and the toes of front foot should leave the floor so that all pressure is on front heel. Weight is then transferred on to ball of back foot. The back heel should not be lowered until the front foot passes it. The front foot should remain in front until the last possible moment before stepping back with it. The right side of the body being held in advance of left, the contrary body movement position occurs when stepping back with the R.F.
Progressive Side Step (Q.Q.S.). Following a walk forward with the R.F., the man steps forward and across slightly to R. with L.F., takes a small step to the side with R.F. and steps forward and across slightly to $R$. with L.F. The girl, having taken a walk back with the L.F., steps back and across slightly to L. with R.F., takes a small step to side with L.F. and steps back and across slightly to L. with R.F. In this step the contrary movement position occurs on the first and third steps for both man and girl (Fig. 2).
Reverse Turn (Q.Q.S., Q.Q.S). The man steps forward with L.F., turning on it to L., takes small step to side with R.F., still turning, and erosses L.F. over in front of R.F.; steps back with R.F., turning on it to $L$, takes small step to side with L.F., and closes R.F. up to L.F. The girl steps back with R.F., turning on it to L., nearly closes L.F. up to R.F., still turning. and closes R.F. up to L.F. ; steps forward with L.F., turning on it to L., takes small step to side with R.F., and closes L.F. up to R.F. On the first three steps half a turn is made. On the last three, a quarter turn (as shown in the diagram) or no turn at all (Fig. 1).

Side Promenade (S.Q.Q.S.). The man steps to side and very slightly back with L.F.


Fig. 2
Fig. 4
Tango : three of the basic steps. Fig. 2. Progressive side step ; it usually follows a walk forward with right foot. Fig. 3. Side promenade, in which thy dancers cross one foot over the other. Fig. 4. Back corte. Throughout the dance the right foot is turned slightly in, and the left foot slightly out
crosses R.l., well over in front of L.F., takes a small step to side with L.F., and closes R.F. up to L.F. The girl steps to side with R.F., crosses L.F. well over in front of R.F., takes small step to side with R.F., and closes L.F. up to R.F. Contrary body movement is used on the second step (Fig. 3).
Back Corte (S.Q.Q.S.). The man steps back with L.F., back with R.F., turning rery slightly to L., takes small step to side with L.F., and closes R.F. up to L.F. The girl steps forward with R.F., forward with L.F.: turning very slightly to $L$., takes small step to side with R.F., and closes L.F'. up to R.F. Contrary body movement is used on the second step (Fig. 4).

In the accompanying diagrams the R.F. is shaded, the left shown in outline only. The dotted outline indicates the ultimate position of foot. It will be casier to follow diagrams if the dancer faces the direction in which the toes are pointing and turns the diagram at the same time. See Dancing : Foxtrot: Quickstep: Waltz.
Tank. See Cistern; Gallon.
TANKARD. The modern tankard is a plain drinking vessel usually large enough to hold a pint of liquor and made of silver, pewter, glass or earthenware. They are cither open or with lids. Genuine antiques and tankards reprorluced from old sty!es are nearly always lidded. The tankard is shaped somew hat after the stylc of the flagon (q.v.), but the latter is an earlicr type of drinking vessel, and whereas tankards vary from about 6 to 9 in . in height, 7 in . being usual, Hagons were as much as $15 \frac{1}{2} \mathrm{in}$., and more cumbersome picces.
Tankards are sometimes found in old Sbeffield plate, but more fŕcquently in silver and, copied in the plainer styles, in pewter. The lid and hinge are the chief points of interest: in the older examples a thumbpiece on the hinge strap is placed so that the lid may be easily raised. Both handle and thumbpiece were often artistically decorated. The latter was cut in two main shapes, a horizontal corkscrew, and bifurcated. Fine tankards occasionally have a lion thumbpicce and in later examples this is sometimes fluted.
Dating from the end of the 16 th century to the reign of Charles I, tankards were straightsided, but often richly chased and ornamented with repoussé designs. Very plain styles with flat lids followed in Puritan times. Restoration tankards were massive with cylindrical bodies, Hlat lids and engraved with coats of arms and


Tankard in ailver dating from 1830, when these pieces were richly ornamented Courtesy of chapmle \& Mantell
crests. Queen Anne tankards were for the most part fairly plain but clegantly shaped and often embellished by gadroon ornament to edge the lid and base. or by reeding round the body of the tankard. A knob appears on the lids occasionally. This disappeared on the domed lids of Georgian tankards (sce page n54), many of these pieces being bellied and the thumbpiece, or purchase, well in evidence. The tankard illustrated dates from the reign of William IV and shows the reappearance and claboration of the knob into a floral ornament, the bellied body, spreading foot and lavish raised decoration of the perind. It will be noted that the thumbpiece is absent from the hinge strap, the knob by this time having been substituted for it.

What are known as peg tankards have small pegs fixed inside in a line with the handle; the object being to regulate the quantity of liquor to be drunk on ceremonial occasions in honouring each toast. See Pewter; Silver.

TANNIC ACID. Oak galls are the source of tannin or tannie acid, which is a brownish powder with a strongly astringent taste. Common preparations are : glycerin of tannin, suppositories of tannic acid and lozenges of tannic acid.

Tannic acid is an efficient astringent, lessening the discharge of Huid from any ulcer or mucous surface to which it is applied. It is also a powerful hacmostatic, as it clots the blood Howing from a vessel. The powder may be used as a snuff to check blceding from the nose.

Internally tannic acid is used in the form of an infusion to check diarrhoca. It may be used in a douche to check leucorrhoea. The glycerin of tannin, 1 part to 8 parts of water, is an efficient astringent gargle in sore throat.
TANSY. This is a small family of hardy herbaceous perennial plants. The average height is about 2 ft ., and the yellow, daisy-like Howers are borne in summer. Seed should be sown in spring in ordinary soil. The value of the ordinary tansy, Tanacetum vulgare, is in


Tansy. Leavea of Tanacetum vulgare, a valuable addition to the herb garden
its leaves, which are used for Havouring pud dings, and also for decorating dishes. Cost mary, T. balsamita, is grown for the salad value of its leaves. Tansy tea is also an oldfashioned country remedy. All kinds may be increased by division of the roots in autumn. See Herb Garden.

TANTALUS. A tantalus is a small upright wooden stand used as a receptacle for spirit bottles, in which the latter are locked up but visible. The bottles arc of cut glass and generally number two or threc.

Tap: For Screw Threads. See Stocks nd Dies.

## Taps: The Household Types

## Hints for the Handyman on Fitting and Repairs

This article describes the leading forms of domestic water tap. The articles on Frost and Water
Supply should be consulted for further information. See too Bath; Hose Pipe; Hot Water Supply should be consulted for further information, See too Bath; Hose Pipe; Hot Water Supply; Sink; also Pipe; Plumbing; Soldering

The water taps in general use in the home are of two classes, known as plug and screwdown taps.
The plug tap consists of a body and a plug. the body having a passage-way through it which is crossed at right angles by a second passage-way tapered in shape. This is occupied by a similarly shaped piece of metal known as the plug. The plug has a hole through it lincable with the first or throughway hole. When the plug is turned in its socket so that the hole in the plug is opposite that in the borly, the liquid passes through. When the hole in the plug is at right ang!es, the through-way is closed and no liquid can pass, if the pluy is a perfect fit in the socket. This kind of tap is used for water at low pressure. A similar type is used on gas pipes.

The screw-down tap consists of a handle and screwed rod which turns in the upper part of the body and has at the lower end an enlarged portion known as the jumper. This can be raised or lowered under the action of the handle, the function of the jumper being to cluse or open an aperture between an upper and lower water-way formed in the !ody of the tap. The construction is clearly indicated in Fig. 1, which illustrates a stop cock. Fig. 2 shows a bib cock with the jumper nut and washers removed. A pillar valve for baths and lavatory basins is illustrated in Fig. 3.

Screw-down taps are generally used on all water fittings in connexion with public sup-
plies, as they are durable and reliable in use and tend to minimize wastage of water. It may be noted that some considerable pressure of water is needed to operate the screw-down tap, so that it is useless fitting this type to a rainwater tank, for cxample. A plug tap should be employed for such purposes.

In Figs. $\simeq$ and 3 the component parts are indicated as follows: A, handle and barrel. $B$, jumper. $C$, jumper nut. $D$, washer. $E$, joint washer. F , borly. G , cap. H , fixing nut. J, union piece and nut.
The tap usually fitted to wator pipes for domestic purposes (Fig. 2) is known as a


Tap. Fig. 1. Sectional view, showing principal parta of the acrew-dow type of atop cock
screw-down bib cock. The compononts are clearly shown, as they bave been taken apart in their proper order. The hody is seen at the bottom. right; above it is the washor which makea the joint between the body and the barrel watertight. Next ahove the washer is the jumper washer (top, right), and jumper with retaining nut (bottom, left). The jumper seats on to a valve face within the body, and is praclically the only part that is likely to give trouble. It is replaced when needed with a new washor, which can he obtained in various sizes from ironmongers. A washer of a special material is needed for pipes on the hot-water system. As soon ns the pipe commences to drip, and water is not easily turned off, a new washer should be forms of domestic work. as, for example, when fitted. Sometimes the jumper nut gets cor- a small part has to be securely attached to a roded and will not unserew : in such a case it base plate or other part. The screw passes is best to fix a new jumper and washer complete. through a clearance hole in the part to lie

The barrel at the top consists of a stuffing box to keep the joint between the screwed part of the handle and the barrel watertight. The lower part of the barrel is threaded to screw into the top of the body. Usually this part is screwed left-handed, that is, the barrel is unscrewerl by turning it backwarl, or against the clock. It is sometimes fitted with a setscrew to prevent it unscrewing. This should be looked for at tho start, removed if present, and the barrel can then be unscrewed with a large spanner applied to the bexagonal part at the botton of the barrel.

The same principle is adopted with stop cocks and other taps, including the pillar types of bath and lavatory basin valves, an example of which is illustrated in Fig. 3. The internal structure and arrangements are similar to the foregoing, but the outlet from the body is set at an angle to enable the tap to stand in a vertical position. This has the adrantage that the pipes can be more readily erected and are less obtrusive, as they can be hidden to a large extent behind the basin or hath.

As will be evidnnt from an inspection of Fig. 1, there is a right and a wrong way to fit a stop cock, the correct way being with the lower of the waterways towards the direction of flow of the water. This is because the water as it passes the jumper and washer is then able to lift it of its seat, and thus there is a minimum of friction in passing. If the tap be arranged the other way round, the water will tend to force the jumper down and thus partially choke the waterway, and there will be much more pressure needed to force the water through the stop cock. On some makes of tap the jumper is positively attached to the spindle by a Hoating joint, and this joint automatically lifts the washer and jumper from the valve seat.

TAP BOLT. Alternatively known as a stud bolt or cap screw, the tap bolt, which has a square or hexagonal head, is employed in metal work when an ordinary bolt and nut cannot be used. Examples are found on many
attached, and bites in a thread cut into the main part of the apparatus. See Bolt : Nut.

TAPE. It is not always best to buy cotton tape in mixed packets. A small assortment in varying widths is useful, but the stock bundles usually include a proportion of the less necrled sizes, and
Tap Bolt for use in metal work
 these take up room in the workbox.
Linen tape is naturally stronger and more durable than cotton tape, and, although nsually unbleached, it whitens in the course of washing. Tape makes an excellent sub stitute for twine, especially in packing stationery and books. Stationers sell special tape for such use, as well as red cotton tape for tying documents and narrow green silk tape for batches of typewritten shects.
Special tape is also made for heading and gathering curtains, which pulls out flat for washing. These headings ensure good pleating and are supplied in all colours and in various widths.

TAPE GRASS. The half-hardy, ornamental grass with small white flowers, which is known as tape grass, is suitable for indoor pools, aquaria, or water basins. It should be potted up in a small receptacle filled with rich garden in springtime It a the wate temperature of about $60^{\circ}$. Tape grass is also known as eel grass. There is only one important variety of it.
holder in Sheffield plate, about 1800


Taper Holder. Wax-jack type ol

TAPE MEASURE. A good tape measure is an indispensable adjunct to the workbasket. It is, as the name implies, made on a strip of material which looks like tape, usually about $l \mathrm{in}$. wide, and is finished off at one end either with a metal tab or a loop. The length is usually 60 in . and is divided into inches on one side and centimetres on the other. The whole can be rolled up neatly and put away in the workhasket without taking up raluable space. Similar measures are made in narrower widths in a box or reel which contains a spring. This draws the measure back automatically when the end is released and involves no winding.
TAPER. Wax tapers bought by the dozen are useful in the house for lighting up purposes, especially with incandescent gas. They are obtainable in colours and in white. The hearier make of white tapers can be inserted in a brass holder which can be adjusted to the length of the taper, and prevent it curling up at the end when a few inches have been burned

Such a holder is convenient when hung near the gas cooker for lighting one burner from another with the taper contained and for preventing the fall of drops of wax.
Taper Holder. This antique was designed for holding a tiny candle or a coiled wax taper when the introduction of sealing wax made some device for melting it a necessity on the writing table. Good specimens in silver and Shefficld plate are greatly valued to day by collectors. The holder took three main forms, a stick, a box, and a jack. The stick resembles a small candlestick and is also to be found in brass. These pieces followed the standard candlestick patterns. Some have a chimney glass as a protection for the flame against draughts.
The box is a small, rounded canister, about 3 in . across. It has a loose lid, through the centre of which is a tube which holds the taper. An extinguisher is often attached to it, as it is to the candlestick. The jack is a less familiar picce. Sometimes it, too, was supplied with an extinguisher. The example illustrated has a cage of flat wire work and a side handle, by which it was held. The ring is fixed to the taper bar round which the long wax taper was coiled, except the small portion in use which comes through the hole in the top. Another type of wax-jack without the cage is illustrated in page 1144. See Candlestick; Sherlield Plate.

TAPESTRY. The word tapestry is used to cover a range of decorative patterned fabrics, the design rather than the texture determining the classification. Thus a type of machine-woven furnishing materials, carpets, wallpapers and needlework, are all spoken of as tapestry. The real thing is confined within the limits of its handwoven texture, of which the design forms an integral part. It may be woven on an upright or a horizontal loom, but the resulting fabric is the samc. Tapestry was woven in Egypt many centuries b.c., while beautiful fragments exist of ancient Greek work. Although made in France from the 14th century, important manufactories were first established in England in the 17th.

A textile is not tapestry in the strictest meaning of the word, even when handwoven on a loom in which a double warp (vertical thread) is used and the shuttle carrying the weft (horizontal threads) is thrown between the warps to their full width, the interlocking of the textile being accomplished by use of


Beauvais were also flourishing, and at Mortlake in England fine work was being carried out.

Designs are classed under two broad headings, verdure and personnages. The former may be of massed foliage only, or also introducing flowers and fruit ; the style known as mille fleurs, in which Howers and leaves are scattered in profusion over the ribbed ground: the landscape designs, for which the workshops at Beauvais were particularly famed. Mille fleurs and landscape designs often introduce figures and animals, but the main interests of flowers and foliage class them as verdure.
Personnages designs, as the name implies, are figure pieces, battle and hunting scenes, cartoons and copies of pictures in which people are the chief intercst. Heraldic or armorial tapestries were usually surrounded by borders of verdurc. In old tapestries made for mural decoration borders were an important part. Pancls are completely bordered by a narrower design or on three sides with inscriptions at the bottom, while lengths, originally part of hangings which covered whole wall surfaces, usually display a border top and bottom.

Besides this broad classification based on type of design, which embraces all periods,
the treadle, which brings first one set of warp threads to the top, and then the other.

Real tapestry is bobbin woven. One set of warp threads only are used, and the bobbin passes the weft by hand in and out of each warp thread alternately. Only the weft threads are seen on the surface, presenting the design with the ribbed or rep appearance, exactly the same on both sides, which distinguishes the genuinc fabric. In the article on looms a simple tapestry pattern is shown being woven on a string warp, and the principle of the weaving is demonstrated by the illustration.

Of all textiles, tapestry is the most durable, as this complete interlocking of warp and weft produces a web which is almost indestructible in ordinary usage; but it will be readily understood that even modern real tapestry must be a costly production when it is considered the time, patience, and artistic skill required to produce a yard, copying the forms by use of the number of colours and shades which go to the making of a fine design. Old pieces fetch prices beyond the purse of the ordinary buyer, except by some lucky chance. Anyone possessing genuine tapestry which has been cut'or torn should have it repaired at a tapestry studio; otherwise it may be irretrievably spoiled.

The three great epochs and corresponding centres of tapestry making were, in the 14 th and 15 th centuries, Arras (the name of the town becoming a synonym for tapestry hangings); in the 16 th, Brussels ; in the 17 th, Paris, when the Gobelins workshops were assisted by Louis XIV to become the finest centre of the art. At this period the ateliers at Aubusson and
tapestries are also classed as Gothic, Renais-
sance and Later French, and these terms are often used by modern decorators in speaking of various patterns. The Gothic designs of the Middle Ages, which are considercd the fincst, are flat in drawing and almost without
perspective. Fewer gradations of colour were used, and in consequence the patterns have stood the test of time, while subtler shading has become blurred in more recent work.

Some of the loveliest Gothic designs, copied to-day for mural punels or to upholster valuable chair-frames, are the mille fleurs. In the Renaissance designs attempts were made to copy the lifelike style of the painting of this period. The Later French period tapestry, often spoken of as Louis and sometimes as Aubusson, where a great deal of it was made, chiefly shows the charming designs inspired by the paintings of Boucher and Watteau; dainty and delicate in colour and treatment, these are largely reproduced to-day for covering white and gold or gilt frame chairs and settees.

Simulated Tapestry. In the machine-made jacquard tapestries effects are well reproduced at a moderate cost. This fabric is made in panels to copy tapestry pictures with verdure borders, varying in size from big wall-pieces to cushion covers. It is also made by the piece, repeating the all-over verdure design, and sold by the yard. It has splendid wearing qualities, and its texture looks better next to a polished wooden surface than a dull one. The charming effect in a hall of such tapestry in a pictorial form is shown in the illustration. Block printing by hand of a good tapestry design on a horizontally ribbed material, simulating the real tapestry texture, is another form of imitation for mural purposes. The colouring and designs used are good, and at a little distance the effect is rich and pleasing. Above a dado carried out in oak block printed rep looks its best. Pictorial and other tapestry effects are carried out in needlework, using the stitches described in the subsequent article.

Painted tapestry in imitation of the Gobelin tapestries has a foundation of corded or rep canvas over which the designs are painted. Its resemblance to the genuine tapestry is duc to the particular kind of canvas of which it is made, for the real Gobelin tapestry has also a corded ground, though the designs are woven, as already described, instead of painted. The painting is done by experts, and the finished article is therefore somewhat expensive.
Tapestry carpets are imitations of Brussels. In tapestry wallpapers the verdure designs are copied in pleasant colourings. Sometimes figures are introduced, or landscapc panels. See Living-Room ; Louis Style; Loom.

## TAPEstry Needlework: Stitches \& Designs

Embroidery for Chair Seats, and Other Canvas Coverings
This article explains the practical application of this decorative needlecraft in the home. See also Bag; Cross Stitch; Embroidery; Laid Work; Queen Anne Style: Rug; Stool ; Victorian

Included under the heading of tapestry needlework are all the canvas embroideries in which the stitchery covers the whole groundwork of the fabric and in which the work is done on countcd threads. This type of embroidery was done in England in early Tudor days and continued in use for wall and bed hangings until the end of the 17 th century, and on, when it became the fashion for chair, settee and stool seat coverings. In Victorian days it was much used also for firescreens, draught screen panels, footstools and tapestry pictures. On stools and chair coverings, opaque white and crystal beads were frequently introduced as high lights on the patterns. In some examples of older work silk thread is used for the same purpose and some needle tapestry is embroidered entirely in silks.

Materials Required. One of the most fascinating things about the work for furnishing purposes is that designs can be obtained or evolved which suit any type of room and furniture, but in which the same simple stitch or group of stitches are employed,
however intricate the appearance of the work when completed. Another immense advantage is durability. It is therefore wise to use the best wools for embroidery, and canvas for foundation. Materials, including designs with colour charts, canvas already traced for working, or with the patterns outlined and colours suggested by painting them on the fabric, wool and silk embroidery threads, canvases in a variety of meshes, needlework frames and needles are stocked by all good art needlework shops and departments in stores. Work can also be reshaped if pulled, or mounted when finished if required.
Tapestry wools vary in thickness according to the nature of the work, canvas and design. For a large piece of work such as a chair seat, which will be required to withstand constant wear, a heavier type of thread is required than for a bag design embroidered on finer canvas. Among other excellent makes of wool Pearsall's tapestry and crewel wools, Whitc Heather Embroidery Wools, Penelope Crewel Wools, and Copley's " Darnart " Embroidery

Wools are all made in a wide range of colours and are obtainable in small skeins.
Silk threads should not be used for upholstery covering as they do not withstand wear. In several old pieces where silk threads have been introduced into portions of the original work the wool worlied portions are unimpaired, but the silk ones have perished. Silks are lowever useful for brightening smaller designs for pole lire screens, cushions, cosies, blotters and purses. Artificial silks, owing to their brilliancy, are often liked for this purposc. For very fine work Filo and Filoselle threads are recommended as the strands can be split and any thickness used that the worker requires. Mercerized embroidery cottons such as Sylko are sometimes employed, and wear well, but nothing can beat the beauty of wools for this form of embroidery. Tapestry wools are best used for heavier work, light crewel wools for fine petit-point embroidery on such articles as bags.
Tapestry is worked on either a single thread canvas, or double thread Penelope canvas, and a variety of meshes are ohtainable according to whether the design requires a fabric having many holes to the inch or comparatively few. For instance, there might be 120 stitches across a design, and if the work was wanted to measure 12 inches across when finished, the canvas should have 10 holes to the inch. Double strung canvas is best for covering furniture. The canvas is obtainable in single and double widths when bought by the yard. Special blunt pointed tapestry ncedles should be used for the work.
For large pieces of embroidery it is wise to use an embroidery frame, but this is not necessary for a smaller piece. A frame simplifies the task as there is a tendency for the work to pull crookedly. Should this happen the remedy is to damp the work thoroughly on the wrong sidc, place it face downward on a piece of clean cotton cloth on a board and tack it flat to the board, testing with a ruler to sce that the work is stretched to the exact shape required when finished. and leave it to dry.
Colours and Designs. For all fine needle tapestry it is essential that colours should be subtly gradel. The richness of pattern is obtained by the use of 4 or 5 shades of one colour in proximity and by the contrasted plain colour of the solid background. Expert workers get wools specially dyed according to their colour charts. When copying some of the older designs it should be remembered that colours were originally brighter and probably cruder. This is especially the case with greens. The lovely bluc-grcens of the old Jacobean work are to a great extent the result of accident. The blue dyes employed endured, while the yellow were fugitive. The most delicate pinks and yellows in many Queen Anne period pieces have in some places faded to indeterminate whitish shades.
Artistic workers use undyed tapestry wool for these, the natural tint of the wool giving exactly the right tone when used as the lightest member of a group of greens, reds and pinks, blues or yellows. Another hint which can be applied when embroidering a cover for a period chair or stool is to change the pale shades slightly in the repeats of the pattern to give the partially faded eflect of inellowing age. The result is to make the new cover belong to the frame instead of proclaiming its modernity at a glance. If in spite of careful choice of "old" colours to suit period pieces the result is still too crude, the tapestry may be dipped in tea and then tacked to a hoard or frame to dry and preserve the required shape.

While art needlework shops supply designs elaborately prepared there are many pieces of heautiful work which can be done directly on the canvas by counting stitches and follow-
ing clear charts of clesigns and colours. The pattern motifs are always worked first and the plain backgrounds put in afterwards.
Period designs are obtainable in Florentine, Cluny, Gothic, Gobelin, English 17th century, Queen Anne. Chippendale, Adam, Victorian, and: also in Louis styles. The last are often used for embroidering beautiful bags, and a typical one is illustrated in Fig. 11, with its landscape motif surrounded by a scrolled frame and floral pattern. A great help to anyone who wishes to work a cover for an antique stool or chair is to visit the Victoria and Albert Muscum and study the necdlework covers of furniture in the collections there. For the most part earlier designs show a tendency to all-over patterns, which have again appeared in tapestry work for quite modern pieces, particularly Florentine patterns consisting of vandylies or wavy lines in which the rich effect is gained by use of varied colours. Many of the later designs were composed of central floral or pictorial motifs, either surrounded by fancy borders or a plain continuation of the background stitchery.
The Stitches. The stitches most used in needle tapestry are petit point, gros point, cross-stitch, straight Gobelin stitch and mosaic stitch. Whole pieces can be worked
 is offen known as tent stitch, finest elfects being gained by it on a small-meshed, singlethread canvas. This stitch is worked diagon. ally over one thread of the canvas and is actually worked from left to right upward diagonally, but the row always progrcsses from right to left, as shown in Fig. 1. For alternate rows the work is turned upside down. Fig. 2 shows the same stitch on double thread canvas.
Gros point is worked in the same way, but over two threads or two scts of double threads on a dunble-thread canvas. This stitch is greatly used for chair seats and for groundings. A padded effect is gained by laying a thread, as shown in Fig 3, between the threads of a horizental line of the canvas. and working the stitch over it. Do not pull the wool tightly when working over a coarse canvas as it is a sign of bad stitchery when the canvas threads show through. Some workers use double wool for heavier types of designs on coarse meshes. Do not thread the needle with more than ahout 20 in . of working thread.

Cross-stitch for tapestry is usually worked over 2 vertical and 2 horizontal single or double threads of the canvas. To ensure an even look stitches must always be crossed the

 in tapestry. Fig. 5. Straight flling stitch. Fig. 8. Mosaic stitch
same way. In a pattern each stitch should be finished singly, but when working a grounding it is permissible to work the first half of the stitch along a row and return crossing. In Fig 4 the stitch is enlarged to illustrate detail

Straight Gobelin stitch is worked in horizontal rows for groundings. The thread is carried vertically over ? threads of single.


Tanestry neeulework. Fig. 7. Queen anne style chair with a drop-in seat covered by a piece of tapestry needlework in a design of the period Courtesy of Bartholomew \& Fletcher
thread canvas (or 2 double threads of doublethread canvas), len ving each time one thread of material between the stitches. As clearly shown in Fig. 10. the effect is rertical and not diagonal. This stitch is used to imitrte the ribbed grounding of Gobelin woven tapestries. A straight filling stitch shown in Fig. 5 and a wide oblique Gobelin stitch are sometimes used.


Fig. 8. All-over pattern of a single conventional floral motif repeated at regular intervals, a suitable design for the chair shown on the left
The latter covers 2 vertical and 3 horizontal single or donble threads of the callvas, and advances one thread of the canvas at a time. Mosaic stitch makes another useful grounding, as shown in l'ig. 6. It is worked along the Ist row with a long slanting stitch and a short one alternately. The 2nd row completes this by adding the second short stitch. The 3rd row is like the lat and the 4th row like the 2nd. The final row is all of short stitches. A stitch used in Florentine patterns is worked in slanting lines, the thrend being carried a!ternately over 2 and 4 crossings of the canvas, the stitches in the $2 n d$ row being short where those in the previous were long, and so on to cover the canvas. There are many othel


Fig. 9. Lircuiar prece ot tapestiy woiked 102 a siool uovering. Fiz. AU. Yoruon ol same design snoming detail of petit point atitches used for pattern and straight Gobelin stitch for grounding
stitchea which the experienced worker uses occasionally. Sometimes stitches seem to evolve of themselves to suit the particular pattern, but the beginner is advised to use the simple ones until proficiency is gained in keeping the work flat and the stitchery even

To secure the first stitch when a laid thread is not used, a knot is made at the end of the wool. the needle passed through the canvas from the right-hand side about \& in. from the starting point. As the work proceeds from left to right after a few stitches the end of wool is caught in at the back. Afterwards fresh lengths of wool are darned in at the back of the stitches. When using a number of shades of the same coloured wool. knot the cut slieins loosely on to a wooden curtain ring, keeping al! the greens together, all the pinks, etc.

Furniture Coverings. The Queen Anne style elbow chair in Fig. 7 shows the beautiful effect of a needle tapestry covered seat. The design is an all-over foral one of the period, worked in petit point in wool on a doublethread canvas. A cover for a chair or stool with a drop-in seat ie easier to make up than one for an overstuffed frame. When the work is finished, the loose seat is taken out, the tapestry stretched over it, and brought smoothly down to the underside. Tacks with large heads are obtainable, which are plared at frequent intervals to secure the worts to the under frameworls of the drop-in seat. This is then neatened with a piece of hessian, the edges of which are turned in under itself. It is important, when measuring the canvas to be embroidered. to allow agood margin forturning.

A conventional floral pattern is shown in Fig. 8 which could be used with any style of furniture. but would look best for

a chair of the style illustrated. It is carried out in gros point on a double-thread Penelope canvas with 12 threads to the inch, using tapestry wools. Sufficient canvas should be bought to allow a 4 -in. margin all round. This pattern has only one motif, so that the beginner becomes quickly used to working it, and in each alternate row of motifs the colours are the same. Thus the lst row of these oonventional flowers could be done in two shades of pink, with a yellow centre, outlined with maroon, and pale green used for the stem. The 2nd row of flowers have dark gicen stems and are outlined with the same shade, filled in with deep rose and crimson brown and yellow centres. It will be noticed that part of the centres of a row of flowers are worked at the top of the illustration,
repeating the colours of the 2nd row underneath The centre of the canvas is first marked and an upright line drawn through it. The rest of the fabric is then spaced out into squares, the size of each recurring motif The grollnding is put in last, also in petit point, and could the in stone colour, of a dull fawn or black according to the colour acheme of the room.
Acharming central Horal design is shown in Fig. 9. This is worked on single-thread canvas in petit point for the pattern. and in straight Gobelin stitch for the grounding, and could be used for a round stool or, by filling out the canvas with the grounding stitch, could be used for an oblong or square stool. The delicacy of the pattern is greatly enhanced by the different stitchery employed. Fig. 10 illustrates a portion of the design enlarged to show the detail. The roses, carnations and leaves are worked first in natural colours on a stone-coloured or grey blue background. central flower. About 30 Begin with the wool are required for a footstool.

Bags and Pochettes. For bags worked with beautiful designs in petit point the finest canvas is used, and in some cases sill: Filoselle is employed for the design and in others fine wools. Occasionally silks are employed for portions of the design only. Pochettes are of ten worked on rather coarser meshed doublethread canvas and with tapestry wools, as they are more handled and used for ordinary occasions, while the bags in finest embroidery are reserved for the evening.

A bag in petit point with a simple floral wreath or posy would require $\frac{3}{8}$ yd. of 23 -in. wide single thread canvas, a bag frame about $t i$ in across, and silk for lining. The shape of the front of tbe bag is marked out on the canvas, making it the width of the frame across the top, 8 in. deen and curving out the sides with rounded corners at the bottom The design on the front inight require about 20 skeins of coloured silks, while the back of the bay and the grounding would require a bout 12 skising of the same shade. A bag of the same shape as the one just described is illustrated in lig. 11, but a heautiful design of this type requires to be traced for working. Such designs on canvas ready for working can be bought in a number of patterns.

In gros point or petit point conventional patterns of stripes, triangles, encroaching squares and circles are all easily worked, and patterns can be copied from modern woven fabrics for pochettes and larger bag coverings. Shaded vandykes worked in wide Gobelin stitch or in a straight stitch taken vertically over 3 holes are most effective for bags with wooden frames. It may. however, be remembered that no stitchery is so durable as petit point or cross-stitch on a medium nieshed canvar. The longer the otitch the greater tho possibility of threads being caught and pulled out of shape in handling and wear The making un of bags and poshettes is described in the article Bag. They can also be made up in needlework shops. Some workers mercly damp their finished embroidery on the


Tapestry Needlework. Fig. 11. Bag in which a Louis style design is worked in petit point with silks on fine canvas
wrong side and tack it on to a covered board to stretch it bank to the required shape when finished; others find that it is best to press the tapestry with a moderately hot iron, placing the work face downward on a thickly padded ironing board

## Tapeworm. See Worms.

TAPIOCA. In cooking, tapioca, which is obtained from the roots of the cassava plant, is used to make puddings, soups, and jellies, and also forms a good thickening agent. It is nourishing and easy of digestion, and therefore may be included in invalid diet. Tapioca requires long cooking, and should not be placed over too fierce a heat. The grains vary in sizc. The fine kind may be cooked in the same way as semolina.

A cold sweet that requires little preparation is orange tapioca. To make it, put $\frac{1}{4} \mathrm{lb}$. smallgrained tapioca into a pan with a little more than a pint of water and the grated rinds of two large or three small oranges. Simmer the whole until it clears, then draw the pran to the side of the fire and add $2 \frac{1}{2}$ oz. sugar and the strained juice of four oranges. More sugar nay be used if the fruit is sour. before turning it into a deep glass dish, and serve with cream or custard.
Tapioca Cream. A good sweet with tapioca and desiccated coconut as its main ingredients can be made in the following way : Wash 3 oz . tapioca, then let it soak for 12 hours or more in a pie-dish containing 1 pint water. Any water that has not been absorbed when the soaking is over should be poured off. Mix in 3 oz. sugar and 2 tablespoonfuls desiccated coconut, add 1 quart milk, and
it to the boil and then cooking it slowly tor $1-1 \frac{1}{2}$ hours. This can be done by lowering the temperature of the oven once the mixture has reached boiling point.

Serve it cold, with 1 gill slightly whipped cream on top, and 1 tablespoonful desiceated coconut sprinkled over the cream. Apricot sauce (q.v.) may be served separately.

Tapioca Pudding. To prepare this, wash 3 tablespoonfuls tapioca, let it soak for an hour in $1 \frac{1}{b}$ pints milk, and then turn it into an enamelled saucepan, adding a lump of butter about the size of a hen's egg, $1 \frac{1}{2}$ tabiespoonfuls sugar, and the thinly peeled rind of a lemon. Boil these up slowly, and then simmer until the tapioca grows clear. Take out the lemon rind and let the inixture cool at the side of the fire before stirring in the vo!ks of 2 eggs, and then the stiffly beaten whites. Pour all into a greased dish, and bake it in a moderately hot oven until it sets, and the top is lightly browned. A tapioca and apple pudding can be made in the same way as sago and apple pudding (see page 1098). Diet; Food; Scmolina.

TAPPET. In internal combustion engines of the side valve type the tappet, which is a part of the valve gear, is fitted between the end of the valve stem and the face of the cams of the camshaft. A similar device is used on some overhead valves operated by push rods, though a pivoted lever is often used which carries a roller at its free end, the roller bearing against the operating cam. Diagrains illustraling both systems are given in the article on Valve.

Owing to the fact that the face angle of the cam as it makes contact imparts a thrust sideways during the initial stage of raising the tappet, the guide is eventually worn oval. To overcome this fault, anti-friction devices, as shown at $C$, are frequently enıployed that provide a rolling instcad of a sliding contact.

The feature of the adjustable tappet, which is most commonly used, is that the amount of clearance between the end of the valve stem and the head of the tappet may be definite!y set and fixed. This malies it possible irre spective of rear of the parts, to maintain the valve gear. in respect of tappet noise, in good order. Although tappet noise is primarily due to faulty setting of this amount of clear ance other contributory causes are worn cams, worn tappet rollers, and slackness of the tappet in its guide.

The method of adjusting tappet clearance is illustrated on page 813. The gap of a few thousandths of an inch can be tested by a feeler gauge of the correct si\%e. The maker's is: structions should be followed on this point, but as a guide it may be noted that the clearance for most water-cooled engines is about -004 in for inlet


 tor overhead valve operater mixture cool overhead valves the clearance is generally a little more. Tappet clearance should be adjusted when the engine is hot.
Valve gear would be almost silent but for the fact that the varying !ength of the valve stem, caused by engine temperuture, makes it impossible to provide permanent contact of the tappet with the face of the cam and the stem of the valve. Tappet noise can be reduced to a negligible quantity, however, if careful attention is given to the adjustment at a time when the engine is thoroughly warmed up. See Cam ; Motor Car; Valve.

TAR : Its Domestic Uses. Tar is ob- be carricd out in warm weather and only old tained by the destructive distillation of coal, clothes should be worn wood, and bituminous naterials such as

shale. The black semisolid mass left as a residue after further distillation of the tar itself is commonly known as pitch. Tar can be had in a semiliquid state or as a solid material. Liquid tar is applied cold, but may require slight heating in cold weather. Solid tar or pitch is broken up into small pieces and can be put in an old iron bucket, supported on bricks, and a fire kindled underneath to melt it, as in Fig. l.

This must be done in the open and well undersides are tarred and a film of tar be away from anything that is likely to catch fire. On no account should a vessel containing tar be heated over a gas ring or a fire indoors.
The tar should be heated just sufficiently to render it Huid enough for use. If it catches fire tar burns fiercely and emits volumes of pungent smoke; it can be extinguished, though not without difficulty, by smothering with damp sand.
The use of tar in the household is due chicfly to its waterproofing qualities, which render it particularly suitable as a protective covering for wood and metal. This property is taken advantage of in the coating of wooden roofs and other wooden structures which are exposed to the weather; but care should be taken to apply such a coating only where there is no particular risk of fire. Iron fences are often coated with tar to protect the metal from rust, and a fence treated in this way. looks well and also lasts for many years if additional coats are applied from time to time. On account of its waterproofing qualities tar is also employed for dampcoursing.
Liquid tar is applied with a specially made stiff-bristled brush : this is shaped somewhat like a short-haired sash tool, but the bristles are spread out at the ends. One pattern is made with a short single handle; the other variety has a long handle, and the brush head is set at an angle to it. The tar stock brush is made with 1,2 , or 3 rings or sets of bristles, which are mounted on a cross-piece of wood and attached to the handle in much the same way as a garden rake.

Roofs and walls of outbuildings are often covered with tarred felt or similar material which has to be tarred frequently to keep it in good condition. This can best be done with a goorl grade of liquid tar or one of the preparations having tar as a base. It is applied with the long-handled tar brush as shown in Fig. 2, and the worker should stand so that the brush can be manipulated at one side of the body, as this tends to keep the person reasonably clean. Tarring operations should

Tar is applicable in uch a paste to floor covering beneath a boarded floor. In such a casc the tar is mixed with the aggregate, which may be very small pieces of clean broken brick or ash well worked into a stiff mass and laid in a similar way to a cement or concrete floor. This takes some weeks to set, and then the floor boards can be laid directly on it. If the
brushed over the floor surface the result will be as nearly as posaible damp-proof.

Tar can be employed effectively in the top treatment of a path. A simple method is to prepare the surface of the path, which is assumed to be of ashes or gravel. The top is then brushed clean and the tar applied hot, and well brushed into the surface. This is followed by a sprinkling of sand or fine grit, and as the tar sets the surface is well rolled. A damp sack should be rolled up and rested on the framework of the roller, and secured to prevent it becoming displaced. The sack is placed so that it rests on the top surface of the roller, and acts as a brush to keep it clean. It should be damped from time to time. Tar with stone dust can be used as a substitute for asphalte in laying a path. The nethod is described in the article on Path.

Medicinal Uses. Wood tar and prepared coal tar are both used in medicine. Wood tar is a blackish. aromatic-smelling semi-solid substance containing oil of turpentine, creosote, phenols, resins, and other constituents. Juniper tar oil or cade oil and birch tarare used in chronic skin diseases, usually incorporated in ointments. Tar ointment is used in the treatment of chronic eczema and psoriasis.

The diluted oint. ment is also often used with success as a means of check ing the very intractable itching of pruritus. Wood tar is prescribed as a stimulating expectorant in chronic bronchitis or winter cough.

Coal tar is the source of a large number of drugs, such as antipyrin, etc., and numerous disinfectants are manufactured from it.

TARNISHING. The best way to prevent tarnishing is to have the objects lacquered when such a course is possible, as this, when
wcll done, is invisible if a clear or crystal lacquer be employed.

To remove tarnish stains from silverware wash the objects in hot water with a trace of ammonia in it, following this with a good washing with clear hot water and finishing with a rouge polish. Tarnished brass and copper ware can usually be cleaned with a very weak solution of sulphuric acid in water. Add the acid drop by drop to the water. Only a trace of the acid must be used, as it is very violent in action and would speedily corrode the metal. The articles should be thoroughly washed afterwards in hot soda water to neutralise the acid bath, and then polished, and, if desired, lacquered.

Another method of treating tarnished silverware is to rub it well with a solution of powdered magnesia and follow with a polishing with the dry powdered magnesia, finishing in the usual way. Steel and iron are best cleaned with a mild abrasive. For slightly affected pieces this may be a light sprinkling of fine emery on an old stocking moistened with a few drops of lubricating oil. When the tarnishing is severe the best plan is to use the finest old emery paper and finish off with a good metal polish. See Lacquer; Polishing.
TARRAGON. This is a hardy perennial herb belonging to the Artemisia, or wormwood, family. About 2 ft . in height, it is raised from young roots planted about 1 ft . apart in spring. The shoots will be ready to cut down in autumn and store away for future use. Roots may also be started in the heated greenhouse in October for winter use. Propagation is by division of old roots, which should be done annually.
Tarragon is used in conkery for flavouring soups and vinegar, and forms an ingredient of many sauces. The whole leaves serve as a garnish for cold dishes. See Vincgar.
TARSO. This is a method of cutting a design on wood which gives it almost the appearance of inlay. It is a modern form of the old intarsia and affords a simple method for the amateur to decorate such surfaces as screen panels and trays. For the latter, when glazed it would be almost indistinguishable from marquetry. Many pokerwork designs can be adapted to this work by those who have no outfit for the former craft. More or less conventional designs can be carricd out effectivcly, and the outfit is of the simplest, consisting of a tarso or cutting knife, a supply of stains in various colours, and some polish.

The satisfactory appearance of the finished tarso depends largely upon clear, even outline, and therefore it is best to work on a flat panel. A box should not be taken for a first attempt unless books are built up alongside !evel with
the top to provide a sup-

something sma!l and fairly simple in design, such as the tray in Fig. 1, which shows a branch and leaves in tarso work wi:h a full moon, which is filled in with liquid whitc enamel. Another good design is illustrated in Fig. 2, which would be equally suitable for an empty grate screen panel or for a blotter. The colours used would be dark brown, green.


Tarso Work. Fig. 2. Panel asowing a boldly outlined
black and white. The incision should be about $\frac{1}{32}$ in. The design must be followed very carefully, and the various lines cut correctly. Cut anything that lies underneath first, and the rest of the design later. When all the lines are incised, the panel should be sandpapered, working with the grain, never against it. Finish off this stage by giving a final rub with the back of the sandpaper.

The next step is to colour the design by painting in water stains with a brush. The stains must be used almost pure, and made to look even and solid. It is an excellent plan to add 1 drop of ammonia to the stain before using it to prevent the colour from spreading. No shading must be attempted, the aim being to make the design look as though it is inlaid and not painted on. The background is left uncoloured. The colours are left to dry; if not sufficiently dense, any part that needs strengthening should be coloured again. After rubbing lightly with a very old piece of sandpaper, the work is ready for polishing.

A very high polish is required (see Polishing). First the whole surface of the wood is covcred by applying a coat of wood filler with a brush, and this is left to dry thoroughly. If the surface is not sufficiently covered, a second coat may be applied and left to dry. Then put some fine glaze polish into a pad, and body in until a good covering is obtained. Oil polish should not be used for this work. It is well to avoid working too long on the surface; the moment it becomes tacky it should be put on one side and work started on another piece. As soon as a good body of polish is obtained, take a clean pad, put 1 drop of glaze on it, and rub the surface hard, working up and down as quickly as possible until the whole surface is absolutely bright and free from any disfiguring appearance of streakiness. See Poker Work ; Tray.

TARTAR: On the Teeth. The deposit of tartar which tends to form about the roots of the teeth consists of phosphate of lime and other mineral substances. mixed with some organic matter. This tends to favour the activities of microbes and provoke decay of the teeth. Tartar is more likely to accumulate when food is soft than when a fair amount of it requires energetic mastication. See Tceth.

TARTARE SAUCE. This snuce is made by adding $\frac{3}{4}$ dessertspoonful each of chopped parsley, capers, gherkin, tarragon, and chervil to $1 \frac{\mathrm{t}}{2}$ large breakfastcupfuls mayonnaise. Keep it in a cool place until required.

TARTARIC ACID. The crystals of tartaric acid irritate the skin and mucous membranes. Obtained from grapes, tartaric acid closely resembles citric acid, and is used similarly chiefly as a refrigerant or cooling medicine in fevers. The dose is 5 to 20 gr .
It is used in making effervescing preparations; 20 gr . of the acid dissolved in oz. of-water will saturate, in an effervescing mixture, 24 gr . sodium bicarbonate dissolved in 1 oz . water. It may be used instead of citric acid for lemonade (q.v.).
TASSEL. This form of trimming is frequently used for pelmets, lampshades, cushions, to weight corners of work bags, panels, and other ornamental furnishing and dress purposes. There are many kinds, made of silk thread of any colour, of fine braid or ribbon, of gold or silver thread, of wool, beads, or leather. They are employed as a finish to girdles for dressing gowns and sometimes to edge scarves. Another use for a silk tassel is for a necklet. The necklet itself is frequently a silken cord, upon which is suspended a large, decorated bead or amulet, from the base of which hangs the tassel, of the same colour as the cord.
To make a woollen tassel, such as might be used to finish the ends of a girdle for a dressing gown, take a small piece of card, as wide as the required length of the tassel, and bind the wool round it several times, the number of threads in the tassel depending entirely upon individual taste. These strands of wool are tied tightly together at one edge of the card and are cut at the other, all that remains to be done being to hold the ends in one hand and twist a strand of wool several times round just below the point where it was tied. Sce Curtain ; Cushion; Fringe; Pompon.
TATTING: In Needlework. An oldfashioncd kind of fancywork, tatting can be worked in crochet cotton or in purse silk, a tatting shuttle and a crochet hook or bone pin bcing also required. The shuttles are made of bone, tortoiseshell, ivory, and of cbony inlaid with mother-of-pearl, and have a block in the centre, pierced with a hole, through which the cotton is passed.
To fill the shuttle, thread the end of the cotton through the hole, tie it, and then pass it through the ends of the shuttle round and round the block until it is level with the ends of the shuttle. The cotton should then be cut off, about 1 yard of it being left to hang loose. Workars should note that the crochet needle or bone $p^{\text {in }}$ is necded when joining the loops.

In learning the stitch, the chicf thing tc remember is that the thread over the hand is to be kept loose, while the thread from the shuttle is drawn tightly. The work resembles the buttonhole-stitch used in making a loop for buttons, the thread from the shuttle corresponding with the loops of the button loop, and the thread over the hand corresponding with the buttonhole stitch worked upon them. Take the end of the thread in the left hand, between the thumb and the finger. and pass it over the fingers of the left hand; then bring it back to the thumb and finger again so that there is a ring of thread round the fingers.

With the shuttle in the right hand, throw the thread from the shuttle round the back of the left hand and pass the shuttle under the thread round the fingers; then draw it back over that thread and pull it out tightly, letting the loop over the fingers become slack. This forms a loop on the shuttle string, tightened by expanding the fingers.
The first half of the stitch is now completed, but in making the second half do not throw the shuttle thread round the left hand, as previously, but simply pass the shuttle over the loop round the fingers and draw it back under it, thus reversing the process of the first half. Make quite certain after each stitch that the shuttle thread will draw, for if it will not an crror has been made, and the stitch must be unpicked. When twelve stitches have been made, draw up the shuttle thread until the stitches form a ring, the first and last stitch mecting. Leave about $\frac{1}{4} \mathrm{in}$. of thread between this and the next ring, which should be worked in the same way.
These rings are joined together by the picot stitch, which is made by leaving a short length of cotton between the stitches, which, when the ring is joined up, forms a little loop. In a large piece of work the rings arc sometimes sewn together, but ordinarily these loops provide the best means of joining them. Begin by making 4 stitches, and leave a small length of cotton between these and the next stitch. Some practice is necessary in judging the right length, for all loops must be of the same size. Then work 4 stitches and another picot, 4 more stitches and a picot, finishing with 4 stitches and then drawing them up into a ring. There is now a ring with 3 picots, and the following ring must be joined to the right-hand picot.

Begin the next ring in the same way, and when 4 stitches are made insert the crochet needle in the picot of the last ring, and draw the cotton which is round the fingers partly through the picot; pass the shuttle through this loop, and then pull the finger thread tight. Proceed with the same number of stitches and picots as in the last ring.

## TAXIDERMY FOR THE AMATEUR

## A Simple Example Described Step by Step

Herewith are detailed instructions by means of which the nature 'over can preserve and mount in natural positions not only bir sand small animals, but also reptiles and fish. See Arsenical Soap

The work of the taxidermist, which consists in preserving the dead bodies of animals, in their natural forms, is well within the scope of any careful amateur. The following tools and materials are required : A pocket-knife, a pair of small scissors, round-nose pliers, flat cutting pliers, 3 -cornered file, iron wire of various sizes, plain and coloured glass eyes, thread and fine string, tow and cotton wool, clay, pins, preservative soap and powder, camphor. Glasseyes and preserving soaps and powders can be purchased at a taxidermist's or naturalist's shop.

The preservatives used are generally highly poisonous.
Skinning a Squirrel. Supposing that the animal to be preserved is a squirrel, the first step is to place it as nearly as possible in the attitude in which it is intended to remain
when stuffed, Fig. 1. Carefully study the formation and contours of the body, and note down on paper any little details likely to be of use in obtaining a natural appearance. The squirrel is now placed on a board large enough to spread the limbs. The lower portion of the limbs should be tied to the board, holes being bored through the board at convenient places. The specimen is then placed in a good light and at a suitable height, and the skin opened with the large blade of the knife. The cut should be commenced about the middle of the breast and continued down into the lower part of the body, the separated skin being opened out and secured by bent pins attached by pieces of string to a nail.

Proceed to skin the body by first working out the hind legs, cutting the leg bones, under


Taxidermy. Nig. 1. A squirres tast nas been stuffed in a natural attitude according to the instractions given in this article
the skin, at the large joints. Use the cutting pliers to sever the joints. Carefully strip the skin off the lower part of the body, at back and front until the tail is reached, the flesh and small bones of which are pulled out from the skin. The operator is now able to proceed with the removal of the skin from the back and breast until the forelegs are reached, the bones of which are cut away 'ike those of the hind egs.
The neck and head are skinned down to the inner edges of the mouth and nose, and great care must be taken to avoid cutting the outer portions of the ears, eyelids, nose, mouth, and lips. After severing the skinned body from the head, remove all the flesh, the brain, and the eyes from the skull, which will now be attached to the skin by the inner edges of the mouth and must be handled carefully. Clean away all the flesh from the bones of the legs, and the skin is then ready for treatment.

Turn the skin completely inside out and scrape off any adhering flesh or other matter, and then apply a good coating of preservative soap, working it well in with a smal! brush. The skin is now turned fur side out again and hung up for 48 hours to dry and let the soap act. At intervals during the drying period the skin should be gently stretched and worked to keep it soft and supple, and at the end of the 48 hours it should be turned inside out and scraped clean with a blunt knife. Then a liberal application of the preserving powder should be thoroughly rubbed in

Modelling the Head. The interior of the skull, as at Fig. 2, should be filled with tow, saturated in a solution of camphor dissolved in a little pure turpentine. The first step in stuff.
ing is to bring the head to shape, and this is done by placing clay and tow on those parts of the skull from which the flesh was removed and modelling them to the required form. The skull is then replaced in the skin of the head, the glass eyes having been set in the eye-holes. The clay should be used as dry as possible and allowed to harden before placing the skull finally in the skin. Parts that are too low can be raised by pressing in a small quantity of cotton wool under the skin of the head and directing it to the required place by means of a piece of blunted brass wire.
A strong iron wire, about 10 in . long, is pointed at one end and bent to the shape of the backbone It is then tightly bound round with tow to the shape of a long narrow body, and placed in the interior of the skin, the pointed end being inserted well into the skull. A pointed wire, about 8 in . long, is thrust through the sole of each hind foot, and forced well into the tow body and the enda bent over. After the wires have been inserted. the ends should project for nearly 2 in . from the soles of the feet.
The leg wires and bones should be clothed with tow and clay and modelled to shape after the wires are in position. The fore!egs are wired by forcing a 6 in . pointed wire through the underside of the claws of each paw, the ends being thrust into the body and clenched over. Bend the forelegs to the desired position and bring to shape with tow and clay as already described. A thin iron wire. pointed at both ends, and about 12 in . long, is passed througb the cartilage of the tail, inserting the wire at the root and carefully pushing it up to the tip. Secure the lower end of the wire by pushing it into the body and bending over.
The body and legs are now bent into their permaneut positions, and modelled to shape by the addition of more tow or cotton wool until the natural contours are obtained Powdered camphor should be mixed with the
stuffirg material. The opening in the skin is lastly neatly sewn up with tine thread, and a piece of wood about 5 in . by 4 in by $\frac{1}{2} \mathrm{in}$., obtained for a stand
Mounting the Specimen. The stand (Fig. 3) will look better if its sides are irregular, and they can easily be made so by indenting and rounding them with a sharp knife. Bore two small holes for the wires of the feet through the surface of the stand, tuin over, and cut a narrow groove. radiating like an arm of the letter Y, from each hole, as at Fig. 4. Apply a coating of hot glue to the top surface and sides of the stand. and dust on fine sand until all the glued portions are thinly covered, when it should be set aside to dry.
The leg wires are passed through the holes in the surface of the stand, and allowed to project for about 1 in after which they are bent over at right angles into the grooves and clenched into the wood, as shown in Fig. 2. A piece of thin brown paper is cut to the shape of the bottom of the stand and glued thereto to give a neat finish. The tail is bent to a natural curve and a nut placed between the claws of the forefeet, holding it in position by the projecting ends of the wires.
The fur is finally cleaned by gently rubbing it with wadding soaked in benzol, afterwards dusting on fine plaster of Paris, which, when dry is beaten out with a bunch of feathers. The cleaning is best done out of doors as the benzol is highly inflammable. Use a fine tooth comb and brush to bring the hairs of the fur into their positions and folds and arrange the tufts on the ears and the whiskers with a fine wire. The specimen is now complete, and should invariably be kept in a dry place

Fish and Reptiles. The instructions given above are equally applicable to birds, fishes, and the larger reptiles. With patience and perseverance and the aid of a good text book on taxidermy, large specimens also may be attempted

A considerable amount of artistic skill and particularly neat workmanship is required in mounting birds, especially when it is desired to show them with open wings. It is worth while spending time and care on the wiring of the legs. The wire for this part of the work should be of a stouter gange than that used for the body: it should be long enough to lock into the body and be sharpened to an acute point at the end. There is only one position in the scaly part of the leg down which the wire will pass freely without damaging the skin, and that is on the inside of the member on the actual sole of the foot, immediately at the base of the hind toe. The actual position


Taxidermy. Fig. 2. Sectional diagram showing arrangement of wires and stuffing. Fig. 3. Diagram of irregularly shaped atand, showing position of holes for wire attached to the lega. Fig. 4. Underside of stand showing grooves cut from each hole for wire
of the legs should be decided on and the bird buns comprise the usual nursery menu, with a box or metal canister with a close-fitting lid, mounted on a suitable base, such, for instance, either weak tea or milk, and sometimes with or else in a tea caddy.
as a piece of thoroughly.dried peat or a piece of virgin cork
The general shape of the bird is now ad. justed, and if the wings are closed the work is simple, two short pointed wires being required for each wing. For open wings a long wire should be passed, right down through the interior of the wing, into the body and then locked in position For small birds the single wire will generally bc sufficient, but with large specimens the principal wire must be stout, and a second wire passed between the wing feathers close to the base. When the final shaping has been effected, the plumage should he worked into position, for it is very little use to attempt it before. The most suitable tools for this work are a pair of fine tweezers and a needle mounted in a convenient wooden handlc. All the feathers should be carefully looked over, and in places where shot holes have disarranged them it is often advisable to pull them out, stroke them flat, and replace them with a touch of paste at their hases.
TAXODIUM. This is the botanical name of a beautiful conifer, the deciduous or leaflosing cypress, Taxodium distichum. It is a graceful tree with light green leaves which become attractively tinted before they fall in autumn. It will attain large climensions in the course of time and thrives best in moist soil ; it is a good waterside tree.
TAZZA. The silver drinking vessel callerl by this name consists of a silver bowl, in shape not unlike that of a champagne glass, supported by a short stem and a small foot. Originally niade to hold drink, they were afterwards used for fruit and cakes. The word is used sometimes for glass and china dishes of this shape, and also for those made in other metals. Examples in antique silver are rare and fetch high prices. See Silver.
TEA: The Meal. As a general rule, in householls whore dinner is served in the cvening, afternoon tea is a very slight meal. In households where the children's dinner is taken at mid-day, tea is usually quite substantial, combining both tea and supper Bread and butter, jam and simple cakes or ruit in season.
For high tea, which is a rather more solid meal in place of supper for the family, the


Tazza, witu lid, in wrongut iron, inlaid witu silver in a floral design. Modern Belgian work
table is laid much as it is for brcakfast, with knives and forks, as well as the accessories of tea proper, and very often ham or meat of another kind is offered. Eggs, boiled or cooked in other ways, grilled tomatocs, bacon and kidneys, sardiacs on toast, special salads, or sometimes a larg meat pie or a fish dish, are served. while cakes and jam follow. See Afternoon Tea Table; Breakfast; Bridge Party ; Pienic ; Sandwich; Service Wagon; Tray.

## Tea: Its Qualities and Blends

## With Hints on the Best Methods of Infusion

Other entries that bear on the matter include Blending; Bre ikfast; China Tea; Diet; Pekoe;
Souchong. See also Kettle; Teapot; Urn, cte.
Tea owes the properties which have made it so popular a beverage to a volatile oil and to theine, an alkaloid which has a gently stimulating effect on the nervous system. It also containe a proportion of tannin, or tannic acid, which is liable to cause indigestion when tea is not properly male or is allowed to stand too long so that it becomes overdrawn. The proportion of tannic acid varies in different kinds of tea; it is usually from 10 to 12 per cent. The proportion of the volatile oil is about $\frac{1}{2}$ per cent., and of theinc 2 to 4 per cent. A cup of fairly strong tea contains l gr. of theine and 2 gr . of tannic acid.
Of the tea imported into Great Britain nearly 90 per cent is produced within the Empire, chietly in India and Ceylon. The balance is grown mostly in China. China tea contains less tannin than the Indian product. On the other hand, there is a larger proportion of theine in Ceylon tea than is usually found in the Chinese varietics.
There are two classes of tea, namely, green and black, with many varieties of each. The difference lies chiefly in the mode of preparation, green tea being rolled and dried, while black tea is also allowed to ferment. The best green tea comes from China.

Of black China tea the chief kinds are Pekoe, Souchong, and Congou, which arc
practically three qualities of the leaf. Pckoc consists of the bud and the first leaf; it is the first-fruit of the plant, and is named after the young shoots, the word Pekoe signifying white down. Soucnong is obtained from the next leaves after Pekoe, and Congou is the third sclection. Among the varieties there are flowery and orange Pekoes, and others which are largely employed in blending.

Practically all kinds of tea arc a blend of several different sorts, the reason being that it is very rare indeed to find the requisites of flavour, strength, and colour combined in any single kind. Some varieties are highly fragrant, being scented with flower petals, notably jasmine. Bohea, a name once applied indiscriminately to all teas, and sometimes used to-day for a poorer late-grown leaf, is a variety grown in Fu.kien prov., China, which is also noted for red leaf Congou.
Buying and Storing. Tea is sold in packets weighing from $\not \perp \mathrm{lb}$. upward. It should be kept in a dry place and protected from the air. This is particularly necessary whore tea is lept in a store or pantry in the neighbourhood of other commodities, especially fruit or spices, as they may communicate some of their flavour to the tea, the dried leaves of which are very susceptible to the surrounding atmosphere. For this reason tea should be kept in

As a rule a chest of tea contains 84 lb . and a half chest 50 lb . Indian and Ceylon chests contain about 100 lb . These cases are furnished with a protective lining of sheet lead
In buying tea the housewife has a wide range to choose from. Generally speaking the Indian varieties are stronger than the Chinesc, but black teas of all kinds are obtainable, and the purchaser must be guided by her own par ticular taste. Black blended teas are the most numerous. Most firms sell a household blend of medium strength and good flavour for ordinary domestic use A fuller and richer flavour is provided by mixtures of Ceylon and Assam.

The addition of a small quantity of China tca in some blends makes for a more pungent tasting beverage, and occasionally a flavouring of Oolong is added Unblended Indian teas, of fine and expensive quality have a delicate and slightly pungent taste. Darjeeling is fragrant and full-flavoured.
How to Make. In making tea many people think it is best for the flavour of the beverage to use an earthenware teapot. The water used should be quite fresh, that is to say, it must not have been boiled previously and reheated, nor have bcen standing some time. The kettle should be emptied and filled fresh from the tap every time that tea is to be made Soft water is always best for the purpose where the supply to the house is a hard water, a very little carbonate of soda may be put into the teapot along with the tea, care being taken not to put in more than a pinch, otherwise the tea may have an unpleasant flavour.

It is essential that the water should be actually boiling. A second point to note is that the teapot should be heated. A little water from the kettle is poured into the teapot, and the latter can then be allowed to stand until the kettle boils, when the teapot can be emptied and the tea dropped into it.

An old rule as to the quantity of tea required is to allow one teaspoonful for each person and one for the pot. One good teaspoonful, however, should be enough to make two cups of tea easily; with some teas a teaspoonful will make three cups. Much depends on the quality of the tea.

After the tea has been put in, the pot should be filled up as soon as the kettle boils, pouring the water slowly over the tea leaves. The most usual method is to fill the teapot half full, but some people fill it three-quarters full.

The filled teapot should then be allowed to stand for 3 or 4 min . so that the tea is properly infused. This is much more satisfactory than to stir the contents of the pot with a spoon, as is often done to save time. China teas require to be thoroughly infused, and some may be allowed to stand for 8 or 10 min . without any risk of deterioration. Some tca drinkers allow the tea to stand for 2 or 3 min . and then pour it into a second teapot which has previously been heated. In this way the infused liquid is obtained without the leaves, and there is no risk of tannic acid spoiling the tea if it should be left standing.

Another method of making tea is by putting it into a teaspoon infuser. Many persons, especially those who suffer from indigestion, prefer to have their tea made in this way, because it produces an absolutely fresh cup with no possible excess of tannin.

Tea cannot be said to have a food value, except when it is taken in conjunction with milk and sugar. Tastes differ considerably in this respect. Some persons enjoy their cup of tea with milk alone, some only take sugar, and there are others who take neither, while some choose lemion in preference. Even when reinforced with milk and sugar, tea is inferior in nutritive value to cocoa, and also to coffec
madehalf with milk, but neither coffec nor cocoa possesses the refreshing propertics of tea.

From the medical standpoint theine, the active principle of tea, clears the brain, stimulates mental action, and removes feelings of fatigue and drowsiness. The best times to take tea are at breakfast and in the afternoon: for most people twice a day ought to be sufficient. It is well not to give tea to young children, or at least not more than a tablespoonful in a cup of milk.

People who are in the habit of in the habit of S. hensington drinking too much tea, or taking it too were also made of figures. Caddies strong, may suffer sooncr or later from in- painted black, and decorated in the Chinese digestion, palpitation, loss of appetite, sleeplessness, depression, constipation, or nervousness. The remedy is to stop drinking tea till the symptoms disappear.
TEA BASKET. A basket made to carry materials for a pienic tea is very similar to a lunch basket, being of wicker, provided with a lid, and straps for security and as a means of carrying it. Cases are more used thin baskets. The fittings for either consist of cups and saucers, plates and tea knives for two, four, or six people, a larger knife, and several cake plates, a bottle for milk, and tins for holding sandwiches and cakes. They also include cither a vacuum flask or a spirit kettle and stove, teapot and tea caddy. See Picnic.
TEA CADDY. The carliest caddies were of Chinese porcelain shaped like a ginger jar. These were made in great variety hy the English potters, a common type being one of blue and white chinaware. They are often in pairs, one for green and one for black tea.
Soon they were made in silver, brass, pewter, and tortoiseshell, and in the 18th century fine silver pieces were produced. Some of these are chased with pastoral figures, flowers and scrolls. They had slip-in, pull off, or hinged lids Some are shaped like a vase, while others are oval, silver bead edging being found on some of the latter type. Shefficld plate caddies were sometimes hexagon in shape, but the more usual type to be picked up to-day are oblong or oval with beaded or gadroon borders. The hall marks should be on the side or bottom.

The wooden tea caddy was evolved from the metal one. It became usual to encase two of them in a wooden box, and in the 18th century wooden caddies were largely made. These usually contained threc receptacles and were shaped somewhat like a small chest. At either end was a lidded well, one for green and the other for black tea, and in the centre was a receptacle for sugar. The finer woods were used, chiefly mahogany, rosewood, and satinwood. Some were mounted on brass. and many were beautifully inlaid. Knobs of ivory, ebony, and silver are found on them. Specimens of the older caddlies enclosed in a box are sometimes met with. An example is a sct of three silver ones fitted in a rosewood case. Shagreen was occasionally used for the case.
Tea calldies were made by Chippendale and Hepplewhitc. Mahogany was the wood chiefly used by both. Chippendale made some of his caddics rather in the shape of caskets with richly carved lids and feet, the claw


Tea Caddy of harewood and satinwood, with marqueiry of satin and other woods
3!) permission of the Director, Victoria and Albert Museum,
and ball being much used by him. The outlines of Hepple. white's caddies were straighter than those of Chippendale. Instcad of feet he often fitted a plinth to them, and while mahog. any was frequently uscd, delicate veneers were much favoured.
An example of late 18th-century workmanship is an oval box of painted wood, on which is represented Howers, crests, and allegorical scenes, vividly coloured. Some of this type are painted with festoons in the Adam style or medallions revealing Grecian figures. Caddies manner or with mother-of-pearl, etc.
In aldition to the above, which may be regarded as the chief styles, another type of caddy was introduced early in the 19 th century, the decoration of which consistcd of rolled paper filigree work. This consisted of a box, usually hexagonal in shape, which had faces slightly recessed. In the recesses were fitted many coils of paper cut in narrow strips, cach placed on edge and arranged so as to form an claborate pattern consisting of scrolls, leaves, festoons, and gcomictrical figures. The inner edges were glued to the wood, the coils were twisted so that rough handling could hardly move then ont of shape, and the surface was protected with glass. Sometimes the parchment paper scrolls were left ivory colour, sometimes gilded. The eflect was that of fine carved ivory, or, when the strips were gilded, of metal filigree, while some of the tinted work was like Indian lacquered wood carving.
For use with caddics a special kind of spoon was designed in Sheflield plate, silver and other metals.
TEA CAKE. Tea cakes can easily be made from 1 lb . flour, $\frac{1}{2} \mathrm{oz}$. solid yeast, 2 oz . margarinc, a flat teaspoonful of castor sugar, an cgg, a pinch of salt, and milk and water to mix. Sieve the flour and salt into a basin, rub the fat into them until the mixture resembles fine brearlcrumbs, and make a well in centre. Put the yeast into a small, warmed basin, noon tea table spread with an embroidered or lace and linen cloth, and also for a cosy to accompany a dining-room breakfast scrvice of handsome and formal design. Conventional shapes are used in smaller sizes for the cosies which form part of a set for the breakfast tray, with egg cosy, and tray cloth to match. Quaint shapes are seen in the cottage designs worked in various materials and in developments of the same illea, such as "The Old Curiosity Shop," Noah's Ark and house
add the sugar. and mix them together until they form a liquid. Then pour in thent warmed milk and water, mixed in equal quantities, strain the whole into the flour, cte., and mix all to a stiff paste. Turn the dough on to a floured board, knead it until it is smooth and pliable, and then divide it into two or three portions, shaping each into a round. Put these on to a greased baking sheet, cover them with a cloth and leave them in a warm place for about 50 min ., or until they have risen to twice their size.

Bake the cakes in a hot oven for 20 min ., and just before they are ready to be taken out brush them over with a mixture of milk and sugar. Leave them for a few minutes so that the glaze may dry. The latter can be made from $\frac{1}{2}$ gill milk and 1 dessertspoonful castor sugar. For currant tea cakes add 1 oz . picked and cleaned currants to the above.
Smaller tea cakes made with baking powder instead of yeast can be prepared from lb. flour, 1 oz . margarine, 1 teaspoonful baking powder, half an cgg, and about a gill of milk. Sieve the flour with the baking powder into a basin and rub the margarine into them. Beat up the egg and add it to the flour, etc., pouring in also sufficient milk to mix the whole to a soft but not sticky con-


Tea Cake. Small cakes wnich may be served cold or cut open and toasted before buttering
sistency. Roll out the mixture on a floured board until it is about $\frac{1}{2} \mathrm{in}$. thick, then cut it into small rounds, brush these over with milk, and bake thein on a greased baking sheet for $10-15 \mathrm{~min}$.

Tea cakes niay be buttered and served cold, but more often they are sliced in half, toasted and buttered, put together again, and then cut in the same way as an ordinary cake. See Crumpet; Girdle Cakc; Sconc.
TEA CLOTH. The phrase tea cloth has two distinct meanings. In one it refers to the cloth laid on the afternoon tea table, and in the other to the cloth, similar to a glass cloth, which is used for drying the tea things after they have been washed up. Ideas for embroidering and decorating afternoon tea cloths are given in the articles on Drawn Thread

## Tea Cosies Conventional and Quaint

## Directions for Making These Table Accessories in Various Fabrics

The reader is referred to the article on Raffia Work for instructions in covering a tea cosy in that material. See also Appliqué Work; Embroidery ; Felt; Laid Work; Leather W'ork; Patchwork; Painting on Textile Fabrics; Quilt; Ribbon Work; Tapestry Needlework; Woolwork
A tea cosy in common with every other boat notions. These are particularly suitable well thought out accessory should be chosen in company with cottage breakfast ware with due regard to its surroundings both in for nursery or dining room, or for garden style and colour. As a rule a conventional tea tables. There are also hen, duck and shape is best for the dainty cosy on an after- a fcw other animal shapes designed to cover
the nursery tea pot.

Making the Padded Lining. Although padded interlinings can be bought inexpensively in several sizes at art needlework shops, some people prefer to make their own. It is really simpler and wiser to have an independent lining for most cosies of conventional shape, and to slip the cover over it when the latter is completed. In the case of suède or a silk or satin cover which has been hand-painted, stencilled, or very delicately embroidered, it
is sometimes desirable to have the lining particularly dainty renewed, or cleaned separately. In the casc when of pale colours of a washable linen cover of ina colour worked in stranded this will require laundering separately. When the cover is of white linen decorated with drawn-thread work or lace motifs and insertions, the lining which will show through should be of a colour to suit the table ware so that the effect of the needlework is enhanced. A scparate lining can be attached to the cover by a few stitches to keep it in place.

Cosins vary in size from those designed for individual teapots to the large covers for family breakfast teapots. A very small cosy cut in conventional semicircular fashion measures about! in. across the bottom and is 7 in . high at the centre of the curve. A medium size is $14!$ in. by 8 in., while a larger one has a height of 10 in . and a width of 16 in . Whatever the size required to fit the outer cover, allow 1 in . all round for turnings when cutting the lining fabric. The wadding for interlining must he cut exactly to the size of the cosy when finished and no turnings allowed. Sateen is a useful material for linings, but for better cosies. silk and crêpe-de-Chinc are used for the inside of the lining next the teapot, while a cotton material serves for the outer lining naxt the cover, unless this happens to be decorated with openwork.

Cut four semicircles of the lining fabric and two of wadding (some workers use this in double thickness), sew the two semicircles for the outside of the lining pad together face to face, stitching firmly all round except at the bottom. Turn them inside out and then stitch the two inner lining pieces togrether in the same way, but do not turn. The two pieces of waddling are now sewn together round the top and sides with long tacking stitches. If the edges of the wadding are overcast they will not fray out. Slip the wadding inside the outer lining, catch them together with a few tacking stitches to hold the wadding in place, and thien push, smooth and stitch the inner lining into position. The bottom edges should now be neatly sewn together all round to complete the lining pad. An inner lining of silk or satcen to match the cosy cover is marle and adjusted to a wadded interlining when the latter is bought covered in white cotton material.

Afternoon Tea Cosies. Whether a cosy cover is a scparate allair or at one with the paclded lining, any embroidery or painting is done before the fabric is made up. Linen cosics are


Tea Cosy. Fig. 1. Cosy of rose pink crêpe-de-Cbine suita ble to accompany a dainty tea service. The design is quilted by band mployed to cover a


Fig. 2. Cottage cosy made of felt. The lattice windows, rose trees and flower border are worked in bright coloured wools and easy stitches whole canvas foundation, or for a motif the handle at the top. It is very intercstto be applied to a cloth, silk or satin tea ing to work out quilting patterns for oneself cosy. Decorative patchwork makes attractive with the aid of an original drawing or cosics in silk, velvet or suède. For these suitable embroidery transfer for the centres fabrics a gooll finishing touch is a cord sewn of the front and back of the cosy, drawing along the bottom and outside edges. This the border for this, diagonal lines and outer should be done with silk of the same colour as border for quilting, directly in pencil on to the the cord and after the cover has been joined. fabric after taking a few measurements for Take up a tiny piece of the fabric and a correct spacing. few threads of the cord and pull them together; then run the needle under the covering material for the longer stitches and take small stitches in the cord. The ends of this must be neatly finished off. 'To form a handle a loop of the cord should be twisted and left in the middle of the top. Tinscl cords are often used when silver or gold thread is introduced into the embroidery. Thonging is sometimes employed as a finish when suerle is the matcrial of the cover. (See Leather Work.)
Nothing could be more appropriate for a cosy than fancy quilting. The example of this work illustrated in Fig. l was carried out in rose-coloured crêpe-deChine, quilted by hand with back-stitching in silk thread to match. Instructions for fancy-quilting will be found in page 1030 . Italian quilting can be equally well used to decorate a cosy for the drawing-room tea table.

As quilting is done on fabric with an interlining, the inside lining of the cosy made of the same material as that quilted is usually attached to the outer cover, an extra layer of wadding being inserted between the two. Such cosies are pretticst in delicate colours and require to be dry-cleaned. The semicircular edges of the one illustrated are finished with a sclf-piping and strap handle. Sometimes the piping is twisted into a looped bow to form

Cottage Shapes. Felt, raffia cloth, linen. crash, blanket cloth and embroidery canvas are all used as foundation materials for the building of cottage cosics. It is not difficult to evolve one's own patterns out of brown paper, cutting the roof portion scparately, a back and a front piece of the same size, and two side pieces. The chimncy which forms the handle is a straight piecc doubled over and sewn on to the middle of the roof.

The cosy illustrated in J'ig. 2 is made of feit. The thatched roof is of brown, the chimney of brick red, the walls of fawn and the door of dark gicen felt. The height including the roof should be about $10 \frac{1}{2}$ in. when flat. A piece of brown felt measuring about 9 in. deep by 11 in . wide would be sufficient to form the roof, back and front when doubled, and the front and back walls of the cosy would be each 7 in . docep (to allow for joining to the roof), and 10 in . wide. The roof projects slightly at either side. The sides are about $4!$ in. wide and 10 in . high, being cut up to a point between the back and front of the roof. The door is a scrap of green (or other colouved) felt buttonholed to the wall picce. The design of windows and flower bed, ctc., can easily be drawn on the felt with a coloured crayon.
Bright coloured wools are used for the embroidery. The windows are done in chain stitch, the wondwork to match the donr and the lattice in darl grey. The rose tree is in stem stitch, brown for the stalk, single stitches in green for the leaves and a French knot for the centres of the pink roses. The groups of smaller flowers are worked with single upright stitches, small ones crossing these in green to form the leaves and stems and the flower heads put in with lazy-daisy stitch, buttonhole rings and French knots for the buds. Any other stitches can be introduced which the worker fancies, and the flower embroidety can be continued at the sides


Tea Cosy. Fig. 3. Plusa duck cosy tor the nursery teapot. Scraps of the plush left over can be made into ducklings to keep eggs warm

TEAK : The Wood. This The best metal teapots are of silver, but they is a heavy hardwood, dark are also made of Sheffield plate, electrobrown in colour, sometimes plate, aluminium, and enamiel ware. Often with a greenish shade. Like oak and some other woods, it darkens with exposure and age. It is oily, docs not suffer by contact with iron, and is durable under water. Its grain is straight and rather coarse, with a dull surface. When freshly cut it has a peculiar smell, something like leather. Though not very difficult to work, it contains a phosphate of lime which soon dulls the edges of cutting tools. When well seasoned it does not crack.

Teak is largely used for furniture in India, its native place, but only to a small extent in Great Britain, its dull appearance and its weight being against it. It is used occasionally for floors, stair treads, window and door sills, and similar purposes. See
in one group and a few brown stitches to represent the earth of the bed. The back can correspond with the front, but leaving out the door and the rose tree. The cottage walls when embroidered are tacked together and made up by firmly buttonholing the edges with wool to match the felt. Begin at the bottom so that a!l the edges are even at the base. Lay the roof in place over the four sides of the cottage, and stitch it down with long running stitches. It is a good plan to buttonhole the points of the side walls and catch the roof through to the buttonhole stitches. Ruttonhole the little piece of brick red felt for the chimney in the same colour, and attach it in the position shown.

Cottage cosies are obtainable, shaped in canvas, and ready to be embroidered in tapestry needleworts. Transfers can also be bought suitable for linen or raffia cloth covers. Details vary for roofs, windows and garden effects, but in the main the shapes are much the same.
Nursery Tea Cosies. Linen cosies with applied or cross-stitch designs of animals or figures from nursery rhymes are more commonplace than the plush duck tea cosy which is illustrated in Fig. 3, with the duckling as a miniature egg cosy. For the tea cosy $\frac{1}{2} \mathrm{yd}$. of 36 -in. wide woolly plush is allowed, the same amount of sateen for lining, a sheet of wadding for interlining, two black shoe buttons for cyes, and a small piece of orange cloth or felt for the beak
The cosy is cut in duplicate, each side in one piece, shaping it with a smaller portion for the head, slightly waisting the shape below this and then widening out to form the semicircular lower portion. The wings are cut out in 4 pieces roughly diamond shaped and the beak is simply 4 semicircular pieces, 2 for the upper part and 2 for the lower. The lining is cut in duplicate semicircular pieces.

Join the two halves of the plush covering with the right sides facing and stuff the head part well with cotton wool. Pad and line the cosy. Join up the two pieces of the Wing, leaving an opening at the base a that the work can be turned right side out. Scw up the opening and attach in position on cosy. Make the other wing in the same way. Join up the two pieces for the upper beak, turn, join up the other two pieces, and sew in position. Sew in the buttons for the eyes.


Teapot. Two Georgian silver teapots, one of them standing upon ball legs, and both with ebong handles Courtcs/l of Chapple \& Mantell
as well as repoussé work. Two typical ex amples of late Georgian teapots are illustrated. That on the left dates from 1787 and has a fine thread erlge and an engraved shield. Teapots of this shape often were made with stands to match on four feet. The teapot shown on the right dates from 1827 , and lias the four ball feet which makers began to put on at the beginning of the 19th century to obviate the need of the separate stand

About the end of the 18th century some beautiful teapots were made in Sheffield plate Existing examples, which have been largely reproduced, are very retined, hoth in shape and in rlecoration. In these subtle curves, plain surfaces and handles of flowing scrolls are skilfully combined, while the adornment takes the form of pierced ribbonwork and delicate rosettes.

Electric Teapot. A feature of the nickelplated electric teapot illustrated is the "tea ball." This perforated cage is filled with tea and suspended by a chain in the water after it has boiled. It can be raised when required, and the chain has a weighted knob which holds the tea ball out of the water so that the tea cannot be stewed. Connector, Hexible cord and lamp-bolder adaptor are supplied with the teapot.

Teapot Stand. A teapot stand is often necessary on polished wood tables and trays. For a silver teapot a small salver is sometimes used. Many different types of teapot stands are sold. In shape they are usually circular or square, and they are made of glazed earthenware, various kinds of metal and stone. The metal ones, because of their heat-conducting properties, are usually raised on wooden fect. See Salver; Urn.

TEAPOY. This word has two meanings. In one it is a small table supported upon a tripod or upon four legs, and used chietly for holding a tea service or an urn. In the other it is a receptacle for holding tea. These teapoys were the early form of tea caddy and were made of china or earthenware.

TEA PUNCH. This good summer beverage is made in the following way: Make a gallon of fairly weak tea, cover it and let it stand for $\bar{a}$ min. before straining and sweetening it to taste. When it is cold, half fill a punch bowl with cracked icc and add the tea and the strained juice of four lemons. Smal pieces of pincapple, a few stoned cherries, some sliced banana, a handful of mint, and, if required, a little more sugar, should be added just before serving. See Punch.

TEA ROSE. This is a group of garden roses, descended originally from the China rose, Rosa indica. They are distinguished by slender and somewhat spreading growth and are rather less hardy than the hybrid teas and hybrid perpetuals. They bloom in summer aid in uutumn and flourish best on a sunny, sheltercd border. See Rose.

TEASEL. The dearl flower-hearls of the teasel or fuller's teasel, owing to the stiff, spiked hracts that cover them, are employed in textile manufacture to raise the nap on cloth. The ordinary household use of this plant is purely decorative, the close oval heads of mauve flowers, each rising from a circle of long spines, on straight, stiff stems, making it an excellent cut plant for a tall vase. Teasels last well in water, retaining their bcauty even after the Howers are withered. They are raised from seerls sown out of doors in May, and the plants will bloom the following year.
Owing to use of teasel heads for teasing cloth, the name teasel wool is given to a kind of wool, the surface of which is raised with a wire brush after it has been knitted or crocheted.
TEA SERVICE. People who possess old china tea services rarely care to use them every day. Exquisite reproductions are obtainable from the modern Worcester, Minton, Wedg.
woord and other potterics, for those who like their tea tables to present an old world appearance and possess the great advantage that each piece is replaceable in the event of breakage. Many are moderately priced. A service for 6 people, for instance, is sold in modern Wedg. wood ware for less than 30s, and there are other makes of Staffordshire china reproducing the old designs to choose from at equally reasonable prices.
Slightly more expensive are the modern designs and delightful shapes of the china services from the Shelley and Newport pot-


Tecophilaea cyanocrocus, the Cbilian crocus, a beautiful spring bulb with blue fowers. It needs a warm, sheltered situation

TEA TABLE. Usually of light buitd and of small size, a tea table is generally about 27 or 28 in . high. It is obtainable in a !arge number of shapes with single and folding tops, and is made in both wood and wicker. On account of its uneven top the latter kind is only suitable for use with a tray.

Tea Wagon. See Service Wagon.
TECOMA. This is the name of a class of evergreen and leaf-losing climbing plants. Some may be planted against a sunny wall out of doors, while others inust be grown under glass. The two kinds suitable for a wall are grandillora and radicans, both with reddish, tube-shaped flowers. Both are vigorous climbers and will reach a height of 15 ft . or more. They should be pruned in spring by shortening the side shoots.

Of those grown in a heated glassbouse capensis, orange-red, jasminoides, white, and valdiviana, orange yellow, are the best. Pron. Te-cō'ma.

TECOPHILAEA.
These are blueHowered bulbs which may be grown in a border at the foot of a sunny wall or in pots in the greenhouse. They are not hardy enough for the open garden. They like sandy, loumy soil and should be planted in autumn 3 in. deep. teries. In semi-porcelain there is a great choice Cyanocrocus, blue, and Leitchlinii, deeper blue, of old and new patterns. In plain colours are two beautiful kinds; both fower in spring. such artistic services as those in Mooreroft The popular name is Chilian crocus. powder blue ware have much to recommend them. Combination breakfast and tea sets are useful, as in this way space is saved and larger cups are at hand to match the tea cups for those who prefer them. In many patterns teapots, hot water jugs, toast racks, cake plates, muffin dishes, butter and jam dishes can be obtained to match. Particularly bcautiful is the ware with a honcy-glaze ground.
A silver tea service is conıposed of teapot, cream jug and sugar basin. Sometimes a tray and spirit kettle or hot water iug are included. See China; Silver.

TEASPOON Teaspoons may be of silver or electroplate. They are ofters sold in sets of 6 or 12, or form part of a set of table silver. In larger sizes they are used with breakfast cups for tea or coffec. For afternoon tea and after dinner coffee ornamental designs in smaller sizes are specially made. The ordinary teaspoon is used as a measure for liquid Havourings in cookery. It is equivalent in this sense to $\frac{1}{8}$ of a Huid ounce. See Silver; Spoon.


Fig. 3


Fig. 2

Tee Joint. Three methods of attaching a centre upright to a top rail!. Fig. 1. Halved tee joint. Fig. 2. Dovetailed. Fig. 3. Bridle joint

TEE SLIDE. Used in securing dining- there is constipation fluid magnesia in the table slides, the tee slide is uscful because no mornings is a useful remedy, and the best cross-rails are required under the table when remedy for diarrhoea, at any rate at the bethis form is fitted. The table slides are first worked to the correct shape by special planes and the tee slides are shaped to fit and are let in, glued and screwed
ginning, is a teaspoonful of castor oil. Earache may be treated by applying cold cloths to the car. As the child salivates very frcely, it may soak the garments over the front of the chest,

to the adjoining slide. The amateur will find some difficulty in planing the groove, but with lardwood the table slide can be built up with 3 pieces of wood, as in Figs. 1 and 2. A suitable groove is cut in the thicker piece, and then the two thinner pieces are glued and screwed on. Accurate workmanship is needed to ensure easy running, but if this is attended to the method is preferable to any other. To prevent sticking, the inside of the groove should be coated with blacklead. See Dining Table.
TEETH. A tooth exhibits a crown, a neck and one or more roots or fangs. The coots are composed of dentine, or ivory, and this exists also beneath the crown, surrounding a hollow in the centre of the tooth, described as the pulp cavity, which is continucd down into the roots. In this cavity is the pulp, consisting of blood vessels, nerves and loose connective tissue. The crown is formed of an intensely hard substance known as enamel ; it forms a cap of varying thickness for the tooth and may have two or more eminences, or cusps, on its biting surface.
Teething. The process of cutting teeth is called teething or dentition. There are two dentitions. The first of the milk teeth to appear are usually the lower central incisors, and this generally happens in the 6 th month. In a short time the upper central and all the lateral incisors ernerge. and then follow in order the first molars in the 12 th month, the canines in the 18th month, and the second molars in the 24 th month. Variations of these times occur even in healthy children, and in rickets dentition may be much delayed.
The second dentition begins about the 6 th year, with the appearance of the first permanent molars, and each year after this the other permanent teeth are cut-the central incisors, the lateral incisors, the first premolar, the second premolar, the canines and the second molar. The third molar tooth may appear about the 17th year or not until the 25 th , and is also called the wisdom tooth : sometimes it does not erupt at all.

The first teething is sometimes a trying event for the infant and the gums may be swollen, hot and tender, and the child is feverish and restless. The digestion may be upset, and there may be constipation or diarrhoea. Sometimes there is earache, indicatcd by restless movements of the head and erying. It is not uncommon also for a child to suffer from bronchitis while teething. Another possibility is that the child may have convulsions (q.v.).
A child that is being suckled should not be taken off the breast while it is having difficulty in tecthing. Cool, boiled water may be given frecly to cool the mouth and relieve thirst. If
and care should be taken to prevent this.

The use of a baby's comforter creates a danger of infection, because the comforter may be dropped on the floor and be put back in the baby's mouth without being sufficiently cleansed, but there is this further count against it, that it may cause malformatiom of the jaws.
It is desirable that an infant should begin gnawing at crusts or rusks when it it is about six months old. as this practice helps to develop the jarss, and insufficient development may be due to the child not having been given firm food to gnaw ; but this is quite a different thing from a baby keeping a comforter stuck in the side of its mouth more or less constantly.
There is rarely any trouble with the second dentition. Sometimes the teeth are overcrowded and are placed irregularly. When there is no hope of their settling into a correct position one or more should be extracted. Unless teeth are efficiently cleansed there is a tendency to the deposition of tartar about the neck of the tooth, and this may separate the gum from the tooth, giving access to bacteria and possibly leading to pyorrhoea. Morenver, carbo-hydrate foods, such as sticky fragments of bread, may lodge in the crevices between the teeth, and ferment, giving rise to acid substances which attack and dissolve the tooth-substance. That is the beginning of caries.

The natural method by which teeth are cleaned is by chewing crisp foods and such as require a good deal of mastication. The teeth should also be brushed, however, twice a day at least. The motion of the brush should be up and down and it is necessary to hold it vertically when brushing the backs of the teeth. Parts which cannot be reached by the brush can be cleansed by drawing a strand of dental floss between the teeth.

A smooth dentifrice should be selected, as erosion of the teeth has followed the use of a gritty dentifrice. The tooth is worn away at the gum margin and decay is encouraged. A common cause of erosion is the little metal clip often used by dentists to keep a small denture in position. This should be avoided whenever possible, and so far as the upper jaw is concerned the use of a sufficiently large plate may make clips unnecessary.

As soon as decay begins the parts should be cleaned out and stopped, and it is only prudent to have the teeth examined perıodically by a dentist so that the first beginning of caries may be discovered and dealt with.

The importance of keeping the teeth sound cannot be over-estimated. Apart from the digestive troubles that proceed from deficient or defective teeth an enormous amount of illness is caused by the absorption of poisons from defective teeth.
Pain in a tooth, or toothache, is dealt with under that heading. Excessive bleeding after the extraction of a tooth may be arrested by folding a part of a bandkerchief into a pad and biting on it, or by plugging the socket with cotton wool.
Artificial Teeth. Artificial teeth must be kept scrupulously clean. They should be taken out at night and brushed with tooth powder, and then be left in water containing some antiseptic. For a vulcanite plate this might
be hydrogen peroxide, but for a metal plate it may be necessary to use a weak solution of chlorinated soda from time to time in order to keep the metal bright. A removable denture is much to be preferred to bridgework, as juices may lodge beneath the bridge and decompose. See Caries; Dentifrice : Pyorrboea: Tartar: Toothache.
TELEGRAM. Telegrams are divided by the Post Office into two classes, those sent within the United Kingdom and those sent without. For inland telegrams the charge is ls . for the first 12 words, including the address, and ld. for each additional word. Telegrams to the Irish Free State are treated as inland telegrams, but are charged ls. 6d. for 12 words. Telegrams handed in on Sundays, Good Friday, and Christmas Day are charged 6d. extra in England and Wales. In Scotland this extra charge is made on Sundays only.

Telegrams in plain language in any modern European tonguc or in Latin or in Esperanto are charged for according to the number of words. All words not forming part of any modern European language or of Latin or Esperanto, and all unintelligible combinations of letters, are charged for at the rate of five letters to a word. With the exception of words that are ordinarily written as one, such as father-in-law and twenty-six, no combination of words is countcd as a single word. Double names like Rivett-Carnac, although connected by a hyphen, are counted as two words. Abbreviations, such as can't and won't, on the other hand, are counted as singie words.

Figures are counted at the rate of five to a word. For example, 67243 counts as one word, but 567566 counts as two. Fractions are similarly counted according to the number of figures employed, the mark of division being reckoned as one. Thus $\frac{3}{4}$ counts as one word, but $288_{\text {IT }}^{y}$ as two, because there are six figures and marks therein. When a figure or a group of figures is followed or preceded by a letter, e.g. 716 A , the letter counts as a word. Initial Intters arc counted as a word each, with certain exceptions. For instance, the initials of the London posta! districts, e.g. W.C., are counted as one word, as are the abbreviations, a.m., p.m., and H.M.S.

Certain names of places are counted as one word each, irrespective of the number of words of which they are composed. These are : All names of towns and villages in the United Kingdom and the Irish Free State: the naines of railway stations and other places not in towns at which telegraph business is transacted; the names of districts in towns when such are used in addresses in addition to the names and thoroughfares, e.g. High Street, Camden Town. Here Camden Town counts as one word.

Telegrams should be written on the proper forms, which can be obtained free of charge if unstamped. Forms with embossed stamps can be bought for 1 s . each. A book of 20 can be bought with a sheet of carbon paper for copying, for 20s. 3d. A rcceipt for the charge prepaid upon a telegram can be obtained for Id. A certified copy of a telegram can generally he obtained on application to the local postmaster for 6d.

Delivery of Telegrams. Telegrams are delivered free of charge within three miles of the delivery office nearest the address. When that office is a head post office no charge is made for delivery within the town postal delivery area even if the distance exceeds three miles. In the Irish Free State the limit of free delivery is one mile: beyond that porterage is charged at the rate of 6 d . a milc or part of a mile, the extra distance being calculated from the limit of the free delivery.

The cost of a reply telegram, not exceeding 48 words, can be prepaid. In this case a reply form will be handed to the addressec, who is
at liberty to use it for any inland message at any time within 12 months. If the form is not used its valuc will be refunded. Reply telegrams, handed in on Sundays, Good Friday, and Christmas Day will be charged 6d. extra, unless this has been prepaid by the sender of the original telegram, in which event the reply form will be marked on the back "Sunday rate prepaid." If the telegram is addressed to a place in Scotland, the extra chargc must bc prepaid on Sundays only.
The address of a telegram should be sufficiently full to enable it to be delivered without difficulty and without reference to directories or other sources of information. An address ordinarily used for letters is not necessarily correct or sufficient for telegrams.
Telegrams can be redirected to a second address, either by an official of the post office or by an agent of the addressee. There is no charge for officially recording instructions to redirect telegrams for a period of threc months. For any period in excess of three months the charge is a guinea a year. Telegrams redirected on Sundays, Good Friday or Christmas Day are charged 6d. extra, excepting when the redirection is from an office in Scotland, in which case Sundays only are charged for.

The sender of a telegram may have in structions, such as confidential, written on the outside of the envelope. Such instructions
are charged for as part of the message. Telegrams intended for delivery to callers at a tclegraph office should contain in the address the words " poste restante " or " to be called for." Such tclegrams are kept at the office for two days only. Tclegrams for railway passengers should be addressed $\mathrm{c} / \mathrm{o}$ the station master. The post office is not liable for any loss or damage which may be incurred by reason, or on account, of any mistake or default occurring in the transmission or delivery of a telegram.
Foreign Telegrams. Telegrams can be sent to places abroad, the charges varying with the distance and other considerations. A full list of these will be found in the post office guide. Special forms are provided for these telegrams. They are accepted without restriction to most places abroad, but a-few countries maintain restrictions on them. Particulars of these restrictions cau be obtained from any post office.
Telegrams may be written in any of the principal European languages and in certain others, including Esperanto, provided they are written in Roman characters. The maximum number of letters allowed to pass on foreign telegrams at the charge for a single word is 15 . Any excess is charged at the rate of 15 letters to a word. A reply of any length can he prepaid, but the minimum payment is 1/3. See Postage.

# Telephones: Public and Private <br> <br> Regulations for Subscribers and Methods of Installation 

 <br> <br> Regulations for Subscribers and Methods of Installation}

This artic'e is divided into two parts. The earlier is for the benefit of those who have or wish to have, a post office telephune In their bomes. The sciond part describes how a man of mechanical turn of mind can fit into his bouse a telephone service connecting onc room with another. Sec Battery; Bell; Micropho c

Anyone desiring a telephone line to his house must apply to the post oflice. The work of installation will be carricd out by the post oflice oflicials after the neccssary documents have been signed. The subscriber must not interfere in any way with the telephone mechanism; if anything gocs wrong he must tell the authorities, who will put it right. Every telephone line is connected with an exchange and is given a number.

The charges for these telephone lines fall into two classes. There is first of all a quarterly rent. This varies to some extent with the district and is somewhat more for business premises than it is for private residences. For the latter, if the telephone is in London and is not more than two miles from an exchange, the rental is $£ 1$ l2s. 6 d . a quarter, or $£ 610 \mathrm{~s}$. a year. If the telephone is in Glasgow, Birmingham, Liverpool or Manchester, and is not more than $1 \frac{1}{2}$ miles from an exchange the rental is $£ 110 \mathrm{~s}$. a quarter, or $f(f$ a year. If it is in any other part of the country and is not more than $1 \frac{1}{2}$ miles from an exchange the rental is $£ 17 \mathrm{~s}$. 6d. a quarter or $£ 510 \mathrm{~s}$. a year. In case the telephone is more than the stated distance from an exchange, a charge of 5 s. is made for each furlong of the excess distance.
Call Charges. The second charge takes the form of so much per call. This is ld. for every call to a subscriber whose exchange is within a radius of 5 miles from the one to which the caller belongs, and 2ll. a call for those made to an exchange that is more than $\bar{j}$ miles and less than $7 \frac{1}{2}$ miles away. These distances apply to most cases, lut in London and the four large cities, Glasgow, Birmingham, Liverpool and Manshester, there are certain extensions. In the case of the metropolis, calls can be made at these rates to any exchange within an area which in January, 193:, was extended to reach from Dorking on the south to Hatfield and St. Albans on the north and from Gravesend on the east to Eghamı on the west. All calls) beyond these distances are trunk calls, and are charged as such.

Telcphonc rentals are payable in advance, on Jan. 1, April 1, July 1, and October 1. A subscriber is required to deposit a sum suflicient to cover two-thirds of a quarter's account for local, trunk and telcgram charges.
An Extension Line. Occasionally it happens that a person wishes for an extension line carrying the telephone to another part of his house or outbuildings. For instance, a man may want an extension to his garagc. Provided this is part of the same building as the house, one of these lines will be iustalled and a small rental charged. This ranges from 6s. a quarter upward, according to the length of the extension.

One method of securing a telephone is for two persons to join for a single line, and the post olfice has a system by which these lines are provided. This privilege, however, is restricted to subscribers in the provinces whose premises are more than a mile from an exchange. The rental in this case is $£ 1$ a quarter for each of the two subscribers, if the premises are not more than 2 miles from the exchange. If this distance is excecded a rental of 5 s . per furlong for the extra distance rental of 5s. per furlong for the
is charged. The fees for calls are the same as in the case of lines which are used by one household only.

Co-operative telephones are provided on another plan Rural party lines, as they are called, are intended to afford a cheap service for residents in country districts. Under this arrangement several subscribers share the use of one circuit from the exchange. Their calls arc distinguished by a code of rings. Thus, if the bell rings once it is for Mr. A's house-
$\qquad$


hold; if twice, for Mr. B's. and so on. In these cases each subscriber in the ordinary way pays $£ 1$ a quarter. To secure this rate the number of subscribers must average not less than one for every $\frac{1}{2}$ mile of the circuit beyond a radius of $\frac{1}{2}$ milc from the exchange, and there must be a minimum of three. Thus, if the line is 5 miles from the exchange there must be at least nine subscribers.

If sufficient subscribers cannot be found to comply with these conditions, the rental is fixed to produce $£ 2$ per quarter for each mile of circuit beyond the $\frac{1}{2}$ mile radius from the exchange. Thus, if there are five subscribers and the distance beyond the lirst $\frac{1}{2}$ mile is 3 miles, the rental must produce $£ 6$ per quarter, being $£ 2$ for each mile. In this case cach of the five subscribers must pay \&1 4s. per quarter. Calls made by subscribers to party lines are charged for at the same rates as to other subscribers, except that in the case of these party lines the rental covers all calls made to other subscribers on the same exchange. These telephones will not be provided for persons who live within mile of the exchange, or in districts that are not rural.

The post office is prepared to open a new exchange in places where there are a number of persons wishing for a telephone. Applications for new exchanges in small areas remote fron existing exchanges are entertained favourably, provided that the cost of connecting them with the existing exchange system is not excessive, and that a minimum of eight new subscribers, each renting an exclusive circuit, is forthcoming.
Trunk Calls. Subscribers who wish to speak to persons at a distance must make use of one or other of the trunk lines that are available for this purpose. By trunk lines are understood those exchanges, except in London, Glasgow, Birmingham, Liverpool, and Manchester, that are more than $7 \frac{1}{2}$ miles from the one to which the subscriber belongs or from which he speaks. In London a trunk call :s one to any exchange outside the London telephone area. In the other four cities the distance varies, but broadly speaking there is no need for a trunk call when a subscriber within the city is required
The charge for a trunk call varies according to the distance and the hour of the day or night. It costs most between $7 \mathrm{a} . \mathrm{m}$ and $2 \mathrm{p} . \mathrm{m}$. is somewhat cheaper between 2 p.in and 7 p.m. and is still cheaper between $7 \mathrm{p} . \mathrm{m}$. and 7 a m The fees range from 3d upwards. This allows for a conversation of 3 min . If more time is wanted an extra fee must be paid.

Call Offices. For persons who have no telephone in their homes, or are away therefrom, public call offices are provided, these being usually in post offices and railway stations. The fice for the usc of a call office, in cluding communication with any exchange within a radius of 5 miles, is 2 d for each 3 min or less during the day, and for each 6 nim. during the period between 7 pm and $7 \mathrm{a} . \mathrm{m}$. The charge for a call to an exchange between 5 and 7! miles distant is 4 d . for conversation of 3 min. during the day and of 6 min. at night. In the metro polis the distances are much greater. Persons can also use a call oflice to get on to a trunk line by paying the necessary fee and the usual $2 d$. for the use of the call oflice.

Overseas Calls. Telephone commu: nication can also be obtained with most of the countries in

Europe, including the Irish Free State, and alao with Canada, the United States, Mexico and Cuba. It lias also been established with Australia, and with certain places in Argentina Brazil, Chile and Uruguay, as well as with
Java. Mor occo and places in Indo-China telephone service is also available with certain ships that crose the Atlantic, these including the three great White Star liners, Majestic, Olyınpic and Homeric. For these services full charges are in force during the day, hut reduced during the night. These are roughly three-fifths of the day charges.

Private Telephone Wires. The above remarks apply to the service of telephones operated by the post office, which department has control of all wires leading to the various exchanges There is, however, nothing to prevent a private individual from installing a telephone of bis own and using it for communication between one part of his premises or estate and another ; for instance, between one room and another, between house and garage or stable, or hetween house and the cottage of a gardener or chauffeur
A person who possesses, or contemplates possessing, such a telephone line must carefully note one or two matters. He must remember that he cannot use his own line to communicate with any house or premises that only possess a telephone attached to the public system He must, too, take great care that his own line is not linked in any way with any wire that is part of the public service. With these limitations, however, a private line may serve within its own sphere a very useful purpose.
Simple Domestic Telephone. The circuit for a telephone is shown diagrammatically in Fig. 1, the different parts being indicated When a receiver is lifted off its hook the latter automatically makes a contact and places the apparatus in circuit. Normally, with the receiver at rest on its hook, the telcphone line is connected to the bell. The simplest type of telephone system for domestic use is shown in Fig 2. The apparatus consists in the main of two parts. At the top is a push, similar to a bell push, with a hook fitted to its underaide and a plug projecting from the top. Wires from this plug are taken to the lower instrument, which is the actual telephone. At the upper end is the receiver, beneath which is a handle incorporating a switch, while at the bottom is the microphone. The whole instrument is conveniently shaped so that it fits the ear and mouth.

The connexion of this instrument with another of identical design is shown in the diagram. This scheme enables the Mne to he worked in one direction only. That is, station A will only he able to ring station B. Station B can reply, but cannot originate a call. Such an arrangement is useful in the home when $A$ is situated in the dining room and $B$ in the kitchen Ringing is accomplished by pressing the push at station A, but the line will not be clear for speech until the handle switches on hoth stations are pressed. The latter action is more or less automatically done in the hand. ling of the instrument.
No induction coil is incorporated in this apperatus. as it is only suitable for working over short distances The number of cells
required will depend on the distance and the size of the conductors. but normally two only will he necessary. Such all installation may be fitted entirely with homely tools and by unskilled hands, as it is no more complicated than an ordinary electric hell. The use of twin wire over the longer distances will greatly facilitate the process of installation

Fig. 3 shows how the same instruments employing a slight!y different type of wall push and an extra bell may be made The headphone magnet windings may be to work in hoth directions. It will be seen that wound to have either a low resistance or high the main line now consists of three separate con resistance. High resistance headphones are ductors. and that there are two bells. Such an very sensitive, and are thus particularly suitinstallation is still within the scope of the able for use with crystal receivers. amateur or handyman of the house. In this instance it would be better to use single conductors, either laid side by side along the walls of the house, or elsc enesased in wood or conduit.
The battery can consist of two dry cells of large size. and these should last for nine to twelve months, after which they should be scrapped and replaced. Both the ahove sys-

In the case of a valve receiving set, it is hetter to employ low resistance headphones (which are more robust) in conjunction with a telephone transformer to isolate the magnet windings from the steady current flowing in the anode circuit of the valve. This is highly important in a mains operated wirelesg receiver. See Microphone.
tems may be fitted to existing bell installations with very little addition. All that has to be done is the substitution of one of the telephone appliances for the ordinary bell push.

Telephone Receiver for Wireless. The function of the telephone receivers in wireless reception is to convert the rectified impulses in the detector circuit into audible sound waves

## Telephone Covers and Screens

## Several Attractive Kinds to Make and Decorate

Atractive and practical methods or conc aling the telephone instrument are suggested in this article. For further informatio t the readcr is referred to the contributions on Fretwork; Gesso
Work; Italian Renaissance Work; Lacquer Work; Leather; Pencil Painting; Tarso. See also Work; Italian Renaissance Work $\begin{gathered}\text { Lacquer Work; Leather; Pencil Painting; Tarso. See also } \\ \text { Lampshade ; Writing Table }\end{gathered}$

In some of the newer houses small wall cupboards are fitted into halls and livingrooms for the special purpose of accommodating the telephone, or a compartment is preparcd for its introduction into a bookcase or writing-desk fitment. The flap of the cupboard pulls down, and, by means of a metal arm, forms a convenient little table for the telephone, directory, and a pard with pencil duly attached for taking notes.
Wherc no such arrangement has been thought out a convenient cover for the whole telephone can be made by adapting a small white wood hanging cuphoard. This should be of sufficient height and depth to admit of the instrument standing on a shelf, with space beneath for the directory and pad.
The back is cut out to admit the instrument and a small horizontal slot at one side next the wall for the cord. The cupboard should be brought into the colour scheme of the hall with enamel or stain, and the door presents an excellent panel surface for a piece of well-chosen painted, fretwork or tarso decoration.
There are many rooms in which a wall cupboard is not suitable, but in which an undisguised telephone has too businesslike an air. A dome-shaped oak stand can be obtained which is like a small cabinet, or a cover can be purchascd or made at home after the style illustrated in Fig. 1. The head and arms and also the
wire frame for the billowing skirt which conccals the telephone can be bought for about 5 s . Any silk, velvet, brocade, etc., can be used for the dress, and this can be faslioned in an Elizabethan, early Stuart, Queen Anne, Georgian or early Victorian style, when skirts were worn over farthingales, hoops or crinolines.

If a new piece of material is to be hought $\frac{7}{8} \mathrm{yd}$. of $50-\mathrm{in}$. width is sufficient to make a dress with gimp or tinsel lace for trimming and ribhon for a sash. A shot artificial silk is inexpensive and quite charming in mauve and blue, or rose and gold. A frame measures usually 10 to 12 in . across at the basc and is from 15 to 17 in . high. The wires must be covered in the same way as a lampshade frame and either coloured silk or cambric strips cut on the cross 1 in . wide is hest for the purpose (see page 689).

A variety of heads are obtainable with hair done in different styles and made of silk, of real hair like an ordinary dolls, or with curls of the same composition or china as the face and arms. In some ways the last is the most serviceable choice, as there is nothing to get out of order and the doll has a Dresden china appearance. The head portion is provided with wires which when twisted firmly round the upper wire of the frame attach the two togother. This is done before the wires are bound so that there is
nothing untidy about the inside of the cover.

The skirt is cut from the width of the material in a straight picce merasuring $18-20$ in in deptl. The length depends on the height of the frame, and the skirt should be an inch longer than this, after allowing for turnings. Having heinmed and joined it at the back, it is slipped on to the frame and neatly gathered to fit the waist The hodice on the figure illustrated is simply two doubled strips measured and cut the length reguired to fit from the waist in front to the waist at the lack when crossed back and front. To then are sewn little straight picces to make the sleeves gathered to fit the arms above the clbow. Cut out and adjust the strips in paper first to see the exact length needed, and also what width to cut the slceves.
The frill requires a straight atrip ahout 3 in . wide and cut from the width of the matcrial and half as much again. It may be edged with lace, as may the sleeves, or a tinsel gimp may be used for both. Instead of one wider frill several narrower ones may trim the skirt. A ribbon sash with a bow and long ends completes the dress. A rather more trimmed style has an under petticoat of a lighter shade covered with gathered rows of narrow lace over which the skirt is draped at the sides. The bodice has then a crossed lace fichu and lace frills to the slecves. A woman olever at dressing dolls can design a charming period dress in colours to suit her room.


Telephone Cover. Fir. 1. Period Hrure cover. A doll's body to the waist is used for the upper portion and the silk skirt billows out over a wire frame


Fig. 2. Plywood telephone screen witn painted design and border in bright colours. This screen can be easily made at home ior a trifling cost

Wooden Screens. Small wooden screens are particularly attractive whether painted in plain colours with a scverely geometrical border, or handsomely decorated in gesso, Italian Rcnaissance work. lacquer work, or Tarso.

A screen of the type of that illus trated in Fig. 2 is expensive to buy, but if made at home can he produced for a trifling cost. The materials required are sufficient thin plywood (q.v.) to make the 3 folds, (the middle one being 16 in. high at the top of the curve, and measuring 7 in. across, while the sides each measure $5 \frac{1}{2}$ in.), 4 small screen hinges, sandpaper, enamel or brush lacyuct colour for the ground, and oil colours, liquid oil colours or bronzes for the design. A coat of varnish should be given on completion.

Plywood can be obtained in various thieknesses, but a thin one is best, as it is casier to cut. A small fretsaw will be


Fig. 3. Wooden screen on a revolving base. Tae panels are decorated with painted flowers and gilded edges. The telephone pad has a cover of imitation vellum painted in coloured inks, and is glued on to a gilded wooden base
fretsail. The screen is supported at the base by means of a block of wood glued at the back. The block is large enough for the telephone to stand on, and sufficiently solid to counterweight the screen when the instrument is removed for use. Sometimes the idea of the lady in full skirts is adapted to plywood and paint, and the figure is then cut out and supported in the manner just described.
Care must be taken when drawing the design to see that the telephone will be fully covered by the skirt before the figure tapers ahove the waist-line. The hlock and the back of such screens should be painted the same shadc. In the case of the bouquet designs green or brown is the best choice, as they do
not clash with the brilliant colours employed for the flowers. Metallic paint in silver or gold adds a gay note to the figure design.

Although not so durable, excellent little screens and telephone pads can be olstained in parchinent-covered carlhoard of a heavy make. These are quite inexpensive and can be decorated charmingly with pencil painting. or in any of the ways suggested for decorating parchment in the article on Lampshades. When rarnished, the parchment keeps clean for a long time. Parchment paper screens are also supplied in sliect form, traced ready for colouring. They are designed in 3 sections with a wire frame for mounting the work when completed.

## Telephotography for Amateurs

Practical Details of an Important Branch of Photography
Though at one time thought to be the exclusive province of experts carrying specially cumbersome cameras, teleplootography is now within the raach of all, and its nttrac:ions are clearly set forth in this article. Sec Exposure; Focus; Lens; Photography
Telephotography nay be roughly described $\mathrm{f} / 3 \cdot 5, \mathrm{f} / 5 \cdot 6$ (for reflex cameras) and f 6 5 ) as combining some of the adrantages of a for hand cameras. These are suitable telescope with those of a camera. It provides for use on small 3! in. by $2 \frac{1}{2}$ in. cameras. a means wherely with an ordinary hand $A$ form of the second type is the Adon camern capable of a certain amount of ex- (Fig. 2), which is designed for use by itself tension photographs may be taken on a on all sizes of chmeras possessing focussing much larger scale than with the orilinary screens. It includes a rack and pinion for medium focus lens.

Thus, with an ordinary camera photographs of distant vicus, high mountains, or architectural subjects are not only reproduced on a very small scale, but are liable to be wrong in perspective. With a good telephoto lens distant olijects zan be photographed directly on a large scale. and only require subsequent enlargement. Excellent photographs have, for instance, been taken with telephoto lenses of mountain penks 90 miles away.

With the type of lens usually fitted to a camera the size of the innage given on the focussing sereen depends on the focal length of the lens. Thus, comparing a small pocket camera whose lens is $3 \frac{1}{2}$ in focal length with a large cancra the lens of which has a focal length of 7 in ., the image secn on the focussing screen or negative will be twice as large with the 7 in . lens as it is with the $3 \frac{1}{2} \mathrm{in}$. In order, therefore, to get an image four times the size, a 14 in . lens would be required, and so on in proportion. Now since with the norinal lens the focal length is approximately the distance between the hack of the lens and the focussing screen, the greater the inagnification required the longer the focal length and the bulkier and more unwicldy the camera.
These difficulties are overcome by the tele. photo lens. which consists in principle of two systems of lenses : (1) the normal positive lens, or combination acting as a positive lens, such as is used in every camera; (2) a negative lens, or lens combination, such as is used in opera glasses. The first combination, the positive lens. may be the ordinary lens of the camern, in which case a negative lens is added, such as the Zeiss Distar. In many cases the negative and positive lenses are combined in the telephoto system, which may be used by itself as a complete lens or in rddition to the ordinary lens.

An example of the first is the I)allon (Fig. 1), a series of anastigmatic telephoto lenses of 9 in . and 10 in . focal length working at apertues of



Telephotography. Fig. 1. Dallon telepaoto lens, suitable tor use without any other lens on small cameras, 3$\}$ in. by 2$\}$ in. Fig. 2. Component parts of Adon lens, for use on cameras with focussing screens

Courtesn of J. H. Dallmencr. Lid
sufficient extension. Thus, for a $\ddagger$ plate an extension of $5 \frac{1}{2} \mathrm{in}$. is necessary, which is the normal of a single extension $\frac{1}{4}$-plate camera. Its weight complete is only 7 oz . Of course, it must he remembered that the greater the extension available on the camera the greater the magnification which can lie obtained.

Other good types of telephoto lenses are the Zeiss Magnar and the Dallmeyer Grandac, hoth working at $\mathrm{f} / \mathrm{IO}$; and the Ross Teleros, which is of large aperture working at $\mathrm{f} / 5 \cdot 5$ and $\mathrm{f} / 63$. A narrow angle Zeiss lens is the Tcle-Tessar, working at $f / 6 \cdot 3$. The Dallmeyer Large Adon series work at $f / 4^{-i}$, permitting telcphoto snapshots and requiring extensions of $4 \frac{1}{2} \mathrm{in}$. for a $3.2 \mathrm{in} . \times 21 \mathrm{in}$ camera, and 61 in ., for a quarter plate, the magnification being $\xlongequal{2}$. All the lenses described, with the exception of the Adon (Fig. ') and the Grandac, are of the fixed focus type, focussing being done hy racking the camera front in the ordinary way. Focussing lens mounts can, however, be supplied in most cases.

With telephoto lenses of the fixed focus type, which are used in place of, not in addition to, the ordinary camera lens, there is no complication of any kind. They are used in precisely the same way as the ordinary lens, and exposures are made according to their aperture or $\mathrm{f} / \mathrm{m}$ mimer. When telephoto lenses are used in addition in the normal lens, or when they are of the variable focus type, certain calculations require to be made. With Adon and certain other lenses special calculators, in the nature of ready reckoners, are supplied. The data required are (1) the effective aperture of the combination; (2) its focal length; and (3) the degrec of magnification in use.

The magnification, or size of the image, increases proportionately with the camera cxtension. The degree of magnification is found by dividing the distance between the back of the telephoto attachment and the focussing screcn by the focal length of the telephoto or negative lens and adding 1. Thus, to take as an example, a telephoto lens working at 10 in . extension when combined with a positive lens, the focus of the telephoto negative being $2 \frac{1}{2}$ in. $\frac{10}{2!}$
$+1=5$, i.e. the magni.
fication on the negative
greatly inceren that exposures must be greater increased. and further that the grten the magnification obtained and the xtension used the more the anerture is reduced and the exposure increased. Not only does the exposure increase with increasing extension, but magnification is also limited


Telephotography. Firs. 3-5. Showing magnification obtained with telephoto lens. Fig. 4 represents a magnification twice the size of reppresents a mand Fig. 5 four times the size. both the latter being taken with the same Dallon lens at different extensions
with a magnification factor of 2 , which actually means increasing the area of the inage 4 times, since the magnification factor is a time allowed after focussing, etc., for camera linear one. With some tclephoto lenses mag- and stand to become perfectly steady, fairly nification factors are marked upon the mount. light apparatus may be used. With the

A little practice will soon enable the ainateur higher magnifications an additional strut titted to calculate the exposures required. The basic rule for exposure when using is combination of the telephoto nugative lens and the ordinasy positive camera lens is to multiply the exposure required by the positive by the square of the magnification factor. Thus, if the lens without the telephoto nttachment requirs under certain conditions an exposure of $\& \mathrm{sec}$, and the magnification is three times, the exposure reguired when the telephoto lens is midded will be $\frac{1}{2} \times 3^{2}=\frac{1}{2} \times 9=4 \frac{1}{2}$ sec. This, of course, applies only to telephoto lenses; of the fixed focus type.

When variable focus telephoto lenses are used in combination, it is necessary to find the aperture or $\mathrm{f} /$ number of the whole combination according to the rule already stated. This f/number can then he used with any exposure meter in the ordinaty way. If the telephot.. lens itself is stopped down the length of exposure must be multiplied by the number of the stop used.
It is necessary to calculate exposures with telephoto lenses rather more closely than with ordinary lenses, and it will he found in practice that exposure times given by the calculations refired to are maximum figures, which should not be exceeded, particularly with distant objrets, owing largely to atmospheric haze. It may be found, in fact, that an exposure of half the calculated time will give good results with a distant object. For objects at moderate distances the calculated exposures are correct. When photographing distant objects, results will always be improved by the use of colour screens as used with panchromatic plates. They cut out the atmospheric haze, but must


be of good quality, as any from the front of the camera bascboard to one defects in them are magnified of the logs of the tripod will help considerably

Telephotography. Fig. 6. Nature photograph taken with an ordinary Telephotography. Fig. 6. Nature photograph taken with an ordinary
lens. Fig. 7. Showing how the Dallon telephoto lens obtains a large scale photograph of the central feature from the same standpoint as Fig. to ensure steadiness.

Focussing must, of cosurse, be done very carefully and very finely ground glass used as the scrcen. A magnifying focussing eyepiece used on the focussing screen will be found of great assistance. Such a glass may be purchased from any photographic dealer. All telephoto lenses should be fitted with long hoods, such as that seen in the photograph. Fig. 2; these hoods cut off stray light and greatly improve the brilliancy and contrast of negatives.

The serics of illustrations Figs. 3 to 9 demonstrate some of the varied uses of telephoto lenses. Figs. 8 and 9 show examples of subjects which could not otherwise be satisfactorily photographed at all

For nature photographs (Figs. 6 and 7) the telephoto lens offers the immense advantage of being able to secure pictures on a good scalc at a considerable distance away. Similarly, groups and street scenes are much more easily obtained. Not only, however, are the photographs obtained on a good scale, but the actual perspective rendering is greatly improved.

TELESCOPE. There are two main types of telescope, refracting and reflecting. The former is suitable for either terrestrial or astro nomical observations, and the latter usually for astronomical observations only

In the refracting telescope the light from the object observed passes direct through the object glass, and the image formed is observed through a magnifying cyepiece. In the commonest form of retlecting telescope, known as the Newtonian reflector, the light from the object observed is collected by a mirror at the base of the tube, and reflected into a small mirror. The image formed on the small mirror is observed and magnified through an eyepiece.

The function of the object glass, or the mirror, as the case may be, is to gather sufli- cient light to make a perccptible image in the focal plane. The function of the eyepiece is to enable the eyc to see the image when as near解


Figs. 8 and 9 . Statue of Louis XII at the chateau of Blois; a good example of the value ol a telepiota lens for photographing from a distance an awkwardly placed subject

## Television in the Home

## The Basic Principles and Methods

+ 

This contribution is complementary to the interco inected series of wireless articles in our work.
It explains the fundamental methods o transmitting an image from studio to receiver. Sec Broadcasting Receiving Sets; also Wireless Reception
In order better to understand the process tenth of a second and the "definition" of the of television we may compare it with that final picture will depend upon the number of involved in telephony. When we speak into light spots into which the subject is scanned a telephone transmitter sound vibrations are At the receiving end the lamp must also be converted into impulses of electrical current, scanned in the same way and the speed must
which at the other end are re-converted into sound vibrations through the electrical currents setting the diaphragm of the telephone receiver in vibration.

Much the same thing happens in the case of television, for instead of sound vibrations we have light of varying brightness acting upon a piece of apparatus which has the property of varying its electrical resistanco to a current with a varying intensity of light. This, in turn, allows electrical currents of varying strength to be set up in the wires connecting the receiver and transmitter, and at the receiving end these currents are utilized to cause a lamp to be illuminated with an intensity which varies in harmony with the changes
 employing kathode ray oscillographs, on the syatem due to von Ardenne Conurtesu of The Wireless World be accurately synchronised with the speed of sranning at the transmitting end, as ctherwise the picture will be hopelessly distorted or will fail to appear at all.

The simplest arrangement of television consists of a powerful source of light focussed on to a disk which has a number of holes in it arranged spirally around the disk. This disk is cansed to rotate, and on the other side of the disk is the obiect to be transmitted. The light passing through the holes illuminates the object in successive strips, and with every revolution of the disk the entire object has been covered. The light, of varying intensity, reflected from the object is conveyed to a light-sensitive cell, which when suitably connceted in an electrical circuit will 1 ransmit electrical impulses corresponding to the light impulses it receives.

In other systems the scanning is done by means of a series of reflecting mirrors arranged around a wheel or disk and tilted at slightly different angles, so that a spot of light reflected from them whilst the disk or wheel is rotating will be deflected at different angles and can be made to scan or traverse the whole of the object. Where it is desired to produce a large image the scanning disk can be replaced by a rotary switeh sweep-
in intensity occurring at the transmitter. ing across a series of contacts connected to a Ncither television nor the cinema would be large number of electric lamps built up into possible if it were not for the fact that the human eye is slow to follow changes; we do not see the individual pictures which, passing in front of the cinema projector, give us the impression on the screen of a continuous moving image. This slowness of the eye is known as "persistence of vision," and the efficet of a continuous picture can be obtained if the successive photographs comprising a cinema film pass before our eyes at the rate of about sixteen per second.

Now, in the case of television we cannot transmit over wires or by wireless a complete subject instantaneously, but have to send it by successive impulses and must, therefore, employ what is known as a "scanning" device, which enables us to illuminate only one spot of the subject to be transmitted at a time, but, by moving the illumination to and fro all over the object, eventually to cover the whole. The travelling spot of light will actuate our light-sensitive apparatus powerfully when the illuminated spot is light in tone and weakiy where the object is dark, and produce corresponding electrical currents The principle of scanning was suggested in 1834 by Nipkow, and is still the basis of most television systems of to-day. Any scanning arrangement has to cover the entire object in something like a
the form of a screen. To produce an image with reasonable definition on a screen 4 ft .6 in . by 2 ft . as many as 2,100 separate lamps have been used. Arrangements such as this are not suitable for enıployment commercially on a big sca!c. and for home reception the scanning
disk is still the most promising device, on account of its simplicity.

The progress which has been made in television of recent years is very largely due to improvements in light-sensitive, or photoelectric cells. The greatest obstacles to the realization of television in a perfected, or even commercial, form are bound up with the inertia or lag in operation of certain of the essential components, and it is for this reason

"Baird Televisor," or home receiving set Baird Television. Ltd.
that much attention is now being paid to the possibilities of using kathode rays. In such a system the image appears on the screen of a kathode ray tube, the illumination being due to the projection of electrons through the tube, scanning being obtained by the deflection of the electron stream by means of a varying magnetic field controlled by the electrical impulses arriving at the receiving end.
Practical Considerations. Since the installation of a television receiver entails a fair outlay, the prospective purchaser may welcome some information on the scope and value of the apparatus from the point of view of entertainment. On the Continent a kathorle ray receiver is available, but in Great Britain the only commercial system is the Baird "Televisor." This is sold as a kit of parts for home assembly, or as a complete receiver. In addition a wireless receiving set is necessary The image as received is quite small, and is magnified by a lens, appearing to the observer as a rectangular light-picture about 5 in . square.
There are obvious limitations to the distance from which the picture can be viewed, and the number who can sec it comfortably at the same time. A varying amount of distortion is often present, and the apparatus needs some care in its manipulation to secure uniform results. As to the programmes which are receivable on the apparatus, these are broadeast from B. B.C. stations on a wave length of 356 metres for vision and 261 metres for sound. The times and other details are given


Television. Schematic diagram to show methoj adopted by Baird to project a television p.cture on to a screen composed of 2,000 small lamps Coutest of The W'irelexs lineld
in the daily broadcasting time-tables. The television programmes include such items as songs before the piano, character sketches, talks on sport and cartoons drawn before the transmitter. Public events are occasionally televised.

Future Possibilities. The Baird company is building its own transmitting studios and, of course, is constantly experimenting with a view to improving its apparatus. Other systems are in course of development, and it is not improbable that the elimination of mechanica! hindrances made possible bv the use of the kathode ray oscillograph may give equally effective if not better results.

TEMPERATURE : Of the Body. The average temperature of human beings in health is $98.4^{\circ} \mathrm{F}$. Usually it rises a little during the day and falls gradually cluring the night, so that the body is hottest in the cvening and coolest in the early morning.

After a meal or aftor exertion the tempera ture is raised a little. In women it gocs up more readily than in men. In children a considerable rise, amounting to slight fever, may occur from such trifling causes as a fit of crying or an attack of indigestion. Uni formity of temperature is maintained by a balance letween the production and the loss of heat by the body.

The temperature may be taken by placing the thermometer in the armpit, the mouth, or the rectum. To take it in the armpit wipe the skin with a soft towel. Place the bulb of the instrument in the hollow. Fold the arm closely across the chest and cover the patient To get a corrcet reading the thermometer should be left in place for a period of ten to fifteen minutes.

A quicker and generally more accurate reading is obtained with the mouth. Carefully wash the thermometer with soap and water Place the bulh under the tongue. Leave it there for 3 min . The patient should kecp his mouth shut and breathe through the nose The clinical thermometer should always be washed after and before use. See Fever Thermometer.

TEMPERATURE: In Gardens.
All greenhouse temperatures and those that are necessary for the well-being of plants, which are given in this Encycloperlia, are those of the Fahrenheit thermometer, with its freczingpoint of $32^{\circ}$ and a boiling. point of $212^{\circ}$

Plants arc liable to severe injury from sudden changes of temperaturc. If venti lators are closed down too precipitately the alteration from an open, free, air to a close, stagnant atmosphere is likely to cause trouble.

TEMPERING AND ANNEALING. The process of heating and cooling steel to give it hardness is known as tempering. lt is the opposite of annealing, by which a metal is softened. Different methods of tempering are employcd according to the size and nature of the stcel, but the principle is the same.

The steel is first hardened by being beated to a dull red glow and plunged into cold water or oil, the rapid cooling thus obtained making the metal dead hard. In this state it is generally too brittle and hard for practical purposes, and it is polished up bright and heated again, but this time by a more gradual process. When it has been hrought to the required heat it is once more immersed in water or oil, which fixes the temper.

The degree of hardness or temper is indicated by the colour of the metal. If a bar of brightly polished cast steel is slowly heated from one end, a series of colour changes will travel along the bar in a definite and regular order. The first colour appearing is a light straw or yellow. Quenching the hardened metal at this state gives the hardest of cutting edges. The light straw is followed by a dark straw colour, giving a rather softer temper Dark straw gives place to brown, a usual
temper for plane irons and wood-cutting tools. Light blue is the next colour, and this is the stage at which most knives are tempered. When it changes to a dark shade a fairly soft temper is obtained for articles such as wood saws and many forms of springs.

Annealing. Metals are annealed to make them softer and more easily workable. Steel and iron are annealed to remove the internal strains that are incident to manufacture. The piece of metal can be brought to a bright red heat in the stove, or in a forge or furnace if available. It is then left in the hot ashes all night, to allow it to cool slowly. Brass is annealed by slow and continued heating, taking care not to burn or melt the metal. Copper is annealed by bringing the metal to a dull red heat and then plunging it into cold water. In the case of pipes and similar objects the worker should beware of the escaping steam. See Case Hardening; Har. dening.

TENANT. A tenant is one who holds land or other real property of another. The terms of a tenancy depend entirely upon contract. In the absence of agreement to the contrary, when a tenant enters upon the land and pays rent for a year, or any aliquot part of a year, he is a yearly tenant, whose tenancy can only be determined by sis months' notice to quit, expiring at the end of a current year of the tenancy. He is also a ycarly tenant if his agrecment is at a yearly rent, though that rent may be payable monthly, weekly, or in any other fashion. But if a tenant agrees to take a house at so much a month or week, he is a inonthly or weekly tenant, entitled only to a month's or weeli's notice.
In the absence of agreement to the contrary, the tenant is liable to pay all rates and taxes except property tax. As to property tax, the tenant is liable to pay it to the tax collector, hut may deduct it from the lirst rent he subsequently pays to the landlord. See Distraint; Landlord : Rent

## Tennis Courts: Grass and Hard Surfaces

## How to Lay Them and Provide the Necessary Accessories

This article describes the laying-out both of a grass and a hard court, afterwards giving directions for marking out a court. Related entries include thosc on Garden Lawn; Spirit Level For the game itself the article Lawn Tennis should be consulted. See also Table Tennis

Provided there is sufficient spacc, any household can, at comparatively small cost, provide itself with a grass tennis court. The chief expense, apart from the preparation of the ground, is caused by the necessity in most cases of providing wire or other fencing around the ground. The laying of a hard court is a more expensive matter, but it can be done by the amateur. The measurements of a standard court are given in the diagram, p. 702.

Laying a Grass Court. If the ground is fairly level the only preparation needed is to cut the grass closely and to water and roll it to as level a surface as possible. Any lad places can be filled in with a few turves cut from unimportant ground, cutting away the turf, making the soil beneath flat and level, and then fitting the new turf and beating it into place.

The preparation of the ground or turf should be carried out in the autumn or very early spring, so that it will have time to settle down before play begins. Slight bumps can be levelled by lifting the turf and scraping out the surplus soil, and immediatcly relaying the turves in the same place. All disturbed turf ought to be wcll watered daily for a few days, beaten flat, and rolled with a heavy roller at two-day intervals until the grass looks healthy. Mowing and rolling are then carried out. and in a sliort time the ground will be in condition for play.

When it is desired to construct a tennis court on a piece of rough meadowland, the nature of

TENCH. This fresh-water fish needs careful cleaning. It is usually boiled or fried, and is in season all the year round.

Before hoiling tench clean it, remove the gills, and then soak it for about an hour in cold salted water. Rinse it in fresh running water, put it in a pan of boiling salted water, covering it completely, and let it cook slowly until it is tender-about $\frac{1}{4}$ hour. Garnish it with parsley and cut lemon, and serve some melted butter sauce separately.
To fry tench cover it with llour, put it into a pan of smoking hot fat, and brown it well on both sides. Then drain it and serve it garnished with fried parsley, and accompanied by some piquant sauce. See Saucc.

TENDON. Sinews or tendons are the strong, tough, fibrous cords by which muscles are united to the bones or other parts on which they act. Rupture of tenclons is a not uncommon accident. In dancing, for instance, the Achilles tendon, which connects the muscles of the calf with the heel, is sometimes ruptured. The patient feels as if he had been struck a severe blow above the heel, and he loses power to use the foot, or may fall to the ground.

TENNIS CAKE. This iced fruit cake can be made in the following way: Beat together jo oz. sugar and ! Ib. butter or margarine until they are like cream; then add 3 eggs, one by one, beating all the time. When they are well mixed, stir in 1 lb . Hour, $\frac{3}{4} \mathrm{If}$. sultanas, 2 oz . pecl, a little milk, and a few drops of essence of lemon.

Turn the mixture into a greased tin and bake it in a moderate oven until it is lightly browned; then let it coot on a sieve. When cold, cover the top with almond paste or marzipan, and over this put some fondant or royal icing. Decorate the border of the cake according to taste, write across it the word Tennis, using pink icing, and complete it with a design of two tennis racquets. See Almond I.aste; Cake; Fondant Icing; Marzipan.
the soil, the gencral position of the site, and the geological conditions should all be taken into account, as well as the amount of money that can be spent in order to lay out the court. On a light or readily and naturally drained site the principal work is levelling, which is generally a inatter of removing the earth from the high parts and depositing it at the lower. It is necessary to consolidate the made-up ground, and preferable to let it stand for a ew weeks to settle down, and then to finish by very carcful levelling. The surface can be made up with turves, or by sowing grass seeds, according to choice. A good result can be obtained by both methods.

When the ground is heavy or likely to become watcrlogged in wet weather, it will be advisable to remove the carth to a depth of 12 in . or so and to make up the bottom with rubble or well-broken soil, adding agricultural drains as necessary. The rubble is raked and roughly levelled and then covered with a good layer of medium soil. This is raked and rolled and covered with a good top soil with an admixture of manure. The whole is levelled and watered, rolled, and allowed to settle. The surface is made good as required, and it can then be covered with turves or sown with grass seed.

Hard Courts. There are several types of hard court, some laid with cement or concrete, others with asphalte or a tar composition or with burnt ballast. A system extensively used
is that developed by the En-Tout-Cas Co., Ltd., of Svston, Leicester.

Courts laid with this patent method permit of play all the year round; they exhibit the characteristics of the best grass courts, and the bound of the ball is absolutely true. They are made with a special material laid on a bed of ashes, and being semi-porous, they can be played on within a very short time after rain. The patent material is only laid by the company's workmen, but the whole of the preparatory work of making up the ground, levelling, and preparing the ash bed can be carried out privately if desired.
The preliminary stages are dealt with on similar lines to the grass courts. The levelled surface is covered with a layer of ashes to a depth of a hout $4 \frac{1}{2} \mathrm{in}$., but local conditions may call for special treatment. These ashes are levelled and rolled. The foundations are covered with the patent material, well graded, screeded, and rolled until a flat and true surface is obtained. The sockets for the posts, previously embedded in concrete, are set at such a height that the top of the socket is about level with the surface. The ash foundation is not laid in a haphazard manner, but is properly graded. Gencrally speaking, when laid on a reasonably wèll-drained subsoil, no additional drainage will be necessary.
The ashes are laid according to the type used, and graded with the largest at the bottom and the smallest at the top. The nature and amount of fine ashes in the bulk determines the manner of laying and keying the top ashes. A considerable quantity of ashes is needed, amounting to something like 65 tons for a court measuring 120 ft . long and 60 ft . wide, calculating on the assumption that the depth of the court will be about $4 \frac{1}{2}$ in.
The surfacing material is a special type of clay burnt in a kiln to such a hardness that it will not weather back after it has been laid and subjected to ground moisture. At the same time, it is not so much burnt as to reach the vitrifying stage, otherwise no binding power will be present. The colour is a shade of red that enables the path of the ball to be seen readily, even in glaring sunlight.

After the court has been made the lines are marked out and permanently defined by the use of metal or painted linen strips, the former composed of compressed lead tape. This is fixed to the court with long galvanized nails, and the tape heaten in level with the surface. The only subsequent attention is a coat of white paint about once a year.

Marking the Court. To mark out a tennis court a start should be made with one intended for the double game, as its markings can easily include those necessary for singles. First determine the position of the net and fix in the line chosen two pegs 27 ft . apart, as in the diagram. Then take two measures and fasten their respective ends to the pegs $A$ and $B$.
On the first measure, which will go diagonally across the court from $A$ to $C$, take a length of 47 ft .5 in . On the second, which will go from $B$ to $C$, take one of 39 ft. Pull both measures taut so that at these distances they meet at C , and this gives one corner of the court. At a point marked F, 21 ft. from $B$, put in a peg to mark the end of the service line. The other corner, $D$, and the other end of the ser vice line, $G$, can be found by repeating the process.
 is shown. A B being the place for the net

The same measurements on the other side of the net will complete the boundaries of the court. By prolonging the base lines $4 \frac{1}{2} \mathrm{ft}$. on each side, and joining the four new points that are thus obtained, the sido lines of a double court are made, and to complete the marking all that remains is to mark the central line by joining the middle points of the side lines.

For double court alone the interior side lines need not be prolonged to meet the base lines. In all cases the net posts must stand at a distance of 3 ft . from the side lines. Therefore, if a single game is played on a double court, the net, unless the posts are shifted and a single court net is used, should be stayed up to the right height by means of single posts placed at a distance 3 ft . from the single court side lines.

Tennis Net. For the purpose of playing lawn tennis a net across the centre of the court is necessary. This is usually fastened to posts, one at either end.
These tennis nets are sold in various qualities. For ordinary use a fine hemp net with lines top and bottom is suit able, but a stronger one can be obtained with a linen band. More expensive ones have a band of woven web and a steel or copper headline with a hempen end and pins. The nets are fastened to posts of wood or metal, the latter being specially suited to hard courts.
Good wooden posts are of ash, fitted with brass ratchets for winding purposes. The posts are fitted into iron sockets which enable them to rest on the ground and these are fastened by pins driven into the soil. Metal posts are of iron or steel. As these cannot be pinned down on hard courts, they are set into an iron receptacle sunk into the ground. Steel posts are also made in the same way as iron ones and with portable iron feet, and ground screws are made for use on grass courts.

The illustrations show the modern methods of fastening the tennis net, both on grass courts and on hard ones. Fig. 1 shows a winding apparatus consisting of a cone drum, which has taken the place of the hollow drum formerly used. In the older types of ratchet the liability of the copper cord to kink and break necessitated the adoption of a rope end for use at the winding post. In the ratchet of the one illustrated a small hook on the drum receives a loop made in the copper cord itself and the winding is accomplished without the slightest danger of kinking or breaking, this being due to the shape of the drum, which allows the coils of
the copper cord to be laid up evenly. The post illustrated, Fig. 1, is $3 \frac{1}{2} \mathrm{in}$. square, and its metal points are of nickel and brass.
Fig. 2 shows the socket for the post of a tennis net. This, suitable for use on grass courts, is usually fastened to the ground by feather pins, as shown, but it can be made secure by ground screws. Fig. 3 shows a socket made to stand on a hard court, especially one where no holes in the ground or flooring are allowed. It is kept in position by the weights, of which there are four to each post.

Another method of fixing the net on a hard court is shown in Fig. 4, but for this a hole must be made in the ground. This done, it gives a thoroughly secure hold. The top of the base is level with the surface of the ground and so offers no projections that will impede the rolling of the court.

With ordinary care a good tennis net will last a long time. The winding arrangement may get out of gear, but usually this is not serious. To take off the strain the net should be lowered after play is finished, never left taut.
TENNIS ELBOW. Strain of the muscles of the forearm below the elbow, often referred to as tennis elbow, is usually treated by strapping the forearm for a short distance with adhesive plaster. It is a painful condition, but does not interfere with

Fig. 2
Tennis Fet. Fig. 1. Sanare jost fitted with patent oone ratchet. Fig. 2. Detail oi gortable loot. Fig. 3. Post and weights for asphalte end hard conrta. Fig. 4. Hard court polt with rotary locking device Courlesy of F. H. Aures, Led.
the stronger movements of the arm, for example, lifting weights, but movements that call for finer adjustment of the muscles are rendered difficult. It has been suggested that the condition may be induced by the handle of the racquet being too bulky for the grip of the player.
The position of the forearm in the back stroke is likely to expose the parts about the upper joint between the two bones of the forearm to injury, and inflammation may occur in the joint itself. Some doctors advise vigorous massage, while others recommend rest. See Elbow; Strain.
TENON: In Woodwork. A mortise and tenon joint is employed in all classes of woodwork. The tenon is that part of it which fits into the slot or cavity cut in another piece of material. The tenon can be shaperl almost entirely with a hand saw, preferably the type known as the tenon saw. In making a tenon the wood is first prepared to, its finished
size and marked out, as in Fig. 1, with a marking gauge and set square. The breadth of the tenon should be about $\$$ the breadth of the wood. Resting the material on the bench against the bench hook, a cut is made with the saw across the grain of the wood at the shoulder or termination of the tenon. This cut must he very carcfully made. If it is even a fraction out of 1ruth or out of square, or not quite perpendicular to the face, a had joint will result, especially if, as is often the case, it should he impracticable to trim up the shoulder with a paring chisel. A similar cut is made on the opposite side.

After this, the work is preferally set upright in the vice, and two cuts are made with the saw at right angles to the first, and in the direction of the grain, as in Fig. 2. Here again it is imperative that the cuts be made very accarately to the lines marked on the work. The aim should be to saw away the exact
amount of wood so that the tenon can be fitted into the mortise with the minimum of trimming and finishing

To ensure a close fit it is desirable to chisel across the grain of the wood, as in Fig. 3, removing the saw cuts, and gencrally smoolhing the surface. It is usual practice to drive a tenon home with a mallet, but common sense must bo employed when doing this, as if the tenon is too tight and driven home too violently, the wood in the vicinity of the mortise will split. The aim should be to make all four sides of the tenon fit snugly against the four walls of the mortise. The example illustrated is the simplest form of tenon. There are many developments of it, according to the nature of the joints which are to be made. The principal forms are described in the article Mortise.
Tenon Saw. For household use the most serviceable size of tenon saw is from 10 to 18 in. long, with about 10 teeth to the inch. The saw blade is reinforced by a backing piece of stecl or brass.

The teeth are bent over to the right and left altcrnately, an arrangement known as the set, which enables the blade to move freely in the slot cut by the teeth. If the set is insufficient, the blade will jam in the slot and probably buckle or distort. It is important to allow for the breadth of the saw kerf, for which reason the wood should be sawn on the waste side of the line and not actually on the line itself.
In use the tenon saw is grasped in the right hand with the right forefinger extended on one side of the handle, and the right thumb on the opposite side. The bulk of the handle is gripped with the second, third, and fourth fingers of the right hand, the first finger and thumb guiding the path of the saw. The blade must bo kept perfectly upright with sufficient ontward pressure to make the teeth bite into the fibres of the wood. The forward stroke does the cutting; the return stroke brings the нaw hack without allowing the teeth to rasp the surface of the wood.

A wooden strip should be made to protect the teeth. It is equal in length to the blade of the saw, as shown in Fig. 4, and measures


Tenon. Fig. 1. Marking out tenon beiore cutting. Fig. 2. Cutting the tenon with a tenon saw. Fig. 3. Finisining the tenon with a chisel. Fig. 4. How a wooden strip is applied to protect the teeth of a tenon saw
about $\frac{3}{4} \mathrm{in}$. hroad and about $\frac{3}{8} \mathrm{in}$. thick. A saw cut is made along one edge for a depth of about $\frac{1}{i n}$. and when the saw is not in use the strip is laid over the teeth of the saw and
secured in place with a piece of tape. Before putting the saw away, the blade should be wiped over with a greasy rag. See Joint; Mortise; Pergola; Saw.

## TENTS FOR HOLIDAY MAKERS

## Their Construction and Erection by the Handy Amateur

An article on this subject will be very ust ful to horidav mikers and others who live tor a time out of doors, or who for one reason or other may wish to sleep in the open. See also Bathing Tent;

Holidav; Mlotoring: Sieep

The main points of utility in tents are the ease with which they can be erected and dismantled, the comparatively light weight of their component parts, and the facility with which they may be packed and transported from one place to another.

A handy bathing tent is illustrated and described on page 68. Tent trailers, for towing behind a motor car, are dealt with in the article on Motoring.
A simple form of bivouac shelter is shown in Fig. 1. It is constructed by first marking out the intended floor space, and then thrusting a long stick into the ground at each corner. These sticks are lashed together at their upper ends, in pairs, then the ends of the ridge pole, which supports the canvas, are placed in the forks as shown. After the canvas sheet has been placed in position its lower sides are secured to the ground by means of wooden pegs or heavy stones. The open triangular ends may be covered with separate sheets, or canvas flaps, as indicated by the dotted lines in the diagram, could be made and sewn in position.

Although it is simply designed all the features which a good canvas shelter should possess are embodied in the example illustrated in Fig. 2. It will house six adults comfortably, with plenty of room for furniture and stores. The canvas is supported by galvanized wrought iron tubes. The covering fabric is light Willesden canvas, which may be obtained in short or long lengths, the widths
stocked ranging from 2 ft . to 8 ft . Sailcloth may be used, but it is not readily procured in greater widths than 2 ft . The following is a list of the inaterials required for this tent.

|  | Long. <br> ft. in | Diameter. in. |
| :---: | :---: | :---: |
| $\underline{2}$ G.W.I. tubes (H) | $10 \quad 5$ | 1 |
| $\cdots$ G.I. T- pieces (.J) | () 3 | 1 |
| 1 G.W.I tube (L) | 1 | 1 |
| 8 G.W.I. tubus (P) | 610 | 1 |
| 8 G.W.I. tubes (Q) | 0 O | d |
| 12 G.W.I. tubes (S) | 13 | 4 |
| Galvanlzed iron wire | 40 | 1 |
| Soft iroll wire | 09 | 右 |
| 42 brass eyclets and washers | - | 3 |
| 8 ditto . | - | 1 |
| 1 iron pipe. . . | 30 | 1 |
| 1 iron rod ... | 20 | , |

1 length of hardwood, 8 ft . long by 1 in . broad and in. thick.

100 ft . of light Willesden canvas, 5 it. wide. 2 or 3 skeins of white sewing twine.
2 or 3 medium sized sacking needles.
1 sewing paltu.
54 vards of 8 in hemp rope.
When purchasing the two tubes $H$, it is advisable, if the necessary appliances are not available at home, to get a thread cut on one end of each tube and the T-pieces fitted. The tube $L$ should also have both ends threaded to screw into the T-pieces. The bores of each T-picce should be screwed.
The arrangement of the tubes is shown in Fig. 3, their sizes and preparation being detailed in Fig. 4. If the



Fig. 5


Fig. 7
two gable tubes ( H ) have not been bought be accidentally driven down entirely into the ready threaded, a thread must be cut on bores of the tubes into which they are fitted. one end of each of them, for about $1 \frac{1}{2}$ in., To mark the depth to which the tubes H and P and a T-piece, J, fitted as in A, Fig. 4.

The Metal Framework. A hole of $\frac{1}{4} \mathrm{in}$. be painted round each tube at a point 18 in . diameter is drilled through the diameter of each T-piece, from a point marked off $\frac{3}{4} \mathrm{in}$. from one end of the T portion. Two 10 in . lengths are cut from the $\ddagger$ in. wire, then each is bent to the size and shape of the shackle K , detailed in diagram B . The upper angles of the shackles are inserted into the holes in the T's and bent over, as shown in diagram C.
Sectional diagram D shows how the angles may be quickly bent by hamnering a short length of iron pipe down the bore of each $T$. The rims of the upper ends of the tubes $P$ should be neatly rounded with a file, then a hole of $\frac{1}{8} \mathrm{in}$. diameter is drilled through the

diameter of each tube, from a point marked off 1 in . from the upper end. Each hole should be slightly counter. sunk with a $\frac{1}{4}$. drill. A tube $Q$ is fitted into the upper end of each tube $P$ and driven down for 3 in.; a hole of $\frac{1}{\frac{1}{a}}$ in. diameter is drilled through the diameter of each of these tubes $Q$, from the holes drilled through the tubes $\mathbf{P}$.

Eight 1 in. lengths are cut from the $\frac{1}{8} \mathrm{in}$. diameter soft iron wire, then a length is fitted into each alinement of holes, as shown in sectional diagram E . The ends of the wires are riveted over into the counter-sinking of the holes in the tubes $P$ by rapid and not too heavy taps from a ball peine hammer. This securing of the small tubes by rivets is necessary, as otherwise they are apt to work loose and be lost or


Fig. 8. Three sheets of canvas for roof. Fig. 9. Shapes of marging on the roof sheets and gable abeets
indented metal disk fastend to a leather circle. the latter being buckled round the right hand by an attached strap. The leather circle. with the disk ontward, rests on the palm of the hand.
In sewing, the point of the needle is inserted into the canvas by the fingers of the right hand, the eye of the needle being received into any one of the indentations in the disk. By pressing up the disk, the needic is casily forced, up to its eyc, into the thickest folds of canvas, after which it is pulled through by the right hand and the twinc drawn taut so as to form a firm stitch

A simple stitch, which will serve for all the sewing required, is shown in Fig. 7. In this diagram the stitches are shown loose, for clearness of illustration, but in practice each stitch must be drawn taut, as it is made, or the seams will not be held firmly together and the sewing will appear unsightly. A firm knot should be made on the long end of the twine before commencing to sew, and better progress will be made if a length of about I yd. is used at a time and rencwed as recuired, instead of one very long length, which will take extra time to draw through the seam after each stitch, and is apt to become tangled during the work, thus involving much delay.

The roof sheet A is composed of 3 separate lengths of canvas, each 14 ft .2 in . long. The centre sheet is $4 \mathrm{ft} .8 \frac{1}{2} \mathrm{in}$. wide, the right and left sheets being both 4 ft . $9_{4}^{1} \mathrm{in}$. in wilth. A $1 \frac{1}{2} \mathrm{in}$. margin is markerl on the right and left sides of the centre sheet, then a 3 in margin is marked off on both ends. A 3 in. margin is marked on the right side and on both ends of the right sheet, and a $1 \frac{1}{2}$ in. margin is marked on the left side.
A 3 in. margin is marked on the left side and on both ends of the left sheet, then a $1 \frac{1}{2} \mathrm{in}$. margin is marked on the right side. A space of 4 in . from the 3 . in. margin line is now marked ofl at both ends of each shect. A space of $3 \frac{3}{3} \mathrm{in}$. is next marked off from the 3 in margin on the right side of the right shect, then a similar space is marked off from the 3 in. margin on the left side of the left sheet. The 3 sheets are shown in Fig. 8, their margins being marked M .

The next step is to cut the ends of the margins to the shapes shown in the diagrams. The measurements from which the cuts $\mathrm{A}, \mathrm{B}$, and C are marked out are detailed at A, B, and C, Fig. 9 After all the cuts have been made, the 3 in . margins are folded double, turnel inwarl, and then sewn to the canvas as shown in lig. 10. The 3 sheets are joined together by first overlapping the $1 \frac{1}{2}$ in. margins on the centre sheet with the $1 \frac{1}{6} \mathrm{in}$. margins on the right and left sheets, and then sewing each pair of overlapped margins together, as shown in Fig. 11. Whan the roof sheet is complete, its dimensions should be $1: 3 \mathrm{ft}$.8 in . by $1: 3 \mathrm{ft}$.
The gahle canvases 13 and C, Fig. 12, are each composed of two sheets of the same size and shape, one bcing detailed in Fig. 13. To avoid waste, the 4 sheets may be cut from a length of canvas 29 ft . 6 in . long by : ft . wide, the sheets being marked out as shown in lig. 14. After the 4 sheets bave been cut to size, a 3 in . margin is marked off on the upper side, lower side, and diagonal side of each sheet.

A $1_{2}^{1}$ in. margin is next marked on the right and left sides of each sheet, then the ends of the rectangular margins are cut as detailed in Fig. 9, the comers of the diagonal margins heing slit and cut as shown in the diagram. The 3 in . upper and lower
margins are now folded double, turned inward, size being measured from the lower edge of the and then sewn to the sheets in the same manner as the 3 in margins on the roof sheet. In sliaping the left corners of the 3 in . upper and lower margins on the right half of each gable sheet, the cuts must be reversed, as shown in diagram C, Fig. 9. It is important to place the shects on a flat surface for accurate marking off, and care should be taken to mark out and shape these cuts correctly. They must be folded and sewn as neatly as possible, so as to lie flat when both sheets are united. The sheets are next joined in pairs, by overlapping the $1 \frac{1}{2} \mathrm{in}$. margin on the long side of each right sheet with the $1 \frac{1}{2} \mathrm{in}$. margin on the long side of each left sheet, and then sewing both overlapper margins together, as shown at A, Fig. 15. After the upper and lower margins have been folded and sewn, the height of each gable sheet should be 8 ft .8 in ., and the breadth, between the $1 \frac{1}{2} \mathrm{in}$. margins on the right and left sides, $9 \mathrm{ft} .4 \frac{1}{2} \mathrm{in}$.

The side sheet 1 , I'ig. 16, is made from a length of canvas $12 \mathrm{ft} .10 \frac{1}{2} \mathrm{in}$. long by $\overline{5} \mathrm{ft}$. wide; a 3 in . margin is marked off on all 4 sides, then the ends of the margins are cut as shown. The lower margin is folded double, turned inward, and sewn. The margin on the right side is overlapped with the $1!\frac{i n}{}$. margin on the left side of the right gable sheet, then both margins are sewn together, as at B, Fig. 15.

The margin on the left sice is next overlapped with the $1 \frac{1}{2} \mathrm{in}$. margin on the left side of the left gable sheet, then both margins are sewn together. After the side sheet has been attached to the gable sheets, its length should be $12 \mathrm{ft} .4 \frac{1}{2} \mathrm{in}$. by 4 ft .6 in . wide, the latter
sheet to the inner line of the upper margin
The two side shects, $E$ and $F$, are the same size and shape, and are both detailed in Fig. 17. Each sheet is cut from a length of canvas 5 ft . 6 in. long by 5 ft . wide. A 3 in . margin is marked on the 4 sides of each sheet, then the ends of the inargins are cut as shown. The left margin and the lower margin of the right sheet, E , are folded double, turned inward, and sewn then the right margin is overlapperl with the $\frac{1}{2}$ in. margin on the right side of the right gable shcel, both margins being sewn together as shown in detail at C, Fig. 15.
The right margin and the lower margin of the left sheet, $F$, are next folded and sewn in the same way, then the left margin is overlapped with the 1.5 in . margin on the right side of the left gable shect, both of these margins being securely scwn together, as described When attached to the gable sheets, the length of each side sheet should be 5 ft. by 4 ft .6 in wide, the latter size being measured from the lower edge to the inner line of the upper margin on each of the sheets.

The door-flap G, Fig. 18, is formed from a shcet of canvas 5 ft . long by 3 ft .6 in . wide. A 3 in . margin is marked ofl on all 4 sides, then the ends of the margins are cut as shown. The right, left, and lower inargins are folded clouble, turned inward, and sewn to the sheet After the 3 margins have been sewn, the dimensions of the flap should be 4 ft .6 in . long by 3 ft . wide; the length being measured from the lower edge of the shect to the inner line of tis upper margin of it.
en holes, each about $\frac{1}{8} \mathrm{in}$. in diameter and 6 in . apart, are now made, in a row, in the


Tent. Fig. 10. Method of sewing margins to canvas. Fig. 11. Each pair of overlapped margins sewn together. Fig. 12. Snape of gable sheets. Fig. 13. Detail of one gable sheet. Fig. 14. Economical method of marking out gable sheets. Fig. 15. Various methods of conne cting overlapped margins. See text for lettering
centre of the right and left margins on the door-flap. A $\frac{8}{8}$ in. eyelet is inserted into each hole, from the outer side of the flap, and a washer fitted. The stems of the eyelets are expanded with cone punches and finally riveted over on to the washers by light taps from a ball peine hammer.
Each stem must be expanded gradually, first with a $\frac{1}{2} \mathrm{in}$. cone punch, which should be lightly hammered to avoid crushing the stem, then a larger cone punch is used and the stem expanded to its full extent, after which it is riveted over on to the washer. It is often advisable to use three or even four sizes of cone punches in order to expand the metal without fracture. The margin and eyelets to be riveted should rest on a block of wood during the process. An eyelet and washer, and a sectional diagram illustrating how they are fitted, are shown at A and B respectively, in Fig. 19. A special punch set can be procured for this purpose.
After the practice acquired in fitting 2 or 3 eyelets, rapid progress will be made with the remainder. Eleven $\frac{3}{8}$ in. eyelets are riveted in the right side sheet, $\mathbf{E}$, as follows: A space of 3 in . in from the left side is first marked off, then a parallel line is drawn through the point, across the width of the sheet. The points at which the eyelets are to be inserted are marked off on the parallel line, from the measurements given in Fig. 17, then holes are cut and the eyelets fitted and secured in place as previously described. Eleven $\frac{3}{8} \mathrm{in}$. eyelets are fitted in the left side sheet, $\stackrel{F}{5}$, a parallel line 3 in . from the right side being drawn and the positions of the holes marked on it, their spacing being the same as those in shect E .


The next step is to place the right side of the door-flap so that it overlaps the left side of the right side sheet for $33^{3}$ in., then the upper margin of the flap and the upper margin of the sheet are sewn together where they overlap. The left side of the flap is placed on the right side of the left side sheet and overlapped for $3 \frac{3}{4}$ in., then the upper margin of the flap is sewn to the upper margin of the sheet, as before. After the door flap has been sewn in position, the width of the door opening should be $2 \mathrm{ft} .4 \frac{1}{2} \mathrm{in}$., which space, added to the 5 ft . length of each of the side sheets $E$ and $F$, makes the total length of the front of the tent $12 \mathrm{ft} .4 \frac{1}{2} \mathrm{in}$.

The diagonal margins on the right gable sheet, $B$, are folded double, turned inward, and then sewn to the under side of the right side of the roof sheet, as shown in diagram D , Fig. 15, the inner line of each margin being sewn to the line previously marked off $3 \frac{3}{4} \mathrm{in}$. from the right side of the roof shect. The upper margin of the side sheet, D , is folded double, turned inward, and sewn to the under side of the roof sheet, as shown in diagram E, Fig 15, the inner line of the margin being sewn to the line marked off 4 in . from the upper side of the roof sheet.

The upper margins of the side sheets E and $F$, and the door flap $G$, are folded double, turned inward, and sewn to the underside of the roof sheet, the inner lines of the margins being sewn to the line marked off 4 in . from the lower side of the roof sheet. A $\frac{1}{2}$ in. ryelet is now riveted in the upper and lower sides of the roof sheet at each of the points shown in Fig. 20. The diagonal margins on the left gable shect C are folded double, turned inward, and sewn to the underside of the roof sheet, in the same manner as the margins of the right gable sheet.
The sewing having been completed, the ercction of the tent may now be proceeded with. The ground plan of the tent is first marked out on the site. and a hole 18 in. deep is made at- each of the points detailed in Fig. 21 . The holes are formed by driving
the 3 ft . long by 1 in . diameter iron pipe into
the ground by means of a heavv hammer or mau!. (The arrangement of the framework members is shown in Fig. 3.) The ridge tube $L$ is now screwed into the T's on the gable tubes H ,'then the canvas is folded and stretched flat on the ground, as shown in Fig. 22.

The 3 tubes are next placed inside the canvas, then the lower end of each gable tube is laid at the hole prepared for it in the ground. Two 14 ft . !engths of $\frac{3}{8} \mathrm{in}$. hemp rope arc attached to the shackle in each T, then the gable tubes are raised, simultancously, by two men and erccled in the holes. After the gable tubes have been brought perpendicular, the roof sheet is adjusted centrally on the ridge tube, then the side sheets are raised and the tubes P fixed in position in the holes prepared for them. The cyelets in the roof sheet arc placed on the small projecting tubes in the upper ends of the tubes $P$, then the side sheets are lowered.

## Process of Erecting the Tent

The 12 tubes, $S$, are now driven into the ground at the points shown in Fig. 3. Each tube should be about 4 ft .6 in . from the tent, and driven in a sloping direction into the ground. Twelve 8 ft . lengths are cut from the $\frac{3}{8} \mathrm{in}$. hemp rope, to form the guys, $V$, then a toggle is fitted to each length, as shown in Fig. 23. A firm knot is made on one end of each rope, then a small loop is formed on the other. These loops are placed on the small tubes where they project through the eyelets in the roof sheet. The toggles are adjusted, and the large loops of the ropes placed over the ground tubes, $S$. A toggle is fitted to each of the ropes previously attached to the shackles in the T's on the gable tubes. The ends of the ropes are knotted, and the toggles adjusted to form the ropes into loops, which are placed on their respective ground tubes, as shown in Fig. 2.

The next step is to tighten up all the guy ropes until the canvas is stretched taut. Two 5 ft . lengths are cut from the $\frac{3}{8} \mathrm{in}$. rope, then one end of a length is inserted into the upper eyelet in the side sheet $E$, and sccured.


Tent. Fig. 16. Side sheet. Fig. 17. Two side sheets for forming open side of tent. Fig. 18. Diagram giving measurements of door flap. Fig. 19. Showing atting of eyelet and washer. Fig. 20 . Position of eyelet holes in sides of roof sheet. Fig. 21. Method of marking out ground plan. Fig: 22. Folding canvas and stretching it flat before erecting. Fig. 23. Method of attaching toggle to rope. Fig. 24. How to lace door flap


Terrace. Paved and stepped terrace with its gay Hower beds and topiary trees, which forms a charming trangition between housc and lawn

Humpliren \& Vera Joel

with a knot. Onc end of the other length is sceured in the upper cyelet in the side sheet F . Thesc ropes serve to lace up the door flap when required, both ropes leing rove through the eyclets as shown in Fig. 24. After finishing the lacing, the lower end of each rope is secured by a $k$ not made inside the tent. which is now complete.
To dismantle the tent is an casy matter. The guy ropes are first loosened and remored from the ground tulies. The side shects are then raised and the tubes indicated at $P$ in lig. 3 are pulled up. Two men next withdraw the gable tubes and lower them to the ground, where they are removed from the canvas and the ridge tube unscrewed.
When choosing a site on which to erce the tent, a place where the ground is level dry. and sheltered should be selected, and it therc are any olstructions, such as stones, roots, etc., they should be removed before marking out the ground plan. After erecting the tent, a shallow runnel must be rug in the ground, at the gables and sides, and connceted to drain away rainwater.

During wet weather the guy ropes should be kept slach, as rain causes both them and the canvas to shrink. T'lis precaution should sot be neglected, as the shirininge of the tight guy ropes may strain the roof sheet so greatly list it may cause it to split or tear apart al the seams.
Legal Points. In some districts there are by-laws compelling holiday makers and others who live in camps or caravans for more than three days to provide for a proper water supply, samitation, and other matters nffecting health and cleanliness. These by-laws are not in tended to apply to campe conducted for boy scout and similar organizations. See Trespass.

TEREBENE. Obtained by distilling a mixture of oil of turpentine and sulphuric acid, terehene is a colourless fluid withan aromatic odour. It is a powerful antiseptic, disinfectant. and deodoriser. Terchenc has been used with much success in the treatment of chronic bronchitis. It may be given interrially, as an ingredient of cough mixture, or as an inhal ation. It is also a good intestinal disinfectant.

## TERRACE: In

 Gardens. A paved bricked or tiled terrace at the back of the house is a practical and ornamental feature. Where there is no loggin veranda or summer house such a terrace provides the basis for n garden room, easily made with the help of an awning carried down at the sides to form a screen against cold winds Garden furniture which can be casily moved adds to the attractiveness of the scheme.Where there are somewhat larger grounds a paved or brick terrace makes a delightful transition between house and garden and affords scope for some formal garden ing items, such as plants in tubs or vases, an ornamental seat and a lavender hedge. A charming paved and stepped terrace of this type is here illustrated with low l,rick walls, topiary trees and encroaching clumps of llowers.
The banks and slopes in a garden of suitable extent may be arrangerl to form terraces of grass, with berls of cultivated plants and lulbs. The incline should not exceed $45^{\circ}$, otherwise the making of beds, stepping, and trimming of grass will be a diflicult matter, whilst water will quickly run away, to the detriment of plant roots.

Soil preparation, levelling, and turfing shoukd be completed and left to settle clown before planting leegins. The surface should be a good even depth of sound loam, otherwise


Terra Cotta. Fig. 1. Persian jar in glazed terra cotta, with fantastic paintings in black, It prodauly uates
there is the risk of hot weather cracking shallow soil, and grass perishing in consequence. Turves should be cut in thick squares, kept flat, and laid from the bottom to the top of the terrace, keeping in place with pegs if necessary. After making them firm with a turfbeater, fill up the spaces with dry powdered clay, and brush the whole with a very still brush or besom.
Shrubs, roses, geraniums, fuchsias bu!ls, and similar plants are all effective on a formal terrace slope; or an alpine bank may lic constructed. In shady gardens a sloping terrace of hardy natire ferns and plants in tubs is attractive. See Awning; Brick; Crazy Paving; Italian Garden; Lawn: Rock Garden; Steps.

TERRA COTTA. This term. which neans balied earth, is applied to a class of pottery made of selected coloured clays, which


Terra Cotta. Fig. 2. Statue group designed for a fountain jet by Antonia Rossellino, 1427-1479
produce bufl', yellow, and red tints. The red is due to the presence of iron. The surface may be left unglazed, or covered with transparent and coloured glazes. The unglazed ware is porous, and includes butter coolers, lottles used for keeping water cool by evapor?. tion as well as pots for the purpose of admitting air to the roots of plants.
Because of its cleanliness and brightness it is in demand in the form of bricks and tiles for the paving of garden paths, verandalis, halls, and kitchens. Terra cotta jars, orna ments and vases of gool design are used effectively in the formal garden. The Doulton works are responsible for good development in modern glazed terra cotta tiles.
An idea of the beauty and antiquity of this clay fabric aud its durable quality is gained liy a survev of existing specimens in a muscum. The example of ancient terra cotta illustrated in Fig. 1 probably dates from some period during the 2nd millennium b.c. The primitive design of the painted and glazed decoration has no connexion with Persian art of subsequent eras, but is quite unimpaired. Exeava-
tions of beautiful terra cotta ligurines at T'anagra have thrown light on ancient Creek costumes.
Later, beautiful statue groups were executed in Italy by noted sculptors, and an cxample dating from 15 th century is here illustrated. luring the Renaissance the vitrified terra cotta enamelled in colours was introduced.
The older English potters employed terra cotta frecly for roof-ridges and finials, as well as for chimney-stacks, of which there are some fine Tudor exaniples. From the Low Countries came later that form of terra cotta with a tin-enainclled glaze which, under the name of Delft ware, gave the first impetus to modern decorated carthenware in direat Britain. Since then British potters have been so fully occupied in perfecting white-bodied ware of all descriptions that they have done little with portable terra cotta beyond making reproductions of Tanagra figurines and other ancient statucttes. With the exception of Della Robbia reproductions, large modern pieces of glazed and coloured terra cotta are for the most part unpleasing and crudc in design and colouring. See Delft: Faience: Majolica: Tiles.
TERRIER. Amongst the divisions into which dogs are grouped by the Kennel Club, the most numerous is the terrier family. Generally speaking, all thesc have characteristics in common, such as loyalty to their owners, an irrepressible vivacity, alertness, and fearlessness. Their keep costs little, and they take up no room indoors, being cqually at home within the house or outside. In the country they are ready for every sport.

As regards the various companionable qualities, there is little to choose betwcen them, but for protection or as a trusty guard cither an Airedale or bull terrier is to be recommended on account of its size, preferably the former. The bull terrier is somewhat headstrong un!css carefully trained, and he is scarcely so amenable to discipline as the other. The Kerry blue (q.v.), though lighter, is perhaps too ready for fighting to be a desirable companion for ordinary people. The red Irish terrier is also a reliable protector.

Fox terriers still stand foremost in popular csteem though the Sealyham has made great headway ; he is a dog for the country. The Welsh terrier, somewhat homely in looks, is an excellent companion, besides being cheap. Any of the Scottish varicties can be reconmended. The Cairn suits those who want a very small dog that is not a toy. Dandies are lovable little creatures with hearts of lions. See Aberdeen; Cairn; Dog; Fox Terrier ; Irish; Kennel ; Scalyham; Yorkshire, etc.

TERRINE. The original form of tureen is terrinc. A French dish is so called from terrine, which means an earthenware pan. This dish was composed of quails, chickens, pigeons and mutton, the neat being cut into portions and the whole baked in carthenware in the oven. Terrine is the name usually applied to the small earthen pot employed for potting foic gras and other savoury potted meats. See Tureen.

TERRY. Turkcy towelling is the kind of terry cloth that is most commonly used in the homc. Bath robes or dressing gowns can be nıade at home from this material, which can be bought in plain bright colours and also with coloured patterns. In making bath mats for Jloors a thick quality should be used, otherwise the mat will not easily remain Hat. 't'erry cloth is also useful for bathroom curtains and for nursery cushion covers.

TESTER: Of a Bedstead. The tester originally described the flat covering of material that was stretched on a frame above one of the bedsteads used in olden times. Soon it was used for the wooden canopy that was fitted on to many bedsteads, and for

'l'etratneca. Small pink blossoms of this evergreen indoor ahrub, which makes an attractive pot plant
this reason these are known as tester beds. Tester beds were popular in England during Tudor times. In many the tester is beautifully carved as are the bulbous turned posts that support it. In most of these bedsteads there are four posts, but in a few the head end is filled in with panclling as far as the underside of the tester: consequently two only are reguired, these being at the foot end. Sometimes a hiding place was made in the tester. See Bedstead; Tudor Style.

Tetanus. See Lockjnw.

TETANY. In the condition known as tetany spasmodic contractions of the muscles, mostly of the hands and fect, occur from time to time. In children it is associated with rickets, and in adults with disturbance of the digestion. It is treated by giving large doses of calcium chloride and by attention to the general health.

TETRATHECA. This is the name given 10 a greenhouse evergreell fowering shrub with red or pink flowers during the summer months. It thrives in the usual potting mixture in well drained pots in a sunny position in the greenhouse. Propagation is by cuttings. The necessary temperature a verages $50^{\circ}$, and plenty of water is necessary at all times.

TEUCRIUM. The small family of plants known as teucrium consists chiefly of hardy perennials with fragrant sage-like lcaves. They are suitable chiefly for the rock or wall garden and are increased by division. T. Chamaedrys has shining leaves and purplish, llowers in summer ; T. Marum is the cat thyme.

THALIA. This plant may be described as an aquatic perennial, of which only one kind, T. dealbata, is grown. It is a handsome purple-flowered plant for the margins of brooks and ponds where the position is warm and sheltered. It is hardy if roots are placed deep enough to avoid frost.

THALICTRUM. This is the name of a group of attractive hardy flowering plants with deeply cut, alnost fern-like leaves, and popularly called meadow rue. They flourish in ordinary well-drained soil and are increased by division in spring. Those most suitable for the flower border are aquilegifolium, 3 ft ., purple; flavum, 3 ft . yellow, and dipterocarpum, 4-5 ft., rosy lavender. Minus, which grows only 12 in . high. has yellow flowers; its variety, adiantifolium, is commonly called the maidenhair plant, because of the small, fern-like leaves.

## Thatching: The Process Explained

## Modern Applications of an Old and Attractive Method of Roofing

The reader of this article may with advantage consult the enrries that deal with the various types of building, eg. Bungalow; Cottage: House: Summer House. For other forms of Roofing see Roof; Slate; Tiles
Thatch has much to recommend it as a tools consist chicfly of the bill hook and a roof covering. It is warm in winter and cool somewhat similar but flatter knife, known as in summer, and when the thatch has settled an caves knife, about 18 in . long. This or a
down the ris- from fire is not serious in culuntry districts. It is not expensive as a roofing, but requires certain skill and ability to perform the thatching of a roof in a satisfactory manner. Thatch is suitable for roofing all manner of garden erections, and it is probably in this dircction that the amateur may use it.

Figs. 1 to 3 show the manner in which the present-day house is thatehed. The thateher's pair of stout shcep shears are used for trim. ming the eaves. One or two hand rakes with iron teeth arc necded, as well as ladders long enough to reach to the ridge of the roof of the building.

Other necessary articles are a supply of pegs, binding corl made of threc-strand hempen cord, sometimes known as marling, a wooden mallet, and some stout cord with a running


Thatching. Picturesque example of a modern thatched roof on a little country inn
noose to carry the thatching materials from the ground to the roof.

Preparing the Straw. Thatching customs vary in most counties. In Norfolk the spear grass found in the fens is largely employed and is the strongest and best thatching material. In Sonicrset and Dorset straw is extensively used, and so on with other districts. To begin with the material is made into bundles known as boltings or covings when the material is straw, as threeves when prepares from heather, and as fathoms when of reeds. Thesc arc delivered to the site, when the roof has been prepared for them, and are unloaded and stacked.
The preparation of the straw is important Straw of a dry, loose character cannot bc packed as tightly and securely as damp straw ; for this reason the straw should be well douched with water and turned over with a fork until it becomes thoroughly moistened The hear must then be slightly compressed


Thatching. Fig. 1. Rooi prepared by nailing wooden runners to the joists. Fig. 2. Thatching begun by sewing the straw with twine to the runners Fig. 3. Laying a plaited ridge roll, one way of finghing off the apex of the roof Courtesil of Boulton \& Paut, Ltd.
by beating with the fork or by treading. The
straw should next be drawn from the bottom of the heap where the pressure is greatest. The usual method is to grasp as much straw as can be gripped by both hands held close together. The straw is then drawn out by a quick movement of the arms towards the right, followed by a swing over to the left, finally laying the bunch of straw at the worker's feet with the thicker end to his right hand. This work of yealming, as it is called, is usually undertaken by the thatcher's assistant.
When a sufficient quantity of this partially straight straw has been collected the worker goes through it, using his fingers to regulate it and to remove any loose portions, at the same time drawing the bundle to his fect until the layer amounts to as much as he can hold in the grip of both liands. Great care should be exercised to exclude all short ends and picces of straw, so that, when properly prepared, the ycalm will he perfectly straight

The yealm of straw must then he gathered in the hands and a small quantity pulled out at one end, turned down and wound round the top of the yealm, forming what is known as a staple. The projection thus formed at the head of this staple prevents it from locing withdrawn after it has once been inserted in the turves as described below. A yealm thus formed should never be broken, but kept firm and secure until it is placed in position. As the yealms are completed, they are placed crossuise on a short rope or cord, the thick and the thin ends alternating. When sufficient in number and weight for a man to carry, the rope, which should have a running noose. is drawn round the yealms, which are in this way pulled on to the roof.

Two Methods of Thatching. There are two ways of using straw. One is to lay a covering
of fibrous turf over the roof and to push the straw through the turves, while the other is to sew the straw directly to the roof. To prepare the roof for thatching by the first. method, the rafters must be fixed on to the roof in the usual manner, wooden battens being nailed on at about 6 in. apart. These battens should be about 3 in . broad. The turves arc placed upon the roof, working from the bottom and proceeding in an upward direction as with slates. When cutting the turves a thick curved cutting-iron must be used, so as to obtain turves thick in the centre but gradually tapering off towards the sides. Then, when laid on the roof, the overlapping

alternative, two pieces of wood may be utilized, the boards being cut to the same length as the roof and fixed so as to overlap the thatch for some distance on each side. This method of thatching is, perhaps, more extensively practised than the one above described, as it is often impossible to obtain

firm, fibrous turf. Thatch should overhang the walls to a considerable extent, to allow the drippings to fall clear. Dormer windows, valleys, and hips are all covered in the gencral run of the work. Separate cdges will make the turf covering level and the roof will be of one thickness throughout.

For laying the staples of straw a thatching iron will be necessary. This implement is slightly forked at the apex in order to catch the twisted head of the staple. In this manner the latter is pushed through the turf, and is prevented from coming out again by the head of wound straw. The work of laying the staples must be commenced at the caves, and should proceed upward until the ridge is reached ; at this point a layer of turves is placed over the straw in order to form a bolster, or well-delined ridge, and the thatch. ing is then complete. An alternative method of finishing off the ridge is to fix in place a tightly plaited straw roll, as shown in lig. 3.

When preparing the roof for the sccond method of thatching, namcly, sewing the straw directly to the roof, the rafters are laid, the wooden battens nailed on, and the straw prepared in the same way. The straw is then sewn directly to the battens, commencing at the bottom and working upward to the ridge. Sewing twine is usid for this purpose, and the work will be found quite a simple operation after a little practice has been obtained. In order to finish off the ridge turves may be requisitioned, as in the former method. As an
gutters are unnecessary, and the cost of a broken roof is thus less than when covered with tiles, which have to be carefully fitted.

Heather and Reeds. In ccrtain districts heather is used extensively in the thatching of dwelling houscs, and particularly rustic summer houses and sinilar buildings. This material is not always procurable in abundant quantities, but in the north and central counties of Scotland it forms the staple medium for thatching purposes. When carcfully cut, heather will require but little preparation beyond straightening out. The roof is prepared as in the case of straw thatching by the second method, and the heather sewn fairly tightly and closely together. This makes an excellent and very durable roof.

Rceds, where they are procurable, are also a valuable material for thatching purposes. They arc used in a similar manner to straw, being either sewn direct to the roof or inserted through turves. Broom is used in other districts in a similar manner to heather

On the roof of a dwelling-house, ten bundles, or 5 cwt., of straw will be required to each square of thatch. A square is 100 sq . ft. When thatching is carried out in a thoroughly expert and experienced manner, the roof should remain quite watertight for about 30 years, if composed of the finest quality wheat straw, or for 40 years if rueds are employed. If the work is done indifferently it may not last for more than 10 years. Much of this information is taken from Leaflet No. 236, issued by the Ministry of Agriculture.


Fig. 4. Thatched roof nearing completion. Note the ornamental finish of the ridge around the chimney stack, and how the thatch overbangs the gable ends of the roof Courlesy of Boulton \& Paul. Ltd.

## Theatricals for Amateur Actors

## Some Practical Hints on Play Producing for Amusement

This article contains useful information for those desirous of giving entertainments of this kind in a simple manner. See also Fancy Dress; Makc-Up; Stage

When a theatrical performance has been decided on the most important step is to sccure a good etage-manager or producer. A professional is cometimes engaged to produce the play and has the assistance of an amateur stage-manager. For the less ambitious type of performanco the amatcur stage-manager combines with his other duties those of producer. Some experience, ability to play cvery part in the piece, tact, inperturbable temper, rcadiness to listen to arguments, and lack of obstinacy are qualities required in the producer-stage-manager
The next point is the choice of a play. Consider the aren at disposal ; twelve people cannot be expected to move and act naturally in a space which can only accommodate three. Consider the height; the balcony scene in "Romeo and Juliet" cannot be given with only seven feet of headroom.
Consider the inevitable limitations of the scenery. Consider the capabilities of the actors as a combination. A simple piece well acted all round is more satisfactory than one star performance badly supported. Consider, above all, the audience; in ninety-nine cases out of a hundred they prefer to be amused. Finally, it is a mistake to select a piece which many of them have probably recently seen performed by a first-rate prolessional company.
The casting of the piece naturally follows, and there are advantages in leaving this task to the stage-manager or producer. Do not in any case choose hurriedly, for mistakes cannot afterwards be rectificd easily.
The producer must study every part in the play. He should work out the inovements and positions of every character from rise to fall of curtain. When all this is accomplished, a convenient date is fixed for the first rehearsa!. At this the producer should read the play through, afterwards giving each performer some idea of the character he is playing, and generally clearing away any difficulties. The second rehearsal should take place on the stage, or on a space of the same size, with the furniture arranged as on the night, and the positions should be gone through, giving time to the actors to mark them in their books.

## Importance of Rehearsals

The next three rehearsals, assuming the play to be in three acts, should be devoted to one act apiece in turn. The sixth, seventh and eighth will be well employed in the same way, but now rigidly enforcing the rule " no books," supplying all the properties required, and insisting on the actors playing as if it were the actual performance ; paying special attention to the principal characters, and letting no awkward positions, meaningless or cxaggerated gestures, or wrong intonations or emphases pass uncorrected. Two or three rehearsals of the whole play, not counting the dress rehearsal, should then be sufficient.
The dress rehearsal inust be carried out as a performance, and the stage-manager will have to see the stage set and all the stage properties in place; perhaps make up the actors: get the beginners on the stage ; draw the curtains; prompt-though it is wiser to appoint a special prompter; see that each actor is at the proper entrance in time, and has any hand propertics needed ; close the curtains at the end of the act; change the furniture, if necessary; start the music, if any ; and so on until the curtain falls.

A platform raised two feet from the floor of the room adds to the enjoyment, but is not absolutely necessary, and unless the room is 14 feet high should not be attempted. The
drawbacks against using the floor of the room for the stage may be mitigated by setting the front row of seats as far back as is consistent with the rumber of spectators; by using low seats for the front rows; and by reducing as far as possible the number of scenes in which the actors themselves are sentcd.

The proscenium is the partition which divides the audience from the stage, carries the curtain, and forms a frame for the scene. One of those rooms partly divided into two by an archway gives a proscenium ready made. Failing this, a built-up proscenium is not altogether essential, as an entertainment can be contrived by selecting scenes from the works of the older playwrights, all of which were so constructed that the dramatis personae simply walked on at the beginning and off at the cnd, or by picking out more modern plays which do not commence with the discovery of some of the characters or end with an una voidable picture. A couple of screens high enough to conceal completely those on the stage and wide enough to meet in the middle when drawn out from either side will serve as a combined proscenium, curtains, and wings for those waiting their entrances "off," and entail a minimum of trouble and expense. Such screens can be constructed to the desired size, of light wood, by a professional or amateur carpenter, and covered at home with cheap material.

Practical Curtains. A more ambitious arrangement is attained by the use of curtains. Iron piping, about an inch in diameter, makes the best rod for these. One piece, the full width of the room, and an upright at each end against the wall sccurely fastened to the first, will be sufficient if the room is not wide; but it is safer to provide a second upright on each side at the front corners of the stage. The distance of these from the walls must depend upon the space available, but not less than three feet on each side is desirable.

A tie rod, close to each wall, firmly attached at the point of junction of the crossbar and support, sloping back at an angle of $45^{\circ}$, and screwed through an eyehole to the lloor, combined with the supports for the scenery, should provide the necessary rigidity. If these are insufficient, similar ties may be attached to the tops of the inner supports running up stage parallel to the walls. Sufficient rings for the curtains should be placed on the crosspiece before the uprights are attached to it.

The side curtains should be wide enough to fell into folds, with small bags of shot or little leaden weights sewn into the bottom hem to prevent flapping. Bolton sheeting is a good
selection for material. A valance across the top adds to the appearance but is not essential. The best effect is produced when the proscenium is carried right up to the cciling, but the essential height is about 8 ft . The ends of all rods touching the walls should be wrapped in some soft material to prevent damage to paper or paint.
The front crosspiece will carry the curtains. These should meet in the centre, drawing back to the sides like ordinary window curtains, and by a simple arrangement of the cords may be closed and opened by one person. They should be worked from that side of the room in which the door is situated. The best cord lor the purpose is ordinary picture-cord. Care should be taken to see that it is in good condition, for the breaking of the cord at a critical moment is a humiliating accident.

## Hints to Ensure Smooth Running

A few weights at the corners of the curtains, and at intervals along the bottom, may be added to keep thein steady, and a little blacklead rubbed along the top of the rod will facilitate smooth running, while a hook just inside onc curtain, about three feet from the floor, to fasten into a ring attached, at the same height, a lout four inches inside the other is serviceable in preventing accidental openings Do not forget to unfasten the hook before starting to open the curtains;

Scenery in any way approaching that used on the professional stage should not he attempted. In the cramped space at disposal even one change will be difficult and more than one almost inpossible, so that the choice of a play would he restricted to a one-act play, or to longer pieces, the action of which is all laid in the same scene, and in that case the walls of the room itself will be more convincing. Where more than onc scene is demanded, curtains of the same colour and material as those for the front of the stage are better than indifferent scenery and long waits between acts.

A rod identical with that supporting the proscenium should be fixed at the back, but the interior uprights may be placed a foot or eighteen inches nearer together than those in front, and in an ordinary room the two against the walls may be safely dispensed with. The back rod should run two or even, if space allows, three feet away from the walls of the room to permit of free passage behind. The rods for the side curtains should start from the end wall, be secured to the back uprights, and to the front horizontal rod one foot from the edge of the proscenium away from the centre. The curtain on each side should not extend to the front, but should leave an opening of about two feet to serve as an entrance to the stage. If the back curtain is divided down the middle the two sides may be drawn back when necessary to provide a centre entrance.

The furniture will show that an interior is meant ; a standard lamp, lighted, will indicato


Theatricals. Easy method of arranging stage and curtains
night-time : and iugenuity will doubtless used in Great Britain. On the Fahrenheit suggest conventions to indicate an exterior scene. The programme, moreover, will tell the audience what each scenc is supposed to be, and if the play is well acted they will never feel the absence of scencry.

A row of footlights is not practicable where space is linited, and is apt to cause hard, unbecoming shadows when not properly balanced with other lighting. If a chandelier hangs in the middle of the room, a sheet of tin or even white cardboard of sufficient depth to cut off the light from those seated farther hack will not interfere with their view, and will, at the same time, serve to reflect the light on to the performers.

Should there be no central light, or any way of improvising one, side lights alone nust suffice; in that case, given electricity, wooden battens should carry cight or even ten bulbs apiece.
If lamps are the only resource, each should be placed in a two-sided screen reflector large enough to enclose it completely, painted white within and placed on a steady support outside, but close to the proscenium, the outer side of each screen being parallel with the front of the stage. A few trials on the spot will soon show the best position for these to ensure the maximum of light on the performers, without impeding the view of any member of the audience, bearing in mind the fact that a broad diffusion, not a concentrated glare, is nerded.
The first thing for the performer is to learn the author's words and the cues-that is, the ends of speeches which precede his own; the second, to read the play through with care to find out what his character is, how to make up, dress, etc., and so form a concrete image of the personality of the part. Tricks and mannerisms which would be appropriate should be tried; those minor movements which come under the heading of "by-play" or "business" and where and when each is to be employed should be settled, and always when going through the part kept to its appointed place. Each speech in turn must be gone through and the meaning duly emphasised in order to convey this to the audience. Rehcarsals should not be wasted in learning parts, but in fitting the figures conceived into the rest of the picture, and developing the general effect, for play-acting is teamwork in which the harmonious interaction of all the per formers is essential.

THERM : In Gas. The therm is a unit of measurement introduced by the Gas Regulation Act of 1920. A therm is equal to 100,000 British thermal units or B.Th.U., and is the hasic unit upon which charges for the supply of gas are made to the consumer by the public gas undertakings. See Gas.

## Thermionic Valve. See

 Valve; Wircless.THERMOMETER This instrument is used for measuring heat. One is usually part of a weather glass, this being used to measure the heat of the atmospherc. The heat of the body is measured by a clinical thermometer.
Heat on the thermometer is measured by ilegrees. There are two scales in ordinary use, Fahrenheit and centigrade ; there is also a third method, namely Réaumur, which is not much


Thermometer for the greenhouse Courles" of Negrelli i Zambra
$212^{\circ}$. On the centigrade, which is the one most used in scientific circles, freczing point is $0^{\circ}$ and boiling point Read scale, freezing point is $0^{\circ}$ between and boiling point is $80^{\circ}$

Lines

It is quit vert realing casy to con into thang on one scale another. For instance, $55^{\circ} \mathrm{C}$ is equal to $131^{\circ} \mathrm{F}$. This is done by the following formula :

## $55 \times 180$

100
The formula for the reverse process, i.e. converting Fahrenheit into centigrade, is :
$\frac{(131-32) \times 100}{180}=\frac{99 \times 100}{180}=55$ Clinical Thermometer. A selfregistcring instrument known as a
clinical thermoncter is used in medicine clinical thermometer is used in medicine for measuring the temperature of the
body. The tube in which the mercury rises is very much constricterl just above the mercury bulb, so that when the mercury rises to a certain height in taking a temperature it remains at that height until shaken down. This is what is implied in the term self-registcring.

In Great Britain clinical thermometers arc graduated according to the Fahrenheit scale, but on the Con-

Clinical Thermometer, and diagram it correctly it correctiy
 tinent the centigrade scale is adopted. On the former scale the thermometcr registers between $95^{\circ}$ and $110^{\circ}$, and each degree is subdivided into 5 parte, indicated by shorter lines than those denoting degrecs. In reading off a temperature the subclivisions are read as decimal fractions; thus one subdivision is $\cdot 2$, two 4 , and so on. The normal temperature of the body, $984^{\circ}$, is shown by an arrow running across the scale.

Before proceeding to take a temperature the nercury should be brought down $1^{\circ}$ or $2^{\circ}$ below normal, and this is accomplished by grasping the stem firmly with the thumb and index finger and making several forcible flicking movements with the thermometcr. There is also a device, here illustrated, for lowering the mercury in the tube by making the case $B$, containing the instrument, revolve rapidly on the swivelled crosspiece A.

The method of taking the temperature is described under the heading Temperature (q.v.). If therc is occasion to use the instrument several times during the day it will be convenient to keep it in some antiseptic lotion in a glass, a picce of cotton wool being placed at the bottom of the glass to minimize the risk of breakage. See Prescrving.

THERMOPSIS. These are hardy herbaccous perennials with pea-like flowers in early summer. Montana, $2 \mathrm{ft} ., \mathrm{ycllow}$, and barbata, 12 in., purplish, are the hest kinds. They thrive in ordinary well tilled soil and dislike being disturbed. The best method of propagation for these plants is by seeds.

THERMOS FLASK. This is the name of a kind of vacuum flask for retaining liquids in a hot or cold state. The glass vessel can be replaced at a moderate cost if it gets broken, but with ordinary care this should seldom be necessary. The tlask should be left uncorked when not in use, as otherwise the stopper may become musty. See Vacuum Flask

THERMO-SYPHON: Cooling. In the great majority of cases the internal combustion engines used on motor cars are water cooled. The thermo-syphon method makes use of the natural law that a given volume of hot water weighs less than an equal volume of cold water. The water, as it bccomes heated in the cylinder jackets, expands and rises, giving place to cooler water entering from below, after passing through the radiator. By suitably arranging the position of the radiator in relation to the engine, the purely automatic circulation of the water through the medium of the radiator keeps the enginc at a definite temperature within limits.

Apart from radiator position, there are threc points to be considered, namely the capacity of tho radiator, the amount of cooling surface, and the diameter of the flow and return pipes. These should be as large as possible, not less than $1 \frac{1}{2} \mathrm{in}$. in diameter, so as to restrict the passage of the water as little as possible. A fan is usually filted to force air through the interstices of the radiator, so that the cooling action is to this extent independent of road speed or wind.

The tempcrature for a watercooled eugine should lse about $200^{\circ} \mathrm{F}$. The water should remain somewhere about this figure during the whole time the engine is running. To obtain this result the difference of height between the bottom of the cylinder jacket and the bottom of the radiator is determined by experiment, so that the water, after passing through the radiator, will still be at a fairly high temperature when it again enters tho cylinder jackets.
The higher the bottom of the cylinder jacket in relation to the bottom of the radiator, the slower will be the thermo-syphon action. If the bottom of the radiator is level with that of the cylinder jacket, the fullest advantage is taken of the system, and therefore the water, as it enters the jackets, will be at a very low temperature. The most effective arrangement is shown at $\mathbf{A}$ in the illustration.

If the relative positions are as slown at $B$, the amount of cooling surface is considerab!y reduced, and the water will still be at a fairly high temperature on entcring the cylinder jackets.

When the front of the velicle is lifted, as in climbing a stecp hill, a varying extra amount of cooling surface is automatically provided, because for the time being the difference of level is increased. This is all to the good, hecause it comes at a time when in all probability the engine of the vehicle will be working at full output on the low gear. With the radiator placed behind the engine tho reverse is the case, which probably accounts for the lact that for this system pump circulation is invariably employed.

Temperature Control. By the incorporation of a thermostat in the thermo-syphon syetem
the temperature of the cooling water can be of fracture of the thigh: It may affect the automatically regulated. The thermostat, upper extremity, especially the neck, the shaft which is pre-set to the desired degree, opens or the lower extremity. Fractures of the or shuts a valve which governs the flow of circulating water. An increase in flow brings about an increased cooling effect, and vice versa. Thus the temperature remains approximately uniform, irrespective of vehicle specd or weather conditions. See Motor Car ; Pump: Radiator.
THICKENING: In Cookery. A mixturc of which flour is the principal ingredient is used to thicken soups and gravies, to convert stock into sauces and for binding cutlets and rissoles. It is used also to thicken milk for invalids, 1 oz. flour being used to every pint of milk. The llour is first mixed smoothly with a little cold milk and the whole then boiled for ten minutes.

The most important thickening is roux, both brown and which become painful by fing of equar proportions of the the phile one too large will be finest white flour and butter cooked together continual!y dropping off. until the two are amalgamated.

Roux is fried or baked if brown roux is de. sired. It is simply stirred over the fire until the flour is incorporated with the fat for white roux. Occasionally a thickening of butter and flour which has not been previously cooked is added to the liquid. It should then bc worked together on a plate with a knife.

A more simple method is to mix the llour into a thin paste with cold liquid and stir it into the gravy or sauce to be thickencd. This method, however, has a tendency to impoverish the sauce, while the addition of butter softens and enriches it. Colouring must be added if a brown sauce is required.
Certain grains, such as crushed tapioca, rice, semolina or sago, eau be used as thickening. The grain should be sprinkled into the liquid while boiling and lakes from 10 to 15 min. to cook. Pearl barley is used to thicken broths, but must be blanched first, and given a much longer period to cook. Arrowroot and cornllour are frequently employed in thickening, first mixed with a little cold liquid, and they must be stirred in gradually.

Eggs may be used to thicken white sauces, soups and milk, also for custards and light puddings. The eggs must always be thoroughly heaten before being mixed with the liquid, and must never be allowed to reach boiling point, or they will curdle. Egg. worked with sugar make a thick basis for many kinds of cake, and when mixed with oil or butter form the groundwork of salad dressing.

Lentils and peas when cooked and made into a puree thicken vegetable soups. Haricot beans may also be used for this purpose. Oatmeal is occasionally employed as a thickening for soups, but it cannot be strained away, neither does it become absorbed. See Browning; Flour ; Gravy ; Sauce ; Soup.

THIGH. The thigh bone or femur in man belongs to the class known as long bones, that is to say, it consists of a shaft and two expanded extremities. The head is received in a cup-shaped cavity on the haunch bone, known as the acetabulum, so that a ball and socket joint is formed. The average length of the bone in an adult male is about 18 in . the lower end of the femur articulates at the knec with the tibia. These are possible dangers

THINNING: In the Garden. When applied to trees and shrubs thinning out means the removal of old and superlluous branches. The term is also applicd in gardening to the removal of unwanted seedlings so that those remaining shall have proper room for development. Fruits too must be thinned to allow those left to reach full size. In thinning grapes care should be taken first to cut out all small berries and then those in the eentre of the bunch. It should be noted that unless grapes are correctly


Thinning Fruit. Shated portions show how to evsure fine specimens Bu special arrangement with Amatrur Gardentng

THISTLE. The most ormamental thistle being essential that the machine shall he for the garden is the cotton thistle or onopor- capable of driving the engine so that full don, tall handsome plants, 6 ft . or more high advantage can be taken of the engine as a with pale purplish tlower heads. The chief retarding force when descending steep hills, kind is Onopordon acanthium, commonly or when wishing to slow down the machine called the Scotch thistle. These thistles are gradually without recourse to the brakes. most suitable for the wild garden: they With all types of huh gear designed for motor flourish in ordinary soil and are raised from cycle use some form of clutch is incorporated seeds sewn out of doors in spring.
THORN APPLE. This group of annuals and greenhouse shrubs belongs to the potato family. The botanical name is datura (q.v.).

The common thorn apple (Datura stramoniums bearing large prickly fruits sometimes appears as a weed in gardens.

THORNBACK. Being a species of skate, the thornback is a salt-water fish found round the British coasts. It can be cooked in the samc way as skate. See Ray ; Skate.

THREAD. It is an cconomy not only to buy the best quality of thread but to secure the right kind for the purpose in hand.

Domestic sewing cotton consists of six separate strands twisted together to the requisite tightness. No. 24 is a strong coarse thread for buttons, 40 or 50 for hand searcing. For sewing machines thread of 60 or 80 is suitable.

Linen thread is stronger but more uneven than cotton and especially useful for bootbuttons, carpet-sewing. rug-backing, and similar uses. Silk sewing thread is userl throughout by the best tailors; for buttonholes which have to take much wear silk buttonhole twist is indispensable. Merccrized cotton can be used for buttonholing but does not give the same satisfaction.

Threads are specially made for crochet, embroidery, knitting, and other forins of fancy work, and experience has taught the manufacturers which numbers are best for particular purposes, and their advice is always valuable, as threads are prepared with a view to the needles or hooks with which they are to be employed, and with an eye to appearance. Artiticial silk threads are largely used for embroidery as well as for knitting, and they may give trouble unless suitable needles are used. See Crochet; Embroidery ; Knitting ; Sewing Machine.

## Threadworm. See Worms.

Three-ply Wood. See Plywood.
THREE-SPEED GEAR: For Cycles. Variable speed hub gearing is used on pedal cycles and motor cycles. The latter is dealt with in the article on (iear. In motor cycle practice this system has largely bcen displaced by one employing spur gears, located between the engine and rear whecl.
The chicf difference between the two types of hub gear !ies with the method by which the gears are operated; with the pedal cycle gear the mode of operation is through the medium of ratchet tecth and pawls, but with the motor cycle type of gear the niethod of operation is by means of clutehes that, apart from bringing the repuired gear into operation, also lock the required gear as solid with the huls: i.e. there is not a i.e. there is not a
frec-wheel action, it s a means by which the engine may be disconnected from the hub.

Fig. 1 shows in part section a three-specd coaster hub for pedal cyeles. Although termed
a three-speed gear, actually only two geared also in engagement with the stationary pinion speeds are employed, namely, a low speed and A rotating the cage $B$, of which the ratchet a geared-up speed. The middle speed is teeth $K$ are a part, and these teeth engage called normal, meaning dircet drive, i.c. the the cage pawls $H$, that are a part of chain ring drives direct to the hub shell by the hul) shell D, thereby means of ratchet teeth and pawls. Fig. 1 is a completing the drive. This detailed drawing in part section of the com-being the low gear, C, M, plete hub. The outer shell that carries the and $N$ will be rotating at whenl and tire is driven on all three specds by a greater speed than the ratchet tecth and pawls, so that it is possible to const or frec-wheel with any of the speads.

Fig. 2 is a diagrammatic lay-out of the gears. A is the stationary pinion, $B$ is the Hoating cage that carries the four planet wheels, and C is the outer internally toothed ring with which the planets are always in engagement ; the pinion $A$ is also in constant mesh. with the planets. To obtain the low gear the outer ring $C$ becomes the driven member, driving the eage $B$ through the mediun of the four planet wheels that are attached to the cage by their bearing pins. Thesc planet wheels are also in engagement with the stationary pinion $A$, so that as they are rotating the plancts will travel in the same direction as the outer ring, but will move more slowly. The final drive is from the cage B to the hub shell D.
The high or geared-up gear is obtained by a reversal of the foregoing, Fig. 3. The cage $B$ is the driven menber, which by rotating causes tho four planet wheels, through the medium of the stationary pinion A, to revolve, and these by so doing rotate the outer ring $C$, but at a greater speed than that of the cage $B$. In this case the final drive is from the outer ring C to the hub shell D , it being understood that the power applied to the driven member in both cases is through the chain ring shown at M, Fig. 1 .
Fig. 4 shows the operation of the low gear. The direction of the drive is transmitted from M to N , then via the ratchet teeth T . They engage with the pawle $Q$, which are a part of the outer ring $C$. Then the drive is through the medium of the planets $E$, that are


Three-speed Gear. Fig. 8. Derailleur gear, in which a free-wheel with two or more sprockets are used, chain being actuated by a lever-and-cahle control Courtes!y of Cyclo Gear Service

Derailleur Gears. There is another type of variable speed gear-considerably used on the Continent-in which a free whee! with two or more sprockets is emploved. the chain being moved from one sprocket to another by a lever-and-cable control on the top tube of the bicycle frame. A tension cog takes up any slackness of the chain between the smallest and largest sprocket. When the control lever is moved a rotary morement is given to a quick thread on which the actuating sprocket is mounted, so that the sprocket moves laterally into line with the cog sclected. The deraillcur gear, as this type of change-gear mechanism is known, is obtainable as a two, threc, four, or sixspeed gear, and the twospeed pattern (illustrated and pawl $T$ and $Q$, thence
via the Paw ! and ratchet $F$ and $G$ to the hub in Fig. 8) can be fitted to an existing whecl shell D. The drive is now solid, the gear wheels without alteration other than lengthening running idle owing to the stationary pinion $A$. the chain.

Fig. 6 is the high or gcared-up speed. THREE-WHEELED CAR. The "threeThrough the medium of $S$ and the thrust wheel "car is a step between the motor cycle collar $L$ the cage 13 with the outer ring $C$ is with sidecar combination and the four-wheeled drawn further still to the right. By so cloing ear. An advantage is that in the cyes of the the ratchet and pawls T and Q, Fig. 5, are law it is a motor cycle and trailer, and theredisengaged, and the ratchets $P$ and $W$ tale fore comes under regulations of licensing up the drive. The eage 13, of which the ratehet different from those which apply to a car. teeth $P$ are a part, is the driven member. The tax on a three-wheeler is $£ 4$ per annum, through the medium of the planets E , which whereas a four-wheeler of the same horsein turn drive the outer ring C. The pawl and power would be taxed $£ 9$ or $£ 10$. Moreover ratchet F and G take up the drive to the hub the design is simple, and since the back axle shell D. Diagrams 4,5 and 6 should be read with its complicated worm, or bevel and in conjunction with Fig. 1. The arrangement crown whecl, and differential is eliminated, the of the controls is shown in Fig. 7 below. cost of construction is distinctly low. The

Note, the parts
shown in thick line donot rotate
are operated by the chain S.to which
they ure connected
Internal Teeth


Fig. 7

Three-speed Gear. Fig. 1. Part-sectional drawing of a type of three-speed coaster hub for pedal bicycles. LA, thrust nut sleeve : $R$, index sfud ; $\boldsymbol{\nabla}, V$, cones ; $X, Y$, sleeve nuts; $Z$, end cover. Other references explained in text. Fig. 2 . Diagrammatic lay-out of the gears, showing position for low gear, outer ring $C$ being the driven member. Fig. 3. Posilion of gears in high gear, cage B becoming the driven member. Fig. 4. Longitudioal section showing low gear engaged. Fig. 5. Normal or direct drive engaged. Fig. 6. High gear engaged. Fig. : Diagram showing arran


See figi for reference letters A.B E


See Fig. I for reference letters $A_{1} B$

weight of the completed vehicle is somewhat less than that of a similar four-wheeled type.

This lightness of weight gives the vehicle a relatively high performance, equalled only by high-powered cars at much greater cost; and it becomes a very fast and relatively powerful car at the price of a motor cycle and sidecar. This is by no means the limit of the appcal of the three-wheeler, for therc are on the market soveral excellent "family models" which give the same accommodation as a small four-seater car with much lower first cost, running


Three-wheeled Car. Morgan three-wheeler, lamily moded Courtesy of The Motor Cucle
suitable for the Hower horder or rock garden. The commonest is Armeria vulgaris (or maritima), a favourite cdging plant which bears light rosecoloured flowers in summer: laucheans is a varicty with blooms of decper colouring. Sea pink is another name for this plant which grows wild among the rocks by the sea side in the West ol England. Two goorl and maintenance costs. Most three-wheelers laller thrifts suitable for the border are lati are driven by a two-cylinder engine of the motor folia and plantaginea, 12 in ., with rose-coloured cycle type which drives the back wheel by blooms; of the improved varietics raised ir means of chains; in one design the power is applied direct to the front wheels, thus obviating the use of long chains.

In the Morgan car the power unit is a twocylinder engino either of the air-cooled or water-cooled type which transmits power to the back wheel hy means of a short shaft and chains. There is no gear-box in the accepted sense of the term. From the shaft the drive may be taken at will through either of two chains, which provide different speed ratios. The type of borly on this chassis varies from two-seater tourers and four-seater "all. weather models" to twoscater "super sports" models capable of over a hundred miles an hour.

The B.S.A. three wheeler is driven by a twocylinder air-cooled engine, but, unlike the Morgan. the drive is on the front wheels and not on the single rear wheel. This form of construction is moderately cheap, since all the mechanical elements are concentrated at one end of the vehicle.

Various other types of three-wheel vehicles have becn introduced from time to time but have not caught the public fancy, and are no longer made, except the Seal, which is in effect a sidecar combination built as one machine instead of two. It is fitted with a two-seater body on car lines.

Theoretically the three-wheeler is not so stable as a four-wheeled car, the relative stability of the two types of vehicle approximating to that of a three-legged stool and the conventional chair, respectively. In practice, however, the disadvantage of a threcfold support is not so apparent, and in the hands of an efficient driver the three-wheeler may be reckoncd as safe as the four-wheeled car, though it requires greater skill in driving Motor cyclista prohably make the best drivers, since many motor-cycling conditions obtain.

Manufacturers as a rule do not equip a three-whecler with a reverse gear, and the steering gear is not of the somewhat complicated type used on a car, with the result that steering is perhaps a little more fatiguing. Advantages of the three-whecler include lower weight, greater power in proportion to weight, greater economy in petrol, simplicity of construction, and lower taxation.

A three-wheeler ranks os a motor cycle, therefore the age limit for holding a licence to drive it is sixtcen years, instead of seven teen, as in the casc of a car.
THRIFT. This is the name of a low growing evergreen tufted plant (armeria)

B.S.A. sports model of three-wheeled car

Courlesy of The Motor Cucle
emulsion, and there are various proprietary insecticides. See Insecticide; Peas; Spraying; Syringe.

THROAT. The space behind the mouth, including the fauces, pharynx and larynx, is called the throat, though the name may also be applied to the front part of the neck. A sorc throat, which usually means some degree of inHammatory disturbance, may have many causes. It occurs most frequently, perhaps, in connexion with a common cold, but it may happen also at the beginning or in the course of other infections diseases. It may also be due to tobacco or some other irritant.
In young children the throat may be sore and there may be little to indicate the fact. For this reason the carly stages of diphtheria may be overlooked. It should always be the rule, therefore, to examine the throat of a young child when it is ailing. To do this the child should be held where a good light will shine into the mouth, and the tongue should be depressed with the llat handle of a teaspoon.

A number of methods are available for the application of remedics to a sore throat. Gargling has the disadvantage that the movements made in carrying it out themsclves tend further to irritate very sensitive parts. Patients who are old enough to do so may get more good from simply allowing the gargle to lie in contact with the back of the throat for a
minute or two. In acute conditions spraying is better, or the parts may be steamed.
Benefit may be derived from the application of hot or cold compresses to the front of the neck. These are of several thicknesses of flannel or lint, covered with gutta-percha tissue or oiled silk. and a bandage. Chronic sore


Thritt. Rosy flower heads of the nopular sea pink
throat may follow the acute or may result from over use of the voice, dyspepsia and other causes. See Adenoids; Cough; Croup; Crowing; Diphtheria; Eustachian Tube; Gargle; Inhalation ; Laryngitis ; Larynx ; Quinsy ; Tonsillitis.

THROATING. This name is often given to a groove cut on the underside of a projecting portion of a building to check the passage of rainwater. When rain falls upon the top surface of the sill it spreads out and llows over the edges; by capillary attraction it flows underneath the sill, and in the absence of a throating groove it continues until it meets the surface of the wall, where it runs partly down the surface. If a groove is cut near the front cdge of the under side of the sill, the water gathers there, and by its weight drips from the cdge of the gronve, thereby kceping the remainder of the sill and the wall dry.
Throatings are not always sct in a hori zontal position. Examples are found in many windows in a vertical position, both on the moving part and on the framework or fixed part. The purpose in both cases is to act as anti-capillary grooves, which, by collecting the rainwater, provide a channel for it to run down and drain away.

THROATWORT. This handsome green house plant, 2 ft . or so high, bears bunches of light blue flowers in summer: its botanical

name is. Trachelium caeruleum. It is easily grown in a compost of loam, leaf-mould and sand and is increased by cuttings in late summer or by seeds sown in June. During vinter a temperature of 50 degrees is high enough. It is sometimes planted in flower beds for the summer months.
THROMBBOSIS. The formation of a clot of blood in the heart or in a blood vessel, usually a vein, is called thrombosis. If thrombosis succeeds in obstructing the flow in a blood vessel, little may happen if the blood is able to move on through other blood vessels, but when it occurs in one of the principal veins of a limb it causes dropsical swelling of the limb, with stiffness and tenderness. The symptoms and consequences of thrombosis depend upon its site. See Embolism; Varicose Vein.

THROTTLE : In Car and Cycle. With all makes of carburetter the device known as a throttle is used to control the anount of gas entering the cylinder on the induction stroke. There are two types in common use, namely, the butterfly and the piston, the former being the more popular for motor car work and the latter for motor cycles.
The butterfly type is mounted on a small shaft positioned across the centre of the mixing chamber and over the jet. The closed position is capable of fine adjustment for control of the amount of mixture past the pilot jet, used for keeping the engine running very slowly while the vehicle is stationary. The piston type operates by rotary or sliding movement. The amount of throttle opening is graduated, apart from piston movement, by a $V$-shaped slot cut in the side of the piston, and with the multi-jet carburetters the slot is so shaped that as the throttle opening increases the jets are uncovered in turn.

A proper use of the throttle consists of something more than opening and closing it, according to the engine power required. It is imperative that the speed of the air sucked past the jet should increase as the throttle is opened if a uniform mixture is to be retained. In other words, unless the speed of the engine rises with the throttle opening, the suction on the jet will fall, with the result that the mixture will be relatively weak. Therefore, although the throttle is wide open, the engine will not be giving its full capacity of power.

When the vehicle is climbing a hill and the revolutions of the engine fall off to an appreciable extent, to open the throttle wide will only result in making matters worse. The correct procedure is to change to a lower gear, speed up the engine, and, if the nature of the gradient is suitable, change up again as quickly as possible, at the same time gradually opening the throttle as the speed of the engine increases.

Wear of the bearings of the buttertly throttle, and wear between the piston and cylinder of the piston type, is of considerable importance. Especially is this the case when the engine is running on the pilot jet, because, owing to the throttle being practically closed, air will be drawn in at any possible point, thereby seriously upsetting the mixture. The only cure is to renew the worn parts in the case of the piston throttle, and rebush the bearings of the butterfly pattern.

The speed and power of the internal combustion engine are directly allied to throttle control. Therefore, careful periodical attention should be given to all working parts, from the control lever or pedal down to the throttle arm. Particular attention should be paid to the spring that retains the throttle in the closed position, because, should this come adrift or break, the throttle may assume the full open position, with disastrous results, unless the driver imnediately realizes what has happened and switches off the ignition.

See Carburetter ; Internal Combustion Engine ; Motor Car ; Motor Cycle.

THRUSH : The Bird. A constant inhabitant of the garden where there is a hedge or bushes suitable as a nesting site, the song thrush is not loved by the fruit-grower, although he has a better reputation than the blackbird. In this connexion, it must always be remembered that the thrush feeds mainly upon worms and snails. The persistent manner in which the latter are hunted and destroyed can be demonstrated by placing a large stone in a convenient spot, and noting how the bird uses it for breaking open its prey; the ring of shell debris around it will testify to the thrush's usefulness.

THRUSH: The Disease. In a parasitic inflammation of the mouth, or thrush, whitish patches appear on the tongue, inside of the cheeks, and also on other adjacent parts. The ailment, which usually occurs in infants, is caused by a fungus. The disease is contagious; that is, it may be carried from one child to another through the medium of bottleteats or spoons.

Mild cases can be cured in 6 to 9 days, the diseased patches coming away and leaving a healthy surface. If the child is sickly and treatment is neglected, the attack may last for months.

Care should be exercised to keep the mouths of children clean, and this is all the more important when they are sickly. The mouth should be cleansed after every meal, so that no remains of food may be left to form acids. In sickness the mouth should be washed 2 or 3 times a day with a weak alkaline lotion, such as lime water, or water in which a little bicarbonate of soda is dissolved, a teaspoonful to $\frac{1}{2}$ pint of water. If the child is hand-fed, the bottle, tubes, teats, and the utensils used for heating the milk should be kept scrupulously clean. The milk must be pure and fresh. Starchy food should be given with the greatest caution before the age of 10 months. If there are any signs of indigestion or acidity of the stomach, add about $\frac{1}{4}$ limewater to the child's milk.

As soon as the spots appear they are to be treated with any of the following applications: Solution of boric acid, 10 gr . to 1 oz . water; or solution of salicylic acid, 2 gr . to 1 oz . water; or sodium bi-borate, 12 gr . to 1 oz . water; or permanganate of potassium, 1 gr . to 2 oz . water. Any of these lotions may be applied with a camel-hair brush, or with a piece of boiled lint wrapped round the end of the finger, or they may be sprayed on the patches of thrush.

THRUSH : In Horses. Horses of every kind are liable to thrush of the feet, which is denoted by a discharge of matter, and is generally due to insanitary conditions in the stable. It is most commonly the horse's hind feet that suffer. Many farm horses get the discase through no drainage being provided. The cobble-stone paved stable is a fruitful cause, unless this has been set in the concrete and is well drained.

The trouble affects the cleft of the foot pad, or frog, as it is called. A frequent cause is through allowing soiled straw, etc., to lodge in the feet, and there remain until it drops out, proper use not being made of the foot picker. The feet should be picked up and cleaned out every time the horse leaves the stable, also whilst it is in the stable. When a horse returns from work it is customary to wash the feet, but care must be taken not to wet the clefts of the frogs and the hollows of the heels.

It is of primary importance to attend to such hygienic matters as a clean dry stable floor, drainage, plenty of straw bedding, and regularity in picking out the feet. Dress the cleft of the frog daily with calomel and pack it
into this by inserting a pledget of tow. This will usually cure it in a few days; but if not, try a lotion consisting of 5 gr . of corrosive sublimate dissolved in loz. of methylated spirit. This dressing, which should be used daily, is applied by pouring it into the cleft, soaking a piece of tow in the solution and packing it into the cleft.

THUMB. The human thumb has a very free range of novement. It may be flexed or bent in on itself, extended or straightened out, adducted or drawn across the palm, adducted or carried out from the hand, and opposed or brought across to touch the other fingers. It is characteristic of paralysis of the median nerve that while the thumb may be adducted it cannot be opposed to the other fingers. The part played by the thumb both in performing fine land movements and in gripping is a very large one, and these functions are seriously impaired in median nerve paralysis.

The ball of the thumb is technically called the thenar eminence. Both this and the hypothenar eminence, the corresponding muscular mass on the inside of the palm, manifest wasting in ulnar nerve paralysis. The thumb is not infrequently dislocated, and great difficulty may be experienced in reducing the dislocation. See Bandage; Hand.

THUMB LATCH. This term is used to describe a type of latch which is operated on one side of the door by the thumb. As a general rule it is similar in appearance to that known as a Norfolls latch. See Latch; Norfolk Latch.

THUMBPIECE.
Known also as the purchase, this is often found on jugs or tankards and other drinking vessels that possess a lid, being placed on or near the handle so that the drinker can raise the lid by placing and keeping his thumb thereon. The two main shapes for the purchase were corkscrew and bifurcated. On a tankard of the 17 th century the thumbpicce is sometines a very decorative feature. On one it represents a pierced heart, cmbossed and chased with Howers, foliage and figures. See Silver; Tankard.

THUNBERGIA. This is a pretty climbing plant for a heated greenhouse. The favourite kind is alata, of which there are several varieties with blooms of various colours. These plants are very pretty when grown in wire baskets suspended from the greenhouse roof. They bloom in summer and are raised from seeds sown under glass in spring ; a compost of loam, leaf-mould, sand, and a little decayed manure suits them.

THUNIA. This is a family of hothouse orchids, about $l \mathrm{ft}$. in height, and with white, yellow, or purple flowers in the summer time. They need plenty of heat and sunshine during the growing season, which is from March till October. At this period plenty of water is necessary. During the winter months, $60^{\circ}$ is sufficient. Propagation is effected by division of the pseudo-bulbs when the plants are repotted in early spring. See Orchid.

THUYA. This is the botanical name of a group of evergreen conifers; the common name is Arbor vitae. They are closely related to the cypress or cupressus and some of them are used to form tall hedges in gardens. One of the most striking kinds is the so-called red cedar (Thuya plicata or Lobbii) which grows into a large tree. Thuya dolabrata from Japan, and orientalis from China, are familiar garden trees. There are several ornamental varieties of the Chinese Arbor vitae (orientalis), e.g. aurea, and glauca with golden and grey-blue leaves respectively, and of the American Arbor vitae (occidentalis). These conifers, which should be planted in SeptemberOctober or in April-May, thrive best in deep loamy soil which does not dry out in summer.

THYME. These fragrant-leaved plants are types of goitre, for mental deficiency in young valued both in the kitchen and the flower- children. and in obesity. See Cretinism; garden ; they like light or well-drained soil Exophthalmic Goitre; Goitre and a sunny place. The wild thyme is Thymus serphyllum, 2 in . high, with purplish llowers: this together with its varieties coccineus, which lias rose-red blooms. the lemon thyme


Thyme. A flourishing plant of the fragrant common thyme, much used as a flavouring in cookery
(citriodorus), and the grey, woolly-leaved in an average temperature of 60-65 degrecs. thyme (lanuginosus) are delightful little plants Propagation is by cuttings of young shoots for the rock garden and paved paths. The taken in springtime and inscrted in pots of dried shoots of the lemon thyme are used for sandy soil. The favourite kind is rutilans, scent sachets and for perfuming soaps. The which bears crimson flowers in winter and common thyme of the kitchen garden is Thymus vulgaris.

Uses in Cookery. Thyme is used in cookery for flavouring dishes. For this purpose it may be raised either from sced, division of old plants, or from cuttings. Seed should he sown out of doors in light soil, in early spring, or cuttings may be made a little later on in the season. The shoots shoukl be collected, tied up in bunches, and suspended in a wellventilated room or shed to dry. See Bouquet Garni ; Herb Garden.

THYROID GLAND. The funstions of the thyroid gland, which is situated in the front of the neck just below the Adam's apple, are very important. It has a powerful inlluence on the nutrition of the tissues of the human body, and on the mental and bodily development. The gland is larger in women than in men, and sometimes reaches an enormous size in goitre. The secretion of the gland contains a certain amount of iodine in organic combination.

In some children the thyroid is very small when they are born. or it may waste in the early years of lifc. These children sufler from cretinism. Sometimes in adults the gland wastes until it almost diappears, and in such cases the disease myxoedema is prolluced. Both diseases result from absence or diminution of the lluid secreted by the thyroil. Enlargement of the gland is a common discase.

Thyroid extract, or the powdered dried gland preparcel from the thyroid gland of nowly killed healthy sheep, is used frequently in the treatment of diseasc. It may be employed in cretinism, myxocdema, certain

THYRSACANTHUS. These beautiful hot house flowering shrubs grow from 2 ft . to 3 ft . in height. They thrive in the usual potting mixture of loam, leaf-mould and sand
nasses, suggesting the creamy-white edges of waves: hence the name foam flower. Propagation is by division of the roots in spring.

TIBOUCHINA. Sometimes called the Brazilian spider flower, this is an evergreen Howering shrub suitable for a heated greenhousc. Macrantha, which is the most suitable for anateur cultivation, forms a large bush and bears purple flowers in winter. It should be grown in well-drained pots or tubs lilled with peat, sandy loam, plus a little charcoal and sand, all well mixed together. It may be trained to trellis, pillars, or walls.

TIC. A muscular twitching of museles, usually the muscles of expression, is known as tic. It occurs most commonly in young girls. It is treated by re-education in the control of the muscles affected. Mimic tic is a more serious condition which generally occurs after middle life. It is incurable.

TIC DOULOUREUX. This extremely severe forn of neuralgia sometimes occurs in the branches of the fifth cranial nerve, also known as the trigeminal nerve. This nerve has threc main branches, one supplying sensation to the eyeball and to neighbouring parts, another supplying the region of the upper jaw, and the third the region of the lower jaw. The pain occurs in paroxysms, at first at long intervals perhaps, but later on al most continuously.

Large doses of quinine are sometimes useful, also such drugs as antipyrin and aspirin. But as they have to be used in large doses, all such medication should be at the hands of a loctor. The application of warmth, of clectricity, of cold, or of anodyne liniments or ointments may afford adequate relief in the mildest eases. Cure, however, can only be secured in one way, and that is by operation. See Neuralgia. Pron. Tik-doo-lo-roo.

TICK : On Dogs. This very noxious little insect is sometimes found on dogs, as it is on other animals. In appearance it bears a resemblance, as far as the body is conecrned, to the spider, and varies in size from that of a pin's head to that of a small pea. In colour the smallor ones are light grey, but they become dark when too gorged with blood.

The tick fastens on the skin, and holds on with such tenacity that the attempt to remove it will often lead to the insect breaking into two parts, when a nasty sorc will usually be left on the affected animal. The insect is found occasionally in the cleanest kemnels and on the best kept animals, as a dog may have come into contact with one that is iafested with it. As soon as ever the tick makes its appearance, steps should be taken to get rid of it. The dog should be treated with one of the preparations that are sold for this purpose, and the treatment should also include the kennel, as the pest often finds a lodging in the wood. See Dog.

TICKING. This very strong limen or cotton material has its chief use in the covering of mattresses, because it is so closely woven that the feathers camnot penctrate it. It is usually twilled, and white in colour, with pink, red, or blue stripes. It is also sometimes cinployed for awnings and tents. S'ee Mattress.

TIE BEAM. In louiding work, the tie heam is the very important member of a king post roof truss or a queen post roof truss, which ties the truss together at the fect of the principal ralters and prevents the truss from spreading.

The tie beam is fixed to the fect of the principal ratters uith the aid of long iron bolts and straps, and it is supported in the centre by a gib and cotter. See King Post; Queen Post; Rafter: Roof

TIE DYEING. This is a form of fancy home dyeing by which very beautiful multisoloured effects can be achieved for lampshade silks, scarves, and short curtains. There is no outfit required heyond thread, wax, and a few brushes and dyes.
Jap silk is one of the simplest materials to use, but crêpe-de-Chine and georgette of good quality also yielrl good results. A little piece of silk is pieked up in the middle of the square, circle or strips and tind with thread which has been dipped in wax. The silk is pulled up again and tied $\frac{1}{2}$ in. lower down, repeating this at intervals all over the piece of silk, and tying once only. The material is dipped into lukewarm water, then into a dyc-bath. When the string is removed the strangest patterns will be found on the silk. Match-ends dipped in wax and placed on the matcrial to form stars, squares, etc., give many variations.

Small portions of the material may be accordion pleated, ticd up, and dipped in wax. This will preserve them, and when the rest of the material is dyed they will remain the original colour of the material. Where several colours are used the material can be ticd at intervals, increasing in size while working outward. Wet the silk, then dip each section into a different colour.

When al! the tying is tinished the material is spread on a piece of damp newspaper, and a large brush charged with colour is used to tap the top of each little tied-up piece. The brush should be charged quickly and the wet material splashed all over, using first one colour and then another. Light shades should be employed lirst, as dark ones are very penetriting. A small brush dipped in either black or brown is useful for making thin lines, which give a cohwehby effect. The material should be kept as llat as possible on the paper, and untied as soon as all is coloured When almost dry it should be irened out.

Good quality dyes naturally give the best and most permanent results, those sold for Batik being excellent. Fixing acid, acetic acid, or vinegar must be added before dyeing is commenceil. See Patik: Dyeing.

TIGER FLOWER. This is a brilliantly coloured bulb Hower which needs rather sperial treatment. They should be planted


Tiger Flower. Brilliartly coloured flowes of the Peacock type, suitable for a sunny border

3 in . deep in March in a well-diained border of sandy loam in a sheltered sunny place : it is wise to set the hulbe on sand. In autumn they should be lifted and stored in sand for the winter. If grown in pots the bulbs are potted in autumn or winter, placed in a frostproof frame until top growth appears, and then brought in the greenhouse. Great care
must be taken not to give much water until the bulbs are well rooted.

The peacock tiger iris (Tigridia pavonia) is the favourite kind; there are varieties in gorgeous shades of colour. Conchiflora, yellow and scarlet, is another handsome sort
TIGER LILY. This is one of the best hardy lilies for amatcur gardeners. It reaches a height of about 4 ft ., and hears orange-red llowers in August and September. The bulbs should be planted 5 in. deep in autumn or spring in wel! dug soil with which leaf-mould and sand have been mixed freely: they may be left undisturbed for years. The linest varietics are Fortunei giganteum, and splendens, with flower stems 5-6 ft. high and orange-scarlet Howers. See Lily
TIGER MOTH. This describes the garden moth, whose caterpillars air known as woolly
bears. The caterpillars feed on flowering plants and vegctables. The parent moths may be identified by their red and black bodics, brown and cream forcwings, and hind ones of purple, red, and orange. Destruction of the moths and hand-picking of the caterpillars are the only effectual remedies.
TIGER WARE. This ware was used for a certain type of jug made chicfly in the l6th century, and now much sought by collectors. The ware is a dark, mottled pottery, very hard with a finc glaze, and the jugs are often silver mounted. The style has been much imitated by modern makers. One example, dating from 1559, is mounted with neckband, cover, and foot of silver gilt; the neckband is engraved with foliage and strapwork, and the cover embossed with fluting. The thumbpiece is fruit-shaped.

## Tiles and the Process of Tiling

Protective and Decorative Uses Described and Illustrated
This contribution is conceraed with a number of s ructural and other matters, both in house and garden. on, which there are entries in this work. Such include Bathroom; Bungalow; Cotage; Garage ; House ; Kitchen: Path; Roof; Sink. See also Concrete; Floor ; Mosaic ; Pantile: Rubber, etc.

A tile is a comparatively small and thin piece the section shown, it is moulded so that the of haked clay, made in substantially the same overlapping part fits into a grooved portion way as bricks. Such tiles are extensivcly on the tile beneath it
used for roof coverings, wall surfaces, floors, and other purposes. Glazed earthenware tiles are used where an impervious and cleanly wall covering of a more or less ornamental character is needed, and for fireplaces.
The largest class of tiles consists of those emploved for roof covering. Hand-made rooling tiles are noted for their good colour and surface. As a rule they weather better than the machine-made variety. Machincmade tiles are genera!ly harder and more homogeneous, more uniform in colour and texture, and more regular in shape. They are made by processes similar to those used in making bricks, but the matcrial is more carefully graded.

Much of the charm of the small English home is due to the use of the dark red sand faced tiles. This is especially the case with old tiles, to which time has imparted warm tints often relicved by traces of moss and lichen. Apart, however. from their picturesque appcarance, tiles form an extromely durable roofing material; many houses with tiles over 100 years old are as weatherproof as when they were first roofed.

The colour of British tiles ranges from warm reds, browns, and strawbery colours to tints of bluc, gieen, and grey. Among the earlicst tiles are those known as pantiles, a flat $S$ shape, averaging about 14 in . in length, $9) \mathrm{in}$. in width, and in. thick. Onc colge of the common pantile is turned down rather more sharply than the other, and this edge overlaps the Hatter edge of the neighbouring tile (Fig. 1). The projecting nib which rests against the roof batten is shown in the section bencath.

A development of the pantile has been evolved by different makers. Some of these tiles are of considerable sizc, and are flat for the major portion of their area. Onc edge is sharply upturned, and the other is more or less scmi circular in shape. A rooting tile of the intcrlocking type is illustrated in Fig. 2. As will be secn by

By far the greater number of tiles for roofing are of the so-called flat type (plain tiles) illustrated in Figs. 6 to 12. Of these there are many kinds, varying in colour, density, weight and durability. Choice is largely a question of price and effect. The chcapest are a bright red in colour, and machine made. The average size of the plain tile is 10 in . long, $6 \frac{1}{2} \mathrm{in}$. broad, and about $\frac{1}{4} \mathrm{in}$. thick. On the average, about 650 tiles, weighing $1 \frac{1}{2}$ tons, are needed to cover a square, that is, 100 sq . ft. of roof area.

Plain tiles are made in three widths, known as half-tile, tile, and tile-and-a-half tile. The two latter are used as end tiles in alternate courses, so as to break the joints, that is to say, so that there should not be a continuous series of vertical joints in the roof covering. In some cases, half-tiles cannot be fixed satisfactorily, and it is customary to use a tile-and-a-half tilc, which has the same effect in breaking the run of the joints. The plain tile is rectangular, and there are fancy or shaped varieties for decorative purposes. such as a few courses of bandings or fancy patterns introduced as a varicty in a large roof arca. Similar tiles employed for covering walls are known as hanging tiles.

The ordinary plain tile is not perfectly flat. but is curved in the direction of its length and across the breadth. Consequently, the upper surface is slightly dome-shaped, which ensures the water draining off the surface. For fixing purposes, tiles are made with small projecting nibs on the top end edge ; and two small


Fig. 1


Fig. 2
Tile. Fig. 1. Pantiles as laid on battens; beiow, section of a pantile showing nib which catches on batten. . 2. Interl three tiles
holes through the tile near the top edge for ordinary tiles are laid continuously, in the long. Some mortar must be in readiness, and nailing if required. To support the tiles, manner shown at Fig. 6;, or the valley may be horizontal battens are nailed at regular constructed with valley tiles, one being intervals to the roof rafters. In preparing allowed for each course. Alternatively, lead an estimate for tiles for roofing purposes, it is or other guttering may be provided for the necessary to ascertain the area in terms of purpose. Having ascertained the quantity of squares of 100 ft. superficial. The first thing required is to ascertain the approximate number of tiles that wi! cover a squarc. Allowance must be

tiles neerled, thi should be turned into round figures and cstimates obtained for them to be delivered on the site. In comparing prices, it is as well to have samples of the tiles, so as to judge their quality, fexture, and colour. When the
choice has been made and the tilesare received, they should be unloarled
Tile. Fig. 3. Common ridge. Fig. 4. Serrated ridge. Fig. 5. Decorated Serrated ridge tile
ridge

$$
\text { and stacked on } \Omega
$$ conveniently near to the sccne of operations.

The lirst step in the actual laying of the i.iles is to have the roof prepared for their reception. They can be laid directly on to the battens, or the roof may be covered with rough boarding with tarrod felt over it, and hattens upon which to set the tiles. The battens must be perfectly horizontal and laid at the proper distance or gauge from each other. The meaning of the expressions lap and gauge, as applied to plain roofing tiles, is made clear by the diagram, Fig. 7. From this it will be seen that the gange is the distance lictween the top edges of two hattens and the lap is the amount by which one tile overlaps the tile on a course next but one below it.

For completc protection, it is necessary that at any given point there should be three tiles. The ronf remains weathertight not because the surface is sloping, but because the tiles overlap each other. Owing to the triple lap. any water that penetrates the outer layer of tiles will le deflected by the lower layers.

Ordinary tiling is commenced at the caves, and preferably at the right-hand end or verge. A scaffolding is required, and it should be placed so that the worker stands about 2 ft .6 in . from the caves line. The first step is to lay the eaves course, made of special tiles, which are about threc quarters of the length of the ordinary tiles. These are inclined at $n$ differeni angle to the rest of the roof, rather Hatter than the remaining courses so as to tilt up the lowest course, this tending to make the roof drier. A fow are laid as a start.
The next step is to commence laying the first course whose lower edges coincide with those of the eaves course (Fig. 8). These are rested with their nibs on the upper cdge of the batten, and the first few tiles may be further secured by means of galvanized iron nails, about $1 \frac{1}{2} \mathrm{in}$.
should be sprearl over the tops of the eaves tiles before fixing the first course, so that the latter is bediled in mortar.

After the first fow liles of the first course have been laid, a tile-and-a-half tile is set on the second course, commencing from the verge as before, and bedded in mortar. The tile is gently tapped down so that it rests firmly on the tile heneath it, by lightly tapping upon it with the end of the trowel handle, as in Fig. 8. Several more ordinary tiles are then laid on the second course, but thesc will not need to be bedded in mortar. The third course is commenced, the first tile being bedded in mortar and the edges brought up level with those beneath it. The next course is then continued, and the worl: goes forward, gradually working along and up the roof until the ridge is reached.

To save labour and the time of constantly clambering on and off the roof, an assistant can stack the tiles by resting them between the battens with others at right angles to them, as shown in Fig. 9. Thus the tiler is supplied constantly with tiles, conveniently placed

It is desirable in exposed positions to nail about every fourth course by driving $1 \frac{1}{2}$ in-


Tile. Fig. 8. Setting the tile-and-a-balf tile for the start of the second course
galvanized iron nails through the lioles in the tiles. It is not necessary to nail every tile except in very exposed districts. If half tiles are used instead of a tile-and-a-half tile, they are set in place in exactly the same way. Should there not be enough of these, ordinary plain tiles can be cut in half by scoring a line along the centre and cutting them with a sharp blow from the edge of the trowel, cutting downwarl rather than across the tile.

The appearance of the verge or end of the roof when it is completed is shown in Fig. 10, which also indicates a simple method of finishing the tiles around a chimney stack with strong cement mortar applied round the sides of the stack and on top of the tiles. This is not necessary when tlashings are fitted, as thesc come on the tops of the tiles and keep out the wet.
The ridge tiles are set on the apex of the roof and are merely bedded in strong cement mortar. Hip and valley tiles are worked where requisite at the junctures between roofs which meet at an angle. In another method a valley gutter is often formed with lead set upon valley boards, and the tile courses terminated with the tiles cut diagonally. A detail of this class of work is illustrated in Fig. 11. To support the tiles where they overlap the gutter a continuous batten or ridging is necessary to raise them above the surface of the gutter. Usually, however, the vallcys should be worked
with the proper valley tiles which course and hond with the plain tiling, or the tiles may be swept and laced, as illustrated in Fig. 6. A valley board about 9 in . wide is laid up the valley, and the tile courses are continued from the two intersecting slopes of the roof, so that each tile on the main part of the roof overlaps a tile on the subsidiary part. Alternatively, the courses from cach slope may be taken over and under in alternate courses. The last tile of every course, of which only the corner will show, is preferably a tile-and-a-half tile. Tiles can only be laid in this way when one roof is subsidiary to the other, otherwise the ridge line will be broken.
At the verges, the finishing may be by close tiling, that is, the tiles project only from 2 in . to 3 in . bevond the gable wall, and are given a slight inward tilt to throw water away from the edge. Alternatively. a projecting varge and a bargeboard ean be adopted, the cnds of the tile courses being pointed with strong cement mortar.
Tile Hung Walls. Vertical tile hanging is a method of covering the surfaces of walls in exposed positions, and it forms an excellent protection. The method is shown in Fig. 12. The groundwork is often composed of horizontal battens of wood nailed to the brickwork The objection to such a plan is that the timber is liable to rot and decay, but it is often the only practical plan. The tiles are hung on straw. These are beaten down comparatively


Tile. Fig. 9. Showing bow to stack tiles on rafters ready for use. Fig. 10. Verge with tiles in place and cement fillet around chimney stack. Fig. 11. Tiles cat to form simple valley gutter. Fig. 12. Showing bow lowest courses of tiles on a tile-hung wall should be tilted
hollows and grooves are overlapped, the gauge being about $4 \frac{1}{2}$ in.
Doubling courses of tiles are used under the roof eaves, and also on the lower courses, and above any openings. The tiles are given a considerable local upward tilt, as in Fig. 12 to throw the drops of water clear of the window. sill or opening beneath it. Fig. 13 depiets a small cottage tile-hung with dark red, sand. faced tiles of ornamental pattern. A method known as Winchester underhang is illustrated on page 1077.
Ordinary plain tile roofs should have a pitch of about $45^{\circ}$ to $47 \stackrel{1}{2}^{\circ}$, and be rather stceper in exposed positions. Apart from the tiles already mentioncd, there are others specially shaped and adapted for particular purposes. Glass tiles arc built into a roof to help to light the intcrior, and there are various fancy shaped and special purpose tiles. The repair of tiled roofs usually consists of raising the tiles in the vicinity of those which are damaged, pushing them upward and lifting them over the battens, replacing them in a similar manner with new tiles. In all such roof repairs, the use of a proper roof hoard or some adequate method of protecting the tiles from breakage is of paramount importance, otherwise more damage is likely to be caused. One plan is to rest a light ladder upon two large sacks filled with nibs and each is acparatcly nailed. The flat before they are rested on the roof, and


Fig. 13. Atlractive effect of a cottage tule-nung with dark red sand-faced tiles of an ornamental pattern
act as a soft pad between ladder and the tiles. The amatcur should attempt only the simplest replacements (c.g. to a low roof, such as that of an outbuilding). The builder uses a special "duck" ladder, which is securely fastened at top and bottom. Apart from the likelihood of the amateur damaging the sound part of the roof, there is considerable personal risk in work carricd out on a bigh roof.

Decorative Tiles. With the advance of hygienic wisdom in the home glazed tiling for kitchen, scullery and larder is bocoming more general. Though other suitable mural coverings are somewhat less expensive tiles are worth the extra cost where durability, elcanliness and labour-saving are the first considerations; also they do not depreciate in wear. The advantages of tiles in the bathroom are obvious and the scheme is sometimes completed by a tiled floor. Where paint is used for the walls, inset tiles form an excellent splash back for the bath and lavatory basin.

British glazed tiles are uncxcelled in qua!ity, colour and designs. Fine decorative mural tiles are made of glass as well as of clay. The glass has a matt surface, is semi-opaque and can be obtained cither stained in plain colours or painted with pictorial designs. Use is mado of these for inset borders and wall panels.

The depth of the glaze of carthenware tiles varics with the style of the design. In some cases this is in relief, in others it is painted, while a third class of tile depends for beauty only on its fine monochrome glaze. In choosing tiles for a hearth and fireplace, should a pictorial pattern be required, only good designs should be considered, as cheap ones are unpleasant to live with and plain tiles of barmonious colouring are preferable.

These tiles are generally small and square, varying from 3 to 6 in . in size. They are laid in a similar manner to llooring tiles on a concrete hed with plaster or mortar. Generally when a tiled fireplace is purchased a hearth is laid to match, and tiled curbs are obtainable.

Simple Tiled Work. If it is only desired to half-tile a wall, the joint between tiles and plaster wall face is made with a simple wooden moulding. A tiled sink back is invaluable in the kitchen of a sinall flat. Tiles of a suit. able character can be obtained from the better-class iroumongers and may be set in place against the wall with a good breking of plaster. especially when the tiles will fit
under a window ledge. A proper key must be provided to the brichwork of the wall, as describerl in the articles on Cement and Rendering. To avoid the difliculty of cutting the tiles to the slope of the draining hoard, the latter can be reinoved, cut back a little, and refised. The joint between the sink top and the tiles is preferably made with strong l'ort land cement mortar. The tiling of large arras is hardly a job for the home worker, and the services of an experieneed workman should be obtained for this.
Tile Paper. This term is used to deacribe wallpaper the surface of which is printed to represent tiling. See Wallpaper.
TILLANDSIA. These are hothouse erergreen plants with large, strap-shaped, green or coloured leares and coloured bracts. They flourish in pots in n well-drained compost of loam, with which sand and brokun brick are mixed, and are propagated by detaching and potting the suckers or offshoots in spring. Lindeni and splendens are two of the best sorts

## TIMBALE: In Cookery. Rich and

 saroury mixtures of meat or fish, such as scallops of chicken, small birds, game, !ohster or oysters may be served in the ornamental case known as a timhale. The case may be composed of macaroni, spaghetti, or even of aspic, but the slape is invariably round and it is usual!y cooked in a special mould.For a macaroni casc the large variety should be used. This must be boiled with stock and then cut into $\frac{1}{2}$ in. lengtles. A plain, buttered, round mould with a rounded top should be used, and the pieces of macaroni so arranged that they line the whole inside of the mould standing on end. Over these a layer of forcemeat is placed, and the surface of this is smoothed with a knife dipped in hot water The forcemeat is necessary to prevent the portions of macaroni from sljpping. The mould is then filled up with a savoury mixture and steamed.

Any mixture of cold meat, game or poultry is suitable for filling the timbalc. The proportions are as follows : $\frac{3}{4} \mathrm{lh}$. cold coolied meat, chopped small, 2 oz. white beadcrumbs, 1 oz butter or dripping, 2 egges, 1 dessertspoonful chopped onion, half teacupful stock, 2 teaspoonfuls chopped parsley, $\frac{1}{2}$ pint brown sauce, salt and pepper.

Melt thic butter in a saucepion, add the onion, and fry lightly, then remove it and mix with the meat, crumbs, and parsley Beat the eggs, arld the stock, stir into the rest of the ingredients, season well, and be sure that all the ingredients are mixed smoothly and evenly. Put the mixture, a little at a time, carcfully into the lined mould, and press in gently but firmly. Twist a piece of greased paper over the top, and steam the timibale for half an hour.

Take off the paper, and turn out the 1 imbale carefully on to a hot dish, and strain the hot brown sauce around it.

Beef Timbales. Timbales made from spaghetti and cooked bcef can be prepared thus Brak 2 oz. spaghetti into small pieces, wash it, and then cook it in a pan of boiling water until it is tender. Grease some sınall, plain moulds, and line the sides and hottoms with some of the strained spaghetti, pressing it well to make it adherc. Then fry a peclerl and chopped onion and a chopped mushroom in 2 oz. dripping. Mince 6 oz . cooked beef previously freed from skin and bone, and add to it 3 tablespoonfuls breadcrumbs, 1 teaspoonful chopped parsley, the cooked onion and mushroom. Mix well, add salt and pepper to taste, ahout $\frac{1}{2}$ gill brown gravy, and a beaten egg. Put the mixture into the prepared moulds, cover it with the remaincler of the spaghetti and tie a greased paper over each. Steam the timbales for about 30 min . and, when they are almost cookerl, fry 4 tableapoonfuls freshly cooked or bottled runner
beans in 2 oz . butter. Turn out the timbalcs carcfully on to a hot dish, pour a gill of hot brown gravy round them, and use the beans as a garnish.

Fish Timbales.
These are usually made with an aspic casc. Turbot, halibut, or any firm white fish may be used. Salmon also is good in a timbalc. To make, pound some of the cold cooked fish with enough stiffened white sauce to moisten it, adding seasoning to taste: then line the inside of a large timbale mould with some melted aspic jelly. When it has set, mask it with the pounded fish and fill up the centre with some flaked fish, also moistened with white sauce to which has been added some cream and a little piquant flavouring. Put a layer of the pounded tish on top, and İeave the whole to set. When quite firm, turn it out of the mould on to a dish and garnish it with chopped jelly and salad.

TIMBER. The trunk and larger limbs of trees are usually known as timber after they have been felled and stripped of the outer covering of bark. Timber trees are those which can be used for general building or wood working purposes, and they are classilied into two groups, conifers and broad-leaf trees. Examples of the former class are northern pinc, producing yellow deal; Pinus strobus, producing yellow pinc; Larix europaca or larch : and Pinus rigida or pitch pine. Of the latter class, oak, ash, lime, and sycamore are examples. There is also a sub-division into hard and soft woorls.
Timber trees which have reached maturity are felled during the autumn and winter, when the sap is more or less dormant. The timber has then to be seasoned, during which process it shrinks and drics; it is then converted to suitable sizes, and further seasoned prior to use. The newly felled trec is called a log; when trimmed it is known as a ba!k. When sawn, the various sizes are known as deal, plank, board, batten, scantling, and quartering. See Beech; Deal; Grain: Mahogany; Oak; Wood, etc.
TIMING: For Engine Speed.
power which is developed by any type o internal combustion engine will depend entirely upon the correct timing of the ralves and the ignition, assuming that the compression, carburation, and sparking plugs are in order.
To deal first with the valves, there are four phases in the cycle of their opcration, namely, induction, compression, explosion or power stroke, and exhaust. Not less than two valves per cylinder are required, one controlling the inlet of the fresh gases, the other the exit of the burnt gases: these are known respectively as inlet and exhaust valves. They are timed througl the medium of the camshaft to open and closc at the correct moment of piston position.
The greater the speed of the engine the earlier must the inlet valse open, and re. main at its full open position until the piston has just. started on the up stroke. The object of this is to give the gases the maximum of time in which to enter the eylinder. Owing to the continuity of direction or flow of the gases, the fact that the crankshaft has just passed the bottom dead centre and is about to start the piston on the up stroke is not felt by the gases until well


Tining. Fig. 1. Showing diagrammatically some examples of chain driven timing gears
after the inlet ralve has closed, thus allowing the compression stroke to take place.

Meantime the exhaust valre is closel, and it remains closed until the piston has descended to within approximately $\frac{1}{A}$ in. from the bottom of the power stroke at which point it opens, and does not again close until just before the top of the stroke is reached. This period is termed the exhaust stroke. Immediately the exhaust valve closes, the inlet valve opens. Sometimes the timing of the valves overlaps, i.e. the inlet valve opens just before the exhaust valve closes. Especially is this the case with the high-speed engine.

A timing diagram is given on page 812, and should be read as showing average timing only In all cases the timing diagram issucd by the makers of the engine should be strictly adhered to. Timing gears being positivels driven and contained within the crankcase are protected from any chance of derangement other than a fracture of the parts involved.

Before dismantling a timing gear the setting should always be noted careful!y In most cases marks will be found at the root of a tooth of one wheel that clenote its position in relation to corresponding marks on the wheel with which it is in engagement. These marks should be brought together and a reference made of piston position, i.e. make absolutely certain whether the timing is marked for the commencement of the inlet stroke or the exhaust stroks, as makers are not all in agrecment on this point.

Accuracy in re-asssmbling is essential if untoward consequences due to back-firing are to be avoided. If the amateur is not confident of his ability to re-time correctly he will be well advised to employ expert help.
With multi-cylinder engines the periphery of the flywheel is sonctimes marked to show the top and bottom dead centre of the crankhaft, with adiacent marks reading inlet and exhaust, to show the point at which the respective valves open.

Timing Gear. All timing gears for fourstroke engines lave a two to one reduction, i.e. the crankshaft makes two complete revolutions to one revolution of the camshaft the ormer drives. The two types of timing gear in common use are the spur cog-wheel drive and the silent chain drive. The silent chain drive may be carricd out in three ways as shown in Fig. 1. The simplest arrangement is that depictel at $C$, one chain embracing the three sprocket wheels; by varying the position of the magncto sprocket, which is fitted on a separate bracket, the whole of the gear is adjusted.

The arrangement shown at A employs two chains. The magneto chain can be adjusted by the means described for C , but it is only possible to keep the camshaft chain at a uniform tension by fitting a spring-fed jockey sprocket wheel, as shown. In most cases where two separate chains are employed, the arrange-
ment is as shown at B, with the chain adjusiment the same as at A.
The gear-whicel clesign of timing gear as commonly employed for multi-cylinder car engines is shown at A (Fig. 2). With a view to sitence in operation, skerp or helical gears are frequently used, and very olten the large whicel which drives the camshaft is formed of vulcanized fibre, supported on both sides by a disk of phosphor bronze. The timing
gear for the overhead valve is often identical in principle with long tappet rods, but fitted to connect from the cams to the ovcriead rocker arms. An alternative arrangement is the positioning of the camshaft as a part of the detachable head, i.e. the detachable head. valves, rocker arms, and camshaft form a complete unit. With this arrangement the drive to the camshaft is either by silent chain or some form of toothed wheel drive, transmitted to the canshaft by means of it vertical shaft that in turn is driven off the crankshaft. Since the timing gear is disturbed each time the cylinder head is removed in the process of decarbonizing the engine, careful note should be made of the timing marks on the wheels.

Sometimes the camshaft is connected to the drive of the vertical shaft by means of a disk coupling that is provided with a location stud, thus ensuring the correct timing of the vaives when reassembling the unit. With this design the removal of the detachable head in no way interferes with the timing gear.

Timing the Spark. Of equal importance is the timing of the ignition, whether it be by magneto or by the coil and distributor method. The two systems in common use are known as the fixed and the variable. With the former the spark should be set to occur just before the piston reaches the top of its stroke. J3y this arrangement the crankshaft has crossed the top dead centre before the full force of the explosion is felt. No definite rule can be laid down for this setting, because the actual amount of lead given will vary with different types of engine. On an average the platinum points of the contact-breaker should be set to part just when the piston is still within approximately $\frac{1}{\frac{1}{3}} \mathrm{in}$. from the top of the compression stroke. With variable ignition the platinum points should separate at the top of the stroke, with the control lever for the ignition at the full-retard position. By so doing, on advancing the control lever the spark occurs earlier.
The time taken by the gases to reach a state of complete combustion is always the same. Therefore, at high engins speeds the spark must occur proportionately earlier, so as to assure complete combustion by the time the piston is starting to travel downward on the power stroke. As engine speed decreases the spark must be retarded, otherwise a pronounced knock will be manifest.

Although with coil and distributor ignition the same end is attained, the method of control is entirely different. The usual procedure is to rotate the distributor about the wipe contact, thus causing the wipe to make contact with the segments of the distributor either early or late in relation to the positions of the piston. See Magneto; Tappet; Valve.
TIN: The Metal. A white, soft, and malleable inetal, tin is not used to any extent by itself. Owing to its softness and ductility it is easily worked, and articles made from it can le finished with a brilliant polish, but the surface is easily scratched and bruised. It is considerably used as an nlloy, and it readily combines with copper, antimony, bismuth, zinc, and lead. Tinman's solder is composed generally of equal parts of tin and lead. When hardened with a small amount of


Timing. Fig. 2. Diagrammatic examples of cog-wheel

copper, tin forms the best pewter, and although it is often combined with lead for the same purpose, the result is not satisfactory. Bronze is formed with a larger proportion of copper than that used in pewter T'in is employed for conting iron and copper vessels used for cooking pur poses, in the latter case to prevent the poison from the copper getting into the food.

The most con. siderable use to which tin is put is in forming a protective covering for thin sheet iron which is comnionly known as tin, but correctly described as tinplate. It is also used on iron wire and small articles made of iron. So long as the protective coating remains intact the iron is prevented from rusting. See Tinplate.

TIN LIFTER. A kitchen utensil used to take hot tins and dishes from the oven, a tin lifter somewhat resembles a pair of pliers in appearance, and has the same gripping action. If kept in a convenient place near the stove, it does away with the necessity of an oven cloth, and protects the hands from minor burns.

TINNED FOOD. Tinned or canned foods, if they are properly handled and stored, will keep longer and better than any other class of preserved food; in fact, certain goods, such as salmon and sardines, improve with kecping. Some classes of foods, however, should only be kept about a year; these are fruits canned with the stones, such as cherries and plums, and all classes of fruits and vegetables which contain acid in fairly large proportion, such as apples, pineapples, tomatoes and asparagus.

Tinned shellfish is liable to discoloration by reason of the large proportion of natural phosphate contained in it. To overcome this difficulty, such fish as lobsters, crabs, crayfish, prawns, etc., are now wrapped in heavy vegetable parchment paper, and as a result can be kept much longer than formerly.
Glass containers are also used for preserving foods, and much thought and care has been exereised in producing caps which will form a reliable airtight seal. The practical advantages attached to cans are that they arc casier to handle in the factory, are less fragile, weigh less and are more cconomical as regards transport costs.

Improved Containers. Onc of the greatest improvements in the canning industry of recent years is the introduction of a tin commonly called the sanitary tin. In this the use of solder is entircly eliminated, thus doing away with the danger from the acid of fruits acting upon it. The side seams are locked and lapped, while the ends are stamped out of tin plate and edged with rubber solution. The bottom is attached by means of a double seam, and the same process is gone through after the can is filled. Further improvement in canning has been attained through lacquering the inside of the tin to kecp the contents a natural colour, for such products as fruit, crab, lobster, etc.

Examining Food. The public are protected by the examination of all imported canned goods at the port of entry. The inspectors, acting under the local authority, examine each consignment. As it is impossible to open every case and examine each can, they
take a percentage of the consignment, which is usually about 10 per cent, and carefully inspect these. If it is found that only a small perosntage of cans are "blown," or otherwise unfit for food, the cargo is passed. Should the percentage of doubtful tins prove large the whole consignment is thoroughly examincd. Further examination of tins is periodically undertaken at the shops.
In case some cscape the vigilance of the food inspectors the following may prove helpful. "Blown cans" and "swells" are tins in which certain organismis have not been killed; they develop in the food and form a gas, which causes the ends of the tin to swell out, or become convex. Such tins, when tapped with the fingers or something hard, give off a "drummy" sound instead of the clear resonant note of a perfect can. These should not be used, as in all probability the food is unfit for human consumption. In all cloubtful cases, if the tin has only just been bought, either return it to the retailer, or submit it to the local food inspector, or medlical officer of health, for his opinion. See National Mark; Sardine, etc.
TIN OPENER. A strong and really adequate tin opener should be included in cvery kitchen outfit. The commonest type has a sharp blade for cutting, with a projecting spike bencath. The latter is used to knock a hole in the side of the tin. The blade is then inserted, and the cutting done all round the edge of the tin. The tin opener must be kept clean and free from rust.
Sardine tins are usually supplied with a key opener, which, when turned, rolls back the top of the tin. These are often unpractical and resort has to be made to the ordinary opener. In opening tins, care should be taken to see that the cutter does not slip, for cuts caused by the jagged edge of a tin often result in blood poisoning.

TINPLATE : How it is Worked. Tinplate is a shect of iron or steel coated with tin on cither side. It is commonly made in two qualities or varieties, known as charcoal and coke brands. These names originated when tinplate was made from charcoal iron for the better quality plate and coke iron for the inferior grades. The distinguishing names are retained, but now represent the depth and finish of the tin coating.

Coke plates are largely used for can construction. For conimercial tinplate a common proportion of pure tin to the sq . ft . of plate is $\cdot 023$ or $\cdot 024 \mathrm{lb}$. Tinplates are made in sizes measuring 10 in . by 14 in ., and also in multiples of these sizes for larger work. The sizes most commonly used measure 20 in . by 18 in . and 20 in . by 14 in

The thickness of tinplate varies to standard commercial sizes, mensured in Stubbs' wire gauge. The thinner gauge plates are known by the table of weights and gauges berewith :

| Designation | Gauge | Weight per <br> sq. i. |
| :---: | :---: | :---: |
| 56 lb. | 38 | 0.257 |
| 7.5 | 34 | 0.345 |
| 100 | 30 | 0.459 |
| 130 | 36 | 0.803 |

Tinplate is often called block tin or simply tin, but these appellations are erroneous. Tinplate in which a certain amount of lead is added is known as terneplate, and consists of soft sheet steel plates coatcd with a tin-lead alloy, of which a common alloy is made with $\frac{1}{3}$ pure tin to $\frac{2}{3}$ lead. This form of tinplate has considerable rust-resisting properties, and is used in roofing work. For this reason it is also known as roofing plate. Terneplate is manufactured in the same sizes as tinplate

Tinplate lends itself to the construction of many articles to be found in the household.

a large tinplate box. Tinplate is useful for repairing utensils, as for example in mending a leaking kettle. watering-can, etc. When an acid tlux is used all traces should be washed away or the surface will be corroded. A domestic utensil should be boiled out, or washed out with boiling water and well rinsed beforc using. See Soldering.
TIPSY CAKE. This wine flavoured cake can be made with a tower shaped sponge cako which should be at least 24 hours old. Cut the cake into thick horizontal slices and spread these with apricot jam. Return them to the


A sharp pair of tinman's snips should be used for the amateur is to for cutting the plate, and the amateur may find it an advantage to wear an old pair of gloves, as it is very easy to cut the hands on the rough and aharp edges of the material. In cutting tinplate, care should be taken to keep the tin free from scratches or buckles.
How to Bend Tinplate. In order to bend it, the tinplate is smoothed round cylindrical former where a uniform curved surface is required. Care must be taken to avoid too sharp a bend in one particular place. The whole length of the shcet should be held, and the bending process not localised to one edge of the shect. In bending the shect into a curved surface the most difficult part will be found to be the ends of the material. The commencing end should first be bent to the required radius, then the main body of the sheet.
The operation of bending a sliect of tinplate to a cylindrical shape is shown in Fig. 1 Where an article of conicul shape is required, a correspondingly tapered former should be uscd the tinplate being first marked out to the correct shape. The risk of wasting the material by incorrect cutting may be obviated by marking and cutting a shect of atiff brown paper to the size required. If this is found to be correct, the paper may be pasted on the tinplate or the tinplate marked off from the paper. Before cutting, allowance must be made for the seam or method of joining. Where a soldered joint is to be made on!y a slight overlap will be required ; it is known as a simple lap scam.

Further strength is iniparted to the joint hy means of the grooved scam. This is illustrated in construction in Fig. 2, where the edges are turned up on opposite sides of the tinplate to form a hook when the ends are brought together. After the ends of the cylinder have been folded together the scam is hammered flat by inserting a bar to the inside of the tube, on to which the seam rests during the hammering process. In allowing for the sean in marking out, three times the width of the single turned-over edge should be allowed. If the joint is to be watertight the seam must also be soldered. An easy method of turning over an cdge or lip is illustrated in Fig. 3. where a straight strip of metal is held against the bend while the lip is hammered flat to the top of the strip.
Where it is required to fit a bottom to a cylindrical object in tinplate several methods of fitting are utilized. Probably the most simple
for the amateur is to
cut a disk of tinplate fitting exactly inside the bottom of the cylinder or contsiner. When in position, the work is turned upside down and the bottom soldered in place. Further to securc the bottom a ring of brass or similar wire is fitted to the inside of it and soldered in position.

Where the cdge of a tinplate article is left exposed, it can be bent must be allowed for the wiring of an edge.

Tinplate articles can be purchased so cheaply that it is not worth while to make such things as a kettle, or coffee-pot, which are seamed by machinery and shaped in a press. However, little toys call often be made up from odd pieces of plate or even from material got from
round a wire to form a smooth and neat original shape of the cake and place it in a glass clging, as in Fig. 4. This can only be accom- dish. Half a bottlc of sherry is usually pourcd plished successfully when the sheet is in a flat over it, but the quantity varies according to state, and it should be done in an carly stage. the size of the cake. Baste it at intervals with As in the case of a lapped seam, extra metal the wine which runs from it, and when quite


Tinplate working. Fig. 1. Bending to a cylindrical shape. Fig. 2. Closing a seamed joint, which is made by turning up the edges on opposite sides Fig. 3. Turning over a straight lip. Fig. 4. Forming a neat edge to a sheet of tin by working it round a wire dish. Half a bottlc of sherry is usually poured
over it, but the quantity varies according to soft stick all over the surface splinters of sweet almonds which have been blanched and dried, without colouring, in the oven. Pour over all a cold, thick rich custard and decorate the lase of the cake with littlc heaps of stifflywhipped cream, glace cherries and angelica. See Blanching ; Trifle.

## Tires: Their Use, Care and Repair

## How Motorists May Avoid Expense and Danger

Too often the car owner is content to see that his tires are not visibly slack. If he will follow the hints and suggestions given here he will find that a minimum amount of regular attention will sceure him from any serious tire trouble. Sec also Bicyele; Motor Car; Perambulator:

Puncture
The wheels of all vehicles have special outer the modern pneumatic tire consisting essentiwearing surfaces or tires, whether they are ally of an elastic rubber tube containing comthe flanged steel tires of railway vehicles, the pressed air, and a protective outer cover or steel tires of horse-drawn velicles, solid rubber casing of flexible rubber rendered practically tires, or the pneunatic tires used on bicycles, unstretchable by cotton reinforcement cm motor cycles, and motor vehicles. Only the pneumatic tire need here be considered in detail.

The high comforte drivig speals of modern modern motor vehicles would hardly be efforts between the wheel and the road. It possible without pneumatic tires, which will fail to achieve these objects unless inflated cushion the innumerable minor inequalities to the proper pressure. When so inllated the of the roads and co-operate with the ordinary suspension springs and with the upholstery springs to reduce the effect on the passengers of the more serious road defects.
The original cycle tire invented by Dunlop consisted of an endless inflated rubber tube fitted in the wheel rim. From this has evolved
bedded in the rubber.

In a pneumatic tire compressed air is utilized to support the weight of the vehicie, to absorb air forces the cover outwards with a uniform pressure of so many pounds per square inch, and the part in contact with the road is flattened until the total pressure exerted by the air from the insicle of this flattened area equals the load carried by the tirc. The higher the pressure the smaller is this flattened area.


Tire. Fis. 1. Rim for beaded tire. Fig. 2. Straight side rim with flat base split trausversely. Fig. 3. Straight side rim with flat base and detachable flange. Fig. 4. Well base rim for straight side tire

All tires are either of the beaded edge type of coarse woven fabric, with the strands or the wired (straight sided) typc. Practically all modern cars, motor cycles, cycles, or aeroplanes are fitted with tires of the second type. Very large numbers of beaded tires are still in use, but this type of tire is rapidly becoming obsolete.
The beaded tire is fitted on a special rim having inturned edges or clinches, as shown in Fig. 1. Each edge of the tire is made with a hook or bead which engages under the clinch and has a core of hard ruhber. The bead can only be placed in position by stretching it over the clinch, but is nevertheless too elastic to remain on the rim except with the aid of the internal pressure, which forces it into the clinches of the rim and thus holds it firmly in position. If the pressure is seriously reduced the beaded tire, unlike the wired tire, is liable to be forced off the rim by lateral pressures when the vehicle is swerving or cornering.
The straight-sided tire, on the other hand, has no beads. The edges are reinforced by several strands of steel wire which render them practically inextensible, and the rim is also of entirely different design. Three forms of rim suitable for straight sided tires are in use, namely: The llat hase, split transversely (Fig. 2); the flat hase with one fixed and one detachable flange (Fig. 3); the well base (Fig. 4). The first type has rarely been used on British cars, since the rion is necessarily detachahle from the wheel, but it has found much wider application in America.

In the second type of rim the detachable flange is sprung into a groove on one side. The flange can bc detached by using a lever, and the tire may then be removed sideways without much difficulty. This form of rim is largely used with heavy commercial tires of the type frequently described as giant pneumatics.

The well type rim is widely used on cycles and motor vehicles. It possesses the advantage of simplicity and lightness coupled with ease of removal and replacement.

The internal air pressure in the tube puts the cover into considerable tension. To render the rubber cover practically inextensible without seriously impairing its flexibility a cotton reinforcement is used. At one time the reinforcement consisted of a number of layers

running one way, known as the warp, crossing over and under the strands running the other way, and known as the weft. When subjected to tension the

AXLE WEIGH'TS (cwt.) AND RECOMMENDED INFLATION PRESSURES (lb. per s(l. in.)
PALLOON TIRES-WIRED TYPE

| Carrying Camcity per Axle. | $\left\lvert\, \begin{gathered} 6 \frac{1}{2} \\ \text { cwt. } \end{gathered}\right.$ | $\left\lvert\, \begin{gathered} 88 \\ \text { cwt. } \end{gathered}\right.$ | $\left\lvert\, \begin{gathered} 10 \\ \text { cwt. } \end{gathered}\right.$ | $\begin{gathered} 12 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 14 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 16 \\ \text { covt. } \\ \hline \end{gathered}$ | $\begin{array}{\|c\|} 18 \\ \text { cwt. } \\ \hline \end{array}$ | $\begin{gathered} 20 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 24 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 26 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 30 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 34 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 38 \\ \text { cwt. } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Tire Section |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3.50 inches | 22 | 26 |  | . | $\cdots$ | $\cdots$ | $\cdots$ | $\cdots$ | $\cdots$ | $\cdots$ | $\cdots$ |  |  |
| 4.00 4.40 | $\cdots$ | $\stackrel{24}{24}$ | 27 | 30 | $3 \cdot 1$ | $\cdots$ | $\cdots$ | $\because$ | $\because$ | $\because$ | $\because$ |  |  |
| 4.50 ", | $\cdots$ | $\cdots$ | 25 | 29 | 33 | $3 i$ | $\because$ | $\because$ | $\cdots$ | $\cdots$ |  |  | $\because$ |
| 4.75 " | $\ldots$ | . | 23 | 27 | 31 | 35 |  | $\ldots$ | $\therefore$ | $\because$ | $\because$ |  |  |
| $5 \cdot 00$ " | $\cdots$ | . | $\cdots$ | 25 | 29 | 33 | 37 | $\cdots$ | $\cdots$ | $\because$ | $\therefore$ | $\because$ | $\because$ |
| $5 \cdot 25$ $5 \cdot 50$ | $\cdots$ | $\because$ | $\cdots$ | $\cdots$ | 25 | ${ }_{26}^{29}$ | 33 | 37 | .. | $\because$ | $\cdots$ | $\because$ | $\cdots$ |
| Ci.00 ", | $\because$ | $\cdots$ | $\because$ | $\because$ | $\cdots$ | 26 | 28 | 34 31 | 38 |  | \% | \% |  |
| 6.50 |  | $\because$ | $\because$ | $\cdots$ | $\because$ | $\because$ | 25 | 28 | 38 | 8 |  |  |  |
| 6.50-23゙ inclues | $\because$ | $\because$ | $\because$ | $\cdots$ | $\because$ |  | 2 | 31 | 35 | 36 | 410 |  |  |
| 7.00 inches 7.30 7 | $\because$ | $\cdots$ | $\because$ | $\because$ | $\because$ |  | $\because$ | $\cdots$ | 30 20 | ${ }_{29}^{33}$ | 38 | 43 |  |
| - $7 \cdot 50$ | $\because$ | $\because$ | $\because$ | $\because$ | $\cdots$ | $\because$ | $\because$ | $\cdots$ | 27 | 29 | 31 33 | 38 37 | 45 |

HIGH-PRESSURE TIRES-STRAIGHT SIDE AND BEADED EDGE

| Carrying Capacity per Axlc. | $\begin{gathered} 6 \\ c w t . \end{gathered}$ | $\begin{gathered} 8 \\ c \cdots t . \end{gathered}$ | $\begin{gathered} 10 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 12 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 14 \\ \mathrm{cwt} . \end{gathered}$ | $\begin{gathered} 16 \\ \text { cwt. } \end{gathered}$ | $\begin{gathered} 18 \\ \text { cwt. } \end{gathered}$ | 20 cwt. | 23 cw | 95 cwt | 30 cwt. | 34 cwt. | 38 cwt. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 65 mm . | 25 | 50 |  |  |  |  | $\cdots$ | $\ldots$ |  | $\ldots$ | + |  | . |
| 80 mm . and 3 in . | $\ldots$ | :38 | 50 |  |  |  | . | . . | - | . | . . | $\ldots$ | . . |
| 90 mm and $3 \frac{1}{4}$ in. | . | . | 40 | 4.5 | 50 | 60 |  | $\ldots$ | . . | $\cdots$ | $\cdots$ | $\ldots$ | . |
| 105 mm . and 4 in $1 \because 0 \mathrm{~mm}$ for | . | . . | . . | . | 45 | 50 | 60 | . . | . | . | . | . | . |
| 105 mm rim | .. | . . | . | . | . | 45 | 50 | 60 |  | . | - |  |  |
| 120 mm |  | .. | . | . | . | 45 | 48 | 50 | 60 |  | $\cdots$ | $\cdots$ |  |
| 43 inches | $\cdots$ | . | . . | . | . | 45 | 48 | 50 | 55 | 60 |  | . |  |
| 135 mm . |  | . . | . . |  | $\cdots$ | . |  | 45 | 48 | 50 | 65 |  |  |
| 5 inches |  | $\ldots$ | . | . . | .. | . | $\cdots$ | 45 | 48 | 50 | 60 |  |  |
| 150 mm . |  |  |  |  | - |  |  |  | 45 | 45 | 52 | 65 |  |

BALLOON TIRES FOR EXISTING RIMS
\(\begin{aligned} \& \cdots <br>

\& \cdots\end{aligned} 22 |\)

$31 \times 4 \cdot 45$ beaded
3 inch
3.1 inch

105 mm .

| . | 22 | 25 | 29 |
| :---: | :---: | :---: | :---: |
| . | 27 | 33 | $\ddot{ }$ |
| . | $\cdots$ | 25 | 29 |
| . | $\cdots$ | 25 | 29 |
| . | $\cdots$ | $\cdots$ |  |


| 29 | 3 |
| :---: | :---: |
| $\ddot{29}$ | $\dot{3}$ |
| 29 | 3 |
| $\cdots$ | 3 |


| 35 | $\cdots$ |
| :---: | :---: |
| 36 | $\cdots$ |
| 36 | $\cdots$ |
| 31 | 38 |




BALLOON TIRES FOR NEW DIAMETER BEADED EDFE RIMS $720 \times 120$
$730 \times 130$
$.775 \times 145$
Considerable attention is given by tiro manufacturers to the design or pattern formed on the tread. Each manufacturer endeavours

## Inflation Pressures for Cord Tires

strands are continually le ent first one way and then the other. As a tire flexes when in use the strands work over one another and the friction and distortion creates a great deal of heat. This method of construction, although widely used until a few years ago, s now practically obsolete. The reinforcement used in all rubher tires to-day consists of four, six or more layers of cord made from fine Egyptian cotton. Each cord is completely embed led in rubber of the others, so that friction between them is eliminated and the tire if properly inflat-
long wear and a reasonablc degree of freedom from puncture the tread of the tire consists of a considerable thickness of rubber, while the outermost layer of cord is further protected by the breaker strip A, which consists of a strip of coarse canvas running right round. The tire is finally vulcanized or cured by raising it to a certain temperature so as to render it tough, completely elastic and reasonably hard. ed runs much
. I
 .  1

different sizes should be run, and all tires are to reach the cord reinforcement may ruin a tire liable to the same kind of failure if they are not run at the proper pressure. The pressure in any given size depends within limits upon the load carried. The table in page 1299 shows the pressures recommended by the Dunlop Company for the various permissible loads on various sizes. The diameter as a whole is not mentioned; only the width nced be considered. In many cars the load on the front tires is less than that on the rear tires, but the Dunlop Company recommend that, except in the case of high pressure tires, the front tires should be pumped as hard as the back in order to provide easy steering and to reduce wear of the tread.

The appearance of a tire is no guide to the inflation pressure. Long before a tire looks flat, irreparable damage may have been clone. The only satisfactory method is by the use of a pressure gauge applied to the valve independently of the punp. The gauge should be used at least once weekly and any shortage should be made up. If this is done regularly very little pumping is required.

## Results of Under Inflation

Reference will now be made to a few of the more probable results of under inflation. Every tire when working is flattened slightly at the part in contact with the ground and one result of this flattening is a slight bending of the side walls. If the inflation pressure is insulficient this bending becomes excessive and is greater than the natural flexibility of the walls can deal with, so that the cord frays and ultimately breaks. The effects may not be immediately apparent. l3y the time that the outer coating of rubber or the tire paint shows signs of a split running round or partly round the side wall, the cord reinforcement may be ruined beyond repair.

A further result of under inflation is excessive wear due to the tread not being sufficiently supported and therefore being flabby, so that it distorts and scrapes over the road much more than usual. This wear is additional to the normal wear due to the transmission of stcering stresses and the driving and braking efforts.

The front wheels on nearly all cars are splayed outwards slightly, so that there is a tendency to wear rather more on the outside than on the inside. When the tires are insufficiently inflated, the outer pait wears down rapidly. In the ordinary way any differences are small and can be equalized by turning the tire round about every two thousand miles.

Another form of trouble known as a concussion burst is due to a tire striking in sharp projection, such as a brick, at speed. Such a blow may be so violent and so localized that it will fracture one or two of the cord reinforcements, and this trouble may spread until the cover bulges or bursts. The effects may not become appaient until several weeks after the actual blow causing the trouble. The probability of damage is reduced to a minimum by running the tires at the proper pressures.

The front wheels of a car may lo parallel to one another but should preferably be given a small amount of " toe-in," the front edges of the rims being between $\frac{1}{8} \mathrm{in}$. and $\frac{5}{16} \mathrm{in}$. closer together than the rear cdges. Any departure from these conditions of alinement will result in excessive wear.

Apart from troubles due to under inllation or non-alinement, the amount of wear of tires depends very greatly upon the manner in which a vehicle is driven. The forces exerted botween the tire and the road when a car is accelerated or braked suddenly are very great and are all transmitted through the tires. It will thus be evident that the service obtainable from tires is largely within the control of the driver.

Care of Tires. However tough the rubber of the tread be, it is liable to be cut by sharp Hints, nails, glass, etc. A snall superficial cut is of no importance, but a cut sufficiently deep
to reach the cord reinforcement may ruin a tire
in a short time owing to moisture reaching the cotton and causing it to rot. The trouble may thus spread outwards from the original opening and ultiniately result in a burst which is too large to repair. A lookout should therefore be kept for deeper cuts, and they should be clcaned out and filled up with some epecial rubber com position.

Rubber is rendered soft and spongy by exposure to oil or paraffin. Any oil on the tires due, for example, to a leaky back axle or pools on the garage floor should be cleaned off with a rag and a little petrol. Petrol itself is a solvent of rubber, but evaporates so quickly that it cannot in the ordinary way causc any damage.

Whenever a puncture occurs, the first con sideration should be the cause of the trouble and the cover should therefore be examined carefully for evidence of a sharp flint. the point of a nail, ctc. Punctures or cuts in tubes may be repaired by vulcanizing or patching. The former metliod need only be applied when the cut is large, and is best left to tirms liaving suitable vul canizing apparatus. The possession of vulcanizing equipment by a private owner is
seldom worth while. Most punctures can, however, be repaired quite readily by patching, a.nd the
following reinarks will apply to most of the puncture repait outfits avail able to-day

The tube must first be thoroughly cleaned and


Fig. 8. Removing and replacing straight sided tires fittec to well type rims. When cover at $A$ is pushed down into the well, the edge at $B$ will come over the rim easily. Force must not be used rendered free of oil, grease, or moisture. This may be effected by a little petrol applied with a rag or by rubbing with the special perforated metal scraper supplied with the outlit. Solution from a tube is then applied over a sufficiently wide area and in some cases the surplus is scraped off at once with a knife; in other cases the patch must not be applied until the solution has become tacky, or almost dry.

While the solution is drying the patch can be cut out from the shect, the edge heing bevelled by a pair of scissors. An attempt may then be made to tear it in halves across the middle. The linen protecting the prepared side will thereby be torn in halves, but the rubber will yicld and will not be allected. Half of the linen may then be peeled off and care must be taken that the fingers do not touch the surface which is thus exposed. This exposed surface should then be applied to the tube, as shown in Fig. 7.
The other lialf of the linen should then be pulled off and the remainder of the patch stuck down. Finally the patch should be rolled hard or worked down with considerable force to ensure good contact with the tube. Neglect of this final operation may make it necessary to remove the patch-a somewhat difficult operation-and apply a fresh one.

Many small punctures cannot readily be found by inspection and it is then necessary to remove the tube completcly, inflate it with air as far as this can safely be clone, and immerse it in water. A small bowl of water, in the absence of a large receptacle, is sufficient for this purposc. Each section when immersed should be watched carefully for bubbles of air, which in the case of a small hole may only rise at intervals. The position of the puncture when found should be marked with pencil, but the whole of the tube should be tested for any fuither punctures. A slight leakage from a tire may be due to a defective valve. This may readily be ascertained by turning the wheel until the valve is on the top and then testing its tightness by means of a small cup filled with water. Should there be any leakage the inside of the valve must be replaced.

## Removing and Replacing Tires

Reference has already been inade to the ease with which a straight-sided tire can be removed from or replaced on a well type rim. The method of doing this is illustrated in Fig. 8 The edge should not in any circumstances be forced over the rim, as no useful purpose is served and it may be damaged. Before removing the tire all parts of the valve should be removed and both edges of the cover should be pushed right into the well at the part diametrically opposite the valve. The edges of the cover near the valve may then be gently levered over the rim. When replacing the cover one edge should be pushed over the llange of the rim right down into the well and the edge of the other side of the cover can then be pushed easily over the flange. The tube should be slightly inflated but not stretched tight and is then placed in the cover with the valve projecting through the hole in the rim. In many cases the valve projects towards one side and the tube must therefore be placed correctly in position. The second edge of the cover may then be placed in position by pushing it down into the well of the rim at a point diametrically opposite the valve, and it nay be gradually worked over the Hange. The last few inches may be forced on, if necessary, by small levers.

The removal and replacement of beaded edge tires presents somewhat greater difficulty, since the beads have to lie sprung over the elinches of the rim. To remove a tire the straight end of the lever is forced in as shown in Fig. 9 and the lever is bent round, using the clinch of the rim as a fulcrun, as shown in Fig. 10. Two or three levers will have to be emploved, working right round the rim in this manner.

In general it is sufficient merely to remove one edge of the tire, leaving the other on the rim. The tube should be partly inllated and then inserted into the cover and as far as possible over the rim, the valve being inserted


Figs. 9 and 10. Removing a beaded edge tire. Fig. 11. eplacing a cover. Fig. 12. The tube must not be nipped, as shown bere, when replacing cover
through the hole in the rim. Starting near the valve the edge of the cover may lic inserted in the clinch and worked into position gradually all the way round, using the hooked ends of the tire levers as shown in Fig. 11, hit care must be taken that the lever clocs not nip the lube, as shown in Fig. 12. Two or three levers should he used. but it will generally lue necessary to expend some effort to force the last section of bead over the clinch The levers should always be held firmly, otherwise the elasticity of the tire may cause them to jump "p violently into the face of the opelator or a bystander.

TISSUE : The Dress Fabric. All woven fabrics are tissues in one sense, and certain of them are officially described as woollen lissurs or worsted tissues in British trade returns. The F'rench call light cloths tissues as distinct from heavy cloths or draps. The word is often used in Euglish in order to denote tinsel cloths.

TOADFLAX. There are some charming annual and perennial plants among the toadflaxes, all suitable for the rock garclon and llower bo:cler. The most vigorous kind is the Dalmatian toadfan (Linaria dalmatica): it


Toadflax. Purple double-lipped flowars of Linaria
grows 3 feet high bears yellow flowers in summer, and thrives in ordinary soil. Linaria alpina is a pretty little plant for the rock garden, bearing orange and purple flowers. The Kerilworth ivy (Linaria cymbalaria) is a trailing wild plant useful for planting in walls ; it has lilac-coloured flowers. It is best to raise these plants from seeds sown in boxes in a frame in spring. The annual toadilaxes are easily raised from seeds sown out of doors in spring where the plants will bloom in summer: the chief species are bipartita and maroccana.

TOAD IN THE HOLE. The dish known as toad in the hole can be made from 2 lb . mutton or beef, $\frac{1}{2} \mathrm{lh}$. flour, 3 eggs, $1 \frac{1}{2}$ pints milk. Sieve the flour and salt into a loasin, stir in the eggs and a little of the nilk, and beat all to a smooth batter. Gradually work in the rest of the milk and let the whole stand for at least half an hour.

Free the meat from fat, skin, and hone, cut it into neat slices, , ry these in hot dripping, and then put them into a greased pie-clish. Sprinkle them with salt and pepper, pour the batter over, and bake the whole in a moderate
oven for $1 \frac{1}{3}$ hours. Serve it very hot, with a folded naplin pinned round the dish. If preferred, this can he marle witl sausage or cold meat, when it will require only about an hour's baking. See Batter; Sausage.

TOAD LILY. 'The chief species of toad lily is Tricyrtis hirta, a hardy, or ucarly hardy, herbaceous perennial, with white, hairy stems, alternate lance-shaped leaves, and white, violet-spoterl flowers in autumn ; height about $2 \frac{1}{2} \mathrm{ft}$. It should have a sheltered, sumny position in a friable loamy soil. Propagation is by division in spring. These plants may be grown in pots in the greenhouse.

TOADSTOOL. The popular name of toadstool is usually applied to an uneatable fungus as distinguished from eatable agarics, of which the common mushroom is an Axample. More than 1,000 species of agarics are known, some being poisonous.

It is often difficult to distinguish between edible and non-cdible kinds. Suspicion should be aroused if any fungus has a thin cap as compared with its gills, and if the latter are of even length; if its collar is wehbed or its juice milky; and if it quickly decays into a dark Huid. Caution should be used, also, if the stalk grows from one side of the cap.
The conmon edible mushroom grows naturally on hilly slopes or in open meadows, and in its carly stage is like a small white globe. This form is followed by development of a Hattish top with rough, brownish white skin and pink gills, the latter being just clear of the stem. When fully mature the gills change from pink to brown. and tinally to a colour that is nearly black, the skin easily peeling off, quite unlikic that of toadstools. It is best never to gather what are apparently mushrooms growing in woods, under trees, or other shaded places, unless with intimate knowledge of mycolog.y. Even in open places indiscriminate picking is risky. See Fungus: Mushroom.

TOAST. Brearl should be toasted evenly and only on the surface, and it must fecl quite crisp to the touch. It is served cither buttered or as dry toast.

Toast is used extensively for many culinary purposes. It forms a foundation for dishing various savouries, vegetables and small birds. Toast cut in shapes is used as a garnish.
1)ry toast should be macle with bread which is at least 24 hours old. Cut as many thin, even slices as will be required and toast each piece under the gas grill, or an electric toaster, or on the fork before a clear fire.

When the slice has been toasted each side lay it on a board, press it flat, and at once remove the crust, then stand it upright where it can be kept warm while the remaining pieces are locing toasted. Toast should always be made as required; if kept waiting it will be hard and leathery. If the crust is not cut off immediately, the steam cannot escape and the toast becomes sodden

For buttered toast, the bread should be cut rather thicker. After being toasted and the crust removed, the slice should lie laid on $\Omega$ hot plate and the butter placed on it in small pieces, and as the butter melts it should be spread over lightly without scraping the toast underneath. Lay the second round, after toasting it, on the first, and butter it as in the first instance. Cut the slices of buttered toast into neat pieces and pile them on a very hot dish, covering them over.

For cinnamon toast mix equal parts powdered cinnamon and castor sugar, sprinkle thickly on the toast after buttering and place under hot grill or before a clear fire until the sugar melts and the cinnamon is incorporated with the butter

French toast is a good way of using up slices of bread and butter which have been left over from tea. It should be made with rather thin bread and butter. Two slices are laid one over
the other, with the butter side inwards. They are lightly pressed together, and should be toasted in the ordinary way. No extra butter is necded, as the butter already on the bread penetrates the soft part and also imparts a rich, crisp taste to the toast. It should be eaten very hot straight from the fire. Set a plate on the hearth to catch any falling grease.

## Toast Water. This is a refreshing and

 wholesome drink. To make it, a verv thin slice of bread sbould be toasted until it is thoroughly brown and dry all over, but it must not be burnt or blachened in any way. Put the slice of toast into an carthenware jug and nour over it $1 \frac{1}{2}$ pints of boiling water, then cover over the jug and set it aside till cold. The success of toast water greatly depends on whether the water is actually boiling when poured on to the toast and whether it is freshly made.Toasting Fork. When toasting bread or cakes in front of an open coal or gas fire the use of a special fork is advisable. The simplest form consists of three or four short wire prongs and a long handle of wood or metal. Mere ornamental designs are also employed and reproductions of old designs in brass can be purchased for a few shillings.

Toast Rack. Toast racks are made of chima, carthenware, silver, Shefficld plate, and electro-plate. There is not a great varicty of styles in these pieces, but metal designs copied from lith century models are usually more elegant than later ones. Specimens of the 18 th centurv toast racks are fairly often seen. Some of them are boat-shaped, with beaded borders. simall china and semi-porcelain toast racki are made to match most modern tea and dinner services.

TOBACCO. In purchasing his tobacco the pipe smoker has to consider the qualities which the desires in his particular brand, and also the strength which suits him. The latter considcration is the more important of the two, and the proof of it lies in the fact that practically every good pipe tobacco can be olstained in the three standard strengths, mild, medium, and full flavoured.
1.ipe tobaccos are sold cither loose or in packets of 1 oz . and 2 oz . Larger quantitics are retailed in tins containing $\frac{1}{4} \mathrm{lb} ., \frac{1}{2} \mathrm{lb} .$, or 1 lb . While the majority of smokers usually buy their tobacco in small quantities, it is of ten convenient and slightly more economical to lay in a week's supply or more at a time,
Tastes differ proverbially as to the choice of a brand. It does not necessarily always follow that the more expensive sorts are the best for everyone. A good mixture at 10d. or ls. per oz. may be quite as satisfactory as one costing ls. 3d. per oz., although it lacks certain choice ingredients only to be found in the latter. It is all a matter of individual taste.
The first object is to get a cool-smoking tobacco. However fragrant and agrecable to the palate a mixture may be, the pleasure of smoking it is entircly spoilt if it is too hot on the tongue and perhaps has a tendency to heat up the howl of the pipe. It is the lighter mixtures that are apt to offend in this way unless the hlending is skilfully arranged ; those which are liberally sprinkled with dark shreds burn more slowly and with a steady glow. For those who can smoke the strongest. tobaccos no dilficulty is likely to arise, and when the pipe is once properly lit a long, cool, and fragrant smoke should result.

The choice of a mixture is assisted by some knowledge of its composition. The principal ingredient is ncarly always the Virginia lraf in one or other of its numerous forms. Of all kinds of tohaceo this is casily the most popular. Virginia is graded in so many different qualities that only an expert can distinguish them all, but the smoker has usually no difliculty in picking one out for himself to be sampled at
home. Severa! may be tried before the right mixture is obtained.
Between the two extremes of light aud dark is the widely popular medium, which is neither too hot nor too strong, and generally has all the fragrant qualities, with only a inoderate amount of the dark leaf. Even this, however, is too strong for some smokers, who should therefore select a light quality, as, for instance, one in which a quantity of orienta! leaf has been blended with the Virginia. In most of these the leaf is cut very fine, just as it is in such strong, full-lla roured tolnaccos as shag and returns. In other mixtures a broad-cut leaf is used, and in some a double-broad cut, so that even in the matter of cut the smoker has a variety to selcet from.
The range of tobaccos is further extended by the cut plugs, which are extensively in use. This is a very handy form of tobacco for pipe smokers. The p!ug is cut up into thin slices. which are packed in 1 oz or 2 oz packets or in 4 oz tills From 2 to 3 slices are sufficient to fill the bow! of a pipe of average size. They should be rolled in the hand before being loaded into the pipe bow!. Some smoliers prefer to buy their tobacco in plug form and cut it up for themselves. Cake tobacco is a nother form which is wide! y used like the plug tobaccos, it is sold in various steengths, the milder qualities being light in colour and the strong tobacco almost black.

It is in the loose mixtures that the retailer turns to account his knowledge of all the various kinds of tohacco leaf, the subtle variations in strength and llavour which different soils produce in the plant, and his skill in blending, for which long experience is required. One obvious advantage in buying the loose tohaco is that the smoker can see what sort of mixture he is getting, although, as a matter of fact, the average snoker knows comparatively little of the echnical side of the subject. and is generally guided by considerations of price It is therefore advisable in purchasing toracco as with most other things, 10 deal with a firm of repute

Blending Tobaccos. Tobaccos of several strengths are used, varying in colour from a pale golden yellow to dark brown and black. These are laill out on a specially made table to be dried and matured, and are then blended in the proportions required in accordance with particular recipes. The bulk of the tobacco is American, the produce of Virginia, Kentucky and the Carolinas, but fine Turkish is also employed. Some of the more expensive blends receive a sprinkling of latakia, the aromatic leaf of Syria, which imparts a distinctive Havour that is highly esteemed by some smokers.

Recipes for bending have a commercia! value, and the details of many of those in the possession of manufacturing firms are carefully guarded secrets. Some retailers follow certain old-established reciess which they obtained from their predecessors in business, and these form an asset of distinct value where a particular mixture has been popular perhaps for many years with a large circle of customers. Dealers who have expert knowledge make blends of their own, and sell them not only loose, but also in packets, where they have proved particularly successful, often with their own registered trade marks. Small dealers who are not themselves expert in this c'ass of work may produce blends from recipes supplied by the large manufacturers.
Tobacco Pouch. Most pipe smokers carry their tobacco in a pouch or case made in various si\%es and of some soft material such as india-rubber or oilskin, or a variety of leather, such as buckskin, with an inner lining of india-rublier Tobacco is also kept in leather cases without india-rubber. A widely popular style of pouch is made entirely of rubber, one half folding over the other in which the tobacco
is contained. It is best to choose one in which the material is moderately thick, as the rubber is apt to wear and to cut at the creases.

Pouches of buck. skin or otbcr material with a lining or pocket of rubber are more substantial in appearance, and with ordinary carc will last for ycars. Reindecr, antelope. chamois, doc, calf, and other skins are employed and a silver shield or embroidered mono. gram is a customary form of ornament. The leather wallet is another favourite variety, made from pigskin, crocodile, scalskin, and other
 eathers, strongly sewn together. Oilskin pouches are rect- some decorative value because of its fine leares. angular in shape and can be obtained in both For experiments in tobacco growing the large and small si\%es. See Pipe; Smoking.
TOBACCOPLANT. The favourite tobacco plant for gardens in Great Britain is the half hardy annual Nicotiana affinis, which bears white llowers which are delightfully

## TOBOGGAN FOR WINTER SPORTS

## How to Build a Clipper for Two Adults

The amateur who wishes to make a tobozgan should consult also the various articles in our work that deal with the tools and materials used by the woodworker, such as Amateur Carpentry; Bit;

As the sport of tobogganing consists mainly in coasting very rapidly downhill, the design of a toboggan, which is a form of sledge, must be strong enough to withstand rough usage. In its simplest form the tologgan consists of boarding fixed across a couple of wooden runners, but more claborate forms are in use to accommodate parties instead of a single person.

A clipper toboggan large enough to carry two adults is shown in Fig. ], its component parts being detailed in Fig. 2. Only wellseasoned pine, ash, or elm of the best quality sliould be used, cut to size and ready planed. The timber and other materials required are shown in the table.

Having made sure that each piece of timber is cut exactly to size and properly squared, the rods for the hand grips B are prepared. The centre of one of the long sides of each rod is found and a parallel line drawn through the point from end to end of the rod : then four ${ }^{3}$ Io $i 11$. diameter holes are bored through each rod from points marked off on the centre line. The first point is $1 \frac{1}{2} \mathrm{in}$. from the right end; the second, 7 in . from the $\mathrm{l} \frac{1}{3}$ in. point; the third, 7 in . from the 7 in . point ; the fourth 7 in . from the last 7 in . point. All the points must be placed exactly on the centre lines, then the holes are carefully bored through and afterwards countersunk with a rose-bit.

Both erlges of the side of the rod from which the holes were countersunk are now planed to a slight hevel, as shown in Fig. 3, then both ends of each rod are rounded as detailed in the same diagram.

The two runners $C$ are the same sioc and shape, the marking out of the planks from

|  | Long <br> ft. <br> inf | Broadl <br> in | Thick |
| :--- | :---: | :---: | :---: |
| in. |  |  |  |

which they are made heing as follows: A space of 8 in. is marked off from the right ends, then a line at rigl:t angles is drawn through each point across the breadth of each plank. A space of 4 in ., measured from the upper left corner, is marked ofl on the annual $N$. tabacum may be sown in gentle heat in early spring and planted out in a sunny border in June. The plants should be freely watered, and will be ready for gathering for drying at the end of Scptember.
scented in the evening. It is mised by sowing seeds in a heated glasshouse in February and planting the seedlings out of doors in May or carly Junc. There are several coloured varieties of red, crịnson or pink llowers, but they are less fragrant than the white ones. All makc good pot plants for the conservatory. Nico. tiana sy!vestris is a handsome plant. 5 ft . high, with large leaves and white tlowers in summer. It is raised from secd sown under glass in spring. Commercial tobacco is olitained from Nicotiana tabacum a filant which is oi

parallel line draint through the point from end iron. Eive $\frac{3}{18} \mathrm{in}$. dianeter holes arc drilled from $\Omega 3 \mathrm{ft}$. 10 in . length of 1 in . broad $\frac{1}{2}$.round to end of the hoard; the runncr-planks and through the centre of the thickness of each strip iron. Eight $\frac{3}{16}$ in. diameter holes are loard are then placed flat on the bench in the length from the points detailed in Fig 7 the positions shown in lig. 4, the centre line on the hoard being a continuation of the line previously drawn through the 8 in . point on each runner. A space of $9 \frac{13}{10} \mathrm{in}$., mensured end to end of each length, then the points from the lower side of the lower plank (i.e. for the holes are marked off. The first point the plank nearest the front of the bench), is marked off on the line on the board, then a similar space is marked off from the upper side of the upper plank.
The next step is to draw the curves with a compass set to a radius of $9 \frac{18}{18} \mathrm{in}$., using the points marked on the lines as centres, as rletailed in Fig. 4. If a large compass is not available, the curves may be drawn by machi
arranging a pencil, tacls, and loop of string as from

shown. A space of $\frac{7}{8}$ in., measured from the upper side, is marked off on the surface of each plank, then a parallel line is drawn through each point fiom end to end of the plank, as detailed in Fig. 5.

Four' $\frac{3}{16}$ in. diameter holes are bored through the thickness of each plank from points marked off on the parallel lines. The first point is 3 in . from the right end of each plank; the second, 6 in. from the 3 in. point; the third, 11 in . from the $f(\mathrm{in}$. point ; the fourth, 11 in . from the 11 in point, Fig. 5. The planks are now cat to shape, the waste wood being removed from the right ends by sawing along each curved line with a keve hole saw, then the curves are neatly finished with a spokeshave. The left end of each plank is cut to the angle shown in Fig. 5, by sawing along the diagonal line.

The three pieces of wood for the crossbars $D$ are prepared by planing two of the long cdges of one of the broad surfaces of each piece. The portion to be removed from each edge is marked off as follows: From the right and left long edges mark off a space of $\frac{\mathrm{in}}{} \mathrm{in}$. on the surface and right and left sides, then draw a parallel line through each point from end to end of each piece of wood (Fig. 6). The three brace irons $E$ are each made from a 15 in . length of $\frac{3}{} \mathrm{in}$. broad, $\frac{1}{2}$-round strip

second, 1$\}$ in. from the $\frac{5}{8} \mathrm{in}$. point ; the third, $5 \frac{1}{4} \mathrm{in}$. from the $1 \frac{3}{4} \mathrm{in}$. point; the fourth, $5 \frac{1}{4} \mathrm{in}$.
from the 54 in. from the 51 in ; the fifth, $1_{4}^{3} \mathrm{in}$. from the last in. point.
The points are marked with a centre punch and the holes bored with a $\frac{3}{16}$ in. twist drill fitted in cither a brace or a hand-drilling length from the points detailed in Fig. 7, the drilled through the centre of the thicliness of points being placed on centre lines. The centre cach length from the points detailed in Fig. 9. of the brealth of each $\frac{1}{2}$-round side is found, A centre line is first drawn, then the points are and a parallel line drawn through the point from spaced in the following order: The first point on each length is $\frac{1}{2}$ in. from the right end; the second, $1 \frac{1}{2}$ in. from the $\frac{1}{2}$ in. point ; the third, $9 \frac{1}{4} \mathrm{in}$. from the $1 \frac{1}{2} \mathrm{in}$. point; the fourth, 6 in from the 94 in point ; the fifth, 131 in. from the 6 in. point ; the sixth, 6 in. from the $13 \frac{1}{8}$ in. point; the seventh, $5 \frac{1}{8} \mathrm{in}$. from the $(8 \mathrm{in}$, point ; the eighth, 4 in . from the $5 \frac{1}{8} \mathrm{in}$. point. The holes are drilled and countersunk in the same way as those bored in the brace irons.
The ends of each length are next marked and hent to the angles detailed in Fig. 10. A space of 3 in., measured from the right end, and a space of $5^{5}$ in. measured from the left end, are marked off on the $\frac{1}{2}$-round side and slightly incised with a cold chisel. The left ends of the lengths are lieated to a bright


Fig. 6
red for about 6 in . and bent from the incised marks to the angle of the left end of the runners, as shown in Fig. 10. The right ends are similarly treated, aft.is which each length is reheated and bent $t o$ the shape of the curved ends of the runners.

Useful hints for manipulating ironwork will le found in the article on Forge. If the home worker has not the facilities for this part of the work the blacksmith from whom the strip iron is bought would doubtless do the bending and drilling for a reasonable charge.
To assemble the parts the runners are placed on a level surface and set in position 12 in . apart, exactly parallel to each other and in line, and hot glue is applied to their upper sides. The seat boards are fitted in position on the runners, as detailed in Fig. 11, both ends of each board being secured by three $\check{\sim}$ in. oval wire nails. Hot glue should be applied to the long sides of the boards before fitting them in place. The hand grips $B$ are glued and nailed to the sides of the seat, then a 2 in. screw is inscrted into each of the countersunk holes in the hand grip and driven firmly into the seat boards.
The crossbars D are glued and fastened by 3 nails each to the underside of the seat, the position of each bar being detailed in Fig. 2. A 2 in. screw is driven into both ends of each bar from the holes previously bored through the runners, countersinking the holes before inserting the screws. In order to secure the bars further, a $\frac{3}{16} \mathrm{in}$. diameter hole is bored through the seat at each of the points detailed in Fig. 11, then each hole is countersunk and a 2 in . screw driven into the centre of the crossbar below. It may be noted that the screws will be easier to drive if a small gimlet hole is made for each and a little vaseline applied to the flireads.

Fitting Brace and Runner Irons
The brace irons E are fitted to the crossbars as shown in Fig 2, each iron being secured with three 1 in . screws. A $\frac{3}{16} \mathrm{in}$. diameter hole is bored with a gimlet through each runner from each of the holes in the angles of the brace irons, then a recess of the exact size of the nuts on the $1 \frac{1}{4} \mathrm{in}$. bolts is cut at each hole on the outside of the runners and a nut placed in it. The bolts are inserted into the holes in the angles of the brace irons and driven in with a screwdriver until they are firmly screwed into the nuts, as shown in the sectional diagram in Fig. 12 . If the ends of the bolts project, they should be filed down nearly flush and then riveted.
The runner irons $F$ are now fitted in position on the runners and attached with screws. A $1 \frac{1}{2} \mathrm{in}$. screw is driven into each end hole, and a 1 in. screw into each of the other holes. The drawrope $G$ is attached by first enlarging with a $\frac{3}{8} \mathrm{in}$. drill, the $\frac{1}{8} \mathrm{in}$. diameter hole previously bored at the curved end of each runner, then an end of the $2 \frac{1}{2} \mathrm{yd}$. length of rope is inserted into each hole from the inner side of the runner and secured.

The woodwork should be well smoothed with sandpaper, and all the corncrs and edges carefully rounded with a rasp. A nail punch should be used to drive each nail in the seat, hand grips, etc., a little below the surface of the wood, to remove a possible cause of torn clothes or injuries while sledging. When the runner irons have been polished smooth and bright with coarse emery cloth, the toboggan is complete and may be given several coats of good varnish paint as a finish.
TOBY JUG. The original Toby jug used for holding beer was in the form of a stout figure of a man wearing a cocked hat and knecbreeches, and generally embodying a variety of glazed colourings. A typical example shows a squat little figure attired in a purple coat, green waistcoat, yellow brecches, and white stockings, in Staffordshire pottery. Potters
frequently rang the changes on these colours by varying the colour of the coat or breeches in products of the same inould. There are many variations in the design of the figures, which have recognized values among collectors according to their artistic merit and rarity.
Favourite designs include the typical English squire, John Bull, the sailor, the snuff-taker, Simple Simon, the postboy astride of a barrel, the watchman with his lanthorn. Others represent historical characters like those which bear the name of Nelson, Napoleon, Jord Howe, and many other celebrities in the later varietics of the Toby jug. Green and buff glaze is common, but at least one variety is blue and white with a flat beaver hat.

Modern Toby jugs of brown Doulton and other ware are decorated with small facsimiles of the old English figures and other designs in white enamel.


Toby Jug modelled by Walton early 19th century
British Museum
tumbler one-quarter full of boiling water. Cover it over until the sugar is dissolved, and then add a wineglassful of whisky.

According to the old practice toddy or grog should be made in the large, wide-mouthed glasses generally known as ruminers. The whisky is always added last, and according to one of the old recipes it should be laid in spoonfuls on the top of the boiling water. This process is sup. posed to get rid of fuscl oil.
In serving toddy it was customary to use ordinary wineglasses as well as the rummers. These were intended for the ladies of the party, and were filled from the rummer with the. long, curved silver spoons or ladles known as toldy spoons.

Many choice examples of cut-glass toddy tumblers and spoons are to be found in private houses, and are still brought into use on occasions when it was These may be formerly the custom to brew a bowl of punch. bought singly or in sets of three in different See Rummer. sizes. Toby ware is also used for tobacco jars and for small cructs.
TODDY. Toddy is a mixture of whisky, . Toddy is a mixture of whisky, should be grown in a closed case kept moist sugar, and hot water. To make it, put into and shaded. One of the most beautiful is a tumbler a lump of sugar, a piece of thin Todea superba. See Fern. lemon peel, and a silver teaspoon. Fill the Toe. See Foot.

## Toffee and Toffee Sweetmeats

## Recipes for Butterscotch, Caramels, Humbugs, and Other Varieties.

This contribution deals with confections that require a basis containing as its main ingredients sugar and butter, or cream. Other sweet-making information is given under the headings Chocolate Makirg; Nourat: Sweets: Turkish Delight. See also Glucsse Sugar: Treacle; and the entries on other ingredients

The hard sweetmeat known as toffee is made chiefly from butter and sugar. Unlike other hard sweets, such as rocks, for which white sugar is userd, a large proportion of brown sugar or treacle is used in most toffee-making to prevent granulation during boiling and stirring, and a fatty constituent is required Glucose or cream of tarter is also included in many of the recipes. Various flavourings or nuts are added to make the different kinds. Recipes for the toffees are here given before proceeding to the toffee sweetmeats.
A good plain toffee, often known as hardbake, can be made by melting 3 oz . butter in a small bright pan, stirring in 1 lh . brown sugar and continuing to stir until the mixture bernmes hard and brittle when a small portion is tested in cold water. If stirring is discontinued the toffee will burn. When ready pour it into an oiled tin and leave to set. Before it is quite hard mark it into squares.

Butterscotch. This is a delicious variety of toffee distinguished by being made with white sugar instead of brown. Place 1 lb . loaf or granulated sugar into a saucepan con


Toffee. Fig. 1. Butterscotch, made with white sugar
taining 1 gill fresh milk. Heat slowly and stir occasionally till the sugar has melted. Arld a pinch of cream of tartar, and 3 oz. fresh butter, the latter a small piece at a time. Boil the mixture until it is a light coffec colour, drop a little of it into very cold water, and leave it a few seconds.

Take out the little lump, and, if it is quite brittle, add a few drops of essence of lemon and lemon-juice, and pour the mixture at once on to oiled tins or plates to the depth of a $\frac{1}{4} \mathrm{in}$. When it is nearly cold, cut it into oblong-shaped pieces, as shown in Fig. 1. If to be stored in a tin first wrap each piece in wax paper, and then in tin foil. Keep the toffee in a cool, dry place.

Everton Toffee. The ingredients for Ever ton toffce are 2 lb . white sugar, $\frac{1}{4} \mathrm{lb}$. dark sugar (Barbados), $\frac{1}{4} \mathrm{lb}$. glucose, $\frac{1}{4} \mathrm{lb}$. fresh butter, $\frac{1}{2}$ pint milk, a pinch of salt, and a few drops oil of lemon. Melt the sugar, glucose and milk in a large pan, then place it over a slow fire, add the butter and boil to $270^{\circ}$. Stit in salt and oil of lemon very gently, and pour the toffee into greased tins. Brush these over with pure vaseline first. This is taste less and harmless, and, unlike butter and vegetable oils, frec from rancidity.
Ginger Toffee. To make ginger toffee, mix in a saucepan 3 lb . brown cane sugar and ${ }^{\text {g }}$ level teaspoonfuls ground ginger, and add about $\frac{1}{2}$ pint white vinegar and a lump of butter slightly larger than a hen's egg. Let these stand by the side of the fire until the sugar has melted, then boil them up and continue boiling until the toffee snaps when a little of it is dropped into cold water. Pour the toffee into oiled tins, and let it harden

Honey Toffee. Melt 1 lb . Ioaf sugar in $\frac{1}{4}$ pint water over the fire When it is on the point of boiling add 1 dessertspoonful glucose, $\frac{1}{4} \mathrm{lb}$. each honey and butter. and 2 or 3 table. spoonfuls cream Boil the whole to $285^{\circ} \mathrm{F}$., stirring all the time ; then pour it on to a buttered marble slab, and when cold break it up, wrap the lumpa in waxed papers twisted slightly at either end, and store in a tin

Nut Toffees. Walnut toffee is composed ol 1 lb . white sugar, 1 lb . brown sugar, $\frac{\mathrm{lb}}{}$ glucose. 2 oz. butter, a full ? nint water. \& lb


Toffee. Fig. 2. Walnut toilce cut into bars
walnuts, slightly roasted, a few drops oil of lemon. Boil to $270^{\circ}$ as already explained Remove the pan from the fire and add the walnuts, cither whole or chopped Stirgently PJace on the lire again for a few minutes, add the lemon and pour. Mark toffee deeply with oiled knife, and when set cut into hars
Almond and brazil nut or peanut toffice may be made in the same way, using blanched, skinued and neatly cut almonds or the other nuts in place of walnuts Coconut toffee is made a little differently. Put loz. butter in a saucepan, add to it when it is melted I small tablespoonful golden syrup and the same of milk. When these are mixed, add $1 \frac{1}{2} \mathrm{lb}$. fine white sugar and 2 tablespoonfuls desiccated coconut. Stir frequently and boil the mixture fast, until it candies and grains well on the sides of the pan. Stir in half a teaspoonful of vanilla and pour it out into an oiled tin. Leave it until cold and cutit up.
Peppermint Toffee. Put into a saucepan a tin of sweetened condensed milk, $1 \frac{1}{2} \mathrm{lb}$. brown sugar, $\frac{1}{4} \mathrm{lb}$. butter, and two tablespoonfuls golden syrup, and stir them at the side of the fire until they melt. Then place the pan directly over the lire and boil its contents rapidly, stirring all the time. When they are a dark chocolate colour, take the mixture from the tire and drop a little of it into a basin of cold water. If it hardens, the toffee is cooked. and some peppermint essence may then be stirred in. Pour all on to a greased tin and let it cool a little before marking it into squares, then set it aside to become quite cold

Russian Toffee. This is made with the following ingredients: 1 lb. brown sugar, I lb. white sugar, $\frac{1}{2} \mathrm{lb}$. glucose, $\frac{1}{2}$ pint milk, $\frac{1}{2}$ pint cream, $\frac{1}{2}$ lb. fresh butter, a few drops of vanilla essence. Place the sugar, glucose, and milk in a large-sized pan and boil carefully to $\because 60^{\circ}$. Add the cream, and bring up to $260^{\circ}$ once more. Add melted butter and boil to $270^{\circ}$. Remove from the fire, gently stir in the essence. pour into oiled tins, mark off when partly set. When cold, cut into squares as seen in Fig. 3. If desired to store, wrap the block in waxed paper and cut off the marked squares as required.

Treacle Toffee. The main ingredients of treacle toffee are 2 lb each of black treacle and brown cane sugar. Put these into a pan with a lump of butter about twice the size of a hen's egg, and lat them melt slowly at the side of the fire. Then boil up the toffee, stirring it all the time. and continue stirring until it hecomes brittle when a spoonful is dropped into cold water. Add a little vanilla flavouring, and pour the whole into an oiled tin.

Caramels. A softer type of toffee is the basis of the sweets known as caramels. Coffee, chocolate and vanilla are popular flavours.

Vanilla carannels may be either of the hard or soft varieties. For the hard caramels take $2 \frac{1}{2} \mathrm{lb}$. White sugar, 6 oz glucose, 1 pint cream, $\frac{16}{2} \mathrm{lb}$ tin condensed milk (unsweetened), $\frac{1}{2}$ pint milk, vanilla essence Place the sugar, glucose, and milk in a large pan. melt, and boil to $250^{\circ}$ Carofully add cream and boil continuous!y to $280^{\circ}$ Stir all the time. At $280^{\circ}$ rently stir in the vanillia, and pour into an oiled tin (olive oil) to the deptb of about $\frac{1}{2}$ in Mark deeply with an oiled knife into $l^{2}$ in squares before the mixture is set. When cold cut it right through and twist up the squares in waxed papers Chocolate caramels are similarly made by stirring in about $\frac{1}{4} \mathrm{lb}$ plain melted chocolate

For soft vanilla caramels take 2 lb . white sugar. $\frac{3}{4} \mathrm{lb}$. Barbados sugar, 3 lb . glucose, 1 quart cream. 2 oz. coco-butter, 1 pint water vanilla essence. Melt as before and add cream gradually at $250^{\circ}$. Slowly boil to $255^{\circ}$, stirring continuously. Just before removing the pan from the fire, stir in the essence. Pour on the oiled tin, mark off, and wrap up when cold

To make coffee caramels. melt l lb loa sugar and 6 oz . glucose in a pan containing a small teacupful of water, placing the pan at the side of the stove or over a very low lire so that the process may be slow. When the whole is reduced to liquid, boil it to $245^{\circ} \mathrm{F}$. then add 3 oz . butter and enough coffee essence to give the desired flavour. Continue boiling without stirring the mixture, and when it has reached $245^{\circ}-250^{\circ}$, pour it into a well-oiled tin, cutting it into squares when almost cold, with an oiled knife or a caramel cutter

Fudge. This type of toffee sweetmeat is of American origin and instructions for making two kinds are given in page 499. Vanilla chocolate fudge requires the following in gredients: $\frac{1}{3} \mathrm{lb}$. granulated sugar, 4 table spoonfuls cocoa powder 2 tablespoonfuls butter. 1 dessertspoonful golden syrup, small tin unsweetened condensed milk, about $\frac{1}{2}$ teaspoonful vanilla essence.

Blend the cocoa with the condensed milk to a smooth paste and add gradually to the melted butter in a small bright saucepan Add the sugar and syrup and stir while the mixture boils up Allow it to boil until a little dropped into cold water hardens to the desired consistency Add the vanilla essence to the


Fig. 3. Russian toffee, a very rich variety
mass, beat it up well and then put it into a nougat frame lined with waxerl paper to set.

Another recipe requires 1 teacupful brown sugar, 1 dessertspoonful golden syrup, teacupful finely grated chocolate, I teacupful milk (half milk and half cream is used for a richer fudge), 1 dessertspoonful glycerin, $\frac{1}{2}$ teaspoonful vanilla essence, and 1 oz . butter.

Place the sugar, butter, milk and syrup in a saucepan and bring to boiling point. Add the glycerin and hoil rapidly for 10 minutes, and stir in the chocolate. Continue boiling and test in cold water. Turn into an oiled tin and mark into squares when almost set.

Humbugs. These old-fashioned sweet meats are also called bull's eyes, and are made from pulled torfee cut into tho shape known as a cushion. (See the directions for cutting boiled sweets in this manner given in page 1244.) To make, dissolve $\frac{3}{4} \mathrm{lb}$. best brown
sugar and $\frac{3}{3} \mathrm{lb}$. loaf sugar with not quite $\frac{1}{2}$ pint water in a strong pan; the pan must not be tinned inside. When the sugar is melted add 2 tableoponnfuls glucose and boil to the soft ball, then by degrees put in $1 \underset{2}{1}$ oz. butter cut in thin slices
Boil again till the toffee will snap This can be tested by dropping a little of the syrup into cold water and breaking it between the thumbs : it should harden at once and break with a crack Pour the toffee mixture, with the exception of about two tablespoonfuls, on to an oiled marble slab. Then drop in essence of peppermint to taste. It is impossible to give exact quantities of essence required, as the strength varies in all essences
Turn in the edges of the toffee as soon as it can be handled and pull it until it is a light cream colour It may be pulled with the hands or thrown repeatedly over a candy hook, as explained in the directions for making rock in the article on Sweets. The toffee will take about 10 min to pull. The remaining toffee should be kept liquid in the pan over hot water

When the pulled toffee is ready turn the clear liquid on to an oiled dish. Take up small pieces and stretch them in thin strips: lay them along the pulled sweet, which should be in even lengths; straighten the length out and cut into cushions with a strong pair of scissors. The humbugs should be cream with pale brown transparent stripes.

TOFFEE PUDDING. To make this, take 10 oz . self-raising Hour, 3 oz . butter, 2 oz . granulated sugar, and $1 \frac{1}{3}$ oz. eac:! of shredded suet and laril. Make a short crust with the four, suet, and lard, and a little water, and roll it out to $\frac{1}{2} \mathrm{in}$. thick. Next cream the sugar and butter together and spread the misture on the pastry, which should then be rolled up and both ends securely fastened. Put it into a pie-dish and bake it in a quick oven for 35 min . As the butter and sugar ooze out of the pastry usc them to baste the roll, on whicls they will form a toffee-like surface.

TOILET. Cleanliness and nentnees are the chief factors of success in the evcryday toilet which achieves a well-groomed appearance. Well-brushed and cared-for clothes, clean linen and footwear, immaculate hands and hair, are most important. The morning loilet for those who go to busincess away from lome should be particularly efficient.

After a few exercises, and thorongh brushing of the hair, a warm bath concluiled by a colit shower, or sponge down, and followed by a lirisk rubbing with a loofah or hath brush and drying with a rough towel, has an invigorating effect on most people. A good rubbiug with the towel across the back of the neck and behind the ears stimulates the circulation.

When housewo:k nas to be done at honic. most women complete the toilet afterwards A cap should be worn to proteet the hair from dust while sweeping, and the hands should be protected by rubber or wash-leather gloves when porsible.

Articles for the toilet such as hair brushes, tooth brushes, sponges, soaps, powders, creams and lotions, should be of the best quality. It is a mistake to economiz on these things. In paricular powders and soaps for the baby: toilet should be absolutely pure. Should a wrong soap have been used--that is, one in which there is free alkali, and irritation of the skin has been caused, gently ruh in a little pure olive oil. The powder must contain no white lead and the pulf must be kept scrupu lously clean. See Baby, Beauty Culture; Hair, Shaving: Soap: etc.

Toilet Cover. See Duchesse Cover.
TOILET MIRROR. Of the toilet mirror as a distinct article of furniture there are many varieties. Some are fitted into a frame and
swing between pair of supporting columns with a cross-piece bet ween, or perhaus with a hase in which is a drawer. Others have a flap that lets down in front and rests upon supports that pull out. The fraine may be of mahogany, walnut, or the cheaper woods. Sonic are inlaid with a line of satinwood, while others are hand painted or lacquered in black, green, red, or yellow, with raised designs gilded and lined with black in the Chinese style. Triple mirrors are also made both framed and frameless. (See pages 390, 391.)
Toilet mirmes can be placed on any table or chest of drawers, provi. ded it is a suitable height. For a ma hogany piece a plain Chippendale design is perhaps more suitable. Mirrors with only a frame, or only $n$ frame with $n$ box or shelf at the base, are frequently very useful for hanging on the walls of bedrooms, bathrooms and dressing-rooms. Sometimes these are hung above a dressing-table. Others are fixed to a door or the inside of a wardrobe door.
Many of the mirrors made to-day are reproluctions of l8th-century picces, and a typical example is here illustrated of Qucen Anne style in walnut with gilt gesso dicoration. Most of these mirrors swing from uprights that rise from bases baving three trinket drawers, this being a pattern that has heen much copied Their frames have a decorative shaping at the upper part, and occasionally a cresting such as is seen on the wall mirrors of the prriod. Some of these are inlaid with veneers, and occasionally two or even three sets of drawers, one above the other, are seen in the lower part.

A magnificent example of Qucen Anne worl: in the Victoria and Albert Museum. It is of pinewood and is decorated with gold lacquer in the Chinese style on a green ground. Jelow the glass, which is in a rectangular frame are small drawers and pigeon holes very like those seen in a bureau, the resemblance being carried further by the presence of a lid that when open serves also as a desk.

Later, in mid-Georgian days many ova! toilet mirrors were made. The cxample here illustrated with the cut-glass toilet set is typical of the mahogany style in vogue with its curved support and lower part inlaid with satinwood lines, bow fronted, and having three drawers. See Bathroom; Dressing Table. Mirror: Qucen Anne Sty!e ; Silvering.

TOILET SERVICE. Sets of toilet ware for the washstand are sold under the name of toilet services. They are sold in single or double sety. The single set of five pieces is composed of basin and ewer, chamber, soap dish, and tooth-brush vase. The double service is composed of 12 pieces, which includes a toilet pai! and sponge bowl. The last two articles can be bought separatcly and added to the single service. Sets in stock patterns


Toilet Mirror in Queen Anne style, made of walnut and decorated with gesso work
are to be had in many good designs, any article of which can be replaced in cvent of breakage. Spode designs look particularly well with manogany, and are reproduced with squat-shaped or tall ewers.
Servises in plain bright colours mitist be chosen with due regard to the colour scheme of the room. Sometimes the tiles in the fireplace arc matched, or a predominating shade in carpet or curtains. For small and corner washstands the mininture services in a Spode design or in willow pattern are pretty. For a country cottage leadless glaze toilet services are liked, also sets of rough brown pottery with vellow glaze inside. Glass services are heautiful and costly, whether of cut crystal or decorated with gold.
TOILET SET. A toilet set usually refers to the collcction of articles that stand on the dressing-table, and the toilet service to those that stand on the washstand, although the two are sometimes confused. The usual constituents of a toilet set are a brush tray, two scent bottles, a powder jar or bowl. ring stand, and one or two sminll vessels for holding cold cream ctc. A beautiful set in modern English cut crystal is here illustrated in which a pair of candlesticks is niso included.
Sometimes the whole equipment of a dressing table including hair brushes, etc., is hought to match. In silver, for instance, the articles can


Toilet Set. Modern English cut-glass toilet accessories look their hest on a polished mabogany dressing table, as illustrated in this photograph

Courtesy of Webb d Corbett
and some, such as those of Reading and Sheffield in gold.
Tokens of the first period are generally thin pieces of copper. or other bnse metal, aliont the size of a sixpence, and forgeries are scldom met with About $20,(10)$ varicties of these quaint little tokeus are believed to have been struck, but only about half that number are extant. These are catalogued in countics, in a work by the late William Boyne, which may be consulted at any large public library.
The second and third periods exhibit better workmanship on more sulistantial disks of metal, and contain many private tokens, that is to say imitation tokens issued by collectors for exchange with other collectors. These private tokens are not currency tokens, and good anthorities, such as Charles Jye have noted and distinguished all the private tokens of the second period.

Other more or less spurious pieces of the two later periods are : The several serics of public buildings (notably at Coventry, Birmingham, and London, and in the scattered series with a globe on the reverse) made by coin dealers for sale to collectors political and satirical picces, such as Spence's and medalets-all easily diatinguishable by their designs and legends: mules, so called from each being struck from two dies never originally intended to lre combinel for one coin, non-local tokens manufactured in mass by die-sinkers to sell to traders, who profitably circulated the stuff without liability for redemption ; any apparent token not showing clearly the name of the issuer and the place of origin or redemption.
The most confusing of the spurious pieces are the mules of the second period. Expe-


Token. Obverse and reverse of tradesmen's copper coins issued in Great Britain. 1. London (Jewin Street) halfpenny, 1667 . 2. Swansea balfpenny 1796. 3. Cheltenham penny, 1812
rience, however, and a reference to Charles Pye's volume of plates, will soon train the collector's eye to reject spurious pieces. Mules of the third period are comparatively scarce. See Coin Collecting.

## Tomatoes: Growing and Cooking

## With Recipes for Some Tasty and Economical Dishes

This contribution deals first with the growing of this userul plant, the section including some lnfo mation about the diseases to which it is subje:t. Information about various ways of cooking the fruit follows. See Disbudding; Greenhouze; Kitchen Garden ; Omeiette; Salad; Snow Fly

This half-hardy plant, of which the fruits superphosphate of lime and liquid manure are used ns vegetables, has incrased enormously in popularity in recent years and immense quantitiee are sent to market. It can be grown to produce fruit throughout spring and summer under glass a nd out of doors in summer.
For summer fruiting it is raised from seeds sown in a heated greenhouse in February; the seedlings arc potted singly in small pots in a compost of loam and leaf-mould, and subsequently in 5 -in. pots in loamy soil. The plants should be grown in a temperature of about 50 degrees, the greenhouse being ventilated freely in mild weather; close, moist conditions will lead to failure.

Early in June tomato plants may be planted out of doors : a border at the foot of a sunny wall or fence is the most suitable. The soil should be dug deeply but not manured and must be trodlen firmly; tomatocs do not thrive in loose soil. The plants are set about 2 ft . apart and are supported by strong stakes. Al! side shoots must be rubbed off to restrict each plant to $\Omega$ single stem. When the first fruits are set, superphosphate of lime, at the rate of 2 oz. per square yard of grounul. should be applied and forked beneath the surface. The tops of the plants should be cut off when three or four bunches of fruit have set.

If the summer happens to be dry and warm tomatoes will do well in the open garden, but in a dull, wet season they are likely to prove disappointing.

For cultivation under glass the plants in 5 -in. pots should be re-potted into those 9 or 10 in . wide, or planted in a border of loamy anil not more than 12 in . deep and made firm by treading. The stems must be supported by stakes. The secret of success is to keep the plants as cool as possible and the soil moderately moist. Free ventilation is necessary. When the fruits are well developed
inay be given alternately once a fortnight. Great care in watering is necessary, especially if the tomatocs are p!anted in a border ; if the soil becomes sodden the plants are not likely to do well. To produce a crop of tomatoes in spring under glass, seeds should be sown in $\mathrm{S}_{\mathrm{t}}$ ptember.

There are innumerable varieties of tomato almost every scedsman hay his special sorts. Some of the best for cultivation out of doors are Essex Wonder, Bide's Recruit, Best of All, Ailsa Craig, Sunrise and A1. For cultivation under glass Princess of Wales, Abundance, Scarlet Beauty, and Earlicst of All are suitable. The yellow tomatoes, e.g. Golden Perfection and Golden Queen, are more suitable for the greenhouse than for out of doors.

Tomato Diseases. The chirf discases which affect tomatoes are black spot, sleeping dis ease, and yellow spot or stripe. Black spot attacks the eye of the fruit and causes it to crumple up and decay. Sleeping disease attacks the leaves of the plants. It causes them to lose their freshness of colour and droop, with the result that the whole plant ultimately perishes There is no effective remedy, and affected plants should be destroyed. The house in which the pest is found may be disinfected by a spray of a solution of sulphate of iron.
Stripe is mainly a disease of plants grown under glass, but it has been seen on those grown in the open in a position facing south and sholtered by a high wall. The symptoms are dark, vertical stripes on the stoms, brown sunken patches on the fruit, and brown shrivelled areas on the lraves. The disense frequently occurs in the seed bed, producing rapid destruction of the plants and necessitating fresh sowings.

The varicties of tomatoes differ very much in their susceptibility to disease. Generally
speaking, those varieties that show rapid, soft growth in the early stages are most susceptible to stripe Manure has considerable influence upon this susceptibility As with other diseases, excessive quantities of nitrogen and a lack of potash tend to lower the resistance power of the plant to the invasion of the parasite. The effect of too much nitrogen can be largely counteracted by an increase in the amount of potash. Sterilization of the soil by beat should be practised when an attack has occurred. Dry, airy conditions should be maintained under glass Soil infected by celworm ought to be removed from the glass. house and replaced by fresh soil.

How to Cook. Tomatoes that have been picked before they are ripe may be used to make chutney, but if it is desired to ripen them they should be placed in rows on a shelf in a warm room or where the sun can reach them. A little space should be left between each, otherwise they will become soft. Tomatoes too soft for serving whole, but only bruised and not over-ripe, may be used for stews and soups, but those that are to be served raw should be firm and unbroken Tomatoes give a good flavour to stewed beef and mutton To peel tomatoes without damaging the pulp, dip them into boiling water for a few seconds, and the peel will then come away casily They should not be left in the water too long, otherwise they will become partially cooked

Boiled tomatoes can be served either as a substitute for, or in addition to, a green vegetable. To prepare them, wipe them with a clean cloth, pull off the stalks, and drop them into a saucepan of slightly salted boiling water. Boil them slowly for 5 min . or a little longer, then drain them, place a few small pieces of butter on them, season with pepper and salt, and serve in a hot vegetable dish

Breakfast Dishes. Grilled tomatoes are excellent with bacon or sausages. Cut each tomato in half, season with pepper and salt, and place it under the grill. Fried tomatoes served on slices of fried bread are also a good brenkfast dish. Fry the bread in some beef dripping. then cut the tomatocs into halves and fry them in smoking hot fat until thev are tender. Selve three or four halves on each piece of bread, according to its size.
Tomatoes stulfed with fish can be made thus: Choose 1 lb . firm. even-sized tomatoes ;


Tomato. Fine fruit of the variety Sunrise
with a sharp knife cut a round piece from the stalk end of each, and scoop out some of the soft interior, reserving the pulp. Take the skin and bones from $\frac{1}{1} \mathrm{~b}$ cooked dried haddock, break up the flakes, and mix them with a large tablespoonful of boiled rice, a tablespoonful of chopped pickled gherkins. a chopped hard-boiled egg, 1 oz. melted margarine, the tomato pulp and seasoning to taste If the mixture is too dry, a little milk may be added Fill the cavity in each tomato with this stuffing, heaping it slightly on top Sprinkle over some browned breadcrumbs then bake the tomatoes in a moderately hot oven until they are tender, but not broken. Have ready a croûton of fried bread for each tomato, placing the latter on top and serving very bot
Devilled tomatoes, served on squares of grilled ham. are prepared thus: Cut 3 or 4 tomatoes into thick slices and spread each slice with a mixture made by seasoning a lump of butter about the size of a hen's egg with mustard, pepper, salt, and cayenne Bake the slices on a tin in a moderately hot oven and serve them as has been already stated.
thoroughly hot, put it into a pie-dish, and place the slices of cooked tomato on top Serve sprinkled with chopped parsley.

A savoury supper or luncheon dish is pro vided by tomatoes au gratin. To prepare it, mix 1 lb breadcrumhs with the sume quantity of grated checse, and shake a layer of them into the bottom of a greased fireproof dish. Cover them with some thick slices of tomato and a little chopped onion, add a sprinkling of pepper and salt, and continue these layers until the dish is full. About 2 lb tomatoes will he required. The last layer, which should be a fairly thick one, must be of cheese and crumbs. Put 3 or 4 small lumps of butter on top, and bake the whole in a hot oven until the top is browned. The dish should be sent. to table immediately it io ready
Tomato Chutney. To make this chutney, put 6 lb . sound tomatoes into a large enamel pan, break them with a wooden spoon, and then add $1 \frac{1}{2} \mathrm{lb}$. apples cut into quarters but not peeled or cored, 3 small onions peeled and minced, l oz. crushed mustard seeds, $\frac{3}{3}$ oz ground ginger, 4 oz . salt, a small teaspoonful of cayenne, and 13 pints malt vinegar.

Bring all these to
the boil, then simmer them until they begin to soften. Add 1 lb . moist sugar, stir until it dissolves, and then continue simmering until the tomatoes and apples are a soft pulp. Rub them through a hair sieve, stir them well, and bottle the chutney in two days' time

Tomato Jam. This vegetable jam can be made by wiping and stalking 6 lh tomatoes, cutting them into slices, and putting them in a preserving pan with $1 \frac{1}{2}$ pints water. Cook them slowly until they are tender, then rub then, together with the water in which they were cooked, through a sieve Put the purée
back into the pan with 5 lb sugar and the strained juice of six lemons
Bring the whole to the boil, remove the scum, add the grated rind of the lemons. and continue boiling for about 45 min . or until the mixture forms a jelly. Stir the jam occasionally to prevent it from burning, and skim it whenever necessary. When it is sufficiently coo! turn it into pots, tie it down when quite cold and store in a dry, cool place.

Tomato Ketchup. For this relish 4 ib .
 cloves, and allspice, a gill of vinegar, and a little salt are netded Cut the tomatoes in halves, place them on a dish with the cut sides upward and sprink!e them with salt. Leave them thus for 24 hours, then put them into a pan and simmer them until the skins become loose Strain them through a coarse sieve. and to the liquid add the minced onion, the ginger cut into small pieces, and the pounded cloves and allspice. Turn all into an enamel pan, and boil them unti! they are reduced by one-third Add more salt, if necessary, and when the ketchup is cold strain it into bottles Store it in a dry, cool place.

Tomato Omelette. A savoury omelette, with tomato and onion as flavouring ingredients, can be made thus: Melt $\frac{3}{4}$ oz. butter in a small frying pan. and fry in it a slinned tomato cut into slices and 1 teaspoonfu! chopped onion. In the meantime separate the yolks from the whites of 2 eggs, beat up the former, adding salt and pepper to taste and a teaspoonful of grated cheese Whisk the whites with a pinch of salt to a stiff froth, and fold them lightly into the yolks.

Melt ${ }^{3}$ oz. butter in an omelette pan, and when it is hot pour in the egg mixture, stirring it round to prevent it from sticling to the bottom of the pan. When it begins to set, place the hot tomato and onions in the centre, and linish the omelette in the usual way.

Tomato Sauce. Tomato sauce for serving in place of gravy may be prepared with fresh or tinned tomatoes. Weigh out $\frac{1}{2} \mathrm{lb}$. tomatoes, wiping them and cutting them into slices if they are fresh; then put them into a saucepan with an onion and a carrot, pceled and sliced, $\frac{1}{2}$ oz. margarine, $1 \frac{1}{2}$ gills stock or water, $\frac{1}{4}$ teaspoonful celery seeds tied in muslin, a teaspoonful sugar, and pepper and salt to taste. If tinned tomatoes are used, only 1 gill stock will be required
Cook the whole slowly until the vegetables are tender, then take out the celery sceds and rub the sauce throngh a hair sieve. Put it back into the sauce pan, thicken it with a teaspoonful of corn flour mixed to a smooth paste with a tablespoonful of oold water, and then let it boil slowly for 5 min . stirring all the time.
Tomato Soup. To make tomato soup, put into a frying pan 2 oz . ham or bacon, cut into dice, and 1 oz. butter. liry in this for 5 min . a carrot, a turnip, 3 sticks of celery or a little celery seed, and a bouquet garni ; then add 2 lb . ripe to matoes, or for pref erence 2 lb . tinned ones. Let all simmer for 20 min .; afterwards remove the bouquet and pass as much as possible of these ingredients through
a hair sieve. Have ready at boiling point a of 40 . Predisposing pint of good, well-scasoned stock, which should be thickened with $\frac{1}{2}$ oz. corntlour made into a thin paste with some stock. Add the pure to the stock, and, if required, a squcéze of lemon juice and some more seasoning. Boil up and simmer for 10 min ., stirring well. Fresh tomatoes may need rather more stock than the anount mentioned.
TON. This measure of weight consists of $2,240 \mathrm{lb}$. or 20 cwt . It is used for weighing coal and other heavy materials. See Avoirdupois Weight.

TONGS: For Household Use. Tongs arc appliances for gripping and moving any object with safcty or conifort, and without soiling the hands. In their general form for louschold use, in moving coal from the scuttle to the fire, they consist of a pair of levers pivoted at one end, or with an open spring loop, their length depending upon the purpose for which they are required. The longer varietics have a handle fitted at the end at which they are pivoted. These are now seldom used, but are still seen in ornamental brass and stcel as a decorative finish to period fenders or curbs of the same metal. Tongs are a component part of a set of fire irons. (See page 458.)

TONGS: For Metal Work. Special tongs are used to hold iron pipes in gas and hot water fitting. The gas tongs illustrated in Fig. I is a convenient tool for gripping gas piping without damaging the pipe. It is made of forged stcel and hardened at the gripping end. One end is curved to encircle the pipe, while the other end is short and has a sharp, square inner edge which bites into the softer metal of the pipe, thereby holding it securely. Tongs of this type are made only for one size of pipe.

A further application of tongs is found in the blacksmith's trade. These invariably take the general form of those illustrated in lig. 2, the salient feature being that their handles arc long compared with their gripping ends, in order that great leverage, and therefore gripping powers, may be applied. The larger of the two pairs illustrated is made primarily
of 40. Predisposing decayed or broken teeth, badly fitting dental plates, excessive smoking, and anything that scts up inflammation or irritation.

Acute inflammation or acute glossitis is most often caused by wasp stings, or stings and bites of other insects ; also by burns and scalds, and by wounds which become scptic. Treatment would be directed by a doctor.
The commonest cause of chronic inflammation are syphilis, tobacco smoking, drinking alcohol not suffiattaclis of acute inflammation. to be held in the mouth. ciently diluted, decayed tceth, and previous

Uleers of the tongue may arise from injury or dyspepsia. The former variety is generally due to decaycd teeth or badly fitting artificial teeth. The ulecrs due to dyspepsia are generally on the tip and upper surface.

Wounds are most commonly caused by jagged teeth, but may be caused by the person biting his own tonguc, or by instruments or weapons. If bleeding is rery free, try to grasp the wound firmly between the fingers while awaiting the doctor. Otherwise give ice

Tongue as an Aid to Diagnosis. The state of the tongue varies in different diseases, as the following particulars will show: In chronic dyspepsia the tongue is often swollen. flably, and coated with fur, which may be white yellowish brown, and sometimes black. In

for gripping Hat picces of metal and enabling the latter to be held sccurely on the surface of the anvil while forging is in progress. The smaller pair inds its greatest use in gripping chisels for the purpose of cutting metal by that tool. In this par ticular case the chisel would be held in position by an assistant while the blacksmith applied the hammer. See Casting; Forge: Pipe; tongue is coated with a thick white or Plumbing; Spanner; Wrench.

TONGUE : Its Diseases. The tongue is composed of a number of different muscles the fibres of which run in various directions. Over the surface are scattered numerous small, reddish, pointed projections, which have to do with the sense of taste. The chicf duties of the tonguc, in addition to acting as the organ of taste, are to assist mastication, swallowing, and the pronunciation of words.
Amongst diseases of the tongue is cancer, which is about six times as common in men as in women, generally occurring about the age
acute gastritis the fur is white, but does not extend to the tip and cdges of the tongue, which are bright red. In prolonged constipation the

'longued Joint. Fig. 1. Plane used in preparing tongue. Fig. 2. Use of grooving plane
however, needs longer soaking and very slow cookiny. Pigs' tongucs are prepared in the same way as sheep's tongues. Cold tongue, cither alonc or with salad or cold cooked ham, makes a particularly good luncheon dish, and, like most other cold meats, can be made into sandwiches. It inay also be potted.

There are various ways of serving cooked tongue when a hot dish is needed. If minced, combined with breadcrumbs, and heated up, for instance, it nakes excellent savouries. Pass the tongue through a mincing machine; then pound it with about one-third its quantity of breadcrumbs and ewough sauce to bind it. Season it with caycune and a little lemon juice and rub the whole through a siece before heating it over a slow fire. When it is thoroughly hot, pile it high in some newlyfried cases of bread and garnish each savoury with a little parsley

Another incthod of heating up cold tongue is to cut it into neat slices, season them to taste, sprinkle them with lemon juice, and let them stand for a while before dipping them in egg, coating them with breadcrumbs and then frying them to a golden brown colour in smoking hot fat. Serse them at once, garnished with parsley and thin slices of lemon. See Calf's Head ; Ox Tougue ; Potted Meat: Shecp's 'Tongue.

TONGUED JOINT. This is a joint in which a sma!l projection along the length of one part, known as the tongue, fits into a slot or groove in the other part and so completes the joint. A common application is found in tongucd and grooved floor-boards. This material is finished on one side and generally measures in width 4 in . to 5 in . The average thickness is nominally 1 in., but actually it measures slightly orer $\frac{\pi}{8} \mathrm{in}$. Thicker boards are available, but are seldom used except in high-grade work or where very considerable strength is needed, ordinary 1 in . tongued and grooved flooring being guite satisfactory for most domestic work. The amateur will find that this elass of timber with its tongued
joint is extremely useful for a great many purposes.

In the construction of tongued joints, a tonguing and grooving plane is usually entployed, such as that illustrated in Fig. 1, which has variously shaped irons and adjustable fences, and makes grooves $\frac{1}{i n}$. in width. On one side is an adjustable fence composed of a strip of hardwood which locates the position of the groove in respect to the working face of the material.
The niethod of using this plane, as illustrated in Fig. 2, consists of securing the work in $n$ vertical position on the bench between blocks of wood or by holding it in the bench vice. The plane is rested on the upper surface of the work $w$ ith the fence resting against the face, and worked backward and forward in the usual way. The tongue can be made with the same plane, and finished by the regular tonguing and grooving plane or matching plane, specially prepared for the purpose The plough plane is also used for this class of work.

Tongued joints are found in many kinds of woodwork, particularly in cabinet work and the better quality joinery. Examples are also seen in metal-work. In both cases they are akin to the feathered joint, except that, instead of using a separate strip and sinking it into a groove in cach piece of material, the joint is formed from the solid. For woodwork, the tongued joint forms one of the best methorls for jointing the edges of long picces of material, and when well cramped up and supported by cross battens it makes a particularly rigid structure. See Joint; llane.

TONIC. Drugs or mixtures of drugs which increase the efficiency of the body as a whole, or of any of its systems, are called tonics. Thus there arc nerve, blood, heart, and general tonics. The following are cxamples of a tonic designed to brace up the nervous system :

## Tincture of nus vomica <br> Spirit of chloroform.. <br> Water, enough to malie <br> Dose for a grown person : I tables oz."

 a day after meals.Solution of strychnine hydrochloride.
poonful 3 times Iron and quinine citrate
Spirit of chloroform.
Tincture of calumba Water, enough to mak Water, enough to make ... 6 o\%." Make into a mixtıre. Dose: $\frac{1}{2}$ to 1 tallespoonful
The following arc examples of tonics directed towards improving the quality of the blood:


Water, enough to mais 102.

Make into a mixture. Dose for a $\downarrow$ rown person: 2 tablespoonfuls 3 tines a day after meals. Sulphate of iron
 8 oz.
Make into a mixture. Dose for a grown person: $\because$ tablespoonfuls 3 times a day. This prescription is appropriate when there is any tendency to coustipation
The following is an example of a bitter tonic often very valuable where the patient's appetite is capricious and he is run down:

| Tincture of nux vomica | 2 drims |
| :---: | :---: |
| Iron and quinine citrate | 2 |
| Dilute phosphoric acid | 4 |
| 'Tincture of orange | 2 |
| Chloroforn water, enough |  |

Trincture of orange
Chloroform water, enougli $i_{0}$ make
Make into a mixture. Dose : 1 to 2 teaspooniuls
an hour before cach meal. ? an hour before cach meal.
The following is an example of so-called simple digestive tonic mixtures:

$$
\begin{aligned}
& \text { Tincture of cascarllla } \\
& \text { Dilute hydrochloric acid } \\
& \text { Syrup of orange } \\
& \text { Water, enought to naike }
\end{aligned} .
$$ 2 to 4 teaspooniuls 3 times a day.

One of the best all-mound tonics for general debility is Easton's syrup, dose, $\frac{1}{2}$ to 1 dram

3 iimes a day alter meals. No tonic shouid be taken for longer than a month or 6 weeks at a stretch, as otherwise it may upset the digestion, also losing its original cfficacy.

TONING : In Photography. Toning is a method of chinging the colour of a photographic print after development and after or luefore fixing. Whether on P.O.P. or bromide paper, all prints which include a silver salt in the light sensitive film can be toncd. Prints made on P.O.P. by daylight invariably need toning, as otherwise the colour is not pleasing. Prints made on gaslight or bromide papers are only toned when it is desired, from black and white to warmer colours or tints.
Nany varicties of P.O.P. have toning chemicals included in the film on the surface of the paper, so that when placed in the fixing bath toning is carried on automatically at the same timc. These are known as self-toning papers (q.v.). With the non-toning printing-out papers the toning process may be combined with the lixing, or the two operations may be carried out separatcly. The latter is the better course, as when a combined bath is used there is a risk that the print may be removed from the bath before fixing is complete because the desired colour has been obtained. Thus prints, not being sufficiently fixed, will not be permanent.
Toning of P.O.P. This is practically always carried out with a salt of gold, although warm black tones can be obtained by using platinum compounds. Both agents are extremely expensive, but are only required in minute quantities. The gold is used in the form of gold chloride, sold in tubes containing 15 gr.
The following are standard formulae for gold toning the common gelatino-chloride papers :

Gold Stock Solution
$\begin{array}{llllllll}\begin{array}{l}\text { Gold chloride } \\ \text { Water }\end{array} & . . & . . & . & . . & \text { to } & 15 \mathrm{gr} \text {. } \\ 15 & \mathrm{oz}\end{array}$
Sulphocyanide Stock solution
Wamonium sulphocyanide .. $\quad$. 100 gr .
For use, mix in the following order:
Stock solution 13
Water
Stock solution $\ddot{A}$ 20 oz
$2, "$
A bath recommended by the Ilford Company for warm tones is the following: Stook Sulphite Solution
Sodium sulphite in $\begin{aligned} & 15 \mathrm{gr} \\ & 10 \mathrm{gr}\end{aligned}$
The toning bath is made up as follows :
Stock solution A
stock sulphite solutiou
Nitock solution 13

Mix in the order given. The sulphocyanide toning bath should not be used more than once. If a large number of prints are being toned at the same time, it will be found necessary to strengthen the bath when toning becomes slow. This may be done by adding small quantities of the following solution, which must be made up as required :

## Water

Stock solution B
50 oz
1
5
All gold solutions work best after they have been allowed to stand for at least 24 hours. This toning bath will give red to purple tones. Before toning P.O.P. in this or other baths, prints must be well washed in water until the washing water shows no trace of milkiness. At least six changes of water are required if running water is not used. This washing removes the soluble silver salts from the paper, which would otherwise act on the gelatinc and produce discoloration.

In hot weather it is important to harden theprints before toning. They should be immersed for 10 min . in the following bath and washed thoroughly for 10 min . after hardening. The employment of this alum and salt bath will secure regularity of tone.
Common salt
Alum
(i) $20^{1 \frac{1}{2}}$,

Toning P.O.P. may be carried out in weak daylight well away from a window. A large porcelain dish should be used and kept for this purpose only. Prints are imnersed in the solution one by one, care being taken that air bubbles do not eling to their surfaces. The prints must be lept in constant motion and must not be allowed to stick together. If these precnutions are not observed, uncqua! toning or stains may result.

While in the bath the prints must be carefully watched, and a little experience is necessary to determinc when they should be removed. The colour gradually changes to brown, then to purple, ending with a slaty blue. The shorter the time of toning the warmer or redder the finished print, the longer, the colder or bluer will be the final colour. A cold solution is liable to give muddy tones, whilst a bath which is too warm will give pinkish prints. The temperature should be about $65^{\circ} \mathrm{F}$. A bath containing too much gold hastens toning, but gives muddy tones; while a slow bath, due to deficiency of gold or cxcess of sulphocyanide, gives pinkish tones.
When toning is judged to be complete, prints should be washed at once in running water to prevent continuance of toning. The quickest method of stopping toning is to immerse the prints in a weak solution of sodiun sulphite $5 \mathrm{gr} . \mathrm{per} \mathrm{oz}$. of water.

Poor negatives will never give good prints on gelatino-chloride P.O.P. Defects in the linished prints are due to the following causes : Handling the prints before toning with moist or greasy fingers will cause red patches. Allowing prints to stick together in the toning or fixing bath, or insufficient washing after the hardening bath, or other stages, causes unevenness of tone. Small quantities of hypo introduced into the toning bath will cause brown discoloration or coniplete absence of toning. It is, therefore, advisable to complete toning and washing before begimning fixing or otherwise handling hypo solutions.

## Combined Toning and Fixing.

If sufficient care is talien to ensure complete fixing, combined toning and fixing will give good and pleasing colours. The prints must be made distinetly darker than when separate toning is carried out, and placed face downward without previous washing, as distinct from the careful washing of separatcly toned prints, in the combined bath. They must be left in the hath at least 7 min . to ensure lixing : they should not be in more than 10 or 12 min . Following is a good formula :

Dissoive in hot water in the order given and prepare at least 24 hours before use, shaking well. After standing, decant the clear liquid, allowing $\frac{1}{2}$ oz. for each 1 plate print. Throw away after use. Keep the prints moving.
Sulphide Toning. Gaslight and bromide prints may be toned in a variety of colours. The most popular process is the sulphide method, because of its simplicity, good colours, and permanent results. After fixing and washing, bromide prints should be dried before toning by the sulphide process.

The print is first bleached in the following bath, which can be made up as a stock solution and used until its bleaching powers fail:

> Potassium ferricyanide
> Potassium bromicle
> $\because$ to $20 "$

The solution should be stored in a yellow or lirown bottle away from the light. The print bleaches to a faint yellow in a few minutes in this bath, is then rinsed well, not washed too long, and put into a sorlium sulphide toning
bath, which restores the image in fine brown and sepia tones. Make up a stock solution of 2 oz. of pure sodiun sulphide (white, not green crystals), in 5 oz . of water. For use, take $\frac{1}{2} \mathrm{oz}$. of this solution and add 10 oz . of water. The print is toned rapidly, and no variation in colour is obtained by leaving it in after the image is completely redeveloped. Wash thoroughly for about 15 min . in running water. After use, the sulphide solution must be thrown away.

Variations in colour with this process can be obtained by first bathing the print in the sulphide solution, then washing, bleaching in the ferricyanide solution, and finally redeveloping in sulphide solution. To get deep sepia and warm black tones the process is carried out as first described, with the exception that bleaching is stopped before it is complete. The more of the original black image left the deeper will be the final colour.

All the processes described above for bromide papers are applicable to the toning of lantern slides. See Developing; Fixing; Negative; Photography ; Printing.

TONSIL. The tonsils are two sinall glandular bodies situated on each sidc of the back part of the mouth, at its juncture with the throat. Their main function appears to be that of trapping toxic matcrial as it passes backward from the mouth. See Adenoids.

TONSILLITIS. Inflammation of the tonsils is of several types and occurs in an acute and a chronic form. The former occurs inost commonly in young people during spring or autumn. People of a rheumatic tendency are more liable to the disease than others. The most common causcs blamed for exciting an attack are exposure to cold and damp or to overheated and impure air.

The earliest symptom of acute catarihal tonsillitis is pain when swallowing. If the tonsils are examined they will be scen to be red and swollen, dry at first and then covered with a layer of mucus mixed with pus. An attack scldom lasts more than a few days. It is often associated with pharyngitis, and may be followed by inflammation of the middle ear.

The symptoms of acute follicular tonsillitis are more severe. The patient should be kcpt away from other members of the family, as tonsillitis is more or less contagious, and it is not always easy at first to distinguish between an attack of this discase and diphtheria. He should not be allowed to talk or to swallow anything but liquids or semi-solids.

To prevent relapses the mouth and teeth should be cleansed morning and night, some antiseptic mouth wash being used. A good protective measure is to hathe the neck in cold water.

Chronic tonsillitis, popularly known as enlarged tonsils, is usually the result of repeated attacks of the acute form. It is met with mainly in children from 5 to 15 years of age, and is more common in boys than in girls.

Usually the affected child breathes through the mouth, keeping it always open, in consequence of which he has a stupid expression. At night his breathing is noisy and irregular, and he is often the victim of nightmare and night terrors. Cough may be troublesome at night. The patient is especially liable to attacks of nasal catarrh. He continually hawks up mucus from the throat. At times swallowing is painful, and both the sense of taste and the sense of smell are often defective. The bearing also is frequently impaired, and this may develop into complete deafness.

In very slight enlargement, measures to build up the health may be effective in subduing the symptoms and preventing the development of the enlargement. But the correct treatment of diseased tonsils is to have them removed. See Adenoids; Quinsy.

## Tools for the home Worker

## A Selection to Suit All Ordinary Requirements

This contribution gives some detailed advice on the selection and care of tools for simple wood and metal work. Further information about individual tools will be found under such specific headings as Chisel; Plane; Saw. See also Amgteur Carpentry; Bench, etc.

Prepared collections of woodworking tools
ften contain some which are seldom used by often contain some which are seldom used by the beginner, and it is better for the amateur to start with the fow indispensable tools and add to them gradually as he acquires dexterity and experience in his hobby. The outfit desirable for simple carpentry will also be adequate for most of the odd jobs which fall to the handyman, if supplemented by a few metal working tools. A start could be made with the following, and if desired only those marked with an asterisk (*) need be procured at the outset.
${ }^{*}$ Haminer, Fixeter pattern, $\frac{2}{2} \mathrm{lb}$.
*Pane" ball peine, 1 lb .
*Panel' saw, 24 in .

- Tenon saw, 15 in .
*Screw driver, London pattern, 9 in.
Ratchet screwdrlver, 3 in. blade
${ }^{2}$ Gimlets
${ }^{2}$ Bradlawls
-Carpenter's brace
*Set of centre bita; * 3 twist bits; turnscrew bit countersink for wnod, rose bit countersink, flat countcrsink bit for iron, auger bits, $\}$ in., 是 in., $\frac{1}{2} \mathrm{in}$.
- Steel rule, 2 -ind 24 in.
-Carpenter s square, 8 in
Spirit level, 10 in
Marking gainge
Compass saws (handle and 3 blades)
Compass saws
Coping saw and spare blades
Chisels, firmer, *t in. ; $\frac{2}{6}$ in.; $\frac{1 \mathrm{in} . ; 1 \mathrm{in} \text {. }}{\text { Cong }}$
- Mallet, joiners
- Metal vice 4 in. jaws; C'arpenter's bench vice

Spokcsliave, metal
Jack plane, 2 in. iron
-Smoothing planc

- Nail punch

Putty knife
Glass cutter (whecl)
-Glue pot
*Oil stone in case

- Pincers, Lancashire, 8 in.

Wing compasses, 8 in.
Hand axe, American pattern
Combination pliers, 8 in.
Centre punch
Hand drill and set of twist drills ( $\mathfrak{r}^{1} \mathrm{in}$. to l in . rising by $\frac{y}{y}$ in.) in metal holder

Broaches, $\frac{1}{}$ in. $\frac{1}{2}$ in., and 1 in.
Broach holder, adjustable
Files: *Saw fle, 6 in.; hand filc, 8 in. basta
cut

Cold chiscls, that chipping, ${ }^{*} 8 \mathrm{in}$. by $\frac{1}{\frac{1}{2}} \mathrm{in}$; 16 in . by ${ }_{8} \mathrm{in}$.

Mason's hammer 2 lb
Soldering blt, adjustable, 1202.
Tinman's snips, straight, 8 in.

- Adjustable spanner wrench, 10 in.

Adjustable pipe wrench
Set of fixed spanners
Tools should be kept in a simple rack or in shelves adapted to each type or group of tools. Orderliness preserves the tools and saves tine.

In the article on Amateur Carpentry will be found helpful information about the lay-out of a workshop and the arrangement of a bench. Should the home worker decide to make his own bench he will find the necessary plans and details in the article Bench. As a makeshift a stout false top can be used on the kitchen table if the latter is of substantial construction. The top should be of 1 in . T. \& G. flooring or similar stuff, and can be cramped to the table top when in use by a pair of 6 in . G cramps. A piece of board can be interposed between the screw of the cramp and thc underside of table to prevent marking the latter, and a recess might be formed in the upper side of the false top to take the jaw of the cramp.

With the kit of tools enumerated above the handyman will be equipped to tackle all sorts of repairing jobs about the home, and to do simple constructional work. Since timber can readily bc obtained in a prepared state, the amateur will not be called upon to do much planing. If he further arranges for his
boards to be ripped to width at the timber yard (in cases where a stock width board will not work in) there need be little sawing but that involved in cross cutting to the desired dimensions.

Moulded sections in a wide and usefus variety can be obtained, and turned sets of legs suitable for tables, cabinets, or stools The stiles and rails for a panelled door, e.g for a cupboard, can be made from ready grooved material, the groove being of a size to take stock plywood. The legs for a cabinet can be purchased with grooves formed in them, saving much labour to the novice. These refinements permit of quicker and easier construction, and avoid the purchase or use of tools like the moulding planes, plough, fillister. etc. Joints can be simplified by the use of dowels to a considerable extent.

The woodworker as his skill increases may desire to undertake cabinet making and perhaps inlaying, marquetry and similar ornamental work. The tools for these are detailed in the specific articles on the subjects mentioned. Woodcarving also demands tools of a special nature.

Apart from these special requirements the worker can well supplement his tool kit with the following:

Rip saw, 28 in., 4 points to incl,
Hand saw, 26 in., 7 points to inch
Bow saw
Trying Plane, 24 in .
Rebare planc
Side fllister
Slough
Mortise chisels, is in., is in.
Mortise gauge
Firmer gouges, $\ddagger$ in., $\frac{1}{2}$ in.. in
Saw set and assorted saw files
Sash cramps (2)
Plunb rule
Plumb bob and line
Bevel square
Half round rasp, 8 in
Mitre box
In place of the scparate rebate, fillister and plough planes mentioned above, the worker could buy a combination tool with an assortment of cutters.

## Tools for Outdoor Work

For outdoor work the following will be handy : farmer's saw, for cross cutting rough wood ; Kent axe, draw knife; beetle or maul, for driving posts, splitting timber, etc.; one or two alngers and handle; brick trowel, 10 in . ; pointing trowel, 5 in .; sledge hammer, 3 lb . If a permanent workshop is available it will pay to invest in a leg vice, which stands on the floor and is screwed to the bench. A small nnvil will be invaluable for riveting operations, and can be had to rest on bench, or with a spike to knock into a wooden block. The latter is useful in dealing with a job which cannot be taken to the bench. The amateur who wants to do a little forging should refer to the article on that subject, where the necessary implements are detailed. A grindstone or some type of bench grinding machine will be needed to kecp the cutting tools in proper order.

The tools used in wood turning are dealt with in the article on that subject, while the amateur metal worker will find appropriate tools listed under such headings as Lathe; Metal Turning and Metal Work. The cutting of screw threads by hand and machine demands special tools, about which the relevant information is given in the articles Screw Cutting: Stocks and Dies. If any considerable amount of metal work is done it is well to include in the tool kit a small steel set square, spirit level, scribing block, surface plate and
sliding caliper gauge. A stecl rule about 12 in long is convenient for this worl:

Care of Tools. Ordinary wooden Irying, jack, and smoothing plancs are made of becch. In making a choice, the direction of the grain should be carefully noted; it should run straight along the side, and the annual ringe should be of large radius curving towards the sole. with the medullary rays vertical The irons should be double and with parallel sides, with the back iron well arched, and should fit snugly in the mouth. The menth of a new plane should be stopped with putty and the opening filled with linsed oil and left until line globules of oil appear on the ends, the surface being wiped over from lime to time. Iron blanes of the above type should have double irons, those fittel with single irons being of !ittle use for serious work.

Mach trouble can be avoided by tho annateur in planing if the right soit of plane is used for the work in hand. The smoothing plane, for instance. should on no account be used except lor taking the finishing slavings off a previously planed surface. This plane is short and liglit, the mouth is smail, and the irons should be set close together ; it is not intended to true a surface in the sense of making it level, but to render the trued surface perfectly smooth.
For most gencral purposes a correctly adjusted jack plane, either wood or metal, is capable of doing all the work the annatcur is likely to tackle, but, even considered as a general-purpose plane, there is a correct way of holding it, and several ways of adjusting it to suit particular uses. The shavings from a correctly set and properly sharpened jack plane shoulcl be parallel and have an even curl, and the sound of the cut is easily recog nizable by the experienced woodworker. The necessity of a sharp cutling edge is very important in the case of the simaller planes, such as the rebate, plough, beading, mou!ding, and similar tools, and it is not a simple matter to sharpen the sma!! curves while retaining the correct shape

## Choice and Care of Saws

Saws of all kinds should be of the best quality obtainable. The skew-back hand or lip saw with the blade extending well into the handle is generally preferred, as it is more under control and is not liable to work loose in the handle. The brass or iron back on a tenon saw should be heavy and made of stout inaterial, and it should be noted that its own weight ought to be sufficient to carry it through the wood. A good handsaw can be tested by the sound when struck sharply with the finger nail, and it should be possible to bend the blade to a semicircle without affecting its straightness

When not in use. tools should be kept in a drawer, cupboard, or chest, and arranged with a special place for each. When they are on the bench care should be takell that the cutting edges do not come into contact with other tools or with the bench. The planes should be rested on a thin !ath placed across the bench. The wedges should be carefully driven in with a mallet, but the same tool should not be used to adjust the iron. The mallet is the best tool to use when loosening the irons. The sole of the plane should be frequently wiped over with linseed oil, and to protect the surface umplaned wood should be brushod over hefore planing to remove grit, etc. The cutting irons of rebate, beading, moulding, and similar narrow planes are liable to damage if allowed to lie on the bench, and these tools should be put away directly after use
Saws should be hung up when not in use, unless there is a special place for them; they should be frequently wiped over with vaseline, lallow, or a good lubricating oil. If they are
not kept in a chest or cupboard properly supporied, it is a good plan to cover the cutting edges with a strip of wood in which a groove has been sawn. Chisels should be placed down on the bench after use with the bevel side downward as there is less risk in this way of the edge getting damaged but the better plan is to have a rack on the bench, conveniently placed at the back so that tools being used on a piece of construction can be placed out of the way of damage. The handles of chisels used for mortising soon become bruised on the ends, and unless the smal! chips are trimmed off they will act as wedges and split the whole handle. It is useful to keep a coarse-cut file handy for trimming the end of the wood.
On no account should wood-boring bits of any lind be allowed to lie on the bench after use ; they should be placed in a rack or drawer. The try square is another tool requiring careful usage, as it soon gets out of truth if allowed to fall on the floor or get knocked about. Quite as much care is needed with metal.
working tools, although they are as a rule heavier and less liable to damage. Tool racks should be provided for the metal-working bench, not only to prevent damage to tools, but in order to be able to find them when required. Metal clips are obtainable for attaching to the wall, but wooden racks or other suitable means of support are easily made. The amateur craftsman should make a point of providing a place for each tool and sec that it is in its place when not in use
'Tools such as a hand-drill need a special place in the tool box or cupboard, and shonld not be buried among all sorts of heavy imp!ements Smaller toola, well smeared with grease, caı be kept in a long narrow tin biscuit box Drills, reamers, broaches, taps, etc., are best kept scparate in Hat cigarette tins, each sort in a special box. Only one layer should be accommodaled in the i , or the cutting edges will sufler damage by contact with tools above The tools if greased will be free from rust, and the arrangement mentioned will enable any one to be found quite readily

## Tool Chest : How to Construct

## With Working Drawings for a Simple Type

Our article on the receptacle for the tools used by the amateur carpenter or mechenic is complenentary to the proceding one dealing with the selection and care of tools themselves. It is followed by a contribution describing how to make a tool cupboard. Reference should also be made to the entries on the various too's and processes
A chest large enough to take a complete lengths should be left as glued up. Tho width equipment is shown in Fig. 1. There are six of the back piece should be reduced to 19 in . shallow she! res, and the bottom is divided into the sides to the same width, and the front compartments. Half the front is hinged for greater convenience in getting at the shelves, and certain of the tools are attached to the inside of the lid. The wood should be sound yellow pine: if ordinary vellow deal is used it should be free from linots.
The main dimensions of the chest are shown in the sectional plan and clevations in ligs. 6,3 , and 4. The carcass is of 1 in . wood (linished size). and the wood should be at least $1 \frac{1}{8}$ in thick before planing. It saves much labour and time to have the wood machine-planed
The carcass of the chest, as in Fig. 5 , is made to inside measurements of 34 in by 18 in . by 18 in ., but as it is impossible to obtain pine or deal of this width it will he necessary to glue up 2 boards. Allowing for waste ends, 16 ft . by 11 in . by 1 in . and the same length of 9 in . by 1 in . boards will be required, with the top and falling front Hap.

First prepare the boards for glacing by planing up one side and edge, cutting the front and back pieces to $36 .!$ in. and the end pieces to $20!\frac{1}{2}$ in. long. Fach joint should be tested before glucing, as it is important that the join should be perfect. The pairs of glued boards shou!d be placed between cramps and left until the glue has set. If the wood is already machineplaned to the correct thickness, the elges only need be planed, but care nust be taken to have square edges to ensure the pieces having a true surface when glued.

The best method of joining up the sides of the carcass is by dovetailing, as in lig. 5, but an easier and al. ternative method is to use the lock corner joint. In both cases the
to $10 \frac{1}{2} \mathrm{in}$. wide. First maik off 17 in . each side of a centre pencil mark on the wood on both the back $A$ and front 13 pieces ( $\Gamma$ igs $3-5$ ), and then mark another line 1 in further along. The end pieces $C$ are marked ! in. each side of a centre line and then marked 1 in . further along.

There are two methods of inaking the clove tail joint. That in ordinary use by the cabi net maker consists of marking out the sockets and sawing them complete. The saw cuts are placed on the ends of the front and back pieces in turn, the tenon saw placed throug! the cut and marked on the ends of the wood as in l'ig. 6. This is a good method in the hands of a skilled worker, but the amateur who is not practised in making the joint is arlvised to proeeed with the cutting of the pins first.
In the former method the pins are cut out by sawing on the waste side of the saw cuts and the waste cut out of both pieces with a chisel. In culting the pins on the ends of the back board, first set off two $\frac{1}{2}$ pins top and bottom and then space out the remainder; $s$ is suggested as a reasonable number. The amount of the slope need not he more than $\frac{1}{8}$ in in the 1 im . "idth, and it may be less in hardwood. The easicst way of marking out a number of pins is to cut out. a dovelail marker from a piece of tinned sheet or brass as in Fig. 7. This is placed on one set of marks, and a pencil line drawn each side. When the marks have been made, the sa w should be placed in each case on the waste side of the line and carried down to the correct depth. The waste is cut out witha chise from the narrow side first, and the remaining portion


cut from the other side, taking care not to allow the chisel to go below the line.

The pins are placed upright on the side of the end pieces so that the widest portion of the pins is on the inside of the two lines, as in Fig. 8 A sharp pencil is drawn along the sides of the pins, and then the waste side of the pencil lines is sawn down with the tenon saw. In cutting out the waste with a chisel, commence about $\frac{1}{8} \mathrm{in}$. from the back with a chisel measuring about half the size of the widest part of the opening, and cut a hole as in mortising, taking it half-way through. Turn the wood over and repeat, the remainder of the wood being cut out afterwards with little risk of breaking the sides of the sockets. The bottoms of the sockets as well as the pins may be slightly undercut in the middle, but great care must be taken not to go below the lines on the outside of the wood.

Other Methods of Joining. The alternative lock corner joint is marked out by setting off equal spaces of 1 in . or more on the ends of all picces, and before sawing it is important to mark very distinctly those portions to be cut out and to saw on the waste side of the line. Instcad of joining the corners in either of the above methods, the side picces can be accurately cut to 18 in . wide for a height of $10 \frac{1}{2} \mathrm{in}$. and 19 in . for the remainder ; the front and back are in this case glued and screwed to the ends. Although this method will be strong, it is not зо satisfactory and does not look so well, but it certainly saves time.
The sides and ends are now ready to fit together, but before this is done the method of securing the bottom $D$ must be considered. The easiest way is to fit the wood exactly as in Fig. 4, after the work is glued up, and then either screw or nail it in. The nails or screws will be covered by the plinth moulding. The most satisfactory method is to tongue the edges of the bottom board and plough a corresponding groove in the sides and ends, as in Fig. 9, so that the wood can the glued only. If this method is followed, the work of rebating the edges of the bottom and grooving the sides and ends of the carcass must be done before the work is glued up. The bottom board is accurately finished to $34 \frac{1}{2}$ in. by $18 \frac{1}{2} \mathrm{in}$. and gauged $t$ in. from the top and from
the edges, and the waste is removed with a rebate plane or fillister A gauge line of $\frac{3}{5}$ in., followed by another of 1 in, is made from the bottom edges of the back, front. and ends of the case, and the groove made with a plough plane.
The joints of the carcass can now be fitted together, but in driving the sockets home, a piece of waste wood should be placed on the ends to avoid damaging the material. The wood for


Fig. 4
the falling Hap is now prepared. and accurately fitted in position as at E , and strengthened at the ends with two $8 \frac{1}{2}$ in by 4 in by $\frac{3}{4}$ in. pieces glued and screwed on, the flap being 34 in by $8 \frac{1}{2}$ in by 1 in. It is joined to the front B by two 2 in . by $\frac{3}{2}$ in brass butt hinges, let in flush with the surface.

The bottom plinth or moulding should be prepared from $\frac{3}{5} \mathrm{in}$. wood and planed to $3 \frac{1}{4}$ in wide. The front and back pieces G are $37 \frac{1}{2}$ in. finished, and those at the ends, $\mathbf{H}, 21 \frac{1}{2}$ in They are chamfered on the top edge to a line drawn $\frac{1}{4} \mathrm{in}$. from the inner edge and another $\frac{3}{4}$ in. from the top. The corners can be mitred, hut the better method is to dovetail them to form a frame, the top corners only being cut to a mitre, as in lig. 10 . In the latter case it is enough to glue them, but if simply mitred the wood must be bradcled, Before the plinth can be fitted to the carcass the proecting ends of the dovetails on the latter should be carefully sawn off a little away from the surface and then neatly planed down with a smoothing plane. but this must be left until a later stage. The plane should be used towards the centre of the sides and ends, as this will avoid breaking of the corners. The lid $J$ is planed down on the edges to the exact size of the top, 36 in . by 20 in ., and a moulding $2 \frac{1}{4} \mathrm{in}$. by $\frac{3}{4} \mathrm{in}$. prepared for the front


Tool Chest. Fig. 2. Sectional plan of tool chest shown in the opposite page. Figs. 3 and 4. Side and end elevations shown in section. Fig. 5. Sides of carcass joined by dovetailing. Fig. 日. One method of marking a dovetail joint. Fig. 7. Dovetail marier. Fig. 8. Alternative way of marking dovetail joint Fig. 8. Joint for securing bottom of chest. Fig. 10. Top corners of moulding cut to a mitre. Fig. 11. Bottom arranged with partitions. Fig. 12. Support for shelves. An explanation of all lettering will be found in the text
and ends as at K and L . This is dealt with in same width exactly, but the lengths are 33 in . the same way as the bottom plinth, with the and the total depth with the plywood bottom front corners dovetailed, but in addition to 2 in . The lowest shelves are $2 \frac{1}{2} \mathrm{in}$. deep and the moulding it will be necessary to screw on 32 in . in length. two battens M of 2 in . by $]_{\frac{1}{4}} \mathrm{in}$. wood, chamfered

The top trays should be provided with a plywood cover with $\frac{1}{2}$ in. by $\frac{1}{4}$ in. fillets on the inside edges for it to rest on, and holes drilled for


Tool Chest. Fig. 13. Plywood cover on top shelves of tool chest described in the previous pages. Fig. 14.
Sloping partitions. Fig. 15. Coinpartments for nails and screws. Fig. 16. Partition cross-halved. Fig. 17.

on one side and cut to 18 in . long. These are screwed on 1 in. away from the moulding and slightly tapered in front to allow the lid to fit down easily. The lid is hinged with $2 \frac{1}{2}$ in. by 1 in . brass butts let in flush, and should fit snugly on the top.

The next stage is to fit the partitions in the bottom. These can be made with $\frac{1}{2} \mathrm{in}$. wood, but $\frac{3}{4} \mathrm{in}$. is better. It will be seen in Fig. 11 that 4 compartments are arranged at the bottom; those at the back are divided into 3 parts, and the front one is a single one covered with a hinged lid. The actual dimensions do not matter very much. If the space is divided out equally it will be sufficient. It is suggested that the division pieces N and O should be about 5 in . wide; the partition pieces can be $5 \frac{1}{2}$ in. apart, and all let in $\frac{1}{1}$ in. deep grooves. This with $\frac{3}{2}$ in. wood will leave a $5 \frac{1}{2} \mathrm{in}$. space to be covered with the hinged lid P , measuring 30 in . by $6 \frac{1}{4} \mathrm{in}$.

## Details of Trays and Fitments

For the lid to clear the upper fitments, a 2 in. by $\frac{3}{} \mathrm{in}$. piece $Q$ is fitted at both ends. and a ledge or fillet R is screwed to the front for it to rest on; this should be $\frac{1}{2}$ in. square in section. Loose lids may be fitted over the open partitions, as shown by dotted lines, if desired, but they need not be more than $\frac{1}{4}$ in. plywood with $\frac{1}{2}$ in. fillets on back and ends. The shelf trays are arranged on supports T screwed to the ends of the case, and made from a 1 in . board, as in Fig. 12. The length is $17 \frac{1}{4} \mathrm{in}$., and it is built up with one $4 \frac{1}{2}$ in. wide piece rebated 2 in . down the side and $\frac{1}{2}$ in deep with a $\frac{13}{3} \mathrm{in}$. by $\frac{3}{4} \mathrm{in}$. piece screwed on underneath. Instead of rebating a 1 in . board, one 2 in . by $\frac{1}{2} \mathrm{in}$. and one $2 \frac{1}{2} \mathrm{in}$. by 1 in . piece can be fitted each side, the $1 \frac{3}{3} \mathrm{in}$. by $\frac{3}{4}$ in. strip being screwed to the latter piece. The top of this fitment is 3 in . down from the top of the case.
The two top trays are made with $1 \frac{1}{2}$ in. by $\frac{1}{2} \mathrm{in}$. wood, with long sides 34 in . long and ends 8 and $7 \frac{1}{4} \mathrm{in}$. respectively (Fig. 4). The corners can be nailed, but the shelves will be stronger and more workmanlike if dovetailed, and in this case the ends should be 1 in. longer than stated. The bottoms are nailed or screwed on, using $\frac{1}{4}$ in. plywood. The trays below are made in the same way; they are the
lifting up, as in Fig. 13. The trays can be partitioned off with strips of plywood to suit particular tools. One can be reserved for bits of all kinds, and have sloping partitions as in Fig. 14; another can be fitted to take the oilstone, bradawls, gimlets, rule, pincers etc,. The two top front shelves should be reserved for nails and screws, and partitioned off as suggested in Fig. 15. The partition pieces should be cross-halved where


Fig. 1
they join, as in Fig. 16, and are neater if they are housed into the sides, this being done before the tray is made up.
Ball feet or ball castors can be attached to the bottom, and handles fitted to the sides. A strong box lock fitted to the flap will keep the shelves secure, even if the chest should be overturned. The outside of the chest should be painted with 3 coats of good oil paint, removing the handles beforehand. The saws can be fitted to the inside of lid, as in Fig. 1; the method is to cut out shapes to fit the handles, screw them on, and fit a wooden turn-button. The tips of the saws should be fitted in slotted pieces glued and screwed on; these pieces are shown in Fig. 17. All the small tools, such as chisels, gouges, and other handled tools should
be placed in grooves in the bottom of the trays, as in Fig. 18, leaving the bottom partitions for the larger and heavier tools. A special part of the chest should be reserved for metal-working tools.

A tin of petroleum jelly should be kept in the chest so that all steel tools can be wiped over periodically. A place should be made for a tin of lubricating oil and a small oil can. If a paraffin blow lamp is used a special compartment will be needed for it, and a place to take a can of methylated spirits for priming the lamp. Soldering flux, kept in an earthenware bottle, will require accommodation also. If a petrol lamp is used it should be kept in a safe place out of doors, with the petrol supply ; paraffin blow-lamps are preferable.

TOOL CUPBOARD. It is often found convenient to arrange a small number of tools in a cupboard such as that illustrated in Fig. 1. The outside dimensions are 36 in. wide and high and 10 in . decp; the doors fit inside the framing and are stiffened with battens.
The internal arrangements allow of a 26 in . cross-cut saw on one door, attached to the shaped block at A; alongside is placed a tenon saw at 13 . The two racks on the other door, C and D , will take such tools as gange, square, pincers, screwdriver, hammer, gimlets, bradawls, ctc., suitable slots being cut to hold them sccurely. Inside the cupboard a jack plane will fit in the space at $E$, with the smoothing plane underneath at F ; a bow saw can be hung at the back on hooks at $G$, and on the other side can be hung a brace at H .

A mallet, oilstone, and rebate plane will rest on the to $\rho$ she!f at $J$; chisels and gouges can be placed in slots cut in a length of wood as at K, at the back of the lower shelf at L. . In front of the piece $K$, a flat length $M$ will hold the bits, and leave room in front for other tools. There are two pigeonholes at N and O for glass paper, etc., leaving the top drawer $P$ for small tools, and the lower ones, Q and R, for nails and screws. The advantage of this arrangement is that each tool has its own particular place and is easily picked out The whole collection can thus be placed in a convenient position.
The construction of the cupboard is quite simple. The outside boards are 1 in. thick finished, and should be obtained machineplaned to this size; two finished lengths of 36 in . and two of 34 in . should be prepared to a width of 10 in. The back is $\frac{3}{16} \mathrm{in}$. or $\frac{1}{4} \mathrm{in}$.


Tool Cuphoard. Fig. 1. Small cuphoard, shown open, for the handyman's tools. Fig. 2. Elevation of cuphoard when closed. Fig. 3. Side elevation. For lettering see text


 $\frac{1}{3}$ in., and end $15 \frac{3}{3}$ in. by $1 \frac{3}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$., and a bottom $16 \frac{3}{4} \mathrm{in}$. by 8 in. by $\frac{2}{4} \mathrm{in}$., to fronts being rebated as for the drawer above. If flush handles are fitted the drawers can be full length from front to back, but if the handles project suitable allowance must be made in the lengths of the sides and the bottom. The inside of the drawers can be divided off to provide compartments for nails and screws, plywood being quite suitable for this purpose.

The doors are each 34 in . long and $\frac{3}{4} \mathrm{in}$. thick; one is $17 \frac{3}{8} \mathrm{in}$. wide and the other 17 in wide. A rebate $\frac{3}{8} \mathrm{in}$. each way is cut on the meeting edges of each door, as in the section at Fig. 8, and then a batten of 2 in . by $\frac{3}{2} \mathrm{in}$. wood is placed along the bottom of each door and glued and screwed on.

The fitments to hold the saws and other tools should be attached before plywood, and, although it can be nailed or betwcen $L$ and $V$ and be flush with the back of the doors are hung; the binges can be litted screwed on the back edges, a much neater job the narrowed portion of the shelf $L$, to provide at this stage but not screwed up. The saws is made if it is rebated, as shown in Fig. 3, a boxed portion for the chisel blades. The are fitted with a shaped block to fill in the which also shows the two sets of drawers.
The method of making the carcass is shown in Fig. 4. The sides $T$ are nailed or screwed to the top and bottom pieces U , but the various partition pieces should be housed into the outer frame first, as in Fig. 5. To do this work accurately, the wood must be marked out as far as possible with the parts placed together. The two sides T. should be placed side by side, a line being marked 1 in . down from each end to indicate the position of the top and bottom pieces U. A line is marked off 2 in. up from the bottom line, and this should be followed by drawer to fit in this space is shown in lig. 6 ; handle space, a turn-button made to the length, it is made with a front 27 in . by 5 in . by $\frac{3}{4} \mathrm{in}$., and then the pieces can be srewed on at the two sides $6 \frac{3}{4} \mathrm{in}$. by $4 \frac{3}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$., and a back top. The tip of the saw should be arranged to 26 in . by $4 \frac{3}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$. The front piece should fit just in the top of the bottom batten, but it be rebated $\frac{1}{2}$ in. each way at the ends, and will be necessary to make a slotted piece to $\frac{1}{2}$ in. by $\frac{1}{4}$ in. underneath to take the bottom, take the end of the tenon saw. The slotted measuring 27 in . by $6 \frac{3}{4}$ in by $\frac{1}{4} \mathrm{in}$. Glue, nail, piece in lig. 9 indicates the method of making or screw the parts together, and smooth with the supports for the tools on the other door ; glass paper to allow it to move freely in the each tool should be separately fitted, and the space. Suitable handles are fitted on the correct sized hole cut.
front as shown.
The various hooks are now placed in the
The two bottom drawers, Fig. 7, have fronts back to hold the bow saw and brace. A long $16 \frac{3}{3} \mathrm{in}$. by 2 in . by $\frac{3}{4} \mathrm{in}$., sides 8 in . by $1 \frac{3}{3} \mathrm{in}$. by strip of $1 \frac{3}{4} \mathrm{in}$. sq. wood is fitted to the back of another $\frac{1}{2}$ in. above, in order to give the position of the groove for the lower shelf V . The next shelf is 5 in . above, and two lincs are marked off. one 5 in., and the other $\frac{1}{2}$ in. above it. Thesc shelves, $I$. and $V$, measuring $34 \frac{1}{2} \mathrm{in}$. by $8 \frac{1}{4} \mathrm{in}$. by $\frac{1}{2}$ in., arc placed together so that the groove for upright W and its continuing piece underneath can be marked out, as well as a corresponding piece to the under piece on the other side between V and L . These pieces are 3 in . from the outside pieces, so that the grooves should be $3 \frac{1}{4} \mathrm{in}$. from the ends. The piece $W$ is $26 \frac{1}{2} \mathrm{in}$. by $8 \frac{1}{4} \mathrm{in}$. by $\frac{1}{2}$ in., and the 2 pieces $\%$ under the shelf $L$ are $5 \frac{1}{2} \mathrm{in}$. by $8 \frac{1}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$. The piece at $X$ is 8 in . above the shelf $L$, and is cut to $3 \frac{1}{2}$ in. by $8 \frac{1}{4}$ in. by $\frac{1}{2}$ in.. the shelf $J$ is 31 in . by $8 \frac{1}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$., and is the same height The division piece at Y is fitted half way between the sides, and cut to $2 \frac{1}{2}$ in. by $8 \frac{1}{4} \mathrm{in}$. by $\frac{1}{2} \mathrm{in}$. It will be seen from Fig. 5 that the long shelves which fit in the sides T are let in the full width, but the other parts are notched at the ends and fitted in stoplied grooves, $\frac{1}{i n}$. deep and $\frac{1}{2} \mathrm{in}$. wide. When all the parts shown in Fig. 4 have bcen prepared, and a 1 in. deep slot cut at the back of the shelf $L$, the carcass can be glued, nailed, or screwed together. In doing this, care should be taken to see that the corners are quite square.

The back is next cut to fit in the rebate. If, however, this method is not used, the width of the partition pieces should be 81 in. instead of $8 \frac{1}{4} \mathrm{in}$. Small brads or screws will be sufficient to retain the back in postion and make a solid case. A 27 in . by 5 in . by $\frac{1}{4} \mathrm{in}$. piece should be fitted in the space


Tool Cuphoard. A well-stocked tool cuphoard for the bome worker in wood and metal Courlesy of R Melhuish, Ltd.
the top sheif L, and slots as at Fig 9) cut in to take the chisels and gouges. These should be placed side by side as closely as possible : $\frac{1}{} \mathrm{in}$. in between the handles will be ample space. The slots are marked off on the strip and cut out. When fitted in position, the blades will fit in the space belween the top drawer and the back of the cupboard. A 1 in . by $\frac{3}{}$ in or lin. strip will be large enough to hold the bits, shanks downwards. The best method of making the holes for them is to drill a slightly smaller hole, and then cut square with a narrow chisel, as in lig. 10

Cupboard bolts are fitted, together with a lock, and then the outside can be either painted or sized, stained. and varnished. As the cupboard will be fairly heavy when completely filled with tools. special precautions should be taken to secure it to the wall. One method is to screw on strong brass mirror plates on the top and on the sides near the bottom, and screw to a wooden wall or to fibre plugs in a brick or plaster wall As an alternative, two mirror plates can be fitted at the top and the bottom supported with iron brackets.

## Tooth. See Teeth

TOOTYBACFE. There are two different diseased states of a tooth which may give rise to toothache. One results from in flammation in the soft centre or pulp of the tooth.

The pain in this form of toothache is sharp or shooting. It varies in intensity at different times: usually it is increased on lying down. But the tooth itself is not painful on being tapped. The taking of a meal tends to increase the pain, more especially if food is pressed into the cavity or hot liquids reach the exposed nerve.

In the treatment of this iorm of toothache it is most important to find the cavity in the tooth and, if possible, to clear away any food which may be causing pressure on the nerve. The next step is to fill the cavity with a small, loosely rolled pledget or wad of cotton wool dipped in oil of cloves or strong carbolic acid. The excess of these drugs should be gently pressed out of the cotton before insertion. The gum in the neighbourhood of the painful tooth may also le painted with tincture of iodine. After drying the gum with cotton, this should be applied with a small brush, and the mouth held open for 2 or 3 min ., so as to ensure that the iodine may not be washed quichly away. A dentist should be consulted at the earliest opportunity.

The other diseased condition of the tooth which may give rise to toothache requires different treatment. In this variety the pain is dull, continuous, and boring. The tooth is painful on pressure or tapping. The tooth frequently appears ulongated or raised in its socket, and when the teeth are closed it is often acutely painful. The inflammation in this case is really outside the tooth, round its root. From the inflamed stage it may pass on to suppuration, and the pain is then likely to be more or less continuous for two or three days, until the pent-up matter is able to force a passage through the bone, when a gumboil appears over the root of the offending tooth. The gumboil is itself painful to pressure, but the boring pain usually passes away almost suddenly with the appearance of the swelling.

Some relief may be got by painting the gum in the manner already described with a mixture of equal parts of tincture of iodine and tincture of aconite. Water, about as hot as it can be borne in the mouth, may also be tried. A saline purge is often useful in the carly stages of the disease, and 5 to 10 gr . of aspirin will frequently give relief in this form of toothache. All these remedies arc, however, quite unsatisfactory except for
temporary relicf, as the cause of the trouble remains. For this reason it is most important that the sufferer should have the offending root or tooth properly treated or extracted by a dentist. See Caries; Teeth.

TOOTH BRUSH. Handles that are fashioncd from bone are much the best for tooth brushes, as they do not easily chip or warp, and cut lengths of white French or unbleached yellow bristle are principally used for good tooth and palate brushes. The latter are made with larger handles and more rows of knots for cleaning dental plates, etc.
Substitutes are very little used in toothbrush making, although in very common varieties a tine libre horse-bair or poor bristle may be found. All quality brushes are made either by trepanning or are wire-drawn, the former being recognizable by the plugged holes in the end of the brush, and the latter by the lined back. The tops of the bristle are cut straight, concave, or serrated, the last style being preferred by many for thorough brushing.

It is cssential that a tootl) brush should be kept clean and dried after use. Washing the brush occasionally in warm water should not be neglected, as this will remove any accumulation round the roots of the knots A holder or rack should be found for tooth brushes where they can hang, or they should be stood up to drain and dry. On no account should they be left lying about, as they are liable to pick up undesirable matter. The importance of the operation a tooth brush is intended to perform warrants a more careful selection than is gentrally made. As in the case of all other brushes, cheapness is not only poor economy in the long run, but in use a poor tooth brush is decidedly unpleasant. Bristles break off or come out in the mouth and most of those remaining are entangled and cramped, with a few in a likely position to puncture the gunis when the brush is again used after being dried. A brush in this condition should always be discarded and a new one ohtaincd. See Dentifrice; Mouth wash; Teeth.
TOOTHPICK. Toothpicks may be cither of quill or of wood, being short pieces sharpened at one end. The latter are easily made with a penknife. The use of a toothpick, however, is not, in the opinion of the best anthoritics, advisable, as it is liable to injure the enamel. If there exists a cavity in the tooth in which food lorges, it is well to consult a dentist. See Teuth.

## Tooth Powder. See Dentifrice; Teeth.

TOPAZ. A semi-precious stone, the topaz is surpassed in hardness by very few other gems. It is found in several parts of Great Britain. Its value depends upon its depth of colouring, the sherry-coloured stones being considered the best. The white topaz is not unlike the diamond in appearance, but diamonds can always be distinguished by their excessive hardness, apart from their lustre. Pink topazes enjoy a certain measure of popularity, but their colour is artilicial, being produced by heating the sherrycoloured stones. There are also blue, green, orange, and pale and golden-yellow topazes.
TOP DRESSING: Of Plants. Rich soil or manure that is spread over the soil to assist the development of trees or plants is called a top dressing. It may be put on for the purpose of keeping the soil moist in hot, dry weather, or to increase the size of fruits or Howers. When such plants as chrysanthemums, lilies, or tomatoes are grown in pots it is usual to leave space at the top for a top dressing of rich soil when Hower buds or fruits are developing. Sand is an excellent nutumn top dressing for a lawn on heavy land; sifted
leaf-mould and decayed manure benefit a lawn on sandy soil.

TOPIARY. The art of clipping and training trees into various artificial and formal shapes is known as topiary. The yew is the

principal subject, but other trees and shrubs are frequently treated in this way, including box and holly. Many firms make a speciality of growing trees in tubs suitable for topiary work. Topiary trees should be clipped in May and again in August. See Box; Hedge; Yew.
TOPSIDE : Of Beef. The top or outer portion of the round of beef is known as the topside, the inner half bcing the silverside. It is a most economical joint for a family, especially where a large number are to be catered for ; but, although well flavoured and full of gravy when served hot, it is apt to eat dry when cold. It inakes excellent pie ineat, being full of gravy and free from bone or gristle. It is also good for stews, or a la mode beef, which requires lean meat.

Topside is often salted and boiled, but silverside is preferable for thie; purpose. The topside, however, is excellent if spiced for Christmas beef. A good-sized piece will take from a fortnight to 3 weeks to pickle. It eats better if it is larded with strips of fat hacon inserted in it at intervals. Portions of topside of beef may also lie potted; the meat should be freshly cooked, flavoured with vegetables and spice. It is better to stew it in the oven, adding as little water as possible. When cooked, the vegetables should be removed and the meat minced, then pouncled and potted in the usual way with butter, spice, a little of the gravy it was cooked in being strained and added. See Beef; Carving; Stew, etc.
Torch Lily. This is an alternative name for the red hot polier (q.v.).
TORENIA. This is a greculouse annual flowering plant, with violet-blue or yellow Howers. It should be grown in pots, or baskets suspended from the roof, containing a mixture of loam, leaf-mould, and sand. The secels should be sown in February in a temperature of 60 degrees. When large enough, the scedlings may be transferred to $5-\mathrm{in}$. pots, and the side shoots pinched off as they develop, in order to induce the plant to make bushy growth. The best species are T. Fourneri, violet-bluc, and T. Bailloni, yellow.
TORTOISE : In the Garden. A reptile with four feet and encased in a strong shell protection, the tortoise is cold-blooded and
lives to a great age. The two kinds usually liept in Great Britain are the land tortoise and the marsh tortoise or terrapin. The former is mainly herbivorous and can be fed on lettuce, cabbage, grass, dandelion and buttercup flowers, also soft fruits. The niarsh tortoise is mainly carnivorous.

If the land tortoise is to be kept in the garden it must be restricted in some way; or it will cause damage to vegetation. If possible, it should be assigned to a sunny position near a wall bounded with wooden boards, with a portion of the space covered with felt or Willesden canvas to provide protection from the sun and rain. Tortoises will bury themselves in the ground during the winter. They may be placed in a box containing soil or leaves, and left in a cool room until spring; when they awake they can be fed on lettuce or cabbage leaves, although they will eat very little at first.

TORTOISESHELL. Tortoiseshell, which is the horny covering of a species of sca turtle, varies in value, the finest shells being marked with reddish-brown and golden vellow shades. Many consider the blonde shells io be the most heautiful, but for brush-making the darker less transparent kinds are more popular.
Tortoiseshell is used to make all manner of toilet accessories. Manicure sets, powder boxes, hair brushes and combs, and complete dressing-table sets can be bought both in genuine and imitation tortoiseshell. Other articles made from tortoiseshell include spectacle rims, cigarctte, carcl, and match cascs, lorgnettes, purses, mirror backs and vanity cases. This shell is also used for inlaying clock cases, cabinets and other articles of furniture with delicate metal or brass tracery after the style of Buhl.
Whether tortoiscshell should be mounted or not is a matter of taste, some maintaining that it needs no adornment. Tortoiseshell may be cleaned with olive oil. See Buhl; Fan ; Spectacles.
TOUCH : The Game. Perhaps the simplest form of this popular outdoor children's game consists in one player running after the others with the object of touching one of them When he does this he must call out touch, and the one touched takes his place and becomes the chaser. A variant is known as touch wood. In this the players can sccure a respite from heing chased by touching anything of wood. As long as they do this they cannot he toucherl. A further variant requires the player who secks a respite to whistle in addition to touching a piece of wood. As sonn as he ceascs to whistle he can be touched.

TOURMALINE. The mineral that is known as tourmaline is found in a wide range of colours, but it does notrank anong the most cxpensive gems. Its tints include various shades of red, green, grey, blue, and yellow, the green tourmaline bearing some resemblance to the more valuable aquamarine.
Red tourmalines sometinues possess deep tints and are known as rubellites.


Towel. Bath towels ornamented with stitchery in colours. The upper has lines and stripes carried out in shades of blue and the lower has circles in mauve


Tourniquet. Improvised tourniquet applied to right brachial artery Lower bandage is applied to hold he stick used for twisting
easily made at home as they are simply formed by a straight strip of towelling 3 yd . long, or the most convenient length for the particular door on to which the roller is fitted. The strip is neatly seamed in order that it may revolve when required.

Bath towels are made of Turkish towelling in different qualities and sizes. The largest are known as hath sheets and are usually stocked in two sizes, 48 in . by 72 in ., and 48 in . by 80 in . Other white Turkish towels vary in sizes from about 20 in . by 40 in . to 30 in . by 60 in . These towels are sold hemmed ready for use. Terry towelling which is obtainable in colours and also in patterned designs is used to make coloured bath towels Coarser bath towels are light brown in colour, but are strong and hard-wearing.

Hand towels vary greatly in quality and price, and are made in 3 usual sizes. 18 in. by $32 \mathrm{in} ., 20 \mathrm{in}$. by 36 in ., and $22 \mathrm{in}$. by 40 in. Huckaback towels in fine weaves with damask borders finished by hemstitching are always pleasing. For family use a somewhat stronger weare is recommended and plain hemming may be considered more satisfactory than hemstitching. Huckaback towels may also be purchased with coloured borders, and coloured damask guest towels are obtainable. The usual size for these is 15 in . by 22 in .

Ornamental Towels. Bath, hand and guest towels may be improved by worked monograms or borders in coloured cross-stitch. A pretty design of a type suitable for the latter purpose is slown in page 420. Guest towels can be made of fine white huckaback, measuring 15 in . by 22 in. after being hemstitched. Embroidery is usually placed only at one end, but both ends are hemstitched. Very dainty trimming is supplied by a small design in Renaissance or Khetha work, both of which are illustrated in page 420. The embroidery can be worked in colour, or in white on a coloured towel. Crochet lace is also a suitable edging and trimming.

Many women buy plain towels of a good quality and decorate them with a little stitchery. The towels here illustrated arc embroidered in coloured stranded cottons. The top one has 3 lines and the row of short vertical stripes worked in chain-stitch in 3 shades of blue. The lower one has 3 lines of stem-stitch and a row of circles worked in plain and raised satin-stitch, using several shades of manve. Other borders may be carricd out with sprigs of Howers in lazy-daisy stitch, buttonhole rings and snail-stitch. Three rows of different feather-stitching is also an effective trimming. 1 Roller towels and the coarser bath towels may be marked with marking ink, but bath towels of good quality are improved by initials boldly designed or embroidered monograms.

Towel Airers and Rails. A towel horse to match the wood of each washstand is usually provided, when there is general bathroom accommodation for a number of bedrooms. A towel airer is a convenience in the bathroom It is often made in the form of a plated stand either heated by electricity or by connexion with the hot-water system. Aluminium towel rails arc obtainable in lengths varying from 24 in . to 26 in . with wall brackets for fixing. Swing towel airers in the same metal are marle with 2 or 3 arms. Burnished aluminium is labour-saving, rustless, untarnishable and incxpensive. See Linen.

## Toys and Toy Making

## Suggestions that will Interest both Parent and Child

The important part played by toys in child life is recognized in this article, which adds to the information given under the headinps of individual toys, such as Aeroplane; Doll; Kite; Knitted and Stuffed Toys; Jigsaw Puzzle; Noah's Ark, and various model engineering contributions, such as Boat; Engine; Locomotive; Railways. See also Casting; Child; Christmas; Nursery
Children find expression in toys from earliest cost but by the amount of interest and amuseinfancy. A rattle or a coral with tinkling bells ment that they can get out of the toy inspires them with the desire to repeat the pleasant sound. A brilliantly coloured hall excites their admiration. They pass through a stage of surprise at a jack-in-the-box or clockwork animal to curiosity, which, though perhaps indulged in at the expense of the particular toy, is the beginning of knowledge and invention. Imagination is stimulated by the games of make-believe, from a Noah's ark or doll's house to the wonder of things made by hand out of toy looms, from carpentering sets and plasticine to a meccano set.

The playing of games of skill with hard and fast rules develops a child's character by the discipline of competition within limits, but into his play with toys he weaves the fancies which are the outcome of his individuality.

For this reason it is a mistake to interfere too much with his choice among his toys. Having had the winding-up of a new tumbling clown explained to him, he may be delighted with its novelty for a while, but when that has worn off hic has no further use for it, and turns to play for hours with a grocer's shop, weighing out commodities from bottles and tins on miniature scales, or doing up tiny parcels and falling in gladly with a suggestion that his horse and cart should be a delivery van. The great thing is that he should learn concentration by being absorbed in whatever he is doing at the time. Boredom lies in going from one toy to another in a desultory fashion

Toys should be put away when playtime is over, and a child should have a special shelf if a cupboard or locker of his own is not possible. If it can be avoided, it is a mistake ruthlessly to sweep away his unfinished creation of bricks or the setting of a farmyard drama, but a warning can be given that time is nearly up, and sometimes a little assistance will help towards the satisfactory completion of an edifice or episode. The care and repair of toys should be taught to children from an early age.

Nearly everyone who has had to do with young children has had the experience of seeing an expensive toy fail to please or be cast aside in favour of a cheap one. Value is re presented to their minds not by its


The younger the child the more eager he is for a toy which is symbolical rather than real. istic. The round block of wood spotted red and blue, with roughly carved neck and head edged with fur, and set on four legs and a green wheeled stand, is more dearly loved than the finest mode! of a pony with real skin and hair. They outgrow this stage when a Noah's ark becomes silly because the elephant is out of all proportion to the rabbit; or the nursery floor as an ocean for the ship on wheels fails to satisfy the little boy who has seen a friend launch his boat on real water.

Some children delight in miniature things. They like to collect families of tiny dolls, furniture, and animals. A few low shelves where they can set out these things and leave them undisturbed till the next playtime is a happy arrangement, especially if provided with a curtain on rod and rings. Other children like to impersonate the characters in their games. A toy outfit of a bus conductor may give more pleasure than a mechanical model of a motor bus, even though a sofa with a few dolls on it represents the vehicle to be driven.

Outdoor toys are nearly always fascinating. Hoops, skipping-ropes, scooters, battledore and shuttlecock, sailing boats, balls, and dolls' perambulators all have their attractions, but probably none give more joy than the wooden spade, the shrimping net, and the tin pail at the seaside. The garden becomes an absorbing toy. Such gifts as a practical toy gardening set, consisting of a number of tools and a wheel-barrow, and a small piecc of the garden, usually have a great appeal.

When choosing a toy as a present, especially for a small child, occasionally people makc the mistake of giving something which amuses them, such as a mascot or novelty of the moment, which has no meaning to the little recipient, instead of some simple toy which would really pleasc. Should the present be intended to impress the parents of the child

\& glued in hole bored across Axletree to give further security to the Ax/e screw


Toy. Fig. 1. Diagram illustrating methods of repair. A. Detail of lug and slot for wheels of mechanical toys. B. How to solder lugs in body construction. C. Securing a metal wheel to spindle by soldering. D. Insertion of wood screws to mend a fractured wooden joint. E. Another repair for a wooden toy.
rather than the child himsclf, it is better to let it take some other form

Mechanical Toys. Constructional toys in the form of collections of parts afford much entertainment to children of the age to understand them. It is a waste of money to give such sets to a younger child, who will be better pleased with a robust clockwork toy. The constructional set depends for much of its entertainment and educational value upon the appeal it makes to the imagination and ingenuity of the owner, who can combine and re-combine the parts in a variety of ways. The parent can initiate the work, and assist, but the youngster should be left to solve his own problems as far as possible. Steam engines and clockwork or electric motors can be purchased to supply power to the working models thus built up.

Model railways are dealt with in a separate article, but a word or two here about toy train sets may be appropriate. The common tinplate track as supplied with train sets is usually neither strong nor durable, and it is well worth while to purchase a good set of rails from one of the reliable firms which specialize in these goods.

A word of advice may be given here about clectric sets. An accumulator is the best means of supplying the current to the conductor rails. It can be placed on a shelf out of harm's way, the leads being talsen down to floor level and ending in a plug fastened to the skirting. The leads should be secured to the wall in some way, and also to the shelf, so that the battery cannot be dislodged by a pull on the wires. Another method is to make a simple wooden box to hold the accumu lator, the lid being secured by a small lock, and the box being screwed to the floor in a corncr of the room In this case also the leads can be taken to a plug on floor or skirting. Train scts can be oblained for connecting to the electric light mains, but these are not suitable for children without supervision.

There is a third method of running an electric train, in which a small battery carried in the engine or tender supplies the current. The battery has to be replaced by a new one at frequent intervals, of course. but this is a simple method, and no conductor rails arc needed on the track. The above remarks apply to the smaller or toy train sets.

Mending Toys. The cheaper clockwork toys do not usually admit of repair, and even in the case of the better made ones the gears and spring wear out or lose resilience, as the case may be, after a period of strenuous service.

In repairing mechanical toys made of metal, a certain amount of skill with the soldering iron will reduce labour considerably. Where toys are finished by a lithographic printing process, it is absolutely necessary to remove the coating of paint entirely, and to get down to the bare metal by scraping, before attempt ing to apply the solder. Many cheap toys are made with cog wheels fitted to their shafts or axles with lugs or slots, or by flattening the spindle each side of the fly-wheel boss. Such devices usually give trouble, and even a new toy will be considerably improved in strength and its life trebled by soldering such joints together. If the paint has to be scraped off to do the soldering, the part can be touched up afterwards with a little oil colour. Points in body construction can also be dealt with in a similar manner, the soldering of the lugs being effected from the inside wherever possible.

Glue is the proper adhesive for wooden toys, but in addition it is often advisable to drill a hole and insert a wood screw across the joint of a fractured part. In fitting screws the preliminary drilling for the sceew should not be forgotten, as toys are generally made of the cheapest kind of wood.
The toy maker frequently drives a big nail or screw into the end of a wooden rail and


Toy. Fig. 2. Flufly rabbit which is very realistic when made in white fur cloth
makes the nail the axle of a wheel supporting the whole weight of the toy. Such fixings in end grains are never satisfactory. A cure may be effected by crossing the screw with a wooden plug, as illustrated, or by fitting an all-metal axle such as is used in a perambulator: Wooden wheels should be bushed with short pieces of brass tube. The methods of repair mentioned are illustrated in the accompanying diagram (Fig. 1).

Soft Toys. Instructions are given in the article on Dolls for making a rag doll, and other soft toys are dealt with in the article on Knitted Toys. Plush or fur cloth covered toys are easily made by the home worker.

An odd length of white fur cloth can be utilized for the rabbit shown in Fig. 2. The main part of the body and the head are cut in one, but the underpart and the ears are added separately. A quarter of a yard of cloth, 48 in. wide, is needed, together with a little pink flannelette for lining the ears.

When cutting out, use the cloth folded with the selvedges together, and arrange the patterns, cut to the shape shown in Fig. 3, in the positions there seen. First join the long, straight seam of the base or underpart ; then take it, still folded, so that the seam runs along the top, but with the wrong side inside, and slip it between the two layers of the main body. The latter should be so put together that the right sides face.

Stitch the cdges of each layer of the base to the edges of each layer of the main part, matching the sets of two notches, and also drawing the curved back part of the base down to the lower edge of the main part. Next stitch the two main parts of the body together above the inserted base portions, commencing at the front just below the head, and working around this and along the top of the body to the back of the inserted base

Leave a small opening in ime part of this seam, however, so that the stuffing may be


Fig. 4. Tinker Boy, a strange but appealing anima covered in wocllen nlash and easily made at home Courtesy of "Best W'ay"
put in. Turn the shape inside out, stuff it tightly with kapok, and then sew up the open. ing. Line cach ear with the flannelette; then make a pleat in the straight edge and sew it to the head. The addition of two boot buttons for the eyes gives the finishing touch.
Patterns for other toys of this description can be obtained from "Best Way" 291a, Oxford Street, London, W.1. A delightful example, called Tinker Boy, is illustrated in Fig. 4. This curious

stand should be made, as the toy will act equally well on the edge of a table or mantelshelf provided the balancing wire is long enough. Another form of balancing toy is shown at Fig. (i, string being substituted for the wire to hold the weight, and the various parts


Toy. Fig. 3. Diagrams ior making the fluffy rabbit, showing the shapes for ear, base and body, and (above) how to join up the cover before stuffing creature requires 1 yd. woollen plush, 2 glass of the body hinged together. It is advisable eyes, bell and ribbon for the neck, a little to use a close-grained wood or 3 -ply, the black darning wool, and kapok for stuffing. thickness of each piece being $\frac{3}{16}$ in The The latest "Best Way" book on Home-made various parts are shown in Fig. 7, and are cut Toys should be obtained at a ncwsagent's, as out with a fretsaw ; the two pieces for the new patterns are irequently invented and body should be pasted together temporarily described.
Wooden Toys. Toys can be made by the home craftsman from wood with a few simple tools. with a piece of paper between and sawn to shape, as this ensures their being alike. Al! edges and surfaces should be glasspapered. To begin with balancing toys, there is The small pieces are glued to one of the considerable scope body pieces in the positions indicated by the for inventiveness dotted lines. Small nails are driven into the with eitherthe fixed ends of the head and tail picces, which should or flexible balance. be further rubbed with glass paper to make A good example of them a little thinner than the small pieces this kind of toy is attached to one of the body pieces. Holes are shown in Fig. 5, in bored or drilled through the body and the the form of the bal- head and tail for the hinge screws, and ancing horse. The slightly enlarged in the two latter pieces to outline of the horse, allow free movement. The balance weight or anyotheranimal, can be of the same shape as that used for the horse, but it should have a groove or a hole through it to enable the string to be fastened. A round ball can be cast in the same way, and looks neater than the flat weight.

Each length of string should be about 8 in.. but the
is marked out on a piece of thin wood about $\frac{1}{3}$ in. thick and cut out with a fretsaw. Any closegrained hardwood is suitable for the work, but with plywood there is little risk of breakage. The pendulum or balance should be of lead, which is cast in a plaster of Paris mould or in a well-greased tin lid. The wire is placed in the mould before the lead is poured in, and the other end of the wire is pressed into a prepared hole in the body or other suitable position on the animal. The stand is made from short lengths longer it is the better, as the toy will work of dowel fitted in a wooden base; the uprights for a longer period. It is necessary to support can be square in section provided sufficient the stand either by a weight at the back or space is allowed for the balance wire to a small $G$ cramp. The toy can be made move freely. It is not essential that the more realistic by fitting it on a platform
and making a small food trough undor the small end. undercutting it $\frac{1}{2}$ in. head A development of this kind of toy is The dovetail to fit in the slot made by arranging two parrots on a strip of in the axle block should be wood and connecting the strings to a pendu- sawn out and the piece glued lum, or cutting the shape of two men holding a hammer and striking an anvil, which is arranged between them.
The pole cart in Fig. 8 is composed of two sides nailed to end pieces and to a base. Cast-iron whee!s are screwed to axle blocks, and the handle, which is fitted to a projection in front, is so arranged that it will not fall down further than an angle of $30^{\circ}$ in front. The two sides are 16 in by $6 \frac{1}{2}$ in by $\frac{1}{2}$ in.. the ends 9 in by 7 in by $\frac{1}{3}$ in, and the bottom 20 in by $10 \frac{1}{2}$ in by $\frac{1}{2} \mathrm{in}$, planed up and finished smooth, preferably from a liardwood such, for example, as birch or elm

The sides of the cart should be securely nailed or screwed to the ends and the bottom attached in the same way. The axle blocks are 12 in by $2 \frac{1}{8}$ in by 3 in and must be of hardwood. One side is quite straight, and the other shaped to 1 in deep at the ends from a line drawn 3 in each side of the centre, and the ends cut off with a chisel to an octagonal form.

One of the axle blocks is screwed to the bottom board 1$\}$ in from the end: the other, as in Fig. 9, is slotted to take the dovetailed end of the projection to carry the handle. Plane up a length of hardwood to 11 in by $4 \frac{1}{2} \mathrm{in}$. by $\frac{3}{4}$ in., reduce the end to 24 in. wide, and cut a 24 in. long by $\frac{3}{4}$ in. alot at the


Fig. 15. Push horse shown in side elevation, with dimensions. Fig. 16. End elevation of the push horse
The winding roller is cut to 3 in . from a length The winding roller is cut to 3 in . from a length
of 1 in or 1 l in round, axles being provided by suitable lengths of hard brass wire fitting through holes bored in the sides of the uprights. The latter pieces are nailed to the base with a 3 in . by 1 in . by $\frac{1}{2} \mathrm{in}$. piece, and a 4 in . length of $\frac{3}{8} \mathrm{in}$. dowel between at the end to strengthen the base, as shown.

The uprights to support the base of the arm or jib are $2 \frac{1}{2} \mathrm{in}$. by $1 \frac{3}{4} \mathrm{in}$. by $\frac{1}{2}$ in. ; they are tenoned at the ends, fitted into slots in the base, and the top corners trimmed off. The slots or mortises in the base are '" in from the ond and $\frac{3}{4}$ in. apart; the arm is made from two pieces 15 in . by $\frac{1}{8} \mathrm{in}$. and tapered evenly from $1 \frac{3}{4}$ in. to $\frac{3}{\frac{3}{2}} \mathrm{in}$. Two $\frac{1}{2}$ in. thick blocks are prepared for fitting between the lengths.

They must be shaped to allow of a width of $1 \frac{1}{2} \mathrm{in}$. at the bottom and sufficient to take a small grooved pulley at the top. The ratchet wheel and catch in Fig. 12 are made from a piece of sheet brass. The method of flattening the ends of the wire for the axle, together with the handle, is shown in Fig. 13. The arm is held in position with suitable lengths of small brass chain, and similar material can be used for the rope, a hook being fitted on the end.
The travelling crane in lig. 14 is shown in a small size, but if the main proportions are retained it can be built much larger. The number of parts have been reduced as low as possible, and the construction could hardly be be more simple.

Dimensions for a push horse are given in the elevations in Figs. 15 and 16 , and represent a medium size. The body is cut to 10 in. from a round of 4 in . diameter, and Hattened at the bottom; the legs are 10 in . by 1 in . diameter, tapering to $\mathcal{F}$ in. at each end. The head is shaped from a piece of $5 \frac{1}{2} \mathrm{in}$. by $4 \frac{3}{\mathrm{in}}$. by $\frac{1}{2} \mathrm{in}$., and let in to a depth of $\frac{1}{2} \mathrm{in}$. The base is 12 in . by 4 in . by $\frac{1}{2} \mathrm{in}$., with 1 in . square lengths underneath to screw the wheels to, tho latter being $2 f$ in diameter and $\frac{3}{4}$ in. thick if of wood, as is usual.
The handle is formed with two 18 in . by $1 \mathrm{in}$. by $\frac{3}{8} \mathrm{in}$. lengths, with a 4 in. length of $1 \frac{1}{8} \mathrm{in}$. diameter round between, these pieces being joined together with $1 \frac{1}{2} \mathrm{in}$. wire nails. The saddle and harness is usually formed with
coloured paper, such as the imitation morocco paper used by bookbinders. The mane and tail can be made from a piece of an old skin rug. By fitting a projecting blook to the front axle a pole can be fitted, in the same way as for the pole cart, that will enable the horse to be pulled instead of pushed.

TOY DOG. This name is given to various small dogs which are sufficiently diminutive to be carried on the arm of their mistresses. They are obtainable in many breeds, the Pekinese being one of the most $\mu$ ppular, while Pomeranians and Yorkshire terriers are also much sought after.

The original toy terrier, which was only sobtainable as a toy dog, is not so often seen Aince breeders took to breeding smal! dogs of other and more attractive types. The Belgian griffon is another favourite, while the King Charles was perhaps the first of all, and still maintains its popularity to a great extent. With Yorkshires, Pomeranians, pugs, and the like, it must be specially mentioned if a toy size is required, as they are also bred to their normal sizes. See Dog; Japanese Spaniel : Pckinese; Pug.

T PLATE. Steel or iron plates in shape resembling the letter T are sometimes employed to strengthen the joints of woodwork. They are arranged in pairs, one on either side of the joint, and bolted right through the timbers, holes being provided in the wood and the plates for this purpose. T plates are also placed on the tie-beam and the vertical posts of a queen-post truss.
TRACHELOSPERMUM. This is an evergreen climbing shrub for greenhouse cultivation, sometimes known as Chinese jasmine or Chinese ivy. The best species is jasminoides, which produces fragrant white blossoms from June to August and reaches a height of 12 ft . It should be planted in spring, in pots of fibrous loam, peat, and sand, or in well-drained borders, training its twining growth to trellis or walle. The plant should be pruned slightly after flowering.
Tracing : On Paper. The operation of tranaferring a drawing or picture by means of prepared paper can be done in two ways. A sheet of tracing paper, which is a specially prepared semi-transparent paper, is placed on the drawing, and the lines underneath are drawn over with a pencil. This method of providing a duplicate of a prepared drawing is used by architects and builders as well as woodworkers and engineers, but tracing cloth is often employed instead of the paper, as it is not so easily torn. Duplicate plans and elevations can be made in this way, colouring being done with coloured inks or water colours.
Anothe: method of transferring drawings is to trace them through a sheet of carbon paper placed underneath the drawing. This method is useful for transferring designs on to metal wood, and other materials.

In all tracing it is necessary to keep exactly to the original lines; at the same time it gives the skilled draughtsman an opportunity of correcting faulty lines on the original. In using carbon paper, it is advisable to pin the dvawing at the top so that the progress of the work can be followed, otherwiso it may be found on the completion of the work that important details have been omitted. See Drawing; Embroidery; Plan.
TRADESCANTLA. This is the name of a genus of hardy herbaceous and greenhouse plants. The favourite hardy kind is the Virginian spiderwort (virginiana), 2 ft . high, which bears purplisb-blue flowers in summer and will thrive in ordinary soil in a shady border. It is known as Flower of a Day, because the individual blooms soon fade, but the plants flower throughout many weeks. The greenhouse species are valuable trailing


Tradeacantia. Trailing foliage of a greenhouse
plants which will flourish in soil beneath the greenhouse staging, or if grown in pots they form an attractive edging. They may also be planted in hanging baskets. A compost of loam, leaf-mould and sand suits them and they are very easily increased by cuttings.

TRAGACANTH. This describes a gummy exudate from a Syrian tree, which has the property of swelling into a gelatinous mass when added to cold water, and has a soothing and demulcent action when applied to irritated mucous surfaces. It is an ingredient of some throat lotions, but its chief use is as a means of holding in suspension iusoluble powders, resins, and oils.

TRAINING: Of Plants. During the first few years of growth the training of fruit trees is of paramount importance. The nursery specialist supplies young trees in various shapes, chiefly bushes, pyramids, standards, cordons, espaliers, and fans.
Bush Trees. Bush trees are the best allround kinds for the amateur. They are easily accommodated to limited space if kept properly trained, and are particularly suitable for simple cultivation and the production of such utility crops as apples, pears, plums, gooseberries, and red, white, or black curiante. Yenrling maidens of apples, pears, and plums usually consist of one main stem which is shortened during winter to about six buds. The following season these buds will produce leader and side shoots, all of which will require shortening to about onefourth their length. During their third season they will develop further, leading and lateral growths, one of which should be pernsitted to grow


Training of trees and plants. 1. Method for frames: $a$, cane or wire anpports. 2. Eapalicr for fruit : $a$, wood ; $b$, canes ; $c$, wire. 3. Greenhouse trainers a, rings, ringed ataples and wire. 4. Garden trainer for weeping roses or climberg: $a$. child's hoop; $D$, cross strainers ; $c$, wire : $d$, wooden support with tarred base and holed apex. 5 . Garden trainer of wood and netting for sweet peas
base and holed apex. $a$, tarred bases for insertion in soil
at the extremities of each branch, a! laterals being reduced to their fourth leaf.

Gooseberries and red and white curranta can be raised from simple cuttings, denuding each of all its buds except the three top ones. These will produce threc shoots, all being allowed to continue growth until the fall of the vear, when they are cut back ahout half-way. Thus, the following season a larger number of shoots will progress, these in turn being reduced in !ength rluring the winter. The next year they will require summer pruning of all laterals, with another slight trimming during winter. In preparing cuttings of black currant none of the buds must be taken off.

Pyramids. Pyranids are suitable for apples, pears, plums, and cherries, and are trained by cutting back a maiden tree to about 12 in . from its stock as a result of which leader and side shoots will appear. During winter the leader should be rerluced by about ove-third and laterals by half, staking the former securely to keep it upright. Subsequent training is similar to that for bushes, but particular care must be taken to ensure pyramidal shape.

Standard Trees. These have a clear stem of about 6 ft . and a head of branches which develops from the uppermost buds. Every winter for the first few years the season's main shoots should be cut back by about half to ensure a foundation of strong branches. Care must be taken to keep them about 2 ft . apart to prevent overcrowding in subscquent years. Side shoots should be pruned to two or three buds each winter for the first few years, but established trees are pruned chiefly by thinning out superfluous shoots and branches. Half standards, which are on stems about 4 ft . high, are treated in the same way.

Cordons. Single cordons are trained from a maiden stem and cut back about half-way during winter. The resultant leading shoot is then permitted to grow on, all side growths being carefully reduced to two buds in winter. This procedure is continued until the stem is well furnished with fruiting spurs.

Double cordons are trained by allowing two shoots to grow on after the first proning back of the maiden stem. Another form of cordon is horizontally trained, its two cordons being trained to strong horizontal wires about a foot or so from the ground, to which point the primary cutting back of stem is carried. Apples, pears, red and white currants, and gooseberries all do excellently in cordon form.

Espaliers. Espalier is a term given to the method of training fruit trees on supports of
iron, stout wire, or wood, as usctul and decorative margins to walks of kitchen garclens, trees thus trained heing known as espalier trees. Such trees are almost beyond the average amateur and therefore should be obtained reads formed from a truit specialist. Treatment subsequent to planting is merely training to supporte and suitable pruning to maintain and increase fruiting spurs.

Fan-trained trees, also, are best sccured from the specialist. This type is suitable for the cultivation of apples, pears, plums, peaches, figs, and cherries on walls. See Wall.

The Diagram Explained The diagram shows also methods of training adaptable to roses of a weeping character, and also to greenhouse and outdoor plants. Fig. 1 shows a simple fixture for frame culture of cucumbers. tomatocs and plants of similar habit. It consists of a simple stem support, with a top, length of canc or stretched wire from front to back of frame. Fig. 3 gives at a glance an excellent wiring method of training plants in a lean-to greenhouse, the principles of which may easily be extended to the full-span or any other type of house.

Fig. 4 is an umbrella trainer of particular value for the display of standard weeping roses or other drooping plants, its simple components being merely a child's hoop, an upright with cross picces, and a suflicient quantity of stout wire : its conslruction is quite easy to follow from the sketch. Fig. 5 is another simple but useful type of trainer, specially suitable for sweet peas, but handy also for climbing nasturtiunis and p!ants of similar habit. It may be constructed of two circular pieces of wood-butter-tub hoops will do quite well, these being attached to four fairly stout uprights as sketched. The bottom ends of the uprights should be tarred or creosoted to prevent decay. Wire, or preferably rot-proof string, is then arranged, tubular fashion, securely to hoops and uprights, thus forming an inexpensive contrivance. This is particularly effective for swect peas when grown in tubs. The netting employed should have a good open mesh.

TRANSFER. Designs printed on thin, transparent paper and capable of being transferred to other surfaces are known as transfers. They can be bought from most fancy necdlework shops and artist's colourmen and are obtainable in llower, fruit, and other designs. They are used for embroidery, beadwork. painting on glass and textile fabrics, pattern printing, leather work, gesso and liarbola work, batik, and for transferring designs on to lampshades.

To use a transfer on a textile fabric, place the latter on an ironing table with the right side upward, then pin the transfer to it with the waxed side down, and press with a moderately hot iron. If the material is thin, the flat of the iron should not be used, otherwise the wax may spread and cause distiguring marlis. The heel of the iron may, however, be used without harmful results. When painting on transparent materials such as gaure or fine georgette, the design mav be tacked underneath the fabric, or the latter may be pinned over the transfer on to a board.

Transfers can be used scveral times, even though the wax has been ironed off, for the outline still remains. They are also used in the following manner for transferring to paper, parchment and prepared wood surfaces: Cover the portion of the fabric to which the design is to be transferred with a sheet of carbon paper, lay the transfer on top, and pencil over all the lines.

Various women's periodicals specialize in transfers for embroidery and designs which may be adapted for other art crafts.

Transfer for Applying Decoration. Another kind of transfer is specially prepared for applying decoration to various materials in

the form of lines. coloured designs, and pictures. Imitations of painted decoration, marquctry work, bandings, stringing, sign wriling, glaining, Iloral patterns, and pictures in miniature can be obtained in the form of translers.

In applying transfers to wood, the surface must be perfectly smooth and clean, and preferab!y borlied up, with french polish. although this is not essential. The exact position of the transfer must be marked lightly, the outlines of the design being indicated on the back of the transfer, so that it is not difficult to place the paper in the correct position. First cut away most of the unnecessary paper surrounding the edges of the transfer, leaving a margin of about $\frac{1}{8} \mathrm{in}$.
The face of the transfer is wiped over with a clean duster, and then with a small, stiff brush it is given a thin coat of gold sizc. The paper is then placed on one side, frce from clust, for the size to dry. A suitable size can be made by dissolving $\stackrel{1}{2}$ oz. of best gelatine in 1 pint of water. If the wood has been bodied up, the surface should be rubbed down with powdered pumice-stone placed in a pounce bag and linally wiped over with a clean, dry rag.
The transfer is ready for application when the gold size is tacky. On no account must the surface be wet. It can be tested by placing the end of the finger on it. If the finger sticks without pressure the surface is not dry enough, but if a little pressure is needed to make it stick to the linger it is ready for application. If the transfer is on duplex paper, it should be divided and the thick backing paper thrown away. The surface of the transfer is carcfully placed in position and well rubbed into contact with the work. It should be noted that when once the transfer has been placed on the wood


Transfer applied to wood in imitation
it cannot be shifted without spoiling it. It is therefore best to commence with one corner and gradually press it into contact . this method also minimizes the chance of air bubbles appearing under the transfer when finished.

Immediatcly the transfer lias been pressed well down on the surface, rub it further into contact with a slightly damp spongc. The sponge is dipped in warm water to wet it thoroughly, and the paper surface of the transfer is wetted, allowing about 5 min. for the water to soak in. One corner is lifted up and the paper is peeled off, leaving the design on the wood. The coloured surface is lightly washed over with the wet sponge, working from the centre to the outsides, and it is then dried by gentle pressure with a clean cotton rag. If there are air bubbles, they may be removed by pricking with a needle point and pressing the transfer down with a wet finger tip.
On no account should the transfer at this stage be touched with a dry finger, as the paint will stick to it and spoil the work. The superfluous gold size round the edge of the transf('r can be removed by dipping a dry sponge in turpentine and wiping over the transfer from the centre to the outside until all traces have disappeared. This operation should not takc more than a few seconds or the turpentine will attack the paint and dissolve it. Directly the size has been removed, the surface should be wiped dry with a clean cotton rag. When dry the colour will harden, and can be coated, if desired, with a transparent polish.
The method of applying coloured transfers or linings to polished metal surfaces is somewhat similar, but special care will be necded to fit the paper on curved surfaces, otherwise the finished work will appear slovenly. In transfers of lines making a panel with ends, these portions should be applicd first and then joined up with butt and not overlapping joints. To make an effective join, the length of line between the cnd portions must be accurately measured, and, in the case of the end picces as well as the lines, as much of the outside paper as possible cut off. See Embroidery ; Graining; Painting on Textile Fabrics.
TRANSFORMER: In Wireless. This is an apparatus for converting an alternating current from one voltage to another and more convelicnt voltage. It comprises two windings, viz. primary and secondary, which are coupled to each other so that energy is transferred from the primary to the secondary by electromagnetic induction.

In low-frequency alternating current circuits the windings are mounted upon a laminated corc of a metal having a high magnetic permeability, such as iron or an alloy in which iron is the main constituent. In high-frequency transformers, the primary and secondary windings are wound upon an insulated former and a core is not used.
When the primary winding of a transformer
is connected to a source of alternating current supply, a magnetic flux is set up which becomes linked with both windings, the voltage per turn being the sanic in each winding (neglecting losses). The voltage across the secondary winding is, therefore, directly proportional to the ratio of the number of turns on the secondary to the number of turns on the primary. Thus, if the ratio of secondary to primary turns is three to one, the voltage across the secondary terminals will be thrce times the voltage across the primary terminals.
In a perfect transformer the secondary power output will be the same as the power or energy consumed by the primary, but in practice the power factor and losses in the windings and core have to be taken into consideration. Transformers may be designed to give a high secondary voltage and a correspondingly small current. or a low voltage and a large current.
Transformer Coupling. This is a method of coupling wireless receiving valves in cascade for a mplifying at high or low frequency. In a high-frequency transformer the secondary is usually tuned and the primary is untuned, the number of turns on this winding being adjusted to give the required degree of selectivity. The coupling between the two windings is normally fixed, and the degree of selectivity will be minimum when the transformer has a turns ratio of $1: 1$. Decreasing the number of turns on the primary increases the selectivity but may decrease the energy transfer between the primary and secondary circuits, and therefore the sensitivity. In practice it is necessary to effect a compromise with the object of achieving good sensitivity and adcquate selectivity.
Transformer coupling is employed in lowfrequency magnifiers, and provides greater magnification per stage than either resistancecapacity or choke coupling. A good lowfrequency transformer should possess a high primary inductance and a secondary winding of low self-capacity.
A high primary inductance ensures an adequate amplitication of the low notes, but it is essential that the valve connected in the primary circuit should have an appropriate A.C. resistance or impedance. Suitable types of valves are usually recommended by the makers of the transformers and these should be employed. The high-tension voltage nust be adjusted so that the current flowing through the primary winding is within the linits specified for that particular transformer.

Transformers having alloy cores are often isolated from the high-tension current flowing in the anode circuit of the valve by a method known as parallel or shunt feeding. This is to prevent loss of inductance and saturation of the core. The anode current is passed through a resistance which is connected between the high tension positive terminal and the anode of the valve. The low-frequency impulses are then applied to the transforiner primary winding by way of a fixed condenser. The response curve of the transformer is affected by the values of the resistance and condenser, and also by the A.C. resistance of the valve used, and the transformer maker's instructions should be followed if maximum results are desired.

The high magnification given by transformer coupling renders unnecessary the use of more than two stages, and low ratio transformers are an advantage both from the standpoint of quality of reproduction and stable operation. See Amplitier.
TRANSMISSION : In Motor Cars. Transmission is the mechanical means by which the power developed by the engine is transmitted to the road wheels.

The usual lay-out of the transmission in a four-wheeled vehicle consists of the clutch, the
gear box, propeller or cardan shaft, and the live or back axle. Two other lay-outs arc clutch and gear hox as a part of the engine unit, and the gear box as a part of the back axle unit. Of the three the second is the most common, and the third is seldom met with. The clutch, of whatever type, forms part of the Hywheel or is directly connected with it. In the three-unit system (independent gear box) the driven member of the clutch is connected by a short shaft to the primary shaft of the gear box. A universal joint is fitted at each end of the clutch shaft so that in the event of chassis distortion unduc strain will not be placed upon the bearings of the gear box and the clutch spigot.

The propeller or cardan shaft, if of the open type, is fitted with a universal joint at each end, one of which is designed for sliding as well as universal movement. This feature is necessary owing to the difference of centres between the axle and the spring anchorage and that of the gear box and the cardan shaft. With the enclosed cardan shaft one universal joint only is provided at the gear-box end, the springs being anchored by shackle plates at both ends. The road wheels of the back axle are driven by either bevel or worm gearing through the medium of the axle shafts and the differential gear.

The clutch and gear box unit construction follows exactly the same lines, except that a clutch shaft fitted with universal joints is dispensed with. A short semi-floating shaft entirely enclosed takes its place, and a longer cardan shaft is necessary, which may be either of the open or the enclosed pattern.

In the third system, gear box and back axle unit construction, the drive is transmitted by a cardan shaft, fitted with universal joints at each end, if of the open type, and onc universal joint at the clutch end if of the enclosed pattern. As a rule the clutch is provided with a short shaft that goes to a bearing at about the position usually occupied by the gear hox. The cardan shaft is universally jointed to the clutch shaft at this point. The object of this is to relieve the clutch mechanism of the lateral strains imposed as well as to reduce the length of the cardan shaft.

Chain transmission is now found only in the motor cycle and the commercial vehicle. For the motor cycle the transinission is either solely by silent roller chain, or by chain from engine to gear box and thence by belt to the back wheel.

To revert to the motor car forms of transmission, there are, of course, other principles that have been tried, such as hydraulic, clectric, and patent devices that give an infinite number of gear reductions, also the friction drive, used on some light cars.

Fluid Flywheel. This is a hydraulic transmission device introduced by the Daimler Co. The mechanism, which replaces the ordinary clutch, consists of two cup-shaped members facing each other-the one, filled with oil, attached to the crankshaft, and the other, enclosed by the driving cup, rotating with the first motion shaft of the gear box. Both cups a re divided off by radial webs into a number of cells, and the adjacent cdges of the two sets of cells (in driving and driven members respectively), are separated by a narrow gap. When the driving cup revolves, the oil receives a circulatory motion and, in passing to the driven member, gives up its energy to the latter, so rotating it. At very slow engine latter, so rotating it. At very slow engine
specds the amount of slip is large, and practi-
cally no drive is transmitted, but as the engine is accelerated the slip quickly diminishes until at normal speeds the loss is only about 2 p.c. Thus the device acts automatically.

Loss of road speed and of general efficiency, of ten attributed to minor engine faults, can frequently be traced to neglect and want of !ubrication throughout the transmission. Sueh parts as the universal joints of the cardan shaft shou!d be frequently looked to, because, apart from rotary movement, they have also to bear a considerable movement that is set up by the varying axle position in relation to the chassis.

It is perhaps seldom realized that when the car is travelling on top gear the clutch shaft and cardan shaft, including all the universal joints, are revolving at engine speed, a fact that easily accounts for the rapid wear that takes place unless proper attention is paid to lubrication.
A worn universal joint should be immediately replaced or rebusled and new pins fitted, otherwise a fracture may easily occur owing to the severe blows imparted by the torque of the engine. With chain or helt drive it is imperative that the sprockets and belt pulleys should be dead in line. All worn parts should be attended to, as it is through neglect of thesc that transmission noise is caused.
With reasonable care and intelligent driving, transmission wear or risk of breakdown should be neg!igib!e in the modern car. The driver, however, of a morlerate powered car who is afraid to use his gear box and forces his engine to labour on hills, or after turning a corner, is placing severc strain upon the transmission system at every point from the clutch to the back ax!c. See Clutch; Differential Gear : Gear; Live Axle: Motor Car : Motor Cycle : I'rope!ler Shaft.
TRANSOM. The prepared piece of wood which divides the upper glazed portion of a window or door frame is usually known as the transom. In casement and French windows, or doors with a glazed opening above, the transom serves also as the door head. In an ordinary window of this type, the transom would be about 6 in. wide and 2 in. thick on the inside, tapering on the top surface to a thickness of $1 \frac{3}{4}$ in. outside the window. This is technica!ly termed weathered, and is designed to throw off the water. A groove is gencrally cut underneath to prevent water running along to the sash, or, to use the technical terms, the underside of the transom is throated.

In many windows, the transom is bevelled off from its highest point. Casement windows or sash windows with a fixed or fan light above are called transom windows. This type of window is often made in mcta!, but the division between the smiall upper portion and the lower portion is still called a transom. See Casement ; French Window, Window.

TRANSPLANTING: Of Plants. Carelessness in transplanting is the cause of many failures in the garden. Plants, whether seedlings or maturc specimens, should be lifted from seed box or open ground with a good ball of soil if possible, but always with their fibrous roots intact. Care of these roots is of paramount importance, for it is their hair-like tendrils that collect the nourishment upon which the health of the plants is entirely dependent.

After plants have bcen lifted they should never be left cxposed to the air, but should


Transplanting. 1. Transplanting streptocarpns : $a$, crocks : $b$, rough ; $c$, peat ; d, fine soil. 2. Lapageria rooted cutting detached from parent, transplanted to pot and plunged in a frame. 3. Transplanted tree carnation layer : a, crocks;
b, broken turf ; compost
d, sand. Calceolarias transplanted to box : $b$ broken turf ; $c$, compost; $d$, sand. 4. Calceolarias transplanted to box: $a$, leaves; $b$, soil ; c, ventilating block $d$, glass. 5 . Transplanting a standard, showing circular trench to be flled with water before lifting tree. 6. Hown to
lift a seedling. 7. Same transplanted correctly. 8. Transplanted too deep. 9. Dry weather transplanting. 10. How to transplant on wet soil
ture between two or more joists or rafters, bridging the space betwcen them with stout timber about 25 per cent thicker and equal in der,th to rafters or joists. These timbers are known as trimmers and should be tusk tenoncd to the others. Intermediate rafters or joists that have to be cut to form the aperture are mortised and tenoned into the trimmers.

In the Floor. Filiets of wood are in the majority of cases fitted around the inner faces of the trap hole with their upper surfaces at such a depth as is necessitated by the thickness of the trap door Notches or openings are cut in the fillets where lec transferred to their new quarters or de- necessary to clear the battens. The upper posited in a shady place. The smaller surface of the floor is cut back so as to reveal kinds should be covered with wet moss and about half the thickness of the joists and this soil, and large specimens such as roses and is then filled in with a mitred framework. fruit-tree enclosed in sacking and drenched with water. They should be replanted at the earliest possible moment, when the sun is down, and watered frequently until they are again established. Syringing during the evening will be of additional benefit, particularly in the case of transplanted evergreens.
TRAP. This word has three main meanings, as far as the household is concerncd. It refers to a piece of mechanism widely employcd for catching obnoxious insects and animals, such as beetles and mice. It means secondly a contrivance used to hinder the passage of foul air from a waste pipe, and finally a small vehicle which is drawn by either a horse or a pony. See Beetle Destruction; Carriage: Dog Cart: Drains; Fly Paper;


The trap door should be very solidly constructed and lit the hole accurately, and when in position should be flush with the normal surface of the floor. It requires to be properly hinged with cellar or trap loor hinges. These comprise three parts; two are fitted to the framework and the trap door, and the third serves as link connecting the other two, there being two hinge points, one near each end of the link. The trimming has to be cut away so that the flap hinge can be sunk into it with its upper surface level with that of the Hoor. Fig 1 illustrates this type of hinge and the mode of recessing the timber for its reception.
When the trap door does not exceed about 21 in. square, ordinary butt hinges may be used. These are fitted vertically into the joint between the trap door and the lloor hoards, as illustrated in Fig. 3. Good stout screws slould be used to secure them, the hinges being of the malleable cast variety, or of some other kind that possesses sufficient strength to stand the strain.
To enable the trap door to be lifted, it is desirable to fit a sinall ring handle, such as that shown in the illustration, and, to prevent the trap door being opened, it is a wise precaution to provide it with a couple of bolts on the underside.
Loft Doors. When fitting a small trap door for access to a loft, or other similar part of a

Mice; Pipe: Rat; Vermin.
TRAP DOOR. The general use of a trap door is to close an aperture through a Hoor, ceiling or roof. It is a horizontal door and usually consists of stout looards jointed together and strength. ened by cross battens. The framework round the trap door must be strong enough to support any load which may be brought upon the floor.

A commonly adopted plan is to make an aper-


Trap Door. Fir. 1. How the flap hinges are fitted. Fig. 2. Making a small trap door of foor board with deal cross pieces. Fig. 3. Simple lifting device consisting of a small ring
building, its width should not be greater than that between two joists, and then it will suffice to fit two cross members betwcen them and secure them with stout spikes driven through the ceiling joists. The trap door can be composed of floor board with cross-pieces of 3 in . by l. in. dea!, screwed to the upper side as in Fig. 2. This rests on fillets in the aperture.

As commonly fitted, the trap door giving access to the space above the ceiling of an upper storey is made of stout matching, and has no hinges. It rests on a lining lixed to the trap aperture and is simply pushed upward into the loft to open the trap.

Roof Doors. Trap doors when fitted into a roof are usually made to lift off bodily, although examples are found in which the hinged flap is used. However it may be arranged the outer surface must be covered with weatherproof material, such as slieet lead or zinc.

A cross sectional view of an external trap door is shown in Fig. 4, the aperture through the roof being framed up with trimmers. The inner faces of the opening are lined with stout timber projecting several inches above the normal roof surface, and covered by a Hashing (q.v.) of lead or other material to ensure a water-tight joint. The trap door

shoult be several juches larger each way than the trimming, and should fit on a lied, or fillet on the under side, to keep it in position. The outer edge of the door is preferably fitted with a small, downward projecting batten of wood and the whole corered with lead. The lead is turned under the outer batten to provide a drip for rain water. Two stout bolts should he located about the middle of the trap. Sec Attic: Cellar: Ladder; Loft.
TRAVELLER'S JOY. This is the popular name of Clematis vitalba (old man's beard), a rampant climbing plant. It hears a profusion of white Howers which are followed by Hufty fruits. This plant is used as a stock on which to graft named, large-flowered varictics of clematis.

TRAVELLING BAG
Several of the receptacles cmploved for luggage are covered by this term, which is applied to suit cases, Gladstone bags and liit hags amongst others.
Bags made of leather should be rubbed over from time to time with neat's foot or harness oil if a polished surface is not requirct, but, as the small leather bag is usually finished with a polished surface, the best treatment is with a good white or brown boot polish. To renovate an old leather bag, the grease and dirt
must be removed with a strong solution of with a soft brush and then polished with a common soda, in the proportion of 2 o7. of soda to a pint of hot water. Apply the soda water with a soft rag when warn, not hot, and if very dirty rub the material with a brush. If the leather is stained, a weak solution of oxalic acid will generally remove the marks, but it should not be applied until the soda solution has been used. The cleaned surface should be washed with lukewarm water and placed in the sun or a warm spot away from the fire to dry.
The leather should now be treated with a wax polish, applied with a solt rag, rubbed in

## Trays: Shapes, Styles and Materials

## Choosing, Decorating and Making for all Household Needs

Several articles in this work describe the materials or processes used in making and dccorating trays, i.e. Inlaying ; Lacquer Work ; Papier Maché; Repousse Work; Tarso. Sec Salver: Shcfficld trays, i.e. Inlaying ; Lacquer Work; Papier Maché ; Repousse Work; Tarso. Sec Salver: Shcfficld
Plate; Silver ; also Ash Tray; Fruit Tray

No housewife need have an ugly tray even in this article. Anykind of coloured embroidery in the kitchen, as the plainest variations in could be substituted for the sill needlework tin, papier mâché, stainless composition and lacquered wood are obtainable in goorl colours at very moderate prices. Oak trays with handles are always useful as waiting trays when laying or clearing the dining-room table.

Vencered and inlaid mahogany trays of Sheraton style should be provided with a glass top to fit inside the border. Such trays when solidly constructed are apt to be rather heavy. If it is desired to use one as a tea tray, it can be laid on the table with the cups, and the teapot, etc., carried in on a lighter tray and placed on it. The same method of service is often resorted to with old Sheffield plate and other metal trays.

A pretty tray with handles suitable for after-dinner coffee service is made of mirror glass framed in polished stecl. This idea can be adapted by the home worker, the tray being made up with a wooden moulding and bottom to fit a picce of mirror glass of desired size. The moulding should be silvered or gilded with metallic paint and handles should be attached as shown in Fig. 4.

Small trays for occasional use are made of papier mâché. These may be bought finished in black with gilt stars, or in sone light colour. A further suitable decoration when something more uncommon is liked is to cut out large roses from a flower scedsman's catalogue, paste and varnish them on to the centre of such a tray, maintaining the Victorian aspect of the papier mûché foundation. Another idea is to embellish the tray with pictorial patchwork. (See page 914.)

There are manv ways of ornamenting trays constructed on the simple methods described
clean cloth. See Luggage; Suit Case; Trunk.
TRAVELLING RUG. A good trave!ling rug is an expensive article when made of thick pure wool. A favourite type has a plaid design with fringed ends. Others are woven in reversible colours. Large numbers of travelling rugs are manufactured for car use in fur fabrics, real furs made up into the standard oblong or square shapes and lined with cloth. leather lined with a woollen check material, and livery cloth, or some waterproof material lined with wool. in this article. Any kind of colourd embroidery under glass in the example illustrated in Fig. 10. A sampler or a group of conventional trces and figures in multi-coloured cross-stitch, a wreath or basket of flowers in tapestry necdlework are a!! effective. A tray cloth in real lace may be mounted on silk to tone with the tea warc. Pen painting and pokerwork, tarso and pencil painting are all art crafts which may be utilized and are quite serviceable when frame and glazed in this manner.

Special decp-sided trays are made for carrying bottles, or decanters with a number of glasses. These trays are provided with movable, raised frames having cut out sections in which the glasses, etc., stand. They are specially useful for carrying drinks into the garden. Other trays are fitted with china or
glass dishes for hors d'oeuvres. Early morning tea trays are often made of stainless composition and surrounded by a wicker-work border. A useful wooden breakfast-in-bed tray is illustrated in Fig. 11. This type of table tray is light to carry and more comfortable to eat from than a tray placed at the side of the bed.

Making Trays. There are several forms of construction suitable for trays. The simplest method perhaps is that in which special metal corners are used in conjunction with a simple moulding having a rounded top edge. Plywood forms the bottom of the tray. Figs. 1 to 4 show progressive stages in making a tray, and are self-explanatory. The moulding, copper corners and suitable copper nails can be had from Messrs. Handicrafts, Ltd., or their agents.

Another simple method of tray construction is to screw mitred lengths of moulding on the top of a wooden base, as in the section at Fig. 5. The base should be of oal-faced plywood a bout $\frac{1}{4} \mathrm{in}$. thick. The use of a rebated moulding is shown in the lower section, the finished tray being seen in Fig. 6. If the decoration is effected with transfers the surface must be thoroughly claned with glass paper and well boiled in with french polish. The position of the transfer decoration can be marked with a chalk line, which should be thin; a length of thread passed over a piece of chalk will provide a suitable line.
The dircctions for laying the transfer should be carefully followed : on no account should the work be hurried, and when in position the wood should be placed on one side to allow the surface of the transfer to harden. A final coat with a transparent polish or varnish should be


Tray. Figs. 1-4. Showing the construction of a tray from the parts supplied by Handiorats, Lta. Fig. 5. Section of a tray corsisting of mouling gerawed. to a base, also a seotion made with cabinet makers' moulding. Fig. 8. Oak framed tray. Fig. 7. Selection of tray mouldings. Fig. 8. Tray handlea Courlesy of Handicrafts, Ltd.
applied, and then the moulding can be placed on the edges, the mitres being carefully planed up on a mitre planing board in order to obtain a clean joint.
The usual handle for this type of tray is seen in the section at Fig. 5. A few other patterns are illustrated in Fig. 8. It is screwed directly to the outside of the moulding, or the plates


Tray. Fig. y. Simple form of decoration with inlaya of different coloured woods
can be let into the wood if desired. It should be sufficient to glue the mitre joints and screw the base to the moulding, but a nail can be driven in at the ends to give further security. A number of tray nouldings are shown in Fig. 7. The uppermost is for screwing direct to the base, the next being a grooved scetion and the third a rebated one. The bottom moulding is for use with metal corners as shown in Figs. 1 to 4.
A varied assortment of mouldings can generally be olitained at the shops which specialize in woodworking materials. As will be gathered from the illustration here given, there are various methods of fitting the base of the tray.
In the tray shown at Fig. 9 the sides should be from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. thick, according to the dimensions of the base, but a tray measuring about 18 in . by 12 in . will not require a greater thickness than $\frac{1}{4} \mathrm{in}$. and a licight of $1 \frac{1}{2} \mathrm{in}$. on the long sides. The ends should be about 3 in . high, shaped to an even curve, and the handle opening cut to about 4 in . long and $1 \frac{1}{4} \mathrm{in}$. lleep. The ncatest method of joining the corners is by the dovetail joint illustrated in the diagram.


Trays. Fig. 10. Pretty atternoon tea-tray made trom a piece of embroidery, backed, framed and glazed. Fig. 11. Hreaklast-in-bed tray of wood, with wicker surround and legs. Fig. 12. Well planned table tray for invalid, with adjustable baize-covered wooden centre and side panniers of wicker for books and work. The tray shown underneath is used in conjunction with the table portion for meals

Fig. 12 bu courtesy of London Association for the Blind

A simple form of inlay decoration is illustrated, consisting of four small squares, each of a different coloured wood, arranged in the form of a square. Thesc may be joined with a length of stringing, but the effect of the corner decoration is quite pleasing. The small squares should be cut from wood planed to $\frac{1}{8}$ in thick and from $\frac{1}{2}$ in. to lin. side, according to the size of the tray. The holes are marked out in pencil and recessed with a sharp chisel, giving the edges a slight undercut so that the inlays will fit tightly in the recess.

Fig. 10 illustrates a tray made up with oak moulding and a woollen botton, over which is placed a piece of embroidery, the latter protected by a shect of glass. In constructing this type of tray the greatest care must be taken to ensure that the glass lies tlat and that the groove or rebate in the mou!ding docs not "bind" the edges at any part.
The honce worker who can manage a little simple basket work may like to construct the useful bed tray slown in Fig. 11. It has a wooden botton, which might be lacquered, or stained and varnished. The table portion should be mads up first, the top fixed, and the basket-work guard then attached to the latter. A devclopment of this iclea is illustrated in Fig. 12, consisting of an invalid's work-table and "breakfast-in-bed" tray. The adjustable sloping work-table is of wood covered in baize. The removable tray shown beneath is used to fetch and carry the meals, and rests on the table, the latter, of course, being adjusted to the horizontal position.
Trays are also used in travelling trunks, drawers, tool chests, etc. In the case of trunks they are usually made with wooden sides to fit inside the trunk and rest on fillets. The bottom is formed with webbing, which is
cooths, which may also be used as table mats, decorated with drawn thread work
stretched from side to side and end to end, and covered with canvas or other material, and in large trays with one or more wooden strips nailed across from side to side to strengthen the bottom.

Trays for drawers and tool chests are made from thin wood resting on fillets which form runners. They can be divided into compartments, and are uscful for storing small articles, or, when used in drawers, to avoid crushing delicate materials. Trays are madc of wire for confectionery and letters and of vulcanite for photographic work.

TRAY CLOTH. Small cloths of washable materials made to fit round, square, oval or oblong trays are provided either as protective mats or to enhance the appearance of a tray. They are also necded when a meal is scrved on a tray. Besides their nominal use they make covers for small dressing-tables and chests, and are often preferred on the afternoon tea-table to a larger cloth, especially when embroidered on linen to match a cosy cover. Scts of tray cloths are also most convenient as place mats for the dinner table.

The housewife can hardly have too many of these charming little cloths, which are so easily marle and laundered at home. They nay be of brightly coloured linen, embroidered and scalloped with white embroidery cotton, of unbleachell linen worked in colours, and with hemstitched edges, of crash with amusing designs in woolwork, or of finest white linen, lace trimmed, or decorated with beautiful Richelieu, Renaissance, or drawn thread work, They may also be inade entirely of tilet, or crochet lace, of oil baize or ralias cloth.

Linen is the most uscful material for tray cloths intended for ordinary household purposes. The set illustrated is nade in coral pink linen with a border design of drawn thread work. Usual sizes, unless made especially to fit a tray, are an oblong measuring 12 in . by 17 in.. or one measuring 15 in . by 20 in . Transfer designs are obtainable in great varicty and to fit different shapes and sizes. Scalloped edges are used for oval and
round tray cloths. See Drawn Thread Work Embroidery; Heınstitch; Pattern Printing; Raflia Work; Scalloping.

TREACLE. The uncrystallized syrup that drains from raw sugar in the process of refining, and is known as treacle, contains a large proportion of saccharine principle, and is valuable as an article of houseliold diet. I is cheaper than sugar for many purposes.

The uses of this syrup in cookery are manifold. It is used in making all linds of ginger cakes, gingerbread, and brandy snaps. It is often adcled to the pickle employed for curing hams and spiced becf. The finer variety of syrup known as golden syrup is usually employed for making roly-poly puddings or treacle tarts, but the pure brown treacle will be found superior to a highly refined syrup for most puddings or for calies. The very darkest form of syrup, called black treacle, is not suitable for table use.

Treacle Fruit Cake. Gollen syrup or treacle is used to mix this fruit calic, which is made according to the following directions:


Treacle Fruit Cake. A wholesome caise for nursery tea
Wash 6 oz. each currants and sultanas, wipe them in a clean cloth, and put them aside to dry. In the meantime, sieve together 1 lb . flour and $\frac{1}{4}$ fiat teaspoonful carbonate of soda; rub in $\frac{1}{2} \mathrm{lb}$. margarine until the mixture resembles fine breadcrumbs.

Add the fruit, previously stalked, and 2 oz . candied pecl cut into small picces, mixing all these ingrerlients well. Break 2 eggs into a small basin, whisk them well; then add $\ddagger \mathrm{lb}$. syrup or treacle, and continue whisking. Dissolve $\frac{1}{1} \mathrm{lb}$. sugar in 1 gill milk, add these to the eggs, and when they are thoroughly mixed pour them into the dry ingredients and beat the mixture for a few minutes before turning into a large, round cake-tin previously greased and lined with greased paper.

Bake the cake in a moderately hot oven for about 2 hours, lessening the heat after the first 20 min . If it becomes brown on top before it is thoroughly cooked, cover it with a picce of paper. When ready, lift it out of the oven on to a calip-sieve and leave it to cool.

Treacle Pudding. Mix together 6 oz . flour, a little more than 2 oz. finely chopped suet, 3 teaspoonful ground ginger, a pinch of salt, and 1 saltspoonful bicarhonate of soda. Then add an $\mathrm{cgg}, \mathrm{l} \frac{1}{2} \mathrm{oz}$. treacle, and enough milk to mix the whole to a soft consistency. Turn it into a greased basin, cover it with a piece of greased paper, and steam it for about 2 hours. Scrve it with heated golden syrul or golden sauce (q.v.).

Anotlier variety of treacle pudding is made by sifting $\frac{1}{\frac{1}{2}} \mathrm{lh}$. flour with $\frac{1}{4}$ teaspoonful salt into a basin, adding $\frac{1}{2} \mathrm{lb}$. finely chopped suet, $\frac{1}{2} \mathrm{lb}$. raisins stoned and cut small, or $\frac{1}{4} \mathrm{~h}$. raisins and an equal amount of cleaned and picked currants. Stir together 3 tablespoonfuls treacle with $\frac{1}{2}$ pint cold water, and with this mix the dry ingredients in the basin to a dough. Grease a pudding basin, turn the mixture into it, cover with a cloth, and boil for 4 hours. Serve with sweet or golden sauce.


## Treacle Tart, a cheap and attractive sweet

For Palmeston pudding, another form of treacle pudding, equal quantities of breadcrumbs, suet, and treacle are reguired. The pudding is boiled in a greased loasin covered closely with a cloth for about 3 hours.

Treacle Roly Poly. This is made in the same way as jam roly poly (q.v.), and $\frac{3}{4} \mathrm{lb}$. treacle or golden syrup is required. This should be niixed with 3 oz. lreaderumbs and $1 \frac{1}{2}$ teaspoonfuls lemon juice, being first warmed in a pan if the weather is cold. Golden sauce should be served with it scparately.

Treacle Tart. Some short crust pastry, $\ddagger \mathrm{lb}$. golden syrup or treacle, 2 tablespoonfuls line breaderumbs, and $\frac{1}{4}$ teaspoonful ground ginger are necded to malie a treacle tart. Roll out the pastry to a round about $\frac{1}{4} \mathrm{in}$. in thickness, use some of it to line a round greased tart-tin, and decorate the edges with a fork. Mix the breadcrumbs with the ground ginger, add to these the treacle, previously warnied, and pour the whole into the lined tin.
Roll out the remainder of the pastry, cut it into strips about $\frac{1}{4} \mathrm{in}$. wide, twist each of these two or three times, and then lay them across the tart so that they form a trellis-like pattern, as shown. Bake the tart in a hot oven for 20 min ., and then turn it out of the tin. It may be served hot or cold. See Golden ludding; Pastry; Suet Crust; Toffee.
TREADLE. Used in foot-driven sewing machines, fretsaws, lathes. and other small machines, for propelling a $\| y$-wheel, the treadle or foot-motor is a hinged plate fixed to a base or to the framework of the machine and attached to the fly-wheel by a connecting-rod known as a pitman.

The treadle is balanced on a spindle to give an up-and-down movement to the pitman, and is variously shaped from a single foot rest of the portable treadle here illustrated, the double foot rest fitted to some makes of sewing machine, to the heary bars, and pierced iron plate of the lathe. The portable treadle driving wheel is useful in the amateur's workshop for driving a polishing head, a small circular saw or drilling machine, but it must be securely screwed or bolted on the fioor.

Inconvenience is often callsed when using a treadle by the fly wheel stopping


Treadle. Portable treadle with a single foot rest Courlesu of R. Melluish, Lld.
at dead centre. It is not experienced to any cxtent with a light machine but generally with a lathe fitted with a heavy fly-whecl. The best method of overcoming the dead centre on the crank and so bringing the treadle into the correct position for starting when the inachine is at rest is to clamp a weight on the fly-wheel so that when the machine is at a standstill, the treadle $u p$, and the crank just over the top centre, the weight is at the bottom of the whicel. A sharp downward push on the treadle will send the crank over the bottom centre, and the impetus given will carry the wheel round. See Fretwork: Lathe: Sewing Machine.

TREE: For the Garden. Trees should never be planted close to a housc. Not only when fu!ly grown do they hinder the free


Tree Carnation. Blooms of the variety Einchantress, a beautiful greenhouse carnation. See below
passage of light and air, as well as inducing dampness, but their presence is a menace to the structure of the building itself.

As a ru!c, the roots of a tree spread just as far underground as the radius of the branches ahove. In the course of time, therefore, this spread of roots is quite likely to underminc the foundation of a house, and to render it unsafe. Oaks and yews are the least desirable trees to have near houses.
Some of the most attractive trees for planting in the garden are various Conifers; for example, cypress, deodar cedar, spruce and silver fir: hawthorn, laburnum, catalpa or Indian bean tree, bronze-leaved plum (Prunus Pissardi), ornamental crab (Pyrus foribunda and others), ornamental cherry, scarlet oak (quercus coccinca), variegated maple (acer negundo variegatum), and green and variegated hollies. See Apple; Fruit; Grafting; Hazel ; Laurel; Rose ; Syeamore, etc.
TREE CARNATION. This name was used to distinguish the original type of winter and spring-flowering carnations grown under glass, a type which has bcen to some extent superseded by the perpetual-flowering carnations. They need a minimum temperature of about 50 degrees, and are propagated by cuttings inserted in sand beneath a propagating case in the greenhouse. A few of the finest varieties are Spectruin, red; Laddie, salmon; White Pearl, white; Topsy, crimson; and Enchantress, light pink. See Carnation.

TREE LUPIN. This vigorous hardy shrub Fig. 2. There is another form taken from the grows quickly and soon forms a large spreading bush 4 ft . or more high. It needs plenty of room and is scarcely to be recommended for

small gardens. The Howers of the typical kind (Lupins arboreus) are pale yellow and fragrant: they are produced very frecly in May and June. Somerset is an improved yellow variety. The variety Snow Queen has white Howers. Thesa plants thrive best in well-drained soil and dislike being disturbed; they are easily propagated by seels sown out of doors in spring. Straggling shoots should be cut back in March.

TREE OF HEAVEN. This is the popular name of a hardy leaf-losing Chinese trec (Ailanthus glandulosa) which will reach n height of 50 ft . or more. It is valued for its long pinnate leaves and red fruita in autumn. This tree, when young, is often hard pruned each spring and restricted to one now stem. for under this treatment the leaves arc exceptionally fine, though its height docs not then exceed 5 ft . It does well in town gardens and flourishes in ordinary soil. Propagation is by suckers in spring, by lagering in summer or by sowing seeds.

TREE PEONY. This shrub (Paeonia moutan) bears immense double or single Howers in spring. It is scarcely suitable for general planting, for it starts into growth carly and the young shoots are liable to be damaged by late frost. It needs lonmy soil and a position in which the morning sun will not reach it. It is a Japnnese shrub and the numerous varieties have chiefly Japlancse names. Paeonia lutea is a handsome tree
 peony from China and bybrids have been raised between this and the common trec peony.
TREFOIL .
The trefoil, which is a favourite form of Gothic ornament, as employed in architecture, is an ornamental foliage of threc divisions that is based, like the quatrefoil, on a geometrical construction. The simplest form of it is shown geometrically in Fig. 1 and a pointed form often scen in stonework in

Fig. 2. There is another form taken from the clover leaf in Gothic carving. It may be used with good effect in relief carving and is one of the most suitable motifs for the amateur woodcarver. See Quatrefoil.

As an ornamental support for flowering plants trellis work is much alin to lattice and rustic work, although the latter term is generally applied to the construction of articles of rough, natural material.

As a rule trellis work is carried out with relatively thin prepared timber, in which sawn plastercr's laths play an important part, hut the term is often a pplied to work carried out with wood in its natural state. The work consists cssentially of interlacing, cither at right angles or diagonally, thin strips of wood, which are fixed to some form of support or


Trellis. Figs. 1 and 2. Two methods of Gxing the laths: in one they cross at ripht angles, in the other diagonally
rough grounds. In sone cases the strips are not actually interlaced, but are placed so that they cross over one another either at right angles or diagonally, and the appearance of interlacing is obtained.
A general idea of the method of lixing the laths is given in Figs. 1 and 2, where they cross at right angles and diagonally. The joint where they cross is completed by driving a small nail through it and clenching it. The ends should be fixed to somas supporting frameworl. The common expanding diagonal trellis can be obtained so cheaply that it is only when some more robust and permanent form is desired that the worker will be called upon to make up this type.
lig. 3 shows trellis work in prepared timber, which is very suitable when its purpose is to act as a screen rather than purely as a support for plants. The framework has grooves worked on the inner edges in which the trellis is fitted. The latter is carried down to just below half the total height, and the lower portion is filled in with match boarding. The framework, which is made from specially prepared timber, is joined together ly stub tenons cut in length to just the depth of the grooves, the joint being strengthened with nails.

The length and height of the whole should be first decided upon, and a decision made as to the number of intermediate uprights that will be required. The various lengths are then cut off, always allowing for the tenons. The !atter are marked out, using a square to get them true. and sawn with a tenon saw. The thickness of the tenons may be obtained from the grooves into which they fit. and it is advisable to cut them rather full so that a tight

TREILLAGE. Literally this is another name for trellis but it is applied specia!ly to a frame of stout wooden uprights crossed with squared laths of ligbter substance and adapted for the support and training of fruit trees.

## Trellis and Trellis Work

## Structures for Screening and Beautitying the Garden

A number of articles in our Encyclopedia have reference to one or other of the uses of this form of woodwork. for instance Arch; Fence; Garden; Pergola; Porcl1; Roof Garden; Rose Garden. Sce also Rustic Work; Summer House
joint is obtained, affording the necessary strength and rigidity. The top rail, which is bevelled on hoth edges, runs through the whole length, as in Fig 3, the micldle or intermediate uprights being jointed into it as in Fig 4, and the end uprights as in Fig 5 . It should be noted that the end uprights are grooved on one edge only. Fig. 6 shows the details of the jointing of the centre rails, which are niso bevelled on both edges, and are further rebated on one of the lower edges to take the matchboarding. The lower rail is also rebated on the upper edge as in Fig. 7. and is jointed to the end upright as there shoan : the intermediate uprights are tenoned into it, mortises being cut for this purpose. These latter should he carefully measured off and miarked out in accordance with the length of the centre rails so that the uprights are perfectly vertical when they are fitted in position
The trellis work may be composed of plas. terer's laths, or a quantity of narrow, thin stuff may be obtained for the purpose Whichever is used, it should be obtained in conjunction with the timber for the framework, since the trellis fite into the gronves in the framework The width of the grooves equals double the thickness of the laths, since one series of the latter is placed llat on the other. It is not always necessary to nail every joint where the !aths cross, especially where a very close mesh is required, each alternate joint being usually sufficient. The matchboarding is secured after the main framework has been erected by nailing. After the whole is in position, it may be coated over with one of the various preservative stains.

An onk trellis is shown in Fig. 8, suitable for erection at a boundary or in place of a solid wall. It is supported at intermediate


Trellis. Fig. 3. Type of trellis work composed of prepared timber which will be found exceedingly lettering refers to details of providing a screen. The
disiances by brick pillars. The horizontal positions of the supporting posts. The next into the ground. After the posts have been members are alternately placed on the outer stage is to prepare the posts to the requisitc erected in position and well rammed and conand inner sides of the uprights, and the height. this depending upon the nature of the solidated, the positions of the horizonta! lower rail is supported by short uprights surround and the plants to be trained thereon. members are decided upon. and these are built into the top of the brickwork The If such plants as rambler roses are to be placed in position and naile. 1 to the posts. The whole is toned down to a dark colour, and when covered with climbing plants forms a very effective screen.

The trellis in Fig 9 is erected against the sides of a house. for the purposes of training creepers. It is built up in set designs with a border and is sccured to a gromidwork of hattens applied to the walls. The porch on the right is of prepared timber, mortised together, rooled in at the top with timber and covered with one of the patent rooting materials. A fairly heavy moulding is mitred round at the fopl, the tre!lis built up in sections and afterwards secured to the who!e. When deciding upon trellis to be made up in sections and applied to a wall, careful measurements should he made for the position of windors, doors, drain pipes and the like, and allowance mado for them : also for the rough grounds to which they are to be fixed, since this materially enlarges the length required for the trellis. A method of fixing the grounds is shown in Fig. 10, which illustrates the use of a spacing gauge.

Rustic Trellis. The trellis made of laths has many applications as a screen, but natural appearance given by rustic construction is very pleasing. and a vustic trellis is often more in harmony with the garden and its surroundings. A completed trellis is shown in lig. 11, stages in its construction being illustrated in Figs. 12 and 13.

Having obtained suitable and sufficient material, the first step is to mark out the position in which it is required to place the screen. This can be done in the ordinary way with a line and a few pegs, marking out the
 horizontal members should be less in diameter than the posts, and of such length that the joint made between any two comes at one or other of the upright posts. If the poles are ot any considerable thickness, the ends can be trimmed off flat and nails driven through both
 into the posts.
Having fixed these pieces, which in the example illustrated
trained over the screen, the posts may be are located one along the top of the posts anything up to 8 ft . or 9 ft . in height, and the and the other about 3 ft . above the ground, screen illustrated has been constructed on the principal cross pieces are placed in this assumption It is a good plan to treat the position and fixed to the posts or horizontal boltom of the posts with either tar or creosote members with stout wire nails. This The posts should be sunk from 18 in . to 2 ft . operation is illustrated in Fig. 12 These


Trellis. Fig. 8. Type of rectangular trellis carried out in oak. Fig. 9. Example of trellis work applied to the walls of a house, the porch being designed in.the same medium to harmonize. Fiz. 10. Use of spacing gauge, fixing the horizontal strip to vertical. Fig. 11. An example of a completed rustic trellis forming an excellent support ior rambler roses, etc. Fig. 12. Fixing principal diagonal members. Fig. 13. Fixing lighter diagonals into trellis screen
cross pieces may either be fixed in their natura round shape or flat tened on one side

The spaces bet ween the main cross members are filled in with lighter material in much the same way lixing these in an X fashion and, if possible. interlacing them one over the other until the required degree of closeness is obtained ( Fig 13)

TRELLIS: In Needlework. This filling stitch is used to cover large spaces in embroidery on linen and is worked on counted threads of the fabric It consists of horizontal and per pendicular lines o! working threads held down by a cross stitch where the lines meet. In some designs a small running stitch crosses the junction of the lines. Two other filling stitches with epaced working threads set diagonally are illustrated in page 684, Figs. 4, 5,

The threads of the ground material should be counted both ways, so that they are set evenly apart. If the small stitches which form the tirst half of the crosses are worked in one direction in one long row, and in the reverse direction on the return journey, all the crosses will be worked in the same way and give a more even effect.
The illustration shows the needle in the correct position, working downward and form ing the cross stitch at the junction of two lines See Cross Stitch; Embroidery : Laid Work

TRENCHING. This is the best method of cultivating garden ground; it ensures the finest possible Howers and vegetables. Those who grow for exhibition trench the ground three spits (about 30 inches) deep ; for orllinary purposes it is suflicient to trench two spits (about $20 \mathrm{in}$. .) deep. If the land has been in cultivation for some years the upper soil may be brought to the surface and the surface soil buried. When trenching new ground, however, the layers of soil must be kept in the same respective positions.
When tronching cultivated land the first thing to do is to dig out the soil two spits deep and 2 It. wide; the excavated soil is placed near the other end of the plot. The bottom of the hole is forked over and leafy garden rubbish is mixed in. The next top layer of soil is transferred to the first trench and the next second layer on top of that. Thus the first trench is filled and the second is emptied. Eiach trench is dealt with in the same way. the last trench being tilled with the soil first talien out.
In trenching new land the turf should be stripped off and stacked for a year. The first trench is dug two spits deep and 2 ft .
wide and the top layer of soil is also taken off the next strip, hoth lots being placed at the other end of the plot. The second layer of soil from the second strip of ground is put in the first trench and the top soil from the third strip of ground is placed on top of it


Trellis in needlework. Method of making this stitch, useful for Method of making th
overing large spaces

Thus the lirst trench is filled and the layers of soil remain in the same respective positions. Farmyard manure or hop manure should be mixed with the second layer of soil when trenching hoth new and old land. When trelsching is finished new land must be limed, using one bushel to three rods. The lime should be turned in with the garden fork. The best time for trenching is in autumn and winter. See Celery : Digging ; Spade.
TRESPASS. There are threc kinds of trespass in law, namely, trespass to land, to goods, and to the person. The last of these is more usually called assault. Trespass to goods consists of any actual taking of or a direct and immediate injury to a nother's goods or chattels. For instance, it is equally trespass if A rides away with B's horse or hits the animal and causes it to run away. If A throws a stone and hits B's head it is trespass.

Remedies for Trespass. The remely for trespass to goods is by an action for damages. The damages recoverable are, where the goods are taken away altogether, the value of the goods; and where they are merely injured, then the amount of the damage done to them. An action for trespass to goods will not lie unless the plaintiff had the goods in his possession at the time of the trespass.

It is, however trespass to land that is usually spoken of as trespass. This is committed where anybody, whether wilfully or otherwise, goes upon the land of another without his permission. The word land includes houses and other buildings. This offence, like trespass to goods, is an interference with possession rather than with owner ship, so that the tenant of a house o land can bring the action.
The remedy is an action for damages, and these damages
are by no means limited to the actual peeuniary loss sustained by the occupier of the land or house. Thus, very heavy damages have been awarded against a trespasser who walled into another man's ground and paraded up and down in front of his windows, into which he stared in an olfensive manner. In the same way, when a monev lender has seized furniture under a bill of sale, and has wrongfully kept a bailiff in possession for several days, he has been made to pay very heavy damages, and this although the bill of sale was only void on a technicality

Besides actions at law, the householder or landowner has the right to protect himself against a trespasser by turning him out, proviled that he only uses as much force as is necessary, and no inore. He sloould lirst be requested quite civilly to go out.

Trespass is not generally a crime, in spite of the common notice that "trespassers will be prosecuted." It is, however, an ollence to trespass on to land belonging to a railway company or on to any land if damage is thone to the land, or in pursuit of game. It is also an offence to drive a motor vehicle on to private land or on to a common.

Trespass by Animals. The owner of tame animals is liable to an action of trespass if he allows them to escape on to the land of his neighbour, unless the neighbour was under some duty to maintain a fence and failed to do so, whereby the eattle, etc., were able to strixy upon his land. This does not apply to logs or eats. If cattle are being driven along the highway, their owner is not liable for any damage they may clo or for trespass at all if, without any negligence on his part, they stray upon unfenced land

Anyone who takes upon his own land some thing which is liable to cause injury if it escapes, must pay damages if the dangerous thing does escape and goes upon the land of a neighbour, and this whether there was negligence or not. The best-known case was where the defendant constructed a reservoir upon his land and it cracked and the water cscaped and flooded the workings of an adjoin ing mine. The owner of the reservoir was held liable, although it was no fault of his that the reservoir gave way. A trespasser must take the land as he finds it and will have no remedy if he injures himself by falling into a pit or quarry

Man Traps, etc. Even a trespasser is entitled to be protected against man traps, spring guns, or other engines calculated to do bodily harm or to destroy life. Anybody who sets such a device on his laid with intent that it shall destroy or inHict bodily harin upon a person coming in contact with it, is guilty of a criminal olfence, and is liable to penal servitude for not less than three or more than five years, or imprisonment for not more than two ycars with or without hard labour It is equally an ollence to leave such an engine in position if it has been set by a previous occupier.

The houschokler is, however, entitled to protect his dwelling house by setting a man trap, spring gun, or other engine between sunset and sunrise. Nor is there any law to prevent him setting traps for vermin, and a trespasser who walks into a rat traj has no remedy if he is hurt
TRESTLE. In building operations and redecorating, the trestles mostly used take the form of a self-supporting pair of steps. They arc most usually employed in pairs, placed at a convenient distance apart, generally from 6 to 8 ft . span. Scaffold planks or other strong boards are rested upon the treads of the trestles to form a platform.

A strong trestle of a nother type which is useful for such purposes as the support of a wash tub is illustrated in the following page


Trestle. Esample of a strong trestle suitable for domestic use

It is substontially built from stont timbers, the top about 9 in. wide and $2 \frac{1}{2} \mathrm{in}$. thick; the legs about 4 in . wide and 2 in. thick; the cross pieces 3 in . wide nnd 2 in . thick; the whole being securely halved and screwed together. It will be noted that the logs splay in two different directions, spreading out wards like the letter $A$. When viewed from the side and from the front they incline outward from the top part, this being done to give greater stability: A pair of light hinged tiestles is used to support a table such as that deseribed in the suceceding article. See Scallolding; Steps.

TRESTLE TABLE. There are many uses in the ordinary home for a table supported on a pair of trestles such as that illustrated in Fig. 1. It may aerve for the support of a table tennis table, and may also be used as an emergeney talile at Christmas or other times. To the amateur constructor it affords a temporary support for work, and when papering a room it is most uscful as a pasting board.
A complete set of the compononts required for the trestles is illustrated in Fig. -2, which also gives the leading dimensions. The legs are of deal or other tough wood measuring 2 in. wide and 1 in. thick. The crosshars are of similar material, but those on the top should be 2 in . deep and $1 \frac{1}{2}$ in. thick. The crossbars can be dowelled and serewed to the legs, which are glued and serewed into notebes or housings cut in the top bar.

When the timber has been prepared to the correct length and size, planing it up on all four sides, the positions for the crossbars at the lower part of the log are marked out. It will be noticed that the logs of the trestles are splayed in order to aflord stability. In addition, considerable care must lic taken so as inget the notches in the
lop picces cut at the proper angle, and the ends of the crossbars also must meet the legs at a similar angle.

One of the side pieces and a crossbar are grasped in the vice in the manner illustrated in Fig. 3, at the proper angle, and both of them arc drilled through with a brace and bit as shown. A dowel pin is driven temporarily through this hole and a second drilled about 1 in . from it. All the dowel joints are prepared in the same way and are assembled hy inserting the dowels into the side pieces, placing the crossbar against them, and after coating the joint faces with hot glue they may be cramped up until set

The top pieces are prepared and notehes cut in them, so that the legs can be fitted. The legs should lit very closely against the shoulders of the slot in the top bar, to add to the stilfness and general stability of the structure. When fitted, they should be glued and screwed in place. After the glue has set hard, any overhanging or projecting portions should be planed off.

The final operation is to hinge together the two members of each trestle with stout butt hinges. This is best accomplished by placing the two top edges together, laying the hinges llat on the upper surface with half on cach crossbar. Holes are then drilled and the screws driven home. Two serews should be placed in each hinge as a start and one of the
kgs lifted up, as shown in Fig. 4, to sec that it folles back properly. Any necessary corrections in the alinement of the hinges should be made, and the remainder of the screws then drivell home.

The table top is constructed from a few lengths of tongued and grooved floor board, the outer edges planed up smooth, and the cuds and the centre strengthened by cross battens of wood about 1 in . thick and 3 in . or 4 iin. broad. To prevent the legs of the trestles from opening too far, a stout cord is threaded through holes drilled through the centre of each of the lower crossbars and prevented from pulling out by tying a knot in each end of the cord. The length of both the cords should be equal, to ensure the heights of the two trestles being uniform. See Folding Table; Table.

TRICHOMANES. This is the name of a group of beautiful filmy ferns which are grown in glass cases in a shady greenhouse in an exceptionally inoist at mosphere. They should be set in well-drained pots or earthenware pans, in a compost of sandy peat with pieces of sandstone intermixed. Propagation is by spores, at any time during the year, or by division of the roots in early spring. On no account should be plants be syringed.

TRICHOPILIA. The small evergreen orchicl called Trichopilia flourishes in the

intermediate house. It has flowers of various colours, some of which are slightly fragrant. They grow best in pots or baskets hung from the roof of the grcenhousc, in a mixture of peat, sphagnum moss, and charcoal. The necessary average temperature is $50^{\circ}$, rising to $60^{\circ}$ during the summer months or growing period. Trichopilia is propagated by division of the preudo-bulbs in early spring, when the plants should be repotted. See Orchid.

TRICYCLE. For the use of children tricycles are made in considerable numbers as well as for adults of both sexes who are unable to adapt themselves to the bicycle. The modern type of light tricycle is as easy to propel as a bicycle. A diflerential axle allows the rear wheels to turn independently at different specds when going round a bend. The frame is made generally in two sizes, 22 in. and 24 in ., and the wheels are usually 26 in . The same methods of cleaning and ailjustment used for the bicycle also apply in the case of tricycles. Sce Bicycle: Tire.

TRIFLE. A sweet with a basis of spongecake, trille can be made from a variety of added ingredients and is usually named according to the predominant Havour Whipped cream, almonds and other nuts, angelica, crystallized flowers, and glacé fruits are all used in the decoration of triffes.

A good plain trifle can be made by splitting six small sponge cakes, spreading the cut sides with jam, and arranging the lower halves in a glass dish with the cut sides uppermost Boil up $\frac{1}{2}$ pint milk, soak the cakes in the dish with some of it, put on the top halves, and then pour on the rematinder of the milk Prepare some custard with 1 pint milk, 1 tablespoonful custard powder, and 1 oz . castor sugar, flavour it with a icw drops of vanilla and let it cool. Then pour it over the cakes, set the whole aside until it is colcl. and decorate it with glacé cherries.

Another varicty of trifle is made either from a Siwiss roll or two jan sandwich cakes. Cut the calic into blocks each about $\frac{1}{2}$ in thick, heap these on a glass dish, and pour over them I pint custard, basting them until they are well soaked. Whisk $\frac{1}{2}$ pint cream until it thickens, stir into it the stiffly whipped whites of 2 eggs , and add sugar and vanilla llavouring.

Heap the mixture all over the soaked cake, lecorate the top with a few ratalias, and blanched and shredded almonds. If liked, the quantity of cream may be lessened and the cake may be soaked with fruit syrup flavoured with ratafia before the custard is poured over. See Banana Trife; Fruit Trifte ; Ratafia.

TRILLIUM. This is the botanical name of the wood lily or trinity Hower, a charming hardy plant for the rock garden; it bears large, three-petalled Howers in spring. The roots should be planted in autumn in slight shade in soil with which peat and leaf-mould have heen mixed. The common wood lily is Trillium grandillorum, 12 in., with beautiful white Howers: sessile, 9 in., has reddish blooms, and those of nivale, 10 in ., are white.


Trillium. Curious three-petalled flowers of the wood lily (Trillium nivale), a low-growing plant for the rock garden

TRIMMER : For Cutting. Various kinds of trimmer are made for cutting paper, prints, card, and wood. A useful tool of this litud for photographic prints is made with a curved linite blade attached to the side of a llat base, but as the edge of the blade requires frequent sharpening it is generally more convenient to usc a detached linife.

TRINKET. The word trinket is used to describe a small ornament usually of slight value, as for example the cheaper kinds of


Trifle. Plain variety of this party sweet
brooches, bangles, fancy pins, and necklaces A sniall box suited for holding such articles and to stand on the dressing table is known as a trinket box, but for these there is no conventional pattern. See Enamelling.
TRIPE: How to Cook. Tripe is the inner lining of the stomach of the ox or cow As a food it is tender and easily digested. There are various kinds, named according to the part of the stomach from which they are taken. Honcycomb, blanket, and booli tripe are perhaps the best known.

As sold in the shops, tripe is usually partially cooked, but if totally unprepared it needs careful cleaning in three or four dilferent waters and should be left to soak in clean, slightly salted water for two or three hours It needs long preliminary boiling. As many as 16 hours may be required before the tripe is tender. After cleaning, it should le covered with cold water, brought to the boil. then strained, and more cold water added. This process should be repeated until the tripe has lost its unpleasant smell. It should then be covered again with cold water and cooked until tender. For prepared tripe the process is simpler. The cold water needs to bestrained off only once, and two or three hours' slow cooking is usually sulficient The tripe may then be prepared.

Tripe and Onions. The most popular method of cooking tripe is to stew it with mills and onions. 'To do this, boil $: 2 \mathrm{lb}$. tripe for two or threc hours, adding. after about one hour's cooking, three or four pecled and quartered Spanish onions. When this preliminary cooking is over, cut the tripe into pieces of a convenient size and chop the onions. Melt 2 oz . butter in a sauccpan, thicken it with 2 tablespoonfuls llour, and when the two are smoothly mixed strain in 2 large breakfastcupfuls of the stock in which the tripe was cooked. Stir the sauce until it boils, add 1 breakfastcupful

milk, scasoning to taste, and the pieces of tripe and onions, and cook all slowly for about 20 min . Serve the whole on a liot dish.
Casserole of Tripe. Tripe can also be cooked in a casserole. Slice six onions and fry them brown in lutter or dripping. Then, having cit the prepared tripe into pieces, put it into the casserole. where the onions have been placed, and add to it 1 pint white wine, one or two carrots cut into small pieces, a tealspoonful cach chutney and salt, a few peppercorns, and a bunch of herbs. Shut down the lid very tightly and, if necessar!, elose the edges with a thin strip of dough so that no steam can escape from the interior. It should then be cooked in in gentle oven for four or five hours. If made the day before, it can be reheated, the fat being first of all skimmed from the surface. It can be served in the casserole, the herls having been first removed.

Curried Tripe. To serve tripe as a curry cut $1 \frac{1}{2}$ Ib. prepared tripe into small pieces. Melt $1 \frac{1}{3}$ oz. butter in a pan, cook 5 tablespoonfuls minced onion in it, and when it is lightly browned add $\frac{3}{4}$ tablespoonful cury powder and the sance quantity of flour. Fry all these ingreclients well lefore pouring in :3 gills white stock and half that quantity of milli. Stir the whole well until it boils, and then add seasoning to taste. Add the tripe to the sauce and cook it slowly until it is heated through l'reshly boiled rice should be served with this dish, either as a garnishing horder or handed separateiy. See Casserole; Curry

TRIPOD: For the Camera. 'The amateur photographer who attempts anything but snapshots is immediately faced with the question of the kind of tripod to use. There are imumerable varieties on the market, few of which, however, fulfil a! the reguirements of the ideal ripod.

Such a ripod should be of very light weight and fold up compactly : it should cxtend to $4 \frac{1}{2}$ to 5 ft ., and when extended should be rigid and able to support without vibration the


Tripod. Fig. 1. Aluminium tripod witu automatic closing action. Fig. 2. Folding tripod made from sections of brass tubing. Fig. 3.
Courles! of Westminster Plioho. Exc
weight of a grood-class $\frac{1}{4}$-plate cancra, using metal slices and glass plates. The old fashioncd folding wooden tripod on which $\frac{1}{2}$-plate and larger fiedd cameras were supported met none of these requirements except that of rigidity.

The most successful of modern tripods aie those made in metal, brass, or almminium, generally in tubular, telescopic form. A very good example is made in triangular aluminium Tulics (Fig. 1). It is extremely light, rigid when open, while its automatic closing action overcomes the tediousness of closing section

bysector which was experiencert with earlier forms of aluminium tripods. The photograph shows one leg


> Tripod. Figs. 4 and 5. Metal tripod which folds up to form a walking stick. Fig. 6 . Ingeniously designed tripod in larchwood, which folds compactly together and forms a walking stick. Fig. 7 . Small scale view of the walking stick tripod extended for use Figs. 4 and 5. Courtesu of Westminster Photographic Exchange, Ltd. Fias. 6 and 7. Courlesy of A Adams i Sons, Ltd. of the tripod
closed up, the right leg with each of the a level. The little and nearly uselcss viewfinder 5 sections pulled out a little, while on the centre is largely responsible for this fault, and the leg is shown the small press button, pressure effect is that 90 per cent of the photographs upon which releases the catch and allows all taken have the view point of a being with cyes the sections to be thrust home in one in his stomach instead of in his head. If the movement. This tripod extends to the useful tripod itself has not sufficient extension, it height of 5 ft . when open.
The tripod-using photographer, whether amateur or professional, requires that the burden of photographic apparatus he is to carry about shall be made as convenient is possible. Accordingly, various forms of tripod close into walking sticks and other easily portable forms. An extremely compact form is the Zciss-Ikon (Fig. 2), which has a Hat metal plate for the head, on which the camera is very firmly based. It only measures 12 in. when closed, and its sections of brass tubing open to nearly 5 ft . Being made of brass, it is somewhat heavy to carry.
A still more compact camcra stand is the Ensign Featherweight llat tripod (Fig. 3), which, measuring only 11 in . when closed in its case, extends to 42 in. It provides a folding flat head giving rigid support; its weight is 17 oz .

Ingenious varietics of tripods which fold up into the form of a walking atick are shown in Fige. 4-7, closed and open. That shown in Fige. 4 and 5 is of metal, the handle and ferrule screwing off top and bottom. The three legs then separate and the extensions are pulled out, as in Fig. 5. The walking stick tripod illustrated in Figs. 6 and 7 is a handsome specimen maile in hardwood.

For small hand cameras a device such as the Kodak Optipod or Kodapod illustrated in page 939 , make good substitutes for a tripod when fixed to a fence,


T'ripod. Fig. 8. Ball-sau-socset head to be screwed on top of tripod
should either be mounted on a raised object or an extension rod added to the top.

A useful accessory is the ball-and-socket head, such as that shown in Fig. 8, which can be screwed on to the top of any tripod. This enables all levelling to be done after the tripod is set up. With the ordinary tripod the camera has to be levelled by moving first one leg and then another, and on rough or slippery ground this is apt to the an extremely tedious business. With the ball-and-socket head the tripod can lo set up in any position, and the camera is quickly and simply levelled and pointed in the right direction by releasing the screw on the side of the socket, tightening it up again when the correct position is found. Moreover by means of the slot scen in the side of the socket the camera can be turned completely over on its side. so that photographs can be taken in either horizontal or vertical position without the necessity of unscrewing the camera from the tripod head.

When using a tripod indoors on linolcum wood, or stonc floors, it will be found that the metal pointed feet have a lendency to slip. This is simply overcome by using a piece of string with four loops tied in it, one at each end and the other two at $\frac{1}{3}$ of the distance from each end. In use the two end loops are slipped over the foot of one of the tripod legs and the other loops ovor the other two legs. The legs must be firmly strained against the string loops.

TRITELEIA. Also called spring star Hower, this is a hardy bulb which blooms in spring. It will Hourish in sunny or shady places in ordinary soil. The chief kind is Tritcleia uniflora, which grows 6 in. high and bears white Howcrs, shaded with purplish bluc, in April. It is suitable for the rock garden and for planting in grass among trees; bulbs may also be potted in autumn and grown in the greenhouse. See illus. below

TRITONIA. These are hardy bulbs which bear flowers similar to those of the montbretia They should be planted in autumn in wcll drained soil in a sunny sheltered horder, as for instance at the foot of a house wall, where they will Hower in early summer. The chief kind is Tritonia crocata, of which varieties of brilliant colours have been raised. One of the finest is the orange-yellow I'rince of Orange. Other species of tritonia are generally included in montbretia (q.v.)

TRIVET. In the ordinary domestic sense a trivet is a movable iron frame cither fixed to the bars of a grate or supported on three legs and used for holding the kettle when it is oll the fire. Gas and clectric fires arc sometimes fitted with a trivet attachment for boiling a kettlc.

TROLLIUS. This is the botanical name of globe flower, a very showy hardy spring and early summer blooming plant especially suitable for the sharly border or for moist soil by the garden pool. The plants grow from 12 to 24 inches high and bear large, globeshaped blooms in various shades of orange and vellow. They should be planted in autumn in deep moist soil. Trollius europaeus, lemon yellow, and asiaticus and Ledebourii, golden yellow, are the chief species, but many beautiful varieties have been raised and these are now chiefly grown. A few of the best are Orange Globe, Empire Day and Fire Globe.

TROPAEOLUM. These are hardy or half hardy perennials and annuals, some being of great beanty. The loveliest of all is the Chilian flane flower (speciosum). a slende


Triteleia. Charming effect of this white spring star flower at the base of rocks. See article above
twining plant with graceful leaves and bearing a profusion of scarlet Howers in late summer. It attains its greatest beauty in gardens in Scotland and the north of England where the cool moist air suits it perfectly. In southern gardens it must be planted on the north side of a hedge, shrub or trellis in leafy soil : its light green foliage and brilliant llowers look especially well if allowed to trail over holly or other evergreen trees. The stems die down in autumn. Roots should be planted in spring about 4 in. deep.
The Canary creeper (Tropaeolum aduncum) is a popular half-hardy climbing plant with
yellow flowers in summer: it is raised from seeds sown under glass in March, the seedlings being planted out of doors in May. The common climbing nasturtium is Tropaenlum majus. Tropaeolum polyphyllum is a hardy perennial of low growth with grey leaves and yellow Howers: it should be planted in a sunny place in the rock garden and given some protection in winter. The scarlet flowered Lobbianum is a popular annual for pots in the grcenhousc. See Nasturtium.
TROUGH. Employed for holding various kinds of food for animals and poultry, troughs are made of wood, iron, stone, and cement. The simplest form is made of two boards nailed together in the form of a $V$ at an angle of $60^{\circ}$ or so with two ends of square wood. It can be used in thin wood for chickens, in thicker wood and to a larger size for rabbita and fowls, and in hardwood for pigs.

The usual type of trough for fowls, ducks, geese and turkeys is made from galvanized iron with wire guards and is obtainable in two sizes, 18 in . long and 6 in . wide and 24 in . long and 7 in . wide. The advantage of the guarded trough lics in the fact that the food cannot be trampled on and therefore it effects a saving of food. See Pig.

TROUSER PRESS. This is an appliance for pressing the creases in trousers. Some are provided with an extension to which the trousers are attached for the purpose of stretching as well as pressing them, in order to remove any bagginess at the knees.

Trouser presses are obtainable in several sizes, from those suitable for placing in a suit casc to those large and heavy enough to take several pairs of trousers. They are generally made in polished hardwood, with plated fittings.

A press can be constructed quite inexpensively. The plated fittings can be purchased for three or four shillings, and also moulded oak boards for the top of the press. The hase may be made of $\frac{1}{2}$-in. plywood. A stretcher attachment can be added if lesired.

In use the press is opened out, the trousers carefully folded and placed, on the botton board, and the top placed in position. The screws nearest the hottoms of the trousers are acrewed down first ; the top of the trousers is stretched, being held in position by the fingers while the sccond set of screws is tightened. If the press has a stretching attachment the top is removed and the top bar of the stretcher is folded back. The trousers are placed in position, the top replaced and tightened at the hottom, and the top bar of the stretcher placed over the cloth and screwed down tightly. The projection is folded back underneatl the bottom board and the top screws tiglitened up.
The method is the same when two or more trousers are placed in the press, but pieces of


Trouser Press. Compact press for several pairs of trousers. It is not too beavy to pack in a travelling trunk
stout cardboard or thin plywond must be provided to place between cach pair. When placing trousers with the permanent turn-up botton in the press, this portion of the trousers must be left outside, otherwise it is impossible to obtain a long crease.

TROUSSEAU. The trousseau or outfit of a bride is usually supplied by her parents, the amount spent upon it varying according to circumstances.

Fashions change so quickly that the old idea of the outlit which lasted for ycars has been modified considerably. A trousseau anerely contains as adequate and charming a collection of dresses, wraps, underwear and dress accessorics for the immediate scason as can be afforded.

Extra monev which the parents can give for the purpose is more useful in the form of a cheque for later spending than in buying up an excess of clothing which cannot be given reasonable wear before it is oll-fashioned.

The girl who is clever at needlework can make delightful additions to her trousseau at small cost. Dainty embroidery and handwork add greatly to the charm of lingerie, and are well worth the time and trouble they demand, as these things are expensive to buy when ready-made in beautiful stylcs and qualities Underwear should be marked with the bride's Christian name or initials and her new surname This marking can be done in ink, or the letters may be embroidercd. See Wedding.

TROUT. Anongst the various species of trout the river fish is most highly esteemed for its delicate flavour. It is in season from March to Septomber. When buying this fish, care should be taken to select one with bright eyes, red gills, and firm flesh, and it should be cooked as soon as possible after purchase. There are various methods of cooking trout, the larger fish being prepared much in the same manner as salmon.

Baking Trout. Baking is a favourite way of preparing trout. Clean 3 small fish, split them open and take out the bones; then lay them with the skin side uppermost on 3 thin rashers of fat bacon placed at the bottom of a lireproof baking dish. Season them to taste. Sprinkle a little chopped parsley and some lemon-juice over them, cover them with a greased paper, and then bake them in a moderately hot oven for about 20 min .

Frying Trout. To fry trout, clean the fish, split it and remove the bone as directed in the previous recipe, then sprinkle it with scasoned Hour, brush it over with beaten egg, and coat it with brealcrumbs. Fry it in a pan of smoking hot fat, and when browned on both sides, Irain and lift on to a hot dish. Fried parsley is the most suitable garnish, and mayonnaise sauce can be scrved separately.

Broiling Trout. Trout may also be broiled. To do this, first clean and split open the fish and take out the bone Season it to taste with salt and caycune sprinkle it with lemon juice, and then brush it all over with melted butter. Broil it before a clear fire for ahout 8 min . and serve with parsley sauce.
To boil trout, the fish, after cleaning, is put into a pan of boil ing water to which a little vinegar and salt have been added About one teaspoonfn each of vinegar and salt are needed to every pint of water. 'Take the scum from the top as it rises. The time
required for boiling depends upon the size of the fish, one weighing ' lb . needing about 15 min . When ready, Irain it and serve with shrimp sauce. Cut lemon makes a suitable garnish. See Fish; Salmon; Sauce.
TROWEL. Various patterns of trowel are used in building by bricklayers and plasterers, and small trowels of a different shape are uscful to the gardener. See Brick Casting; Cement: Plaster: Pointing: Ren dering; Tool.

TROY WEIGHT. This weight is employed for weighing gold, silver, diaınonds, and precious stones generally. It is as follows: 24 grains $=1$ pennyweight (dwt.), 20 pennyweights $=1$ ounce (oz.), 12 ounces $=$ 1 pound (lb.). The pound troy is not the same as the pound avoirdupois, as it only contains 5,760 grains against 7,000 .

TRUFFLE. The trulle is really an edible fungus which is found just below the surface of the ground in wooded districts and in forcsts on the Continent, some parts of France being famous for truffles. They are also obtained in limited numbers in England, but these are usually found to lack the par ticular flavour of the continental varicties.

In colour, truffics are red, white, or black. The black ones are the ripest and the most commonly seen, and are used to Havour sauces and stews and also sometimes scrved as a dish by themselves. They are very expensive, whether bought by the pound or in bottles, and are in season in October, Novem ber, December and January.
Bot tled truffics need no preparation before they are cooked, but fresh ones nced to be soalied in cold water for an hour or more to remove any particles of carth that still adhere. They should then be washed in several cold waters, brushed well, dricd, and peelcd and cut into shapes. The pecl may be used for flavouring purposes and should on no account be thrown away.
If served alone, truffles should be left whole, each one wrapped in a piece of buttered paper and then baked for about an hour in a hot oven. They are sometimes stewed in champagne, flavoured with vegetables and herbs. When used as a garnish, truffles are first boiled for about 15 min . They may be cut up either before or after boiling, according to taste.
Truffle Sauce. Clean a dozen truffles, cut them into thin rounds, and then stir them in a frying-pan over the fire, with a lump of butter slightly larger than a hen's egg, 2 dessertspoonfals. each finely chopped parsley and shallot, and scasoning to taste. After about 10 min . cooking, drain ofl some of the fat addl a little more fresh butter, $\frac{1}{2}$ gill gravy, the strained juice of $\frac{1}{2}$ a lemon, and a dust of cayenne. Continue stirring the saucc mintil boils and then scrve it immediately.

TRUG. A convenicnt type of basket for gathering vegetables and llower sprays is that known as a trug or Sussex trug. It is a wooden arm basknt with rounded bottom, and in length is about thrce times its width. It is largely employed for garden purposes in most country districts.
TRUMPET FLOWER. This vigorous, climbing plant, 18 ft . or more in height, bears tubc-shaped llowers in summer. Only two are suitable for cultivation out of doors and they must be planted against a sunny wall Teconra grandiflora and T. radicans, both with reddish-orange flowers. In mild districts they form admirable wall plants. They should be planted in autumn or spring in deeply-dug soil with which old turf and de cayed manure have been mixed. The side shoots should be pruned in spring. For a heated glasshouse two of the best kinds of trumpet flower are capensis and jasminoides.

TRUMPET LILY. This name is usually given to the familiar white flowered Lilium longiflorum, often called Easter lily becausc it is forced into bloom in large numbers for decorative purposes at that season. It is more useful for cultivation in pots under glass than for planting out of doors, where it does not usually Hourish for more than one or two seasons. Bulbs should be potted in autumn or winter, singly in 5 -in. pots placed in a frost-proof frame or greenhouse, and covered with fibre until they are well rooted. They should then be set in a light position in a heated greenhouse wherc they will make quick progress. The bulbs must be set low down in the pots to allow of a top-dressing of soil when roots form at the base of the stems. See Lily.

TRUNK. This word is used for a box made to carry luggage. A useful type is that known as the cabin trunk. The essential fcature of this is a lack of height, which en ables it to be stored away in a cabin. A serviceable size is 36 in . by 20 in ., with a height of 12 in ., but they are sold in larger and in smaller sizes.

Onc variety of cabin trunk has a frame of three-ply wood covered with brown canvas. It is strengthened by wooden hoops and is. fastened by two locks. A tray that can be lifted out is the only internal fitting. A better type has a fibre foundation and the corners are protected by stout pieces of leather.
Wardrole trunks are bulky, but their fittings and compartments make them easy to pack and unpack. It is not advisable to buy large trunks in cheap qualities.
So much confusion arises when trunks of similar appearance are unmarked, or when the labels are torn off, that it is always wise for the owner to have his or her initials painted on in a conspicuous place. This will help to avoid loss or delay. See Holiday; Lock; Lost Property ; Packing ; Suit Case.

TRUSS. By the term truss is generally meant an apparatus usually composed of a leather-covered spring and a pad used in the treatment of hernia or rupture. Its object is to prevent the hernia from slipping out after t has been reduced.

A truss should be worn continuously while the pationt is in the upright position. While in bed it may be discarded, unless the patient suffers from a cough. The whole virtue of a truss lies in its being correctly fitted and adjusterl. In young children the complete cure of rupture may sometimes be looked for if a correctly fitting truss is worn constantly for two or three years. In children in their eens, and adults up to well past middle life, a complete cure by operation is nearly alwavs preferable to the wearing of a truss. See Piles; Rupture.

TRUSTEE: His Duties. When one person holds property of any kind for the benefit of another or others he is said to be a trustee, and to hold the property upon trust for the beneficiary or beneficiaries, who are also called cestui qui trustent. A trust may ba created by will, deed, or other writing, or even by word of mouth; but it must be evidenced by writing if it relates to land or other hereditaments.

If a trustee dies or becomes incapable of acting or desires to be discharged, refuses or is unfit to act, or remains out of the United Kinglom for more than 12 months, then a new trustee may bc appointed. If the instrument creating the trust gives to anybody the power of appointing new trustees, that person makes the appointment; but if there is no such person then the surviving or continuing trustees or trustee or the executor or administrator of the last surviving or continuing trustee appoints the new trustees or trustee

If there are more than two trustees, and one of them dies or retires, it is not necessary
to appoint another in his place so long as there are two left; but if there are only two. then one cannot retire without another being appointed to replace him. If a trustce mis. conducts himsclf, an action may be brought by any beneficiary or co-trustec to have him removed and another trustee appointed.
A trustee should only invest trust money in trustee securities, unless the trust deed or will gives him power to do otherwise. If he invests money on mortgage, he should have the land or houses valued by a competent surveyor, and not lend more than two-thirds of the valuation. A trustee is liable personally for breaches of trust; but he may apply to the court to be protected should he have acted honestly though
 mistakenly.
A trustee ought not to carry on a business co-trustee should never allow the other counless the trust deed or will gives him power trustec to administer the trust without to do so. Suppose the testator who created constant checking. It is his duty, if he allows the trust left the whole of the property to his co-trustce to receive trust money, to take trustees in trust for his widow and children, care that it is properly invested or otherwise and amongst the assets is a business, it is the trustees' duty to realize the business and invest the proceeds in trustee securitics, because it is for a trustce to look to safety rather than to high interest. In some cases, however, the will or deed gives trustecs wide power of investment, and then they are safe so long as they keep within the four corners of the instrument. If a beneticiary tries to persuade a trustce to make an unauthorized investment, the trustec should always take from him a letter requesting such investment to be made, and giving an indemnity against the consequences.

Trustee Investments. The sort of investments allowed by the law are the following : British Lovernment securities; Bank of England stock; Indian Government stock; Metropolitan stock; Metropolitan Water Board stock; British railway debentures or preference stock, if the railway for 10 years has paid 3 per cent dividend on its ordinary stock; guaranteed Indian railway debentures; British water companies incorporated by royal charter or special Act of Parliament, where the company has paid 5 per cent on ordinary stock for the past 10 years ; municipal borough or city corporation stock, where the place has a population exceeding 50,000 ; mort. gage of real property up to two-thirds value : any security for the time being authorized by the high court.

Breaches of Trust. When trust property has been improperly disposed of, the beneficiaries are entitled to follow it as long as it can be traced and identified. If a trustee mixes trust money with his own, as by paying it into his own account at his bank, the beneficiaries are entitled to be paid out of that account in priority to anybody else: because it is always assumed that any money which he drew out for his own purposes was his own money and not trust money, and therefore all that is left is trust money.

Where there are co-trustees, each one is liable to see that the funds are properly taken
care of and cluly administered. Therefore, a

## disposed of at once

If he is informed that the money has been invested on certain securities, he should demand to sec those securitics; and he ought to take care that all trustccs' securities, such as mortgages and stock certificates, are made out in the joint names, and are deposited in the joint names at some bank or other place of equal safety.

If a trustee is found guilty of a breach of trust, and is ordered by the court to make good the money which he has lost, the beneficiaries can compel any one or more of the trustees to make good the loss; but the one who has in fact nuade it good can sue the other or others for their share. If a breach of trust has been committed at the instigation of a beneficiary, and the trustce is ordered to make it good to the trust estate, the court will also order the beneficiary in question to indemnify the trustee out of his share of the trust funds.

Trusts are very often family affairs, and it is sometimes inconvenient to administer them on strict lines; but a trustee who departs from the straight path, even with the best intentions, may find himself landed with heavy liabilities. as a consequence of his mishandling of trust funds. The iollowing fase, although an hy pothetical one, may scrue as an example.

Suppose, for example, a man left all his estatc to trustees upon trust to pay the income to his wife for life, and after her death to divide the capital amongst his children. It may be that the estate is a very small one, and that upon some emergency the widow's income does not suffice for her needs, and she asks that a portion of the capital shall be handed to her or used for the benefit of herself or one of the children. If all the children are of full age, the trustee will be safe if he procures them alk to sign a letter requesting him to make the payment which their mother requests; otherwise he is running a risk.

A trustee is not allowed to use money for his own purposes out of the trust money, or to make any profit out of his trusteeship,
unless expressly permitted to do so by the trust deed. It sometimes happens that where money is invested at low interest in goverument securities a trustee will say, Let me use the money in iny business and I will pay $7 \frac{1}{2}$ per cent. If he docs use the money in his business, and makes a prolit out of it of more than $7 \frac{1}{2}$ per cent he can be compelled to hand over every penny of that profit. On the other hand, should he lose the money, he is liable to pay the whole of it back with 5 per cent interest.

When a trustee is in doubt as to the proper course to take, especially where the will or deed is of doubtful construction. his best course is to apply to the court. Anybody interested in the trust has a similar right to apply to the court on doubtful points. See Executor; Guardian; Ward.

TRY SQUARE. This is a carpenter's tool employed for testing the accuracy of rightangles. As can be seen from the accompanying illusitration, it consists of a tlat parallel-sidel steel blade attached to a stock made of a parallelsided piece of hardwool. The working edge of the stock is faced with a strip of brass, the angle between the face of the brass and the inner edge of the steel blade being exactly $90^{\circ}$.

In a well-made square the outer edges should be at right angles, and when the square is placed on a level surface in a vertical position, the blade should be at right angles to the level surface.

## T SQUARE.

 parallel lines, usually comıprises a long blade of mahogany or other wood and a stock made of thicker wood. The working edges of the blade and the stock should be at right angles to one another, the blade and the stock being firmly united by dowel pins and screws. Its most extensive application is in the preparation of drawings, when the $T$ square is used in conjunction with a drawing hoard. It should be slightly longer than the board. Probably the most serviceable pattern is a mahogany i' square about 30 in . long. A common type is made in pearwood. The usual practice is to have the left hand
edge of the drawing board smonth and true, and to worls the T' square from this edge. The mode of operation is illustrated in ligs. 1 and 2. See Drawing; Set Square.
TUB. Tubs are employed for various domestic purposes. In former days they were much used for washing, and the dolly tub, as it is still called, is sometimes scen today. Another use is for holding


Testing a joint lor prightness advantage.
water. must be bored in the bottom for drainage and crock (pieces of broken flower-pot) placed over them. It is necessary to use loamy (turfy) soil for the bulk of the compost; a little decayed manure may be mixed in with

Some of the best flowering plants for tubs are hydrangea, bluc African lily (Agapanthus umbellatus), plantain lily (funkia), fuchsia, lemon-scented verbena, myrtle and rosemary. The myrtle, verbena, hydrangea, fuchsia and agapanthus should be kept in a frost-proof place for the winter. Suitable evergreen shrubs are holly, box, bay laurel, retinospora, rhododendron, skimmia and lanrustinus. Roses too may be rown in tubs. of a plant, stored with starchy food, which gives nourishment to the young buds or cyes which it bears at intervals, until they are strong enough to obtain nourishment direct from the soil. When a stock of plants is increased by separating the tubers, as in the case of potatocs or dahlias, the resulting crop is always true to type. See Artichoke: Begonia; Dahlia; Gloxinia; Nasturtium; Potato, etc.

TUBERCULOSIS. This disease is characterized by the development of small nodules called tubercles, which are due to the presence and activity of
plants that serve to ornamay also be let into the ground and used to hold

Tub Plants. Many attractive shrubs and plants can be grown in tubs; they look particularly well on terraces, on cither side of garden steps, in paved courts, by the side of doorways and are admirable in town and roof gardens. Tubs made of teali are particularly to be recommended because they remain sound indelinitely, but they are expensive. T'ubs of oali and other wood are also used; they are usually painted dark green. Holes

TUBER. In gardening a tuber is the saliva, or using his food utensils which have TUBER. In gardening a tuber is the saliva, or using his food utensils which have
swelling or underground expansion of the stem not been properly cleaned, may convey the the tubercle bacillus. The commonest means of entrance of the bacillus into the system are by inhalation. the patient breathing in the germ ; by inocula. tion. the germinding its way through a
broken surface in the skin or mucous membrane ; and by means of food or drink infected by the germ. Milk and meat are the commonest articles of diet which are likely to be contaminated by the tubercle bacillus.
lersons crowded together in the poorer districts of cities are naturally nore liable to contract the disease than those who live in the country and get plenty of fresh air and sunshine. Thin, llat-chested persons account for many victims, but the discase is by no means uncommon in the well developed. Indoor workers, particularly in dusty trades, such as stone cutters, miners, mill hands, and factory hands in general, are all more than normally open to the disease.

Those who live in close association with people suffering from the disease run great risks unless care is taken to use a sputum tlask and disinfect the sputum, in which the real danger lies. If this is allowed to be disposed of about a room it dries up, and the dust of the room becomes impregnated with it. Using a book the pages of which have been turned over by a consumptive moistening his finger with
 Tuber. 1. Of flame nasturtium, 2. Ranunculus. 3. Peony. 4. Madeira vine. 5. Richardia. 6. Incarvillea. 7. Potato. 8. Wax lountain flower infection. Infants fed on milk from tuberculous cows are liable to incur infection of the glands of the bowels, whence the disease may spread to other parts. Children convalescing from meas!es and whooping cough often lall victims to the disease.
Tuberculosis attacks certain parts of the body seemingly by preference, but practically no part is exempt. The most common site is the lungs, the discase in that case being known as consumption. Tuberculosis also attacks the bones and joints, the intestines, lymph glands, kidneys, peritoneum, bladder, and the brain, heart, spleen, and generative organs.

In the treatinent of tuberculosis in general, sunshine, fresh air, and a gencrous diet, including plenty of fat and especially cod liver oil, play a very important and indispensable part. Specilic treatment in the shape of injections of tuberculin are of the utmost use in some cases.
The Disease in Poultry. This is one of the most common diseases of fowls and other birds. Affected fowls become anaemic, thin, listless, cmaciated and lose weight. The comb and wattles become pale, and in the later stages there is usually persistent diarrhoea. When this sets in, the appetite, which was good in the earlier stages, becomes impaired and feeding is very erratic.
As a consequence of extreme emaciation, which is a noticeable symptom, the bones become very prominent. The joints of the foot,
knee, or shoulder are somotimes affected and slowly become enlarged and painful, causing lameness or drooping of the affected wing, according to the position of the lesion. The onset of diarrhoea is followed by exhaustion and death. These facts are taken from Leaflut No. 78 issued by the Ministry of Agriculture.

Hoalthy birds become infected with tuber culosis by eating food or drinking water which has been contaminated by the droppings of infected birds. Damp, dirt, and absence of syunlight greatly favour the spread of the disease; good ventilation and strict cleanliness in the runs and sheds assist against, though they do not prevent, its spread.
All diseased birds should be killed and buricd in lime or burnt; the poultry house should receive several thorough applications of disinfectant, and the tainted run should be heavily dressed with quicklime and dug over. Several months should elapse before birds are put back into old quarters that have been cleansed and disinfected.

Where the discase breaks out, it is best to clear off old stock and make a fresh start with new stock later. Attempts to dea! with diseased birds only with a view to saving part of the stock are almost certain to lead to dis. appointment, and new cases among birds in the Hock will cone to light from time to time. When the premises have been thoroughly disinfected, the new stock'should be carefully selected from strong, healthy birds, which should not be brought on whilst any part of the original stock remains. If this is impracticable, the old and the new stock should be carefully separated from each other.
The disease, in exceptional cases, may be transmitted from affected birds through the eggs to the chicks, though the latter may not show symptoms until they arc fairly well grown. It is advisable, therefore, not to use any eggs for hatching which have been de rived from fowls amongst which tuberculosis is known or suspected to exist. See Consumption; Curvature; Gland; Light; Lupus.

TUBEROSE. This is a pretty and pop ular half-hardy tuberous plant, with white fragrant flowers; the double forms enjoy the greatest favour. Pearl is one of the best varicties. The botanical name of the tuberose is Polyanthes tuberosa.

The tuberose is grown from imported bulbs, which are best potted singly in 4 in . or 5 in . pots, in a compost of loam with a third of decayed manure or leaf-mould and a liberal admixture of sand. Leave the upper part of the tuber exposed. Stand the pots in a frame or cool greenhouse, and give very little water for two or three weeks: then put them in a warm house in successional batches and kenp the soil moist. This will ensure a long supply of bloom.
The flowers are charming for wreaths, buttonholes and bouquats. It is not worth while to keep the tubers after Howering, and fresh supplies should be procured annually.

TUBING. Flexible metallic tubing is largely employed for connecting gas rings or gas table lanps where portability is desired. The best method of cutting this tubing is to file a slot along one of the spirals until it is thin enough to break off. A three-square tile is suitable for the purpose, but a hack saw may be used. The brass and copper tube used for gas is dealt with in the article on Pipe. Other information will be found in the articles on Brass and Copper.

Rubber or canvas tubing is much employed for garden watering or washing down the concrete Hoors of garages or outbuildings. It is dealt with in the article Hose Pipe. See Barrel; Gas.
TUCK: How to Make. A stitched fold takom up double in the material and arranged to lie over single material constitutes a tuck.

They are made on the right side of the fabric, and vary in widt
arranged in groups.

The distances allowed between the tucks is very much a matter of taste. Narrow tucks may almost touch each other, or the space apart may be the tuck's width; where the tucks are very wide the distance between may he less than their width. Unless the tucks are being made in a garment cut from a paper pattern, on which both the tucks and spaces would be marked, it is a good plan to experiment with a piece of paper till a satisfactory offect is gained.
The narrowest tucks are termed pin tucks. As these only necessitate the taking up of a few threads of material in each a group will not seriously effect the length or Tuck. Showing the use of a cardboard (h) of a garment, but for gauge to ensure evenness of the tucks wider tucks extra material
 must be allowed. For instance, a tuck that is to be $\frac{3}{\frac{3}{4}}$ in. wide when finished will take up $\frac{3}{3}$ in. of material, and lie over ${ }_{R}^{3}$ in., i.e. the tuck width.
In making tucks the great point is that they must be straight whatever the width. For a pin tuck it is sufficient, at the position needed,

## Tudor Style in House and Furnishing

## Models which Influence Design and Craftsmanship To-day

## This article belongs to the group in our work dealing with British period styles in building, decoration, and furnishing. Other entrics containing information on Tudor style are Chimney; Door ; Fireplace; House; Linenfold; Panelling; Settle; Sideboard; Silver W'are; Stained Glass; Staircase. See also Jacobean Style

Althoug! the Tudor style in architecture is added as the rich influence of the Renatissance described as transitional between the Gothic spread during the latter reign. and Renaissance, it possessed marked features. Throughout the 16 th century there occurred which resulted in a blend that was cssentially in England a remarkable development in English and culminated in the erection of clomestic architecture, made possible by the many beaut iful buildings including such famous increased security that followed the abatement clwellings as Hampton Court, St. James's of the civil wars. Manor houses were built Palice, and Haddon Hall. instead of moated and fortified dwellings and Nominally including the years between town planning was carried out 485 and 1603 it found its chief national ex- Early Tudor houses, cven the important pression during the reigns of Henry VIII and ones, show little orderliness either of elevaElizabetb. Founded on the austority of the tion or plan, but the lack of symmetry gives Gothic tradition, colour and comfort were them pietureaqueness. Gables and centra! or
 Tudor Stgle. Fig. 1. Tudor room in the richly decorated manner of the latter half of the 16th century, at Sizergh Castle, Westmorland
Bu uermission of the Dircctor. Fictoria d .llbert Museum. S. Kiensinyton
flanking towers in the larger oncs, lean-to roofs in the sma!ler farmhouse type, very substantial chimney stacks, hcautiful stonework around doors and windows, cusped window heads showing trefoil and quatrefoil formations, the Tudor arch, and the half-timbered walls to be found on many, are all features which make them attractive.

One way to distinguish carly from late Tudor is by the windows. In the former there is only nne row of lights, and these are quite small, though probably large enough for the height of the rooms they served. The reluctancc to have large windows in outside walls still lingered, a relic of the tradition that a house should show as few vulnerable points as possible to hostile missiles from outside. Also glazing was not in general use and glass was cxpensive. As late as 1573 it is recorded that the windows of a country mansion belonging to the duke of Northumberland were carefully stored during his nbsence in London for fear the precious glass should be broken, and other similar cases are on record.

Later the window space was enlarged, transoms or crosshars were intronuced, and windows were brought into conformity with the loftier ceilings and larger apartments generally that were characteristic of the end of the 16 th century.

Tudor designers always made a feature of their chimneys. The method was to group two or three fireplaces together, as is done nowadays, but the flues were carrice up the great stonc or hrickwork stack in single shafts, which were often surmounted by handsome caps. In the reign of Henry VIII chimneys were often twisted and counter-twisted; they were wreathed with spiral bands of stone or brick, or the shafts were intricately panelled. This characteristic feature is revived in moderation and adapled to-day by architects for suitable houses. Some cxamples are shown in page 230 as illustrations to the article on Chimney.

The arched window disappeared in farour of the square-headed one, and in important houses classic pilasters were used to frame the mullioned windows: a complete entablature at every Hoor level made the circuit of the


Tudor Stgle. Fig 2. Double seated bench or settle in oak. The carved motifs in the panelled back and the frieze of the seat show designs in low relief characteristic of the period
Bu Dermission of the Dircetor. Victoria \& Albert Museum
building instead of the plain string course, and the gables were frequently linked together by a balustraded parapet, all in obedience to the new fecling for orderly design in the Renaissance manner.

The various wings of the larger Tudor houses were, as a rule, ouly one room wide, which meant that some of the rooms hiad to be thoroughfare rooms; a very incouvenient arrangement in modern eyes. Then the typical staircase of the Tudor house was of the corkscrew type; a straight flight in the thickness of a wall was its alternative.

One feature, however, of !ater Tudor architecture, viz., the bay window, readily adapts itself to modern building, and even the overhanging oriel window can be copied with charming effect where the design admits of something of this kind.

It is probably truc that a larger proportion of country and suburban houses built during the latter years of and since the end of the 19th century are based on the Tudor model than on any other period style. They are only beautiful when designs are modified and adapted by highly skilled architects, who avoid superficial imitations which have cither lost significance in modern surroundings or are out of kecping with the size of the house, but bring into the scheme the essential features evolved to suit an English background. The builders and craftsmen of the Tudor period used the materials close at hand. Thus in the Cotswold district and in Somerset 16 th century houses are mainly of stone, while in Surrey, Sussex, and Kent they are half-timbered, oaliframed, the pancls between the timbers being filled in with wattle and dnub, both inside and out, and washed with buff or whitc.

Interior Decoration and Furniture. Excepting the halls of the larger mansions, or manor houses, rooms of the earlier Tudor period were low built, while doors and fireplaces show the flat arched openings of the shape known to-day as the Tudor arch. Linenfold panelling was replaced in the houses of the rich by more decorated styles and as rooms were built higher in the larger houses, ceilings were also intricately and lavishly decorated. Colour was of ten introduced into their plaster work modelled in floral and heraldic designs.

An example of a beautiful Elizabethan room, reconstruc. ted in the Victoria and Albert Museum, is shown in Fig. 1. The panelling was removed from the room known as the "inlaid room" at Sizergh Castle, Westmorland, and the frieze and ceiling are reproductions in plaster from the originals sti!l at Sizergh Castle. The ceiling is enriched with pendant ornaments from which spring ribs forming compartments with foral designs, medallions of goats. chained stags and shie!ds of arms. The plaster frieze has a repeating floral pattern with demi-figures. The panelling is of oak inlaid in holly and bog oak. The upper portion has a row of arcades, while the lower portion or dado is divided into panels by mouldings. There are three horizontal bands of geometrical inlay.

In Tudor days colour was lavishly used in strong, bold tones ; reds, greens, and white were most gencral. Besides inlay, gilded and coloured wood and plaster enrichments, ta pestry (mostly imported) and


Tudor Style. Fig. 3. Oak cabinet, 4 feet high on a atand with legs united by square stretchers. panela shows the popular arcaded formation Victoria ، Albert Museum
painted canvas or tapestry needlework hangings were employed as wall coverings. Stained glass was introluced into the windows by wealthy houscholders. Chimnfy pieces were massively decorated above the fireplaces with coloured and gilded ornamentations in stone, plaster, and woodwork. Floors were of wood blocks, of clm planks and of brick or stone.
Carpets began to be imported from the East. They were smal! in size in romparison to the rooms, as may be seen in Fig. l, but made up for this in richness of colour. Delicate tones are out of place in any Tudor decorative scheme, and the same may be said of limsy materials. Velvet, linen (plain or embroidered) heavy satin and damask were the textile fabrics used.

The pieces of furniture, though still scanty, increased in variety in late Tudor times. In Fig. 1, the forcrunner of the gate-lcg table is seen on the right, and a carved oak side table on the left, while the beautiful chair, the chest and also the tester and headboard of the bed are decorated with inlay and carving.

The oak settle illustrated in Fig. 2, has the panelled back with carved motifs frequently seen on later Tudor pieces of the less costly type. Strapwork and guilloche decoration was also much used on thesc. Renaissance ornament consisted of classical heads in medallions, dolphin-headed scrolls, vases and floral forms. Fine carving in this style was done on seats, court cupboards, and chests designed for great houses.

Earlier furniture was more austere. It was often carved with linenfold, horizontal, and vertical and the pieces were simple in shape. The oak cabinet illustrated in Fig. 3 has inspired the shape of countless cabinets in different styles of decoration and in different woods which have been constructed through intervening periods, and still find places in modern rooms.

TULIP. This is the most brilliantly scarlet; Kaufmancoloured of spring and early summer flowers and unsurpassed for providing an attractive display in beds and borders. The two chief types are the early or April Howering tulips and the May flowering tulips, which consist of Darwin and Cottage varicties.

The tulips which bloom in April are great favourites for planting in spring flower beds, where they provide sheets of glowing colour. The bulbs should be set 3 in . deep and about 7 in . apart in October; as the soil is dug, some thoroughly decayed manure and a sprinkling of bone meal should be added. If the soil is clayey it is a good plan to add sand. Some of the finest varieties are Artus, bright red; Chrysolora, yellow; Cottage Maid, rose and white; Coulcur Cardinal, crimsonscarlet; Primrose Queen, pale yellow; Prince of Austria, orange buff. fragrant; Queen of the Netherlands, pink; White Swan, white, and Yellow Prince, yellow, fragrant.
The double tulips which bloom in April have large and handsome flowers. Couronne d'Or, orange yellow; El Torcador, red and yellow; Imperator rubrorum, red: Murillo, pale rose; and Vuurbaak, scarlet, are some of the best. The A pril fowering tulips are about 12 in . high when in bloom.
The May tulips are magnificent flowers the large, handsome bloonis are on stems from 20 to 30 in . high. The bulbs should be set early in November, 5 in. deep on heavy soil, 6 in . deep on light soil, and about 10 in . apart. In association with Siberian wall. flower and forget-me-not they provide many brilliant colour schemes.

Most of the Darwin tulips have immense cup-shaped blooms, those of the cottage tulips are chiefly long and pointed. A few of the finest Darwin tulips are Antony Roozen, rose; Bartigon, red; Clara Butt, pink; Europe, rose red; Farncombe Sanders, red; La Tulipe Noire, almost black; Pride of Haarlem carminc ; Rev. H. Ewbank lavender; The Bishop, palc purple, and Zwanenburg white.

These are beautiful cot tage tulips: Amber Crown, amber-rose; Bouton d'Or, yellow; Carrara, white; Dom Pedro, maroon and brown; gesneriana lutea, yellow; gesncriana spathu lata, deep red; Golden Crown, orange-red and yellow ; Inglescombe Pink, rose pink; La Merveille rose and buff; Moonlight pale yellow; Mrs. Moon yellow; Walter T. Ware golden yellow.

The parrot tulips arc striking flowers of brilliant colouring with deeply cut petals. They bloom in May: the stemsare weak and must be supported or the Howers will be spoilt. The old English tulips, which are classified as bizarres, byblocmens and roses, according to their colours, are rarely grown nowadays, except by connoisseurs and exhibitors. The flowers of the Rembrandt tulips, which open in May, are blotched and striped with various colours. Three new types of tulip are the lily-flowered with reflexed petals, which are in full bloom in May: Mendel, specially adapted for cultivation in pots under glass, and the Triumph tulips, which are intermediate between the April and the May flowering varicties.

Some of the wild species of tulip are very beautiful and suitable for planting in the rock garden. Clusiana, red and white; Greigii,


Tulip. Beautifully shaped pink blooms of the Inglescombe variety, suitable for outdoor plant-
ing. Above, vivid flowers of the parrot tulip in a large number of shades, R. Above, Divid Aowera or the parch tulp niana, cream; linifolia, scarlet, and persica,bronzeyellow, are particularly attractive.
The Duc Van Thol tulips, which bear small red, pale rose or yellow blooms, are useful for forcing: if potted in AugustSeptember and grown under glass they will bloom in winter. Some of the April flowering tulips also do well in pots.

TULIP TREE. This is the common name of a North American leaf-losing tree (Liriodendron tulipifera), which is hardy in Great Britain. It belongs to the magnolia family, will reach a height of 60 ft . or more, and thrives best in loamy soil. The green and white flowers open in spring.
TULIPWOOD. This is a richly figured wood used in former days for inlaying and marquetry. It was used to decorate pieces of furniture made in the Adam and Louis styles, and was employed with much effect by the great French cabinet makers. See Inlaying; Louis Style ; Marquetry ; Wood.
TULLE. The thin gauze-like silk material which is known as tulle can be obtained


Tulip Culture. 1. Placing bulbs in pots or bowls. 2. Bowl culture: a, charcoal; $b$, fbre ; $c$, moss. 3. Stage at which light should be allowed. 4. Pot culture : $a$, crocks ; $b$, rough soil ; $c$, compost ; $d$, moss. 5. After planting : $a$, ashes; $b$, covering box ; $c$, glass. 6 . Correct outdoor planting $: a$, sand $i b$, fine soil. 7. Bad planting : $c$, glass. water accumulation ; $b$, lumps soil instead of fane compost
made in varicd qualitics. The best are of fine cut glass. They are usually sold in dozens or half-dozens, sometimes to match the rest of the table glass, and can be had in several sizes.

Antique tumblers may be valuable. They were made toward the end of the 17 th century by the great glassworker John Greene. These werc either plain or ribbed, horizontally or perpendicularly, or adorned with surface moulding, pressed, as it is called. They werc of different sizes, and many were originally arranged in nests, each nest containing 6 or 12 . For beer they were made in their present shape early in the l8th century, but good specimens are rare.

The best tumblers date from the middle of the 18 th century. These taper very slightly and are sometimes engraved with sprays of roses, with hops and barley, or with a vine pattern. Toward the end of the 18th century the tumbler became fairly common. Those seen in antique shops arc chiefly of the carly part of the 19th century. They include squat and heavy examples made of fine cut glass as well as the taller pattern, tapering considerably and cut nearly all over in a scries of indents. See Glass Ware; Rummer.

TUMOUR. In medicine the technical name for a growth is tumour, and there are two main groups, the simple and the malignant. A simple tumour, if it does damage, does so only by pressing on neighbouring structures. A malignant tumour, on the other hand, infiltrates and clestroys adjoining tissues, and at the same time its cells are carricd by the lymph or blood streams to distant parts, where they grow. Thus a cancer in the breast or in the stomach may lead to a secondary growth in the brain. Hollow tumours are given the name of cysts. They contain some kind of fluid. See Cancer.

TUNICA. These pretty little hardy plants belong to the pink family. The most attractive is Tunica saxifraga, 8 to 10 in . high, with slender stems and small, blush-coloured Howers in summer. It is suitable for the rock garden or for setting in the crevices of paved paths. Seeds may be sown in spring where the plants are to bloom in summer, or the seedlings can be raised under glass and transplanted.

TUNING: In Wireless Reception. This is the act of bringing the tuned circuit, or circuits, of a receiver into resonance with the wave-length of a broadcast transmitter.

Tuning is normally carried out by means of a variable condenser connected across an
inductance coil, and the circuit is said to be in resonance or tune when the condenser control is adjusted so as to give maximum volume.

A receiver will only give the best results when the wave-length to which its highfrequency circuit or circuits are adjusted is the same as that of the desired broadcast transmission. It is essential that the tuning circuits of a "ganged" receiver should be correctly matched, otherwise one of these circuits may be slightly out of tune when the others are in tune, thus producing a loss of efficiency and therefore diminution of volume. See Selectivity.

TUNING FORK. A tuning fork consists of a bar of steel bent into an elongated $U$. shape, with the prongs supported at the bend by a foot. When struck smartly upon a firm but not hard body it gives a musical note.

Owing to the fact that the tuning fork is practically invariable in its pitch, and that its tone is singularly pure, it is commonly used to indicate an exact standard of pitch. For ordinary use they are procurable generally for A or C .

TUNNY FISH. This is a fish of the mackerel tribe, and, like lax, it is preserved in oil. It is served as hors d'oeuvres, being cut into thin slices and having fresh oil poured over it.
A good savoury of tunny fish can be made in the following way: Prepare a thick white sauce, add to it some flaked tunny fish, and cook them over a slow fire until the fish is heated through. Then pour the mixture on to small rounds of hot buttered toast and serve at once. See Fish; Lax.

TURBOT : How to Cook. The finest of all flat fish, turbot is at its best from April to September. The flesh is firm and white, cuts


Turbot. Boiled turbot garnished with slices of lemon and some pargley from the middle and back being the thickest and considered the best.
Turbot can he cooked in many ways, but boiling is the most favoured method. To prepare the fish, first clean it, wash it in several waters, and then rab it with a piece of cut lemon to remove any discoloration of the skin. Do not cut off the fins. Turn the fish over so that the black skin is uppermost, and score this down the middle to prevent the white skin on the other side from breaking while the cooking is in progress. Then put it into a pan of boiling salted water or fish stock, laying it so that the white side of the skin is uppermost, and cook it gently until the Hesh begins to leare the bones. Keep the water or stock in which the fish is cooked well skimmed. Boiled turbot may be served with melted butter, shrimp, oyster, or hollandaise sauce.

To broil turbot, first season it to taste and lay it in a dish containing a gill of salad oil and half that quantity of lemon-juice. Then broil it in front of a clear fire, basting it frequently with the oil and lemon-juice and turning it several times. It may be served with oyster sauce and garnished with parsley.

Steamed turbot, coated with egg sauce, provides another good dish. To prepare it, clean the fish, place it in a steamer over boiling water, and steam it for $15-20 \mathrm{~min}$. If a stcamer is not available, stand the fish on a plate over a saucepan of boiling water and cover it with
a saucepan lid or a basin. If cooked in this way it will require a little more time. Pour the egg sauce over it on the dish and proceed to serve it at once.

Made-up Dishes. Remains of cold turbot may also be utilized in the following way: Melt a lump of butter about half the size of an egg in a small pan, stir in 1 dessertspoonful flour and when they are smoothly mixed add 1 teacupful milk, salt, pepper, and cayenne to taste, and $\frac{1}{2}$ teaspoonful anchovy essence. Keep stirring all the time, and when the last of these ingredients has been added, draw the pan to the side of the stove so that its contents may cool a little and stir in the yolk of an egg.

Pour a little of this sauce into a fireproof dish, then cover it with some cold cooked turbot that has been boned and broken up with a fork. Continue with these layers until all the ingredients are used, then sprinkle some browned breadcrumbs and grated cheese over the top and bake until it is heated through.

Reheated and served in the following way cold turbot makes an excellent luncheon dish. Peel a small onion, stick a few cloves into it, and put it into a saucepan with $\frac{1}{2}$ pint milk and 1 oz . butter. Let these stand at the side of the fire for an hour or so, so that the milk may become well flavoured, and in the meantime boil an egg for 15 min ., then shell it, cut it into halves, and take out the yolk. Cut the white into small pieces, rub the yolk through a fine sieve, and take the skin and bones from 6 oz . cold turbot, breaking the flesh into small flakes.

When the milk has stood for the required time, bring it to the boil, take out the onion and cloves, and sprinkle in half a tumblerful of breadcrumbs, the flaked fish, white of egg, and salt and cayenne to taste. Stir these well over gentle heat until they are well mixed and thoroughly hot, allowing time for the bread to cook; then add 2 tablespoonfuls cream and reheat the whole for a few minutes.


Turf and its uses in garden and greenhouse. 1. Stack for potting soil : $a$, tarves ; $b$, lajers of lime. 2. Marrow mound. 3. Turi as base for pot planta : $a$, ashes ; $b$, turf. 4. Dimensions for cutting. 5. As rooting medium for seedlings. $e^{e}$. Gentle hotbeds: $a$, ground soil ; $b$, turves ; $c$, manure

Serve it on a hot dish, garnished with lines of powdered parsley and the sieved yolk of egg. Cold turbot may also be curried, adding the Haked cold fish to a good curry sauce. Serve very hot with a border of freshly-boiled rice.
The roe of turbot should be blanched and sliced, baked in a buttered dish in a moderately hot oven, and basted frequently with the butter. It will need about 20 min . cooking. See Curry; Fish; Hollandaise Sauce; Sauce.
TUREEN. A tureen is a large dish or bowl, usually fitted with a lid. Either round or oval in shape, it is used for holding soup or sauce at the table. Tureens are often made to match a dinner service, and range, therefore, from pieces of the costliest china to those of the cheapest earthenware. They are also made in silver and Sheffield plate and some of the 18th-century specimens are of great value. See Ladle; Sauce Boat; Soup.
TURF. This is a term used to denote the top spit of meadow land, or a stretch of lawn. Lawns laid with turf become fit for use sooner than others made by sowing lawn grass seeds, but it is most important to lay turf which is free from weeds and coarse grass or it will cause endless labour. The chief details needing attention in the maintenance of a perfect stretch of turf in the garden are mowing, rolling, the destruction of weeds, and the use of fertilizers. If the top spit of meadow land is pared off in turves, about 4 in . thick, and stacked for a year, it becomes what the gardener calls turfy loam. If alternate layers of manure and turf are stacked the loam will be still more valuable. See Lawn.

## TURKEys: Rearing and Cooking

## Hints on the Treatment Needed to Produce Good Table Birds

The early part of this article is mainly for the benefit of country readers. The sections on preparing and cooking the bird will be of value to readers in all districts. The articles Duck; Fowl; Poultry ; also Casserole ; Forcemeat ; Stuffing, deal with related subjects. See Carving ; Christmas

The rearing of turkeys is best carried out on a large scale, one reason being that the abundance of natural food required by the birds necessitates extensive feeding grounds. They require, too, a good deal of care. Nevertheless, as smallholders and other persons with a little land may like to keep one or two, some information, from Leaflet 229 issued by the Ministry of Agriculture, is here given.

Although turkeys may be raised on heavy land, as a rule they do better on lighter soils, except in dry weather, when there may be a
deficiency of green food. The best results are obtained upon a rich soil which is not absolutely heavy in character. If a choicc of position is possible, preference should be given to a dry and sheltered one, facing south and protected from cold winds. Every advantage should be taken of banks, hedges, and belts of trees which will serve as windscreens.

The Best Breeds. The American Bronze is a popular breed of turkey, but the Cambridge Bronze is probably a better one for ordinary
keeping purposcs. On the average its males reach from 20 to 24 lh . and its females from 12 to 16 lb . They fatten up readily. For those who want a smaller bird the white turkey is recommended, while a cross between this and the Cambridge produces a hardy bird comparatively casy to rear.

Roosting. Adult turkeys should roost in the open all the year round. Special protection may be necessary to enable them to do this, but it is better thin placing the roosts under cover. Where large trees are available, the lirds may be allowed to roost on the branches, if they are strong enough. If not, perches should be placed under the trees. They should be removable, and should be of fir poles, broad enough for the birds to grip firmly and raised threc feet or so above the ground.

Sheds for the Birds. When turkeys must for one rcason or another, be accommodated under cover, a special form of shed is neces sary, because they need an ahundance of fresh air. The floor must be dry, and the roof should, if possible, be thatched and lofty. The walls should preferably be made of wattled furze about two feet thick, as this ensures, not only perfect ventilation, but fresh air without draught.

Turkeys usually remain on their perches until let out in the morning, when it is their habit to fly straight out and alight on the ground some distance in front of the roost. Therefore, to prevent the birds fiom damaging themsclves, the greater part of the front of the house should be made to open with folding doors or gates consisting of strong frames hung on hinges and covercd with wire netting.

Breeding Considerations. As regards brecding, close breeding should be avoildcd. Mere size is not very important. An approximation to 25 lb . in the males and 15 lb . in the females are suitable weights for ordinary brceding purposes, other considerations including width of shoulder, contour of breast, and a medium length of leg. Stock birds should preferably be from two to three years old, and eight or ten hens should be mated with one cock bird. Yearling hens are not recommended for breeding, but may be entployed as mothers during the first season.
The correct feeding of these stock birds is important. Their diet varies according to weather and other conditions, but a suitable mash can be prepared by using equal parts of ground oats, or barley meal and middlings, to which 5 or 10 per cent of meat meal may be added, with grain at night. Many brceders, however, prefer a whole grain diet for both morning and evening feeding, using wheat, barley and oats, and adding cabbages and swedes where the pasture is poor.
Much depends upon the supply of natural food available. When this is plentiful a supply of grain as stated above is sufficient, but when natural food is scarce some soft food in which meat has been nixed should be given three or four days a week. From January onward breeding turkeys necd to be in a hard sondition, and they must, therefore, have plenty of excrcise. A generous supply of grit and oyster shell is also essential.
During March the hen birds require watching, or they will choose an out-of-the-way spot in which to nest. It is therefore advisable to make up nests in sheltered and secluded positions in which the birds may lay their eggs. April is the best month for hatching, and it is generally undesirable to continuc hatching beyond June. Turkey hens are usually good mothers, but their eggs may also be hatched under barndoor hens. Artificial methods of hatohing and raising are not recommended, though incubators are sometimes used. A turkey hen will cover 15 or 16 eggs, and a large barndoor hen 8 or 10 . The period of incubation is 28 days. The
nests should be upon earth bottoms, and the the ordinary fowl's.
Care of Young Birds. In rearing young birds the principle of the roost house should, as far as possible, be applicd to the coops. The doors should be wire-netted and covered, if possible, in severe weather with sacking. The birds should be cooped with their natural or foster mother in a dry, sheltered position with a sunny aspect; a rich, medium soil is the most suitable. The coops must be moved a shoit distance daily to a fresh paitch, and the hens allowed out with the young birds whenever possible. The coops should be placed on short, fresh grass where the soil is quite sweet, and for the tirst 10 to 14 days they should be fitted with enclosed runs in front The coop and run should be moved daily to fresh ground.

Young turkeys should receive no food whatever for 36 hours after hatching. Afler that a suitable diet consists of steamed rice dried with fine sharps and mised with curds and finely chopped green food. With any soft food an admixture of finely chopped grass food, particularly dandelion leaves, clover and lettuce, is especially benelicial. It is important that the feeding board should be sprinkled with fine, sharp grit and powdered vegetable charcoal if curds are absent from the diet.

The fecding should be begun early and continued until late in the day. Very little food is required at one time, but it is necessary to give it at frequent intervals, commencing with six meals daily, and the soft lood allernated by a feed of coarse oatmeal and cracked wheat in equal parts. At about the third week the diet may be changed to include most of the foodstuffs given to ordinary chickens. Boiled wheat is also a good food during carly days. Later, new corn will be


Turkey. Handsome specimen of a full-grown turkey cock with wings and tail outspread
found helpful in the hirds' dict. Unless plenty of natural food is available, some meal must be included in the ration.

Fattening for the Table. The sclection and separation of the birds for stock purposes should be made during the autumn, preference being given to birds of good frame and stout legs, rather than to merely heavy specimens. The birds intended for fattening should be allowed full liberty until November. Until that time, in addition to the run of the ficld,
they should receive a liberal feed of grain twice a day The birds that respond mosi satisfactorily to the fattening process are those that have been kept in good condition from the carliest days.

About a month before they are to be killed the birds should be conlined at night in a large open-fronted shed situated in a quiet position. They must be liberated daily to prevent their fretting froin conlinement and to allow them exercise An abundance of soured skim milk or buttermilk is necessary in order to give colour and mellowness to the flesh, and, in addition, to stimulate, by the acid in the milk, the appetite which might otherwise fail.
A suitable food for these days is Sussex ground oats, wheat meal, or barley meal and sharps, and in many cases cooked potatocs or beetroots are mixed with the meal in the proportion of one part of the roots to two parts of meal. Soured skim milk or buttermilk is uscd for mixing the meals into a crumbly, moist condition. Once or twice weekly boiled meat offals should be given wilh the soft food The meat should be linely chopped, and the liquor used in place of milk for mixing the meals. The Sussex ground oats is made by grinding oats into a tinc meal. The special finely ground product is obtained by mixing a small proportion of barley with hird, llinty oats.

During the fattening period some give the birds rice boiled in milk, in order to whiten the flesh. lor the evening wheat, oats or barley is usually given in place of the mixture mentioned above, though some prefer to give soft food entirely. Plenty of grit, to which may be adder small pieces of vegetable charcoal, should be supplied in a box, or hopper, so that the birds may use a。 much as they want.

Turkeys should bo killed by dislocation of the neck after having been starved for 24 hours. They should be plucked at once. The birds should be plucked quite clean, except for the neck and the feathers on the back, covering the hips, which are ususally left on in order to prevent the skin from rubbing.

How to Cook. Turkeys are in perfection at the age of about 6 months. For braising or stewing, which demands long, slow cooking, an older bird may be used, but for roasting turkeys should be young and tender. Young turkeys arc known by their smooth black legs, bright eyes, red heads and supple feet. Immediately after they are killed they should be hung up to bleed and kept for 3 or 4 days before being cooked. Turkey may be boiled, roasted, braised, made into soup, or served cold. plainly or as a poultry salad.
To roast a turkey, singe and draw the bird, wash it as quickly as possible in cold water, and stuff it with chestnut stuffing or a good veal forcemeat. Sew it up, truss it as for a roast fowl, wrap it in greased piaper, and cook it in a good oven for about 2 hours. This is the time required for an averige-sized bird. Kcep it well basted and take the paper from the breast a little while before lifting the bird out of the oven. When it is ready, put it on a hot dish, remove the trussing threads and strings, and strain some good brown gravy round it. Fried rolls of bacon make a suitable garnish, and some extra gravy should be served in a sauceboat. Cranberry sauce (see page 312) is often liked with turkey. If preferred, fried sausage may be used instead of bacon, and sausage meat is often einployed for stulfing.

Boiled Turkey. Choose a medium-sized bird for boiling and, after plucking it, draw it by cutting off the bead, slipping down the skin round the neck, cutting off the neck and removing the crop. Turn the bird round and from the other end take out the inside, being careful not to break the gall bag. Cut
off the fcet and part of the legs to the first joint, draw the sinews, wipe the inside of the turkey, and truss it into shape.
To do this loosen the skin round the legs, draw the legs under it, press them well in so as to push up the breast, and skewer them into position or sew them with a trussing needle. Fold the loose skin from the neck over the back, and turn the wings and skewer them so that they keep this skin in position. Put some thin slices of lemon over the breast, then cover, the latter with a greased paper. The bird has next to be tied in a piece of ntaslin.

Put the turkey in a large pan of boiling water or stock, add a few mixed herbs tied in muslin, an onion stuck with a few cloves, and a carrot and turnip. Take out the herbs after $\frac{1}{2}$ hour's cooking, or they will discolour the stock. Simmer the turkey gently for about $2 \frac{1}{5}$ hours, keeping the stock well skimmed, then add 2 lb . of sausages and continuc cooking for another 40 min . Serve the turkey on a large dish, place the sausages round, and pour the sauce over all. Some of the liquor in which the turkey was cooked may be served separately.
Casserole of Turkey. Braising is a good way of cooking an old turkey. Pluck, singe, draw and cut the bird into neat joints, cover these with thin slices of fat bacon (remove the rind), place some more bacon at the bottom of a large casserole and lay the pieces of turkey on it. Add also the washed heart and liver. Peel and cut into dice 2 carrots, 2 turnips, and an onion, add them to the casserole with the green tops of 2 sticks of celery and 4 cloves, 12 peppercorns, and some parsley stalks, thyme and bayleaf tied together.
Pour in enough cereat or vegetable stock to cover half of the turkey, bring all to the boil, and then simmer gently for 4 or 5 hours. Serve in the casserole with the vegetables, but first skim the gravy, and if necessary add a few drops of browning. Season it to taste, and pour it over the turkey.

Devilled Turkey Legs. The legs of a cooked turkey make a dish in themselves if devilled according to the following directions: With a sharp knife score the legs round and lengthways in deep, regular gashes, brush them over first with melted butter and then with a mixture consisting of 1 teaspoonful each French and English mustard, 2 teaspoonfuls chopped chutney, and a sprinkling of salt, pepper, and cayennc. Over this sprinkle a few browned crumbs, then grill the legs on a greased gridiron before a clear fire.

When browned all over, serve them on a hot dish, with a few small lumps of butter placed here and there. Garnish with watercress.
Turkey Blanquette. For this method of using up the remains of a cold turkey, first put the bones into a stew pan, cover them with cold water, and cook them slowly for an hour. Then strain the liquor, and with it make some white sauce, seasoning it to tastc. To the sauce add some white pieces of turkey cut into neat squares: simmer all gently for about 20 min., and then draw the saucepan to the side of the fire.
Beat up the yolk of an egg with the juice of a lemon and a little of the hot sauce, and add it to the stew, stirring all the time. Return the pan to the fire, and continue stirring until its contents thicken, but take care that they do not boil or the egg will curdle. Just before serving, stir in a little finely chopped parsley. Triangles of fricd bread, placed round the dish on which the stew is served, are a good garnish.

TURKEY CARPET. The style of knotted floor coverings that is universally recognized as Turkey carpets or rugs comprises woollen fabrics with deep red grounds, bearing conventional medallion designs with broad horders, usually carried out in strong blues and yellows. A regular industry, with headquarters at

Istanhul and Smyrna, is engaged in meeting the demand for these productions from all parts of the wor!d, and the designs and sizes have been more or !ess standardized.

The term fancy Turkey is used for similar commercial makes, especially in carpet sizes, in which the colourings and designs are more varied. The grounds of these are available in greens, rose, orange, light blue, ivory, manves and pinks. There is a large output of Turkey patterns in British and continental makes, cspecially for stairs and corridors. By being able to tackle warps of considerable length, power-looms readily turn out these goods in the piece, although such carpets lack the hand-knotting of the native weavers.

There is a large production of carpets and rugs in Turkish lands, cspecially in Anatolia and Kurdistan. They differ from the more characteristic of the Persian rugs by being invariably made with the so-called Ghiordes or Turkish knot, one effect of which is to turn the nap toward the right or left top corner instead of atraight up the rug. They also usually have wool warps and wefts, often dyed to the prevailing colour of the design, with solvedged sides and knotted warp-ends.

Styles and Qualities. Various styles and qualities are distinguished by such names na Yapraks and Spartas. Some of them are very iooscly woven ; a Karaman, for example, may have not more than 10 knots to the square inch. There is also a modern output of fabrics made in the homes of the native population, in which the traditional features have a better chance of being perpetuated.

The Ghiordes ruge, formerly among the choicest of the Anatolians, and now often the poorest, frequently have a scparate web sewn on the upper end, instead of being finished with plain warp threads. Kulah rugs, mostly of the prayer type, and often passed off as Ghiordes, are readily recognized by their many narrow horder stripes, which may run to 14 in number. They usually have the field filled in with smallish objects instead of being left plain, and show one instead of two cross-panels outside the prayer niche. They are short-piled and almost lustreless, and generally contain in the border the distinctive Kulah design, which suggests derivation from the dragon associated with Central Asia.

A large class of small fabrics, generically known as Anatolian mats, cither display the varied characteristics of this region or reproduce more or less closely the more distinctive geometrical features of the Caucasian types. See Carpet; Persian Carpet ; Rug.

TURKEY RHUBARB. This drug-providing member of the rhubarb family is Rheum palmatum. It is an ornamental-leaved plant Hourishing in decp, rich soil in sunny positions near the water-side. Propagation is by division of the roots during the winter months. The drug is used as a stomachic and purgative. See Rhubarb.
TURKISH BATH. A Turkish bath is carried out in a number of rooms of different temperature, ranging from about $90^{\circ} \mathrm{F}$. in the coolest to $220^{\circ}$ or even higher in the hottest room. The greatest precautions should be taken to avoid exposure on the way home from the bath, which may lead to the contraction of a chill or severc cold. As a Turkish bath may be depressing, it is as well to have medical opinion as to one's fitness for taking it.

The hot-air bath is an improvised Turkish bath, and usually takes the form either of a portable cabinct or an arrangement for an invalid for which the only apparatus required is a large spirit or candle lamp with a metal funnel which can carry the hot air into a framework cage.
The interior of a hot-air bath cabinet is lined with asbestos. The heat is supplicd by a lamp as above or by electric lamps (the radiant heat bath). The patient sits on a chair in the bath.
and care should be taken that unprotected skin does not come into contact with parts which may be unduly hot. Thia bath may be used by healthy persons who wish to have the luxury of a Turkish bath at home, and it is desirable to follow it with cold sponging or a cold plunge. It is used with benefit, however, by persons affected with chronic rhcumatism and rheumatoid arthritis, and in their casc the application of cold must be graded to their capacity to bear it.
The hot-air bath in bed may be used in acute nephritis in place of the warm bath or the vapour bath. See Skin; Vapour Bath.
Making a Bath Cabinet. A folding vapourbath cabinet that can be made casily by the home craftsman is illustrated in Fig. 1, and consists of four sides hinged together and provided with a flexible top. Inside measurements can be varied to suit requirements: in the example given they provide a squarc floor space of 2 ft .9 in . and a height of 3 ft .6 in . The floor should be covered with a plece of stout cork linoleum measuring at least 3 ft .6 in. squarc.
The sides, as shown in Fig. 2, are made of either $\frac{8}{18}$ in. or $\frac{1}{4} \mathrm{in}$. plywood secured to a framework of $1 \frac{8}{4} \mathrm{in}$. by $\frac{8}{4} \mathrm{in}$. wood. Many of the manufactured baths are made with a framework of wood covered on one or both sides with a closely woven canvas or American cloth, but the plywood covered frame is more satisfactory, as there is little risk of its being damaged, which is the main disadvantage of the cloth-covered frame. The construction of the framework is quite simple: two of the sides aro 2 ft .10 in . wirle, the others are 2 ft .11 in . and 2 ft .9 in . wide, and all four are 3 ft .0 in . high.

The method of attaching the frames, as shown in the plan at Fig. 3, allows of the side A being turned back on the side B , the side at $C$ is folded back on $B$, and the remaining side, D , which acts on the door, folds back on the side $C$. The wood for the framing should be machine-planed to the required width and thickness: if not, it must be hand-planed from 2 in. by 1 in . deal batten selected in straight lengtlis and free from knots and blemishes. For the uprights eight lengths of $3 \mathrm{ft} .6 \frac{1}{2} \mathrm{in}$. should be sawn off and four lengths of 2 ft . $10 \frac{1}{2} \mathrm{in}$., two of 2 ft . $11 \frac{1}{2} \mathrm{in}$., and two of $2 \mathrm{ft} .9 \frac{1}{2} \mathrm{in}$. should be cut off for the rails.

Place the uprights in pairs and set off 4 in . from one end, then $1 \frac{3}{3}$ in., and from this mark set out 3 ft . $2 \frac{1}{2} \mathrm{in}$., taking care that all the pairs are accurately measured to the same distances. The four 2 ft .10 in . lengths are marked out together, the first mark being $\frac{1}{2}$., the next $1 \frac{3}{4} \mathrm{in}$., and the third $2 \mathrm{ft} .6 \frac{1}{2} \mathrm{in}$. The 2 ft .11 in . pieces are placed together and the first two marks are the same, but the third is $2 \mathrm{ft} .7 \frac{1}{2} \mathrm{in}$., while the remaining pair are marked off with the same two distances at the end with a 2 ft . $5 \frac{1}{2} \mathrm{in}$. distance for the third mark.

The frames are fixed together with halved joints, as shown in Fig. 4. A marking gauge is set to $\frac{I^{3} \mathrm{in} \text {., and lines are gauged from the }}{}$ face side of each piece across the ends and down each side to the inner mark. A pancil mark is made at the ends of the uprights on the opposite side to the face, and on the rails on the face side to indicats the waste. The ends are sawn down on the waste side of the gauge lines in each case, and then the waste cut off at the shoulders, care being taken not to saw beyond the lines. The plywond is cut to the required sizes, two are 3 ft . 6 in . by 2 ft .10 in ., one is 3 ft .6 in . by 2 ft .11 in ., and the other 3 ft .6 in . by 2 ft .9 in . To allow for cleaning up the cdges, these sizes may be exceeded by $\frac{1}{1}$ in.

The frames should be glued up and a screw driven in each joint, but they must bc tested for squareness. The best method of doing this is to take a thin lath, place it diagonally
between opposite corners, and mark. If on placing the lath on the opposite diagona! the marks coincide, the frame will be square ; if not, the necessary adjustment must be made. The frames are now glued to the plywood and further secured by screws driven in at intervals with the screw holes countersunk. When the glue has set hard, the projecting ends of the framing are sawn off and the edges of the plywood planed down to the outer surface of the frame. The wood is cleaned up with glass paper and coated with size before varnishing.
The positions of the hinges are shown in Fig. 3. At F the hinges are screwed to the end of $A$ and at the back of $B$; at $F$ they are screwod to the inside of $B$ and $C$, and the hinges at $G$ are fitted as at $E$ to the outside. in this case to $\mathbf{C}$ and D . Ordinary butt hinges or back flaps can be used, but the appearance of the work will be improved if the hinges aro let in flush with the surface. In order to make the joints conparatively vapour-tight, rubber draught strip should be tacked to the uprights as in the sectional detail at Fig. 4. The same material is tacked along the edge of the door piece D on the outer upright of the side $A$, so that the door can butt against it. It will also be an advantage to edge the bottom rails with


Turkish Bath. Fig. 1. Folding vapour bath cabinet. Fig. 2. Measurements of sides. Fig. 3. Plan. showing method of attaching frames. Fig. 4. Balveil joint and position of rabber draught strip. Fig. 5. Portion of flexible top
the rubber st rip. To keep the door fast when closed, two hoolis and eyes should be fastened on the inside.

The top can be made of any closely woven material, but rubber sheeting is the inost suitable. It is marle in two portions, as in Fig. 5, which shows the dimensions for narking out, each piece being 3 ft .3 in . by 1 ft .10 in ., with an opening of 11 in . dianeter in the centre of one side. Commence by marking off a line 1 in. away on one side and both ends, and on the same side set off lines 2 in. inside and make cuts 3 in. long as at $H$. On the other side set off two lit in. lines and cut the opening with the centre on the inner line; the diameter can be lessened if required. The material to the first line is turned under and sewn ; at the same time the material is folded at right angles at the inner 2 in. line and the corners sewn up with the hem. The edges surrounding the opening can be hemned. but the neatest method is to bind it with a roll
cut through one of the sides or a hole A small gas stove can he fitted or one of the small oil stoves of the Beatsice type. A bentwood chair with a perforated wood seat forms the most convenient seating accommodation. For steam or vapour, the water or vaporizing solution should be placed in a shallow pan on top of the stove.

When using the batl, the sides are arranged on a mat or square of linoleum and the top fastened to the sicles and back. The lamp is lighted and regulated and placed in position. The user enters the cabinet, the door is closed, and the top, fastened to the door and buttoned below the head, which is, of course, outside the covering. The outside heater has advantages, as it can be regulated hy an attendant. but it is somewhat difficult to regulate an inside heating arrangement. The correct temperature can lie found after one or two trials. After use, the sides are wiped with a dry cloth
and the cover dried before being packed away.

TURKISH COFFEE. More carc is required for the preparation of Turkish coffec than of ordinary coffce. The metal pots in which it is made are sold specially for the purpose, and have long handles and spouts. They are heated on the small stands with which they are sold. The coffec nust be very fresh and very finely ground.

Enough Turkish coffee for two people can be prepared by putting 2 or 3 lumps of sugar and $\frac{1}{2}$ pint water into the pot, boiling them and then drawing the pot away from the flame while 2 large tablespoonfuls coffee are added. Reboil the whole, take the pot from the flame again for a second or two, and repeat the reboiling 3 times. Serve the coffee without milk in small cups. See Coffce.
TURKISH DELIGHT. This is a favouritc Eastern sweetmeat which is imported into Great Britain. The following is a good recipe. Take 2 lb . loaf sugar and make it into a syrup with 2 pt. water. This syrup sliould be cleared with the whites of 2 eggs. Add 2 tablespoonfuls lemon-juice and turn all into a sugar hoiler; meanwhile dissolve in $\frac{1}{2}$ pint water 4 oz . rice starch, and when the syrup in the pan hoils stir in the dissolved starch and cook all gently, stirring the whole time until the mixture is firm and has been reduced to $\frac{1}{3}$ of its original hulk. Pour half the mixture into another pan, colour it pink, and favour with rose cesence. The remaining half should be sufficiently Havoured with the lemon, but if not add a little essence. Havc ready a few blanched almonds and pistachio nuts cut in pieces. Add some of each to both portions of delight.

Set the inixture between candy bars on a slab dredged with confectioners' starch or icing sugar and cornfour. A tin similarly prepared


Turkish Delight. A favourite soft sweetmeat
may be used instead of the bars. When set, divide into blocks, roll well in starch and sugar, and store in a wooden box with plenty of stareh and sugar. Line the box with wax paper. Another method is as follows: Soak 1 oz . gelatine in $\frac{1}{2}$ gill water in a saucepan and stir over heat till it boils; let it simmer 3 or 4 inin. Place in a large saucepan l lb. granulater sugar with another $\frac{1}{2}$ gill water, melt slowly, and bring to boiling point, then remove from the fire and cool slightly. Add the dissolved gelatine and boil for 20 min ., stirring all the time. Add 1 tablespoonful rum, the juice of an orange and of a lemon, and a strip of thinly cut lemon rind. Stand this for $: 0$ min. in a warm place, then colour half pink and flavour with rose essence. Add a few nute to each portion, and cut separately. See Sweets.
TURK'S CAP LILY. Two lilies are known by this popular name. Of these Lilium chal. cedonicum bears blossoms of scarlet with petals rolled back, while martagon has tiers of drooping, recurved purplish Howers. A beautiful variety of the latter bears waxy white Howers. See Border; Lily.

TURMERIC. The roots of the turmeric plant yield a condiment which is uscd in the preparation of mustard, curry powder, and pickles, and is also of commercial valuc for dyeing purposes. It must be grown under glass in Great Britain.

TURN RUCKLE. This name is given to $n$ typc of straining device, and also to a fastener for a cupboard door. Dealing first with the former appliance, the turn buckle, or bottle screw, comprises a body in which are serewed
one or more portions adapted to receive wood shaped at both ends and bored with a the ends of wires, cords, or the like. The hole for a screw. common type has two screwed ends, and will thus exert a tersion upon two cords simultaneously, this usually being accomplished by providing the body with some form of rotation, threading one end with a right-handed threarl and the other with a left-handed thread, the cye bolts or screwed portions being similarly threaded. When the body portion is turned with a spanner or a tommy bar the screwed portions arc drawn together, so tensioning the guy rope or straining wire to which the turn buckle is attached.

Numerous varieties of this style of turn buckle are available, and should be chosen according to their utility, length of travel, and so forth. When used out of doors, for example, as a means of tightening the stay wires supporting an acrial mast, they should preferably be of galvanized iron or some other

non-corrosive material. They should also have a fairly long travel, something in the nature of 6 in. being practical for the average wireless mast.

## Cupboard Turn

 Buckle. 'The second type of turn buckle, for sccuring cup. board doors and other hinged structures, comprises a neerled, and a which a square, sciewed shank turns, the outer the proportions are reversed. Information on end being provided with a handle and the the choice of a lathe for either of the specitic inner end having a small lever adjustably uses is given in the article on Lathe. The attached to the spindle. The lever is fixed amateur may well consider the purchase of either with a small setscrew or by a screw a Verschoyle mandrel (see page 697, Fig. 4), thread and lock nut. In use the spindle passes through a clearance hole drilled through the framework of the door, the plate being screwed to the outside. The position of the lever is adjusted on the spindle so that when the door is closed and the handle turned the lever stands at right angles or parallel with the floor, thus preventing the door from opening. Sometimes the fastener is provided with a more ornate plate and a drop handle, when it is usual to dispose the handle so that when it is in a vertical position the lever is horizontal. This prevents the weight of the lever rotating the handle and so allowing the door to open.There is another kind of turn buckle which is used chiefly for securing shutters. It is in the form of a pivoted cateh which operates by gravity, the weight of the handle being so disposed that it kecps the catch normally in a locked position.
Cupboard turns are liable to wear the cdge of the door, especially if carclessly used. To avoid this and to repair worn doors, a neat angle plate should ne litted on the opposite door. It can be made in thin brass and let into the wood; the screws used should be placed in countersunk holes. In fitting all turn buttons care must be taken to clear the edge of the door frame and allow sufficient projection to hold the door. See Aerial; Cupboard ; Door.

TURN BUTTON. Used for fastening doors and flaps, the turn button is made in wood and metal. The simplest form is shown in Fig. 1, and consists of a small piece of hard.

Turn buttons in japanned iron and brass are of the shape shown in lig. 2; those made in iron are ohtainable in sizes from $1 \frac{1}{2} \mathrm{in}$. increasing by $\frac{1}{f} \mathrm{in}$. to $2 \frac{1}{2} \mathrm{in}$. The same pattern in brass increases in like proportion from $\frac{3}{4} \mathrm{in}$. to $2 \frac{1}{2} \mathrm{in}$. Half buttons, as in Fig. 3, in japanned iron can be obtained from $1 \frac{3}{4} \mathrm{in}$. to 2 in., and in brass from $\frac{3}{4} \mathrm{in}$. to 1 in . A neater form of turn button is shown in Fig. 4, the button being riveted to a brass plate, and the corresponding metal plate being attached to the face of the door stile. This is used on thin wood or where extra neatness is clesired, and it should be attached by means of Hathcaded brass screws. One great advantage of this type is that the button cannot wear away the cdge of the door, as often happens with the common pattern. See Cupboard; Door.
TURNING. The mechanical processes which are grouped under the gencral heading of turning divide into two independent groups, those associated with the turning of wood, which are dealt with in this Encyclopedia under the heading of wood turning, and the whole series which apply substantially to the turning of any kind of metal and inost of the manufactured compositions, such as ebonite, celluloid, and the like. These are treated under the titleof metalturning (q.v.). The mechanical requirements of the wood and metal turner respectively are somewhat different. For wood turning a lathe with a large Aywhcel is
Turn Buckle. Fig. 1. Turn buckle and hook for use as a strain-
ing device. Fig. 2. Type of cuphoard turn buckle, showing a cupboard door

TURNIP. A prolonged supply of this favourite root vegetable can be assured by sowing the seeds out of doors in March and early April for summer produce and in late Juneand carly July for an autumn crop. Ordinary well cultivated soil frec from fresh manure is suitable. For spring sowing the drills should be 12 in . apart; the seeds need only a slight covering of soil. To allow them full room for development the seedlings ought to be thinned out to 4 or 5 in. apart. Suitable varieties for spring sowing are Early Snowball, Early Milan, and Six Weeks.

The seedlings of autumnturnips should be thinned out to 6 or 8 in. apart ; some of the best varicties arn

Snowball,
Greentop Stone and ChirkCastle. Those who like yellowfleshed tur nips should choose Golden Ball or Orange Jelly, and sow the seeds in July. An carly varicty of turnip miay be sown on a bed of fine soil on a hothed of nianure made up in a franie in January. If turnips are


Fig. 1


Turn Button. Fig. 1. Simple form in hardwood. Fig. 2. Turn button in japanned iron or brass. Fig. 3 . button riveted to a brass plate
doors in August and September the leafy tops will provide a useful winter vegetable.
The Turnip Flea. The turnip flea or fly is the most troublesome pest of this vegetable. It attacks the seedlings and riddles the leaves. Frequent dustings of soot are recommended, together with an occasional application of nitrate of soda, l oz. per square yard of row, to encourage the seedlings to grow quickly and strongly.
Cooking Turnips. The turnip is served as a vegetable with boiled mutton, and it can be made into various dishes of dressed vegetables. It is also used for flavouring soups. Old turnips should never be served as a vegetable, as no amount of boiling will render them tender, but they can be used for flavouring. The turnip is not easily digested by delicate persons or invalids.
To prepare turnips for boiling, pare them thickly and always under the brown line which is apparent when the pecl is cut into. As they are pared divide them into halves or quarters nnd throw them into cold water. Have ready a good-sized pan of boiling water, as they need plenty of room when being boiled. Young turnips take about $\frac{3}{4}$ hour to cook and those which are rather more matured $1 \ddagger$ hours. When the turnips are cooked, drain them thoroughly and press then in the colander with a vegetable presser in order to extract


Turnip Culture. 1. Type to grow. 2. Gross type inclined to waodiness. 3. Outdoor drills for sowing. 4. Good thinning. 5. Outdoor forcing : a leaves; $b$, friable sandy loam: $c$, top soil; $d$, slielter and drill. 6. Plant protected with top glass. 7. Bad thinning. 8. Good thinning. 9. Turnip attacked by gall weevil.
10. Gall weevil (magnifed). 11. Turnip flea beetle (magnifed) 10. Gall weevil (magnifed). 11. Turnip flea beetle (magnified)
all moisture, then rub them through a wire sieve or pass them through a mincer. Rinse out the pan in which they were boiled and melt in it $\frac{1}{2}$ oz. butter for each Ib . of turnips (weight before cooking) and $\frac{1}{2}$ gill milk, scason with salt and pepper, then return the turnips to the pan and heat all together over the fire. If preferred, the butter may be omitted, but niargarine should not be substituted, ns it is too oily.
To stew turnips, pare and wash them and cut them first into slices and then into dice. Allow for each lb . of turnips 2 oz . butter and melt it in a stewpan. Add the pieces of turnip, put on the lid, and stew very gently from $\frac{3}{4}$ to $l$ hour. Stir freguently, and when half cooked add seasoning. This method of cooking turnips is suitable for scrving them in the centre of a dish of cutlets or for garnishing. They may also be served with a roast leg of lamb. A little chopped parsley sprinkled over then adds to their appearance. See Kohl Rabi.
TURNOVER. The turnover is made with short or llaky pastry, rolled about $\frac{1}{2}$ in. thick. The shape may vary, but the filling, which may be savoury or sweet, is always placed in the centre, one half of the sliape being folded over until the extreme edges meet. Cornish Pasty ; Jam Turnover ; Pastry.

TURN THE TRENCHER. This is always a popular game with small children, and is very pretty to watch. All that is needed is a bread trencher, or a amall, round tray. 'The children sit in a circle, and each chooses some article of a lady's toilet, c.g. brush, comb, hairpin, sponge, etc. The person leading the game then tells a story, describing how some young and beautiful lady is getting ready for a ball. As each article of the toilet is mentioned, the child who represents it has to spring into the centre where the trencher is lying and give it a brisk spin.
Another way of playing the game is for each child to choose a llower. One then picks up the trencher and spins it, at the same time calling out one of the Howers, and the child called has to catch the trencher before it stops spinning, or pay a forfeit. It will be seen that the game lends itself to much variety as far as the names are concerned: they might be animals or birds, or even parts of a motor car. In the latter case it could be modelled on liamily Coach. See Children's Party; Forfcits.
TURPENTINE. Oil of turpentine is a colourless thind with a peculiar balsamic odour and pungent, bitter taste. Externally it may be used as turpentine liniment or the acetic liniment of turpentine. Sprinkled on a lot fomentation it makes a turpentine stupe, which is often applied to the abdomen to relieve colic and gaseous distrnsion. It may prove of valua in neuralgia, lumbago, and other forms of muscular rheumatism, and in the later treatment of a sprain.
The uses of turpentine in the home are many and varied. Its odour helps to keep away black beetles, ants, flics, and mice, and shelves and cuphoards sprinkled with it are rarely troubled by insects. A little turpentinc sprinkled in boxes or wardrobe where woollen clothes are stored will also keep out moths.
Paint stains on clothes can be removed with turpentino and household ammonia. Dip the stain first in turpentine and then in ammonia, rubbing it after each immersion. If the stain is not an obstinate one, turpentine alone is often suflicient. Grease marks on coloured fabrics will also yield to vigorous rubbing with turpentine. Place the stained part over a cloth, and rub it with a clean rag dipped in turpentine, until the spot is dry.

Turpentine has antiseptic propertics, and its use in the home can therefore also be recommended on medical grounds. See Clothes; Grease; Paint; Patent Lcather.


Turnip. Fine round roots of the green top white turnip TURQUOISE. An opaque sky-bluc or sold in their natural cream to brown shade greenish -bluc stone, the turquoise owes its which witlsstands any amount of washing and popularity mainly to its colour. It is sometimes exposure. See Shantung; Silk. set in rings, but, being very easily scratched, it is better suited to pendants, brooches, and necklaces. While the turquoise cannot be classed with the more precious gems, large stones of good colour fetch a high price. They are subject to changes of colour.

TUSK TENON. The joint used in carpentry under the name of the tusk tenon is so called because the tenon itself is longer than usual and extends beyond the face of the material to which it is jointed. It is held by means of a wedge driven through a hole near the outer end of the tenon.

The disposition of the parts is shown in the accompanying illustration of a trimmer tenoned and wedged to a floor joist. This joint is largely used in building construction for all openings through floors and ceilings, the chief reason being that the wedge holds the tenoned member firm against the rafters or joists, and prevents the latter from springing or starting.

The length of the tenon which extends beyond the rafter should he at least equal to the thickness of the rafter through which it passes. It is shaped and fitted in the same way as a tenon joint, after which the exact position for the wedge is marked, the tenon withdrawn from the mortise, and a hole drilled through, using a brace and large diameter bit. The hole has to be enlarged with a paring chisel, and the outer facs should be slightly tapered. The Tusk Tenon. The completed joint The inner face, that is, the side nearest to the shoulder, is cut back so that the wedge will bear firmly against the outcr face of the rafter and the outer inclined face on the tenon. The wedge must not bear on the inner wall of the hole through the tenon. The wedge should be preferably of hardwood tapered to suit the hole, and should fit exactly. When the trimmers have been fixed in place, the wedges arc inserted, the rafters preferably being crainped together while the wedges are driven homc. See Floor; Tenon.

TUSSILAGO. This is the botanical name of coltsfoot (Tussilago farfara), a common British weed which bears yellow daisy-like flowers in early spring. For cultivation in gardens the best species is the winter heliotrope, Tussilago (petasites) fragrans, a hardy

TUTSAN. Sometimes known as swect amber, the tutsan is a shrubby species of Hypericuin, H. androsaemum, suitable for growing on banks or under the shade of trees. It bears yellow Howers similar to other members of the St. John's wort family. The tutsan is evergreen, and only requires trimning during April.

TUTTI-FRUTTI. Sometimes referred to as a mixed fruit ice, the sweet called tuttifrutti is prepared by cutting up sonce mixed fruit, dredging it with castor sugar, and soaking it with a little liqueur. When it has stood for a short time it is stirred into some half-frozen water ice, and then the frecziag is continucd. See Frcezer ; Ice.

TWEED: The Material. Hand-spun and woven tweeds are necessarily expensive 10 produce and command high prices. Harris tweeds made in the Hebrides carry with them a peculiar odour of peat-smoke, and of certain of the ingredients used by the dyer. Donegal tweeds, in which there arc usua!ly lumpy, brightcoloured irregularitics, are much liked for sports wear.

Scotch tweeds, machine made in scotland, are amongst the best wearing, and arc procurable in heather mixtures, checks and thecked designs, and in heavy, mediuin or gossamer weights. Hand-made tweeds do not usually wear as well as the best machine-made. The cheapest mill-made tweeds are often of very poor quality, containing much shoddy and cotton. See Harris Twiced; Loom; Weaving.

TWEEZERS. Miniature pincers known as tweczers are sold by chemists and beauty specialists for removing superlluous hair from the face, especially from the cyebrows. It is not claimed for tweczers that they destroy the roots of the hair, but their frequent use has a weakening effect. Tweczers are intended as a remedy only for slight growths of hair. See Electrolysis.

TWELFTH NIGHT CAKE. If a children's party is held on the l2th day after Christmas, Jan. 6th, a Twelfth Night cake is sometimes specially made for the occasion. The cake is after the style of a Christmas cake, and ornamented with icing and coloured candies or candied fruits. Sometimes 12 small candles
are distributed round the iced top, as is done with birthday calics, and there may be a large gilt star in the centrc.

TWILIGHT SLEEP. When childbirth is conducter under the influence of seopolamine and morphine the drowsiness induced by thesc drugs may be made sufficient to send the patient to sleep in the intervals of the labour pains. Such a condition is popularly referred to as twilight slecp.

Pain is not abolished by such treatment, and, indecd, it would be dangerous to attempt this. The inemory of pain may be aholished, however, so that although the patient, on the occurrence of labour pains, may have given obvious indications of suffering, yet at tho conclusion of labour she may know nothing of this.
The method is not required for short, labours, as in these a few whiffs of chloroform may sufficiently ease the paings, hut in prolonged labours twilight sleep may be a decided advantage. It should, of course, be supervised by a doctor. See Childbirth.

TWILL: The Material. For materials of all kinds the method of weaving known as twill is employed, the threads being so arranger as to throw up diagonal ribs upon the surface of the cloth. Cloths are mado to frel thicker by being twilled than if plainwoven. It is apparent that the twill lines commonly seen upon cloths vary in width, some being much coarser than others. Also they vary in the steepness of the diagonal, and the higher angles are most met in the fincr and more closely woven fabrics.

In addition to plain twills, there are the fancy sorts, twilled alternately in opposite direction to form herringbones or cherrons, and these cloths are generally satisfactory, is this method binds the threads firmly together. Twill cloths are not always alike front and back, and some of the most solid twills used for coats and costumes have a plain back.
In twilled shects made in the best manner, the strongest threads are brought up to the surface and takic most of the wear. (heap) sheets are often twilled and made partly from good cotton and partly from cotton wastc. They feel thick and soft, but the twilled ribs are lumpy and irregular, whereas in the hetter qualities the twill lines are sharp and smooth.
Most linings arc twills, and so aro all serges and many tweeds. Gabardine is a kind of twill, and so is Venctian. Some of the hardest wearing cloths for riding brecches are twilled. The best velveteens are woven with twilled backs to hold the pile more tirmly. Twilled mattings do well for kitchen and cottage floors.
TWINE. This is the name given to a strong thread madt up of two or threc strands, twisted, or twined, tightly together. Usually stronger and of better quality than string, its uses are practically identical. See String.
TWO STEP. This was a simple ballroom dance at one time danced as part of the for trot. The steps were similar to those in the galop, but danced more slowly, being written to six-eight time, although they could be danced to four-four time.
The man's steps were as follow's: Glide the left foot to the second position. bring the right up behind the left, glide the left again to the side. Repeat the movement, beginning with the right foot. The girl's step was the same, but slic began with the right foot. See Jancing; Galop: Roger de Coverley.

TWO STROKE ENGINE. This is a type of internal combustion engine in which the cycle of operations comprises one power stroke at every downward stroke of the
piston. It is contrasted with the four stroke engine, in which the power stroke occurs at alternate downward strokes of the piston. See Four-Stroke: Internal Combustion Engine: Motor Cyelc.

TYDAEA. This is a group of hothouse decorative plants with flowers of various showy colours. They flourish in the usual potting inixture of loam, !caf-mould, and sand, in shady positions.

Propagation is by secds sown in a mixture of sand and leaf-mould in the springtime, by cuttings of the young shoots at the same period, or by separating the rhizomatous roots. Rhizomes should be planted in 5 in . pots, several in a pot, in spring to llower in summer.

TYING: Of Plants. The staking of trees and plants is of great importance, and, as a rulc, duc attention is paid to the selection and placing of supports, but the work is often rendered ineffectivc or even entirely useless by the neglect of proper tying. The material used for tying trces must be strong enough to atand sudden strains ; it must also be sufficiently sound to hold securely for a considerabic time without rotling.

A knot is required that.will hold firm under practically any strain, and can be united casily. The knot that best answers these requirements is the ordinary reef or sailor's knot. Green raflia is an excellent material for tying plants to their supports.

## Typewriters: Their Use and Care

## How to Ensure the Working Efficiency of These Machines

Followed by an entry on typewriting, this article deals with the management and care of the
typewriter. Articles on subiects for which the typewriter is useful include Letter; Postage typewriter. Articles on subiects for which the typewriter is useful include Letter; Postage

Typewriters may dall into one of two classes. The type may be arranged round the circumference of a wheel or a segment, as for example in the Hanimond, the action of the keys rotating this whee! until the particular letter struck on the keyboard is brought opposite the printing point; or, alternatively, the type is carried at the end of levers or type-hars which strike the paper when the keys are depressed. Typewriters of the sccond class are much more numerous than those of the first, cxamples being the Empire Remington, Oliver, etc.

Various devices are employed for inking the type. This myy be accomplished by means of an ink-pad before thie depression of the keys causes the levers to move and the type to strike the paper but nore commonly an inked ribbon is inserted loetween the paper and the type. This ribbon is wound from one spool to a sccond by the action of the machinc, and so it is not worn threadbare at any particular point. A further variation is a ribbon in two colours, typing in red or black being performed by bringing the necessary part of the ribbon opposite the type-face.
A third classification may be found in the arrangement of the keyboard. Occasionally there is ono key for each character. Thus the capital A B C and the small a b c would each have a separate key, the capital and the small letters being arranged in two banks

Often each key strikes a capital letter, a small letter, a figure, or a punctuat:on mark, the particular impres. sion depending on the use of a sub sidiary key brought into use simu!tane ously with the letter key These sub sidiary or shift keys move the carriage forward, or backward, or into midposition as required for the character to be used. Obviously this type of machine is preferable, since the construction is simpler and therefore less costly. AII machines are fitted with the universal keyboard, so that it is an easy matter for anyone who has


Typewriter. Diagram showing principal parts of Remington visible machine, No. 10. 1 and 29 . Shift keys. 2. Shift lock. 3. Back spacer keg. 4. Ribbon indicator. 5. Stencil lever. 6 and 24. Marginal stops. 7. Line space and 9 and 21. Thumb wheels. 10 . Line space gange. 11. Paper 9and 21. Thumb wheels. 10. Line space gange. 11. Paper side guide. 12. Paper table. 13. Paper fingers. 14. Pointer.
15. Line gauge. 18. Type guide. 17. Tabulator stop scale. 18. Cylinder. 18. Feed roll release lever. 20. Paper scale. 18. Cylinder. 18. Feed roll release lever. 20. Paper finger release arm. 23. Ribbon spool crank. 25. Mrrginal
stop bar. 26. Ribibon spool door knob. 27 . Margin release. 28. Tabulator key. 30. Space bar

By courtes/l of Remington T!/pewriler Co., Lld.
learnt on one machine to work equally well on one produced by a different firm.
The Essential Operations. Although there are many kinds of typewriters, with numberless differences in detail, tho mechanical parts of each bear a close relation to one another. The essential operations may be reducel to two. When tho key is struck a letter must be printed, and the paper nust be carried a short distance to the left before a second !etter is impressed, so that the letters are printed scparately, and not one on top of the other. The mechanism of the first of these operations has been described, and for the second it is better to wateh a machine actually at work.
It will suffice here to say that the action depends upon the mainspring and the dogs and rack. The mainspring is trying all the time to pull the carriage right across to the left, and would do so but for the dogs and the rack. Each time a letter is struck the mainspring is allowed to pull the carriage along to the width of onc letter, after which the next tooth in the rack stops further progress until another letter is struck.
Other Points to Note. Apart from these two main actions, a typewriter may be fitted with many subsidiary appliances. A bell may give warning of the end of a line, a lock may prevent the machine working after the end of the line is ruached, there may be attachments for corrections and tabulation, for facilitating the insertion of fresh paper, and the like. But it must be confessed that many of these innovations, althougb ureful, are intro. duced by the manufacturers to add points to their advertisements, and the first thing an expert typist often does is to disconnect and remove most of these additional luxuries.

Most typewriters have been modified to perform visible writing, which is, indced, put forward by the manufacturers as a recommendation of great im. portance. Possibly a
beginner may like to see that the letter printed corresponds to the key struck, or intended to be struck, but a practised typist no more needs to look at the keyboord than a pianist needs to look at the keyboard of his piano. A mistake is usually felt automatically, without any refer. ence to the typing.

Accuracy of alinement is essential. To ensure this has called for grent ingenuity on the part of the designers, confronted with the problem of making a system of levers at once strong, rigid, nud light, and of sup. porting them on bearings which are steady and adjustable for wear in conditions where space is much reatricted.

A tabulator is a very useful device whon complicated tabular work has to be carried out. The carriage can be moved instantaneously from any point in one column to nny point in another column, while the columus themselves can be arranged along the width of the paper.

Portable Machines. Portable typewriters are made of the toughest materinls and designed to eesist rust, survive neglect, and withstand all the bumping incidental to travel. The three principal makies of these portable typewriters are the Remington, which is here illustrated, the Corona, and the Underwood. Each of these, without the casc, weighs $6 \frac{1}{\mathrm{l}} \mathrm{lh}$. ; with case the Corona weighs 9 lb . and the Underwood 8 Ib. One general rule should be followed by the operator-his or her attention should be confined to oiling the machine and keeping it frec from dust. The less tinkering there is with a screwdriver or spanner the longer the inachine will givo cfficient service. Permanent loss of alinement and similar troubles are iew if a typewriter is properly oiled and dusted.

Cleaning the Machine. Cleaning is a very simple operation. Once a day the machine should be dusted over with a soft rag, the bright parts being rubbed over occasionally with a piece of chamois leather. Any accummlation of dust from orasures or the surface of the paper used in the interior of the machine can be removed by using a long-handled brush sold for this purpose. Oiling is almost as simple an operation. Use only a fine quality of typewriter oil, non-gummy, and oil judiciously. Too much oil is as bad as too little. Ordinary oil clogs the mechaniam.

A small camel-hair brush is a convenient method of oiling every joint and moving part of contact where friction can be caused. The mechanism should be thoroughly oiled and cleaned regularly -say, once a weck.

The post of the spring drum and the dogs of tho: cscapement should bs: oiled twice a week. any superfluous oil being afterwards wiped off. and occasionally, about every six months, the type-bar bearings alould receive a drop of oil. A daming needle dipped into the oil bottle will collect suftivient oil in the eye for each individual bearing.

Other parts should only be oiled when a squeak is heard, and in these cases the squeaks inust be traced to their source, and there treated. The machine rhould not he given a wholesale oiling to remove a single squeak. Sliding contacts should always be wiped clean before oiling to remove dirt and gum, and after oiling all surplus outside the spot of friction should be wiped off. If this is not done the oil, instead of acting as a lubricant, will attract a large amount of dust and check the sinootl working of the mechanism. If infrequent use or neglect has caused any


Typewriter. Remington portable model, showing names of principal parts Ry courles!y of the Remington Typewriler Co., I.d
parts to become stuck with gum, citleer kero sine or benzine may be used for clcaning, afterwarda oiling in the usual manner.
The type, which must never be allowed to become filled with dirt from the ribbon, is best cleaned by a type brush and a drop of benzine. The letters should be taken in their regular order, depressing a key with a finger of the right hand, so as to push the type-bar forward, when it is held by the thumb and forefinger of the left hand, and cleaned with the bristles of the brush with a downward and not a circular movement. The type-bar is held in this manner to avoid straining the bearings, and should be released gently. If the round characters have become very much clogged with ink or dirt, the point of a pin may be used with advantage, although the nccessity for this should be avoided by frequent cleaning when possible.
Rust on the bright parts is usually caused by settling dust, which holds moist ure from the air. If the machine is clusted regularly,
rust will not usually make its appearance. A rust will not usually make its appearance. A
piece of chamois leather should be kept for rubbing the plated parts, and, of course, when not in use the machine slould always be protected by its cover.
Just ns a piano nceds attention every few months. so a typewriter should be given a thorough overhauling by the makers or other responsible lirm every few years. As originally sent out from the factory, all machines are accurately alined, and unless the instrument is abused, it should not be necessary to return it for overhauling for at least five years. Mechanical intricacies, such as the readjustment of alinement, should never be attempted by the typisi.
Ribbons and Stationery. Good typewriting can hardly be expected unless the ribbons and stationery employed are of the best quality. A good ribbon should neither be thin and short-lived on the one hand, nor thick and muddy on the other. Even when new a good ribbon, nssuming correct touch, will give delicate work, and it should last from 300 to 600 hours say, on an average, 500 hours. If a ribbon supplied by a good firm gives less than $30(0-40)(1)$ hours' work, it may be taken for granted that the operator's touch is too heavy, and an attempt should be made to lighten it. Even when a rihbon grows faint, its useful period is by no means over, since there will be still a large amount of ink on the sicle of the ribbon away from the paper. If the ribhon is turned, its life can, therefore, be prolonged by $30-40$ per cen 1 .

Ribbons are in different sizes and of different colours, and it is important to see that the machine is fitted with a ribbon of the right
size. A ribbon which is too wide has to be cut down, a dirty and cumbersome proccss, while on a ribbon which is too narrow one sct of type may not strike at all. Both the ordinary noncopying ribbon and the copying ribbon for use with the letterbook can be obtained in all ordinary colours. In addition to these there is the hectograph ribbon for use with the jelly copying process: the lithograph ribbon, for making lithographic transfers for use by the printer in striking off a number of copies; and the indelible ribbon, the results of which cannot be erased from the letter-book once the writing has been passed through

A cheap typewriting paper casily rubs into holes, and shows patches wherever any erasures have been made. The best of workers make occasional mistakes, and unlcss good paper has been used the corrections will show. Cheap paper may, of course, be used during practice, but never on actual work.

Envelopes of ordinary shape and make. unless they are of thin paper, usually give a double impression where the paper is double, that part of the envelope upon which the gummed flap is secured. To avoid this, special typewriter envelopes, in which the whole paper surface is even and level, should be employed.

TYPEWRITING. The most obvious necessity for a person wishing to become an expert typist is practice, but no amount of practice will teach the finer shades of the work. nor will practice alone produce the high speed which may be attained by means of the best methods. The touch inethod increases speed enorinously, because the typist does not look at the keys at all, but can keep the eyes on the copy the whole time.
In typing it is important to use all the fingers, much as in playing the piano. The position at the machine should also be much the same as that of a pianist, with the elbows on a line with the wrists. The right thumb should be used for the space bar. The touch should be even and steady, and not too heavy. A heavy touch will strike the keys too sharply and cause them to cut the paper.
It is very largely by the setting out of the work that an expert typist may be linown from an inexpert one. Such matters as margins, spacing, and good paragraphing make all the difference to its appearance.
Margins and Spacing. Tho width of the margin depends very much upon the lind of work in hand. For literary work, official reports, or legal work the margin sliould be wide, varying from $1 \frac{1}{2}$ to 2 in . Letters usually look well witlı a good margin, but this will vary with the taste of the person writing.

It may be laid down as a fairly safe rule that it is better to err on the side of wide spacing. Single spacing may do for long business letters, for extensive cjuotation in the body of another work, and for one or two similar matters; but for ordinary clearness, as required in literary work and the like, double or even treble spacing is the best.

All paragraphs should be marked or in dented by taking the line several spaces inward, five being the usual distance. In official work it is well to double the space between the last line of the preceding para graph and the new one, in other words, to miss a line. This makes for clearness and heightens the effect of the paragraph. In addition, the typist should remember to leave one
opace after a conima, two after a colon or cemi-colon, and three or more after a fullpoint. Long quotations, as already mentioned, may he done with single spacing. They should also be indented to add to the effect.

In numbering pages, the number may be put in the centre of the top, enclosing it either in brackets or ly a dash on each side; or it inay be put at the bottom of the page.

A two-colour ribbon can add greatly to the finish of the completed work. The title may be underlined in red, or typed in red and underlined with the black or purple of the other half of the ribbon. Numbers look well done in red, and a red capital !etter to start the matter is also effective. On the other hand, the twocolour ribbon is by by no means esscntial for ordinary work, though it may be wanted for special work, such as plays.
Duplicating. If many copies of the same manuscript are required, tlicy may be produced either by means of carbon paper or hy cutting a stencil and using one of the many duplicalors on the inarliet. The former method is simple; the number of copies done at a time depends on the sharpness of the type, the thickness of the paper, and the lind of machine. It should be possible to do at least half a dozen good copies if thin paper is used. A layer of carbon paper is placed between each sheet of typing paper, and the whole is then inserted into the machine so that the face of the cartuon is away from the typist. Care should be taken to insert them evenly, in order that the lower shcets should be straight.

For stencil cutting a special waxed shect has to be procured. The ribbon is then removed and the copy typed with the bare type. This cuts the letters nto the wax shect, which can then be used as a stencil and rolled off on the duplicating machine to any quantity requiral.

TYPHOID FEVER. Typhoid fever. which is also known under the name of cuteric, is an infectious discase that occurs mostly in the last quarter of the year. Infection may be conveyod in drinking water, milk, ice, salad, celery and other uncooked vegetables. also through ovsters taken from beds that have become polluted by sewage.
The symptoms develop, from two to three weeks after exposure to infection, and during that time there may be no susjicion that anything is wrong. There may be, however, constant headaches and abdominal pains, with a steadily rising temperature until the patient becomes too ill to get about.

About the scventh day the rash ajpears in the form of rose-coloured spots on the chest or abdomen. In the second week the abdomen may lee swollen and the patient lies in a semiunconscious condition. During the third week the loss of fesh and strength is less marked in a favourable casc. Convalescence should begin with the fourth weck. One attack usually protects from future attacks.
Many complications may develop in typhoid. Two of the most dangerous are haemorrhage and perforation of the bowel, which are not uncommon and occur oftenest after the second week. A warning sign of blecding is a sudden increase of weakness or collapse, followed by a drop of several degrees in temperature.

During an epidemic or when typhoid occurs amongst people who are all using the same milk or water supply, it is only common prudence to submit to inoculution with antityphoid vaccine.
All drinking water and milk must be boiled, and every precaution taken to protect food from Hies, which are notorious carriers of infection. Cups and dishes used by the patient should be kept in the sickroom and never used by other people.
The patient's bed linen, towels, etc., should be soaked for 24 hours in a pail con-
taining $n 1$ in 20 solution of carbolic acid or other disinfectant and then they should be laundered separately. The excreta of the patient should be conptied into a closed vessel half fall of carbolic acid, $]$ in 20 , and allowed to stand for two hours before being emptied.

The nurse should scrub her hands with soap and a nail brush and soak them in a solution of one part of perchloride of mercury to 2,000 parts of water before going to her meals.

Efficient nursing is nll-important, by night as well as by day. Milk should be the main lood until well on into convalescence, but the patient may have as much water or fresh weak lemonarle as he ikes. During convalescence strict attention must be pail to dict.

After convalescence a person may continue to carry typhoid bacilli in his system. Such a carrier of the discuse is a danger to the public, especial!y if he hundles inilk or other food. It is his obvious duty to refrain from handling the food or food utensils of others. See Convalescence: Fever: Infectious Jiscasc.

TYPHUS FEVER. Typhus fever describes an acute, very contagious fever, usually coming on suddenly, causing great prostration and severe nervous symptoms, marked by reddish rash and terminating by rapid fall of the temperature (erisis). Formerly common amoug poorer people, it is now extremely rare. The infection of typhus fever is carried by lice.
Whenever possible, a person suffering from the diseasc should be taken to an isolation hospital. General treatment is set down under the headings Fever and Infectious Iisease.

UFULELE. This musical instrument is really a small guitar. It has four strings, and is played by plucking them. It was introduced into Britain and the United States after the Great War from the Hawaiian Islands, and was used with dance and ja\%\% music. See Guitar.

ULCER. A sore that involves the true skin or sonctimes the mucous membrane is described as an uleer. It is kept open and extends by the death of minute particles of tissue which are liquefied and removed in a discharge. Many different types of uleer are described, but each consists of an area more or less depressed below the general surface of the skin or mucous membranc, which is known as its floor, and around this a margin, or edge. From the surface of the ulcer there exudes a discharge which may be purulent or watery and profuse or scanty; sometimes it is mixed with blood.

As regards causation, ulcers fall into threc main groups, namely, those due to mechanical, chemical or septic irritation, those clue to specific micro-organisms, such as the tubercle bacillus and the spironema of syphilis, and those due to malignant new growths.

A trophic, or perforating, ulcer is one that occurs in locomotor ataxia, diabetes, or some other condition in which there is disease of nerves. An ulcer of this kind is quite painless.

The treatment of an uleer depends on its cause. In the treatment of ulcers belonging to the first group the main considerations are rest and cleanliness and, where necessary, the removal of any constitutional factor in so far as this is at all possible. Commonly, an ulcer can be cleaned up by applying boracic fomentations. Each tinc the fomentation is taken off the ulcer should be washed with an antiseptic lotion. An alternative treatment is to apply lint smeared with boracic ointment.
To obtain healing of varicose ulcers it is necessary to support the limb by applying a pure rubber bandage, a woven elastic bandage or a crêpe bandage. The pure rubber bandage is liable to cause irritation by imprisoning the sweat. A useful application for varicose ulcers is found in Unna's piste. When the uleer has healed it may be desirable to operate for the cure of the varicose vcins. See Antiscptic; Gastric Ulcer: Varicose Vein.

## UMBRELLAS AND THEIR REPAIR

## Smartness and Utility Combined in This Protective Device

This article, after some information on umbrellas in peneral, descrites in detail, with the aid of illustrations, the methods of reparing a damaged one. Sec Hall Stand; Walking Stick
While the choice of an umbrella may depend to some extent on the prevailing fashion, there are two factors, the ribs and the cover, which should always reccive careful attention.

The size is determined by the length of the rib, which varies between 24 to 26 in . for men, 27 to 36 in. for golf or carriage umbrellas, the usual length of rib for a woman's, short-sticked or "chubby" umbrella being 18 to 20 in., and for one with a full-length stick 21 to 23 in . The ribs may be fluted or solid, the latter being cheaper, and of course heavier, but not always so strong. Generady it may be said that an umbrella with solid ribs is a cheap class of article. Paragon or fluted rilos are made from a strip of stecl bent to a U-section, the curve of the $U$ being arranged to come next the cover in a sinished umbrella.
Five types of material are used for covering umbrellas: alpacas or dagmars, levantines, glorias, artificial silks and mixtures, and pure silks. In addition to their buli, alpacas, and more especially the cheaper varieties, have a coarse texture. A good gloria wears well, but many so-called glorias, which ought to be a mixture of silk and wool, contain a large percentage of cotton. Artiticial silks and mixtures have a glossy appearance, but are comparatively harsh in texture. Sill: always looks better than anything clsc, but a mixture of silk with cotton or wool should be chosen for durability, since silk covers have generally a tendency to split.

An umbrella ought not to be kept rolled up when not in use, otherwise splits and rents
are sure to result. After being out in the rain it should be allowed to stand or hang, handle downwards, until dry. If the moisture is not allowed to drain away from the ribs in this manner, rust and broken joints will ultimately be the consequence.

To roll an umbrella neatly, shake out the cover, gather the ends of the rilss in the left hand : pull cach fold into place, and, grasping near the bottom with the right hand, commence to roll. After fastening the elastic, roll again, and pull each fold taut if any looseness collects. If the elastic is worn, replace it with 6 in . of narrow black hat clastic.

Silver and metal collars and bands are fixed to the stick by means of a mixture of weak glue and plaster of paris. A special caplilling cement, obtainable from the wholesalc manufacturer, is used for fastening on knobs and caps. A little of the cement is melted and poured into the cap, the stick being inserted immediately, as the cement sets very rapidly. Only a little coinent should be used, or the stick will not go home.
Umbrella Repairs. The two repairing operations most usually necessary are mending or changing the cover and replacing a hroken rib. Neither of thesc operations should offer any real difficulty.

When repairing a broken rib care should be taken to see that the new rib is of the same type as the others, and that it and its stretcher are exactly the right size, otherwise it will be left projecting or will close before the rest, as the
case may bc. If it is only the stretcher that is serve if the wood or composition cap on the in enany forms of construction the rilos broken, a strctcher taken from a broken rib can he used to repair it. Take off the ontside cap, by punching out the rivets and withdrawing it, as shown in Fig. 3, then unwire the rumer and turn the umbrella inside oint. Before doing this it is better to unstitch a couple of the corners from the ribs; this will guard ngainst splitting the cover or breaking another rib. To turn the umbrella inside out, stand with it partly open, the stick passing between the left arm and the body, the inside of the cover resting against the left side, but outside the left arm, and pull with tho right hand.
A rivet will be seen in the joint between the stretcher and the rib. The head of this should be filed off, and the rivet punched out, a
 bit of spring wire. The new stretcher must be exactly the same length as the old one, and it should be fitted so that its hollow side is towards the handle when the umbrella is open. The taper cap should be replaced and carefully riveted to the stick. The same process of turning the umbrella inside out and measuring carefully must be adopted in the case of a broken rib, but here it will, in nddition, be necessary to unpick the stitches on the broken rib and remove it entirely. If it is only the cye of the rib which is broken, it is only necessary to replace the top tip. The new tip is measured along the rib, the broken end cut off at the right spot, and the tip knocked on, taking care not to close the cye.

If a small slit occurs in the cover, an effective method of repair is to obtain a small piece of black silk, or other material similar to the covering itself, and, after opening the umbrella, carefully stitch the patch on the inside of the cover, commencing on one side of the slit first. The slit is drawn together with $n$ fow tacking threads, and the patch neatly sewn all round. The trekings are then removed and the stitches caught together, and to the patch, with a few threads. Any danage to the fastenings of the cover at the outer ends of the ribs can be remedied with ordinary black cotton. A few turns are sewn into the cover at the point or apex, the needle is passed through the small hole or cye on the end of the rib, the cover drawn tight, and a few stitches are then passed through the eye on the cover.

When the liandle breaks, its mode of repair will be determined ly the material of the handle and of the stick. Many umbrellas are made with composition handles and wooden sticks, and the hnndle sometimes becomes loose. To refix it the end of the stick is smeared with liquid glue, a fow strands of cotton twisted round it, and the handle pushed on. The same procedure will
 To make a secure joh of a handle it may he riveted on after the glue has set hard. The liandle may be grasped in the vice, as in Fig. 1, the other end of the umbirella being supported on a block. A very fine hole, about $\frac{1}{10}$ in diameter, is drilled through the handle and the stick: the two ends of the hole aro slightly countersunk, and a small piece of brass wire, which should fit nicely in the hole, is pushed through it. The two ends can thes be cut off about it in from the handle on each side and riveted any surplus that may project being filed away, as in Fig. 2. To avoid scratching the handle, a piece of card or tin should be wrapped around

fit into little slots cut across the grooved ring formed on the end of the runner. The ends of the ribs have smal! holes through them, and if these ribs be inserted through the slots the holes will register with the groove on the runner. A wire is threaded through the holes, and the ribs are drawn into the groove on the runner, thus forming a kind of hinge pin for each of the ribs The operation pictured in Fig. 4 is that of cutting this wire so as to relcase the stretcher or stay, this being the strut-like portion on the rib which connects with the runner at one end and about the middle of the length of the rib at the other. The umbrella is opened and turned inside out, using the method earlier described, and the stick and ribs are brought into line. This provides access to the top cyes, that is, the little joints in the notch neal the end of the stick.
The cover is then entircly stripped from the ribs, and if the latter are rusted they may be cleancd by rubbing them with emery paper and then reblacked. They should bc sct aside to dry thoroughly hard. and are then refixed to the top notch. This operation is illustrated in Fig. 5 , and is accomplished by first arranging all the ribs so that the stays all point in one direction, and a piece of tying wire, which may be of tinned iron, is bent through the top eyes. The wire is twisted around and the ribs pushed on it until the wire is in more or less a U-sliape.
The first few ribs are inserted in the notch, taking care to note that an additional small notch is generally cut at one point, and is intended for the reception of the twisted end of the tying wire. Consequently the first pair of ribs shou!d be inserted into the slots opposite to this notch. The others are pressed into place, as shown in Fig .5 , and finally the wire is drawn tight and twisted back with a pair of pliers, the surplus being then cut off and the ends of the wire pressed into the little noteh.
The ribs have now to be opened to ascertain that all the stays point towards the handle, and to ensure that none of them have been inadvert ently fixed the wrong way round. If so, the process is repeated and the fault remedied, after which the runner is replaced. The muffles. that is, the little picces of black material which are stitched to the ribs to prevent friction of the ribs wearing away the cover, are examined to sec that they are in good condition : if not, they should be replaced by new ones. They may be any black material, but are preferably the special waterproof oval muffles which only require sewing in place. The niethod of fixing is by stitching them around the ribs.
The next step is to fit the cover,
it immediately above the rivet, as shown. This prevents the filc coming in contact with the handle.

Re-covering. In the re-covering of an umbrella several processes are involved, and the amateur may find it difficult to make an efficient job the first time, but care and a little patience will ensure a tolerably good result, as can be judged from the accompanying illustrations. The first step, as illustrated in Fig. 3, is the removal of the tapered cap covering the outside of the notch ring which supports the rilis. The stitches on half of the tips of the ribs are cut away with a sharp knife, thus releasing the cover in readiness for the next operation, which consists in removing the wire which holds the ribs to the runner, the tubular momber which slips up and down the stick, shown in Fig. 4. the size depending, of course, on the length of the ribs. The cover can be obtained ready made. or, if preferred, can be made up at home. Assuming the cover is bought ready for use, the stick is inserted through the hole in the centre of the cover, this being accomplished while grasping the whole of the ribs in the left hand and supporting the cover with the right. To prevent the cover from splitting, it is stitched with waxed thread around the hole where the stick comes through. The cover should be stitched in two or three places to each of the ribs in turn. It is then worked into place at the corners and seamed parts and drawn to the top of the ribs by passing u thread through the cover and fastening it, passing the needle through the top eye, thus drawing the cover upward and firmly sewing it. The cover is sewn to each rib in
the same way taking carc to draw it well into place before fastening the top corners.

A small rosette is sewn on the outside of the cover to protect it from the ehafe of the taper cap on the outside, which is then fixal in position nnd sccured with a couple of small pins. A rosotte should also be stitched round the runne: near to the ribs to precent it chafing the fingers while opening the umbrella. The umbrella can then be tested, and if properly covered should open uniformly and conveniently. A new tassel or loop may be a.tded if desired.

The forcgoing is a general method of re-covering an umbre!la, and will enable moat patterns to be dealt with. Sunshades may le treated in the same way. Some particular malies of umbrella are rather ilifferently arranged, and may ca!! for modification in the trcatment.

The short umbrella used by women has $n$ cap to match the handle, in mood. glass or some composition and the stick fits into a socket formed in the cap. The cap is usun!ly cemented on, and must be carefully loosened and eased off the stick before turning the umbre!la inside out to get at the top cye. The end of the umbrella may be hedd in a jet of hot steain to loosen the cop, or a little of some spirit solvent mighit be careful!y poured into the joint to dissoive the cement. Since some of the compositions used for handles and eaps may be of an inflammable nature, it is necessary to use great care in applying heat to them. In refixing these fittings the ends of the stick should be roughener to allord a grip for the cement. Shonld the slick fit too loosely into the socket, $\Omega$ few threads of cotton may be twisted round the former after coating it with cement.

UMBRELLA FERN. This is a popular name of the greenhouse fern, gleichenia. Of slender climbing growth, it is very ornamental when trained to cover a wire trellis or sticks. The plants should bo potted in a compost of loam, peat and leaf-mould, with sand added frecely, and they should be provided wit! ample drainage of clean crocks. A temperature of 50 degrees is high enough in winter, and care must be taken not to over-water them at that season. Plants may he propagated by spores, or by selected portions of creeping stems to which roots are attached.

UMBRELLA PLANT. This is the common name of an ornamental greenhouse plant, Cyperus alternifolius. It is easily grown in $n$ temperature of 5.5 to 60 degrees if potted in sandy loam and leaf-mould; the soil must. be kept thoroughly moist. Propagation of the umbrella plant is effected by division or by laking off the tops of the stems and inserting them as cuttings.

UNCONSCIOUSNESS. It is very im. portant when a person is found in a state of unconsiousness to ascertain the exact cause of his condition. Mistakes are frequently made, with scrious consequences to the patient. Thesc errors occur most cominonly when the unconscious person smells of alcohol This suggests drunkenness; but the causc may be apoplexy, a fractured skull, or somic one of a dozen other abnormal conditions.
The following are the principal canses of unconsciousnass: Fainting from temporary weakness of the heart : apoplexy, due usually to bleeding into the brain; epilepsy following the fits: concussion of the brain caused ly a fnll, etc.; compression of the hrain, the result of a depressed fracture of the skull and other causes : heat stroke or the effects of cold : meningitis and other forms of brain disease; asphyxia due to gas poisoning or other causes ; electric shock ; hysteria, in which the loss of consciousness is seldom complete : catalepsy and trance ; internal poisons, as in diabetes : external poisons, such as morphia, chloral, etc.

In stupor the patient can be aroused for a moment by speaking very loudly or stimu lating him in some way.

Sometimes the person appears to be unconscious when he is not so, but only in a weak and dazed condition. A simple test to apply in this case is as follows: Raise the upper eyc lid by pushing up the cyebrow with the index finger. Then most gently touch the eye with the tip of the second finger. If the person is unconscious, the eye remains open; if he is not wholly unconscious, he winks more or less nud the cye closes.
'Treatment will depend chielly on the cause. In ascertaining this certain observations should be made. Note any evidence of $n$ struggle or indications of an accident. If any bottle is near the palient, this and any vomited matter should be preserved for examination by the doctor who has been summoned. It should be remembered that when the smell of alcohol is found it may only signify that the patient drank some whisky when he found a fit coming on, or that, though he had taken alcohol, even more than was good for him, the unconscious. ness may really he due to fracture of the sku! sustained in a fall or to some other scrious cause. Whenever there is the siightest doubt, the person should be treated on the assumption that he is ill.

Unless the cause is clearly known, it is better to lieep the patient perfectly quiet until n doctor comes; otherwise serious injury inay be done by adopting wrong treatment. The


Underpinning. Fig. 1. General disposition of shores and truts for underpinning operations
carving a sirloin it is customary to begin with the undercut, which will often suffice for a small bouseho!d, leaving the more substantial part of the sirloin to be caten cold. Sometimes the underent is removed before the joint is cooked and is served separately as a hraised dish or grill. See Beef; Carving; Fillet; Noisettc: Sirloin; Stcak.

UNDERLAY. This word is used for the material that is placed benenth carpets and other lloor coverings to malic them wear longer and to improve their feel to the fect. Felt of a coarse kind makes the best underlay for pile or hair carpets. Another underlay is felt paper, which can be obtained up to 60 in . wide. Cedar felt is a paper of this kind. It contains disintegrated cedar wood, and holds the aroma of this wooll for years. It is, therefore, an excellent antidote to moth Coarse canvas makes a good underlay. A waterproof underlay, which gives a soft tread and is suitable for linoleum and other lloor coverings, prevents board marks and is inexpensive. See Carpet.

UNDERPINNING. The act of supporting a wall, the lower part or foundations of which are defective, and the huilding up of new solid work for the wall to rest upon is known as underpinning. Underpinning is sometimes necessary owing to the subsidence of the foundations, a common example heing the failure of a bay window or other construction.

Essentially, the operation comprises the shoring up of the building to prevent it falling ; the provision of local supports to take tle weight of the wall above the portion affected: the removal of the old wall and foundations. and the construction of the new work.
Underpinning is resorted to also when it is desired to nake some alteration to the lower portion of an existing building which would necessitate the removal of the main structure at tho base. If, for example, it was desired to insert a shop front into what was originally a blank wall, or construct a cellar under an existing building, underpinning would have 10 be carried out. The materinls used ate principally timber of rather large size and of good quality. For the insertion of $n$ shop front a girder or bressummer is placed across the opening to carry the weight of the building above the window, and the weight of the building has to be supported while the girder is built into position. To clo this it is neccssary to erect a raking shoring. to provent the building falling outward, and for this also timbers arc necded. Ncedles are first placed into the wall. these being made from picces of 4 by 3 in timber. They are placed in holes cut into the wall to a depth of 4 to 6 in . and project beyond the face of the wall alout 9 in .

Over the needle is placed a walling piece, that is, a piece of timber 9 in . liy 3 in . of the length required in the particular casc. A mortise or hole is cut into this walling piece sufficient to let the needle pass through the piece, which is placed lengthways to the vertical of the wall. A noteh is then taken into the needle level with the face of the walling piece placed over it. This notch receives the raking as comfortable as possible, and covered with shore, which is cut so as to fit into it, and blankets or any warm article available. He extends from the wall to a solid base in the should not be raised into a sitting posture. See Apoplexy ; Artificial Respiration : Asplyxia : Brain; Bright's Disease; Catalepsy; Epilepsy; Fainting; Gas Poisoning; Heat Stroke; Poisoning: Uracmia, etc.

UNDERCUT : Of a Sirloin. The undercut or lower portion of a sirloin is also known as fillet of becf, and, while usually of small size in proportion to the upper part, it is considered by many to be the prime part of the joint. In carving, the undercut is carved vertically or at right angles to the upper part. It sliould always be eaten hot, and consequently in
ground. The needle is further strengthened by nailing a cleat above and against it, a cleat being a piece of wood cut out of 4 in . by 3 in. stuff and 9 to 12 in. long.
The piece of timber forming the raking shore may consist of 7 or 8 in . square stuff eut to the length required. The raking shore being firmly fixed lateral support is ensured. The number of raking shores depends upon the size of the opening that is being made, and they are spaced as stated for the needles. The interior of the building has also to be considered, and a vertical strut has to be placed between the
 arranging support while making alterations to damp coursa
floor below and the ceiling above. This strut is formed of 4 by 4 in. stuff, and is sccurcly werlged top and bottom.

Now it is necessary to arrange to takethe weight of the wall, that is, to erect the underpinning proper. A sufficient number of holes are cut through the wall to allow other needles to pass through. These needles are of a larger size than thoso previously mentioned, not less than 9 in square. They are put right through the wall and arc supported in turn by stanchions of the same sized naterial as the needles, the stanchions resting on sole plates that are placed on the ground. Thesc timbers are then werlged tightly into position: they are strutted and cleated as may be necessary, and generally arranged as shown in Fig. 1 on the previous page
When sufficient of these for the size of the opening lave been erceted, the work of making the opening is procecded with. The girder or bressummer is placed in position and built up, and, when properly set, all of the timbers crected to carry the weight are gradually renoved. A similar procedure is followed in forming a cellar, but the work is rather inore complicated. The large needles are placed at a height that will just clear the position into which the girder, etc., is to be placed.
A form of underpinning often necessitated by the failure of the damp-proof course consists in removing a couple of courses of brickwork from a wall, inserting the damp-proof coursc, and building the wall up again. Providing the wall is sound and well built and that the bricks are removed carefully, it is generally possible to carry out this work with no. particular support except at such places as the brickwork beneath a window opening, or under the support of a particularly heavy part of the building. The work may be locally supported in the manner illustrated in Fig. 2, by placing a short, stout timber through the aperture and resting it upon a couple of built-up timber supports, so as to relieve the wall of some of the weight imposed upon it. See Brick; Concrete; Danip Course; House.

UNION CLOTH. Cloth made half of one material and half of another is known as union, and is usually cheaper than the goods which it imitates. Union wool clbths are partly cotton. The cotton threads are generally concealed by the woollen ones, and are ordinarily the up-and-down and not the cross wise threads.
 for glass cloths as pure linen. one shaft to a nother at an angle to it, but their present wide use is due to the development of the motor car industry. 'They have been generally cmployed on motor vebicles for a number of years to give Hexibility to the propeller shaft by which power is transmitted from the ellgine and gear box to the
rear or live axle; rear or live axle;
when so applicd they are often terned Carclan joints and the propeller shaft is often termed a Cardan shaft.

The simple bal! and-socket joints used so largely in stecring con nexions and the controls of motor cars do not transmit rotation and, although they are not usually termed universal joints, an cxample will be described later.

The earliest universal joints were known as Hooke's joints, after their designer, and were constructed on the principle illustrated in Fig. ]. Each of the two shafts carries a fork on its end and the forks are connected by an intermedial member, in the form of


Dniversal Joint. Figs. 1 and 2. Examples of common types of nniversal joint. Fig. 3. Principal component farts of a nniversal joint as used in the projeller shaft of a motor vehicle. For details see text. fig. A. Hardy dist joint. Fig. 5. Ball centre support for shalt


Union cloths are preferred for certain pur- a cross or star. The arms of the cross pivot poses. Union flannels, for instance, are lcss in the ends of the fork, and very little considerinclined to shrink than all wool. Union ation will show that the two shafts can easily linings are neater than all-wool and warmer inove out of alinement, but that they will than all-cotton linings. Union blankets are always rotate together. In another form of cheaper than wool blankets, and the better this joint shown in Fig. 2 the cross is replaced qualities of union blanket are superior to the by a ring, but the action is the saine.
poorest of the guarantecd all-wool kincl. Joints of these designs, although satisfac. Union linen is half cotton and usually not so tory for many purposes, require some modilicastrong as pure flax. Union linen is not so good tion before they can be used on motor vehicles,
for glass cloths as pure linen.
in vicw particularly of the exposure of the

UNIVERSAL JOINT. For nearly threc transmission to mud and dust, the high specd centurics universal joints have been occa- of working, and the power transmitted. They sionally used to transmit rotary movement fiom are, therefore, properly enclosed and carcfully


Fig. 6. Left, sectional view of a rubber disk type of unaversal joint with ba! centreing arrangement. Right, details of the disk lubricated, an example being afforded by the widely used Hardy-Spicer joint, the various parts of which are shown in Fig. 3, as applied at the forward end of the propeller shaft and at the rear end of the gear box.
The intermediate member, C , is pivoted both to the driven fork, $B$, and to the driving member, A. The latter comprises two pivot lugs on onc face of an annular disk which is bolted to a disk, D , fixed to the end of the gearbox driven shaft. The driven fork is formed with a long splined boss engaging the forward end of the propeller shaft so as to allow a small amount of sliding movement which results fron the up and down movements of the rear axle. The joint is enclosed in a hemispherical cover in two parts, of which one part, $\mathbf{E}$, is bolted to the driving disks and the other part, $F$, fits on the boss of the driven fork, but is pressed up against the first part by a helicai spring. The method of pivoting the interinediate member, C , to the fork and disk is interesting and ingenious. Between each pin on the member C and the open-sided hole in the other part is introduced a hard steel hush, G, which is pushed into position inwards, the four bushes being held in position by spring rings and hy the hemispherical cover. The hush is thus held securely in the recess in the fork.
The joint should be refilled with special non-separating grease after about every five thousand miles run.
Owing to the high speed of rotation the lubricant is impelled by centrifugal force towards the outcr part of the casing close to the pivots which form the principal working parts. The pressures on the pins are very liigh and any shortage of lubricant may bring about excessive wear.
Other Types. Another type of miversal joint which has been widely uned on notorcars employs a reinforced rubber disk or ring
to obtain Hexibility. Fig. 4 shows diagrammatically a light form with a two-armed spider fixed to the end of each of the shafts to be connected, this pattern being sometimes used for auxiliaries such as the magneto.

Joints for propeller shafts are constructed with threc-armed spiders, as shown in Figs. 5 and 6. The opposing arms alternate with one another and are connected by bolts to the rubber disk or annulus, which is made of solid rubber with a number of layers of coarse faloric embedded in it. The fabric renders it practically incxtensible, so that a heavy drive can be transmitted, while leaving it quite flexible.


Universal Joint. Fig. 7. An example of a ball joint as used on the steering drag link on a motor car

In this type of universal joint the rubber disk may distort so that the two shafts will not be maintained strictly in line, in which casc one is bound to run out of truth with consequent vibration. To avoid this, the self-centring construction shown in Fig. 6 is adopted. The driving shaft carries a ballshaped extension, $K$, which fits in a cylindrical socket in the driven shaft, the ball being in line with the rubber ring. The two spiders

## UPHOLSTERY AND UPHOLSTERING

## How the Amateur can Save the Cost of Repairs

This contribution describes in detail how various articles of furniture can be upholstered at home. Reference may be suggested to the entries in this work on the articles themselves, eg. Armciair; Chair; Chesterfield; Poufe; Sofa; and to those on the materials, e.g. Amcrican Cloth: Chintz; Cretonnc; Horsehair; Tapestry Needlework; Weaving. See also Colour and the entries on the various rooms, e.g. Drawing Room; Sitting.Room

This article explains with the aid of the illustrations how to cover a plain seat, a sprung seat, and a fully upholstered divan easy chair, thus covering practically the whole range of the upholsterer's eraft, with directions for the subsidiary branch of cutting and making loose covers

Upholstering consists chiefly in stuffing, covering, and re-covering furniture. The materials and tools required are by no means expensive ; those uscd for the coverings are perhaps the most costly.

The most beautiful and durable covers are hand-made. They may be of hand-woven silk or tapestry, or they may be of tajestry needlework on canvas, which is cut to fit the chair or other piece to he upholstered, good turnings bcing allowed before the design is embroidered in wools, colouring and patterns being chosen to suit the frame and room. Needlework coverings can be adapted to modern pieces, but are most suitable for re-covering antique chairs or reproductions of antique styles.

Hand-woven fabrics can be produced in a variety of stripes, sma! patterns and shot effects in wool, silk or flax fibres, separately or in combination, and many variations are possible with a simple setting up of the loom. One piece of furniture can be covered in such fabric, or a whole set of chairs to match, with excellent results if due regard is paid to colour and weaving.

A great deal of work is carried out with machine-made tapestry, which may be woven sither from cotton, silk, artificial silk, wool, or a mixture of either. Ordinary upholstering tapestry varies in width from about 48 to 52 in . and is thu economical for cutting. It can be obtained in a variety of patterns and

J, L, may both be fixed permanently to their respective shafts; that is, a splined connexion need not be cmployed since the rubber ring and the ball joint will allow some end play of the shafts. This type of joint is silent under all conditions and only the ball connexion requires lubrication. Care must, in fact, be taken to avoid oil or grease on the rubber, which would in that case become soft and useless. Petrol, if uscd at once for cleaning, will prevent trouble.

The axes of the two shafts connected by a universal joint should always be as nearly in alinement as possible, both to resist wear and also, in the metallic type, to avoid irregularity in the running In this type if one shaft rotates uniformly the other will be slightly accelerated and retarded twice during each revolution, and this periodic variation of speed, together with the accompanying loss of power, increases as the angle betwcen the shafts increases.

The simple ball-and-socket joint forms a most useful conncrion since it allows frecdom of movement in all directions, but without slackness. An example as applied to the ends of the drag link on a motor car is shown in Fig. 7. This link connects the stcering gear to the axle, and it is, therefore, continually llexing. A ball on the arm works between two sockets which are held in position by a strong helical spring. The screwed plug which in this case forms one of the sockets and compresses the spring must always be locked in position by a split pin. The ball and the sockets are usually case-hardened and regular lubrication with grease is necessary. Small joints of similar construction arc often used on motor car controls.
colours, and is thus adaptable to all forms of decoration Many of the finest designs are in artificial silk mixtures
Tapestry of good quality is expensive, and it is therefore important to choose a design which will cut to the best advantage. Thus, if the selected pattern has a marked feature, such as a cluster of flowers, which is only repeated every 50 in ., obviously this should appear in the centre of the bacli or scat of the chair. To obtain this result, especially if only one or two pieces of furniture are to be covered, would mean a considerable amount
of waste, consequently it is better to chnose a simple all-over style of covering. The same difficulty has to bc coped with in damask. another excollent upholstery fabric.
A material in extensi ve use is velvet, in 50 in width, and obtainable in many colours. Plush is also used but has not the same rich effect. Other materials inclucle mohair fabrics in plain colours and checked designs. rep, chint\%, and cretonne, the latter a braided cotton fabric, much cheaper but less durable than tapestry.

Good leather upholstery is suitable for dining-room furniture. Leather, particularly moroceo or pliable goat skin, is dyed in many colours and finished with a grained or bright surface. It is obtainable in the form of slins of irregular shape, ranging from about 22 by 26 in . in the smaller ones to about 30 by 35 in. in the larger. As the leather has to be stretched in upholstering, even minute blemishes are speedily revealed. Other leathers include the hides or cow-hides, which are cheaper than morocco and obtainable in fairly large skins.

## Leather Substitutes and Ornamentation

Many excellent leather substitutes are on the market with various trade marlis and branded names, among which may be mentioned pegamoid and rexine. Most of these are woven fabrics covered with a waterproof material and closely resembling leather. Oil baize, or decorene, of British make, is another fabric of this class which is often used. Among the various forms of ornament for coverings are the gimps or strips of tape-like material for edging, fringes and cords, brass-headed and other tacks, and buttons, which may have a covering similar to that used in the upholstery

Most of the tools required, illustrated in Fig. 1, will be found in the avcrage lome, an exception being the webbing strainer. The upholsterer uses a special form of light hammer, called the cabriole hammer, but the more common one illustrated will serve for most jobs
The webbing strainer is a pair of pliers with wide jaws or flanges. One of the jaws has a broad projecting portion which engages the side of the chair, while the webbing is gripped between the jaws: the llanged portion rests against the side of the chair, and the handles are pressed downward, thus, getting a leverage on the webbing.
The other tools include a strong pair of scissors and a small chisel, such as a carpenter's old firmer chisel, with a nallet to drive it. A rasp, tape measure, and rule are also needed, and preferably some sort of low table or stand whercon to rest the work. A selection or needles is required, and several are show


Upholsterg. Fig. 1. Necessary tools and equipment, including webbing strainer, ncedies of various shapes, tacks, scissors, hammer and chisel, also chain springs, webbing, canvas, and stuffing materials

fastened into a piece of material in which they are rolled when not in use. The selection should include two or three upholsterer's packing needles, which have two points, ordinary packing needles, and a regulator. The latter is a piece of steel from 6 to 18 in . long, and tapered at one end to a fine point, the other having a flattened portion. The pointed end of the regulator is inserted into the stuffing material while the operation of stitching is in progress.

The flattened end of the regulator is used in buttoned work, and also for tucking away any odd ends of stulting or fabric The needles should range from 4 to 12 in . in length In difficult cases it is desirable to use a semicircular as well as a pattern known as a spring needle. This latter type of needle is straight for some three-quarters of its length, while the remaining portion is curved. Some needles are made with bayonet-pointed ends, so as to cut cleanly through the covering material.

The amateur desirous of taking up uphol. stery work should start with some simple operation such as re-stuffing and re-covering a chair Broadly speaking, there are two methods of upholstering. In one, the chair seat or other part of furniture is simply padded with some suitable stuffing and the exterior covered with the desired tapestry or other fabric. 13y the other method, upholsterer's springs are used to give resiliency to the seat, etc. The springs illustrated in Fig. 1 are spiral or coil springs. They are made in various sizes, and can be obtained from any furnishing ironmonger's.

Webbing is one of the most important of the unaterials employed. It must be made of very strong braid, and only a really good quality should be purchased. The hest qualities are macle of flax, and are sold in pieces about 18 yd . in length, the width varying from 1 in. to $2 \frac{1}{2} \mathrm{in}$. The webbing has to be thoroughly stretched before it is used. One method is to suspend it by looping it over
stout bars hung from the ceiling and hanging known as fibre, which is a species of fine cord, heavy weights on the lower ends of the is often used as a substitute for horsehair, webbing.
Hessian, a lind of canvas woven from jute or hemp, and sometimes known as spring canvas, is used for the coverings of the tops of the springs. Scrym, a light canvas with an
 open mesh, is employed to keep the padding springiness, besides being excoptionally clean on top of the springs in its proper place and sanitary. and shape.

A great deal of stuffing is carried out with
Special kinds of twine are required. Fine wool and flock, the latter being a waste product or stitching twine should be obtained for made from rag. Its manufacture is regulated sewing the edges of the scrym : spring twine, by Act of Parliament, which has the effect which is thicker, is used to fasten the springs of keeping it reasonably clean. Ordinary


Upholstery. Fig. 2. Chair, with old covering and webbing removed, ready to be re-covered. Fig. 3. The irst stage, stretching and tacking down the webbing. Fig. 4. Tacking down folded end of webbing for security. Fig. 5. The seat completely webbed. Fig. 6. Tacking on flrst layer of canvas. Fig. 7. Showing stuffing in place and second piece of canvas being tacked over it. Fig. 8. Applying the covering
to the webbing. The stoutest material is wadding is useful to the amateur for stuffing, often known as laid cord, and is used to tie and particularly as a covering immediately the springs down to the proper size and shape. beneath the outer covering of tapestry, etc. The webbing is attached to the framework by It imparts a smoothness to the finished work. tacks, which should be of the cut or fine A supply of the materials mentioned can be variety, and either brass or black enamelled. obtained from a good-class draper's or Proofed tin tacks are stouter and have larger furnishing house.
heads. Those about $\frac{5}{8} \mathrm{in}$. long should be used for fastening the webbing; others, from $\frac{3}{8}$ in to $\frac{1}{2}$ in., being utilized for tacking the canvas or other materials.
Materials for Stuffing. For the stuffing, nothing beats horsehair, the best being obtained from the tail and mane. In the treatment to which it is subjected it is cleansed and curled into ropes, the curl being the feature which gives horsehair its peculiar springy property. Inferior qualities are short in length and lacking in resiliency. A material

Re-upholstering a Chair. In re-upholstering an or linary chair the old coverings and webbing arc first removed. This is done by prizing out the tacks holding the gimps, tearing off the covering, removing padding and springs and finally removing the webbing by means of an old chisel and a mallet. If the chise! is pressed against the head of the tack and given a sharp blow, it will drive the tack from the wood. The chair should then be thoroughly cleaned, and, if necessary, any repolishing or staining carried out on the
framing, particularly around those noints adjacent to the upholstery, or where the upholstery will ultimately go. The resu t at this stage is illustrated in Fig. 2.
The first process in the actual re-upholstering is to take a pieee of webbing, fold over the end so ns to double it, and nail it to one side of the chair frame. The webbing is cut to length, which should he rather more than the width of the frame. The overhanging end of the webbing is grasped between the projecting jaws of the webbing strainer and the latter pressed downward with the left hand. The webbing is then sccured whilo it is atretched very tightly by driving a tack or two through it near to the inner edge of the framing, this operation being shown in Fig. 3. It is im portant to obtain the utmost levernge on the webbing so as to strot ch it as tightly as possible. The overhanging part is folded back on to the top of the webbing and nailed as in Fig. 4. It should be noted that when the webbing is arranged in this way the loose end is doubled under the webbing in the first fixing, whereas the second end is finished by being doubled over and tacked down on top of the webbing.

The remain:ler of the webbings have now to be fixcd. A common arrangement is that in lig. 5, two webs being arranged across the chair seat from side to side and three from front to hack. The webs should interlace with one piece alternately over and under the others, as shown, each of these webs being


Upholstery. Fig. A. Showing how the gimp is arranged round top of the leg and secuied by covered tacks
attached in exactly the same way as the first. A picce of the canvas has to be fastened to the framework, and old canvas may be used if it is in good cnough condi'ion. It is secured by folding the edges under and tacking it neatly to the framework, as in Fig 6 .

The seat can be padded with any of the materials mentioncd. In the example in Fig. 7 ordinary fock is used. This is worked between the hands to make it even and uniform. It should he distributed over the canvas and worked into the desired curvature of the linished seat, using more flock in the centre than at the sides. After the flock has been arranged, the second canvas or scrym is laid over the flock and tacked to the edges of the framework of the chair, as shown in lig. 7.
The material chosen for the covering must be cut to allow sufficient overhang on all four sides. It is then fixed to the front part of the chair frame, as in Fig. 8, by driving in a few tacks. The nover should be pleated neatly at the corners by folding the material so as to leave only one fold showing at the corner. The covering is drawn tightly and uniformly as the tacks are driven, and should bo neatly and carefully fitted around the tacking lines.

It is finished, as Fig. 0 shows, by trimming with gimp, secured with covered tacks. The gimp should be carefully worked all round to cover the joint between the covering and the frame of the chair, for which purpose the covering must be cut accurately.
Use of Springs. The method of upholstering a chair with springs differs considerably. In this case the webbing is applied to the bottom of the frame. The chair is first pre pared as already described. It is often p!aced upside down on a stout table or trestle, and the webbing applied to the underside of the frame, as in Fig. 10. Springs have to be sewn on to the top of the webbing. The usual plan is to employ three springs, two on the front part of the chair and one behind them centrally. They are sewn in place by stitch. ing through the webbing in three positions for each spring, drawing the twine tightly each lime and continuing from one spring to the other until this part of the work is completed. The method of stitching is explained in Fig. 11, where the fastening of the last spring is in progress. The necdle is thrust through from the top of the webbing with the right hand and pressed through with the left hand, and, when necessary, passed backward again from the left to the right. and so on until the fastening is quite completed.
The springs have next to be fastened with thick spring or laid cord, usually in the manner illustrated in lFig. 12. The springs are socured in such a way that the strings draw them down and slightly depress then. They should be fastened in the first place to each side of the framing, the strings being attached to taeks driven into the frame itself. Another string is used to connect between the front two and the rear spring, and the latter is secured by another supporting string to the back of the frame. The object of fastening the springs in this way is to prevent them from grinding or rubbing when the chair is in use and to keep then in place while the upholstering is in progress.
The purpose of compressing the springs at the start is to ensure that they will constantly exart a pressure between the lower webbing and the underside of the covering material,


Upholsterg. The varions atages in upholstering a spring chair. Fig. 10. Nailing webbing to underside of seat. Fig. 11. Sewing springs to webbing. Fig. 12. 8pringa lashed together with thick string, and fastened to trame of seat. Fiz. 13 . Springs covered with canvas, which is frmly tacised down to frame. Fig. 14. Sewing the aprings to the canvas covering with a spring needle and atrong string. Fig. 16. Placing the stofing over the canvas. Fig. 16. Tacking down a second covering over the stuffing


Upholstery. Fir. 17. Stitching the edges in order to form an edge or roll of stuffing. Fig. 18. Covering the uoderside of the chair. Fig. 18. Tacking down the material that is to be used as the fina chair covering. Fig. 20. Fixing the gimp in place to cover the join
and thereby keep the chair seat in its proper which is a twine worked around the outside of shape. The size of the springs is usually about the curved part of the canvas and caught to 6 in. in length and No. 8 gauge. The height of the set from the bottom of the frame to the top of the seat, when it is finished, should be about $5 \frac{1}{2} \mathrm{in}$. If the seat is to finish 6 in . from bottom to top, it is usual to allow $1 \frac{1}{2} \mathrm{in}$. for the thickness of the filling or stuffing, and therefore it is necessary to compress the springs by about $1 \frac{1}{2}$ in.
In placing the springs the finishing end of the coils should all point in the same direction, towards the front of the seat. The springs should always rest on two webs where they overlap each other. It is also neccssary to tie the springs in such a wny that their upper surfaces conform generally to the curvature of the seat or other part of the chair, and the springs must always be lashed in such in way that they can excrt their pressure in the same line as that of their own length, i.c. upwards and not sideways

## Covering the Springs

When the springs are fixed satisfactorily they have to be covered, in the manner show in Fig. 13, with a piece of strong canvas. This is first fixed to the back rail with a few tem porary tacks. The canvas is then held tightly and tacked to the front rail. The sides are tacked alternately : first with a tack near to the back of the chair on one side, then the canvas is pulled tight and fastened with tacks on the opposite side and so on until it is tacked all round. It must not be drawn tightly enough to depress the springs further, but should just lie evenly upon them. The tops of the springs arc sewn to the canvas with a spring needle by the method illustrated in Fig. 14. The needle is passed through the canvas and each spring sewn in three places, the string being worked continuously from one spring to the other, and finished ultimately at the starting point.
The method of applying the stuffing is illustrated in Fig. 15. Whatever material is used it must be picked or teased out into a loose mass, packed on and around the canvas. and built up as nearly as possible to the desired shape of the seat. To prevent the stuffing from moving, it should be fastened with a laair tie,
the stulfing by sewing at the corners. The string should be about 3 in. up from the frame, and there should be about 8 or 9 in . of space between each tie. This twine is left quite loose and is tightened up when all the stuffing has been worked in.
After the sides have been packed up tightly with stulfing, the centre is filled in and the whole arranged as smoothly and evenly as possible. The scrym has then to be applied to the whole so as to cover and enclose the stuffing, this operation being shown in a nearly completed stage in Fig. 16. The scrym should be of such a size as to allow for turning up on all sides. The first side to be fastened is the back, the canvas being temporarily secured with three tacks. The stuffing is lightly compressed with one hand and the scrym secured temporarily to the front rail. The scrym is an open mesh, the strands of which can quite easily be seen, and in fastening or tacking it down these strands should be kept as straight as possible. This little detail will prevent the risk of subsequent slackening, or at least minimize it.
The sides of the scrym are tacked to the frame, being turned in so as to reveal the edge. This being accomplished, the scrym has to be tied or sewn to the spring canvas with an 8 in. straight needlc. This is used with a tine twine and stitches are made by thrusting the needle through from a point at a distance of a few inches from the point which will form the edge of the chair, the start being made from one back edge. The point of the needle is worked through the stuffing, and emerges through the side of the canvas. To form the edge of the seat, twine is worked in a similar manner from the upper part through the stuffing and out at the side, as in Fig. 17, and drawn tight to form an edge or roll of stuffing. It is important that the line of this work be kept of good shape, as upon that will depend the appearance of the finished chair.

Second Stuming. When the roll or edge has been sewn in this way the chair is in the state known as first stuffing, and can be covered, if desired, without further stuffing. It is, how ever, an advantage to apply an additional
stuffing, which may be of horsehair, wadding, or other material. It should be sewn in such a way that the stuffing cannot shift or work up into lumps, for which reason ties made with loops of fine twine are provided. The ties are made around the seat about 2 in . from the edge, and several ties provided in the centre portion of the seat. The hair is closely worked under the ties, and when completed with loorsehair the surface should appear to be covered with short, curly pieces. The corners are fitted with buckram or thin cardboard folded and tacked to the cornery of the frame to give it a clearly defined shape
They terminate a little distance below the upper surface of the stiffening, and the edges should be rounded so as not to reveal anv marked angles. This second stuffing may be covered with unbleached calico, or some light material, which is temporarily tacked to the chair, the back corners being nailed and litted in the manner already described.

It only remains to cover the underside of the chair with a lining of canvas, turning under the eclges and tacking them firmly to the underside of the frame, thus covering the web completely. The manner in which this is done is illustrated in Fig. 18.
The chair is now ready for its covering, which may be of any desired material. and is applied as shown in Fig. 19. The cover is carcfully tacked to the sides of the frameworls of the chair and neatly worked around the corners, being finished with any desired kind of gimp. as in Fig. 20.

Stuff-over Work. A more ambitious undertaking is that of completely upholstering a chair from the frame and doing the work on a system usually described as stuff-over. The rough frame can be obtained ready for use or taken from an old chair which has been stripped of its stuffing. Instructions and working drawings for making a frame are given in the article on Easy Chair. The appearance of a divan chair frame is seen in Fig. 2d. Fig. 22 shows the frame after being webbed and sprung.
The first step is to apply the webbing to the underside of the lower framowork of the seat and also to the back part of the framework and the sides. The spaces between the arms are filled in with a picce of scrym or canvas, and the springs are then sewn to the web. A stout cane or similar light, flexible bar is lashed across between the two upper portions of the upright part of the chair frame, attaching it to the springs, as in Fig 22, and not to the framework of the chair.

The purpose of the cane is to provide a resilient edge for the seat. The method of sewing the springs of both back and seat and connecting them together with laid cord is shown in the illustration. In this type of divan chair with a spring edge the lower cross rail on the upper part of the frame, known as the front rail, is located only a few inches above the floor. The cross rail must be sufficiently wide to support the greater portion of the bottom part of the spring. Before the springs at the front are actually fitted, a piece of webbing or a double piece of canvas should be placed between them and the rail, and the end pieces attached to them to avoid any chance of their working forward. Another point is to support the middle portion or waist of the spring by lashing from back to front and from side to side with cord

The seat is covered with spring canvas sewn together around the spring edge so as to case or cnclose it. A still better plan is to cover the springs only, and arrange a separate covering for the spring edge by working the canvas so that the pull on it when the chair is sat upon does not draw the spring edge inwards. This can be managed by temporarily fixing the canvas on the front by passing it over the spring edge, fastening it to the stuffing rails


Upholsterg. Fig. 21. Frame of a divan easy chair ready for covering. Fig. 22. Chair with back and
at the sides of the chair, then removing the temporary tacks from the front part of the canvas and folding it back along the edge of the spring edge. This portion is then fastened 10 the front rail with stout cord or ties, the canvas folded back again over the spring erlge and tacked to the front rail. In this way a furrow is formed between the spring portion and the spring edge, which relieves the latter of the bulk of the pressure from the springs.
The chair is stuffed by the double stufling method. The first stuffing should be with horse hair for preference, tied in the manner already described. After the seat has been stuffed it is covered with scrym: the back and sides are permanently tacked, the scrym being fastened at the front by means of a circular needle and fine twine. The second stuffing is then proceeded with and covered as before The back and arms are started after the seat has been stuffed. The arms may be sprung, if desired, with springs about 4 in. long The spring of the back of the chair should be commenced with the springs. the form being obtained by the use of those of proper length and strength. The swell at the back part should have thicker springs if to 8 in . long. In canvasing the back, care must be taken not to strain the fullness of the materia!, and to obtain neatness by folding where necessary. A few ties are worked through the stuffing at various points to keep the whole firm. The appearance of the work at this stage is scen in Fig. 23

Applying the Cover. In the tina! covering the utmost care will be found necessary in planning the various pieces. and if the material to be used is expensive the amateur will probably tind it well to cut a set of patterns in calico or some cheap material and try them in place to sec that they fit properly. This having been ascertained, the proper material can be cut. It is not necessary to allow much for overlap, as the edges of the material need only be sufficiently long to enable them to be tucked out of sight. Any fastenings that have to be made to the framework are accom. plished with strips of stout calico or linen, known as stretchers, which are sewn on where needed; they serve as an extension of the covering and provide the necessary support.

When all the pieces have been prepared they should be marked for identification purposes. The whole of the seat, back, and other parts should be covered with a sheet of wadding, carefully smoothed down and trimmed at the joints. The various portions of the covering are applied, first the seat, which may be tacked temporarily in place, and then the coverings for the arms and back. Slight adjustment of the covering will ensure the design being central and
any !ines uniform The seat is tacked in position, and after it the arms and the back
In the case of a bordered chair the covering is pinned under and sewn with the circular needle, the border being bulged with wadding and a little hair. The covering is pinned under the edge and corded wherever necessary. Any fullness should be disposed of as the work progresses, by pleating and folding. The outside picecs are then fitted. The bottom of a chair of this type is covered with linen or canvas, as shown in Fig. 24, and the chair is linished with gimp and cord. Gimp is used to outline the design and to cover any bad surface that may show. The cording is secured with a small circular needle and carpet thread. The amateur will probably find it helpful, if a corded edge is to be worked on the tapestry, to apply it first in the manner adopted for making loose covers. Some of the finishing cords and circular gimps are merely applied with tacks or sewn in place, according to the nature of the materials.
Loose Seats and Frames. There are many other applications of upholstery which can be carried out in a similar manner. In some cases loose seats are used and are webbed and upholstered on an independent wood or metal frame. The general procedure is the same as has been described, except that in the case of metal frames the webbing is folded round the rod and secured by sewing When buttons are sewn through the material to form a depression and so add to its appearance and strength, they are secured with fine twine sewn with a long, fine necdle, and they are sewn through the stuffing to the spring canvas. Provision for the button points inust be made in the early stages of stuffing. Jutton work should not be undertaken by the amateur until some experience has been gained in more simple work
Many forms of box-spring mattress are upholstered in substantially the same way as a large spring seat, the underside of the frame being webbed, the springs sewn to them, and the upholstery carried out by the doublestuffing method, with buttons at appropriate intervals. If any difficulty is met with in the actual covering of the chair it can often be met in the finishing stages.
Loose Covers. Detachable coverings made of printed linen, cretonne, chinlz, cotton rep, or gingham are useful cither to protect a delicate upholstery fabric or to cover up a shabby one. An enormous variety of patterns in modern and period designs to suit every conceivable colour scheme arc available in 3 l in width, and many in 50 in When making loose covers for settees, chesterfields and large armchairs, it is sometimes more advantageous to buy the 50 in . width if it saves extensions on either side in order
to get a whole width in the inidd!e to balance the design. Small patterns will join more easily than those with large bunches of llowers or medallions. Plain reps are simplest to plan and cut to advantage, but sonmewhat dull in most rooms unless there is a good deal of colour and decoration elsewhere in the furnishing scheme.

Paper patterns should the laken of the chairs, etc., which require covers. If this is done the total length of material required can be fairly accurately estimated by planning out the patterns and measuring them. Ordinary large newspapers can be used and the type and folds of the sheets are a guide to accurate placing on the chair when taking the pattern. Accuracy in shape and lit is most important, both to appearance and durability.

The parts to be neasured for an armchair or scttee of the usual types are : lnner back; Outer back; Seat, front to back and the width from side to side; Inside arme; Band for front of seat to cover stuffed upholetery or frame; Two outside arins: Two small front arm pieces (not always necessary) ; Frill. Measure off a length twice round the bottom of the chair, if this frill is to be box pleated, $1 \frac{3}{3}$ times round if to be gathered. The depth of the frill varics, but it is usually made just to clear the floor.

A narrow piece may have to be inclucled in the parts to join the inner and outer backs so that they fit nicely at the top. If the arm. chair is straight this extra piece may be avoided by taking the pattern right over and cutting the inner and outer backs in one length. In some chairs with rounded tops, as in Fig. 23, the inner back is taken over the stuffed top, and seamed over the outer edge of the top to the outer back piece.
Take a sheet of paper and pin it to the inner back. Let a fold of the paper run straight down the middle. The pattern need only be cut on one side if the paper is doubled in this way. Cut off by the scams of the upholstery, but an allowance of 6 in. for a tuek in at sides and back of the scat and of 2 in. for turnings must be allowed when cutting out the material. Next take the pattern for the outer back and then for the seat. Pin the paper from the back of the seat with a fold of the doubled paper down the middle. Cut off at sides where it touches the arm and back and at front edge. It should be noted that an allowance for the tuck in of 6 in for both sides and for back of seat portion must be made when cutting material.

Take a pattern of one arm only, lirst from inside over the stuffed edge and cut off at seam. Again ( i in . will have to be allowed for the tuck-in at sides in order to join the seat portion, when cutting material: then pin the paper outside the arm and cut off the pattern by the top seam and lower edge of the chair. Pin a piece of paper to the front of


Fig. 23. Divan easy chair, stuffed and covered with canvas and requiring an outer covering of tapestry or leather or loose cover of cretonne
the arm and cut out to shape of the upholstered piece. Any fullness will have to be pleated up to fit the curve of the front arm. Next take pattern of the straight hand in front of the seat which connects the two arms.

If notches are cut in the pattern pieces at connecting points it is a guide to joining them correctly. A duplicate of the right arin should be cut out in paper to aroid thic danger afterwards of cutting out 2 lefts or 2 rights in the naterial. Mark the patterns of the arms left and right.
When making up, pin the pattern carefully on to the material, remembering to leave 2 in or at least $1 \frac{1}{2} \mathrm{in}$. for turnings and the 6 in . for the tuck-ins where necessary. Make sure that the fabric is quite straight before cut ting out The pieces of material can be pinned on to the chair before sewing to ensure accuracy
The seams may be bound with bias strips of the material or piped For the latter method strips of the material cut on the cross and 1 in. wide are required. Allow an extra $\frac{1}{1}$ yard for each chair, or strips of plain fabric,


Upholstery. Fin. 24. Showing how the bottom of an easy chair is covered with linen or canvas Courtesu of Our Homes and Gardens
such as linen or casement cloth, look well to match the ground colour of a patterned crctonne. Lay the material for the covers right side up to cut out. If a fabric with a large clesign has been chosen see in planning out the pattern pieces on it that the main motifs of the design are well placed to come in the centre of the inner back and seat Also that the design matches on the arms. With a large flowered pattern it is well to allow an extra yard of material as it may cut to waste.

For bound scams (see directions for binding in page 100) the cover shou!d be pinned up with turnings on the right side, and fitted closely on to the chair. For piped scams the turnings are pinned up on the wrong side and the cover should fit easily as the piping takes up room (see page 958). All visible seams should be piped. Any fullness at curves should be neatly darted, gathered or pleated into position.

The tuck-in seams and any others that do not require piping or binding should be machined first. An opening is laft at one side of the outer back, or at both sides if the chair is large or in the casc of a settec, so that the cover can easily be remored and replaced. The edge of the open seam must be faced on onc side and have a wrap over to neaten it on the other. Press studs of strong quality are the most convenient fasteners.

For making the frill join up the pieces and press the seams first. For a hox-pleated frill
take up a 2 -in wide tuck at every 4 in. Flatten ench tuck to make a box pleat (sec Pleating), press, and tack into place along the top. Seam to the cover with neatened raw edge on the inside. A gathered frill is simpler to make. Having joined the piecoss divide them into even sections and gather with double cotton. Divide the cdge of the cover into the same number of sections, pin together, right sides facing, and stitch.

UP JENKINS. This is a parlour ganic suitnble either for children or for adulte, the only apparatus required being a threepenny piece or a sixpenef. The players divide into sides, which occupy different sides of a table. Onc side, usually chosen by toss, has the coin to start with, and all put their hands moder the table, passing the coin from one to the other until it reaches the person destined to hide it. They may do this until the captain of the other side says " Up .Jenkins," when they must hold their clenched hands well above the table for inspection by their opponents. The person who has the coin must do all in his power to kecp it concealed.
Hands may be put on the table in onc or two wnys, according to the opposing captain's choice. "Smash" means that they must bc brought down with open palms as violently as possible ; "crawl " means that they must be put down quietly, and the fingers extended slowly when they are on the table. It is then the business of the opponents to remove all hands from the table except the one containing the coin. If this is cleverly concealed between the thumb and forefinger it is very difficult to detect.

If the captain succeeds in his task, the coin then passes to his side and the ganre proceeds as before. If he does not, but orders off the hand containing the coin, the same side has it again. As the captain's position is one of responsibility, it is best for it to be filled by each member of the side in turn.

URAEMIA. The form of blood poisoning due to the presence in the blood of substances which ought to be excreted in the urine is called uracinia. It may occur quite suddenly, the patient sometimes becoming totally unconscious without previous warning. The condition may arise in any disease of the kidneys and in any other affections in which the urine ceases to be excreted by the kidneys. See Bright's Disease.

URIC ACID. Uric acid describes a nitrogenous substance formed in the body, partly from the wear and tear of the muscles and organs and partly from the oxidation of food. Very small quantities, in the form of sodium urate, are passed out of the hody in the urine. If the urine is very acid, uric acill is deposited in crystals.

Uric acid is increased in a varicty of discased conditions, including gout, leucocythaemia, ague, and pernicious anacmia. But the importance of uric acid as a cause of discase is now considered much less than formerly. It is very slightly soluble in water, but dissolves readily in alkaline solutions. This last quality is of importance in the treatment of gout and gravel.

Some foods give rise to a good deal of the acid, while others are free from the substances out of which it is formed. This fact has led to the diet system which admits the consumption only of what are known as purin-frec foods. The foods which contain in the largest quantitics the bases from which uric acid is made are red meat (beef, mutton, etc.), livers, kidney's, sweetbreads, meat extracts, yolk of egg, peas, beans, and lentils, tea, coffee, and cocoa l'urin-free foods include white bread, tapioca, potatoes, cauliflower, cabbage, lettuce, rice, macaroni, nuts, among regetable foods ; apples, grapes, fige, dates, and raisins, among the fruits; milk, cream, butter, cheesc, fats, white of egg, sugar, honcy


Urn. Silver tea uen, with spirit lamp beneath Courtesu of Chapple \& Mantell

URINE. The purpose of the urine is to remove from the blood certain waste materials formed in the body. Urine is separated from the hlood by the kidneys and passes to the hladder, from which under normal conditions it is discharged in average daily quantities of, roughly, $2 \frac{1}{2}$ pints for an adult. This may, however, vary, being increased in cold weather and diminished in hot weather, when sweating is profuse. The quantity is also greatly affected in some discases, as is the colour.

Various causes produce pain in passing the urine. In simple cases, the enting of more vegetables and fruit may effect a curc ; or a few doses of citrate of potash may be given, 20 gr . in a little water. Stoppage inay be due cither to the kidneys reasing to form urine or to inability to void it from the bladder. The first is called suppression and the second retention. Urgent medical treatment is required in all cases. See Kidncys.

URN. Urns in pottcry, marble, and stone are used for garden ornaments. These are of the classical vase shape with or without lids. The urn used for tea, when large quantitics arc required, is made in silver Sheffield plate, or in copper and various alloys, and old pieces are sought by collectors. Some are fitted with a spirit lamp for heating the tea and kecping it hot. Sometimes the urn is used for boiling water only, and the teapot is filled from it at the table.

The first urns of this kind, which appeared in England about 1740, had lamps placed under them, and the tea was made in them. This clid not produce a very satisfactory tea, so an urn was made which had in its centre a vertical tube into which a round bar of hot iron was dropped, the heating being done in this way.

URNFLOWER. This greenhouse bulb belongs to the amaryllis family. The chief kind is Urceolina pendula, which bears drooping bunches of green and yellow Howers in June. The bulbs should be potted in autumn or in winter in a compost of loam, leaf-mould and sand. Propagation is by offisets which dcvelop on the old bulbs. When the leaves fall watering must be discontinued.

UTRICULARIA. Bladderwort is the common nams of this group, which includes aquatic and insectivorous plants provided with small pitchers by means of which insects arc saught. The chief species is montana, grown in suspended pots and laskets in a hot house in a compost of peat and moss.

UVULA. The small rounded nass of muscle covered with mucous membrane that hangs from the middle of the soft palate is called the uvula. In relaxed sore throat the uvula may elongate till it touches the upper pharynx wall or larynx, when it causes an irritating cough, especially when the patient lies down. This should be remembered when a cough is troublesome at night. Elongation, if it is slight, may be corrected by the doctor painting with glycerin of tannic acid or solution of nitrate of silver. See Pharyngitis.

UVULARIA. These are lily-like herbaceous perennials, related to Solomon's Seal. They are suitable for planting out of doors in moist soil of loam and peat in a partly shaded place, or in the bog garden. The chief kind is


Uoularia. Giracelul stems and drooping yellow owers of the species grandiflors

Uvularia grandiflora, which grows 12-18 in. high and hears ycllow flowers in early summer. Propagation is carried out in spring by separating the underground stems. See Solomon's Scal.

VACCINATION. An inoculation with the liquid contents of a cowpox vesicle is used for the purpose of either preventing an attack of smallpox or of mitigating the effects of small pox which is incubating. It produces a local pock at the site of the injection, but in the large majority of cases no general disease beyond some little feverish disturbance.

Vaccination is usually done on the arm, but in girls the leg may be preferred in order to avoid any disfigurement: In young, restless children it is often extrenely dillicult to prevent rubbing of the skin and irritation, and this difficulty is met with whether the arm is covered or left bare. Wire protectors increase the risk of injury. A piece of boracic lint held in place with a soft bandage or adhesive plaster is the best appliance. The arm must be kept at rest as far as possible.
The best age for vaccination is before teething begins. If smallpox is prevalent the child may be vaccinated even on the first day of life. If vesicles do not appear, as sometimes happens, then the vaccination is not successful, and should be repeated. Protection is said to last for 10 or 12 ycars in the majority of cases, but the period varies in different individuals, and may be as short as two years. It is therefors recom-
mended that a child should be revaccinated between the ages of 7 and 12, and that the operation should be repeated between the ages of 20 and 25 .
If an epidemic of smallpox breaks out, however, it is advisable for everyone likely to be exposed to infection to be vaccinated if his previous vaccination dates back further than five years. When infection with smallpox takes place, if the patient is vaccinated within three days the attack may sometimes be entirely prevented, and if within 8 or 10 days the severity of the attack is usually diminished.

The Law of Vaccination. By the law of England every child must be vaccinated before it is six months old, unless the parent has a conscientious objection to vaccination. It can be performed cither by a private practitioner or by the public vaccinator, who will visit the house and vaccinate the child free of charge. If the parent or person
in charge of the child has an objection to vaccination, he must within four months of the child's birth make a statutory declaration before a commissioner for oaths or a magistrate, and within seven days from that time must send this declaration to the public vaccinator for the district. See Smallpox.

VACCINE. The name vaccine was originally applied to the substance obtained from the vesicles of cowpox. The term is now employed for any substance used for protective inoculation, and what is generally used is an emulsion of dead bacteria, of the kind which produces the disease against which protection is requircd. The use of such vaccines assists the natural action of the body in meeting and combating infection.

The diseases treated by vaccines, either protectivcly or curatively, include influenza, gonorrhoea, acne, pneumonia, tuberculosis enteric fever, common colds, anthrax, rheumatism, and many others.

## Vacuum Cleaners

## The Hygienic Method of Removing Dirt from the Home

In connexion with this article on an important appliance for housebold cleaning the reader is referred to the contributions on Labour Saving; Spring Cleaning; and for safety hints to that on Electricity. See also Oiling

The appliance known as a vacuum cleaner is designed for extracting dirt and dust by suction. The valuc of any particular machine of the type is therefore chielly in its suction powers, which must be strong enough to dislodge and extract deep-lying dirt, as well as to gather up surface dust. The powerful current of air should pass through the thickest carpet and draw out every particle of grit and dust without damaging the fabric.

The fact that the dirt thus extracted is at once drawn into the dust-bag of the machine, instead of being disturbed by swecping with the ordinary broom or brush, when a portion of dust must be allowed to blow about the room to escape even the most careful housewife, makes the vacumn cleamer the most efficient and hygienic cleansing appliance. An additional advantage which is claimed for the best machines is that as the suction created by the vacuum is sufliciently strong to penetrate closely woven materials, a dloor can be cleaned at the same time as the carpet, hangings can be rendered dust-free without taking them down, and dirt can be extracted from upholstered furniture or bedding without removing the covers.

There is a great choice o these cleancrs available. Improvements have rendered most of them capable of removing embedided as well as surface dirt. Also, by means of various accessories, such as special brushes for polished wood floors and linoleum, and others for ledges, different sized nozzles, including a large one for carpets, a smaller one for upholstery and in some models a bookcase nozzle, a complete house cleaning system is devised. There are two main shapes, the handle type such as that illustrated in Fige. 1 and 2, in which the dust-bag hangs on the handle, and the enclosed bag type protected by a light metal case. A variation of the latter type possesses an upright metal container and a patent hinged nozz!e, as is shown in Fig. 3.


Vacuum Cleaner. Fig. 1. Non-electric vacuum cleaner which can be used for cleaning carpets, and also with the various attachmento cor cleaning furniture, walls, beds, and curtains


Vacuum Cleaner. Fig. 2. Electric vacuum cleaner with handle. By simply
detaching the latter, the machine can be used in the hand for cleaning upholstered furniture, stairs and for dusting
British Vacuum Cleaner Engineerino Cor, Itd

With the accessories included in the outfit, the vacuum cleancrs provided with this air purification feature not only clean but to some extent disinfect. The dust-laden air drawn

The enclosed bag type of cleaner is provided with a storage case for the safe retention of the complete apparatus with special clips for each accessory. Unless a separate polisher is used, this type of cleaner is not so suitable where there are large polished floor areas as a handle cleaner with polishing attachment.
When using electric vacuum eleaners it is not desirable to obtain current by means of an adaptor inserted into a pendant lamp-hoider. Plugs and socliets on the skirting board of room or staircase landing are the correct incans of connexion. Note the position of the wall socket for the vacuum cleaner at the foot of the stairs in Fig. 8 of the article on Staircase.
As guarantees arc given with all the best makes of vacuum cleaners, no cleaners of the small pump type which can amateur attempt should be made to repair any e used cither for floors or upliolstry Non leficiency or brealage. Various macine electric vacuum cleaners cost nothing to operate, and, in common with clectric cleancrs, are purchasable on deferred terms. The best makes arc fully guarantecd.
Electric Types. Many of the less expensive electric cleaners of British make are excellent value. The handle type illustrated in Fig. 2 is particularly convenient for gencral cleaning. It may be used at its full length (as seen in the illustration) for carjets nnd floors, or by simply detaching the long handle the machine can be held in the hand for cleaning upholstered furniture, stairs and for gencral dusting. The carpet nozzle is fitted with a patent agitator device which picks up cotton and fluff quickly, as well as extracting embedded dirt. In the upholstery cleaning tool the suction is concentrated, and the nozzle reaches every corner. A lloor brush is also included with the accessories for polishing plain floors. This is titted with a buffer band to avoid damage to furniture or skirtings. The dusting brush for ledges and shelves, etc., has long bristles, and the suction behind them gathers in the disturbed dirt. The same company also makes more expensive models in the enclosed dust-bag type of cleaner.
Cleaners vary much in weight, especially those of the metal-enclosed dust-bag type. Made with a flexible hose and without a handle, such cleaners are very useful for rooms with much furniture and houses with many stairs. The light-weight models are particularly convenient for the latter, as some of the handle machines are large for placing on a step. In the case of much furniture time is saved by the use of such a cleaner as the one illustrated in Fig. 3. It is possible by means of the flexible hose to get under and round the pieces without moving them.
In a house with many delicate ornaments, carved surfaces or radintors a vacuum cleaner which possesees a blowing apparatus is advantageous. The air jet is reversed, and instcad of being sucked in, the dust is blown out of such inaccessible places as the inside of a piano or behind gratings. A damp cloth should be placed to catch the dust as it is disturbed.
Two developments of interest are quietness in operation and a disinfecting pad impreg. nated with a pleasantly scented gerinicide-
deficiency or breakage. Various machines depend for efficiency on proper oiling, and the housewife should thoroughly understand this at time of purchase ; also the correct method for assembling and detaching the various parts and accessorics.
The lubrication of the clectric motor is arranged for by the manufacturers, and the greasc cups require refilling only at long intervals. This job should be attended to by the makers' agent, or the local elcetrical engincer shop.

VACUUM FLASK. Vacuum flasks refer to those which are made with the purposc of maintaining the temperature of liquids put into them, cither hot or cold. This is done by surroundling the containing vessel with an

Fig. 3. In this model the usual type of dust-bar is replaced by a sanitary steel canister. Another fixture which makes for efficiency is the patent hinged nozzle
Tcllus Super Tacuum Cleaner Lid.
outside shell, a space being left between and the air climinated from this space.

Before a vacuum flask is filled with any beverage it should be rinsed with boiling or cold water, according to the temperature of the drink to be carried. This will keep the latter cooler or hotter than it would be if poured directly into the flask. After use, the Hask should be washed out with hot water and left to dry at the side of the stove. If it has held mill, the washing process should be repeated several times to prevent a sour odour from clinging to it. When the flask is not in use the cork should be removed.

Vacuum jars and jugs are purchasable in various shapes and sizes. The jars are made with wide openings to permit casy filling and cleaning, and can be used for kceping soups, stews, or any other food hot, or to maintain ice cream in a proper condition. See Pienic.

VALANCE. The box-pleated or gathered frill which surmounts the curtains of a window or other opening is called a valance. It may be fixed to a pelmet board (see page 927), or to a valance extension supplied with a gliding curtain rail.

Valances round the frame and canopy of a bed are seldom seen except on the 18th century style of bed, an exainple of which is illustrated in page 77. The effect of a valance is now obtained, when desirable, with a pleated frill at cither side of the bedspread.

VALERIAN: The Plant. Most of the valerians are of little value in the garden, but Valeriana l'hu aurea is an exception. It grows 2 ft high, has yellow leaves and white flowers in late summer. It flourishes in ordinary garden soil. The roots of Valeriana officinalis, 3 ft . high, bearing rose pink flowers in summer, are of medicinal value.

Uses of the Drug. Valerian root is a drug with a characteristic, highly disagrecable smell and an unpleasant taste. It is chiefly used in medicinc in the treatment of hysteria and similar nervous conditions, sometimes with striking effect.

VALLAURIS WARE. Two types of French pottery are associated with the village of Vallauris, near Cannes. One of these consists of kitchen utensils, including a porous terra cotta, often covered with an opaque green glaze, with or without Horal decorations.
A more important class of decorated faience comprises the majolica and lustred ware developed especially by the Massier family. Discarding the conventional shapes introduced from China, the Vallauris potter, Clement Massier, based his patterns upon the Greek vases, and decorated them in brilliant colours resembling old oriental lustre and medieval majolica.
The ware, usually a leadglazed soft-paste, comprises ornaments covered with lustrous fish-scales, peacock feathers, etc., or with silvered lustre enriched with colour glazes.

VALLOTA. This is an alternntive name for the halfhardy greenhouse or room win. dow evergreen Howering bulb known as the Scarborough lily. See Scarborough Lily.
VALSE. This is the French name for the dance more usually spoken of as a waltz. It is used considerably in music for works which are written in waltz time, such ns Chopin's waltzes. Sce Dancing; Waltz.

## Valves for Wireless Receivers

## The Different Kinds, Their Characteristics and Uses

This contribution deals in a thorough yct concise manner with the types of thermionic valve in use. After a brief account of the basic principles upon which valves work, information is given about the various types and their function in a modern receiving set. Finally the reader is told howto select valves for given purposes, and how to read the characteristic curves which are issued by Rectifier: Wireless Reception

The thermionic valve is a vacuum tube grid bias. The grid bias plug shou!d not at containing two or more electrodes, and may any time he withdrawn from the grid battery be cinployed for either rectification or ampli. fication. The electrodes are enclosed in a glass bulb, the connecting wires from which are taken through the " pinch" to pins in a moulded base usually of bakelite. The valve is inserted in a valve-holder provided with terminals so that connexion can be made to suitable points in the circuit.

A threc-electrode valve or triode comprises the anode. grid and enthode In the battery operated type the cathode also forms the filament, whereas in the indirectly heated mains type the cathode and filament (heater) are separate. The cathode, upon being heated, emits electrons, and if the anode is caused to become positive with respect to the cathode, a current passes through the valve from cathode to anode

The potential of the grid, relative to the cathode, controls the electron stream. A positive potential applied to the grid will cause a considerable current (anole current) to flow through the valve. Conversely the application of a negative potential to the grid (negative grid bias) will decrease the anode current, and if this negative potential is made sufficiently great no electrons will reach the anode, and consequently no current whatever will pass from the cathode to the anode.

A curve showing the anode current at a given high tension voltage for different values of grid potential is called a static characteristic. In practice under working conditions this curve undergoes a change and is then referred to as the dynamic characteristie.

In order that a valve miay function as a distortionless low-frequency magnifier, it is necessary to operate it at a suitable point along thic characteristic, and the correct values of negative grid bias for various high tension voltages are given by the valve makers on the leaflet supplied with the valve. These should be adhered to.
The valve may lose its emission by applicntion of too little negative grid bias or a positive


Valve. Fig. 1 Electrode assembly of three typical medern valves. A. Marconi and Osran valve for high-frequency amplifcation. C. Mullard special power grid detector Courtesn of The wircless World.
while high tension is being applied to the anode. Moreover the filmnent nust not be overrun.

In addition to the threc electrode valve, there are certain other valves which are used for special purposes. For instancc, the screen grid (tetrode) valve possesses an extra grid, known as the screening grid, and is cominonly employed as a high-frequency ainplifier. The pentode has three gridy and provides a high degree of amplification when used as low frequenoy magnifier. The bi-grid valve is a form of four electrode valve which can be employed as a detector-oscillator in a super-betcrodyne.

The Different Types. It is convenient when considering the question of valves to deal with them in the order in which they appear in the modern wireless receiver, namely, highfrequency amplifier, detector and output valve, but before doing this it is as well to make clear at the outset the essential difference between a valve intended for use with batteries only, and one intended for use with ordinary household lighting mains.

A valve intended for use in an "all-mains" receiver is-except in the case of certain types of output valve-provided with an independent cathode for the emission of electrons, this being heated by a filament in close proximity to but not in electrical contact with it. This arrangement is necessary in order to prevent hum due to fluctuations of the filament temperature. Apart from this, the indirectly heated cathode confers severa other advantages in the valve, all of which conduce to greater efficiency than is the case where the filament itself is used for electron emission, as it is in the battery-driven type of valve.

Owing to temperature losses between the heater and the cathode of the indirectly heated type of valve it is necessary that a filament wattage be used, which it is far too uneconomical to obtain from batteries of any kind, but which is exceedingly low when compared with the consumption of an ordinary household lamp.

The modern screen-grid valre, which was first introduced in 1997, has long since completely displaced the old neutralised triode By its use it is possible to bring abont complete stability in an H.F. amplifier, employing quite straightfor. ward screcining arrangements. It gives a far higher degree of magnification than the triode, and since it does not depend on large di-ametersuper-efficient coils for this, it is possible for compactness to be achieved with an actual gain in amplitication. Against these ad-
vantages must be set the fact that the valve is definitely less selective than the neutralised triode. This is due to the fact that its characteristics do not enable it to accept such a large input grid voltage swing, and therefore the valve overloads easily ; the result is that it rectifies, and not only selectivity but also quality is marred. In addition to this, rectification taking place in the $H . F$ valve or valves in the case of a mainsdriven set causes an increased tendency toward hum and kindred troubles, in spite of the precautions that may be taken elsewhere in the set to prevent these evils arising.
These difficulties have been overcome to a very large extent by improvements in valve characteristics, but chiefly by the development of the "band-pass filter" system of tuning, which may be briefly described as a system of double-circuit tuning-usually preceding the first valve in a receiver-whereby a considerablc degree of selectivity is obtained without the attenuation of the upper musical frequencies usually associated with the ordinary sharply.tuned single circuit arrangement.
The Variable-Mu S.G. Valve. Although results which are exceedingly good from all points of view can be obtained from a straight. forward receiver with a modern system of tuning, there is still much room for improvement, and a very big step forward has been made comparatively recently by the intro duction of a highly specialised form of screengrid valve known as the "varinble-mu." This new valve, owing to its relatively heavy high tension current demands and to various other reasons, is only available as an indirectlyheated mains valve. It has less sensitivity than the ordinary screcn-grid valve, but since power consumption offers no difficulty in the case of the mains user, this deficiency can be casily remedied by the use of an extra stage of H.F. amplification. The great advantage of the variable mu valve is that it can handle a large input without overloading, and from this statement alonc it will be seen that all the disadvantages already mentioned as appertaining to the ordinary S.G. valves are disposed of. Another type of H.F. valve having similar good points is the special highfrequency pentode valve which has rccently made its appearance

Rectifiers. It is well known that the ordinary leaky grid detector held the field for a very long time, owing to its simplicity and sensitivity. Indeed, it still shares the honours with the anode-bend detector in the case of battery-driven reccivers, where the utmost economy in the matter of H.T'. current consumption is necessary. The anode-bend arrangement is capable of better quality than the leaky-grid detector except on weak or rery deeply modulated signals, and owing to the absence of grid current, better selectivity is obtained with it; however, its sensitivity is less than that of the leaky-grid detector, and smoothness of reaction control is rather difficult to achieve. At one time a valve of high A.C. resistance was always used as the anode bend rectifier, as it was alnost invariably followed by resistance-capacity coupling. Nowadays, however, it is better to use a valve of moderately low A.C. resistanceusually designated by valve makers by the prefix L-and to follow it by a transformer of high primary impedance.

The mains user has an advantage over the battery user because he can afford the necesaary high plate voltage and heavy plate current associated with the power grid rectitier, which is probably the most satisfactory de tector for all-round use, insomuch that it is undoubtedly the arrangement which gives the nearest approach to distortionless results using one valve only. It has the disadvantage that it tends to cause considerable loss of selectivity; but this is, however, discounted


Valve. Fig. 2. Mazda indirectly heated power pentode for mains. Fig. 3. Electrode assembly of Mazda pentode for tattery operation
consideration the design of set with which the valves are to " be used, but nevertheless a few gencral rules can be given. Ignoring the casc of receivers specially designed for variable-mu valves, al! rcceivers will naturally usc an S.G. valve in the H.F. stage. If the tuning arrangements of the set are not of the modern band pass type, it is well to aim at a valve with a relatively large grid owing acceptance in order to avoid the evils attendant on over-loading which have already been cliscussed. If, however, a preselection band pass filter is used, a valve capable of giving greater amplification with its inevitably lower grid swing acceptance should be chosen This consideration more particularly applies to sets having one H.F. stage only, where a! amplification has to be done by the one valve, and it is equally applicable both to battery and to mains driven receivers.

In the case of the detector,
to a large extent by the use of proper tuning circuits preceding it.
Various special arrangements employing more than one valve for detection such, for example, as push-pull detection, have heen brought forward to minimize distortion, but these have not proved altogether popular owing to the fact that they add to the complications and initial cost of the receiver, and at present they are usually to be found only in receivers designed regardless of expense or of the total number of valves used. The screen-grid and pentode type of valve have already been employed by scveral designers in the detector position, and it is very probable that in the future the multi-electrode valve will figure a great deal more in this pait of the set than is the case at present

Output Valves. With regard to the output valve, one can employ either a triode or a power pentode. At one time the sole advan. tage of the pentode valve lay in the fact that it gave extra amplification and enabled a somewhat grenter signal strength to be obtained than was the case with a triode, but in other respects it was to bc avoided, owing to varions disadvantages, the most important of which was its tendency to overemphasize the upper musical frequencies, due chieHy to the fact that it was mistakenly used with output circuit arrangements suited only to a triode. The modern power pentode valve has shed all its earlier disadvantages, however, now that so much more is known of its correct operating conditions, and provided that proper precautions are taken in the design of the output circuit, the quality obtainable from it is fully as good as that obtainable from a triode.

In the case of battery driven receivers, tlie early types of pentode were not of very much use, because of their extravagance in the matter of plate current and because in the twovolt range, at any rate, they had no greater power output than a triode The modern low consumption type of pentode, however, is the ideal output valve for the hattery man, both from the economy and the quality points of view, and, furthermore, it enables him definitely to dispense with a stage of amplification between the detector and output valves, thus greatly lessening the tendency of the L.F. part of the receiver to approach the oscillation point.
Choice of Valves. When choosing valves of any type it is necessary to take into
valve of medium A.C. resistance-classified by valve manufacturers under the heading of H.L. -will nsually be found suitable for power grid detection in a mains-driven receiver, and indeed a similar type of valve will serve for all types of detector, irrespective of whether the receiver is operated from the mains or from batteries.

The choice of an output valve is the most important of all, for it is the devicc which actually operates the loud speaker. In the first place, it must give the full jower ontput demanded by the loud speaker with which it is to be used. This will vary widely but will never be inuch helow 400 milliwatts. A useful, average value is 1,000 milliwatts, although the battery user will usually have to content himself with half this in the interests of cconomy in running costs. Whether the valve should be of the pentode or triode type depends upon the design of the receiver, but whichever type is used, care should be taken to sec that the transformer which will couple it to the loud speaker is of the correct ratio.

Valve Curves. An article on valves would not be complete without reference to the characteristic curves which nowadays are lublished by all valve manufacturers. Although valve cha. racteristics may be had in tabulated form, a curve is far more useful and helpful. It enables the principal valve characteristics to be seen at a glance in a manner which no amount of attention to tabulated data could do; indeed, if it be compared to a picture and the tabulated data to a written description of the place which the picture portrays, some idea of its inıportance will be obtained.

The most common curve is the one which shows the relationshij) between grid voltage and anode current at
various lixed values of plate voltage, but it must be admitted that the utility of this type of curve is very restricted, and if employed for determining the maximum grid voltare swing of a valve or for determining the value of grid bias, very misleading results can be produced, and for this purpose the type of curve showing the relationship between anode-volts and anode-current for equal increments of grid bias should be employed. In addition, this latter type of curve (which is, without doubt, the most useful of all when dealing with any type of valve, be it S.G., detector or output), enables the "load line" of the valve to be obtained, and by using this as the hypotenuse of a right-angled triangle, the actual value of the "optimum load " expressed in ohms, and of the maximum undistorted power output expressed in milliwatts can be calculated very simply. The first named characteristic is vitally necessary in order to cuable a loud speaker of the correct impedance to be chosen or, alternatively, to permit of the correct calculation of the ratio of the transformer which it will be necessary to use between the output valve and an cxisting loud speaker.

In the case of a screen-grid va!ve, the anode-volt anode-current curves are again cxtremely valuable for determining the load line which, in this case, it is necessary to ascertain in order to prevent encroaching upon what is known as the " nogative resistance kink," which would have the effect of causing loss of selectivity and also hopeless instability. Curves of this trpe are no less useful in assisting in the choice of a detector valve, since such things as rectification efficiency and the percentage harmonic distortion with varying depths of modulation can be easily determined

When choosing a ha!f-wave or full-wave rectifying valve for use in an A.C. mains receiver or battery climinator, it is important to study carefully the voltage regulation curve (which reveals the value of D.C. volts available with varying degrees of load) in order to obtain one which is suited to the particular set in question. On the other hand, if design. ing a receiver, this curve must be studied in order to choose or design a suitable power transformer for the valve and also in order that the designer may be in a position to calculate correctly the value of the various voltage dropping resistances which must be used in the receiver. Similar curves are available in the case of metal rectifiers, which few people seem to realize are valies just as much as their thermionic counterparts.


Fig. 4. Graph showing the grid volts and anode current curve Courtesu of ' The Wireless World

## Valves in Motor Vehicles

## Practical Information About the Different Types

This is one of a group of articles in our work which deals with various parts of the motor car. The reader is therefore referred to such headings as Exhaust; Four-stroke; Internal Combustion Engine ; Motor Car. See also Pump

The flow of a liquid or gas through a port or levers, mounted side by side on a fixed opening is always controlled by a valve, of shaft, each being operated from a separatc which many types are in use. To the motorist cam. The camshaft is some way above the the inlet and exhaust valves, which control crankshaft, from which it has to be driven the working of the engine cylinders, are at half speed, various methods of driving probably the most important and certainly call for most care and attention. Other valves, though essential, so seldom even require inspection that their presence is apt to be overlooked. Among these may be mentioned tire valves, the carburetter throttle valve and needle valve, the valves in the Autovac or in the fuel pump, and ball and similar one-way or non-return valves used in the engine lubrication system, in tire pumps, in grease nipples, and in the grease gun. Only engine valves and tire valves will here be considered in detail.

When the internal combustion engine was first applied to the propulsion of vehicles, expcriments were made with valves of various types, but only the sleeve valve and the ordinary lift valve now survive
The usual conical lift valves, known also as mushroom or poppet valves, con sist of a head with a narrow conical face and a stem working in against a flange on the a guide. The head and the stem merge into one another with a good radius to facilitate the flow of the gases and to avoid the possibility of the stem breaking off under the head.

The several ways in which the valves may be arranged in relation to the enginc cylinder are shown diagrammatically in Fig. l. The side valve engine shown at $\dot{B}$ is to-day used as widely as the overhead valve type shown at C and D. In the former, the combustion chamber extends from the cylinder over the exhaust and inlet valves which arc arranged side by side (one only bcing shown), and both being operated from separatc cams on the samecanshaft. The overhead valve engine gives a more compact com. bustionchamber, the valves being inverted so that they open down wards. Two methods are adopted forvalve operation. In one method, shown at $C$. the exhaust and inlet valves are buth opened being adopted, such as a vertical shaft with skew or bevel gearing on the upper and lower ends, or chain gearing with or without toothed gearing. In the push rod construction shown at D only one valve is visible, the other being arranged in line with it.
A detailed section of the popular side valve engine is shown in Fig. 2, the combustion chamber being shown as formed in the detachable head. The stem of the valve works in a bush, e, pressed into the main casting. A coiled or helical valve spring $f$ abuts at its upper end ower end engages a washer $a$ of $e$, while its which is secured to the lower end of the valve stem by a cotter. The valve is raised from its seat, when required, by the cam $b$. The can engages the lower end of the sliding tappet $c$. the upper end of which lifts the valve. In some constructions the lower end of the tappet carries a roller which runs on the camshaft, but more frequently it is provided with a disk shaped end, as shown. The tappet is free to rotate so that wear is distributed all over the face of the disk. A stem $d$ may be screwed into and out of the upper end of the tappet in order to vary the clearance between the head of this screw and the lower end of the valve stem.
by casting in which the springs by rocking and the upper ends of the

The screw, after it has been adjusted, is secured in position by a locknut. A small but definite clearance must always bc left to ensure that the valve can engage its seat properly, except when it is lifted by the cam The tappet should always be set to give the clearance specified by the makers. In side valve engines this is usually of the order of 004 in., when the engina is cold. Greater clearance will create noiss and may, if excessive, cause wear and affect the running of the engine A smaller clearance will prob. ably, when the engine is hot, result in the valve not seating properly, and in that case there will be some loss of power, while the valve face and the valve seat will certainly be damaged by the leakage past them of the flaming gases.

The recesses in the cylinder


Fig. 3. Overhead valve engine with push-rod operation. Fig. 1. Three types of valve lifters that may be set and left unattended. Fig. 5. Double sleeve valve Daimler engine ; in which inlet and exhaust porta are opened and closed by sleeves
valve engines The push rods pass with
complete freedom through openings in the complete freedom through openings in the
detachable head. The rocking levers are in nearly all cases lubricated automatically and the uperating gear is protected by a cover, but it is well with many engines occasionally to remove the cover and use the oil can to ensure that some oil reaches all the working parts such as valve stems and the ends of rocking levers.

Whenever an engine is decarbonized it is desirable that the valves should be ground in until all marks are renoved If this operation is neglected there is considerable risk that the pitting marks will penetrate somewhat deeply and that a considerable amount -of metal will have to be removed at a later stage when truing up the valves. In order to detach the valve it is necessury first to compress the valve spring and collar or washer so that the cotter pin or similar securing device may be removed from the stem, after which the valve may be removed The spring is in nearly all cases too stiff to be compressed by the fingers, and a proper valve lifter or valve spring compressor saves a great deal of time Many difierent designs of valve lifter are available for this purpose ; examples being shown in Fig. 4. The valve should be down on its seat before the valve lifter is brought into use, and the forked end of the lever should be placed squarely in position under the spring collar to avoid the valve rising with the spring when it is compressed. The collar when lifted clear allows the cotter pin to be readily removed. The valve and lifter may then be taken out together or the spring may be released, but this should always be done gradually.

## Sleeve Valve Engines

The sudden and jerky operation of the ordinary lift valve has stimulated attempts to replace it by valves having a more continuous movement, but practically the only successful alternative is the sleeve valve.

A section through a Daimler double-sleeve engine is shown in Fig. 5. In this construction the piston moves up and down within a thin steel sleeve or tube $a$, which is also given a short vertical travel by a rod connected to a small crank on a shaft driven at half-engine speed. Between the inner sleeve $a$ and the main cylinder casting is interposed an additional sleeve $c$ which is similarly reciprocated by a connecting rod $b$, from the half-time shaft. The up and down movements of the two slecves are out of phase, but they co-operate to ensure quick opening and closing of the ports connecting the cylinder to the inlet and the exhaust passages
Sleeve vaive engines are very silent in operation and valve grinding, and valve adjustments are quite unnecessary. The rate of oil consumption is, however, somewhat higher than in poppet valve engines, this being indicated, particularly when starting, by blue smoke from the exhaust.

In single sleeve valve engines the sleeve is interposed between the piston and the cylinder casting. It receives an elliptical movement, being operated at half-engine speed from a crank in such a way that it is moved both up and down and is given a small a mount of rotation.
Tire Valves. Valves used for tire inflation are always of the non-return type, and since there must be no air leakage, although the pressure may be considerable, a rubber seal or seat is always used. In the ordinary cycle type construction shown in Fig. 6 the stem which projects inwards is covered hy a short length of thin rubber tube. When the valve cap is removed air may be forced upwards through the centre of the stem and then sideways through a small hole which opens against the inside of the rubber tube. The tube is thereby lifted and air flowa into the tire but
the tube prevents any return of air through the stem
On motor car and motor cycle tires the Schrader valve shown in Fig. 7 is gencrally employed. The valve and its seat are shown separate!y at A and form a complete unit. which may be screwed into the stem $b$ when the cap $c$ is removed, by means of 'a slot $d$, in the head of the cap The two main parts of the valve unit include: (l) a screw $e$, and a conical rubber plug $f$, which engages a


Valve. Fig. 日. Showing construction of a cycle type valve. Fig. 7. Schrader tire valve; valve unit. shown separately at $A$, is readily removable
stem; and (2) a metal ring $y$, enclosing a rubiber valve $h$, which bears on the metal seat $j$. The parts $g$ and $h$ are secured to a wire stem running from end to end with some clearance whore it passes through the part $e, f, g$ The valve $h$ is forced on to its seat $j$, by the pressure in the tire, but is lifted off during inflation by air forced through the space between the stem $k$, the screw $e$, and plug f. These valves are practically impossible to repair, and on the rare occasions when trouble develops new ones should be fitted.

VANILLA: The Plant. The vanilla is a hothouse climbing orchid, which may be grown in pots in the hothouse and trained up the rafters. The flowers are borne in summer, and are followed by seed pods which are from 4 in . to 6 in . in length. Water freely during the hot months but only occasionally Juring the colll weather.
The vanilla plant grows best in a mixture of peat and sphagnun1 moss, and the pots or pans should be wcll drained with clean crocks. See Orchid.

VANILLA: The Flavouring. The dried porls of the vanilla plant, which are used in cookery and confectionery as a llavouring, are about 7 in . long and dark brown in colour, the best qualities being nearly hlack. A small piece of the dried pod, or bean, as it is often called, if broken off and adiled to milk or cream imparts a delicate aromatic llavour.
The extract is commonly used for household purposes, but, although more convenient, it does not possess the same qualities for flavouring that belong to the bean itself. The housewife should carefully avoid all cheap extracts of vanilla, as they have not the true vanilla flavour. Vanilla is a favourite flavouring for ices, custards, blancmange, caramels and other sweets, biscuits, and small fancy cakes.
Vanilla Sauce. To $\frac{1}{2} \mathrm{pt}$. white foundation sauce add 2 teaspoonfuls castor sugar. After cooking the sauce, as described in the article under that heading, add vanilla essence to taste, and serve in a hot tureen.
Vanilla Shape. An inexpensive and quickly prepared sweet, this is made in the follow-
ing way: Heat up 1 pt. milk, dissolve in it $\frac{1}{2} \mathrm{oz}$. sheet gelatinc, and then add the beaten yolks of two eggs and sugar and vanilla flavouring to taste. The milk must not be boiling. otherwise the eggs will curdle. Lastly, beat in the stiflly whipped white of cgg and the strained juice of a lemon pour the whole into a fancy mould previously rinsed with cold water, and leave it to set. When firm, turn it out and serve it with thick cold custard or whipped cream.

Vanilla Wafer. Sicve $\frac{1}{2}$ lb. Hour and $\frac{1}{2}$ teaspoonful salt into a basin and make a well in the centre. Beat up the yolks of 2 eggs, add to them I teaspoonfu! cold water, and then pour them into the centre of the flour, working in as much of the latter as the eggs will take up. Then add gradually enough water to mix the whole to a stiff dough, turn the latter on to a floured board, and knead it for about 10 min . or until the dough is smooth and soft.

Roll it out very thinly, stamp it into rounds or fancy shapes, and bake thesc in a hot oven on a slightly floured baking-tin for 5 to 8 min . or until they are yellowish-brown in coloup. When they are donc, brush them over with the whipped white of egg, dip them in powdered icing sugar, and put them back into the oven for 2 or 3 min ., when they will be ready to serve.

VANISHING CREAM. Unlike cold? cream and other similar toilet preparations, vanishing cream is non-greasy, and is used by many women as a basis for face powder.

VAPORIZER. The appliance known as a vaporizer is used for converting a combustible liquid into a gaseous state. In its domestic applications the vaporizer is limited chiefly to apparatus for generating light or heat The usual plan is to force a sma!! quantity of the liquid through a restricted space as, for example, a fine bore tube, or block of metal with small-sized holes through it, which has been heated to a sufficiently high temperature to convert the liquid into gas.

Another plan is to force the liquid through a spiral tube on to a revolving vane, which, by distributing it over a large area, breaks it up into fine particles, forming a gaseous mixture when air is added. By a third methodi the liquid is allowed to How by gravity into a chamber, the lower portion of which is filled with absorbent material, such as asbestos wick or some special form of porous brick. This becomes moistened with the liquid, which on exposure to the air is given off as vapour.
The name vaporizer is also given to an arrangement of various kinds for producing a fine spray of some liquid. See Air Gas, Blow Lamp; Cooker; Lamp: Oil Sprayer.

VAPOUR BATH. In chills, oncoming colds, rheumatism, certain diseases of the kidneys, and other conditions for which it is desirable to produce frec perspiration vapour baths may be used for the purpose. Some skin diseases, such as psoriasis, and types of eczema may also be benefited by a course of these baths. As they are however, very depressing in their effect, no person who has a weak heart should take them without. medical advice.
A simple arrangement for taking a hot vapour bath at home is to sit on a wooden chair placed over a large pan containing a few inches of hot water. Blankets should then be draped over the body, chair, and pan in the form of a tent, the body acting as the tent pole. Someone should then lift up one corner of the blanket, and place in the hot water (by the aid of some firc-tongs) a brick which has been heated in the fire. As the steam from the first brick subsides another may be added, until, after about 10 min ., a profuse perspiration breaks out. This may be followed by a cold plunge. See Turkish Bath.

VAPOURER MOTH. The caterpillars of this moth attack the foliage of a great variety of plants, including most of the fruit trees, and a large variety of other trees. They also devour herhaceous plants in garden and greenhouse. and may be described as general fceders.

The following method of dealing with this pest is in Leaflet 161 issued by the Ministry


Vapourer Moth. the caterpillars of which attack both greenhouse and garden plants
ous may be dealt with by hand conspicu spraying is notdesirable, or shaken off their food plant and destroyed from May to September

Attacked plants may be sprayed with lead arsenate to poison the foliage on which the caterpillars are feeding. The formula is $\frac{1}{2} \mathrm{lb}$. of lead arsenate paste dissolved in 10 to 12 gallons of water. The females being wingless and moving very little, the species can only apread in the catcrpillar stage. See Fruit: Insecticide: Pear; Spraying

VARICOSE VEIN. Firom a variety of causes veins often become dilated and tortuous, when they are said to be varicose. The most common site is in the legs. Policemen, shop assistants, washerwomen, and others whose work involves standing for most of the day are the principal victims. Tight garters and constipation, where frequent and prolonged, may have the same result. Thrombosis. that is. the formation of a blond-clot which results from inflammation of the vein. may sometimes block the vessel and cause dilatation of the veins below. Pregnancy and pelvis tumours are other causes. Once the awelling begins it tends to increase. Ulcers may develop and be very difficult to heal.

Garters should never be worn in any circumstances. Constipation should be prevented. Long standing must be avoided, and in the evening or at intervals during the day it is well to sit or lie on a couch and raise the legs. Exercise is necessary, but should be moderate. Cycling is one of the best forms, and some people find improvement follows dancing if not carried to excess.

So long as the veins do not give trouble or increase much in size nothing more may be necessary. Very often, however, some support is needed. If an elastic stocking is worn it should be of a good quality and a pcrfect fit. When bandages are used, the patient must learn to apply them properly. Any support, whether stocking or bandage, should he put on before getting out of bed and only removed at night while lying down in bed.

When the veins become painful, when ulceration or eczema is likely to ensue, or when the veins adhere to the skin and the risk of rupture arises, a radical cure should be sought. This may be procured by operation, but most people prefer to have their veins treated with injections of sodium salicylate or some other substance that produces a firm clot and thus closes it. See Elastic Stocking; Thrombosis; Ulcer.

VARIEGATION : In Plants. There are many variegated or coloured-leaved varietien of various shrubs and plants which normally have green leaves. The leaf colouring is usually white and green, ycllow and green, or cream and green, though there is a purplish tinge in some. Familiar examples are the variegated aspidistra, euonymus, privet, india-rubber plant and tradescantia. The leaves are liable to lose their colouring if the plante are grown in rich soil. See India-rubber Plant.

## Varnish and Varnishing

## How the Amateur Can Obtain the Best Results

In this contribution, after an account of the kinds of varnish suitable for home use, the process
of varnishing is described. Allied information will be found in the entries on the woods,
fixtures and pieces of furniture that are varnished, e.g. Door: Floor; Oak: Table. See also Brush: Enamel; Paint; Sprayer; Stain

Varnish is a transparent liquid used to form or linseed oil, and on no account should a protective coating with a glossy finish on woodwork and other material. It is applied with a brush or sometimes a spray, and after the lapse of a period varying in length according to the nature of the ingredients the varnish dries, leaving a hard and glass-like skin on the surface.

Generally speaking, varnishes are composed of oil, alcohol or water into which are dissolved various gums, resins, or colouring substances. Oil varnishes are the best for most house decoration. Spirit varnishes are employed for floors and margins, and are quicker in drying. Both kinds may be obtained ready made, and the best quality should always be used Cheap varnishes are composed of poor ingredients, which not only render then difficult of application and cause an uneven and streaky finish, but make the work liable to such blemishes as bloom and a tendency to remain wet.
Varnishes for household use comprise inside and outside. The latter variety is more suited to withstand the effects of the atmosphere, and it may also be used for interior work. Inside varniah should never be used for work out of doors, as it is not only inferior in waterproof qualities, but is apt to peel off when exposed to sunlight. A better class of varnish for outside work where a very good quality of tinish is necessary is that known as carriage varnish. These varietios are all made in various shades, white, light or dark oak, pale and dark, the two latter referring to carriage varnish. It is not advisable to apply two consecutive coats of varnishes made by different makers or of a different nature, as in the process of drying one may contract more than the other and so cause the surface to crack and exhibit other blemishes.

To a pply varnish successfully requires some experience. This can be obtained by experimenting, and it is advisable for the amateur, before com. mencing any serious work, to practise on spare pieces of wood. A suitable class of varnish should be selected in accordance with the nature of the work and the position in which it will be exposed

The Necessary Materials. The materials required are, firstly, two good camel or hog's hair brushes, one of these being wide and flat for wide surfaces, and the other rather smaller, for working in corners, etc. The brushes should be kept with the hair in either varnish
 Varnisting a Door. Fig. 1. Working the first coat on the panels with a flat brush. Fig. 2. Using the felting pad between the two coats of vareish. The motion of the band should be circular
the varnish be allowed to harden on the bristles. A jar can be used specially for the purpose of storing them, partially filled with oil or varnish. The cork should be a good fit, and have two holes cut through the centre large enough for the brush handles to pass through and tight enough to prevent them dropping right through into the jar. If necessary, a nail may be put loosely through the handle in order to hold the brush. The bristles only should be submerged, and it is a bad practice in all phases of the work to allow the handles to become covered with the varnish. If oil is used to keep the brushes in they should be thoroughly cleansed of the oil before use.

Two other requirements are glass paper and a felting pad, these being used for rubbing the work down between the costs. The pad consists simply of a piece of felt, and if desired may be mounted on a wooden base; the method of using it is described later. Pumice powder, for use in conjunction with the felting pad, is also needed. Apart from the bottle or can in which the varnish is stored, an open vessel is required in which to pour the varnish during the actual operation.

For indoor work the chief thing to guard against is a draught. The temperature should be moderate and consistent, and in cases where an open door or window causing a draught is unavoidable a gond plan is to use a screen. Another danger to be avoided is dust, which once it clings to wet varnish cannot be removed. In many cases it is necessary to rub the work down with glass paper before varnishing, and it is easential that the dust caused thereby be allowed to settle and be removed from the work before commencing to varnish.

The Processes Described. When new wond is to be varnished it is first necessary to prepare the surface with size, to prevent the wood from soaking up the varnish and thereby causing it to become blotchy and uneven. If the wond is not stained it should be first glass papered flat and smooth. Size should then be applied with a brush. If the wond is of a coarse, open nature the size should be rather thicker, and when the whole surface has been coated it should be allowed to dry thoroughly Care must be taken to prevent the size running into quirks and corners and accumulating, these parts being brushed out with a fairly dry brush.

A small quantity of varnish is poured into the open vessel, just sufficient for the immediate portion of the work to be covered. It is inadvisable to pour out too much, as it is liable to thicken, owing to evaporation.

Varnishing a Door. To get the best results a job like the varnishing of an outer door should be done at a time when there is the least likelihood of dust or disturbance. Probably the early morning would be chosen for the work. After removing any dust and rubbing down any parts which require
such treatment, the application of the varnish may be commenced.

The brush is dipped into the varnish, to about one-thind the length of the brist!es and applied straight to the door. A surplus should be avoided so that the brush does not drip It is worked in the same direction as the grain of the wood with a light pressure, then crosswise once, and linally with single strolies with the grain. It is necessary to work smartly, as the varnish scts fairly quickly The object in view is to obtain a flat surface free from brush marks. Lxperience will soon show the worker just how much the varnish may be worked

As shown in Fig. 1, the panclled portions of the door are varnished lirst, taking care to work well into the corners and edges. The varnish should be applied in a fair body, but great care must be exercised to avoid rumning. Having completed the recessed part, the rails and stiles are next attended to The stiles are first varnished, and the rails last, so that the joints are cleanly linished off. If, on a similar cloor, monldings are present, these should be picked in lastly with the smaller brush, being careful to avoid touching the panels or stiles, and working the varnish well out of the corners. The whole should then be left to dry thoroughly.
The sane process is adopted when varnishing all kinds of panelled work, working the panels first, then the rails, stiles, and finishing with the mouldings. All the joints in the woodwork should be cleanly finished, so that the brush is always drawn in the same direction as the grain of the wood. The time for drying varies, according to the varnish used and the atmospheric conditions, and this can only be decided by the conditions under which the amateur is working

Rubbing Down. When thoroughly ciry the wiole should be rubhed down with the felting pad. This is done by damping the work slightly with a sponge, dipping the felting pad into the pumicc powder, and rubling it on the surface with a circular motion, as in Fig. シ. The guirks and mouldings may be smoothed down with fine glass paper, care being taken not to rub the projections too vigorously, as this may remove the varnish, and when the second coat is applied it will present a patchy appearance owing to the varnisl। sinking into the bare wond. The whole slould be dried with a duster, removing any traces of dust caused by the glass paper.
The sccond coat is applied in a similar way to the first. If only two coats are desired, this should be finished off as cleanly as possible, the tinal strokes being always in onc direction and the bruah only lightly charged. When a third coat is to be applied, this is done in a similar way, rubbing down between each and being sure that the first coat is quite diy liefore attempting further work. Working on ret or tacky varnish has the effect of pulling off the previous coat. Thic process alove detailed may be arlopted for all ontside work.
Re-varnishing woodwork requires a similar process, but it must be rememhered that rarnish is transparent, and any defects in the under coat will slow plainly when the whole is tinished, so that if the original varnish is hadly damaged it will probably le best entirely to remove it. If, however, it is in fair condition, it should be first thoroughly cleaned with soap and water to remove any dirt and grease. A cotton rag is used for this purpose.
A painted surface may be varnished over. provider that the surface is Hat and not glossy. Plenty of turpentine in place of oil sloould be used in the final coat of paint when intended to le varnished. The process is then similar to that described for new woodwork, c.scept that it is unnecessary to size the work.
For old painted work, the surface should he cleaned with water to which is added soda.
and any nail holes or other inclentations filled in with putty toned to the required lue with colours ground in oil. Tho putty is applied with a linife, care bcing taken not to smear the surrounding surface and to smonth it. If soda is used to clean the work, it should be well rinsel off afterwards with clean water and thoroughly dried. The varnishing may then be carried out.

Treating a Floor. A task which often falls to the home worker is the varnishing of a floor. If the boards are quite hare, it will probably be desired to stain then first. The whole lloor, or that part of it to be varnished, should be lirst well scrubbed, and when dry given a coating of size, and once dgain left to dry. It is then smootherl down with fine glass paper, and all dust removed, first with a brush and linally with a cotton duster. The area can then be coloured as described in the article on Stain. Assuming an oil stain has becn used, a varnish with a similar composition can be employed in much the same inanner as described for other work

The varnish is used frcely, and is well worked out, especially at the corners. The best method is to conimence at one side and work towards the door when the whole lloor is to be coated as otherwise it may be impossible to leave the room without treading on the wet varnish, If two coats are desired the first should be allowed to set first, and is then felted down and lusted before the sccond, in the manner described above.

In cases where a large area has to be dealt with it may be worth while using one of the clear cellulose varnishes. applicd by a spray. A portable sprayer with foot pump can be obtained for a quite small outlay, and would soon pay for itsclf on the many and varied johs for which it is suitable. Information on these points will be found in the articles Enamel and Sprayer.

VASE. Though vases may be of chinn, pottery, marble, jade or other semi-precious stones, of gold, silver, brass,
 of sait, and if they are luted, or in any way difficult to reach with a cloth or the hand, a brush or small mop should be used for the purpose. See China, Copen hagen Ware ; Crown Derby ; Flowers; Garden Furniture Glass Ware; Jisper Ware : Pottery; Satsuma Ware Sealing Wax.

VASELINE, One of the most uscful remedies extensively employed in the home for chapped slin and for various other purposes is vaselinc, which is a greasy, whitish-yellow, semi-solid


Vase. Fig. 1. Ancient Roman onvx vase in a $12 t_{\text {a }}$ 15th or 16 th century, bearing en abbresiated inscription. Fig. 3. Reproduction of a silver Georgian vase. Fig. 4. Cut glass vasc of delicate and beautiful workmanship Fig 1. hin hermassion of the Director, Victorind and Albert Museum. S Kensinglon; Fig 4. Un courtesy of Cecil dirts
bronze, lead or pewter, of glass or papiermâché, the classical shapes continue to serve as morlels even when new forms of clecoration are introduced or applied. A glance at our illustrations of beautiful pieces, varying in styles and periods, reveals familiar shapes seen in vases made to-day of ordinary wares, except that Fig. 4 is often copied or adapted in cut glass without the lid.

Richly ornamented, precious metal, or gennine antique vascs are either collectors' picces or have a decorative value only Apart from the risli of damage or breakage they are not usually even effective as llower vases. For this purpose reproductions in plainer styles of pottery and glass of the classical shapes are most satisfactory. Two other shapes are popular: the straight jar for long stemmed flowers and the globe in glass with a small opening in which it is easy to arrange a few fine blooms.

For table clecoration one or two scts of tour small vases in iridescent, cut, coloured or engraved glass, in white ware, in green or brown pottery, silver or silver lustre are uscful. Whether small or large, llower vases should be shaped so that proportionately they hold plenty of water.

Glass vases need attention if they are to he kept bright and clearr. 'Jhey are very casily stained by flowers, and soap and water is not always sufficient to remove these stains. They should be cleaned periodically with a little spirit of salt, and if they are
 .
paraffin. It is a useful basis for certain ointments, as it does not become rancid.

VAULTING HORSE. As used in gymnastic exercises, the vaulting horse is made of wood suitably padded and covered with leather and supported on wooden legs which are adjustable as to height. A typical vaulting horse is illustrated in Fig. 1. It has $\Omega$ total length of 6 ft ., n width nt the top of 16 in ., and


Vaulting Horse. Fig. 1. Gymnastic uppliance which is adjustable to various beights
a height, without cxtension, of ahout 3 ft .3 in . The curved handles, known as pommels, are fitted in the centre, the portion of the horse between the pommels being the saddle. The left-hand pommel is the neck pommel (N.P.), and the left-hand end of the horse is the neck ( N. ). The right-hand pommel is the croup pommel (C.P.), and the right-hand end of the horse the croup (C.).
The horse is generally used with a spring hoard, referred to also as the bcating board. When the performer is standing so that the shoulders are parallel to the side of the horse, the horse itself is called side horse or horse sideways. Positions in which the line of the shoulders is at right angles to the length of the horse are called cross positions. The side of the horse at which the spring stands is the near side, and the side farthest awny from the board the off side.

The whole of the upper portion of the horse is covered with hide, and the pommels, which are $17 \frac{1}{2}$ in. apart, $4 \frac{3}{4} \mathrm{in}$. above the sadille, $1 \frac{1}{2}$ in. diameter, and $4 \frac{1}{2}$ in. circumference, are of iron covercd with leather, Hesh side outside, tightly sewn to the metal. The ponimels are removable and are attached by large flynuts undernenth the saddle. Exercises on the vaulting horse arc brgun with or without a run. but are always finished in the half-squat


Fig. 2. Smaller anpliance known as a vaulting buck. It is preferable in small gymnasiums
position prior to the upright position. The pominels are generally grasped with the hands, back upward, known as the pike grasp, with the palms of the hands slightly beyond the centre of the pominels towards the off side of the horse.
There are less expensive alternatives to the vaulting horse, such as the vaulting buck, in Fig. ${ }^{2}$. It consists ol a padded top covered

## Veal and How to Cook It

## With a Selection of Attractive Recipes

The reader of this article will also be interested in those that describe other ioints of meats, e.g. Beef; Mutton; and other items of houschold food. See also Bacon; Boning; Brawn; Curry; Food; Forcemeat; Pastry; Soup; Stuffing

The Hesh of the calf is closer in texture than weiglit. Chop the bones so that the breast may beef or mutton, and on this account it has been be dividerl into small pieces, and remove all said to be less digestible, but when pro perly gristle. Put into a frying-pan about 4 oz. handled in the kitchen it is one of the most butter and bacon fat mised together Floui nutritious and palatable of meats. Veal must the pieces of real and fry them in the fat till he eaten while fresh and reyuires to be well and judiciously Havoured with a stuffing or lemon, otherwise it is rather tasteless. Bacon or ham should accompany it to make up for the absence of fat.

Veal may be eaten in some forms by invalids Excellent broth is made from veal and also meat stock for white soups. The superior flavour of calf's head, liver, sweetbrearl. etc., is well known, whilc. the suet surrounding the kidney is particularly arlapted for light boileil puddings or forcemeats.

The calf, when it is killeıl, should be 8 or ! weeks old, and never more than 12 weeks. The best roasting pieces are the fillet, loin, and neck, and occasionally the oyster part of the shoulder. For cooking, 20 min . to the lb . is the correct average time.

A fillet of veal from a calf 8 weeks old should weigh just $12 \mathrm{lb} .$, but the butcher will always divide it into two or more portions. It is an economical joint, as there is very little bone and no waste. Before roasting, the centre piece of hone must be removed and the cavity filled with a well Havoured veal stuffing, of which lemon is always a feature. The stuffing must be well secured in the meat either by binding the joint together by tape or skewering it. Loins and necks of veal are not boned before being roasted, but the bones must be jointed carefully. The stuffing should be inserted by separating the skin from the llank from end to end with a sharp knife and forcing it in place, then it should be secured with string.
The outer slin of veal should be protected with a huttered paper or a piece of the canl, and when the joint is almost cooked the protecting paper should be removed, the surface dredgod with flour, well hasted, and the outside allowed to brown. Veal must be basted frequently while cooking with butter or good dripping provided for the purpose, as the meat possesses little or no fat. Bacon or ham should always accompany roast veal.

Veal Hotch-Potch. Breast of veal makes a good hotch potch. Use a piece about 5 lb . in
a light brown, then put them into a casserole and pour on them - quarts boiling water. Let all boil up, then add 1 pint green peas, a well-washed cos lettuce cut in strips, 2 blades of mace, 3 cloves and 15 black peppercorns tied up in a piece of muslin, a bouquet garni,
 and 2 onions cut in rings.

Season with salt and simmer for 3 hours. Before serving remove the bouquet and the bag of spices. In winter-time sprouts or the hearts of small savoy cabbages and celery cut small may be substituted for the green peas and lettuce.

Knuckle of Veal. This may be boiled or stewed, but much depends on the cut of the joint and how much meat accompanies the knuckle. If cut very low down in the leg, always stew it. A joint of 6 lb . will take from 2 to $2!$ hours to boil, but much longer in proportion for stewing, even if only 3 to 4 lb . in weight. Veal must always be cooked in plenty of water when boiled: it must be carefully skimmed and amply flavoured with vegetables. When dished, a sance should be poured over it into which part of the liquor in which the meat was cooked should he introduced. A small quantity of milk will whiten the sauce and soften it, and it may be tinished with parsley, hardboiled eggs, or, if preferred, it may be left plain.

Veal is a useful meat as the remains of cold joints can be made up into a number of excellent luncheon diahes and entrées. It curries and minces well, makes good rissoles and quenelles, and is excellent in such cold supper dishes as brawn, Cornish pastics, pies, and patties. Recipes for these veal dishes, or recipes which may equally well be adapted to the use of veal, are given under the various headings.
Veal and Ham Croquette. Nince fincly $\frac{1}{2} \mathrm{lb}$. cooked veal and hain mixed, allowing a bout $\hat{6} \mathrm{oz}$. veal to 2 oz . ham. Add 2 teaspoonfuls grated onion, the same chopped parsley. and a smiall teaspoonful grated lemon-rind. Mix all these to a crenmy consistency witl about l gill hot, thick white sauce, and senson carefully. Turn the nixture on to a plate to cool, shape it into even-sized shapes, such as balls, ovals, pear or cork shapes. Roll these in fine white
crumbs, then brush them over with well-beaten egg and give them a second coating of crumbs. Fry the croquettes in plenty of smoking hot fat. Drain, and serve on a fancy dish paper, garnishing with fried parsley.

Veal and Ham Pie. Make some flaky prstry according to the directions given in the general article on Pastry. Roll out to required thickness. Cut $1 \frac{1}{2} \mathrm{lb}$. lean veal and $\frac{1}{2} \mathrm{lb}$. lean ham into neat squares, slice 2 or 3 hard-boiled eggs, and use the slices to ornament the sides and

each of salt, pepper, and nutmeg Remove all the bones and tendons from the meat and spread it, with the skin downward, on the table. Season the meat carcfully with salt, pepper and a little nutmeg Next remove the skin from the sausages, season the sausage meat, and spread half of it evenly over the veal. Cut the ham and eggs in long strips, and arrange them alternately and evenly down the length of the veal so that when it is rolled up the strips run from end to end.

Season the veal again and then spread on the rest of the sausage mixture. Roll up the veal neatly !rom side to side and tie it up in a cloth like a roly-poly pudding. Put it in the stock pot and let it simmer gently for 2 or 3 hours. Then untie the cloth re-roll the meat in it, and place it between two tins or dishes with weights placed at even distances on the top one Leave it until it is quite cold, then take off the cloth, trim a small piece off each end, and brush it all over with a little melted glaze
Veal Goulash. This stew is made by slicing a large onion into thin rings, frying it in a rings, frying it in a dice.
 bottom of the dish, pressing veal on top, and shake over it a little chopped parsley and some powdered mixed herbs, a little grated lemon-rind and seasoning to taste. Cover these with a layer of ham and continue thus until the dish is full. The last layer should be of ham. Pour in some stock, preferably made from veal bones, half filling the dish with it. Damp the edge of the dish, lay a strip of pastry on it, damp this also, and then cover the pie with the pastry. ornamenting the top with pastry leaves and tassel.

Bake the pic in a hot oven for ahout two hours. In hot weather a little gelatine should be added to the stock so that it is certain to set in a jelly. To make a raised veal and ham pie see directions for pork pie and the illustration of pie mould in

## pages 985-986.

Veal Forcemeat. Suet is an important in- stewpan, containing gredient in stuffing for veal as the fat is $1 \frac{1}{2}$ oz. dripping, and essential; l oz. shrealded suet should be when it is lightly allowed to $\frac{1}{2}$ oz. breadcrumbs. Chop 4 oz. browned adding shredded suet finely, mix with it 6 oz . bread- $1 \frac{1}{2} \mathrm{lb}$. leau veal cut crumbs, 1 tablespoonful finely chopped parsley. the grated rind of a lemon, 1 teaspoonful mixed herbs, 1 dessertapoonful lemon-juice, 1 pinch nutmeg, pepper and salt to taste, 2 rashers fat bacon minced finely. These ingredients are bound together with a beaten egg and a little milk.

The stuffing when made can either be pressed inside the joint to be stuffed, or, if preferred, formed into balls rolled in flour and baked in the oven.
Veal Galantine. To male this, take a small breast of veal, 2 lb . pork sausages, $\frac{1}{2} \mathrm{lb}$. cooked bam or bacon. 3 hard-boiled eggs, with a little
into small squares and freed from skin I'ut the lid on the pan and cook the meat until it has lost its rawness; then spinkle in 13 oz. flour and seasoning to taste, stirring the whole well so that the flour is mixed thoroughly. Pour in about a teacupful of stock and a large
glassful of Madeira. and cover the pan again. simmering its contents at the side of the stove, stirring them now and again to prevent burn. ing, and adding more stock if the stew becomes too dry. The time required for cooking is about 2 hours. Half an hour before the stew has finished cooking add four average-sized potatoes cut into small cubes.
Veal Mould. This very serviceable and appetizing dish can be made from l lb . un. cooked veal, 2 hard-boiled eggs. 4 oz . bacon, a little grated lemon-rind some mixed herbs, and a little parsley finely chopped. A little seasoning, some salad for garnishing, and a pint of white stock are also necessary.
Grease a mould slightly, cut one egg into slices, and with it decorate the bottom and sides of the mould Remove any skin or gristle from the veal and cut it and the bacon into small dice; then chop up the other egg. Mix the veal, bacon, egg, herbs, and lemon-rind together, add a little parsley and season it with pepper and salt. Place this in the prepared mould, taking care not to pack it too tightly and moisten each !ayer with seasoned stock.
Cover the mould with a greased paper, place the tin on a baking sheet. and cook it in a moderate oven for $1 \frac{1}{4}$ or $1 \frac{1}{2}$ hours. Then remove it from the oven and fill up the mould with some warmed and seasoned stock. When it is cold and set, dip the mould in hot water and turn the contents into a dish Garnish it with a little green salad composed of lettuce, endive, and cress, season it with pepper and salt, and sprinkle a few drops of Icmon-juice over it.

Veal Pudding. Make l lb. suet crust (q. v.). Cut 2 lb . lean veal and 4 oz . ham into small dice. Grease a pudding-basin, roll out twothirds of the pastry, and line the hasin with it. Put in a layer of real and ham, sprinkle over them a little chopped parsley, grated lemon-rind, and seasoning to taste, and then cover them with some slices of hard-boiled egg; 2 eggs should be sufficient. Continue until the basin is full, and then pour in a gill of water.

Roll out the remainder of the pastry to fit the top of the basin, wet the edges, and put it on, pressing it well. Tie a pudding-cloth over the basin, and then put the latter into a pan of boiling water. Boil for two hours, adding more boiling water when necessary:
Veal Ragoût. This stew may be cooked and served in a casserole. Cut 2 or 3 thin rashers of fat bacon into small pieces, fry them lightly in an earthenware casserole, and then add an onion cut into thin rings. Cook this without browning it for a few minutes, and then put in I lb. veal, previousily freed from skin and bone and cut into pieces of a convenient size, a bunch of mixed herbs, a little shredded celery, and seasoning to taste. Add also 1 teacupfnl stock; then cover the pan and cook its contents at the side of the fire or in a cool oven for about 2 hours or until the meat is tender. When it is cooked take nut the herbs.

# Vegetables and Vegetarian Cookery 

Directions for Preparation and Recipes for Appetizing Dishes

n addition to this article, which deals with vegetables in general and the main principles of Vegetarian Cookery, our work contains entries on the different vegetables, e.g. Cabbage; Celery Onion; Potato. See also Casserole; Diet; Food; Kitchen Garden; Pastry

In gardening the name of vegetable is given to those plants which have edible roots, stems, shoots, flowers, or leaves. Vegetables arc divided into the following chief classes, examples being given of each: Legume-pens and beans: edible rooted-beet, turnip, onion. potato; salads-endive, lettuce, mustard, and cress: vegetables which are really fruitstomatoes, vegetable marrows, cucumbers and capsicums. Cabbage, kale, Brussels sprouts and asparagus are valued for their leaves or shoots, chicory and seakale for their blanched growth, rhubarb and celery for their leaf stalks, and cauliflower and broccoli for the edible flower heads. The mushroom is invariably classed ns a vegetable, although it is really a fungus. Herbs such as parsley, sage, thyme, and other savoury flavourings are usually classed among the vegetables.

Methods of Cooking. The time for boiling vcgetables varies. The Cook's Time-table (given in back cover Part 13) should be consulted Salted water must always be used, the proportion being 1 oz . salt to each gallon of water. Most vegetables should be plunged into fast-boiling water, old potatoes and onions excepted. Old potatoes require cold water, and should not be cooked too fast. New potatoes should be cooked in hot water

Jerusalem artichokes, salsify, and roots of a like character may be cooked partly with milk. An acid, such as lemon-juice, should be added.

Blanched vegetables-seakale, celery, etc.require careful handling, and are usually tied in bundles before being boiled. They are served on toast, being soft and watery. Asparagus is also tied and served on toast.

Onions are better if they are blanched before boiling, that is, if they are boiled up and allowed to cook about 10 min ., then the water thrown a way, cold water poured on them, and finished in the second water. If treated thus they will be whiter and a finer flavour. Leeks are cooked like onions, but are easier to dish if tied in bundles for cooking. All dried pulse must be soaked for at least 12 hours before being cooked, and must be carcfully picked over.

When soaking greens to revive them from packing or handling, add no salt to the water until they have freshened up a little, then change the water and salt it. They should remain about 20 min . without salt. After being thoroughly cleaned they should be plunged in plenty of fast-boiling water and salted according to the directions given.
Green vegetables should be boiled with the lid off the pan to keep their colour. Common soda should never be added to soften hard water. A pinch of bicarbonate of soda may be us 3 d with an enamelled pan or carthenware casserole; not.with aluminium warc. Many salad herbs may be boiled and served as green vegetables. Lettuce particularly is adapted for this purpose. As soon as the vegetables are cooked they should be drained in a strainer or colander, otherwise they absorb water, lose flavour and become discoloured.

It should be the first aim of the cook to preserve as completely as possible the healthgiving salts in vegetables. The usual method of boiling vegetables is too often uneconomical, unwholesome, and destructive of Havour The more hygienic method is steaming.
All the garden roots arc more palatable and wholesome when steamed. There is great loss in boiling carrots, parsnips, and turnips. The nutrients are not abundant in these vegetables, and after boiling only a small residuc remains. Artichokes and beetroot may be steamed, and the taste will be improved. The starch and
sugar in parsnips and carrots is much wasted by boiling. When large roots are steamed they should be cut into portions. Small carrots, turnips, parsnips, and beetroots can be steanied whole. A little salt should be sprinkled over all vegetables before cooking.
Drying of Vegetables. Vegetables are dried commercially by machinery, but the housewife may dry small quantities in the oven. Drying trays may be purchased ready made, or may be constructed by nailing together in a square four wooden laths, and stretching wire gauze across the framework. Vegetables should not be put on the iron trays of the oven. Drying must be done only in a moderately warm oven. After the oven has been used for cooking, take out the oven shelf, put in the drying tray with its charge of vegetables, and leave it all night, with the oven door ajar. On the following morning remove the tray, but if the contents are not dry, put it back in the oven in the evening.
The warm, dry air arising from the kitchen fire may be used for drying fruit and vegetables. The drying tray may be placed on the plate rack, or, if the fire is low, the tray may be hung below the rack. In tbe casc of old-fashioned fireplaces, with the chimney opening immediately over the fire, the tray must be placed sufficiently in front to prevent smoke from passing through the tray, for although the fumes of charcoal, coke, or gas will not cause the dry material to taste, coal or wood smoke will do so. In all cascs the heat must not be sufficient to scorch the vegetables.
Carrots, parsnips, turnips, swedes, and beet need peeling and scraping in order to remove the outer skin. They should then be cut into slices $\frac{3}{16}$ in. thick, or into shreds by means of a hand grater. Steam them for a few minutes, then place them thinly on the tray and transfer them to the oven. The temperature must not exceed $160^{\circ} \mathrm{F}$., otherwise the vegetables will brown. With onions, to avoid the unplcasantness of peeling, immerse them in boiling water for a minute. Then peel and slice them, but do not stcam them before drying them as the other vcgetables mentioned. Leeks should bc treated in the same way, except that they should not be placed in boiling water.


Vegetable Rack. Convenient type of wire ract for the small larder which allows for access of air to the

Spinach, parsley, or mint should be blanched by plunging them into boiling water to which has been added a iittle bicarbonatc of soda, until well scalded. Cool in cold water, drain, and spread on the drying trays. The more quickly these are dried the better the colour is retained, but when drying rapidly they should be watched closely to prevent scorching. These may be dried without blanching, but the colour is not usually so good. Green peas should be well developed but not old. After shelling, put them into a saucepan with some good sprigs of mint, a little salt and a pinch of bicarbonate of soda, cover with cold water, and bring to the boil, or they may be plunged into boiling water and retained there for a few minutes. Finally, cool them in cold water drain, spread evenly on trays, and dry until quite firm.

With runner beans sclect those that are not quite full grown, string and slice, then blanch and cool the same as for peas, but without mint. Spread on the trays to a depth of about $\frac{1}{2}$ in., and when well warmed move them about occasionally to allow the air to circulate freely. When the pieces break upon bending them with the fingers they are quite dry. As regards broad beans, shell well-dcveloped but not old ones. Blanch them in plain boiling water in the same way as peas, and dry them until they become like seed beans.
Celery may be dried in the long leaf or cut up into small picces. It is improved by blanching, although this process is not really necessary. The green outside leaves arc also excellent for flavouring when dried, but these should be blanched like runner beans. Thyme and sage should be dried slowly, at a warm teinperature, or simply hung up in bunches in a warm, airy place

When soaking vegetables for use, a little bicarbonate of soda added to the water will assist them to regain size more quickly.

To store them, the best way is to put the dry vegetables in stout brown paper bage and to hang the bags in the kitchen. If no thoroughly dry room is available, store them in tins or in airtight bottles.

During spring and sumner, when fresh vegetables are plentiful, it is a wise plan to bottle some of them for winter use. A simple outfit is illustrated in page 1008.

Vegetable Presser. Constructed from a good hardwood, the presser is employed to remove the surplus water from vegetables which have bcen placed for the purpose in a colander. These pressers are obtainable in turned wood with a flat and a slightly domed surface.
Vegetable Rack. Racks for the storing of vegetables are made in wood and in metal. An inexpensive, clean and convenient type of wire rack for the small larder is here illustrated. The air is able to reach all the contents of the rack and to keep them fresh and crisper than when stored in wooden trays. The racks are obtainable enamelled in colours.

Vegetarian Cookery. Vegetarian dishes should not be principally composed of vegetables, as excess of the everyday vegetable will cause Hatulence. Nuts, cereals and, where they are included in the diet, eggs and checse are all uscful as main ingredients for thesc dishes. Peas and beans seem nore easily digested if taken in a moist form and if mashed or made into a puréc. Hence pea or bean soup is both wholcsome and agrecable, but, on the other hand, pease pudding or a dish of plain boiled beans will prove indigestible to some persons.

The swect course in a vegetarian dinner or luncheon may be much the same as that for a meat meal, only no suet or lard may be used in the preparation of puddings or pastry, neither may lard be used for any kind of cakes or even for greasing tins. Vegetable butter or real butter is the only fat permissible. Oil is the best medium for frying.

Freah salad herbs should form part of the meal where foods somewhat deficient in mineral salts are the principal dish, pulse foods, for instance. If salad is difficult to obtain, the use of lemons is recommended: oranges also are beneficial, while grapes contain the necessary health salts. Many excellent recipes for salads are given under that heading

Dried fruits such as dates, prunes, raisins, and fige are nourishing and useful in the pre paration of many dishes. Nuts are usually ground, particularly if they are to be added to other ingredients, and a nut mill can be bought for this purpose. Cheese is a strength. giving food and therefore most valuable where meat is omitted. For persons of sedentary habits it is more digestible if grated or cut in small pieces and mixed with other ingredicnts.

Specimen Menus. The following are two specimen menus for a vegetarian meal, the first being suitable for winter and the other for summer

No. 1
Salsify Soup
Lentil Stew
Cauliflower au Gratin. Mashed Potatoes Orange and Chestnut Cream

Dessert
No. 2
Tomato Soup
Haricot Bean Cutlets
Green Peas Cherry Pie

## Dessert

Salsify soup is made like ordinary white soup, except that the necessary liquid or stock consists of water and 1 milk. The lentil stew is inade by soaking overnight and preparing 1 pint red lentils, then stirring them for 5 min . in 2 oz . butter which has been melted in a stewpan. Add l quart cold water, and when all boils up put in 2 onions, 3 sticks celery, 2 carrots (all prepared and cut small), 1 teaspoonful grated lemon-rind, and seasoning. Simmer for $1 \frac{3}{4}$ hours, then stir in 1 oz . barley flour mixed to a thin paste, also 1 tablespoonful chopped parsley and the same of red currant jelly. Cook again for 15 to 20 min ., when the stew should be thick enough. Serve it with croûtons of fried bread or toast.
Orange and chestnut cream is made with chestnut puree and sections of oranges pecled and pipped and tossed in a strong syrup. The purée and oranges should be piled in alternate layers on a dish and masked with whipped and sweetened cream.
In the summer menu the tomato soup differs little from an ordinary tomato soup, except that bacon is omitted and bran stock is substituted for the meat stock. This is made by pouring 1 quart boiling water over 2 tablespoonfuls bran, letting it stand till cold, and then straining it. A small quantity of creain should be boiled up in the soup just before serving it, and it should be well seasoned.

Haricot bean cutlets are made by cooking 1 pint white haricot beans with 4 shallots till tender, then chopping them fine. A thick sauce must then be made, using $1 \frac{1}{2} \mathrm{oz}$. butter, $1 \frac{1}{2}$ on. Hour, 1 gill water that beans are boiled in, and 1 gill milk or cream. Season the sauce well, add the beans, 1 tablespoonful prepared and chopped mushrooms, $\frac{1}{4}$ teaspoonful each mace and lemon-juice, and a little chopped parsley, and mix all together. When cold, shape into cutlets, egg, crumb, and fry in boiling oil. Serve with horseradish sauce.

Many savoury vegetarian dishes may be made by using Italian pastes, macaroni, vermicelli, spaghetti and noodles as a foundation, including also Tagliatelli. For this make a smooth, firm dough with 1 lb . Hour, 5 eggs, 1 oz. butter, salt, and warm water as requircd. Roll out the paste $\frac{1}{18}$ in.
thick, let it set, and then lold it over and over flouring it to prevent sticking. Cut it into shreds and poach for 6 min . in salted water.

Porridge is useful as a breakfast dish. An uncoinmon kind to-day is the old-fashioned frumenty, a wheatmeal porridge llavoured with raisins and cooked in a jar in the oven for several hours. Gelatine must not be used in vegetarian cookery. Aga-aga is sometimes substituted, but it is not recommended for general purposes. Recipes for vegetable cur ries are given in the general article on Curry
Galantine. Excellent vegetarian entrées are made of nuts, onions, or lentils as the basic ingredient. Nuts of any kind and breadcrumbs, boiled rice or mashed potatocs form the main ingredients of a good galantine. It is inade by shelling and blanching 3 oz . nuts, skinning them, and putting them through a mincing machine. To this mince add $\frac{1}{2} \mathrm{lb}$. breadcrumbs, or the same quantity of rice or potatoes, a finely minced onion, and 1 teaspoonful each of chopped parsley and mixed herbs. Season the mixture well, and bind it with 1 gill stiff white or tomato sauce, and the well-beaten yolks of two eggs.
Shape the whole to form a large sausage Put it into a scalaed floured cloth, tie the ends securely and place it in a saucepan of boiling water. Let it simmer for $1 \frac{1}{2}$ hours, put it on a dish, remove the cloth, and press the galantine between two tins with a weight on top. Leave it until it is cold, then trim the ends neatly and brush it over with glaze.

Lentil Cake. The ingredients for a lentil cake are $\frac{1}{2} \mathrm{lb}$. cooked lentils, $\frac{1}{2} \mathrm{lb}$. cooked potatoes, 1 oz. margarine, $\frac{1}{\frac{1}{2}}$ teaspoonful powdercd herbs, a teaspoonful each of chopped parsley, grated onion. flour, milk, breadcrumbs, and frying with a little salt and pepper.
The lentils, which should not be watery, should be rubbed through a sieve with the potatces. Then melt the margarine add the lentils, potatocs, herbs, parsley and onion, after which the whole should be heated, seasoned and mixed well together. Turn the mixture on to a plate to cool, and make it into small flat cakes on a floured hoard. They should he brushed over with milk, coated with breadcrumbs and fried in hot fat. When ready, drain them on soft paper and serve them on $\Omega$ hot dish garnished with fried parsley.

The cakes will be improved if a beaten egg is added to the mixture while it is being heated. Another way is to place on each calie either a poached egg or half a hard boiled one with the cut end downwards, the egg being coated with tomato sauce.
Onion Pudding. To make an appetizing onion dish, take six small Spanish onions, 1 breakfastcupful breadcrumbs, an egg, a little milk, and some brown gravy, together with 1 dessertspoonful melted butter, a little grated lemon-rind, a pinch of nutmeg, and a little pepper and salt. Slice the onions and fry them to a golden brown, and then line a small pudding basin with them. Mix the bread. crumbs, the egg, which has been well beaten, the butter, nutmeg, and lemon-rind together: add the pepper and salt, and mix all thoroughly with a little milk. Pour this mixture over the onions and steam it for $1 \frac{1}{2}$ hours. The gravy should be heated and used for serving with it.
Vegetable Patty. Cooked vegetables. such as carrots, turnips, pas, etc., can be made into patties in the following way: Line some greased patty pans with short pastry, using butter instead of lard, as given in the recipe in page 912 , or half butter and half margarine, fill the cases with rice so as to prevent them from rising in the centre, and then bake them in a hot oven until they are lightly browned. Bake also some strips of pastry shaped like handles. In the meantime, cut all the vege-
tables, except the peas into small dice heat them up in a little thick white sauce and season them to taste

When the pastry cases are cooked take out the rice and turn them out of the pans, fill them up with the hot vegetable mixture and fix a handle to each, using a little raw white of egg to fasten these to the sides. Serve the pattics at once. They are better caten hot than cold

Vegetable Pie. A hot vegetable pie can be made thus: melt 1 oz. margarine in a small pan, add 2 -tablespoonfuls chopped onion and fry these to a pale brown colour before pouring in 1 gill brown sauce or gravy. Simmer the whole for about 4 min ., then add $\frac{1}{} \mathrm{lb}$. cooked macaroni cut into small pieces and 2 oz . grated chcese.

Break a small cooked cauliflower into sprays. and peel and slice 3 tomatoes and 4 large mushrooms. Arrange these in !ayers in a well-greased pie-dish. cover them with the macaroni and sauce, and then put on a lid of short-crust pastry. Decorate the edges with a knife, ornament the to $p$ with pastry leaves, and then bake the pie in a hot oven until it is lightly browned. Serve it in the dish in which it is cooked.
VEGETABLE MARROW. This is the full name for the vegetable more usually known as the marrow, hints on the growing of which and recipes for marrow dishes are given in page 773 . See Marrow.
VELLUM : How to Mount. Vellum is the name given to parchment made from the skin of young calves and lambs, which is exceedingly durable, and is used for legal documents, bookhinding, and for illuminated nddresses. It is finished with an ivorine appearance and is unequalled as a surface for lampshades and other articles for which mitation vellum or vellum paper is generally used. Vellum can be stained by first soaking it in water and then dipping it in a chemical or vegctable dye, but it is advisable to test the effect of the dye on a scrap of the material before attempting a whole skin, as dyes differ widely in their action.

In the preparation of vellum for writing or illuminating considerablo care is required, and although it is often stretched on a board by professional workers, the better plan for the amateur is to mount it on a suitable board. The materials required are a sheet of mounting board of the thickness known as 8 sheet, a basin in which hot water is placed, covered by a saucer, two teaspoonfuls of seccotine and two of hot water being mixed together in the saucer, a basin of cold water, some sheets of clean white paper and some greaseproof paper or thin vegetable parchment, two pieces of clean linen about the size of a handkerchicf, two small sponges, some fine pumice powder, two Hat boards, a piece of heavy cardboard, and some weights for the purpose of keeping the mounted vellum under steady pressure.

First of all the vellum is placed right side up on a shcet of clean paper and thoroughly clamped with a sponge with cold water; the surplus water is wiped off with one of the linen cloths, and then the vellum is turned over and the same procedure carried out on the other side. Wipe off the surplus moisture as before, and then dip the other sponge in the seccotine mixture and thoroughly cover the back, taking care that the extreme edges are covered with the scccotine.

The vellum is now lifted up and placed in the centrc of the mount, with the edges quite square. Beginning at the top, the surface is stroked down with a clean linen cloth to remove the air from underneath and to bring the material into the closest contact with the mount. A sheet of clean white paper is placed on the top of the vellum, the cardboard is laid over it, and the mounted work
is put between two boards with the weights on top. The vellum should be kept under pressure for at least twelve hours in order to allow it to dry quite firm and even before decorating it.
The material is now ready, and should be dusted over with some fine pumice powder, but on no account should it be touched with the fingers. The design or lettering to be placed on the vellum is first drawn out on a piece of thin paper as carefully as possible. The back of the paper is rubbed over with blacklead and thoroughly rubbed in with a picce of rag. The drawing is placed in position, a a the lines transferred to the vellum with an agate tracer or fine stylo, only the thinnest line being required. Ordinary carbon transfer paper is not suitable for use with vellum, owing to its greasy nature and the liability of making other marks caused by the pressure of the fingers on the paper while working.
For the ink work, a waterproof Indian ink should be used. A ruling pen should be employed for straight lines and other lines that can be drawn with a compass; for freehand lines and lettering a fine drawing-pen is required. Colouring is done with the best quality of water colours mixed with a little gum arabic. Gold can be applied, but it should be shell gold and mixed with gum arabic. For silver effects it is better to use aluminium in the same way as the gold, as it is not liable to tarnish as is the case with silver. Lines can be rubbed out with putty rubber.
Scraps of vellum hoiled down make an excellent size for applying gold-leaf, and this is the material generally used. For the purposes of bookbinding there are several kinds of vellum available. Prepared or artist's vellum is prepared in the natural colour of the skin. Roman vellum is similar but darker; it is always attached to the boards with the flesh side downward. Vellum can be cleaned with benzine applied with a sponge, stains being removed in this way without destroying the texture. See Bookbinding; Lampshade.
VELOUR: The Material. The French name for velvet is given in Great Britain both to wool and cot ton plain cloths made with a short and more or less velvety nap, which is produced by finishing the cloth in a special manner. This nap is soft to the touch, and it enriches the colour, lending a peach-like bloom.

Wool velour cloths sometimes show a fancy design, and are known as jacquard velours where the design is woven. Sometimes the pattern is mercly embossed and therefore less permanent.
Cotton velour, which makes rich-looking curtains, showing a double tone of colour, is obtainable in a finc range of colours, warranted not to fade.
VELOUR HAT. Made essentially for winter wear, velour hats are manufactured from hare fur on a foundation of soft felt. The better qualities have a silky, plush-like surface, and Austrian velours, which are the finest of all, are among the most expensive and durable of hats. The cheaper kinds, and especially the imitation velours, wear badly, and quickly lose their shape.
VELTHEIMIA. This is a South African bulb suitable for cultivation in pots in the greenhouse or in a warm sheltered border out of doors. A suitable compost consists of loamy soil with a little leaf-mould, decayed manure and sand. The chief kind is Veltheimia viridiflora, with rich green leaves and pale rose-coloured Howers in summer on a stem 12 in. or more high.
VELVET. Millinery velvet is usually narrow. Collar velvet is a specially dense and fine fabr:c, built for hard wear. Old-fashioned
dress velvet was a warm, hard-wearing silk pile fabric which is not much uscd nowadays. The chiffon and ring velvets are made with a lighter and more open pilc. They hang in graccful folds, and have a soft. rich and glossy surface in which the separate rows of tufts can often be scen.
The most exquisite shades can be dyed on silk velvet and no fabric shows off a fine
 velvet has to be turned down and bemmed
colour to greater advantage. The mohair velvets or moquettes are used largely in place of silk velvet for upholstery.

When cutting velvet for nillinery and trimmings care should be taken to cut it on the cross, otherwise there may be trouble in getting it to lie flat. Velvet can be freshened in appearance by steaming with a hot iron. The face of the iron should be turned uppermost and the velvet passed over the surface by hand. Cuttings of velvet should always

## Veneering for the Amateur Cabinet Maker

## A Decorative and Useful Method of Surface Treatment

In this work are associated articles, ealing with Inlaying and Marquetry. The use of veneers in renovating old furniture is explained in the article on Chest of Drawers. See also Cabinet
Maxi..g; Dressing Table; Sofa; Wardrobe

Vencering is the process of applying a comparatively thin sheet of wood of fine or rare quality to a groundwork of a plainer variety of wood. It thus enables many beautiful woods to be employed for decorative work which are prone to twist or crack if made use of in the solid. A typical example is the employment of curls and burrs, which would prove com pletely unsatisfactory unless applied in the form of veneers.

It is also the only satisfactory method of employing such decorative effects as quartering, balanced matching of grain, and other flat treatments in which the work relies for its effect upon the disposition of various woods, the grain of which runs in contrary directions. In shaped work veneering is almost indispens able. To cut the wood in the solid would entail a certain amount of end graining showing, an undesirable feature in itsclf owing to its exhibiting no beauty of grain and the fact that it does not polish well. Also it would involve weakness of construction.

There are two kinds of veneer, known as knife and saw cut, according to the instrument employed. Knife cut is the thinner of the two and is cut by one of two methods, cither


Veneering. Fig. 1. Cutting knife-cut veneer with a veneer gaw worked againsi a atraight edge
rotary or flat. In the former a $\log$ is placed in a structure similar in principle to a lathe and having a long knife edge stretching along its whole length. The knife is adjusted to cut the required thickness and moves forward against the $\log$ as it revolves, thus cutting a veneer the same length as the $\log$ and of practically unlimited width.
This method has the effect of giving a very enlarged grain, and is impracticable when, for example, a wood is to be cut which relies for its appearance upon the medullary rays, as in figured oak. for which the Hat-knife method is adopted. The finer woods are cut in this way, a machine similar to a plane taking off venecrs. Saw-cut vencers run from $\frac{1}{32}$ in. to $\frac{1}{18}$ in and are cut with a circular saw, all such woods as curls being cut by this method.
Preparing the Ground. A very important considcration in veneering is the ground to which it is to be applied. The wood should be

as straight in the grain as possible, clean and dry, and with the least tendency to warp and shrink. For these reasons Honduras mahogany is the most suitable, as it is not only reliable but holds the glue well. Yellow pine also makes a good ground, and, if possible, a board having the medullary rays running through it should be chosen, as boards cut in this way are less likely to twist. All soft woods should be sized before the glue is applied for the veneering process, as otherwise the ground will be

apt to soak up more than its slare of the glue and leave the veneer liable to peel off.

As the tendency of veneer is to pull the ground, making a hollow surface, it is advisable to apply the vencer on the heart side of the wood so that the natural pull of the wood is opposed to that of the veneer. Another good plan, in order to avoid undue twisting, is to damp the back of the ground. Note that wherever possible, the wood should be veneered on both sides.

All grounds should be roughened with a toothing plane before any vencer is applied. This is done after the ground has first been planed perfectly true and llat. After the use of the toothing plane the ground is ready for the veneer, except in the case of a pine or deal ground, when it is necessary first to size it. The size, which is composed of thin glue, is applied hot with a brush and allowed to harden, when it is rubbed down with coarse glass paper and all dust removed with a brush.

Cutting the Veneer. A piece of veneer is now cut to the size required. If knife-cut venecr is used, this operation may be accomplished with a chisel, as in Fig. 1, using a strnight edge to ensure a straight cut. The straight edge should be firmly held down with the left hand as shown and the chisel held in the right with the bevelled side against the straight edge, and drawn across the veneer. The vencer should be placed on a flat board during the cutting to give support for the chisel, and carc should be cxercised at the completion of the cut to avoid tearing away the edge of the vencer. An extra allowance of about $\frac{1}{2}$ in. should be made on all sides.

Saw-cut veneers may be cut with a chisel, if desired, although a better method is to use a vencer saw, as illustrated in Fig 2. The saw consists of a blarle having a slightly rounded cdge and fitted with a handle screwed to one side of the bladc. It is worked against a straight edge, which, if a wide picce of veneer is heing cut, should be hand-screwed or cramped to the bench to avoid its shifting.

For cutting narrow strips of vencer of equal width a cutting gauge may be used. In this case the sheet of veneer is placed to overhang alightly a that board, and another board or a batten sulliciently long to reach the width of the shect placed on the top a short distance from the end and firmly held down with the left hand. The purpose of the top batten is to
prevent the vencer from buckling, whic would render it liable to split. A cutting gauge is then set to the required width and worked along the edge of the sheet in the manner shown in Fig. 3. Only a slight pressure should be maintained, making several light cuts in preference to one decp one. The vencer should not be cut right through from one side, but is reversed after being cut half through and the process then completed from the other.


Veneering. Fig. 3. Cutting narrow strips of veneer wita a cutting gauge. Fig. 4. Heating the glue under the veneer with a flat-iron. Fig. 5. Use of veneering hammer to squeeze glue out beneath veneer. The movement of the hammer is shown in the diagram below. Fig. 6. Cutting overbanging edges away with a chisel. Fig. 7. One-half of veneer laid and remainder being placed in position, edges overlapping. Fig. 8. Cutting through both thicknesses to make a clean joint
Applying Veneer. For the actual process It will be found necessary to reheat the glue of veneering two methods are available, the with the iron once or twice during the process. hammer and the caul. The latter is used for laying saw-cut veneers, and in all cases where built-up patterns of veneers such as quartering and the like are employed. The former method is employed successfully for the majority of knife-cut veneers. Having trued up the ground a flat-iron is heated and glue prepared.

The glue should be as hot as possible, and of such a consistency that when the brush is lifted from the pot the giue runs down in a continuous stream. All the ground is coated with the glue and also the underside of the veneer, care being taken that no grit or foreign matter is allowed to remain in the gluc. The veneer is placed on the ground in position, and the surface rubbed lightly over with the hands. A wet swab is rubbed over the whole to moisten it, and a little glue added so that


Fig. 9
glue underneath is not un duly weakened.
The hot iron is passed lightly across the surface to heat about half the glue, as shown in liig. 4. A venecring hammer is used to remove

Fig. 9. Showing zig-zag movement of veneering hammer illustrated in use in Fig. 5 above. Fig. 10. Details of veneering hammer; it consists of a brass blade fitted into a block of wood with bandle allacked

When the whole has been worked over with the hammer, the surface is wiped clean with the swab and tested to see that the veneer is everywhere down. This may be done by lightly tapping with the finger nails, when if the work is correctly done, a solid fecl is apparent Any bubbles will be obvious from a ho!low sound, and any such places should be remedied by rcheating and working flat with the hammer.

Particular attention must be paid to the edges, which are apt to work up. The overhanging edges are cut away, as shown in Fig. 6, placing the work vencer side downward on a flat board, pressing tightly downward with the left hand and drawing a keen chisel across the vencer. The cross-grain ends should be cut first, since these are the most apt to alway at the ends, the remaining sides being cut after cleaning off any ragged corners. The work is then left to harden, placing it with the veneer side downward. With a very wide board requiring two widths of veneer, one shect should be laid as described and the second shect put down in a similar way. allowing it to overlap the first by about 1 in. Fig. 7 shows the second half being placed in position A straight cdge is placed along the overlapping portion and firmly held in position

while a cut suficiently deep to pass through both thicknesses is made along its length with a chisel, os in Fig 8 The surplus of the upper thickiless is removed and the veneer raised, as shown in Fig 11, so that the surplus of the lower venper may be taken away The vencer is then re. placed heated with the iron, and rubled down with the ham mer Pieces of old newspaper should be glued over the joint to prevent it from openingw hiledrying
Details of a veneering hammer are given in Fig 10 which shows it to consist of a brass blade having a rounded edge fitted into a cut inade in a block of wood, this being fitted with a rounded handle. One method of hold ing it has already been illustrated in Fig 5, using two bands An alternative method is given in Fig 12 in which the hammer is grasped with the right hand only. When the work is quite set, if any bubbles or blisters are seen they should be removed by slitting the veneer with a thin chisel or penknife to let the air out. working a litt!e glue under the veneer and then heating and finally pressing out with the hammer

Cross Banded Work. Fig. 13 shows the treatment of veneered work having a cross banding and an inlaid line at the edges. This is easily aecomplished by first veneering the centre portion as already described except that it is unnecessary to allow the vencer to overlap, rather cutting it slightly sinaller than the actual size of the ground This done, it should be allowed to set

Sieveral strips of cross-grain reneer are then cut with a cutting gauge, as in Fig 3, to slightly more than the width required for the finished banding. One edge of all these should he planed true on a shooting board, a batten being placed on the top of the vencer to prevent it from buckling. An iron plane or linely set trying planc: is used.

The cutting gauge is set to the width required for the banding, including the line, and a cut made on all lour edges of the work deep enough to cut through the vencer, the surplus veneer being removed with a chisel. If any difficulty is experienced in removing it, the glue should be heated with the llat iron, when the veneer will be found to peel off The line is then mitred to fit at the corners and glued round, driving in a few vencer pins at the side of the line if any difficulty is found in keeping it in place. It should be left to harden (Useful bints will be found in the article on $\ln$ laying) The banding is cut to length with


Veneering. Fig. 11. Kassing one piece oi veneer and removing waste alter cotting with chisel Fig. 12. Alternative method of holding bammer, with one land, compare with Fig. 5. Fig. 13. Laying banding, using the back of
ordinary bammer to press out the supcrfluous glue

## in order 10 prevent them opening

The edges of a board or other piece of work are veneered by placing the work in a vice for the purpose This should not be done until the venecr on the top surface is quite set, after
which the ellges should be planed. using a very which the edges should be planed. using a very k :en-edged plane finely set. Strips of veneer are cut and laid by means of the back of a hammer When set they are trimmed off and the surface scraped and glass-papered It is essential to allow all veneered work to set thoroughly before attempting to clenn it up, which is done with a steel scraper, and afterwards finished with glass papier (ste Sicraper)

Use of the Caul. Tolay saw-cut vencers and built-up patterns by means of a caul requires a different procedure. The vencer is firat cut to size and the ground prepared as described for the hammer method, and both then glued. the vencer placed in position and a sheet of paper placed on top In the case of a pattern, two veneer pins should

$\nabla$ eneering. Fig. 14 (above, right). Showing use of cross piece in caul veneering a large surface. Figs. 15 and 16 (below). Two examples of built-up veneer patterns inents are correct.
be driven in to prevent it from shifting. The caul consists of a board about 1 in thick and alightly larger than the ground to be veneered It is slightly rounded in shape on one side. This is thoroughly heated and quickly handscrewed, round side down, on to the veneer on top of the paper the latter being used to prevent the caul from sticking
For a large surface to be caul veneered, cross pieces are used as shown in Fig 14 The upper pieces are rounded on their under edges to force the glue out and the lower pieces -traight and thicker than the top ones, so that when pressure is applied at the ends the top pieces are bent so that their lower edges become straight. It is essential in all cases of caul veneering to work smartly when once the caul has been heated so that the glue is thoroughly melted Other information about the process is given in the article on Marquetry
To vencer patterns such as those given in Figg. 15 and 16, the design is lirst drawn on paper and the various pieces of veneer cut to whape and glued on to the design It is then treated as a whole and laid with a caul For further information reference should be made to the article on Inlaying, where the treatment of simple designs is dealt with in detail

VENETIAN BLIND. Althougl, it has been largely replaced by the ordinary spring blind, which is easier to keep clean and in order, or by casement curtains, the Venctian blind has advantages. It is the British substitute for the continental shutter and has the same useful quality of keeping out the sun and at the same time permitting effective ventilation. Morcover, it permits the gradation of the light, which may be fnlly obscured by having the slats closed or partially by having them slanting. The great drawbacks are the clumsy nppearance of these blinds and the extra cleaning which they entail. Hew people would seleet them for a new house. but where already installed they can be used without trouble for long periods providing the adjust

The blinds should be dusted with a soft brush at frequent intervals, the laths should be


Cross Piece
turned downwith the laths inclined to the window, and the brush stroked from side to side, working from the top to the botiom on the window side first. The laths are then turned in the oppositerlirection and the same procedure followed on the inside of the room.
In the event of broken cords or tapes it is a waste of time to attempt to repair them. New muterial should be fitted, and,
although this can be done with the blind in position, it is usually more convenient to take it down, and at the samie time to lonk over the other adjustments. The top lath of the blind is either screwed dinectly to the window framing with two screws or supported on small metal bracketa, the latter being the more satisfactory. In old fittings the screws become loose and fail to hold the blind up. The remedy is to use screws of a larger diameter, to plug up the old holea with a glucd peg, and to rehang the b!ind with two small iron angle brackets.
To remove the blind either for thorough cleaning or repair, it should he let down, the tapes unfastened at the bottom, and the cord unknotted and withdrawn. The laths are now slipped out and the top screws removed. With a bracket fastening the blind will remain in place after the screws are removed, hut with those fastencd direct to the window frame each screw should be undone for a few turns, so as to equalise the atrain and allow the top bearer board to be held in position while the screws are entirely withdrawn. The blind is laid on the lloor and the tapcs gathered up close to the laths, so that the blind can be carricd away.
If possible the shop practice of supporting the hlind on angle brackets should be adopted. The brackets can be attached to the wall, to an old door, or to a temporary framework erected for the convenience of handling. If this method is not possible the blind should be spread out at full length on a large table or on the floor. The tacks securing the tapes to the bottom lath should be pulled out with a pair of pincers, the tops of the tapes taken off in the same way, and the lengths can be washed if they are in good condition.
To clean the laths, they should be gathered together and placed in a bucket of sonpy water. so that this edges can be rubbed over with a scrubbing brush. Each lath should be scrubhed over on both sides, and then rinsed in clean water, and placed on one side to dry. The laths should be rubhed over with a dry cloth, and then with beeswax and turpentine, the final polish being given with a soft clean duster.

In some casea a better appearance can be given to Venetian blinds by painting them cream colour or almond green. All blinds in front of a house should be of the same colour. The old paint must be removed and the surface of the laths smoothed with glass paper and given a coat of weak glue size, before applying the necessary coats of paint. Paint with a very hard glossy surface, suitable for exterior work should be chosen for the purpose, otherwise with exposure to the sun there will be a tendency to blistcr.
Re-taping the Blinds. The work of retaping and recording can now be proceeded with. The tape, known as ladder tape, is obtained in several qualities; the best has the ladder or connecting pieces woven in with the webbing, as in Fig. 1, and no other kind should be used. It is mads in unbleached, half-bleached, and white, as well as in green huff. and red. In addition to the lengths required for the laths, two or three short lengths are needed to attach the top lath to 1.he bearer, and these are known as the shading tapes. The total lengths of the now tape and cord after being carefully measured can be secured to the laths with tintacks.

The shading tapes are supported on rollers, which are provided with $n$ long spindle, and fit in slots cut in the top of the bearer. They are not, as a rule, liable to damage, but they should have free movement, and be fixed so as to be parallel with the surface of the bearer. Each length of webbing, which can be taken from the ladiler tape by cutting off the cross pieces, should be 10 in., threaded through the roller opening, carried over the roller, and
brought out to the same side. The ends are folded under and tacked to the top lath, as in Fig. 2, resting the lath on a block of wood so that the tacks can be driven in tightly. In blinds where there are three shading tapes, the two end ones should be secured tirst, taking great care that the top lath and the hearer are quite parallel, and that the lath just clears the bearer when turned up.

The centre tape is adjusted to support the lath and prevent sagging. The long ladder tapes are secured to the top lath, so that the centre is exactly underneath the pulley wheel opening (Fig. 3) $\mathfrak{y}$ about $\frac{3}{} \mathrm{in}$. of the material being turned in undernenth to hold the nails. The ladders must be the same height each side to ensure that the laths will be horizontal, and it is an advantage to hang the blinds on temporary brackets and to fit a couple of laths in position. The double cord for the shading adjustment is secured to the top lath by nailing it in a narrow groove provided for the purpose. Before the cord is fastened on, a Venetian driving cye should be threaded on.

The laths are slipped in position while the bearer board is suspended on the brackets, and the new cord can be threaded through each lath, taking care that the cord runs between the alternate cross pieces of the webbing. Sufficient length of cord should be allowed to bring the loon
should be tested, and it correct the ends of the tape should be folded underneath and secured with two or threc tacks.
In the event of a lath being broken, a new one can be made from a picce of yellow pine planed to the required width and thickness and cut to length. The holes should first be hored with a sinall centre bit and enlarged with a fairly flat scribing gouge: the blind maker would punch the hole out, but this is rather a risky procecding for the amateur There is no nced to take the blind down to fit a new cord. It is a simple matter to thread the cord through the holes and over the pulleys in a bracket-hung blind: in a screw-hung blind the screws can usually be undone sufficiently to allow of enough space to slip the cords over the pulleys.

Old blinds sometimes cause trouble through the cord slipping off the pulleys, causcd by the edges of the pulley being broken or by the opening of the slot being too large. The remedy in the first case is to fit new pulleys; they are generally held in place by a pin, which can be withdrawn with a pair of pliers. A new pulley wheel can be fitted in and the pin replaced. In the second case, the best method is to attach thin strips of wood, to provide a guide for the cord. Another method is to drive a staple as close as possible to the pulley so that the position of the cord is always over the pulley no matter how slack the cord is.

VENETIAN GLASS. This phrase is applied primarily to glass made in or near Venice, but also to pieces made in the samc style by workmen in other countries. The Venctians discovered the way of making the type of glass since linked with their name in the 13 th centurv, but their furnaces were on



Venetian Blind. Fig. 1. Webbing or tape with ladder pieces woven in. Fig. 2.
Method of securing shading tape to bearer. Fig. 3. Blind complete with new Method of securing shading tape to bearer. Fig. 3. Blind complete with new tapes and cords, showing laths in position
the island of Murano, being regarded as too dangerous to be in the city itself. The industry flourished until the 18 th century, partly owing to the jealous care with which its secrets were guarded. It then fell into decay, but was revived in the 19th century.
The characteristics of Venetian glass are its extreme lightness as regards weight and a slight cloudiness of within easy reach when the blind is fully down. hue. The general features of the simpler This is adjusted by securing one end by drinking glasses are a very open bowl, a high, means of a knot, which should fit in the often almost conical, foot, with a folded edge enlarged hole in the underside of the bottom lath, and then pulling the other end through the hole until sufficient remains on the outside. The spare cord is cut off, the end knotted and pulled in to the hole.

With large blinds and those screwed to the window frame, the cord should be threaded through the pulleys and tied while the bearer lath is secured. When the cord has been threaded and secured at the bottom the blind
often almost conical, foot, with a folded edge and a stem slight in proportion to the bowl. In the design there is a sense of poise and balance. Engraved clecoration is rare, but enamelling and gilding adorn the earlier pieces, which sometimes have diamond-scratched designs.
Early pieces, being extremely valuable, are rarely seen in private collections. The glasses of the 15th century, as they were modelled on silver cups of the Gothic style, have a somewhat heavy appearance, but in the 16th
century more delicate picces were made, and sonc of the finest existing examples date from that time. In that period the glass hecame thinner and lighter, relying less and less on enamelling for its beauty. The tiligree was claborated and difirrent colours were employed. Pieces were also made in the form of lions, dragons, gondolas, ctc. The mascaron (q.v.) or raised ornament of glass was often used on vases and bowle. See Glass Ware.
VENISON : How to Cook. Before it is fit for the table venison requires to be hung for two or, if the weather is cold, three wecks.
The principal joints are the haunch, which includes both the loin and the lag, the shoulder, the neck and the hreast. Of thesc the favourite is the haunch, which is roasted and served with rich brown gravy, accompanied by either red currant or rowan jelly. The meat for the greater part of the time it is roasting should be covered with buttered paper placed over a llour and water paste, in order to keep in all the juices and retain the flavour.

To roast haunch of venison, saw off the shank bone, also trim the chine and pare away darkened skin and sinews. It is often necessary to remove entirely the outer skin of venison before roasting it, especially if well hung. Butter a large sheet of kitchen papur and place two more shects underneath it. Cover the meat with a stiff llour and water paste, roll in the greased paper and place it with sufficient butter or good beef dripping in a baking pan and roast it in the oven from $2 \frac{1}{2}$ to $3 \frac{1}{2}$ hours.

It must cook gently ofter the first 15 min ., and must be well basted several times during the process of cooking. About 12 min . before the haunch is ready, remove the paper and paste, scason the meat with salt and pepper, dredge it with flour, baste it and expose it to sharper heat to give it a brown tint. When well frothed up and a rich but not very deep brown, dish it up and serve it very hot, with a superior thick gravy, in a tureen.

The gravy is made as follows: Chop smali the knuckle boue and trimmings off the chine and fry these, with any game or chicken hones left over, in "? oz. butter, adding 4 prepared and chopped shallots, a bouquet garni, and a shredeled stick of celery. Fry all until a pale brown, then add seasoning and 1 gill white wine. Simmer these until ther are reduced to " gla\%e, stiring all the time that the liquor is reducing. Then add $\frac{1}{2}$ pint good stock, mix it in well, and cook very gently for 25 min . The essence is now skimmed and strained through a fine hair sicve. Have ready heated in a saucepan 1 pint good brown sauce and mix in with it the game essence, also the strained juice of half a lemon. lboil all up together and pour the gravy into a turcen.

Venison Pasty For an old-fashioned pasty, bone the shoulder, but as it is sinewy beat it well and steep it in vinegar to which" 2 glasses port wine have been added, leaving it in this pickle for 24 hours. It is better to rub the joint well with sugar before putting it into the vinegar. Do this for 2 or 3 days. When required for use, be careful that al! iraces of suga: are cleared away and that the joint is wiped quite dry from the wine and vinegar. Season it with salt and pepper, then lay the toned shoulder in a large earthenware dish.
Melt $\frac{\mathrm{lb}}{\mathrm{lb}}$ hutter and pour it over the meat, adding $\frac{1}{2} \mathrm{lb}$. fat from a loin of mutton cut fine. Sprink!e over it a little grated nutmeg, clove or mace, and 12 shallots which have heen peeled and chopped Half fill the dish with good stock, and cover it with a light pastry as for meat pie. Bake the pastry sharply for about 90 min ., then slowly for from 31 to 4 hours. The crust must be very rich or it will dry in the long baking.
To make a more modern dish use about 2 lb . of a boned shoulder of venison, beat and


Venetian Glass. Turee beautiful specimens oi whice Yenetian glass, tuat on the right having a stem enclosing orange flowers in coloured glass

5 min., or until well coloured. Put them with the meat and gravy into a stewing jar, add 24 button mushrooms, and cook all gently in the oven or on the top of the stove, drawn back from the fire, for about 2 hours or until the venison is tender.
When ready to serve, remove the bouquet garni, clear the gravy from fat and scum and dish neatly gar nished with croûtes of fricd bread. Mushrooms suitable for this dish may be procured preserved in bottles, and if button onions are not obtainable a Spanish onion peeled and cut into neat pieces may be used in place of them.
Casserole of Venison. For a stewed loin of venison, trim the loin and cover the fillet soak it, and prepare as for the pasty, but cut portion underneath with thin slices of bacon. it into neat pieces. Lay these in a pic-dish and season well, also dredge them with flour Arange among the picees 12 small rolls of bacon and the same number of forcemeat balls, then fill up with good atrong stock into which a wineglass of port wine should be introduced The pie must he covered with a rich rough puff pastry, and will take a bout 2 hours to bake. It should be ornamented and glazed. After it is cooked the centre ormament should tee removed, and in the vent should be poured as much extra gravy as the dish will hold. Venison dishes must always be served very hot. French beans are a good accompaniment.
Jugged Venison. For this savoury dish bone the shoukler and cut the flesh into neat square picces, lut first prepare the meat by beating it and soaking it. Fry the venison with 3 lb. bacon cut in dice until it. is a good brown, then drain off all superlluous fat. Dredge over the meat 3 oz. llour and fry again a fow minutes in order to cook and colour the llour. Keep a! moving, and be careful that the flour does not burn. Now moisten the contents of the pan with 21 pints good brown stock and $\frac{1}{2}$ pint port wine Season well, and add a bouquet garni.

Stir frequently till the whole comes to a boil, and then simmer while preparing the following flavouring: Procure 24 small button onions, peel them and fry them in butter for about
portion underneath with thin slices of bacon.
Tie or skewer these in position, then place the joint in a large casserole with a prepared and sliced carrot, 2 onions, also sliced, a bouquet garni, a lump of butter as large as a hen's egg, $40 \%$ bacon rashers trimmed and cut into strips, 4 cloves, and seasoning. Put the lid on the casserole and let all cook together.

After it has cooked for an hour add 1 pint stock and continue cooking for at least another hour, still turning and basting occasionally Jish the ineat. removing the string or skcwers, and keep it hot. Strain the liquor in which it has been cooked and free it from fat. Add 3 gills brown sauce, a small pot of red currant jelly, a wincglass of port wine, and scasoning to taste. Pour the gravy round the meat and garnish with potalo eroquettes.

The renıains of a cooked joint of venison may be hashed. Place a sliced onion in $\}$ pt. stock, season, add 1 tablespoonful red currant jelly and hoil for a few ninutes. Dust ncat slices of venison with llour, ardd to the stock, etc., and remove the onion. Stew a few prunes with lemon-juice to taste. When the venison is heated, place it round the prunes on a hot dish and garnish with sippets of toast.

The fry of venison makes a good breakfast dish Wash and soak the fry well, then cut into neat pieces and roll each in seasoned Hour. Fry them in butter and dish on fried parsley. Fry them in butter and dish on fried
See Casserole ; Firy ; Rowan ; S auce.

## The Ventilation of the Home

## Modern Ideas on a Matter of Vital Importance

This subject may te pursued further in this work under such entries as Architecture; Chimney; He ting; House ; Window. See also Air-Brick; Bathroom ; Geyser

Incfficient ventilation is often a contribu- per hour for each 1,000 cubic feet of space. tory cause of ill-health. Unless a room is The carbonic acid content of the air is im supplied with ventilators, or the windows are kept open, sufficient fresh air cannot enter. An outlet for impure air is as necessary as an inlet for pure air. Therefore, if there is no chiminey, an opening must be made in the wall.

The air of a room becomes impure mainly through the breathing out of the occupants and the carbonic acid gas produced by burning gas lights or oil lamps. Besides carbonic acid, the expired air contains organic matter and watery vapour. A man sitting in a room will breathe out 6 of a cubic foot of carbonic acid gas in an hour. To keep it at a wholesome degree of purity. from 2,000 to 3,000 cubie feet of air should be introduced
portant as an index of the freshness of the air, and thercfore of the efliciency of ventilation. or, in other words, of the movement of air within the room The malaise, or sense of illness, which is a consequence of a stuffy atmosphere has been shown to be due to stag. nation of air round the bodies of the occupants.
The general result of such stagnation is $\Omega$ diminution or suppression of perspiration, which function is always going on, although we may be unconscious of it. The regulation of body temperature is thus interfered with. Equally important is the loss of stimulation of the nerves of the skin, caused normally by the circulation of the air about the skin. The
effect of this stimulation is to produce an exhilarating sensc of well-being
It has been found that average air in town arens contains nbout 4 parts per 10,000 of carbonic acid gas; the air of a room ought not to contain more than 6 parts. Closely related with this matter is the size of the room A bedroom for one person should be of at least 800 and preferably 1,000 cubic feet. In calculating the cubic capacity of a room the length, breadth, and height are multiplied together, but any height above 12 ft . is not to be counted, because nliove that level little change occurs in the air. The floor space is also important, and for that is suggested $1_{12}^{2}$ of the cubic space
In the climate of Great Britain it is found that the air cannot ordinarily be changed oftener than three times in an hour without the process causing a draught, so that to sccure a supply of 3,000 cubic feet of fresh air per hour the room sjace must be 1,000 cubic feet. A certain degree of draughtiness does not matter so much in a bedroom. A good airing of a bedroom in the daytime is not sufficient. and ventilation during the night also must be provided for It is usually best to keep a window widely open; there is less draught than when only a small slit is left for the air to enter, as the amaller the opening the greater will be the velocity of the air current. If the bed is not between the window and the fireplace no harm results, as a rule, from the wind blowing through the window on to the slecper. But if he is liable to neuralgia or toothache he may have to avoid this. With a screen properly placed, full protection can be obtained from draughts.

Using a Sash Board. For ventilating a room a good plan is to raise the lower sash 4 to 6 in and fill up the open space with a 1 in. thick


Ventilation. Fig. 1. Ventilator consisting of a movable piece of perforated glass fixed to a window pane with similar perforations
board plared between the sash beads. The lower sash is shut down on to the board, which can be painted to match the window frame. This arrangement allows air to conce in between the lower and upper sashes, and as it is directed upward there is no appreciable draught This is called natural ventilation Some artificial system may be necessary for sitting-rooms, nnd may be applied to sleeping rooms as well. There are many such systems. In some houses one secs a small grating fixed near the ceiling to draw away the hot air. It may be arranged that the air passes into the chimney, a backward current being prevented by a valve

A good appliance is the Sheringham vulve, in which there is a wedge-shaper projertion let into the wall of the room, communicating with the outer air and directing the current
of air upward. This ventilator should be an oillamp in the grate, or to light a gas placed about 5 or 6 ft . from the foor. Another jet in the chimney when no fire is going is the Tobin tube. This consists of a shaft This is essential in a sick-room. It must be leading up the inside of the wall to a distance of 5 or 6 ft . The lower end cominunicates with the outer air through an opening in the vall, guarded by a grating. Valves are attached to regulate the amount of air admitted. A screen may be placed in the shaft to filter the air from dust, or a coil of hot-water piping to warm the incoming air

Perforated bricks in the wall also serve to ventilate a room. The openings through these are wider on the inside so as to diminish the force with which air enters. Air movement can be brought about by an electric fan, and if this is placed so that it can direct an air stream in a suitable manner, i.e. towards an outlet, the air is not merely agitated, but exchanged.
The Cooper ventilator Fig. 1) consists of a piece of g!ass which is perforated with four or live holes of a bout $1 \frac{1}{2}$ in. diameter. The perforation is covered with a clisk of glass having per. forations to correspond with those in the other piece of glass The disk moves on an vory pivot which passes through glass and the disk; a stop is also arranged so that the disk will not revolve beyond a certain point, that is, either open or closed To open the ventilator the disk is turned until the holes of the glass disk and the glass sheet coincide.

With the Boyle type of ventilating radiator fresh air is admitted by adjustable air inlets in the wal!, and passes through a radiator heated to a suitable temperature, thus proviling heat as well as ventilation This method has the advantage that two objects are served by one piece of apparatus, and there are no objectionable littings beyond the radiator.

A very simple outlet can be provided by inserting in the external wall a Boyle's mica llap valve. This consists of a metal box having n grid in the front; the inside has a smooth seating on to which fits a piece of mica sus. pended from the top of the grid. The expired air lifts the mica flap and passes outwa:d. The action cannot be reversed, because any air which attempts to pass through from the outside pushes the mica Hap on to its seating. liy the use of this appliance good ventilation can be arranged for bed rooms or apper uoms.
The Boyle air inet panel shown in: Fig 2 is adjustable by opening or closing the Hap at the front, which when open directs the contering air in an upward path so that the fullest advantages are oblained from its use.
When a fire is burning and the window is open there is a good How of air, but if there is no fire the outward current may be very slight. It is a good plan. there fore, if a room lends to get stuffy, to burn remembered that gas and oil lamps vitiate the air of a room to a considerable extent bil against this may be set the fact that air currents are caused, which cffect an exchange if suitable inlet and outlets exist Even when a room is large the air will be impure unless there is free and constan circulation and renewal.

Under-floor Ventilation. The ventiation of the space above the ground and beneath


Fig. 2. Boyle air inlet panel
the floor of a house is pro vided for by building air bricks or gratings into the outer walls just below the damp coursc The sleeper walls, too on which the joists are supported, are built up in honeycomb fashion, so as to leave a number of interstices through which air can cir culate. Unless the under foor space is well ventilated the timbers and floor boards are prone to the attack of dry rot (q.v.) it is im. portant-though trequently neglected - to ensure that the ventilating bricks or gratings should not be obstructed on the outside by earth, plants, etc.

VENTILATION : For Plants. In the greenhouse ventilation is of supreme impor tance, for whilst the glass will rapidly conserve and bottle up sunshine, it will not readily allow the accumulated heat to escape. Too much fresh air cannot be given from the middle of May to the middle of Scptember. During April and the early days of May more care is necessary, owing to weather vagaries.

In winter, ventilation should be allowed whenever the air is mild, opening up during mid-morning and always closing down between 2 and 3 p.in. When the air is very dry or very cold, ventilation should be reduced to a mini mum, and unless heat is available to give it warmth before entrance, top ventilators should be opencd in preference to those at the sides. Another point to remember is that ventilators must be opened to lecward and closed when the wind direction changes. During spells of very severe weather ventilation must be restricted to an hour, or even less. It is a safe rule to open top ventilators lirst, following, when neecssary, with the lower ones, but always


Ventilation: fer plants. 1. Greenhouse ventilation: $a$, lights; $b$, pipes arrows dennte direction of air currents. 2. Frame ventilation: $a$, bricks; b, ligat block. 3. Cloche ventilation. 4. Pot ventilation: $a$, sticks ; ' 1 , glass, 5. How to remove tov light, $a$, of a frame, the dotied lines showing insecure methou of standing aftes removal. 8 . Ventilatinn of a forcing house : $a$, fies ; $b$, pipes ; $c$, lights ; arrows denote air circulation
opening them on the same side of the housc. dVhen constructed ol timber and glass after the Sliding lights are now out of date, and in manner of a conscrvatory, as shown bere in oul modern houses the runs of ventilators are illustration of a first lloor verandah, it forms levered open to any desired aperture at one time, separate levers controlling top and bottom. Another important detail is provision of holes in the brickwork to admit air, where it will be forced to pass around the hot water pipes as showI in the diagram; this arrangement is usially adapted to large bouscs, but it may very well he arranged in those of smaller type. Ventilation of garden frames is often neccssary. and our sketches show simple and effectual methods.

VENUS FLY TRAP. The plant to which this name 18 given is a greenhouse herhaceous perenninl with white Howers. The leaves are edged with sensitive teeth, which are said to close up and interlock when a Hy or other insect alights upon them. As soon as the insect is doad the leal reopens. The plant, popular only as a curiusity and for collections, is grown in equal parts of peat and sphagnum moss.

VENUS' LOOKING GLASS. The hest known species of this hardy annual flowering plant is Specularia speculum, which grows 1 ft . high, with oblong or lance-shaprd leaves, and purple Howers in July. It will thrive in any fairly good garden soil in a aunny bed or border.

VENUS'S NAVELWORT. This name describes a small group of low-growing plants suitable for the rock garden. One of them: Omphalodea linifolia, is a pretty hardy annual, 10 in . high, with white flowers in late spring or summer from seeds sown out of doors in autumn and spring respectively. It necds rather light soil and partial shade. Of the perennial kinds the best are cappadocica, verna, and Luciliae.

VERANDAH. In its usual form a verandah is a raised covered-in extension from an outside wall of the house. In some styles of architecture it is a special feature of the building. A certain type of Victorian villas, for instance, have long narrow vernndahs, situated a few steps above the ground level. The chief draw back to this style is that it darkens the rooms opening on to the verandah, with its curved iron roof, trellis, pillars and railing all obscuring the light; also it is not wide enough to nflord the compensation of being a useful open air sitting-room.

In more recently huilt houses of corresponding size the comparatively apacious bricked, tiled or paved loggia lias largely supplanted the old-fashioned verandah. The latter, however, in a wider form is a convenient extension over a porch or in conjunction with a large balcony on an upper floor.


Verandab. Constructed of timber and glass, this firat floor verandab with its comfortable furnishing forms a pleasant sun parlour

Humphrev \& Vera Joel
a sun parlour. Sectious of its glazed front wall are movable and the glass roof doos not darlien the adjoining living-room. See Conservatory Garden Furniture; Glass: Loggia.

VERATRUM. This is a vigorous hardy herbaceous perennial plant with large leaves and Hower spikes which reach to a boight of 3 ft . to $\mathbf{4} \mathrm{ft}$. It is suitable chicfly for the wild garden or large herbaccous border. It llourishes in ordinary well-tilled and manured soil The chief kinds are album, 3 ft ., grcenish; nigrum, 3 ft., dark maroon; and viride, 4 ft., greenish : all hloom in summer. The rootstocks have poisonous properties and hell. bore powder, used as an insecticide is mnde from the roots of Veratrum viride and album.

Verbascum. This is an alternative name for the border plants known as mullein (q.v.).

VERBENA. This is the name of a popular half-hardy plant which is largely grown for use in summer Hower beds. There are several named varieties, of which the prettiest is the pink one named Miss Willmott, but a packet of mixed seeds will provide Howers of brilliant and varied colouring. If these are sown in a heated greenhouse in Jan. or carly Feb. the plants will bloom in summer. They must he grown in a compost of loan, leaf-mould and sand and gradually hardened off for planting out in June. Cuttings may be taken in August and inserted in pots of sandy soil in a frame.
Verhenas makc charming summer llower beds and yield a wealth of bloom if the shoots are prgged down. Verbena venosn hicars lilacpurple Howers Verlsena chamaedrifolia, which is suitable for the rock garden or a sunny horder of light soil, has scarlet blooms.

VERDIGRIS. This is a green or greenish blue subatance formed by the action of an acid on copper and on metal alloys containing copper. It is used as a stain and a dyc, and for this purpose is produced by subjecting copper to the action of acetic acid.

Articles made of brass are liable to the formation of verdigris, which can be removed by dipping in a strong potash solution. Hydrochloric acid in a weak solution can be used for removing verdigris from articles of rolled gold, and, unless plated articles are badly coated, when the aloove method can be used it will he sufficient to wash them in strong soda water. Sub-acetate of copper or verdigris can be cmployed as a green stain by dissolving it in a hot solution of vinegar. It is also employed in making an ebony atain. See Brass; Bronze; Bronzing.

## VERGE. In gar

 dening operations the straight or curved edge of a lawn is known as the verge. It has to be kept clean and true after the mower has cut the grass as near to the boundary as possible. An edging iron is the best implement to cmploy, aided by a garden line stretched from end to end of lawn.There is also a machine called a verge cutter, which trims off all projections of lawn edges. This cutter is sup. plemented by a knife blade, which requires frequent sharpening. See Lawn.


Verbena. Flowers of the pink parlety, miss Willmott
VERMICELLI: Cookery Uses. A deli cate Italian paste, vermicelli is so called hecause of its thread or wormlike a ppearance. It is used for puddings, sweets and savouries soups are thickened with it, and it forms an excellent substitute for breadcrumbs in the coating of emall cases.

All Italian pastes differ in the time required for cooking them, as if the paste is old or stale it takes longer to soften. Good fresh vermicelli should be done in from 5 to 7 min ., and on that account is valuable when time is limited. No Italian paste should be soaked before it is cooked, but just dropped into plenty of salted boiling water, stirred occasionally, and drained off as soon as it is done.

For thickening clear soup, boil the vermicelli as directed above. Have the soup ready flavoured and strained, put the vermicelli into the turcen, and pour the soup, boiling, over it. Use 2 to 3 oz . paste to each quart of stock. For a family soup the vermicelli may be sprinkled into the hoiling soup about 10 min . before serving it and stirred till it is soft. This latter method saves the use of extra utensils.
The following is a simple but nourishing dish for children: Put into 1 pint boiling white broth or milk 2 oz . rermicelli, season and flavour to taste, and then boil for 5 min ., striring all the time. This should be served with rusks.

Vermicelli Sweets. Vermicelli pudding is steamed, and will take 1 pint milk, the rind of a lemon, 2 oz. castor sugar, 4 oz . vermicelli, and 3 cggs. Infuse the rind of the lemon in the milk for 40 min ., adding a pinch of salt, but be careful not to let the milk waste. Then strain out the lemon and return the milk to the saucepan used for the infusion. Bring it to the boil, and stir in the vermicelli (cooked). Continue stirring over the lire for 4 min ., then draw the pan back. Beat the eggs and sugar together, and mix them thoroughly with the milk and vermicelli. Turn into a greased basin and stcam $1 f$ hours.

A tritle may be made in this way: Cook 6 oz. vermicelli in salted water and drain it. Have rearly $1 \frac{1}{4}$ pints rich custard. Melt $\frac{3}{4} \mathrm{oz}$. gelatine in 2 tallespoonfuls of water, mix this with the custard, and pour both over the vermicelli. Set the misture in a border mould or in a diah, the centre of which has been filled in with a smaller dish. When firm, turn it out and
arrauge it in a glass dish. In the middle of the removed to a cleansing station, the court, if border place a layer of sponge fingers and ratafias soaked with sherry. Cover them with red chopped jelly, and heap it in a mound. Then pipe the whole with Havoured and sweetened whipped cream. Finish by decorating with coloured sugars.
Vermicelli Pie. An excellent pie is made with 4 oz . cooker vermicelli, \& lb . cold meat minced (chicken or veal for preference), 3 or 4 lomatocs, a little grated nutmeg, seasoning, $\frac{1}{2}$ pint vegntable flavoured stock, 4 o7. grated cheese and breadcrumbs. Arrange all these ingredients in layers in a greased fireproof dish, reserving sufficient breaderumbs to cover the top, on which place small dabs of butter, and bake about 20 min . in the oven.

VERMIN. In English law this word is delined to include bugs, Heas, lice, itch, mites and their eggs, larvae and pupre The Housing Act, 1925, states that for houses of a certain rental there is an implied condition that the house is at the commencement of the tenancy in all respects reasonably fit for human habitation, and a similar condition is to be found in the Rent Restriction Acts. Therefore if a tenant moves into a house and directly afterwards finds that the house is infested with vermin, he or she has just cause for complaint against the landlord; damages have been awarded in the courts in such cases.

Many large towns, including London, have acquired powers to deal with vermin, verminous rooms and persons by means of local acts; others have adopted the particular sections of the Public Health Act, 1925. dealing specifically with vermin, and action can be taken under this Act against the persons who cause the vermin. Again, all local authorities have powers given them under the Public Health Acts. 1875 and 1891, to deal with premises which are a nuisance, and injurious or dangerous to health. Several towns have obtained powers by local Acts to deal with the dirty tenant, and where it is proved to the satisfaction of the court that within twelve months of a room having been properly cleansed they have by neglect and filthy habits made the room verminous a fine may be iniposed.

London has considered this subject fullyat various times, and borough councils have the right to enter premises, inspect and serve notices in writing upon the owner or occupier of a house or room to have it cleansed within a certain time, and if necessary to remove necessary to remove showing a measureme
the paper from the walls for the purpose of destroying and removing the vermin. Failure to do so niay upon conviction cause a fine of 10 s . may do the work and recover the costs.
The practical working of this is as follows : A complaint is lodged, or it comes to the knowledge of the sanitary authority, that a housc or room is verminous. The sanitary inspector visits and possibly finds the tenant has only bern there a short time, obviously then the liability is the landiord's and a notice is served upon him to remedy same. However, if it is found that the tenant has occupied the room for some time and the vermin is caused by his or her cirty habits, then the liability is theirs. Much trouble is caused by people huying old furniture and clothes and inporting them into their rooms.

A new departure in public health law which applies to London only came into force in 1928. On the report of the medical ollicer of health that a person and clothing is infeated with vermin. and such person will not consent to be
removed to a cleansing station, the court,
satistied with the application of the local authority, may order his removal and detention. The local authority may take such measures as necessary to free him and his clothing from vermin. Females are protected, inasmuch as the examination of such must be carried out by a woman or a doctor. No charge is made for this personal cleansing.
The Children's Act, 1908, gives the school medical officer and nurse power to examine children, and if it is found that such children are infested with vermin or in a foul or filthy condition, the local authority can give the parents or guardians of such child a notice in writing requiring them to cleanse properly the person and clothing of the child within 24 hours of the receipt of the notice. Failure to do so gives the officers power to remove the child and detain him or her till they are satisfied that the child is properly cleansed.
VERMOUTH. The mild cordial known as vermouth is marle from white wine ilavoured with wormwood and certain vegetable extracts. It is used mainly as an aperitif before luncheon and dinner and as an ingredient in several cocktails. A favourite appetizer is a French and Italian vermouth mixerl half and half.

A vermouth cocktail is made with two dashes of Angostura bitters and one portion of Italian vermouth, filled with ice, mixed and strained into a cocktail glass. Another cocktail is made with three dashes each of Maraschino and Angostura bitters. Add one portion of Italian vermouth, fill with icc, mix and strain into a glass, the rim of which has been moistencd with lemon peel and then dipped into some powdered sugar. See Cockitail.

VERNIER: On Calipers. This is a device applied to a scale to give accurate readings in fractions of the smallest division of the scale. It is used on micrometers, caliper gauges, and scientitic instruments that are designed to work very exactly.

A sliding caliper vernier is shown in the accompanying illustration, as engraved on the sliding jaw. The scale on the shaft gives mcasurements in tenths of inches. The vernier scale has ten divisions, together equal to nine divisions of the scale; each therefore representing ${ }^{8} 0$ of $\frac{1}{10}$ of an inch. In the illustration the zero mark of the vernier has passed the inch mark of the scale, but has not reached the next I' 0 inch mark. To decide the value of the fraction the vernier is consulted, and its 7 line is found to correspond exactly with a scalc mark. The 6 line of the vernicr is $\frac{1}{10}$
of $I^{2} 0$
inch to the right of the nearest scale mark on its left; the 5 line, $\frac{1}{2}^{2} \sigma$ of ${ }^{2} \sigma$ inch: and so on to the zero mark, which is $\frac{7_{1}^{7}}{7}$ of ${ }_{10}^{10}$ inch beyond one inch. The reading thercfore is 1.07 inch. A finer reading could be made if the vernier scale had 20 divisions equal to 19 of the scale, as the difference would then only be $\frac{1}{20}$ of $I^{\prime} \delta$ inch.

The vernier incorporated in a micrometer gauge is essentially similar in principle, though the scale is engraved around the thimble of the gauge. See Gauge ; Micrometer.

VERNIS MARTIN. A brilliant lacquer or varnish used in the painted decoration of articles such as fans, fancy tables, and cabinct panels, takes its name from a French family who during the 18th century developed a form of artistic decoration based on oriental lacquer work. See Lacquer; Watch.
Veronica. Hardy and half-harly evergreen flowering shrubs and perennial plants popularly known as speedivell (q.v.).

VERTEBRA. The spinal column is composed of a large number of separate bones superimposed one on the other, the object of such an arrangement being, of course, to secure Hexibility. Typically, a vertebra consists of a mass of bone in front, the body. and a bony arch behind. The first ccrvical or neck vertelira, known as the atlas, the one on which the skull rests, does not possess a hody, but consists simply of a ring of bone. The next one has on the upper surface of the body a long tooth-like process which engages in the front part of the ring of the atlas. The object is to permit of rotation of the head.
The bodies of the vertebrac are separated from each other by disks consisting of fibres and gristlc. Thesc, known as the intervertebral disks, increase the clasticity of the spine. The arches placed one over the other and the broad ligaments connecting the vertebrae form the spinal canal, which contains the spinal cord. The five sacral vertebrae are


Vetch. Dainty rose-pink flower clusters and vetchlike leaves ol Coronilla varia
fused to cach other in adult life, forming a single bonc, and the same is true of the four coccygeal or tall vertebrac. See Spine.

Vertigo. See Dizziness.
VETCH. Plants with small pea-shaped flowers, vetches are of little decorative valuc. Vicia fulgens, of slender climbing growth, has red flowers in summer. Vicia faha is the broad bean. Coronilla varia, 2 ft . high, has vetchlike leaves and rose-pink blooms.
VIBURNUM. This is a family of beantiful hardy Howering shrubs, with white Howers. Most of the species are deciduous, or summerleafing, while some are evergreen. See Guelder Rose ; Snowball Trec.

VICE: Different Types. The principal requirements in a vice are strength, rigidity, and a tight grip. Vices are made of many patterns, each specially suitable for some particular class of work, but the type in Fig. 1 is the most useful when a single tool has to be depencled on for jobs of all kinds.

One jaw is fixed while the other is movel in or out as required by a screw mechanism concealed in the body of the vicc. The screw is turned by a tommy bar which can slide through a hole in the projecting head of the screw, and has knobs on its ends to prevent it from dropping out. In addition there is a spring catch at the side, a touch on which frees the screw mechanism so that the vice can be open or closed rapidly by hand, the screw mechanism being then used for the final closing of the jaws tight on the job.

The jaws of a vice are serrated and hardened in order to provide a good non-slipping grip; and therefore some protection is needed when
 very rigid, as any movement, however slight, is most objectionable. especially when filing. If the available bench proves to be unsteady, it can generally be inpproved by screwing wooden thattens, say, 2 in. by 1 in., diagonally from the bottom of one leg to the top of the second all round the bench and screwing the legs to the floor with angle hrackets.

In choosing a vice the first consideration is the purpose for which it will chictly be required. If heavy work is to be done, such as forging or smith's work, then one of the regular hlacksmith's leg vices is essential, but for the repair of a car or for bending heavy metal the regulation engineer's vice shown in Fig. 1 should be chosen. The width of the jains shoulal preferably be about $3 \frac{1}{2}$ in., and the opening up to about 6 or 7 in. This class of vice mist be securely bolted to a strong and rigid bench. For lighter work, a vice of the pattern illustrated in Fig. 2 is suitable. It is made of cast iron from $1 \frac{1}{2}$ to 3 in . wide, and is not, as a rule, provided with quick release mechanism. It is serewed to the top of the work bench with stout wood screws.

For occasional use, the portable bench vice in Fig. 3 has many advantages, chief of which is the provision of a self-contained clamp with clamping screw which enables the vice to be attached to the worl bench, kitchen table, or other convenient means of support. If the vice is ta be used for any length of time, a couple of wood screws can be inserted in addition to prevent it shifting.

Woodworker's Vice. For woodworking, a joiner's or carpenter's vice, as shown in Fig. 4, is usually most serviceable. It is made in several sizes, usually with a quick relense mechanism. This comprises a small trigger, located near the screw handle, the action being to press the trigger and pull the vicejaw in or out to its approximate position, then release the trigger and tighten up the vice in the usual way.

These vices have smooth faces to the jaws, and can often be used with wooden faces which can be screwed in position when they are needed, holes being provided for that purpose. This type of vice is attached to the underside of the work bench with the upper edges of the jaws flush or slightly below the
surface of the bench. It is imperative that vice with a long extension piece on the oppo the vicc should be securely fised, as by the use site side to the jaws, these being hinged of coach screws or by bolts with the heads recessed below the surface of the bench and the holes properly plugged with wood.

When circular work is to be dealt with, a pipe vice like that illustrated in Fig. 5 is the best. It consists essentially of a horizontal sole plate or base with an upright portion upon it, through which works the jaw with a $V$ shaped end. This slides in a passage way formed within the casc and closes down to a slot in the lower jaw which is similarly V . shaped. When the handle is turned, the jaws are forced together and the pipe is securely held. As such a vice is subjected to considerable twisting strains it must be bolted to a rigid bench.
In addition there are the various hand vices, ranging from that shown in Fig. 6 down to the jeweller's pin vice designed to hold fine wire while being worked. Some forms of the last named resemble a chuck in shape and action. A useful pattern for the amateur is the hand vice shown in Fig. 6. It is virtually a small

## Victorian Style in Building \& Furnishing

## Its Distinctive Features and its Good Craftsmanship

The coatribution on the Adim and Regency Styles may le referred to as immediately influencing the deve!opment of early Victorian decoration and furniture. Sec also Buhl; China: Davenpor Table; Dressing Table; , jacobean Style; Jewelry; Papier Môche; Sheraton; Tapestry Needle. work; Tudor Style; Woodworking
Much that was cumbersome, badly pro- ornament and design combined with keen portioned, crude in colour and ornament, commercialism. The rise and prosperity of the lacking in appropriate design and in meaning is associated with the decorative art and architecture of the Victorian era. It should, however, be remembered that the period was a long one, and its sixt p -four years are generally divided into Early, Mid and Late Victorian phases by certain marked features and developments.

The lirst of these phases was chicfly characterized by a continuation of the classical revival started at the end of the 18 th century and emphasized in the Adam and Regency styles. In the Mid-Victorian phase there was a great medley of the so-called artistic in
iniddle classes was accounted for by the huge output of the factorics which in turn led to the amassing of material possessions as evidence of social standing. After the Great Exhibition in 1851, china and glase ware factories and all the furnishing trades poured forth a stream of goods, and quantities were also imported, in which domestic confort and the new mechanical processes were supposed to be allied to artist ic designs. In the last Victorian phase reproductions of Tudor houses, Jacobean, Queen Anne and Sheraton furniture were in vogue. These were usually distorted with allectations of the day and stereotyped omaments.

Machine-cut decorations glued on to so-called Chippendale pieces took the place of hand carving. In the early phases colours were bright and designs were naturalistic. In the nineties curionsly conventional designs and "art" shades, lacking in purity of colour, were the fashion. The vast accumulation in most homes of unneccssaryaccessories, draperies and heavily framed pictures reached a feverish pitch. Many things of brauty, old and new, might he included in the furnishing of a room, but owing to lack of tasteful display and the jumble of other shapes and colours their decorative value was lost.
Domestic Architecture. Victorian architecture of the first two phases owes its character to two main influences. The classical style of the preceding period and the Gothic revival which was fervently advocated by Pugin, the prominent architect who designed nany churches, was connected with the planning of the new Houses of Parliament, and whose woodwork in the House of Lords is one of the really considerable artistic achievements of the early Victorian vears
Most of the public buildings and many large dwellings of the period are marred by badly proportioned pseudo classical or Gothic features, while most of the small terrace houses were very ugly in design. In the towns the dominating consideration was a so-called elegance and gentility. Typical Victorian houses are from three to five storeys in height, faced with stucco, and almost invariably adorned with a columned portico surmounted by a balcony, of which a narrower extension is carried to the boundaries. The windows are of the sash variety and the roof of slates. Balcony parapets are generally of wrought iron in a straight or curved pattern, but the square portion over the portico is often composed of stone pillars, curved or butbous, supporting a flat entablature.

To these houses there is usually attached, at the side of the entrance, an area, with stone steps descending to the basement and servants' entrance. Even in comparatively small houses of this type the pretentious portico is adhered to on a reduced scale.

Above the solid front door there is usually an ohlong fanlight. This often consists of fu!ly proportioned panes of glass, whereas the fanlights of the Georgian period were worlis of art when completed by grilles of scrolled ironwork. The hall is narrow, and, once past the foot of the main staircase, continues in a narrower passage to the top of the kitchen stairs.

Distinctively Victorian features of the dining room on the ground floor and the double
drawing room divided by doors or by a heavily curtained archway, on the first floor are the substantial marble mantelpiecca. The first flight of the stairway, up to the drawing room, is broad, with stone or wide oak steps. The flighis diminish in width with cach successive stage, culminating in the steep and narrow wooden staircase to the attics.

In the short transitional period before the Tudor revival in subur. ban and rural districts. a type of house was built in town and country that was free from the worst faults of Victorian classicism. Round arched windows are often a feature of these façades, and verandihs werc another, steps leading up to these and to the front entrances. There is cither a semi-basement or this depressing feature is absent. The portico is also absent, the front door being merely re cessed with a semicircu. lar fanlight above it. The door usually has four panels. the two upper ones being sometimes g!azed and covered with a wrought iron grille.

The ceilings of most Victorian rooms arelofty and there is a good deal of ornamental bookcases and writing tables. were the drawing moulding. Structurally, the Victorian house is room picces, chairs with gilded or ebonized often far better than its molern counterpart, frames, fine cabinets writing tables and bookthe woodwork especially being of greatly cases, walnut chiffoniers and what-nots, superior quality.

Victorian Furniture. Much of the ear!y Victorian furniture was superbly made. The more solid pieces were of mahogany and designs were gracefully curved. Cabinet making retained the excellent quality of the precerling period. Carving was little used, but moulding, were introduced and plain pancls showerl off the grain of the fine wood to advantage. In contrast to the plain mahogany pieces which included wardrobes, sideboards, large


Victorian Style. Fig. 1. The two charming examples of Victorian chairs are covered with wool tapestry needlework. The davenport writing desk was a characteristic piece of the period
interesting small tables, couches and sofas, all of which pieces continued to be made in Empire and Regency styles with brass mountings and decorated with inlay and marquetry or with buhl work Many charming small picces were made in papier mâché, japanned black, delicately painted and inlaid with mother-of-pearl
Conventions governing the choice of furniture for different rooms were much stronger than they are to day. Solidity was the keynote for the dining room in the mid and late Victorian phases, and so the dining-table had to be of large and heavy structure in keeping with the sideboard, which of ten measured 8 or 9 ft . in width, was topped by a heavily framed mirror, and had drawers and capacious cupboards below. Victorian dining-tables of the early period were often circle topped, but later they were fitted with an interleaving arrangement. Even without the extra leaf or two specimens atill in use gencrally occupy a great deal of lloor space. These are oblong in form for the most part, having solid bulbous legs attached at the four corners, the last bring rounded. Dining.room chairs are leathercovered, the backs being slightly sloped. Everything in this room was of plair and aggressively formal design, but muchpattern was introduced into the decorative scheme by the wallpaper, the curtains with festooned pelmets, draped portières, chinıney pieces also draped and crowded with ornaments and an array of Shelficld or silver plate on the sideboard, including probably a massive tea-tray and urn.

Pianos were mostly of the cottage type with pleated silk backings to tracery panels in wood. but immense grand pien ws were also seen with cases of mahogany, walnut or rose
wood. Another musical feature often to be found in the early Victorian drawing room was a handsome gilded harp. Gilding was much to the fore in the decorative scheme as the walls were sometimes literally covered with pictures in heavy gilded frames, all of one pattern irrespective of the size and style of the painting For common use chairs and sofas were upholstered in horsehair, but finer pieces were covered in damask. striped satin, brocade or tapestry needlework. Two quite charming examples of the last are seen in the chairs in Fig 1 Shown with these is a neat little davenport writing desk of the period.

In the middle of the 19th century a walnut fashion arrived and some excellent furniturc was made in the Italian and Spanish varieties of this wood. The former was particularly favoured for wardrobes and other bedroom pieces, as the grain is close and the surface takes a high polish. After this time furniture makers became obsessed with the suite, and many bideous sets of furniture for drawing room, dining room and bedroom were designed, and so well made that they still exist almost unimpaired.

Early Victorian bedrooms in well-to-do households were charmingly and suitably furnished. They were characterized by clear bright colour, crisp silks, chintzes and muslins for curtains, bed and dressing-table draperies, and usually excellent carpets with floral patterns or wreaths on dark grounds. Woodwork was painted in colours to which the polished mahogany furniture formed an agreeable contrast.

With the late sixties arrived the large and cumbrous suite, the stuffy upholstery and the heary curtains. Bedrooms as well as sittingrooms were crammed with superfluous ornaments. Fig. 2 is a good example of the bedroom chimney piece of the mid-Victorian period, and also of the chaotic effect of too many patterns so characteristic of the day. A charning little papier mâché table is doing duty as an empty grate screen, but it cannot be appreciated with the designs of the pierced fender, ugly tiles, and floral brocade drapery fighting against it, while the domes of wax flowers in turn kill the delightful pieces of Staffordshire pottery.

While many of the productions of the art crafts were as inartistic as are some of the specimens turned out to-day, and as some have been in most other periods, the Victorian output of these things was so vast that collectors are now finding much that is delightful and amusing among the treasures preserved particularly from the earlier work. Examples are also being widely copied. Apart from the undoubted beauty of the Victorian papier mâché work and exquisite coloured glass, minor crafts were admirably executed. Paper patchwork (see page 914), which was popular in the previous century, had a continued vogue as also had needlework and tapestry pictures. The Berlin woolwork of a later phase was crude in colour and design.

Beadwork in colour ${ }^{-1}$ class beads was introduced into upholstery covers and widely used for fire screens and purses. Silhouettes and tinsel work pictures of early Victorian theatrical celebrities are now eagerly sought in curio shops, as also are the pretty or quaint specimens of Victorian jewelry, the tea caddies and intricate workboxes. The gay colours and ingenious patterns appeal to modern tastes, and certain of the pieces and ornaments discreetly chosen look particularly well in the plain settings of to-day.
VICTORIA PLUM. One of the best plums in cultivation is the Victoria, which succeeds well in pyramid, standard, or bush form, and will give good crops on a west wall.

As a preserve fruit the Victoria is unrivalled; even the thinnings of green and immature
fruit make excellent tarts. Unfortunately this ingredients by degrees. When the icing is ready variety is subject to the silver leaf disease, for which there is no cure. See Plum : Pruning.

VICTORIA PUDDING. This usually makes an excellent substitute for the more expensive kinds of Christmas pudding. When intended for that purpose it is a good plan to add $\& \mathrm{lb}$. raisins and two or three apples minced.

Boil together $\frac{1}{2} \mathrm{Ib}$. potatoes and the same quantity of carrots. When they are tender chop them very finely, add to them $\frac{1}{2} \mathrm{lb}$. finely chopped beef suet, $\frac{1}{2} \mathrm{lb}$. flour, $\frac{1}{2} \mathrm{lb}$.
cleaned currants, lastly a little spice or grated nutmeg. Mix all well together and press the mixture into a well-greased mould or basin. Cover it with a cloth, put it in a pan of fast-boiling water, and boil steadily for three hours, or longer. Turn on to a hot dish and serve with any good sweet sauce. See Sugar.
VICTORIA SANDWICH. Beat ${ }^{2}$ eggs and 4 oz . castor sugar for about 10 min ., then stir in $1 \frac{1}{2}$ oz. melted butter, afterwards folding in gently $3 \frac{1}{2} \mathrm{oz}$. Glour, and I teaspoonful baking-powder. Turn the mixture into two greased shallow tins, and bake in a hot oven for 10 min . When cold, spread with jam or cream.
VICTORIA WATER LILY. Often called the royal water lily, this is the magnificent aquatic plant scientifically known as Victoria Regia. Its cultivation is quite beyond the scope of amateurs, but under suitable conditions splendid specimens have been raised from seed in Great Britain. See Lily: Water Lily.
VICUNA CLOTH. Very little of the cloth bearing its name comes from the soft, and expensive hair of the vicuna goat. It is a plain, generally dark cloth finished in a particular manner.
Vienna Bread. This term describes a light milk bread prepared with Vienna flour, and is also known as French bread. See Bread.

VIENNA CREAM. Heat $\frac{1}{2}$ pint milk and 1 tablespoonful castor sugar in a small saucepan, and bring them almost to boiling point. Then strain in $\frac{1}{4} \mathrm{oz}$. leaf gelatine previously dissolved in about 3 tablespoonfuls hot water, add vanilla or other flavouring to taste and enough cochineal to give the whole a pretty pink colour. Pour the mixture into a flat dish, allowing the jelly to measure about $\frac{1}{h} \mathrm{in}$. in depth, leave it to set, and then stamp it into neat rings with two plain cutters, one slightly larger than the other.

Have ready $\frac{1}{2}$ pint clear wine or lemon jelly, coat the inside of a mould with it, and when it is set decorate the bottom and sides with the rings of milk jelly, arranging them as tastefully as possible and setting them in place with a few drops of the clear jelly. When these, too, are firmly sct, fill the centre of the mould with a cream filling made as follows :

Dissolve $\frac{1}{2}$ oz. leaf gelatine in 3 or 4 tablespoonfuls hot water and then add 1 tablespoonful castor sugar. Whip up $\frac{1}{2}$ pint cream, and when the gelatine mixture has cooled strain it in, mixing it thoroughly. Stir in also 2 tablespoonfuls chopped glacé cherries and half that quantity of chopped glacé pineapple and then turn the mixture into the decorated mould, being careful not to disturb the rings. Leave the whole to set, and then turn it out carefully on to a glass dish.

VIENNA ICING. A good recipe for this soft icing, which can be used for decorating fancy cakes, is 4 oz . fresh butter to 10 oz . icing sugar, black coffee essence or vanilla essence to taste, and $\frac{1}{2}$ gill rum, brandy, liquetr, or sherry. The butter must be the very best and unsalted, and the sugar must be passed through a fine hair sieve. Work the butter to a cream, then add the other
a filling for a layer cake or Victoria sandwich. See Cake; Icing.
VIEW FINDER. Every camera should be fitted with an attachment by the use of which the photographer can ascertain precisely what part of the view at which he is pointivg his camera will be included on the plate or film. This attachment is known as a view finder and may take one of three forms.

The most common and least useful is that found on the great majority of small hand cameras used by amateurs, called the brilliant view finder. The amateur who wishes to produce anything more than snaps of varying success should discard it.
The image it produces is so sma! that it is impossible to see any detail in the picture, or to gain any clear idea of its composition, as it would be seen on the film or focussing screen. Again and again the amateur who relips on the brilliant riew finder with its tiny image will tind that his film is spoilt by some prominent object which he had not noticed, glaringly out of focus in the foreground.
Perhaps its most serious fault is that its use entails holding the camera about the level of the waist-line a position which is hopelessly wrong. If a scene is looked at from the knecling position, it will have a distinctly different appearance when we stand up and look at it in the normal erect position. In the first case, foreground objects posscss undue importance, and the whole perspective is partially falsified. Since things are normally looked at from eye level in the standing position, the camera should be made to look at them in that position and not as if the photographer were one of those mythical beings found on old maps with eyes in his stomach.

A much better type is the direct vision finder in one or other of its forms. An example of this is seen in Fig. 1. It consists of a double concave rectangular lens fitted to the top of the camera body in a line with the camera lens. It is of the same proportions as the plate or film used. The view at which the camera is pointed is seen in reduced size, but perfectly clearly, on the inner face of the view-finder lens, correct centring being ohtained by means


View Finder. Fig. 1. Showing a direct view finder consisting of a double concave rectangular lens ftted to the top of the camera
of a sighting pin at the proper distance away from the finder.

The camera must be held at eye level, as shown in Fig. 2. When using this type of finder the camera is almost bound to he held squarely. The complete fitting folds down on top of the camera, and can be purchased separately and added to most types of folding camera.

Another form of the direct vision tinder is the open frame (Fig. 3). Here a wire frame of the same size as the plate or film used is attached to the side of the lens mount. In some patteris it is attached to the top. At


View Finder. Fig. 2 Use of view finder as shown in Fig. 1. When this type is used the camera must
the back of the camera a aighting hole is fised, and by placing the eye to it, as clomonstrated in Fig. 3, the exact portion of the view which will be included on the tilm by the lens is seen. Moreover, the view is scen in its full natural size, so that it can be studied and the view point varied as necessary to avoid ugly foreground intrusions or other undesirable fentures. 'I'his pattern has the additional advantage that, as the frame is attached to the lens mount. its distance from the sighting hole varies with the focussing so that the finder is accurate in all positions.

## Vines and How They are Grown

## Hints on Their Cultivation in Greenhouse and Open Air

This article deals first of all with the varieties of the vine and then with the culcure of its most useful and popular forin, the grape vine. Its frult is described under the heading Grape. See also Dessert; Greenhouse; Muscat

Some of the vines are grown for their shoots being left for fruit bearing. 'l'hese ornamental leaves, which colour brilliantly in side shoots ought to be ahout 18 in apart autumn: others, valued for the sake of their on each side of the main stems it is imporfruits, are grown under glass. Although a few vurieties of grape vine may be planted on a sunny wall with fair prospect of a crop of small grapes in a favourable summer, large, well-Havoured fruits and a reliable crop are assured only by growing vines of special varieties in a glasshouse. For planting againat a sunny wall out of doors the best variety is Royal Muscadine, which bears small pale yellow grapres.

Haphazard mothods will not meet with success in the cultivation of the vine. A border must be prepared just outside the glass. house by excavating the eoil to a depth of $2 \frac{1}{2}$ feet. A laver of broken bricks is put in the bottom for drainage and the border is then filled with a compost consisting of threc parts of odd turf, chopped into pieces about the size of one's list, and one part of decayed manure, together with a sprinkling of bonemeal or special vine manure. The compost should be trodden firmly. Vines are best planted in sutunin. A hole is made low down in the greenhouse wall to allow of the stem of the vine heing passed through.

In Jannary the stem is cut back so that it reaches only to the trellis on which the vine is to bo trained. In spring two of the fresh shoots are allowed to grow, one being trained vertically up the trellis, the other horizontally along the front of the trellis. No further pruning is required until the following winter when the past summer's growth is shortened to within 2 ft . of the base. In spring the new shoots at the ends of the two branches arr. allowed to grow unchecked and a few othera are left to form side shoots or laterals, which will produce grapcs. The same routine is practised until the available space is filled, the main branches being allowed to progress at the rate of 2 ft . every year and other

VINAIGRETTE. This refers to a small box, often made of silver and occasionally of gold with an inner perfurated lid that is used for holding a sponge soaked in aromatic vinegar. It was carried in the pocket and the vinegar inhaled as a restorativo.

VINAIGRETTE SAUCE. This is made by mixing together 6 tablespoonfuls of tarragon vinegar, a teaspoonful of chilli vinegar, and 2 teaspoonfuls each of chopped tarragon and chervil. Stir these well in a basin, and season with salt and pepper. See Salad

Vinca. See Periwinkle.



Vine. 1. rrupagation oy "oyes." "Eye" suitably pottea witn its base in powdered charcoal. 3. Rooting of same. 4. Propagation in piece of turl: the eye is planted with a base of sand and charcoal dust and covered with fne rich soil. 5. Grafting a vine by approach. 8. How to top shoots : pricking out points shown by thick lines. 77 and 8. Thinning scissors and special stick for thinning. 9 Bunch suitably tifinned


| is |
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When the grapes are the size of peass they ought to be thinned; this is done by cutting out all the smallest berries and those in the middle of the bunches with n pair of scissors having long pointed blades. A further thinning will be necessary to give the berries room for lull development. When the grapes begin to change colour a dry airy atmosphere is again necessary

If the rinc is grown in an unheated greenhouse it will start into growth later than if the glasshouse is heated and the grapes will ripen later in the summer During dull wet weather great care must be taken to ventilate correctly and to keep the air of the greenhouse as dry as possible to prevent an attack of mildew : it is most important also to attend to summer pruning in the way advised to prevent overcrowding.
The best grape to grow in an unhcated glass house is the varietv known as Black Ham hulgh: this variety is also well suited to a heated glasshouse where, however, others Thay be planted. Those most easily managed are Alicanté, Gros Colmar, Madres tield Court and Fos ter's Seedling (a pa!e yellow grape). Oi her lirst rate grapes which need soinew hat skilled attention are Lady Downe's. Muscat Hamburgh. Mrs. Pince and Muscat of Alex. andria: the last na med is a pale yellow grape: s,enerally regardeld as the most delifions of all which requires rather a higher tem perature than most others to bring it to 50 degrees in February and cluring the spring months. As the temperature rises out of doors the ventilators must be opened to prevent the glasshouse becoming excessively as the day advances if necessary. In the afternoon, an hour or so before the sun has ceased to shine on the roof, the ventilators ought to be closed, at the same time the Hoor and walls should be syringed. The vine Hourishes in a warm moist air excepl when the bunches are in flower: then the glasshouse bunches are in flower: then the glasshouse mild perfertion.
Propagation. Vines are propagated by eyes or buds. In Junuary a piece of shoot of
further risk that mildew will set in and the grapes will not ripen properly.
In winter, all side shoots, whether they have borne fruits or not, nust be pruned to within two buds of the base of the past summer's growth. If in spring both buds sturt into growth one of the shoots, the weaker of the two, must be rubbed off. Summer and winter pruning in the way described is an important detail in the cultivation of the vine, and success depends chietly on its being carried out. As the years pass this hard annual pruning will result in the formation of woody swelling, called spurs, at the base of the side shoots.

## Ventilation and Thinning

Other details which need attention are ventilation, the regulation of the temperature and thinning the bunches. If the glasshouse is heated, a night temperature of 45 degrecs should be maintained in January and one of
the previous year's growth is cut off : it should be about. $1 \frac{1}{2}$ in long and contain a bud. If set singly in small pots of light soil, placed in a propagating case in a heated g!asshonse and kept moist, these eyes will form roots: they are subsequently potted in smal! pots and repotted as becomes necessary until they are in 8 in . or 9 in . pots. In late sum. mer when growth is complete they should be placed out of doors so that the wood may become well ripened. autumn the young vines may be planted in a border or repotted in 12 in . pots in which they will bear fruits: the stem; or branches are trained on thick bamboo canes inserted tound the edges of the pots. They need similar treatment to that already described. In December all loose bark should be peeled off the vine stems, which must then be treated with a biush dipped in the Gishurst compound preparation : this will help to keep them free from the attacks of pests.

Pests of the Plant. Red spider is a pest which attacks the lower surface of the leaves and disfigures and weakens them ; it is most likely to be troublesome in a dry, warm atmosphere Syringing the lower side of the leaves with salt water, 1 oz . in one gallon of water, is recommended. Mealy bug is the most serious pest ; it can be killed by using a brush dipped in methylated spirit, but great care must be taken not to touch leaves or huds or they will be ruined.

Mildew is a troublesome plant disease to which vines in an unheated glasshouse are particularly liable. It spreads most quickly in a damp atmosphere, therefore if mildew appears the greenhouse must be kept dry and airy. Affected leaves should be "dusted" with sulphur. Great care must be taken not to let the trellis become overcrowded with shoots and leaves. Summer pruning should be practised in the way already advised.

Ornamental vines are handsome leafy climbing plants for covering trellises, arbours and pergolas, and the self clinging Vitis (ampelopsis) Veitchii is invaluable as a wall covering: its small leaves turn crimson in autumn. The best of the large leaved ornamental vines which become beautifully autumn-tinted are Coignetiae, quinquefolia (Virginian creeper), Thompsoni, Thunbergii, Engelmanni and Vinifera purpurea (the purple leaved vine). Vitis Henryana. which has small green and white leaves, is suitable for planting on a wall in mild districts. All these vigorous plants thrive in ordinary well tilled soil.

VINEGAR : Its Uses. Vinegar is a solution of acetic acid in water usually darkened by adding colouring matter. It may be prepared from malt, wine, cider, sugar, wood, and other substances. The ordinary brown vinegar is made from malt. Most French vinegar is colourless, being obtained from the fermentation of light wines.

Besides its use as a ta'ile condiment, vinegar is employed in coskery for giving a piquant flavour to savourics and sauces, for dressing

beautitu border plant
salads and for pickling. Various dishes are prepared with it, as, for example, herrings cooked and soused in vinegar. Tough meat is made tender by stecping in vinegar and water before cooking
It is not difficult to make herbHavoured vinegars at home, and it is useful to have various flavours in the store cupboard. Tarragon vinegar is made thus: To $\frac{1}{4}$ peck tarragon leaves add $\frac{1}{2}$ gallon white vinegar. Leave it in a covered jug for two weeks, then strain it through flannel ; return it to the jug. Dissolve in it a good pinch of isinglass in order to fine it. Afterwards bottle and cork it down.
For chilli vinegar add 1 oz . ground chillies to 1 quart white wine vinegar, put it in a covered jar, and leave it for two wecks, shaking it each day, then strain and bottle for use. To make horse-radish vinegar scrape 3 oz . horse-radish, add 1 oz.ghredded shallot and 1 dram cayenne pepper. Put al! into a jar and pour over it 1 quart white wine vinegar. Cover it closely and let it stand for two weeks, shaking it occasionally, then strain and bottle it.

Cayenne vinegar is useful when a hot scasoning is required. Put $\frac{1}{2}$ oz. cayenne pepper into a jar and pour on it l pint white wine vinegar. Cover it closely and leave it for three weeks, shaking it cvery two or three days. When ready, the liquid must be poured off gently into a bottle or strained through a piece of fine muslin.

Orleans vinegar, prepared in considerable quantities in the Orleans district, is a variety of white wine vinegar suitable for table use and for toilet preparations.

Vinegar is considered to help in the digestion of oily or fatty foods. It should, however, be


Viola Culture. 1. Cutting: $a$ how to prepare: $b$, depth to plant. 2. Natura plantlet : $a$, root growth; $b$, depth to plant. 3. Type of cutting to avoid. 4. Violas from seed : $a$, glass ; $b$, cross sticks ; $c$, sandy soil; $d$, compost; $e$, leaves f. crocks. 5. Seedlings transferred to ahaded cold frame: $a$, ventilating block ; $b$, ahading material. 6. Old plant trimmed to provide cuttings. 7. Soil preparation for cuttings: $a$, sand; $b$, ine losm; $c$, ashes; ${ }^{a}$, gub-soil. 8. Dibbed hole with sand at base. 8. Cutting suitably planted
used in strict moderation, as it interferes with digestion, and may set up irritation of the stomach if taken too constantly or too freely Vinegar is often taken by the ignorant as a remedy for reducing the weight. It should be clearly understood that its use for this purpose is utterly unjustifiable, as the only way in which vinegar can make one thin is by seriously harming the digestion. See Acetic Acid; Pickle: Salad; Sauce.

VINEGAR CAKE. Take 1 lb . self-raising flour, 4 oz. each margarine, sugar, raisins, and sultanas, 1 teaspoonful bicarbonate of soda 1 breakfastcupful milk, and 2 tablespoonfuls vinegar. Rub the margarine into the flour add the sugar and the dried fruit, and then the bicarbonate of soda dissolved in the milk. To these add the vinegar, mix all together, and then bake in a moderate oven for an hour

VIOLA: The Flower. This is the botanical name of the group that includes the viola or tufted pansy, the ordinary pansy and the violet. Some of the violas are charming rock garden flowers, while the larger-flowered sorts are invaluable for filling spring and summer flower beds. The modern race of large-flowered violas originated by cross-


Viola. Tiny gellow nowers of the low growing rockery plant
breeding between Viola cornuta, a Pyrenean plant, and the pansy.
They flourish in ordinary well-tilled soil, and are propagated by cuttings inserted in sandy soil in a cold frame in September; during the winter in mild weather the frame must be ventilated freely. The plants are set out of doors in April, and will bloom throughout many summer weeks if the dead blooms are picked off and the soil is moist. They are also easily raised from seeds sown under glass in spring,. Some of the best varieties are: Primrose Dame, pale yellow; Maggie Mott, lavender; The Swan, white; Moseley Perfection, yellow; W.H.Woodgate, pale blue ; Archie Grant, purple blue; Mrs. Chichester, white and purple ; and Redbraes, yellow.

Viola cornuta is a plant of tufted growth which bears small flowers in profusion; there are varieties with blooms of purple, rose, and other colours which are most useful for planting in rose beds and flower borders.

Of the species or wild types suitable for the rock garden the following are very charming flowers: calcarata, lavenderblue; gracilis,
purple, and its fine variety Purple Robe : and lutea yellow. These ahould be planted in gritty, loamy soil in slight shade.
VIOLET. This favourite garden flower pays for good cultivation If the plants areleftun. disturbed for vears the blooms be. come small. It must be planted in decply dug soil enriched with manure in a slightly shaded position; a border facing west is ideal. In May the old plants should be lifted and separated into
 picces, the best of thesc being replanted. Single varieties are set at 15 in. apart, double varieties at 12 in . apart. During the summer months the soil between the plants should be hoed frequently to keep down weeds, and all runners must be cut off.
To ensure fine flowers the violet bed ought to be replanted annually, or, at all events, every two years. Some of the best varicties aro Princess of Wales, Czar, California, and La France, violet blue; and White Czar, white. These are single flowered. Good double violets are Comte de Brazza, white ; de Parme, lavender; Marie Louise, mauve purple; Mrs. Astor, rosy heliotrope: and Neapolitan,
lavender. Admiral Avellan, red lavender. Admiral Avellan, reddish mauve, and Coeur d'Alsace, pink, are two pretty single violets of unusual colouring.

To obtain violets in winter some of the plants should be lifted and planted in a bed of soil in a cold frame in September; the frame inust be in a sunny position; it should be ventilated frecly in mild weather in winter.


Violet Culture. 1. Plant with rooted runner (a). 2. Runner planted : u, fine soil with sand around roots. 3. How to lift clumps. 4. Trimming same for


It is an advantage to make up a hed of fresh, dry leaves in the frame beneath the soil in which the violets are. See Dog's Tooth Violet.

VIOLET CRESS. The hardy annual that is called violet cress or Ionopsidiun is of miniature growth, and produces tiny flowers of white tinged with purple. It should be sown in spring where the plants are to bloom in summer, in light soil in partial shade in the rock garden.

VIOLET GROUND BEETLE. This creature is a little friend to the gardener, and therefore should not be destroyed. It is one of a large family of beetles, the parents and larvac of which run about the surface of the soil devouring grubs and other pests. This beetle is about 1 in . long; and may be recognized by its colouring of violet-black.

VIOLETTA. This is a small-flowered viola, of which there are many varieties suitable for the rock garden or the front of the Hower border. See Viola.

VIOLIN. To the eye the violin presents three principal parts : the body, which is the resonating chamber; the neck, upon which the finger-board is fixed; and the strings, which extend from one end of the instrument to the other. From a constructional point of view it comprises no fewer than 57 distinct pieces of wood, fitted and glued together, in addition to which there are 13 movable fittings, such as strings, pegs, the bridgn, etc.
The violin is an instrument which demands not only absolute perfection of workmanship, but also most careful adherence to those principles of measurement and proportion exemplified in the extant sjecimens of Stradivari, Amati, Guarnieri, and the other masters. It is possible for good workmen to turn out excellent modern violins, but the merit of these is always according to the personal care bestowed upon each instrument, a care which is necessarily lacking in the case of the cheap fiddle produced by the thousand
Details of the Body. An examination of the hody will show that the wood employed is not the same throughout. There is a reason for this. The back and the belly exert a mutual influence, and therefore if the former gives a . hard, metallic sound when trasted by rapping it with the knuckles it is necessary to counteract this by choosing for the belly a somewhat softer wood.

Besides the density of the wood, there are other factors which enter into calculation. The harder the wood, the thinner it can be worked to promote frecdom of vibration, and this thinning of the plates is an iniportant detail of the workinanship. Though other woorls, such as sycamore, can be used, maple is preferably chosen for the back, as also sometimes for the neck and ribs. The belly and the inside fittings, such as the hass bar, the blotks, the sound-
post, ete., are of pine. The age, density, and grain are all-important considerations in sclecting the wood. The finger-board, the tailpiece, and the pegs are of ebony.
The body of the violin consists of the back and the belly, which are united by the ribs, but it would be too frail to withstand the strain of the strings without some internal adjuncts. These are first of all the blocks, four of which are glued in the corners next to the waist of the violin, with two more at the top and bottom respectively; but the most important fitting is the sound-post, which is placed about $\frac{1}{4} \mathrm{in}$. or less behind the right foot of the bridge. This resists the thrust of the bridge upon the belly, and plays an indispensable part in transmitting the vibrations of the strings to the body. Its thickness, density, and exact position are factors which vitally affect the tone.
The linings are narrow strips of pine, which run all round the inside edges of both back and belly. affording a wider surface for glueing to the ribs, and thus strengthening the structure. The last inside fitting is the bass bar, which is tixed longitudinally to the belly close to the left sound-hole. Mention must also be made of the purfling, the thin black lines of stained plane wood which follow the outlines and obvinte any possible danger of the edges splitting. Lastly come the $f$ or sound holes, which are cut in the belly

Neck and Varnish. The neck is fixed to the upper end of the body, and terminates in the head or scroll. Immediatcly below the scroll is the peg-box, the sides of which are picreed with holes to receive the four pegs. The slight projection at the back is called the nut. Upon the upper surface of the neck is fixed the fingerboard, which is slightly convex, and projects over the belly to within an irch or so of the top of the $f$ holes. The strings extend from pegs, round which their one end is coiled, and pass over the bridge to the tailpiece, in which the other end is fixed. The bottom of the tailpiece has a loop of stout gut, which passes round the tailpin on bottom rib.

This description of the parts of the instrument may be completed by mentioning the varnish, which is put on after the desired yellow, red, or brown has been applied to the wood in the form of a wash. Spipit varnish is often used for cheap violins. Oil varnish, though slower in drying, is more lasting.

The bridge transmits the vibrations of the strings to the belly, and, speaking generally, a heavily built instrument will take a finer bridge than a lighter one. Its position is of extreme importance. The correct place for its two feet is exactly between the nicks on the inner edges of the $f$ holes. The feet must also be adjusted exactly to the curve of the belly. When properly placed, the right foot will be in line with the sound-post, and the left foot immediately over the centre of the bass bar

Tuning the Strings. The four strings are tuned in fifths as follows:


The second string $A$ is the standard by which the others are regulated As they are a!l of the same length, the differences in pitch have to be secured by differences in thickness and density, while the fourth string $G$ is wound round with silver wire. The requisite tension is obtained by turning the pegs so as
to stretch the strings With experienced performers this is done by the left hand, while the right band is free to test the pitch with the bow, but in the case of beginners the instru ment is held by the neck resting it against the kneo, while the pegs are manipulated, the atring heing twanged from time to time until the pitch is correct The final test. however. is alwaye made by the bow

To fix a new string, knot one end, slip it through the proper hole in the tailpiece, and draw it through the slit, where it will be held by the knot Thread the other end through the small hole in the peg, pass it under itsell and turn the peg, which should be pressed inward as it is turned The rest of the coil may then be cut off The $G$ string is sold of the proper length only The pitch of the $A$ string having been adjusted to the pitch required by circumstances, the $D$ string is tuned with it, and then the $G$ string below that. Finally the first string is tuned with the sccond string In cach instance make sure that the fifth is absolutely perfect before proceeding
Holding the Instrument. The violin is held with the left hand encircling its neck, but so that the palm does not touch it The end of the instrument rests on the left collarbone, where it is kept in place by a sufficient pressure from the performer's chin In order to induce greater security of tenure, some players either use n chin-rest fixed to the violin or place a pad upon the collarbone: but this laiter, at any rate, would seem to militate against resonance
The neck of the instrument resting in the hollow of the thumb. the fingers are beld over the finger board, so that the first finger if pressed down will produce $F$ on the first string, the second finger $C$ on the second, the third finger $G$ on the third, and the fourth finger D on the fourth string

The bow is held in the right hand The thumb must touch the raised part of the nut, and the lingers must be rounded slightly over the stick Possibly, with some hands, the little finger will experience difficulty in doing this, but if it can be managed it will be of great advantage in forte playing. The bow crosses the strings at right angles between the bridge and the end of the fingerboard, and in order to secure an even, steady tone it should preserve that position in every respect. The action of the right arm should be without stiffess, and special attention must be given to the freedom and independence of the wrist, the forearm. and the upper arm.
The Music. Music for the violin is always written on the treble stave with the G clef. Bowing is always indicated exactly, otherwise each note receives a separate bow. The combinations of slur and dot, etc., are too numerous to be treated in detail here, and full information must be sought in violin schools; but the chicf thing to he remembered is that all the notes under one slur are to be performed by the same stroke of the bow. A down bow is indicated by and an up bow by $\Lambda$.
The only other notation that need be mentioned here is that for harmonics. A smallo placed above a note means that it is to be played as a natural harmonic. If artificial harmonics are desired, there is a double notation; the notes which have to be pressed down are given in the usual notation, while for the barmonic there is a diamond-shaped note joined to it by the same stem. thus:


VIRGINIAN COWSLIP. This is the popular name of a hardy herbaceous perennial named Mertensia pulmonarioides. It grows

18 in high and bears blue flowers in May It flourishes in ordinary well-drained soil and is incrasaed by division in Feliruary.

VIRGINIAN CREEPER. The botanica name of this favourite hardy climbing plant so often planted on house walls, is Vitis (ampelopsia) quinquefolia; its large lobed leaves eolour brilliantly in autumn. The amall-leaved Vitis inconstans (Ampelopsis Veitchii) is a greater favourite because it is self-clinging, and even more brilliantly tinted. These climhers thrive hest on sunny or only


Virginian creeper. small eaves of the seli-clinging variety known as
slightly shady walls. It is necessary to support the sclf-clinging kind with a few pea sticks until it has started to cling to the wall. The large-lcaved Virginian creeper should be trained to a trellis of wood fixed against the wall. Planting may he done in autumn or spring Propagation is by cuttings placed in a frame in autumn or by small pieces of growth, each containing a bud, set in a heated greenhouse in early spring.

VIRGINIAN POKEWEED. This vigorous hardy herbaceous perennial is suitable for the wild garden or large border. The stem reaches a height of 6 ft . or more and the small white flowers are followed by deep purplish berries ; it is most ornamental in early autumn. Propagation is by seeds sown out of doors in epring. The roots are poisonous.

VIRGINIAN STOCK. This low growing hardy annual blooms in about 6 weeks after the seeds are sown out of doors in March or April. It is a pretty little plant for an edging to a llower border, the blooms being crimson, rose or white according to the variety chosen. Its beauty is rather short. lived, but another sowing may be made to provide blooms in late sumimer. Its lotanical name is Malcolmia maritima.

VIRGIN'S BOWER. This is the popular name of a rampant climbing plant named Clematis flammula. It beara a profusion of small white fragrant flowers in late summer and is useful for covering an arhour or trellis. It flourishes in ordinary soil.

Ampelopsis Veitchii, valued by the gardener for its decorative effect and beautiful autumnal colouring

VISCARIA. This is a very showy hardy annual with rose, crimson, white, or purple flowers. It reaches a height of about 12 in ., thrives in ordinary soil in a sunny position, and blooms in summer from seeds sown out of doors in March and April. As with all annuals it is most neccssary to thin out the seedlings to give them room for development.
VISITING: The Etiquette. The usual method of kceping up with friends who live at a distance is to stay with them or one's own home. Few visits cxceed a fortnight in length and a week-end is the most usual. The invitation naturally depends upon the circumstances both of host and guest, and must be adapted to suit them. l'eople who possess cars often enjoy weekends, which might prove too expensive for a guest to whom the railway fare is a consideration only to he justified by a longer visit.

The hostess will naturally invite people at the time when it is most convenient for her to have them, and if wise will also nake the invitation a definite one. She will ask the gucst for a week, a week-end, a fortnight, or whatever period may he suitable. The guest should seldom stay on after that periorl, even if pressed to do so, unless something has intervened since the arrival to make an extra day or two advisable.
If asked for a week-end the guest should assume that be is not expected before lunch time on Saturday, He will also assuine that his departure early on the Monday is expected. If asked vaguely for a few days the visit should always stop short of the week.
The time of departure is necessarily varied by circumstances. If the guest is lcaving by
 suitable for garden borders
car, as a rule an hour after breakfast is con- portion, either in the form of thick sheet or venient, but if returning to business after a week-end there may be a specially early train to catch which should be understood before, or soon after, arrival. Other departures may be regulated by convenient trains for cross country journeys, but in any case it is best to have the matter clearly settled in advance wherever this is possible.

At the conclusion of a visit of some days a tip of 5 s . is usual to the parlourmaid and also to the housemaid attending on the rooms. The chauffeur would have the same when leaving the guest at the station. Where there is a butler or single-handed manservant instead of a parlourmaid, the same tip would be usual. In the case of a young unmarricd gucst the tips to women servants are often reduced to 2 s .6 d. , and tips to manservants may not be expected.

In larger houses the question of tips becomes rather more expensive for a man. He may be expected to give 5 s . to 10 s . to a footman who acts as valet as well as tipping the housemaid, etc.
VITAMIN. Certain complex substances which exercise a profound influence on the metabolism of the body are known as vitamins. Six are definitely known to exist, and are described as vitamin A, B1, B2, C, D and E respectively. Vitamin A and vitamin D, which appears to occur in close association with it, are not soluble in water but dissolve in fats. They are not easily destroyed by heat. The former promotes growth and the latter prevents rickets, and to a lesser extent promotes growth. Vitamins B1, B2 and C are soluble in water and are more easily destroyed by heat, espccially vitamin C. The absence of vitamin Bl from a diet leads to the development of beri-bcri, the absence of B2 to the development of pellagra, while the absence of vitamin C results in scurvy.
The vitamins originate in plant life and are present in the fresh tissues of animals that live on plants, so that they occur in varying proportions in both animal and vege table foods. Under the heading Diet (q.v.) there appears a list of foods with the vitamins they contain, and the amounts. It will be understood that vitamin D is included with fat-soluble vitamin A.

VITEX. The only kind of vitex in general cultivation is Vitex agnus-castus, a shrub suitable for planting against a sunny wall in mild districts. It bears bunches of white flowers in September, but is not likely to bloom freely in a sunless season. It can be propagated by cuttings in summer and should be hard pruned in February

VIVARIUM. This is the name given to a receptacle for housing small semiaquatic animals and insects, or butterflies. It is generally supplied with a small pond, rockery, ferns and other plants. The construction is on similar lines to that of an aquarium, but it need not be all watertight, the usual form being illustrated in Fig. 1. It is hardly worth while making a vivarium of less than 30 in . by 15 in . with a height of 30 in ., as it would be difficult to arrange for a small pond as well as a selection of ferns and other plants. Teak can be used for the upper portion, which forms a frame for the glass, and zinc for the lower
a lining to a shallow wooden box.
The casc should be madc in thrce parts, as indicated in the section at Fig. 2. The base is a trough measuring 32 in . by 15 in . by 6 in ., as at A. This supports a rectangular framing (B), open top and bottom, filled on the four sides with glass and made to a height of 18 in . The framing is covered with a top (C), with sloping sides, 6 in. high, framed up to match the lower framing and filled in with glass in the same way, but it has an opening at the top 18 in . by 6 in . covered with perforated zinc sheeting.

Several ways of making the framework are illustrated in Figs. 3, 4, and 5. The trough is made of cither deal or hardwood from $\frac{3}{4} \mathrm{in}$. to 1 in . thick, with the corners butted and nailed, or dovetailed. The lining should be of thin sheet zinc, with the corners soldered
The upper portion should fit on top of the trough with an overlapping half-round bead around the bottom edge if the framing is of wood, or a flange if of metal. The latter material can be used, as at Fig. 3, by folding it over to enclose the glass. The top portion of the frame should be in two strips so that the glass can be slipped between them. The corners of the framework should be soldered together. Another method is to use anglepieces, as in Fig. 4, the same method of inserting the glass being used. Fig. 5 illus trates how the frame can be made up of wood. A frame is formed of 1 in . square material, a groove being cut for the glass, and the corners joined with mortise and tenon joints. The top portion is made to mat the lower portion, the 18 in . by 6 in . ventilating opening being allowed for, the sides filled with glass, and a piece of perforated zinc attached to cover the top. For hints on setting out the angles for the mitre joints of top framcwork, see Mitre.

The pond can be formed with a shallow earthenware dish, the rocks made with coke dipped in cement, and the trough filled with soil. See Aquarium.
Fig. 1


Vivarium. Fig. 1, Case in teak, zinc and glass for small semiga a 5 Difer mals.

VOICE : Its Care. The voice is the sound that is produced by the vibration of the vocal cords of the larynx. These are set in motion by waves of air breathed out from the lungs. The pitch of the vocal sounds depends on the rate of vibration. Sounds produced in the larynx are modified by the movements of the lips, tongue, ctc. The quality or timbre of the voice depends upon secondary vibrations, overtones or harmonics, superimposed on the primary vibrations. The loudness of the voice depends chiefly on the quantity of air which is employed in order to set the vocal cords vibrating.
Men have deeper or lower pitched voices than women because, as a rule, they have longer vocal cords. The breaking of the voice, which occurs at the change from childhood to adult life in the male, is due to the rapid growth of the larynx at this time, and the temporary lessening of control over the muscles which govern the tension and rigidity of the larynx.
Loss of voice and gruffuess of the voice or hoarseness may be brought about by anything which interferes with normal movements of the vocal cords. Paralysis of the nerves supplying the cords, growths on the cords, ulceration, catarrhal inflammation, etc., all may interfere to a greater or less extent with the production or with the quality of the voice. See Laryngitis; Larynx ; Throat; Tonsillitis.
VOILE. There are both silk and wool voiles, but thesc arc unimportant in comparison with the cotton voiles. All are light in weight and open in texture.

Crispness is a virtue in cotton voiles, plain or fancy; double voiles, as they are sometimes called, crease less easily than the soft, clinging kinds, last longer, and require washing less frequently. Especially when buying self-coloured voile, care should be taken to choose the harder-fceling variety. Patterned or plain coloured cotton voiles makc excellent glass curtains for bedroom windows.

VOL-AU-VENT. This refers to a round or oval case of puff pastry which, after baking, is filled with some delicate ragout of chicken, sweetbread, lobster, or other fish. Sometimes quenclles of chicken are mixed with the sweetbricad. The sauce used is always rich and usually flavoured with mushrooms and truffles. When served as a sweet the pastry case is filled with fruit.
To make a good vol-au-vent 1 lb . puff pasto will be required. After giving the paste six turns, roll it out $\frac{8}{4}$ in. thick and cut it to an oval shape. Place the case on a baking-sheet rinserl with hot water and brush the top of it with egg, then mark it with a cutter or sharp knife within about $\frac{3}{4} \mathrm{in}$. of the cdge all round to form the lid. Put a hoop of white paper 2-3 in. high and a little larger than the case around it. Bake it in a hot oven from $\frac{3}{4}$ to 1 hour.
When baked, remove the lid, scoop out any soft pieces of pastry, brush the inside of the case with egg, take away the paper and return the pastry to the oven for a few minutes. Have the filling ready and well heated, then fill the casc and cover with the lid. It is better to dish the vol-au-vent before filling it.
Turbot Vol-au-vent. A vol-au-vent case filled with cold boiled turbot reheated in some white sauce makes a good luncheon dish. Prepare the pastry case as directed, break the fish into Hakes, rid it of skin and bone, and then moisten it with the sauce, made from fish stock. Add n few shelled shrimps and seasoning to taste, heat the mixture thoroughly over the fire, and then turn it into prepared case. Serve very hot.

Turkey Vol-au-vent. Small vol-au-vent cases may be filled with a savoury mixture of turkey and ham. While the cascs are baking, mince the remains of some cold cooked turkey, add to it about a quarter of its weight of grated ham, a little white sauce and a spoonful of thick cream. Heat these together in a small
pan, season them to taste with salt. pepper, and mace, and then turn them into the hot cases. Serve them at once.
Fruit Vol-au-vent. A good sweet is made by putting 3 desscrtspoonfuls Demerara sugar into a saucepan containing $\frac{3}{4}$ gill water and allowing the two to boil for 5 min . or until a thick syrup is formed. Add 1 lb . damsons, cherries, plums or other suitable fruit, cook them very gently until they are tender, and then leave them to get cold.

Make the vol-au-vent case, as previously directed, take out the inner circle of pastry.


Frait Vol-au-Vent. an attractive sweet
and when the case is cold fill it up with the fruit, kceping back some of the juice if too moist.
Mix a few drops of vanilla and a sprinkling of castor sugar with 1 gill of cream, whisk the whole until it thickens, and then shake it on to the fruit, decorating the top with one or two damsons, cherries, or neat picces of fruit if a larger kind is used. If liked, a teaspoonful of lemon-juice can be added to the flour when it is mixed with water; this counteracts the richnces of the pastry. See Pastry : Sauce.
VOLT. In electricity the unit of elcctromotive force or electrical pressure is termed a rolt. It is that pressure which will drive a current of one ampere through a resistance of one ohm. See Electric Light.

## Voltage. See Electricity.

VOLTMETER : Its Uses. The instrument known as a voltmeter is used for recording the voltage or pressure of an elcctric current flowing in a circuit. The watch pattern voltmeter is convenient for testing the voltages of accumulators or other sources of small voltage supply. It consists of a metallic casing enclosing the coils, etc., and fitted at its bottom end with a pointed lug which forms onc of the connexions. The other connexion is a short length of flexible wire which passes through a hole in the knob to which the ring is fitted. The outside end of the wire is finished off in a sharp-pointed metal end.
To use the instrument it should be inspected to see if it requires connecting to a circuit a definite way round. If this is the case, a plus sign is usually to be found near its appropriate terminal. This terminal should be placed on the positive side of the battery or circuit under test, while the negative side of the battery is joined to the negative side of the instrument. To obtain an accurate reading the voltmeter should be held vertically. Good connexion is made by scraping and pressing the pointed ends of the voltmeter connexions whiile a reading is being made.
As the voltmeter is required to read the difference of potential between two points in a circuit, it is placed in parallel to the circuit containing the resistance causing the potential drop. In this respect it differs from an ammeter, which is a low-resistance instrument, and, as it measures the total current flow it is wired in serics to the circuit.
Testing H.T. Batteries. Only high resistance instruments should be used for testing the voltages of high-tension batteries, otherwise an unfair load is placed upon the small cells.

In order to obtain an accurate indication of the state of a battery used for a wirelees set all voltage readings should be taken with the battery delivering its normal current to the valves. "Open circuit" readings are misleading, because the cells tend to recover after a period of rest, but when current is consumed the voltage gradually falls to a steady value, depending upon the condition of the battery.

## The ordinary high-resistance volimeter is

 not suitable for measuring the output vollages of mains H.T. unils.
## See Accumulator: Battery.

VOLUME CONTROL: In Wireless. This is a device for adjusting the power applied to the loud speaker. A popular method of controlling the volume is to connect a highresistance potentiometer across the secondary terminals of a low-frequency transformer. The resistance of the potentiomcter should be not less than 500,000 ohms, and the connexions are as follows: Join the two potentiometer terminals (which are connected internally to the ends of the resistance element) respectively to "G." and "G.B." on the transformer. Connect the moving arm or slider (usually the centre terminal) to the grid terminal of the valve-holder. If the grid terminal is already joined direct to " G." on the transformer, this lead must first be removed.
The potentiometer method is also applicable to sets employing resistance-capacity coupling. In this case the usual grid-leak resistance betwoen the grid of the valve and grid bias negative is replaced by the potentiometer. the slider of which is joined to the grid of the valve, and the two ends of the resistance element to the coupling condenser and grid bias negative respectively. See Potential Divider.

VOLUNTEER SNOOKER. This billiard game is a variant of snooker. It can be played by two or more persons either as sides or independently. It is called voluntecr snooker because a player is said to volunteer if, when striking, the cue ball hits a pool ball which he is not on, after the first score.

In general the game proceeds in almost the same way as snooker pool. The samc 22 balls are necessary and there are no cannons. The balls are the white one, known as the cue ball. with which each striker plays, 15 red balls, and one each of the following colours: yellow, green, brown, blue, pink, and black; these six are the pool balls. See Billiards ; Snooker Pool, etc

VOMITING. The forcible expulsion of the contents of the stomach through the mouth, vomiting is generally preceded by nausea and with this a free flow of saliva. The first thought on the occurrence of vomiting will generally be that it is due to some disturbance of the stomach itself causcd by the ingestion of unsuitable food or of some irritant poison, but there is a very large list of possible causes, many of which have no connexion whatever with the digestive apparatus. Those that have such a connexion, apart from gastric affections themselves, include irritation in the pharynx, irritation or obstruction of the intestine, appendicitis, gall-stone, and other affections of the liver and gall-bladder.

On the other hand, vomiting may occur in the eye disorder known as glaucoma, and in some car disorders in which there is disturbance of the apparatus concerned with preserving balance; it is a common incident in pregnancy; it usually occurs when there is renal colic ; it may be an early symptom of meningitis, and is caused by tumours in the brain.
Information regarding the cause of vomiting may often be derived from an examination of the vomitus, or vomited matter. Frequently this will consist of undigested food simply, but when vomiting is caused by corrosive poisons, the vomitus may contain shreds of stomach-lining and blood. In gastric ulcer and
cancer there is also blood, but there are other causes for blood vomiting. Bile is often found in the vomit, and sometimes wrongly supposed to be the cause of the vomiting, when what has happened is that bile has been forced into the stomach by the muscular contractions that caube vomiting.

The treatment of vomiting depends on the cause, and in many of the conditions above mentioned treatment will have to be directed to other things than the vomiting, which is mercly incidental and relatively unimportant. When the cause is irritating food or something of the kind, it is desirable to give large draughts of tepid water. This washes the stomach out, and makes the act of vomiting less distressing. Sips of hot water may check vomiting, though sometimes sips of iced soda water are more successful. In persistent vomiting during fevers, sips of iced champagnc often prove beneficial when other remedies have failed. Counter-irritation over the pit of the stomach by applying a mustard plaster is another useful measure in some instances.

Many drags, including bismuth, morphine, dilute hydrocyanic acid, and others are used in treatment. A convenient remedy may be found in a single drop of tincture of iodine in a tablespoonful of water, the dose to be repeated every 15 minutes for tive or six doses. See Biliousness ; Emetic ; Gastritis; Indigestion; Morning Sickness; Nausea; Poisoning : Sea .Sickness.

VOTE : How to Secure. The qualifications for the parliamentary vote were altered by the Act of 1923. At the present clay a vote of this kind can be exercised practically by all men and women over 21 years of age, provided they are British subjects. Such persons must have resided for six months at the house in the constituency in which they vote, or must have occupied business premises for that period. This is the qualifying period which ends on Jan. 15 or July 15 each year.

A person can vote in two constituencies but no more. For instance, a man or woman can vote as resident and also as occupier of business premises, provided the two are in different constituencies. He or she can also vote for one of these, and, if qualified, for a university In the case of universities the vote can be. exercised by those who have taken their degrecs. Women can rote for a university that does not admit them to its degrees, provided they have passed the necessary examinations. Special arrangements are made regarding the rights of soldiers and sailors to vote. They are registered in the constituencies for which they would be qualified if they were not away on service. This condition applies not only to soldiers and sailors on full pay, but to merchant seamen, pilots and fishermen, and to those engaged on Red Cross and other work of national importance abroad. These persons are allowed to vote by proxy. The Act of 1918 allowed persons in receipt of poor relief to vote; previously they had been disqualified.

The Register of Voters. To exercise the right to vote, the person's name must appear on the register of electors. This is made up twice a year, once in the spring and once in the autumn. The former comes in force on April 15 and the latter on Oct. 15. The town clerk or clerk of the county council is responsible, under the council, for making up the register for his town or county. He decides whether or not a person is qualified to have his or her name placed on the register. Anyone dissatisfied with his decision can take the case to a county court and from there to a court of appeal. A person desirous of obtaining a vote should therefore first find out whether the name is on the register.

Voting for Local Authorities. As regards local authorities, persons, both men and women, are qualified to vote at clections for these bodies if they are 21 years of age and over,
and occupy, either as owner or as tenant, any land or premises in a local government electoral area. He or she must have occupicd the prenises for the qualifying period of six months, and the name must appear on the roll of electors. In this sense a tenant includes a lodger, provided he or she is in the occupation of unfurnished rooms.
VULCANITE. The real difference between vulcanitc and ebonite consists in the quantity of sulphur used in the manufacture. Vulcanite is made by incorporating india-rubber or gutta-percha with ordinary sulphur and lampblack in a masticating machine. It is pressed into moulds and heated in a steum oven at a temperature of $315^{\circ} \mathrm{F}$. In use and methods of working vulcanitc and ebonite are practically identical. See Ebonite; Polishing.

WADDING. Cotton wadding, which may be bought cheaply at any draper's, is used for palding such articles as cosies, and also as an interlining for quilting. A layer of wadding, cut to the same dimensions, is laid betwcen the outer fabric and the lining, and the three are quilted together. A special attachment for quilting is sold by sewing machine makers.

Common wadding is usually of a brownish colour. Surgical wadding or cotton should always be employed for wounds or for direct application to the skin, as in making pneumonia jackets. In re-covering chairs it is often advisable to lay a sheet of common wadding inder the embroidered canvas, cloth or leather. See Taxidermy ; Upholstery.
WAFER. A wafer usually takes the form of an initation seal. It is made of glazed paper, gummed at the back, and is affixed to the Hap of the envelope in the saine way as a seal. At one time they were very popular, and were used by many people, but of recent years they only appear in many colours and designs at Christmastime to decorate letters and parcels of gifts. Occasionally wafers are printed for some charitable purpose, and people buy them and use them on their letters as a means of inducing others to subscribe to the charity.
WAFER BISCUIT. Home-made wafers may be composed of equal quantities of sugar and llour moistened with 1 tablespoonful cream and a quarter that quantity of orangeHower water to each oz. of Hour. The mixture is heaten for 3 of an hour and then baked in portions bet ween the wafer irons, somewhat on the same principle as waffles.
An easier and more modern recipe is to beat 1 oz . butter with the white of an egg till mixed, then to add thein to 1 lb . Hour, together with suflicient cream to form all into a thick paste. It is important to knead the mixture till it is as line and smooth as glass; roll out into very thin pieces, shape and hake 3 min . in a quick oven. Before rolling, let the paste stand 20 min .


Waffle lron. An electric waffle iron suitable for table use

WAFFLE. This Amcrican dish is becoming more and more popular in England. It is composed of a thin, rich batter mixture cooked at high temperature in a waffle iron until crisp and brown. A little practice is necessary to achieve the desired degree of crispness, and the amount of batter required for each waffle. The thickness of the batter may vary according to personal taste, a thicker batter requiring a little longer in cooking to crisp it. Plain waffles are served with maple syrup, golden syrup or honey as a rule, or with just a pat of butter on the top.

A good foundation recipe is as follows: 1 heaped breakfastcupful Hour, 2 egg yolks and 3 egg whites, $t$ teaspoonful salt, Iteaspoonful sugar,


WAGES. Money paid for the services of persons in one's employ is known as wages. In the domestic sphere wages are paid to all indoor and outdoor servants, although in the case of governesses and others of superior status the payment is known as salary. IVages are paid either weekly or monthly. There is no rule on the subject, but in general it may be said that indoor servants are paid by the month and outdoor ones by the week. On the other hand, daily maids are as a general rule paid by the week.
Under English and Scottish law employers have certain legal obligations to those to whom they pay wages. The latter must be insured under the national health insurance scheme and against accidents while in the employ of their master. Wages that are not paid when $\frac{1}{2}$ brealifastcupful milk, $\because$ tablespoon fuls melted butter. Sieve the Hour, salt and sugar together, and milk and egg yolks heaten until light, and the melted butter. Beat well, and when smooth add the egg whites bcaten stithy. The batter is lighter if allowed to stand a little time.

Heat the waffle iron, sprinkle with a teaspoonful of water, and when the iron stops steaming put in about a quarter of the waffle inisture. This quantity may vary a little with different irons and only experiment will show the right quautity to use. If too much batter is inserted it will ooze out when the iron is closed; if too little, it will not spread evenly and the thin places will burn. Generally the squares in the iron should be two-thirds full.

Close the iron, and cook until no steam is seen coming from between the two halves. If the waffle is hot, crisp and brown by this time, lower the heat and cook for a minute or so longer, but be careful that it does not burn. Cooking takes 2 to 3 minutes as a rule.

Cheaper wafflcs may be made by using I egg and 2 teaspoonfuls baking powder to the above quantities, while they can be varied by aprinkling the top of the batter when in the iron with chopped cooked sausage or bacon, cooked chicken or grated cheese.

Wamle Iron. This utensil for cooking waffles can be heated by electricity, gas or fire. The electric ones are the most convenient, requiring no turning in the cooking of the waffles, and inany of the $m$ have gauges which show when they are heated to the right degree. They are often made in aluminium or on bright metal stands for table use.
A new waffle iron needs burning in for 10 minutes before use. Then with a soft cloth dipped in melted fat the iron plate into which the batter is poured should be coated thinly with the fat, the iron closed and the heating continued for 3 minutes. It is now ready for use and grease should not again be applied, the surface merely requiring a sprinkle of water.


Wainscot. Fig. 1. Typical oak wainscot. Fig. 2. Showing how a simple wainscot can be made un
from three-ply and battens
due can be recoverd by an action in a court of law, and in the case of an employer going bank rupt unpaid wages must be paid in full before anything is available for the ordinary creditors. See Employers' Liability; Insurance ; Servant.

WAHLENBERGIA. The most beautiful of all the tufted harebells is a little rock garden plant named Wahlenbergia serpyllifolia. It grows only a few inches high and bears large purple blossoms of bellfower shape. It must be ,planted in gritty soil in slight shade. Pamilio has lilac-blue fowers; Hederacea is of creeping growth and bears pale blue flowers. The best method of propagation is by sowing seeds in a pot of fine soil in a frame.
WAINSCOT. The form of wall covering applied to the interior of rooms and known as wainscot or wainscoting is sometimes composed of marble or other materials, but is usually of wood. It takes the form of panelling at the height of about 5 ft . from the Hoor to the top.

In construction, wainscot consists of a series of rails and uprights varying from 1 in . to 2 in . thick, tenoned into each other, the interspaces heing filled with panels from $\frac{3}{8}$ in. to lin. thick. The edges of the rails and uprights are moulded or hevelled; the corners are mitred, and are also grooved to take the panels. Wainscots are generally surmounted by a
capping moulding and finally finished at the bottom with a skirting board.

In oak wainscot it is a common practice to peg the tenons, no glue being applied to the joints. This was the customary method in carly oak wainscoting, in which the lower edges of the rails were left square, the top edges bevelled, and both edges of the uprights moulded. Fig. 1 shows a typical example of a wainscot of oak. Where a very large room is to be fitted, it is made up in sections and the parts secured in position separately.

A cheaper form of wainscot may be made by securing sheets of 3 -ply to a rough groundwork nailed or plugged to the wall, and then nailing a series of battens to the surface to give the effect of panelling. It is essential to arrange the joints in the 3 -ply so that they come opposite the battens, and are thus hidden. The groundwork also should be arranged in a sinilar formation to that of the battens, so that there is a solid ground to nail to. Fig. 2 shows the finished wainscot of this type and the under-ground. An effective finish to the work can be obtained by staining the battens a darker colour than the 3 -ply.

The term wainscot is also applied to oak boards cut in such a way that the silver grain or medullary rays appear on the surface. To secure this effect it is necessary to cut them radially from the centre. See Panclling.
WAITER. This word is occasionally used for a piece of furniture that serves to hold something needful for the table at meal times. Such pieces are usually known as dumb waiters. The word is also employed for a small tray or salver.
WAKE ROBIN. This common name is applied to the cuckoo pint of the hedgerows (Arum maculatum). See Arum Lily: Cuckoo Pint; Trillium.
WALDSTEINIA. This is the name given to a small family of hardy herbaceous perennial plants. known as the barren strawberry. They rarely attain to a height of more than 6 in., with yellow flowers in late spring and early summer. They are propagated by seeds sown at the same period of the year, or by division of the plants in autumn or winter. Waldsteinias flourish in ordinary soil. The most noteworthy kind is W . fragarioides; it is useful for planting on a dry bank.

WALK: In the Garden. For convenience of access to various parts of a garden and to facilitate the work of maintenance it is necessary to have a number of paths. Those of gravel should be not less than 5 ft . wide to allow of two persons walking abreast in comfort. Paved paths, which are more expensive to construct, are usually laid only in certain parts, as in the rosery, the little formal garden or the rock garden ; a width of 3 ft . is sufficient for these. A wide grass path between borders of hardy flowers is very attractive if kept trim. In making a gravel path the soil should be removed to a depth of at least 18 in . and carefully sifted for stones and other refuse. This refuse. together with bricks, broken flower-pots, and other drainage material, should be placed at the bottom of the walk trench, which should then be filled up with coarse gravel and further surfaced with a layer of fine gravel and sand. The whole should be rolled, leaving the centre higher than the sides. Stone or brick paths must be laid on a foundation of sifted soil, sifted ashes, or sand. See Crazy Paving; Path.

WALKING STICK. Sticks have long been used as aids to walking and as a means of defence in case of attack by dogs or men. They are carried, however, by many men merely as an addition to an outdoor outfit, and a present to a man often takes the form of one of these sticks.
There is hardly any limit to the variety in which walking sticks are made. Many woods are used for them, cherry wood and malacca canc being among the most popular, and they can be bought at prices ranging from a few pence to several pounds. The price depends to some extent upon the material, but more upon the mounting, which may be of silver or cven of gold. Initials are sometimes engraved on a band of the metal, this being especially the case with presentation sticks.
As regards shape, sticks may be divided into those with crook handles and those that have no handle but only a finished top. The former are perhaps more useful, and a good example is of imitation ebony with silver mountings at the nose of the crook and at the collar. The best are fitted with a horn ferrule. Of sticks without handles, a good example is


Walk. A richly flowering herbaceous border enhances the beanty of this grass walk, from which, by means of picturesquely curved steps, one descends to a quaint brick path set between grass borders
of cbony fitted with a gold cap. Others are ot malacca cane with a silver cap.
A development of the walking stick is now specially designed for sporting men and women, tourists and walkers, its specia' feature being the addition of a seat. The stick itself has a sharp spike at the bottom so that it can be inserted into the ground, and the seat is made by opening out the handle or head. These sticks are sold in various qualities and designs. The seat may be of mahogany, walnut, or some other wood. The better examples have fittings of aluminium, and the seat is covered with leather. See Ivory.

WALKING TOUR. Persons who spend a holiday, either long or short, in walking from place to place need to observe a few simple precautions if the tour is to be a pleasant onc. Firstly, there is the choice of footwear. Since everything depends on comfortable feet, this deserves a little carc. Stockings or socks should be made of wool, as this is less liable to cause chafing or blisters. Men usually prefer thick ribbed golf stockings.

Boots and Shoes. The boots or shoes should fit well, especially at the heels, but should not be new If they have been in wear for a few weeks they will have taken the shape of the wearer's foot and cause no discomfort. Square heels are essential. The heels should be inspected beforehand and, if necessary, levelled.

People with tender feet are advised to rub them over with a little methylated spirit before starting, and to put a little boracic or other foot powder in their stockings. Some people recommend soaping the inside of the feet of the stockings with a slightly moistened cake of soap. As far as the other clothing is concerned, so long as it is comfortable all requirements are fulfilled, but the wise traveller carries a raincoat or some sort of light coat to put on if the weather changes or during the pauses for lunch, etc.

In arranging a tour, it is wisest to take easy days at the beginning, unless the walkers are in the pink of condition, and to work up for the longer tramps towards the middle of the week, or whatever the period is. It is also wise, when planning the day's distance, to arrange for a shorter distance the day after an extra long one. Fatigue is often felt more the day after than on the day itself.

Accommodation. The securing of accommodation for the night is an important matter. In the more populous parts of the country, where the villages are not very far apart, it is generally possible for travellers to secure sleeping quarters in an inn, or, if that is full, in a cottage near. Many walkers, however, like to walk over more lonely districts, such as Dartmoor, the Yorkshire moors, the Cheviot Hills or the Black Mountains, where houses are few and often at considerable distances from each other. Such persons should arrange the day's walking so that a village or an inn. can be reached before the close of the day. The arrival should not be too late in the evening, so that, if the inn or cottage is full, there is still time and energy to walk a mile or two to another haven.

In 1931 a movement was started to provide hostels for walkers in various parts of the country, and a few were opened during the summer of that year. The idea is to afford shelter for the night at a very low charge. The travellers bring their own blankets and also their food. for which cooking facilities are provided. The movement is directed by a national organization and the opening of a chain of hostels has been planned.
Maps. The walker will find a good map essential. The best are those based on the maps issued by the Ordnance Survey, and the one-inch to a mile will, for the majority, be found the most convenient, although the
two-inch can also be recommended. They can in particular districts. Devonshire cob houses A useful property of many of the wall boards be bought from any stationer. See Holiday. and the stone buildings of Gloucestershire and WALL: In Brick, Concrete or Stone, the northern counties are examples. A A wall is a structure of brick, stone, or other variety of materials have been experimented material, generally built for enclosing a piece with as suitable for walling purposes, notably of ground, or as a shell in which the mixtures of cement and different are formed the rooms of a build ing. There are two main classifications: walls which are built to resist vertical pressure for the support o objects

A


Wall Board. Fif. 1. Sectional diagram illustrating various methods of atilizing the material, in thla case Insulwood, for attic lining, exterior and exterior walls, etc. Wall board forma a roof sheathing, and is laid also under floor boards. See enlarged details of A, B, C. D in Fig. 2
patent Impermeable Millboard Co.. Ltil
placed upon them, such as floors; and those built to withatand oblique thrusts, such as that of a vaulting or untied roof trusses. Another kind of wall for the latter purpose is the retaining wall for earth.
Walls may be hollow or solid, according to the purpose for which they are required. Brick is the material mostly used in their construction except in districts where stone is available. Concrete, too, is much employed. For light partitions and as walls for small buildinge, wood is extensively used the wooden walls being set on concrete or brick foundations.
The thickness of brick, stone, or concrete walls varies according to the weight or pressure they will be called upon to withatand. For walls not more than 8 ft . high, which are to enclose arcas, and will only have to withstand wind pressure, an ordinary 9 in. brick wall should be strong enough; lower walls, not called upon to withstand much weight, could sometimes be $4 \frac{1}{2} \mathrm{in}$. wide, or the width of a single brick. Concrete for this purpose consists of blocks about 18 in . long, 9 in . wide, and $2 \frac{1}{2} \mathrm{in}$. thick

Internal walls may be made up of timber studding and with wall board. They are dealt with under the heading Partition

Rougher kinds of walls, suitable for boun daries, are usually made of random rubble stone. Sometimes a walling material for a small building is simply rammed earth, the muthod being known as pisé de terre. In addition, many other materials are employed
work many different materials are used, including highly compressed paper, wood pulp or fibre rolled into sheets. ply wood, reed and plaster slabs, asbestos cement. Asbestos cement composition is largety used for exteriors and also for interual panelling and partitions. For external walls the material may be purchased with a rough-cast surface on its outer side.

A common size is 8 ft . by 3 or 4 ft . in width. Larger sizea run up to 12 ft . by 4 ft . Thick ness is from $\frac{3}{16}$ in. to $\frac{s}{8} \mathrm{in}$. As the weight is from 8 oz to $l \mathrm{lb}$. per sq. ft., wall board is a good substitute for wood and plaster ceilings, which average about twice the weight of a good quality wall board. Many varieties are supplied with a linished surface to take coating of enamel or paint
For both internal and external walls in bungalows, garages, or other buildings wall board is much used, owing to its panelled appearance and the rapidity with which it can be put up. The drying-off stages of plaster are obviated and an advantage is that the building is fit for habitation immediately upon completion.


Fig. 2. Diagrams abowink varied application ot insulwood. A. 8howing plaster-base applied in sheets before plastering. B. How panelled effect is obtained by using large sheets of wall board. C. Treatment of internal wall, showing use of plaster base. D. Internal wall of internal wall, showing use of plaster base.
covered with wall board and papered


Wall Board. Fig. 3. Snowing now the nome worker can use wall board to partition of a room. The material shown is Essex board Courtesu of Thames Board Mills. Ltd
cutting into a shect of the wall board, the latter may be cut to shape as required with a rross-cut saw. To cut a straight strip from a length of the wall board it thay be heavily scored with a chisel and bent off at the weakened line, the board being supported at the score by placing it against the edge ol a bench. Rough-cast wall board is cut in a similar manner with the score on the smooth side. The rough side is then broken off by continued bending. See Asbestos; Panelling: Partition, Plywooil.
which the panels may be nailed. The framework should be spaced to suit the width of the panel. It must be secured to solid material, and to this end it is best to plug the walls before nailing or screwing on the battens. If the plaster is bulging or broken away, or the surface to be covered is found to be uneven, small packing strips made from odd picces of the wall board may be tacked underneath. It is important, where the wall board is applied to a plastered ceiling, to ascertain that the panel coincides with the joists.
The space between adjacent pancls is covered with an ormamental strip of wood, which gives the panelling effect to this class of work. A convenient size for this strip measures 2 in. wide and $\frac{3}{8}$ in. thick. Before nailing the strip over the wall board the latter should first be painted, taling care that all holes not covered by the parcilling strip arc stopped. In lixing the panelling strips the vertical strips should continue unbrolien if a sense of additional height is required.

A useful application of wall board is in dividing a large room into two smaller ones by nıeans of a partition (Fig. 3). Information about this is given in the article on l'artition. In the event of a window or ventilator


Wall Gardening. An old wall provides an ideal home for pink and mauve aubrietia, slyssum, arabis, silvery saxifrage, pinks and other suitable flowers
blooms in mild weather in autumn and winter, and is in full beauty in spring. Wallulowers are excellent window box plants and will Hourish on a dry stone wall.

The double wallflowers are grown in pots for the deco:ation of the greenbouse in spring. Sceds are sown in a box of soil set iti a frame in Inly and August, the seedlings being potted singly in small pots and subsequently into others 5 in . wide. Some of the walltlowers, e.g. alpinus, light yellow, and Marshallii orange, are pretty plants for the rock garden, where they should be set in light soil in a sunny place.

WALL GARDENING. A dry wal!, that is, a wall built without mortar or cement in the joints, can be made $n$ very beautiful feature of a garden if planted with snapdragon, wall. flower valerian, aubrietia, arabis, yellow

alyssum, silvery saxifrage, pink, sun rose, stonecrop, dwarf phlox, and other suitalle flowers.
If the wall is shady it provides a home for ferns, foxgloves, ivy-leaved tondflax, mossy saxifrage. fumitory, and liellHower. Sceds mixed with a little moist soil may be sown in the chinks of the wall in spring or late summer, or small plants can be set in spring or autumn. A bank provides an excellent site for a dry wall; or a clouble wall may be constructed in the open garden, space being left in the middle for well drained soil. In building a wall care must be taken that it slopes backwards from the base, so that all the plants receive their share of the rainfall.

Fruit Growing on Walls. On a sunny wall it is possible to grow fruits of the highest possible quality. Fan trained or single or double-stemmed cordon trees are most suitable. Planting should be done in autumn in deeply dug ground enriched with basic slag or bonemeal, and it is thenoficial to add old mortar rubble freely to the soil in which stone fruits are to be planted. Care must be taken to set the stems of the trees about 12 in . away from the wall.
A wall facing south or south-west is suitable for peach, nectarine, apricot, fig and the choicest dessert pears. Plums and pears will thrive on a wall facing west. Swect cherries are suitable for an east wall, and on a north wall the Morello cherry and cordon gooseberries and currants may be planted. In cold northern gardens it is worth while planting some of the choice dessert apples against a sunny wall. For a south or south-west wall:
peaches, Hale's Early, L'eregrine, Bellegarde, Barrington and Waterloo; nectarines, Elruge, Hardwicke and Humboldt: pears, Doyenné du Comice, Bergamot d'Esperen. Beurré Superfin, Fondante d'Automne, Glou Morçeau Marguerite Marillat and Winter Nelis: plums, Coe's Golden Drop. Comte d'Althan's Gage Early Transparent Gage, Jeffierson, and Oullin's Golden Gage.
For a west wall the pears and plums already mentioned are suitable. A wall facing east will provide excellent crops of sweet cherries, e.g. May Duke, Black Tartarian, Early Rivers, Frogmore Bigarreau, Kentish Bigarreau. nud Knight's Early Black.

WALLPAPEI. The most important thing to do when wallpapers have to be chosen is to make up one's mind to a definite scheme of treatment. Every room has, by reason of its use, n character which is emphasized by its furnishing and which can be made a ley to the problem of its decoration. Thc personal factor must not be relegated to a sccondary place, hecause decoration should be the expression as well as the environment of personality.
Whatever the purpose of the room, there are certain general considerations which are of importance ; aspect, lighting, size and proportions are conditions which must inHuence choice. Rooms facing north require tints which suggest warmth; south rooms can be treated with schemes in cool colours.
Effect of Lighting. Window space and the conditions imposed by artiticial light should regulate the shade of the wall covering, whether it :s to be light and so capable of refraction, or whether shades which absorb light can lie used. Insufficient light, whether natural or artificial, is a fault which, if it cannot be remedied, must be corrected by the colour and texture of mural coverings if possible.

The effect of light can be attained by ensuring such contrasts of colour and shade as will make objects easily seen which would be otherwise indistinguishable. A wallpaper having a light background with well defined pattern will carry out this idea, or a brightly coloured border having distinctive forms and sharp contrasts will perform the same service.

In this connexion it must be remembered. however, that what is easily seen seems to be near at hand, so that easily seen patterns may appear to reduce the size of a room; whilst, on the other hand. if it is desired to make a room appear larger, indefinite patterns in low tones of colours, tending towards greys, will give the effect of space. The principle might be summed up thus : whatever the eye sees clearly is imagined to be near at hand. whilst haziness and indefiniteness are mentally associated with distance. The apparent size of a room is materially affected by the volume of light which enters it, or is provided by the proximity of the colour of the walls to white. Light and spacinusness are closely related, whilst shade and dark colours suggest cosiness and enclosure. The effect of colour is dealt with in the article under that heading, and that of texture of wall coverings in the article on Decoration.

Use of Pattern Papers. It is not surprising that woven and printed fabrics, embossed leather and other materials which have been used for wall coverings are closely imitated in appearance and texture on wallpapers. There are papers having the appearance of canvas and hessian, produced by printing and embossing, which make excellent wall coverings for rooms which are much used. The designs in popular use in the 18 th century for printed linens and cotton hangings, and the hand worked embroideries which preceded them, have been followed most successfully on wallpapers, and are satisfying for many bedruoms and sitting rooms where the appear-
ance of brightness is desired. There is a series of such papers known as chintz papers, some based on the designs of Qucen Anne embroideries which are most attractive, recalling rooms in country houses with period furniture.
For dining rooms, hall, landings and staircase, patterns hased on tapestry designs have the advantage of traditional associations in their favour, and also of not showing marks. Many are well produced and can be obtained in a wide range of colourings. Soirette is the name given to a type of paper with silky surface which is used for drawing rooms, bedrooms and other rooms where delicate tints are suitable, and the furniture is highly polished and somewhat French in design.

Of the unpatterned papers which are called semi-plains there is sufficient variety in colour, type and texture to suit every kind of room. Here again materials which are used for wall decoration are imitated in wallpaper, notably leather of many kinds, oals and other kinds of wood grain, plaster of rough-cast and trowelled finish. The suitability of this range of papers for particular rooms depends on their colouring and their degree of finish; they are, however. in general use for livingrooms and hall and staircase walls. Effects resembling old parchment are much favoured for modern decorative schemes and other suitable types resemble stippled and mottled paintwork.

The delightful blending of colours found in marbles of many different kinds has given inspiration for a great range of well produced papers in soft tints, but without any attempt at imitative renclering of actual niarble. Others represent marble with varying degrees of accuracy, and these papers are excellent where Regency or Empire effects are liked
Some imitations of marble are popular for bathroome while others are used in narrow widths as surrounds for doorways, windows and niches. Recently there has been a revival of the use of marble papers for staircase and landing walls; when hung horizontally and panelled out to represent slabs the result is impressive.

Motifs and Panels. A form of wallpaper decoration which has become increasingly used within the last few years is achieved by the use of applique motifs which are made in a great number of types and sizes. There are motifs for corners of pancls, pendants for use with cut-out horders, independent


Walnut. Cluster of green-hirsked nuts
ornaments for centres of panels, ovel mantelpieces, bed heads or other positions where attractive colour is desired. All these present little difficulty in arranging. If there should be doubt they can be separated from the surrounding paper, on which they are printed, and pinned up to iudge of their suitability before actually pasting on to the background paper with which they are used. Anotier type of motif is designed for use above skirting or dado rail and takes the form of groups of flowers of varying height and width. Some of these are very extensive, and are of sufficient beight to reach from skirting to picture rail. Their arrangement is not difficult, for with them are generally supplied illustrations showing how they can be adapted. A floral panel and an applied tree motif are illustrated in the article on Decoration.

Corner ornaments are used to enrich panels, which are arranged symmetrically to cover the wall space. Such panels are formed by using a "stile" or "stiling border." These borders are obtainable for use with appliqué motifs, and in several different widths. First the stile is hung under the picture rail and above the skirting, all round the room, then the stile is hung vertically at angles. It there are large wall spaces the stile can be used to form divisions between angles, the lengths being pinned up before pasting so that the proportions of the panels can be adjusted pleasantly.

It should be remembered that these fancy styles of bordered panels look better if one dimension is considerably greater than the other; if both dimensions are nearly equal the effect is not so pleasant. Square panels of this type are uninturesting. Panels in the proportion of 7 ft . high and 5 ft . wide are pleasing, and the narrower the panels in proportion to their height the greater will be the effect in increasing the apparent height of the room. I'anels which are wider than their height will make a room appear lower.

Assistance in connexion with choosing motifs and simulated panelling can be found in the illustrated booklets which are obtainable from most up-to-date decorators. In the article on Hall the attractive use of a landscape motif on a marbled paper is illustrated, and also of a lincrusta panelling. See Colour; Decoration; Frieze: Hall : Panclling: Paperhanging: Paste

WALL PLATE. This phrase is applied generally to almost all types of horizontal timber set upon the top or some other part of a wall to act as a support for joists, rafters, or the like. In a normal two-storey house three principal wall plates might be used. On the ground Hoor, if the floor were made of boarding, the joists would rest upon a horizontal plate of wooll set upon the lower part of the brickwork; this horizontal plate being known as the wall plate.

A somewhat similar arrangement may be adopted for the first-foor joists, except that the wall plate would either he supported on corbels or, preferably, built into the wall itself. On the top of the wall a horizontal member, also known as a wall plate, is provided as a means of fixing the roof rafters and ceiling joists. See Joist : Rafter.

WALL RUE FERN. The popular name of the fern which is known botanically as Asplenium ruta-muraria : it thrives admirably in the crevices of a shady wall. See Fern.

WALNUT. The fruit of the hardy, summerleating walnut tree is a brown nut enclosed in a green husk, and is ripe in September, when it is thrashed off the trees. It is sometimes removed in summer, for pickling. It is best dried after gathering, so that the husks can be removed without staining the shells, and then stored in jars, with salt placed between each layer.

Walnut trees are raised from seed sown in spring and transplanting the seedlings in
autumn, or else by budding or grafting if it is times seen on chairs. The oil polish is far desired to keep a particular form true The superior to a wax finish, as neither heat nor walnut does not thrive in thin soil over chalk or gravel ; it is most successfully grown in a deep loam, with a fairly dry subsoil The walnut produces separate male and female flowers, and the fruit is borne in terminal clusters. After a young tree has been shaped no pruning is required. The common wa!nut is Juglans regia, of which the wood is in demand for furniture making.

Walnuts as Food. In addition to their use as dessert, walnuts are added as ingredients to many dishes that need nut flavouring. Usually they are shelled, peeled, and toasted in a cool oven until they are slightly crisped, and then chopped or broken into small pieces.

One of the simplest ways of using walnuts is to make them into a salad. Toast them and break them up as already directed, having removed the brown skin, and then mix them with some cleaned and shredded celery Only the white portion of the celery should be used, and the quantity should equal that of the nuts. Season the mixture to taste bind it with some thick mayonnaise sauce. and garnish the top with a few halved walnuts. This salad is a good accompaniment to chicken. (See Mayonnaise; Salad.)

Walnut Stains. Of all stains those caused by walnuts are the most difficult to remove On wool or silk they are best left alone, for the drastic treatment needed to take them out is almost certain to ruin the material. On cotton and linen, however, repeated applications of eau-de-javelle or a warm solution of oxalic acid may be effective.

Uses of Walnut. This wood is fairly bard, heavy, and close in grain, easy to work, and does not warp or shrink much. There is the European variety, the best of which grows in Italy; the American black walnut, which is darker in colour; and another American variety called satin walnut. The Italian and American black walnut are those chiefly used for the better class furniture. Satin walnut is used for cheaper furniture, and is not considered a high-class furniture wood. It is soft and tough, and liable to shrink and warp considerably, but is an easy wood to work. It is a light brown or yellowish colour with darker streaks, and shows a satiny surface when planed. The others range in colour from greyish to purplish brown, of ten streaked with darker shades. Walnut is not used by builders, as it often becomes worm-eaten and its durability cannot be depended on.

American black walnut looks very well when treated with a wax polish. The polisher should look carefully for light portions of the wood, and, having found them, should take a small pencil brush and carefully stain them to match the surrounding parts. Some workers use a feather to mottle up the work.

The colouring up of the light portions may be done with a water stain, made by mixing dry powdered vandyke brown with liquid ammonia. and then diluting this mixture to the desired shade; or it may be done with a judicious use of spirit stain, say, walnut crystal, or powdered stain dissolved in methylated spirit. The stain, no matter what variety is used, will raise the grain of the wood, and the usual course of glass-papering down the work must be gone through. Some workers prefer to rub the work over with linseed oil before using a wax polish. If it is tirst oiled in this way, it should stand for at least 48 hours before the wax compound is applied. For chairs, bedroom suites and sideboards waxed walnut is very effective. Some polishers apply a few rubbers of french polish on the top of the wax after it has been allowed to harden.

Another simple way of finishing walnut is by oil polishing. This is generally used for the tops of dining tables, although it is some-
superior to a wax finish, as neither heat nor
moisture will affect it. Wither raw linseed oil or boiled linseed oil can be used American black walnut is frequently french polished. This begins with a preliminary staining, this being done with a water or spirit stain applied to any part of the work that shows signs of light sapwood No hard and fast rule can be given for the mixing. A good plan is to mix a fairly heavy stain, and to dilute it as required.

The next step is to oil the work. Here again colour must be considered. If the general character of the work appears to border on slate colour, it is necessary to use red oil otherwise the work when finished will be dull and lifeless. On the other hand, if the walnut has a rich red shade, raw linseed oil should be used. After the oiling come the three successive processes of filling in, bodying up, and spiriting out. These are described in the article on French Polishing
Walnut Furniture. For articles of furniture walnut was used earlier on the Continent of Europe than it was in England In the latter half of the 17th century it was in great favour in Holland, and, with the close connexion between that country and England that began about 1660 . much walnut furniture was brought over. Ahout the same time the supply of English oak was diminishing, and walnut began to lake its place, the Queen Anne period around 1700 being sometimes known as the age of walnut. In addition to its use for the body of the article, it was much used for veneering, walnut on oak being a popular form. It was employed for decorative furni ture made in the style of Louis XVI, but in England about the same time its place was taken to a large extent by mahogany. In the middle of the 19 th century there was a great revival of walnut furniture, the Italian variety being particularly favoured for fine furniture See Armchair; Bureau; Cabinet; Chair; Dressing Table ; Furniture ; Graining ; Grand father Clock; Inlaying; Marquetry; Mirror Queen Anne Style: Stool: Tallboy: Vencer ing: Wood.

WALNUT BUN. 'The ingredients for making walnut buns are $\frac{1}{2} \mathrm{lb}$. flour, 2 oz . cornflour, 1 teaspoonful baking-powder, 3 eggs, 2 tablespoonfuls milk or cream, a little jam, and 5 oz . each castor sugar, butter and walnut kernels. Put the walnuts into a moderate oven for a few minutes to crisp, and then chop them finely. Cream the butter and sugar, add nearly all the walnuts, then break in the eggs, beating one in well before adding another. Sieve together four, cornHour, and baking-powder, and then add them to the mixture, with the milk.

Beat the whole for a few minutes and put the mixture into small greased tins on a baking sheet. Bake in a good oven until they are firm to the touch. Turn them out and allow them to cool ; then brush them with a little jam and sprinkle with chopped walnuts.

WALNUT CAKE. The ingredients that are required for a plain walnut cake are $\frac{1}{2} \mathrm{lb}$. each butter, castor sugar, and fine flour, 5 eggs , a good pinch of salt, $\& \mathrm{lb}$. peeled and chopped walnuts, and 6 bitter almonds peeled and pounded fine. Cream the butter and sugar till very light, add 2 of the eggs, and beat for 5 min . Add 2 more eggs and beat again for 5 min .; then add the remaining egg and give another good beating to the sponge. Sift the flour with the salt, add the nuts, and mix it very lightly but quickly with the eggs, sugar, and butter.
Put all into a shallow cake tin and bake till firm and a golden brown colour. The time required for baking varies according to the depth of the tin, but the oven must be steady and not too hot.
This walnut cake should be iced with white fondant or French icing. and should be

ady\& Gentleman
Lady\&Gentleman
Waltz. Fig. 1. Steps of the natural turn for both partners. Fig. 2. Those of the reverse turn
decorated with peeled halves of walnuts placerl here and there on the surface of the icing.

A rather nore spongy cake is made without butter. Beat together for 25 min . the yolks of 3 large eggs with 5 oz . castor sugar, adding a few drops of water from time to time, in all 1 tablespoonful, and flavouring with the grated rund of a lemon. Mix with $2 \frac{1}{2} \mathrm{oz}$. ground walnuts, $1 \frac{1}{2}$ oz. wheaten flour sifted with $1 \frac{1}{2} \mathrm{oz}$ potato Hour and a pinch of salt, then whip up the whitcs of the eggs.

Fold the flour and whites of egg alternately into the sponge, putting in about half of each at one time. Bake about 20 min . in a shallow tin lined with greaseproof paper. The oven should be of a moderate heat, and the cake on no account must be moved while baking until it has set. Ice with white icing or merely dust the top of the cake with icing sugar and sprinkle over chopped walnuts. See Cake: Fondant ; Icing.

WALNUT PUDDING. A variety of bread and jam pudding, with walnut flavouring, this can be made in the following way : Heat up 3 gills milk, then pour it over 3 oz . fine breadcrumbs mixed with $1 \frac{1}{2}$ tablespoonfuls castor sugar and a little grated lemon-rind. While these are soaking, shell some walnuts, weigh out 3 oz . of them and toast them for a few minutes before chopping them finely. Then stir them into the bread and milk mixture, adding also the yolks of two eggs. finally mixing in the stiffly whisked whites.
Grease a small pie-dish, put into the bottom of it 1 or 2 tablespoonfuls of jam, then cover the latter with the pudding mixture, and bake it in a moderately hot oven until it is lightly browned.

WALTZ. There are three fundamental steps of this dance, the natural turn, the reverse turn, and the changes, i.c. chanoring from the natural turn to the reverse turn and vice versa. In these three main steps
there is only ono rhythm, a step to every beat. half a turn is made on the first three steps the The music and the steps go in threes, and as man should close his feet together on the the first beat of the music is accentuated, the third step of the reverse instead of crossing first of each three steps should be a little longer them. The same rule, of course, applies to than the second and third. On the third beat the girl's step. Contrary body movement is in both the natural and the reverse turns and used by both dancers on the 1st and 4th steps. the forward changes the feet must be closed toget her.

An important point to observe is the rise, which commences at the end of the first step and continues through the second, bringing the dancer right up on to the balls of the feet on the third step. Contrary body movement (C.B.M.) is used on the first step of every three.

The Natural Turn (Fig 1). This is composed of six steps. In the first three the man steps forward with R.F., turning on it to R., to side with L.F., still turning, and closes R.F. to L.F., completing half a turn. He then steps back with L.F., turning on it to R., to side with R.F., still turning, and closes L.F. up to R.F., completing the whole turn. When the man is doing the first three steps the girl is doing the last three, and vice versa. It is not always necessary to make half a turn on each threc steps, a quarter turn is sometimes used. This depends on the direction in which the man wishes to steer. Contrary body movement is used on the lst and 4th steps by both man and girl.

The Reverse Turn (Fig. 2). In the first three steps the man steps forward with L.F. turning on it to L., to side with R.F., still turning, and crosses L.F. up in front of R.F. completing half a turn. He then steps back with R.F., turning on it to L., to side with L.F., still turning, and closes R.F. up to L.F., completing the whole turn. When the man is doing the first three steps the girl is doing the last three, and vice versa. As in the natura turn, it is not always necessary to make half a turn on each three steps; but if less than

The Forward Changes (Flgs. 3 and 4) 1. After a natural turn the man steps forward with R.F., turning body slightly to R. (C.B.M.), to side with L.F., and closes R.F up to L.F. The girl steps back with L.F., turning body slightly to R. (C.B.M.), to side with R.F., and closes L.F. up to R.F. 2. After a reverse turn the man steps forward with L.F., turning body slightly to L. (C.B.M.), to side with R.F., and closes L.F. up to R.F. The girl steps back with R.F., turning body slightly to left (C.B.M.), to side with L.F., and closes R.F. up to L.F.
The Backward Changes (Figs. 5 and 6). 1. After the first three steps of his natural turn (1, 2, 3, Fig. 5) the man steps back with L.F., turning body slightly to R. (C.B.M.). back with R.F., back with L.F., only just passing R.F., and finishes with the last threc steps of his reverse turn. The girl, after the first thrce steps of her natural turn, steps forward with R.F., turning body slightly to R. (C.B.M.), forward with L.F., forward with R.F., only just passing L.F., and finishes with the last three steps of her reverse turn. 2. After the first three steps of his reverse (1, 2, 3, Fig. 6), the man steps back with R.F., turning body slightly to left (C.B.M.), back with L.F., back with R.F., only just passing the L.F., and finishes with the last three steps of his natural turn. The girl commences with the first three steps of her reverse turn, steps forward with L.F., turning body slightly to L. (C.B.M.), forward with R.F., forward with L.F., only just passing R.F., and finishes with the last three steps of her natural turn. In the diagrams accom-
panying this article the right foot is shaded but the left is shown in outline only. The dotted line indicates the ultimate position of foot. It will be easier to follow the diagrams which are given in this and the previous page if the dancer faces the direction in which the toes are pointing and turns the diagram at the same time. See Dancing; Fox Trot Quickstep; Tango.

WARD: In Chancery. By the theory of English law the king is the guardian of every infant (i.e. person under 21) in the country, but he exercises this guardianship through his judges, and only becomes an active guardian when in some way an infant is brought before the court. Any person under 21 may be made a ward of court by someone paying into court a sum of money in which the infant is declared to be interested. The court will not usually interfere unless the infant has some property.

The position of such a ward is that he or she cannot marry without the consent of the court. It is a contempt of court punishable by imprisonment for anyone to marry such a ward without the judge's leave. Ignorance that the infant was a ward of court is no defence in a case of this kind

The judge has power to order the infant to be placed in the custody of any person he chooses. He can even take a child out of the custody of one or both of its parents and hand it over to somebody who may or may not be a relative.

The National Society for the Prevention of Cruelty to Children uses this weapon sometimes in order to take children out of the custody of undesirable parents. It is contempt of court for anyone to interfere with such custody or to remove the infant out of the jurisdiction of the court without leave. The wardship ceases when the infant attains the age of 21. See Guardian.


Waltz. Diagram showing the various steps and turns. Figs. 3 and 4 show the detaila of the forward change. Figs. 5 and 8 . The backward change

## Wardrobes: Antique and Modern

With Designs for a Hall Wardrobe and One in Veneered Walnut
After some remarks on the story of this piece of furniture, this contribution pives particulars, aided by diagrams, about making two types of wardrobe. The worker will obtain further assistance by consulting the entries Cabinet Making; Joint; Polishing; Stain; and others on woodworining processes. See also Bedroom; Corner Wardrobe: Cupboard; Fur; Furniture; Hall

The wardrove was evolved about the last panelled: and helow were two small drawer: decade of the 17 th century from the hanging and two larger ones. Contemporary wardrobes cupboard and is a combination of that piece and a chest of drawers. Examples of Queen Anne period pieces are rare, but there is an intercsting child's wardrobe dated 1712 in the Victoria and Albert Museum. It is made in the form of a contemporary house. painted to resemble brickwork. The roof has a gable at either end. a hexagonal chinney and dormer windows. There are three rows of sash windows across the front. The doorway has pilasters and curved steps.

The centre of the front is hinged and forms the door of the cuphoard fitted with clothes pegs. There are two wings, one fitted with small drawers and the other with shelves. It is therefore a complete wardrobe in the modern sense

A hout the middle of the 18 th century a higher standard of comfort was introduced into bedroom furnishing, and accommodation for clothes improved from the usual tallhoy to the clothes press and wardrobe. The clothes press is sometimes known as a " gentleman's wardrobe." It consists of a cupboard enclosing sliding trays and mounted on a low chest of drawers. Most of these pieces were made of plain mahogany, but highly decorative carved pieces were based on a design in Chippendale's "Director."

Hepplewhite also designed and made wardrobes. In one fine example the mahogany piece was inlaid and ornamented with marquetry. The upper part was the wardrobe proper, enclosed by two doors. which were
were of paintcd or lacquered rood. The illus-
tration shows a bcautiful piece with a Chinese design in lacquer work made for Javid Garrick.

Sheraton's designs for wardrohes were usually of mahogany with restrained use of inlay or marquetry in satinwood. The Regency period wardrobes by first-class makers often showed the familiar association of strongly figured woods with brass mountings. By the middle of the 19th century mahogany and walnut wardrobes had reached heavy and vast proportions, and a little later the wardrobe hecame part of a bedroon suite, including also a washstand and dressing table. Such wardrohes usually have a mirror on one side. in the centre, or inside the cupboard door.

Modern Wardrobes. Apart from pieces included in modern suites, which are to be had in mahogany, weathered oak, Jacobean oak, walnut, sycamore and enamelled or painted wood, wardrobes in recent years have again been made as separate pieces either of the compact fitted type or designed to suit a special room. A good example planned for a man's study-bedroom looks like a sidehoard-hookcase, but when open the two sides reveal a wardrobe fitment. The size of the hanging cupboard section is sufficiently large to take a number of a man's suits on hangers and is provided with a sliding rod. The other wardrohe section contains shelves and drawers. The central portion is reserved for hookshelves.

The compact fitted wardrohes are usually in oak or mahogany and are made in three or foum sections. Some de signed particularly for men are provided with hanging space, sliding trays, shelves, an ex tending fitment on which to hang trousers. hootrack and a mirror. Other compact ward rohes are specially de signed for women with more hanging space and good shoe and hat accommodation. The fashion for huilt-in furniture has extended to wardrobes. The illus. tration here shows one provided with an electric light which goes on when the door is opened and out after the required garment has been selected and the door is closed.

Quite an excellent wardrobe can be made of two whitewood cup. boards, a narrow and a medium-sized one, screwed together to make one piece of furniture and painted or stained to match the walls or wood work of the room. The wardrote is provided with brass rods for the accommodation of hangers. One rupboard is used for heavy coats, the other being reserved for light dresses, etc. Alter
natively the narrow cupboard may the fitted with trays or shelves. Ornamental brass drops or ring handles if the wardrole is stained, or if painted china or coloured glass knobs, and a lining of glazed chintz linish the piece The lining is attached with drawing pins, a curtain gimp hiding the edges and being caught down with invisible gimp pins.

Making a Wardrobe. The amateur who is desirous of constructing a wardrobe will find it worth while to study such woodworking articles as Cabinet Making: Cupboard. retc. Some proficien y in the use of tools and the making of the principal joints should be acquired before attempting a joh such as the hall wardrohe or the veneered walnut article later described. If just a simple piece of furniture is needed which entails the minimum of skill and experience, the cuphoard illustrated on page 325 could be modified slightly to serve as a hanging wardrobe. By incorporating a contre vertical partition and fitting the usual shelves, trays and pigeon holes to one compartment a useful man's wardrobe might be built.
On the opposite side $n$ shelf for hats at the top and a rail for hoots and shoes at the


Built-in wardrobe with electric light fitted to switch on with the opening of the door. The light is switched off when the door is closed
hottoin could be contrived, laving the resi of this compartment for coats and suits, supported on hangers which liook on to a sliding litting attached to the under side of the hat shelf. A small mirror in a frame can be serewed to the back of one of the doors. The necessary metal fittings can be purchased at an ironmonger's.
Hall Wardrobe in Oak. A length of 30 in for a hall wardrohe is ample for the small hall. It enables a good many coats to be put away, and does not take up much space The wardrobe in Fig. I is intended to be made in oak. Practically the whole thing can be made up from $\frac{z}{8} \mathrm{in}$. oak for the main framework, and is in. oak-veneered plywood. It is possible to obtain ready grooved oak, the advantage of the use of whinh is that it saves the somewhat awliward job of grooving. If one has a grooving plane there is no difficulty, but this is not a tool genera!!y found in the amateur's
 oincide by fixing the joining parts tog with a cramp and squaring lines across with a pencil. Then set a marking gauge and mark each line. Dowels $\frac{3}{8}$ in. thick are suitable. Cramps should be used after jointing up, so as to draw the parts tightly together
centre. It is nccessary to stop the chamfer on means of dowels let into the edges of the sides the bottom rail at the centre where the up-
(Fig. 3). In order to make good joints the right joins it. This is shown clearly in Fig. $\tilde{0}$. sides should be carefully planed and fitted A moulding. similar to that on the top. rail against the front and back. It is at simple is worked at both edges of the centre upright. The diamond decoration in the top pane is formed by the application of a thin fret with a moulding mitred round the edges. Wrought iron hinges screwed direct to the surface are the most suitable to use. A good finish for the job is a dark oak stain followed by one or two coats of french polish. After
this the surface can be well
 waxed.
Veneered Walnut Wardrobe. Present day design favours the use of large unbroken surfaces in which the work relies for its effect upon the main proportions and upon


Wardrobe. Small wardrobe for use in a hall. Fig. 1. Completed wardrobe. Figs. 2 and 3 . Working details, together with method of construction

For the top a piece of plain plywood can be the beauty of the material. The wardrobe used. If it is intended to use extending hanger shown in Fig 6 exemplifies this tendency. The rods a piece of solid wood should be attached doors have no visible framework, the whole beneath it to provide a fixing for the screws. surface being flat. The decorative effect is Fig. 4 shows how the bottom rests upon produced by the use of choice veneers. fillets fixed to the rails. The addition of the Another feature typical of modern practice cornice moulding completes the main carcass. This is mitred at the carcass. This is mitred at be added if desired.
Making the Door. Fig. 5 shows how the door is made. The framework is put together with mortise and tenon joints and the inner edges are grooved to hold the panels. A decorative effect is produced by moulding and chamfering the edges. The top rail is moulded at its lower edge. The middle rail is cham. fered at the top and has a channel worked along tbe

rests upon fillets ${ }^{n}$ red to the rails. Fig. 5. How the door is made
is the absence of a cornice. The doors run right through to the top and are shaped.
The wardrobe gives excellent accommodation. There are three main cupboards, and these can be fitted up in any way the worker pleases. It is advisable to give over one entirely to hanging space, with possibly a boot rack at the bottom. The other two can be arranged to have shelves or drawers as desired. For the main sizes see Fig. 7. Fig. 8 shows how the main parts are made. There are three separate carcasses for the cupboards and a plinth upon which these stand. Each of these four parts is made up as a complete unit. Yellow pine, mahogany, or some other wood suitable to take veneer should be used throughout.
The Carcass. The sides of the centre carcass stand forward beyond the others. The reason is that the centre door must be contained between them, for otherwise it would be impossible to hinge it. The side doors are hinged over their carcasses. In order that the crossbanded effect on the doors may be continued

thickness of the back before being fixed to the framework. Note ${ }^{\circ}$ ( $\frac{7}{8} \mathrm{in}$.). Rebates of that the top rails must be sufficiently wide to" this depth are worked allow for the shape to be worked in them. in the back edges of the sides to hold the back. This is also true of the centre carcass, but the top and bottom are made narrower still because the door, although it is contained between the sides, closes over the top and bottom.

When the carcasses have been glued up and tested for squareness the backs can be made. These are plain frames mortised together and with grooved-in panels. They are screwed on. If permanent shelves are being introduced these can be either housed in or be sup. ported by fillets. If the former method is adopted the housings should be worked before the carcasses are assembled. It is not practicable to use fillets in the case of drawers, and the rails for them must be housed in.

The Plinth. At this stage the plinth should be made up. Its con round, the front edges of the centre sides are struction is shown in Fig. 8. It consists of cross-banded. In this way they appear to be part of the doors themselves.

No attempt is made to follow the top shaping of the doors in the carcasses, except that the centre carcass is taller than the others and lines up with the over-all height of the side doors. One important point to watch in making this job is that all three carcasses must be made perfectly square. Otherwise, when they are assembled they will not stand true on the plinth, which is, of course, straight.

Lap-dovetails are used in the construction of the carcasses, as shown in Fig. 8. Dealing first with those at the sides, note that the top and bottom are narrower than the sides by the


Working diagrams of the wardrobe illustrated above. Fig. 7. Details of the main measurenents. Fig. 8. How the principal parts are assembled. Fig. 9. Simple method employed for constructing the four stout stub feet into which the rails are tenoned. As it has to support a fair weight 11 in . stuff should be used for the rails. To give additional strength two intermediate rails are dovetailed in between the front and back rails.

After glueing up the joints are levelled and the surface veneered, the grain of the veneer running vertically. A wide, flat moulding is planted on top. Glue blocks should be rubbed in at the angles to reinforce the whole.

A simple method of making the doors is given in Fig. 9. A main framework of $\frac{s}{2}$ in. stuff is made up and a plywood panel glued over the front. The panel should be veneered -
them, provided this took place after they had passed into its keeping.
The charges for warehousing should be paid. when due. If they are allowed to fall into arrears and the arrears become considerable, the warehousing firm may sell the furniture to discharge the debt owing to it. Before doing this, however, ample notice should be given to the owner, or, if he cannot be found, the intention to sell the goods should be announced in the daily papers. The warehousing firm may also refuse to part with the furniture until all its charges bave been paid.

Certain articles, such as pianos, are sometimes warehoused separately from other articles. Most dealers in musical instruments store pianos, and the arrangements for this are practically the same as for other articles of furniture. The storing firm usually undertakes to tune the piano at regular intervals. See Removal.

WARMING PAN. The predecessor of the india-rubber and stoneware hot water bottles was the warming pan, a shallow. circular vessel with a hinged lid, made of stout sheets of copper or brass. It was filled nightly during the cold season with redhot coals and placed inside the bed. It was provided with a long handle, occasionally of iron, but generally of polished wood turned in the lathe. To avoid creasing the sheets, the top, bottom, and sides were made slightly convex in form.

Warming pans were in usc from the 17th century onward. Early examples often bear a date engraved or embossed on the lid, sometimes with homely proverbs, pious mottoes, or loyal sentiments, such as one dated 1622 which reads " God Save King James." These appliances are now in request by lovers of old brass, and they have not escaped the attention of the counterfeiter. They may be kept bright with dry leathers, preferably without metal pastes, and should not be lacquered.

WARRANT : In Law. A warrant is a direction under the common seal of a competent court or magistrate directed to an officer ordering or authorizing him either to seize the property of a debtor or offender, to arrest an offender, or to search a certain place or the actual effects of a certain person.

Warrants for arrest can only be issued by magistrates on sworn information, and will only be issued in the case of serious offences where it may be supposed that the person charged is about to attempt to escape or might run away if only a summons were served upon him. The difference between a warrant and a summons is that a summons is a document that is sent to the offender ordering him to attend the court on a certain day to answer a charge, while a warrant is directed to a police officer ordering him to arrest the offender.

A search warrant is only granted on sworn information and on strong grounds. It is very often applied for in cases of breaches of the liquor licence law. If a mistress wishes to search a servant's box on guspicion of theft, her only legal course is to obtain a warrant and have the search carried out by a police officer.

A prosecutor who goes to a magistrate and gives


Warming Pan in embossed brass Courtesy of Country Homes Supplies
him information, even though it be false, upon which a warrant is issued by the magistrate is not liable in an action for false imprisonment if the charge turns out to be a false one, though he may be liable in an action for malicious prosecution. Any police officer who arrests an alleged offender without a warrant is not liable to an action for false imprisonment if he can prove he had reasonable cause for suspecting that a felony had been committed and that the person arrested had committed it, or that he made the arrest to prevent a breach of the peace.

A private person, on the other hand, who arrests a suspect without a warrant must be prepared to prove that a felony actually had been committed, and that he had reasonable grounds for suspecting that the person whom he arrested had committed it. See Summons.
WART : How to Cure. A wart is a simple growth consisting of over-developed skin papillae. Warts occur most commonly in young people, on the hands, feet, and scalp. They are contagious.

Warts can generally be treated by applying glacial acetic acid every two or three days. This can be done with the end of a match. Care should be talken to keep the acid off the surrounding skin as much as possible. When warts are large in number and widely distributed, the free use of lime water inwardly has been said to be beneficial.
Care should be taken in applying caustics to warts in elderly people, especially those occurring about the face, as the growth may readily become malignant. The so-called butcher's wart is a local infection with tuberculosis.

WART DISEASE. This disease, which is known also as black scab, has been the cause of immense loss to potato growers : the warts, which form in the "eyes" of the potatocs, develop into small, cauliflower-like growths, eventually the whole tuber decays and the soil becomes infccted with disease spores.
Fortunately the introduction of a race of potatoes which are immune to wart disease has been raised; these may be planted even on infected land. Some of the best potatoes which are immune to the wart disease are (early) Witch Hill, Immune Ashleaf, and Di-Vernon, (Second early) Arran Comrade, Ben Lomond, Abundance, King Gcorge, Arran Banner. and Great Scot. (Maincrop) Ben Cruachan, White City, Arran Consul, The Bishop, and Golden Wonder. Popular varicties of potato which are liable to attack by the wart discase and must not therefore be planted on infected land are King Edward, Duke of York, Sharpe's Express, British Queen, Arran Chief, and Up to Date.
WASHER : For Clothes. Where a good deal of laundry work is done at home, the task is simplified by the use of a reliable clothes washer. These machines are classed as gas, non-gas or electric washers. The gas models are provided with a gas burner, a heat retaining outer cover and constructed with a copper tank. Models are also obtainable which are complete with wringers and table tops. Deferred terms can be arranged for British washers which are fully guaranteed.
There is no complicated mechanism, and in most washers the agitator produces the actions of hand washing by means of which fabrics are stirred, squeezed and rubbed. Emibedded dirt is removed by the vigorous swirling of the agitator. A gas model is reckoned to consume about 3d. gas in an hour and to use half a bar of soap in doing the washing for a
family of several persons. Some electric models are stated to cost only ld. an hour to un.
A vacuum electric washer has no moving part. The soapy water is drawn through the weave of the fabric fifty times a minute by


Washer for Clothes. Complete with wringer, this wasber takes up little room, and fits into the legs when not in use Press Caps. Ltd.
the bubble action of the vacuum washer. A tablespoonful of soap flakes are placed in the bottom of the washer tub, the clothes are dropped in and the tub filled with water. The unit cylinder is then dropped into place and the machine is plugged to the nearest electric outlet for 20 minutes. The soapy water is then poured away and the clothes rinsed in a similar manner to that of the washing operation, but only immersed for a few minutcs. See Laundry.

Washing. See Laundry.
WASHING. In Photography. The importance of washing thoroughly all plates, films, and prints cannot bc too strongly emphasized. Prints or negatives which are insufficiently washed will inevitably develop stains and spots, or else the prints, particularly if made on gelatino-chloride paper, will gradually fade until the image disappcars altogether. As many prints and negatives are spoiled by insufficient washing as by any other amateur fault. The object of washing is to remove all traces of hypo (sodium hyposulphite) and free silver.

By thorough washing is not meant prolonged washing. It is quite possible to wash a print in a deep dish, from which the water overflows only at the top, for 10 to 12 hours, and still find traces of hypo. The reason is that hypo solution is heavier than plain water, and sinks to the bottom. Although various hypo eliminators have been recommended from


Wesbing in Paotography. Fig. 1. Wasting tank 10 r plates. It is in japanned tin and fted with a syphon


Washing: in photography.
Fig. 2. Excellent type of washing tank
timeto time there is no doubt that water, pro perly used, sup. plies the quickest and best means of removing hypo. Experiment has shown that 10 min . really efficient washing is sufficient.
The amateur must not imagine that he will be safe if he washes his plates or prints in a sink or bath under a stream of running water for so short a period as 10 min . The most efficient method, though rather tedious, is to immerse the negative or print in a dish in successive changes of water. The print is a!lowed to stay in the water for 7 or 8 min., the dish rinsed out and then filled again with fresh water. If this is repeated eight times the most delicate chemical test will reveal no trace of hypo.

Apart from the use of the commercially inade washing apparatus, several methods are open to the amateur photographer. The points to bear in mind are that the water must always be able to run away from underneatle; that the water must have free access to both sides of roll films, and these must not be allowed to curl up or to get into violent motion which would cause scratches and other damage; that prints should not be allowed to stick together: and, finally, that postcards and prints on thick paper must be washed for a considerably longer time than other prints, since the hypo is present in the pores of the paper as well as in the film. In practice, if the washing methods are sound, the following times will be sufficient:

Glass plates and bromide and gaslight prints on light-weight paper, $\frac{1}{2}$ hour. Roll films and ordinary P.O.P. prints, $\frac{3}{4}$ hour. P.O.P. postcards and heavy-weight prints, one hour. These times will allow a certain margin of safety.
Glass plates may be placed in a clean sink


Fig. 5. Print washer so shaped that, on connecting it to a tap with rubber tubing, the water and the prints are lept in a circular motion Courtesi" of W. Butcher it Sons. LId.
under a gently Howing tap, if means are adopted to prevent them being washed over and blocking up the outlet, so causing the sink to fill and overflow. Adjust the flow of water so that all the plates are sufficiently covered with out the stream being so violent as to move them about. Flat films and prints may be washed in a bath with the waste plug nearly closed and the inflow regulated so that the water level remains constant. Each tilm or print is Hoated by means of a cork in which a nick has been cut with a sharp knife, the corner of the print being inserted in the nick. A large cork can be cut up into a number of slices about $\frac{1}{\frac{1}{2}} \mathrm{in}$. thick, each slice being nicked. The water flow will keep the prints on the move, while the corks prevent them sticking.
Roll films can be washed by a similar method if larger picees of cork are attached at both ends, at one corner and also one or two others along the edge, so that the film is suspended edge downward in the water, while the cork prevents it rolling up. Any risk of damage to the surface of the film while wet is avoided by the use of wooden spring clips to which the corks are attached.
Washing tanks for plates in japanned tin or zinc can be obtained in various forms. A simple form is shown in Fig. I, which holds 12 quarter plates or 6 half plates. It is fitted with a syphon so that the water is removed from the bottom of the tank. A better form is shown in Fig. 2. Herc a complete change of water is obtaincd every minute. The principle is seen in the diagrams Figs. 3 and 4.
An effective print washer is illustrated in Fig. 5. It is connected to the tap by a short length of rubber tubing and so shaped that the water is constantly in a circular motion,


Figs. 3 and 4. Sectional view of tank shown in Fig. 2. Left, syphon shown in full action, hypo laden water (coloured dark greg) being removed, and fresh water (coloured light grey) taken in. Right, when water level reaches bottom of inverted cone on inlet of syphon tube, a hole admits air to syphon and stops water discharging. The whole process is then repeated
ourtcs" of $w$ Rutcher \& Sons. Ltd.
carrying the prints with it. This washer can be obtained with a metal rack to take plates.

Where a considerable number of prints have to be washed, special types of washer can be obtained in which the large numbers of prints are kept in constant rotation by means of apparatus resembling a turbine.

A simple test for the presence of hypo, whicb will indicate whether washing is efficient, is applied by allowing the last drips from the negative or print to fall into a tumbler and adding a little water faintly tinted pink with potassium permanganate. If hypo is present the pink tint will disappear immediately. See Bromide Paper: Fixing: Negative; P.O.P.: Printing.

WASHING POWDER. For washing clothes and other domestic purposes special soap preparations are sold in the form of powders. As some are injurious to fine materials only those produced by reliable firms should be used, and the powder should be dissolved in the washing water before the clothes are put in. Washing powders will make a quick lather, and arc less wasteful than soap. They may be employed also for dish-washing, and are more satisfactory than solid soap for use with washing machines. Sce Laundry : Soap.

## WASHING-UP IN THE HOME <br> How Modern Methods Lighten this Domestic Labour

This article gives useful bints on the daity elcansing of china, glass, and silverware, and also of cooking utensils. Other entries that mav be consulted are Aluminium; Draining Board; Hot Water Supply; Kitchen; Scul!ery; Sink; Water

There are many devices for lessening the
udgery of washing up after meals and drudgery of washing up after meals and cookery. The most expensive is a dish washing larger household the former appliance is probably worth while. A combined clothes and dish washer is obtainable in three models, hot water, gas and electric, and converted from one of its cleansing uses to the other by the simple interchange of two fittings The floor space required is 20 sq . in. : the machine washes and dries all classes of crockery. There are several other types of washing-up machines on the market, the general principle of these being that hot water is sprayed on to the plates, etc., and when the hot water is turned off they are dried by hot air.
Apart from such a machine, the task of washing-up is made less fatiguing by the use of plate racks, draining boards, and various othet devices A plate rack fixed over the sink or draining board does away with the necessity of drying plates and dishes. provided they are thoroughly rinsed An improved type of rack is made to hold cups and tumblers in addition to plates Some are made so that they can either hang on the wall or stand on the drain-
ing board. Sinks should, when newly installed, be placed in a good light and at a convenient. height to obviate stooping too much while working. Where an existing sink is too low, boards made of wooden slats raise the height of the washing-up basin.

Portable draining boards are made to clip and clamp on the side of the sink. These are useful in sculleries where the sink is immediately next to the door or passage-way, and where a fixed board is not possible.

Inexpensive Aids. Papier mâché or wood pulp bowls are more suitable than those of metal for washing up glass and china, as they save a number of pieces from chipping and breakage during the year. A long-handled mop saves the hands. A plate scraper should be used to remove particles of food and grease from dishes, etc., before putting them into the water. A little pad is obtainable for cleansing and polishing knives.

Bottle brushes are invaluable for decanters and other narrow-necked vessels, whilst fresb tea leaves may be used to remove stains from the inside. A spiral rubber mop can be obtained which is excellent for cleansing glass bottles. Wire-headed brush mops are useful.
for detaching particles and grease from saucepans, while a scouring glove and a metal acouring pad are both practical aids for the same purpose.

The cleansing of greasy articles is greatly assisted by the use of soap or soap powder in the water, so as to provide a lather The small pieces of soap that accumulate in a house can be utilized in this way by being put into a wire soap saver. The oddments are placed in the cage of this and boiling water poured on to them, a few whisks with the soap saver quickly producing a lather. To soften the water and to save soap, a little washing soda emulsifies grease and makes it easy to remove. Those who find that soda has a barsh effect on the hands and causes cracks should put a tablespoonful of borax instead of the soda in a medium-sized basin of water. Rubber gloves are suitable in cold weather for anyone whose hands quickly chap and crack. If the insides of the gloves are sprinkled with French chalk before use they do not stick to the hands

Efficient Procedure. Whether the washing $u_{p}$ is done by band or machine, plenty of hot water must be available This is an important matter to be seen to when moving into a new bome For a small anount of washing-up a kettle or large saucepan can be boiled In a gas oven, after the gas is turned out, there is usually sufficient heat retained in the oven to beat a basinful of water ; if it is not quite hot enough a few minutes over a small gas. ring will bring it to the right temperature.

Where there is no constant supply of hot water from the range or from an indejendent boiler, a supply is obtainable at a minimum cost by the use of a small gas or electric water beater placed near the sink In districts where electricity or gns is not available, a rapid water heater may be installed for use with paraftin oil or an oil stove will supply sufficient bot water.
When the washing up is actually done in the sink or in a basin standing in the sink, the right-hand draining board or a small table placed against the right side of the sink is the most handy position for the dirty things Where there is a pantry, finer china, silver and glass ware will be washed at the sink there, the cooking utensils and crockery, etc.. being done in the kitchen.

First remove all scraps. remains of food, and grease from plates, spoons, knives, and forks-a picce of newspaper can be used for the purpose if no scraper or rubber squeegee is at hand. Tea cups and milk glasses should be rinsed under the cold tap. If a little trouble is taken with this part of the work the washingup water will remain comparatively clean

The things abould be wrshed in the following order: Glass, silver, china, knives and other metal articles, saucepans, and baking tins. A few things only shonld be washed at a time, and, when there is a good supply of hot water, a better result is obtained and with less effort if the things are rinsed in hot water. drained, and dried at once. The smeary marks frequently noticed on glass and chinn are due to the fact that water containing soap and soda bas heen allowed to dry on the articles instcad of being removed with a cloth or by rinsing.

When washing china with gilt or hand colouring on it, soda or strong soap powders should not be put in the washing-up water, as the alkali is likely to remove the gilt and spoil the colours. Glass requires special care, particularly when new. The water should not be very hot or the glass cracks, being a poor conductor of heat, and the thicker the glass the more liable it is to fly. A small brush should be used to clean cut and moulded glass.
White marks on water jugs and bottles are often caused by hard water that cannot be removed with soap and water. The best way to deal with these is to allow vinegar to re. main in contact with the chalky deposit for a
short time, then rub hard with a small piece on the same lines as a !avatory basin, in more of cloth moistened in vinegar : the acid in the vinegar dissolves the chalk A rub with a cut lemon answers equally well.

All knives and forks with handles attached require special care. Wbether the handles are riveted or stuck on, they should on no account be put right into the washing-up water, for hot water soon loosens those that are stuck on and cracks and splits ivory. They are best placed upright in a jar or jug partially filled with hot softencd water

To simplify the cleaning of greasy saucepans and baking tins, till them with warm or cold water immediately the contents have been dished up, add some washing soda, stand them on the stove or in the oven, and when ready to be washed the pans will be found to be practically clean All sauccpans, other than aluminium, in which food has been burnt should be boiled up with a strong yolution of soda and allowed to soak, as this saves both the time and labour necessary for hard scouring.

After use, the washing-up bowl mop, dishl cloth. scouring cloth, or saucepan brush shou!d be scalded, and then washed in hot soapy water, rinsed, and hung up. Separate towels are required for drying glass, china. and silver and knives. So that they may be easily distinguished; the glass cloth could be of checked linen of medium texture, the china clotlı of coarse white linen. and for knives and tins a thick, unbleached linen towel is suitable.

WASH LEATHER. Wash leather or chamois lcather is unrivalled as a cleaner and polisher of glass and silver. It should never be used with anything but cold or tepid water: hot water will cook the fibre and render it perished and brittle. After use, the surplus moisture should be wrung out and the leather hung to dry. When thoroughly dry it will be found somewhat hard, but can be returned to its original softness by pulling and stretching.

Wash leather should always be used in preference to other materials for putting the finish on silver and plated articles, after all plate powder or whiting


Wasp. Enlarged pnotograph ol tols stinging summer insect less expensive styles, and provided wit pedestal base or supported on plated legs.
Antique mahogany washstands of corner shape are usually more decorative than practical. Many people cover the top with a fitted board, hiding this with a shaped piece of old brocade, damask or tapestry needlework, and thus convert the washstand into an attractive little corner piece for the sittingroom. Sec Bathroom: Bedroom.
WASP. Usually in hot weather numbers of these insects frequently invade the house, especially congregating where there is anything sweet, such as jam or fruit. They are not only a great nuisance, but, owing to their capacity for slinging, may be a positive danger They can be killed one by one, or trapped and then killed, but a better plan, if it is possible is to seck out and destroy their nest.

Treating a Sting. When a person is stung by a wasp, the part begins to swell almost betore the first acute pain from the wound subsides. This swelling is generally confined to the immediate neighlourhood of the point of entrance of the sting.

Ordinarily the system is not appreciably affected by the poison in the sting, but in rare cases, and particularly when the victim has been stung in a number of different places, the poison may act directly on the heart. A wasp sting over a vein, where the poison is poured directly into the blood stream and so carried straight to the heart, is more likely to be serious than one in which the poison enters solid tissucs underlying the skin.

A wasp sting on the tongue, lips, or inside the cheek may lead to sulfocation through rapid swelling of throat tissucs, preventing air being drawn into the lungs. Not itrfrequently, as the result of the wasp poison in the blood, a type of nettlerash, which may persist for several days, may break out over the part affected. In some cases this rash may cover the whole body.

The wound should first be carcfully examined to sce whether the insect's sting has been left behind. If so, this should be care- fully squeezed out or rewill not only impart a high polish, but its moved with a necdle or a fine pair of continued use will remove light surface tweczers. If the pain and swelling are severe, scratches. The best results nre obtained by a bandlkerchief soaked in lead-water and the aid of a small quantity of jeweller's rouge laudanum lotion may be lightly bandaged applicd as a final operation with soft, dry wash Icather.
Grease marks and other stains on articles made of suede leather or cloth with a ve!vety pile or nap, soft felt hats, for instance, may be removed by rubbing briskly with a clean, dry picce of wash leather. The linings of men's pockets, especially vest pockets, are sometimes made of wash leather. See Glove: Window.
W ASHSTAND. Except in houses where the bathroom accommodation is limited for the number of bedrooms, or in rural districts where the water supply has to be coonomically considered, there is a tendency towards the disappearance of the movable washstand as a piece of furniturc. They can be bought separately or made to match other bedroom pieces, but are not included in many of the more expensive modern suites. Owing to their partial decline in use oak. mahogany and painted wooden washstands can be picked up in reliable secondhand shops at comparatively low prices.

In some of the newer houses and flats hot and cold water fitted washatands are built into the bedrooms. Such washstands are cither concealed in a cupboard, or arc planned
over the part, or the old-fashioncd bluebag may be employed. Another homely but usually efficacious remedy is rubbing the stin? with a strong onion.

Destroying a Nest. Found in the ground or on grassy barks. wasps' nests can be destroyed in several ways, an old methorl being to burn them out with sulphur fumes. This method, however, is attended with some risk, especially to those inexperienced in the use of sulphur. A good plan is to pour some petrol in the opening late in the evening when the wasps are all in their nest, and seal up the hole with some clay. The next morning a little more petrol should be poured in, and then the nest can be dug out and destroyed. Cyanide of potassiuin can be used in the sanse way. The latter should be dissolved in water in the proportion of 3 dramıs to $\frac{1}{2}$ pint, and carcfully squirted into the opening of the wasps' nest with a small syringe.
Trap for Wasps. A wasp trap can very easily be made from a flower pot, a jam jar. and a saucer. The flower pot should be turned upside down, and raised from the ground on three sma!l blocks of wood. The jam jar is then placed over the hole in the bottom of the flower fot, and underneath the whole is the


Waste Paper Basket. Fig. 1. Gilded waste paper basket decorated with flowers in brightly coloured raffia. Fig. 2. Waste paper receptacle with; wood pulp foundation painted and decorated with old gower print
saucer with some sugar therein. The wasps silver or other coloured barbola work throwwill enter in the space between the bottom of ing the ground colour of the basket into the flower pot and the earth in order to eat the sugar. When satiated, they will fly up and through the bole in the flower pot into the inverted jam jar, where they will be caught.

To remove the wasps, a card should be placed between the mouth of the jar and the inverted bottom of the Hower pot. Keeping the card firmly fixed against the mouth oi the jar, this can be removed and immersed in water. drowning the wasps.

WASTE PAPER BASKET. Receptacles for holding waste paper and discarded scraps of other materials are necessary in all sitting. rooms and in most bedrooms. They can be bought very cheaply. especially the varieties in wicker, cane, rush, imitation leather and cardboard covered with cretonne. Metal baskets are constructed of interlaced steel boops and various forms of woven wire work.

Woven cane baskets are enhanced in appearance by barbola decoration (see Gesso Work), the contrasting tones of the gold, harmonious relief. The gilded cane waste
paper basket shown in Fig. l, embroidered in coloured raffia is a variation of the same type. The basket may be bought ready gilded or painted at home with metallic paint. The flowers should be loosely made (see Raffia Work), and two or three shades of pink may be used for each rose, the leaves and stems being worked with green raffia. The basket may be lined with silk and finished at the top with gold galon if desired.

Varieties of parchment covered waste paper receptacles can be obtained either plain or ready decorated. The one shown in Fig. 2 has a wood pulp foundation, is painted green, with a gilded rim and base, and lined with marbled paper. A beautiful old flower print has been used to ornament one side and the whole has then been varnished. Stencilled or hand painted designs would be an equally suitable form of decoration. See Writing Desk Set.

## Watches and Their Mechanism

## Simple Explanation of Different Types of Escapement

Aided by diagrams this article first describes the working of a watch, and in a subsequent section gives hints on the selection and care of this delicate apparatus. See also Clock
Watches small enough to be carried in the for watch cases and dials appeared. pocket were first invented in Nuremberg, the 18th and early 19th centuries pinchbeck about the year 1500 , by Peter Hele, a clock. maker, who devised the mainspring. In 1658 a step forward was made by the discovery of the balance spring, and in 1695 Tompion, the great London clockmaker, patented a cylinder escapement. In the early part of the 18th century Graham brought out his dead-beat escapement, while John Harrison invented the compensation balance to counteract irregularities of time-kseping owing to variations in the temperature. The keyless watch appeared during later Regency days, and after 1850 was made in great quantities in, and exported from, Switzerland.
Though watches have usually preserved a round and fairly flat shape, ball and square, oblong and lozenge forms have appeared from time to time. The watch belonging to Mary Queen of Scots, illustrated in this page, was made in the shape of a skull and beautifully wrought.
In the 17th century decoration in enamel
(q.v.) was used instead of gold for cases, and was sometimes as richly chased and engraved. Silver was extensively used and other examples had outer cases of shagreen, tortoiseshell, ctc. A fairly representative series in order of date is illustrated on page 1401.
The mechanism of the watch will be more readily understood if the article on Clock is first referred to. The num ber of wheels in a watch has always remained the same, variations in the number of teeth in wheels and pinions being made to suit the different escapements that have been used. The mainwheel gears into the centre pinion, which carries the hands. F'rom there the centre wheel gears into the third pinion and the third wheel into the


Watch. Memento Mori watch, be longing to Mary Queen of Scots and given by her to Mary Seaton
fourth pinion, to which is bitted the seconds hand The fourth wheel gears into the escapewheel pinion
Escapements. Various types of escapement have been devised, the first of these being the cylinder or horizontal. This comprises an escape wheel with wedge-shaped teeth, which stand up from the flat of the wheel on stalks. and work in and out of a steel cylinder, nearly half of which is cut away. On the cylinder is mounted the balance and spring, and in swinging it gets impulse from the inclined plane of the teeth rubbing against the edges of the cylinder. This escapement was never used extensively in England, as it was found that there was a tendency to excessive wear on the working parts. Swiss watchmakers got over the difficulty by making the cylinder and wheel of hardened steel, and this device is still in use in the cheaper grades of both Swiss and French watches.
Fig 1. shows a detached lever escapement. typical in the main of the form found in the great majority of modern watches. The balance has a free swing, the pallete $B$ and lever $C$ interposing between the wheel and the balance. Fitted on to the balance staff E is a stecl roller D withra jewelled impulse pin $F$ standing out at right angles to the face; the pallets and lever are fixed together and swing on an axis at $K$.
When the balance swings, carrying with it the roller, in the direction of the arrow, the impulse pin enters the notch of the lever, striking with sufficient energy to move the lever and pallets far enough to release the wheel looth from the locking face of the pallet. The wheel, actuated by the force of the mainspring, now moves forward in the direction indicated by the arrow, pushing the pallet out of its path. By the time that the wheel tooth has reached the end of the impulse face the other pallet will be in position to receive another tooth.
When the pallet was pushed aside it carried with it the lever in the same direction as the roller is travelling, and in its passage it imparts a blow to the impulse pin that sends the halance on with renewed energy. The impulse pin has a dual use, unlocking the pallets by giving a blow on one side of the notch of the lever and receiving a blow from the other. The balance in its swing coils up the balance spring until its energy is expended. Its motion is then reversed by the uncoiling of the spring, when it repeats its operation in the opposite direction.
In the roller a small crescent is cut out, and into this passes the guard pin H to prevent the escapement from unlocking except when the impulse pin is in the notch. There are two banking pins L , set one on each side of the lever to keep the motion of the lever within the desired limits. The locking faces of the pallets are cut back from the radial line, and this causes the teeth to draw the pallets inward towards the centre of the wheel, and the lever is bard up against the banking pins so that the guard pin is clear of the roller. The working faces of the pallets are jewelled, J , and are slightly rounded to lessen the friction.

There are some minor variants of this escapement. The Swiss, for example, have abandoned the pointed teeth and use a wheel with what are called club teeth M, Fig. 2 -that is, teeth with the tips formed into an inclined plane dividing the impulse face between the wheel teeth and pallets. Some escapements are made with a double roller, the guard pin working on a smaller roller


Watch. Typical specimens, 16th to 18 th centuries. Top row : 1 , Single band watch, brass, c. 1560 ; 2, Claud Viet, 1698 , shagreen case ; $3, W$. Tomlinson, $1699-1732$, silver; $4, \mathrm{H}$. Massey, 1692-1707, silver. Middle row: 5, T. Tompion, 1639-1713, gold; 6, H. Prevost, 1710, gold, with repoussé outer case: 7, J. Shearwood, 1769 , silver : 8, J. Harrison, 1683-1776, early work, case in Vernis Martin. Bottom row : 9, Robt. Fleetwood, 1760 , gold, in shagreen outer, case (back); 10, W. Collett. 1789 , tortoiseshe 1 , painted dial : 11, Justin Vuillamy, 1739, Rold ; 12, Ben. Taylor, 1784, skin

Courtesy of Joseph Pizzala. Esu.
this the compensating balance is used, as in Fig. 4. The parts A and B are turned out of one piece of steel. on the outer edge of which is melted a brass band C twice as thick as then stcel band B. These two bands are cut through at opposite sides (D), close up to the arm. leaving the balance with two free ends.
With a rise in temperature an ordinary balance expands, and in so doing increases its diameter, which causes it to vibrate more slowly. With a drop in temperature the operation is reversed. The remedy for this is a com pensating balance. The compensated balance also expands with a rise in temperature but as brass expands more than steel the effect is that the brass bends the rim inward at the free ends. This causes the centre of gyration to approach the centre of motion in the opposite direction to which the mass would expand, thus restoring the balance to its former shape. Around the rim are a scrics of tapped holes, into which screws, E, are fitted, and these can be shifted from one hole to another to vary the compensation. There are also four timing screws F , which can be used for bringing the watch up to time by screwing in or out, thus decreasing or increasing the diameter of the balance.
The balance spring controls the number of vibrations a balance will malic in a given time, so that the strength of the spring is in proportion to the weight of the balance. The usual form of spring is the volute or flat spiral. The inner end is pinned to a collar which is fitted friction-tight on the balance staff, and the outer end is pinned to a stud in the balance cock or the plate. An overcoil or Bréguet spring has the outer coil bent upward and carried in a long curve over the flat plane of the spring towards the centre near which it is fixed. The advantage of this type of spring is that it distends in action on each side of the centre, thus relieving the balance pivots of a good deal of side friction.

The regulator of a watch is gencrally a steel underneat h the impulse roller $N$. The chronometer escapement is only used on very high. class watches, and clocks for use at sea.

Jewelling, two methods of which are shown in lig. 3, is a nother important part of a watch, clear of the jewel hole. Balance pivots arc index held down friction-tight by the end-piece always made this way. The jewels of a watch on the top of the balance cock. Its axis have no value as gems. Their only worth lies coincides with the centre of the balance, the in this useful function of making a smooth run- index finger pointing to a scale engraved $F$ and the pivots being run in bearings made from hard stones set into the brass plates and cocks. These tend to a smoother running and diminish wear. Some of the pivots run in holes alone, others havcendstones placed over the outside of the jewel hole, the pivots in this case taling a bearing on the ends, and the shoulder of the pivot, which is usually cone shaped, standing ning for the mechanism.
The Balance. With the ordinary plain steel, brass, or gold balance, changes in temperature cause variations in timekeeping through the metal expanding or contracting. To overcome


Fig 1

$S$ on the top of the balance cock. At the other end of the index there are two fine pins standing out at right angles. Between these pins passes the outer coil of the spring, about a quarter of a turn from the pinning-up stud, and from these pins to the centre is the effective length of the spring. As the regulator is moved the pins pass along the spring, shortening or lengthening its effective length and therefore making the balance vibrate faster or slower.
The Care of Watches. A watch should be purchased from a reputable watchmaker, who can give much useful information on the question of its choice. It is well to consider if the difference between a high grade watch and a cheaper one is of personal importance. The difference, apart from external details, such as the material of the case, etc., is one of service; a cheap article may serve for a time and give tolerably good results for the money paid. While it is uncommon to find a poor movement in an expensive case, it is by no means necessary to have a gold case in order to secure a good timepiece. Reliable movements in silver or other metal cases can be bought at quite moderate prices.

A watch is a delicate piece of apparatus which violence or ill usage will immediately put out of order, causing damage to its finely constructed parts and rendering necessary a visit to a repairer, with its attendant expense. In the average watch there are upwards of 150 parts, some microscopically minute, although for its size it is a robust as well as a most delicate machine. The watch should be wound at regular intervals, night or morning, and should be removed from the garment at night. To throw down a garment with the watch in the pocket is to risk damage to the delicate mechanism.
The mainspring of a watch is enclosed in a drum or barrel, and consists of a finely made steel ribbon. It is the motive force of the remaining wheels, comprising the whole train down to the balance wheel, which latter may make as many as 18,000 vibrations in an hour. Regular or irregular beats of the balance will indicate its condition : many watch troubles will arise from a defect hereabout, and on the accurate adjustment of the balance wheel and hair spring depends good timekeeping. The hair spring is so fine and sensitive that it should never be touched by any but an \&Overflow expert : it is most easily
damaged and put out of working order, and is usually costly to replace.
The question of periodical cleaning and readjustment is vital to good performance If a watch is allowed to run for years without this, attention the constant running friction will cause the lubricating oil to dry up, or on the other hand it may become thickened. If the oil dries up the effect on the fine pivots, running in dry bearings, can be imagined.
The regulating of a watch when gaining or losing is a delicate operation and is best performed by a watchmaker. The regulator is in close proximity to the balance wheel and hair spring, and if the alteration is made by an amateur a slip with any instrument that may be used may cause considerable damage to these parts. Further, the regulation is not always effectively made with the index or regulator, but may require to be done by way of alteration to the timing screws, to be seen around the balance whecl, and none but an expert should venture this. On some watches, again, the index is provided with a tiny micrometer screw adjustment.
 always connected up with a local supply, and this ensures to the housc an amount ample for clcansing purposes of all kinds, and of a quality good enough for drinking.

In country districts water for the former purpose is often obtained by the collecting of rain-rater, but this will not scrve for drinking. A supply of drinking water, therefore, is often secured by sinking a well but water from shallow wells in the neighbourhood of houses or of land grazed by livestock should be regarded with suspicion. A good plan is to pass all the drinking water through a filter, a process carried out in many homes. When this is done it is of vital importance that the filter be kept scrupulously clean; the filtering medium frequent!y renewed, or if of the poreclain candle type, washed and sterilized. If this is not carefully attended to, instead of filtering the germs from the water, it will add further germs. Water may be divided into hard and soft, cach with its own advantages and defects for washing and drinking purposes. It is quite possible to soften hard water,


The watch pocket should be kept free of dust, sea, the case front and back should be opened since a tiny particle of grit in the working parts will cause a stoppage, and necessitate a cleaning job for the watchmaker. If a watch stops for no apparent reason, it may nced re-winding. Apart from this, try gentle pressure on the winder, and if it fails to start, do not tamper with it, since a stoppage then indicates something amiss.
Should the user of a wrist watch inadvertently omit to remove it before entering a bath or the
sea, the case front and back should be opened
at the earliest moment, draining out all the water possible, after which the whole watch should be immersed in oil to prevent the steel parts becoming affected by rust. The watch should then be passed on to the watchmaker to deal with. If a watch keeps erratic time, it may be because it has become magnetized. The watchmaker will possess an instrument for testing and demagnetizing. which will correct this defect.

## Water Supply and Distribution

## Methods in Use in Town and Country

The subject of this article is touched upon in a large number of related entries in this work. A selection of these only is named here, but a perusal will suggest others: Cistern; Drains; Filter; Frost ; Hot Water Supply ; House ; Pipe ; Pump; Rainwater; Soakaway; Tap; Well

The water that forms the domestic water and this is sometimes done bv the company supply is obtained in a variety of ways. Houses that is in control of the supply. Water in towns and populous districts are almost softening apparatus for use in the home is dealt with later in this article.

The supply of water for domestic purposes may conveniently be divided into two branches, the external supply to the house and the internal arrangements for distributing. Rainfa!l constitutes the chief source of all supplies. For the water supply of towns, :ivers and lakes are dammed and reservoirs are filled from them. Distribution is effected by means of main pipcs. The water is purified by being made to pass through filter beds, which usually consist of concrete receptacles baving layers of different filtering material arranged in them. A typical filter bed has at the bottom a layer of large graded gravel, on the top of which is another layer of smaller grade gravel. This again has pea gravel on top of it, and above this a very thick layer of fine washed sand. Distribution from the purifiers to the houses is nsually accomplished by gravity, and in many cases the water has first to be pumped to a sufficiently high level to ensure adequate pressure.
With regard to the actual chemical contents of an ordinary public supply, the following analysis may be taken as typical in a rural district in England.

Grains Per
Gallon
Gallon
28.00
Total solids

Ammonia $\underset{\text { Albuminoid ammonia }}{ }$
1.00112
0.00042

Nitrogen as nitrites .. .. .. .. Absent.
Nitrogen as nitrates
0.017

Absent vegetable debris and mineral matter, and there was the faintest trace of iron.

In the case of country houses water supply may present a considerable problem, and the choice of a suitable system for its collection depends entirely on circumstances. Wells are still in use, and care is required to choose a site where the water is pure and free from decayed animal or vegetable matter.

The House Supply. The internal distribution of cold water throughout a house where a town main exists presents no difficulty, as the pressure is always ample to supply all foors. Where there is no main, however, a tank placed at the highest point available is essential, and the distribution to lower parts is accomplished by gravity. A common arrangement is to use a storage tank for the supply to the lavatory basins, bath and hot water system. the main being connected to the ground-floor laps only. Automatic regulation of the water to the tank or cistern is accom. plished by a ball valve.

Water from the main supply is carried from the main to the bousc by a service pipe generally of $\frac{3}{4} \mathrm{in}$. lead pipe, fitted with a stop cock situated below the pavement. The position of this stop cock should be noted and the cover should be examined from time to time to prevent
it becoming clogged up 'The service pipes is carried through the wall of the house at some convenient position, and is then connected up to the main internal distribution pipe. In the event of a burst pipe or during a severe frost the internal supply should be cut off at the stop cock by means of a T-handled key.
The usual arrangement of the supply main is indicated in Fig. I, which shows how the pipe is brought into a house provided with a cellar. In addition to a stop cock outside the house (usually in the forecourt), it is an advantage to fit an indoor stop cock at the point of entry into the house, as shown. In districts where the pressure is intermittent it is necessary to use a storage tank at the top of the building for use when the main supply is not operating. but in this case a tap should be fitted to the internal main supply pipe so that drinking water is oblainable direct Storage tanks are also necessary in all buildings possessing modern systems of domestic hot-water services.
The arrangement of the internal distribution of pipes for an intermittent supply is illus trated in Fig 1: the main supply is shown as a solid line and the supply from the tank as a double line It will the noted that the main supply pipe is fitted with an emptying cock; this should always be done and it should be at the lowest point of the pipe. In houses where the supply is obtained from a well or surface storage tank, the water should be carried direct to the upper tank, arrangements being made for emptying the tank at the lowest level of the internal piping. For bungalows in cases where the supply is obtained from rainwater from the roof. a convenient plan is to support a tank as high as possible close under the eaves. The support can be arranged as a cool storc or food
Storage tanks should be provided with u cover and must be periodically and frequently cleaned. Supply pipes should be accessible and not bedded in plaster, and internal pipes must be inclined towards the lowest point.
Water Softening Apparatus. The question of the hardness and softness of water for household purposes is important, and in some districts it is essential that artificial aid be used to render the water soft. The term hard is applied to water which has absorbed mineral compounds from the ground, generally some chemical compound of lime or magnesia

Water softening plants may be obtaincd in sizes suitable for any houschold, and a type of plant in general use for this purpose is the Permutit softener, illustrated in Fig. 2. The wrater is softened by a chemical compound through which it is made to pass. The cylinder shown in the photograph contains the compound, the upper tank containing a common salt solution which is regulated automatically and regenerates the permutit. If a quantity of dry salt is added at stated intervals the apparatus requires no further attention.
There arc a number of reliable apparatus on the market, functioning in somewhat the same manner. Sometimes there are considerations which prevent the installation of a plant for dealing with the entire water supply for the household, in which case it is possible to obtain small supplies of soft water for drinking, toilet, or culinary purposes by using


Most housewives know the deposit of "fur" or "scale" which forms on the kettle where water is hard, and can have some idea of the effects of this on the interiors of hot water pipes and boilers. Hard water has been replaced for various houschold purposes by rain water and distilled water in the past, but the first of these is uncertain in eupply and no always possible to obtain and the second is costly.
As soft water effects many economics in the household, the installation of a softening plant is worth consideration, espe cially as some reliable and effective water softeners are obtainable at very moderate prices. They require no ex penses of upkecp beyond the passing of a solution of ordinary salt in water through the appli ance at stated intervals, talic up little room and are noiseless.
The use of soft water in the kitchen produces immediate benefit and saving both of labour and moncy. Tea and coffee can be reduced in quan tity, as the full value is extracted by soft water. The latter is necessary when cooking vegetables to preserve colour
 and Havour 'I'he consumption or soaps for a portable apparatus connected a! will to a and Havour. The consumption of soaps fo kitchen, lavatory basin, or bath tap. Fig. 3 illustrates a typical softener of the smaller type. No plumbing is nccessary, the appliance being simply fastened to the wall, and the flexible connexion slipped over the nozzle of the tap.

Advantages of Soft Water. While some people claim that a certain degree of hardness makes drinking water more palatable, an excess renders it harmful. Organic purity of water may be attested, and yet inorganic purity may not be attained. The former refer to freedom from harmful bacteria, the latte: indicates the absence of chemical compounds which make watcr hard, as for example, salts of lime and magnesia. toilet and domestic use is reduced almost by unnecessary. For washing-up, the task is lessened when lime and magnesia have been removed and no chalky marks are !eft to polish off glass or silver ware The insoluble curd of soap which makes !aundry work difficult is obviated by soft water, in which a small quantity of flakes produce a copious lather.
WATER BED. In order to lessen friction and pressure and prevent bedsores in case where from paralysis or other illness patients must lie in bed for long periods at a stretch a water bed is often employed in place of a mattress. It is simply an india-rubber bag of the size of an ordinary mattress. A screw stopper is inserted in one corner of the mattress through which it is filled.
The patient should not be on the bed whilc it is filled and should be taken off before it is empticd. The water for filling should be at a temperature of $90^{\circ}$ and sufficient should be used to scparate properly the two surfaces when the patient is on it. On the other hand. it must not be too full or it will be uncomfortable. A water bed should be covered by a mackintosh shect, and a blanket beneath the shect. Sec Bed-making: Bed Sore.
WATER BISCUIT. These plain biscuits are made by rubbing 3 oz . butter into 1 lb flour, and adding sufficient water to mix the whole to a stiff dough. Knead the latter well, roll it out very thinly, and stamp it into biscuits. Prick cach biscuit on top and bake them until they are palc brown in colour

WATER BOTTLE. Glass bottles o holding water are ordinary household items but old ones, some of them unade before the incention or at least the general use of glass are regarded as curios and are prized accord ingly. Some of these are made of skin, but others are of metal, in some cases the precious metals being used for them, and examples may be seen in the various museums.

In the ordinary household the most usua type of water bottle employed is the one which is placed on the washstand. These are bought complete with one or two tumblers, and vary from plain to cut glass or crystal.
Flat-shaped water bottles of glass or aluminium, for carrying when out for a long walk, can be obtained in cases fitted with a long strap. See Hot Water Bottle.

WATERBRASH. The regurgitation of a watery acrid or acid material into the mouth from the stomach is a feature of some forms of indigestion, and is popularly known as waterhrash. It is usually accompanied by a hot sensation behind the breast-bone and in the throat, which is descibed as heartburn (q.v.) See Indigestion.
WATER CLOSET. Both the construc tion and the arrangement of water closets are governed by building acts and the regulations of the local sanitary authorities, and when any alteration or addition is contemplated such requirements must be observed.

The usual apparatus comprises a closet pan and a flushing device known as a waste-water preventer. This consists of a tank or cistern holding two or three gallons of water. When the water is released, it is forced down a vertical pipe and flushes out the pan. The amount of water in the cistern is regulated by a ball cock, which is generally made of thin copper and should be airtight, so that the bal Hoats on the surface of the water. Its function is automatically to raise a lever, which closes a valve and cuts off the supply of water to the cistern when it has reached a certain level.

Should this ball be punctured, it becomes partly filled with water and is no longel
sufficiently buoyant to close the valve with the result that the water continues to run into the cistern and escapes by the overflow pipe. The remedy is to turn off the water at the source of supply, or elsc temporarily to fasten up the valve and then remove the ball and lever. The water is expelled by enlarging the puncture and by warming the ball; then the surface is scraped clean and a small patch of thin copper soldered over the aperture.
If the ball is immersed in water, air bubbles will show at once if there is another leak, which can be remedied in a similar manner. If no air bubbles are visible, the ball may be considered watertight and can be replaced. Another cause of the cistern overflowing may be found in the lever gradually bending and not rising sufficiently. This is remedied by bending the lever to its proper shape with the aid of pliers and spanners. When the valve is the cause of the trouble, the remedy is to replace the worn washer with a new one.

The cleansing of a water closet should be carried out regularly, using a long-handled, stiff-bristled brush and one of the branded preparations or disinfectants which are put up for that purpose, failing which a few drops of hydrochloric acid may be dropped into the pan, which should be thoroughly flushed two or threc times in succession. See Ball Cock; Drains; Pipe; Sanitation.

WATER COLOUR. Damp is the worst enemy of water colour drawings, because its presence is often unsuspected before the damage has been donc. Common effects of damp are the crinkling up of the drawing and the appearance of mildew spots on its surface. Initial care in seeing that the drawing is properly set in its mount-the slightly sunk varicty is preferable-helps to prevent crinkling, but where doubt exists as to the dryness of a particular wall the frame should be kept clear with strips of cork glued at or near its points of contact with the wall. Cork studs about $\frac{1}{2} \mathrm{in}$. thick make a perfect nonconductor of damp. Mildew is very difficult to remove without injuring the drawing, but, if its presence is detected at an early stage, light rubbing with breadcrumbs may prevent its development. See Picture ; Print.
WATERCRESS. Watercress is a hardy perennial herb, and is a true nasturtium. It can be cultivated in gardens without a waterway so long as it is given a moist, shaded position. It will thrive in still water, but steps must be taken periodically to renew it, otherwise it may become foul.
Table Uses. Watercress is an adjunct to salad and is also uscful for sandwiches to be served for afternoon tea, or may be eaten with bread and butter at breakfast. It has medicinal qualities as a blood purificr. The cress must be very thoroughly cleansed and picked before being served at table, and the thick stalks removed. When added to


Water Lily. Soft pink flower of the variety Colossea. which blooms throughout the summer Courtesu ol Amateur Gardening
salads it is divided into sprays, but the leaves are always allowed to remain whole.

Many dishes are garnished with watercress, notably those which are egged and crumbed and fried. As a garnish for ducks, chickens, pigeons, or game it is, after washing and picking, heated over steam or in a cool oven and seasoned with pepper and salt.

WATER GARDEN. The simplest form of water garden is a small pool of which the sides and bottom have been made watertight with layers of cement. On clay land the pool may be rendered watertight by puddling, but it is safer to use cement.

Water lilies, set in shallow baskets filled with loamy soil and planted in April or May, are the best plants for a garden pool. There are many varieties suitable for deep or shallow water. Other attractive aquatic plants are the bog bean, Cape pondweed, and flowering rush (hottonia).

Those who possess some kind of waterway, be it shallow water, ditch, stream, or even bogland, can transform it into a charining adjunct of the garden proper. The mud of the water-edge will accommodate bold groups of Japanese irises in company with Spirea palmata. Then one may select the marsh marigold in single and double forms, together with the vivid orange globe flowers. Space may also be found for the swect flag, funkia, and Japanese primulas. The reed mace will find a home, but its growth must be kept under control. Where space is ample, gunneras, rodgersias and giant reeds are avail able for use. See Arrowhead.
WATERGLASS: For Eggs. As used for preserving eggs, this is a strong solution of silicate of sola and water, varying in specific gravity according to the amount of silicate that is dissolved. The strongest solution usually found has a specific gravity of $1 \cdot 7$, and contains about equal parts by weight of sodium silicate and water.

In preparing the waterglass for use, five or 10 times its bulk of clean boiling water should be added to the concentrated solution, the amount varying with its strength. The preparation should be quite cold before it is used. Experiments have shown that a 3 per cent solution, i.e. 3 parts by measure of the concentrated solution to 97 parts of water, yields as good results as the one of 10 per cent that is often recommended. A 5 per cent solution can be used with safety.

When the waterglass is added to the water, the two must be very carefully and thoroughly mixed. The eggs may be dipped in the waterglass and dried off, leaving a film on the shells and then stored upon shelves, or they may be kept in the liquid until wanted. The latter method is preferable. When.taken out of the solution they should be washed. See Egg.

WATER JUG. Water jugs were made in the 18th century, and some of these are beautiful specimens of cut glass. Others were of pottcry or china, made in plain, fancy and sometimes grotesque shapes. Most of those in use to-day are based on 18th century patterns, or else are of coloured glass, modern in form, and sold to match sets of tumblers. See Glass Ware.
WATER LILY. The nymphaea or water lily makes a charming display in the summer months in a garden pool or even in tubs sunk in the ground. It must be planted in still water open to the sunshine : running water is too cold and it does not flourish in the shade. The larger kinds need 2 to 3 ft . depth of water but the smaller kinds flourish in a pool 18 in . decp, and the miniature water lilies are happy in 12 in . depth of water. The way to plant them is to place the roots in a basket filled with loamy (turfy) soil and manure, weight them with stones, and sink them to the bottom of the pool in April or May. The
baskets will gradually decap. The smallest of all water lilies suitable for tubs or for a shallow pool are pygmaea, white; pygmaea helvola, yellow ; odorata alba, white ; and Luciana, rose.
One of the loveliest of the water lilies suitable for cultivation in a tank or large tub in a heated glasshouse is the blue Nymphaea stellata. If this water lily is started into growth under glass in a tub of water it may be placed out of doors for the summer months. See Lily; Victoria Water Lily.

WATER MELON. The water melon. which is one of the two chicf varieties of melon, the other being known as the musk melon, is a popular dessert fruit and is also sometimes served as hors d'ocuvres. Several different kinds are grown, three of the best bcing known as the Spanish, apple-sceded, and the citron water melon. See Cantaloup; Melon.

## Water on the Brain. See Hydrocephalus.

WATERPROOF. The name waterproof is given to mackintoshes and any other coats which have been so treated in manufacture as to be impervious to wet. Oilskins and cloth raincoats are in this category, and coats made of material that will not in itself withstand the rain are often lined with rubber. All such garments sloould have ventilation boles.
WATERPROOFING. Rubber is the most reliable substance for rendering fabrics impervious to water. There are other commercial processes which are used in the manufacture of rainproof cloths, and they depend mainly on the reaction between two or more substances which causes a substance insoluble in water to be deposited in the fibres of the material.

The process of treating calico and other thin materials with both raw and boiled linseed oil forms another method of waterproofing. It can be carried out by the amateur. The oil should be brushed very sparing!y and dried in a current of air. If the material can be placed out of doors in a position free from dust, it will dry quicker, but the best method is to place it in a room near an open window, which should be covered with fine muslin. Three or four thin coats of oil will be necessary ; raw linseed oil makes the material more flexible, but it takes much longer to dry. A little gold size is sometimes added to the oil, in the proportions of 1 oz . to 16 oz . of oil, to assist the drying. If it is desired to make the material black, the method is to thin some black paint with turps and apply it when the last coat of oil is dry.

Coarse canvas for use as awnings, covers, and tents can be waterproofed by applying a solution made by mixing 1 part of sulphate of zinc and $1 \frac{1}{2}$ parts of sulphate of iron with 18 parts of linseed oil and boiling it for two hours. When cool, add 15 parts of oil of turpentine and any colouring matter desired. The canvas should be left to dry for a week and a sccond application will complete the process.

Methods of rendering brick work and concrete resistant to damp and the action of driving rain or falling water are described in the article on Damp.

WATER RATE. This describes the charge made for the use of water by the municipalities and public companies that provide it. It is payable by all householders to whose premises the water is laid on, and is calculated at 5 or some other percentage on the rateable valuc the amount being fixed by Act of Parliament. It is usually payable every quarter, but in London every half year, and landlords who themsclves pay the rates on the houses they let pay also the water rate.

Water companies make an extra charge to persons who require water for other than strictly household purposes, e.g. those who have a garden hose or a garage or stables. If the water rate is not paid when it becomes due, the supply may be cut off and the occupier of the premises summoned. See Rates.

WATT, In electricity a watt is the unit of electrical power. It is the power exerted by a current of one ampere flowing under a pressure of one volt. A horsc power is 746 watts. See Electric Light.

WATTEAU STYLE. Paintings or decorative designs imitated from the work of Antoinc Wattearr; a French artist of the early 18th century, are said to be in the Watteau stylc.

Graceful fantasies of figures, in the court or pierrot costume of the period, set in a landscape of park or garden, the subjects are sentimental comedy or romance, the colouring is delicate, and the figures dainty, but at the same time realistic and beautifully drawn. Statuce of nymphs, musical instruments, and garlands appear in many of the compositions.
The style is used in mural and cciling decorations for rooms to be furnished in imitation of this period. The ornamentation is often arranged in medallions connected by garlands. Designs for rapestry to upholster the gilt furniture of his time, for paintings on screens, on cabinet pancls, on china and on fans are also often in so-called Watteau style.

Watteau style in dress usually refers to the sacque or overdress in which he painted so many of his court ladies, and particularly to the pleated fold at the back of the neck which flutes out into the skirt and is known as the Watteau pleat. See Fan.

WATTLE. This word is employed in two main senses. It refers to various Australian species of the acacia. This wattle has become closely associnted with that country, and one of the principal Australian holidays is called Wattle Day. The name is sometimes given to the twigs or rods of the willow. See Mimosa.
WAVE-LENGTH: In Wireless. This is the distance betwcen the crests of two successive elcetro-magnctic waves and is equal to $-\frac{V}{\mathrm{~F}}$, where $\mathrm{V}=$ the velocity of the wave in metres per second, and $F=$ the frequency in cycles per second. The velocity of an electromagnetic wave is 300 million metres (approx. 186,000 miles) per second.
WAVE-METER. This is an apparatus for measuring wave-length. There arc three main types, viz. buzzer, heterodyne, and absorption. Buzzer wave-meters comprise a tuned circuit having an inductance coil and shunted by a variable condenser, a high-note buzzer being used to produce oscillatory currents in the circuit.
The wave-meter is placed near the circuit whose wave-length is to be measured and the wave-meter condenser is adjusted until the buzzer note is heard in the loud speaker or telephones attached to the receiver. The buzzer note will be heard most loudly when the meter is in tune with the circuit undergoing measurement, and the wave-length can then be read off on the meter calibration chart.
A heterodyne wave-meter employs an oscillating valve and is capable of giving very accurate measurements. To measure the wavelength of a station, the tuning control on the receiver is sct to the required transmission and the meter condenser is rotated until a squeal is heard in the loud speaker or telephones. This denotes that the wave-meter is heterodyning the carrier wave of the broadcasting station.
If the meter condenser is adjusted further the squeal will hecome lower in pitch, pass through a " silent point" and then gradually rise in pitch. The silent point is the correct adjustment and indicates that the wavc-meter and carrier-wave are exactly in step. The wavelength can then be read off on the chart.

For short-wave rcception, absorption meters are sometimes employed. These consist simply of an inductance coil and condenser. The wave-meter inductance is placed closo to the
tuning inductance of the short-wave set. If the set is tuned to a distant telephony transmission there will be a marked diminution in the volume of the station being received when the meter condenser is adjusted to that station's wave-length. See Heterndyne.

Wax Dyeing. See Batik.
WAX FLOWER. This is the popular name of an evergreen plant of slender climbing growth, with wax-like flowers, suitable only for cultivation under glass. The commonest kind is Hoya carnosa, which needs a minimum temperature of about 55 degrees and bears white flowers tinged with pink. It should be planted in a tub, well drained, and filled with a compost of loam, peat and sand. Propagation is by cuttings inserted in sandy soil heneath a propagating case in spring.

WEANING. An infant at the breast should be weaned gradually when it is nine months old. A meal of cornHour, arrowroot, barley jelly or something similar, with cow's milk, is substituted for a brcast feed, and in the course of a few weeks the child should have a! its meals of the latter description. Should the time for weaning fall in hot weather, or when the child's health is disturbed by teething or some other causc, weaning should be post-
poned till the circumstances are more favour. able. See Baby.

WEATHERBOARD. The particular class of timber knowil as weatherboard is used extensively in the construction of amall buildings. It is commonly made with a feather edge and is wedge-shaped in section, being lin. thick on one side and $\frac{1}{4} \mathrm{in}$. on the other, averaging in width 5 to 6 in.
The boards are weather-tight in virtue of their cbaracteristic overlap, the lower colge of one plank orerlapping by about an inch the upper edge of the plank bencath it.

It would be undesirable to expose the end grain of the weatherboard to the full force of the weather: and for this reason vertical timbers, or cover strips, shonld be employed at all external angles. These strips are erected first, and the weatherhoard fitted into the space between them when the timber is of sufficient length to reach from one side of the wall to the other side.

In addition to the ordinary form it is possible to get rebated weatherboard, the use of which permits of a Hat surface on the inside. Vor good rork T. and G. matched weatherboard should be used. See Board : Draught ; House.

## Weaving in the Home

## With Descriptions of Various Kinds of Loom

This article deals with a domestic industry that is becoming increasingly popular. Aiter a clear description of a typical loom and its mechanism the reader is told how to weave a pece of matcrial suitable for covering chairs, settec, ctc. The article loom maly also be profitably consulted

It is not necessary to provide a large loom Greater speed is possible, and more intricate in order to gain some practical experience of weaving in its simplest form ; narrow materials, braids, trimming, and ties can be made on a board loom of quite simple construction, as illustrated in page 743 of this Encyclopedia. The material produced is weaving in its simplest form, depending on colour for its cffect; but it thoroughly illustrates the essentials of the craft. The proportions of this simple appliance can be increased, but for anything but the simplest work the table loom shown in the same page is recommencled. It is not expensive to purchase, and can be obtained in widths from 18 in . to 33 in ., made cither as a simple loom, as ilhstrated, or with four hoddles, manipulated by cords.

In a pedal loom the heddles arc operated by the feet, and four or more can readily be manipulated, the hands being left free for passing the shuttle and beating the weft.


Weaving. Fig. 1. Hand loom. A, warp stretching from roller to roller. B, lease rods. C, porrey cross. D, heddles. E, reed. F, sleigh. G, breast roller. H, treadles. K. grooves in roller. L, pawl and ratchet
wheel. M, aroove in roller. N. friction brake. O, weight beam. P, beam ward or cane roller. Q. weaver's seat


Weaving. Figs. 2 (abcvc) and 3. Showing a simple warping board, together with the necessary constructional Fimension further details see text

Having selected the warp yarn, decide on the length of material to be made. In calculating the length, at least 18 in or 2 ft . extra of warp thread must be allowed, as it is impossible to weave right up to the end of the threads. The desired width of the material must also be settled, and number of warp threads to the inch ascertained A very good warp for a beginner is thick cotton. This can be used at twenty ends or threads to the inch, and is recommended because its strength and durability render it less liable to break.
Laying a Plain Warp. The chiet thing to bear in mind in making a warp is that all the warp threads must be of equal length. A simple method of getting a series ol cords the same length is by fixing in a board hung on the wal: a number of wooden pega, arranged more or les: after the manner in Fig 2 A dimensioned drawing of the warping board is given in Fig. B3. The pegs (A. B), shown in solid blact, are loose and may be withdrawn from the board, the other pegs being firmly fixed. With the warp thread reeled or spooled, and resting on a thick wire supported on a frame (Fig i). so that the reel or spool will rotate, hegin by looping the end of the warp to the peg of the warping hoard marked $A$

Proceed in the direction marked by the arrow to the left under the first peg. over the second, over the corner pegs 3, 4 and 5 ; then round 6 and back to 7 ; thence to 8 and round 9 under 10 . Next the thread goes over and round $B$, over 10 . thence to 9 and so back to peg 3, passing over 8, 7,6, is and 4 in turn From 3 the thrend is continucd under 2 . over 1 , and under $A$ This must be repeated until the number of threads on the pege $A$ and 13 corresponds $w$-ith those required for the width of the niaterial. Favh forward and each backward run of the thead equals one warp thread a complete course from $A$ to $B$ and back again to A equalling two warp threads Both ends of the warp A to B must now be secured with cords, tightly fastened. Similar cords must be tied at the porrey cross, betwcen 2 and 1 , and the portéc cross, between $B$ and 10, but in these two instances the cords must be long, tied tight!y at the ends, and looped near to the cross These instructions apply to a plain warp. Instructions for laying a striped warp are given in a later section dealing with the weaving of an upholstery inaterial.
The required number of threads having been made, take off warp at peg $B$ and loop warp as if making a crochet chain (Fig. 9) until peg A is reached Insert a smooth stick or iron rod $\frac{3}{8} \mathrm{in}$. or $\frac{1}{2} \mathrm{in}$. diameter through loop.
Beaming the Warp. The raddle is illustrated in Fig. 4, and is a simple framework of wood. The cap, or upper part of the frame, lifte off, displaying a scries of strong wires fixed into the lower part of frame, in this case spaced five to the inch It is between these wires or dents that the warp threads are now to be distributed The suggested warp had twenty threads to the inch, so in order to spread the threads evenly across the loom it will be neces.
sary to put four warp ends together in a space or dent of the raddle On some looms (c.g. the one shown in Fig. 4, page 744) the raddle can be inscrted temporarily in the frame of the batten in place of the reed

Having spread the warp, return the cap to its place, sceing that all the wires are settied in the groove of the cap. Then make it secure by tying cords at either end of the raddle, so that there is no possibility of the cap becoming delached. All is now ready for the warp to be wound or turned or beamed to the warp ro!!er at the back of the loom, as shown


Weaving. Fig. 1. Raddle and stand with warn ready for distributing in dents of raddle. Below raddle shown with cep lifted
in Fig. l, and it is important to spread the warp as eveniy as possible on the warp or cane roller. This can be done by first lifting the iron rod over which the warp is spread and placing it in the groove of the back roller, where it is secured with cords The triangle (Fig. 5) is heavily weighted and placed as far away as possible from the loom, keeping the point to the middle of the loom. Next proceed carcfully to turn the warp on to the roller This is accomplished by means of the turning stick, which is passed through a hole in the end of the roller. Turn the roller until all but a foot or two are on. or uatil the cross in the warp nearest $A$ on the warping board has been ncarly reached. Two round, smooth sticks bout $\frac{1}{d}$ in or $\frac{3}{8}$ in in diameter will now be wanted These are the lease rods, and take the place of the loop ol cord between 1 and 2 in the warp called the porrey cross They will require some support and can be looped up with two cords attached to back and front rollers of loom, as at Fig. 1, B To prevent conusion, tie the warps in group: with a loop.

Making the Heddles. The heddles, which carry the warp, are composed of groups of leashessct on shafts or frames of wood. Each eye in the leash has a warp thread passord

Fig 5. The triangle together with disaram showing measurementa and method oí constriction
through it, and the action of treadling causes the warp threads to rise or fall, making a space between the warps which is technically known as the rising or lowering shed. These leashes can be purchased or may be made on a small board formed as shown in Fig. 8 It is made of a piece of $\frac{3}{4} \mathrm{in}$ board having four pieces of dowe! stick fixed firmly in it. as shown in the illustration

Cut a number of cords of the correct lengtb. Mcasure one by hooking around first peg and taking the double coid down to the pointed end of heddle board where it can be cut. This gives the length of cord required Test one leash to make sure.

In order to make the process clear we may call the pegs $A, B, C$ and $D$, commencing with the left-hand one Begin with a picce of cord by looping it round $\mathbf{A}$ and tying off firmly at $B$, leaving both ends the same length. Then, without cutting, loop round C and tic again finally tie around D and leave the ends uncut. Simple reef knote should be made, and below $B$ and $C$ the cord can be twisted. Fig 4 shows very clearly how the loops are made The loop around C is the "eye " of the leash

Having made sufficient leashes, one for each warp thread, hang them on two thin laths of wood suspenderl by cords, and the licddle is ready to hang in its place in the loom. as at Fig. 1. D. Two sets of these will be required. that is to say, if 100 ends of warphavebecn warped up, it will be necessary to have 50 leashes on cach heddle. The heddle laths should be so arranged in the loom that the cye in the leash is on a level with the tops of the rollers.
The next process consists in picking up the warp threads and entering each, that is, passing the end through an cye of the leash. The warp must take a straight course, and not get twisted round the cye or through the lower or upper loop of the leash. First a back leash is entered, then a front, and so on alternately across the loom, the work being done from left to right.

The batten or sleigh, Fig. 1, F, contains the comb or reed, E . This is made with steel wire, which furnishes spaces of various sizes according to the requirements of the particular work in hand. Some have ten spaces or dents to the inch, some twelve or twenty. For ordinary work a ten or twenty reed will be found very useful We will assume that a t wenty gauge reed is heing employed in the work now leeing described. In arranging the work, as staled above, twenty warp ends were allowed to every inch, so that one warp thread will be entered or passed through each dent or space in the reed ; in the case of ten warp ends to the inch, every other dent would have been left empty; or in the case of forty warp ends to the inch, two threads would be entered together in each dent or space. Al. though a reed can be made with almost any number of dents, coarse or fine work can be done in a twenty rced. For very coarse work, such as thick canvas or rugs, ten or even five dents to the inch would be considerably more suitable.
To prevent confusion at
this slage in gaiting or entering the loom, loop the warps
into groups. Take two iron rods, $\frac{1}{2} \mathrm{in}$. in diameter, and two long pieces of strong cord. Loop the double ends of each cord round the ends of the first rod, and drop it into the groove in the cloth or front roller, Fig. 1, G, and Fig. 6, 0 ; secure firmly with cords, and wind the ends of the cords round the roller until only 6 or 7 in . of the cord hang over. These ends are now to be secured to the ends of the second iron rod, which has been fastened in the same manner to beam warp or cane roller $P$, Fig. 1, and with two small weights attached to the ends, is supported by the reed immediately in front. For the purpose of tying the ends of the warps firmly to the second iron rod several methods can be employed. Take a group of warp threads and pass them over the second iron rod; turn them under, and in the process divide them so that as they come up on the other side of the iron rod half will be on the right of the original group of threads, and half on the left. Tie
first a knot, then a double bow.
The point to aim at is that the warp threads pattern on squared paper; also the tie-up of shall be securely held at about the same the threads, entering through heddles and reed, tension right across the loom. This completes what is called the tie-up of the warp threads.

It now remains to tie up the heddles and treadles, Fig. 6. In order to prevent the sagging of the warp, a friction brake is applied to the beam warp. This consists of a rope wound once or twice round it and tightened with weights, as shown at O, Fig. 1.

The shuttle, Fig. 10, is the wooden instrument or tool which carries the quill containing the weft to and fro across
the loom. The correct way
ent rue correct way and a piece of the fabric woven. Many variations of form and colour are possible with this simple setting up of the loom. There is no limit to the variety of patterns known as weft stripes, formed by a certain number of passes to represent the width of the band.

Weaving a Chair Cover. Fig. 11 illustrates a portion of a piece of material woven on a table loom, for the purpose of covering chairs or a settee. Its application is wider, however, for it can be used for window curtains and other hangings. The warp is of linen in various colours so arranged as to produce a striped effect. The weft is of blue spun silk, a material which, on account of its relatively lighter weight, is less expensive to use than artificial silks. The piece is 12 yd . long and 33 in . wide. The following instructions apply specifically to a table loom of the type illustrated on page 743 of this work.
of threading the shuttle is shown in the illustration.


First Steps in Weaving. One method of making a pass is to depress the right treadle H , pressing the batten back with the left hand, while the right hand has the shuttle ready to throw across the loom through the shed caused by the lowering of the warp threads in the first heddle $D$. The shuttle having passed from the right hand to the left, the right is now free to press back the batten or sleigh. The left foot must now depress the other treadle, when all the warp threads attached to the second heddle will be lowered, leaving an opening or shed in the warp through which the shuttle is thrown to the right hand.

Beat up the weft with the batten by pulling it forward, and by repeating this sequence of operations the fabric will begin to appear, the kind of weaving produced being what is known as plain weaving or tabby.

A glance at Fig. 6 will show a plan and sectional elevation of the warp and draft or


Fig. 7. Spool rack. Fig. 8. Heddie board showing dimensions. Fig. 8. Warp chain showing ties made at crossings. Fig. 10. Simple form of shuttle showing how thread comes off spool on top and is led through eye brown are reached. of peg A, 1, 2 and B, making 8 ties in all.

The Warp. In the warp there are 24 strands strands are under one crossing stick and two to the inch, and since the width is 33 in ., the over, alternately all the way.
latter number multiplied by $24(=792)$, gives us the total number of warp threads needed. In laying the warp a spool-holder (Fig. 7) is used to hold bobbins or spools. Place 2 spools of brown cotton on spool-holder, knot ends of threads together, and place on peg $A$ of warping board. Continue round peg 1 to 2 (forming crossing), thence to numbers 3,4 , $5,6,7,8$ and 9 , finishing at 10 and $B$, taking threads round peg $B$ and back the same way to peg 2, crossing threads reverse way to 1 round peg A. (See Figs. 2 and 3 on p. 1406.

Continue laying the threads as follows: 22 brown, making in all *24, 8 fawn, 4 brown, 2 orange, 2 yellow, 4 green, 2 mauve, 2 blue, 2 mauve, 2 blue, 4 green, 2 orange, 12 fawn, 2 orange, 4 greon, 2 blue, 2 mauve, 2 blue, 2 mauve, 4 green, 2 yellow, 2 orange, 4 brown 8 fawn, 2 brown, 2 fawn, 2 brown, 2 fawn, 2 orange. [1 brown, 1 fawn; repeat four times.] 2 orange, 2 blue, 2 yellow, 2 fawn, 2 brown, 2 fawn, 2 brown **; *** [ 42 fawn, 2 brown, 2 fawn, 2 brown, 2 fawn, 1 brown, 1 fawn, 8 times; 2 fawn, 2 brown, 4 times; 42 threads fawn.] Repeat from *** ( 42 fawn, etc.) four times in all. This forms one complete unit of design. Next repeat pattern backwards start ing from ** ( 2 brown, 2 fawn, etc.) until 24

This finishes the laying of the warp. When only two threads are needed it is best to leave at peg $B$ until required again, or if at peg $B$, leave at peg A. Do not take the same 2 threads back, as otherwise there would be 4 threads instead of 2. Knot threads same way to finish as detailed for the beginning. Tie each side

Take off warp at peg B, and loop warp as if making a crochet chain until peg $A$ is reached (see Fig. 9). Insert a smooth stick through loop and tie this on to front beam of table loom. Place crossing sticks through tie ups of pegs 1 and 2, making sure warp is not twisted. Tie string across sticks to keep in place. Then cut through top ties made at $\operatorname{peg} A$, and take out the crossing. It will be seen that two

Threading the Warp. Tie a twelve gauge reed in position so that it will not move while threading, then turn handle at side, so that one line of heddles is up and one down; make sure that eye is seen from back of loom. Pass reed hook through first eyelet and then through first dent of reed; take first pair of threads from crossing and, hooking one on reed hook, draw through to back of loom. Place hook in lower eyelet and through same dent, drawing thread through in a similar way. Continue thus until all the threads are entered, two in each dent,
up to the entire width of the warp It is best to thread an inch at a time and tie up separately, also to have instruction paper in front of the worker so as to check stripes in warp.

Fasten loom firmly on to a table, so that it can resist the pull of the warp in beaming on. Place triangle, heavily weighted, on the floor as far away as possible, keeping point of triangle to the middle of loom. It is very important to see that eyelets are closed in one line before warping up. Do not take out crossing sticks. Undo chain as far as triangle. Next take first bunch of threads and pull up tight (leaving no loose ones), and tie on stick at back roller, half und and on a between


Weaving. Fig. 11. Hand woven material for chair cover (part width only shown). Border is repeated at right margin, with
brown atripes on a fawn ground between
the batten to press up firmly when beating the weft between each pass. It is necessary to keep the edges of the warp thread and woven material even when winding up, and also to maintain an equal tension all through the piece. After winding on the woven material as described, lift the batten nearer to the front in the first notch and continue weaving again. This sequence of operations is carried out at intervals until the entire warp is finished:

The quantities of linen needed for the warp in the various colours are as follows: Brown, 8 oz. : fawn, 2 lb .8 oz ; orange, $4 \mathrm{oz}$. ; yellow, 2 oz. : green, 2 oz. ; mauve, Blue spun silk is suggested over The stick passes through a number for the weft and $1 \frac{1}{2}$ oz. per yard will be of loops at back of loom. It is best to tie needed. The colour could be varicd to give one inch at each end and one in the middle, and continue until all bunches are tied, at an even tension.
Take crossing sticks down through the warp to triangle, making sure that there are no loose threads or ends. The end of the warp chain is looped over the post of triangle and secured by the peg. This leeps the unbeamed portion of the warp taut and even while winding on is in progress. Place a sheet of paper over the layer of threads on back roller and turn roller, so winding on the warp, until triangle is pulled up to loom. Now take triangle down again (away from loom) and proceed in a similar manner until warp is finished It must be noted that each time the triangle is pulled up close to the loom by the winding on and consequent shortening of the chain of warp, a number of loops of warp chain are to be freed, and the chain secured again. When warp is finished, cut through ties B, take out crossing sticks, open harness and tie on to front stick in the same manner as at the back of loom, but putting the "unders "under the stick, and tie to tops. Continue until finished, when the loom is ready for weaving.
The Weaving. Blue spun silk is used for the weft, but a linen could be utilized, and would make a stronger fabric. Place a spool in shuttle, clamp loom on a table about 25 in. high so that a comfortable sitting position is obtained (see illustration in page 743). Turn the handle at side of loom, which will operate the heddle roller and cause one set of heddles to fall and one to rise, thus forming a " shed " or opening of the threads. Throw the shuttle through "shed " from right to left, catch the shuttle on the left side, bring batten forward as far as it will come. Hold the batten in the centre with the left hand, at the same time turning the handle in the opposite direction to that first used. Push battegn back, throw shuttle through shed from left to right, eatch the shuttle with the right hand, and pull the batten forward to beat as before. Now change the shed by turning the handle opposite way.

Continue weaving until there is insufficient opening to pass shuttle through, when the batten can be set further back by lifting up and moving over one or two notches, so that a good opening is obtained again. Continue weaving further until shed becomes too small for shuttle, when some of the woven material must be wound on to roller. Release the back roller, wind the material round the front roller, placing a sheet of paper between layers to keep the material clean and even. It is important to leave sufficient of the material unwound for
needed. The colour could be varicd to give a banded effect, if desired. Linen might be
used for the weft, instead of silk, if a stronger and more durable fabric is required. The piece of cloth from which our illustration was made was woven for the purpose by the Alston Weaving Studios, from whom

Wedding invitations should be issued from three weeks to a fortnight before the wedding day. They are sent out in the names of the bride's parents or near relative, by either of whom a luncheon or reception is usually given after the ceremony. In the case of a young widow living with her parents, the invitations would be sent out in their names, but if she is living in her own home, in her own.

People invited to a wedding send wedding presents either to the bride or bridegroom. Sometimes this is done as soon as the engagement is announced, and in that case an invitation should be sent to anyone who has given a present, even if there is little chance that he or she will be able to attend the ceremony. Presents are always displayed at the reception, and a special afternoon tea is sometimes given, also for this purpose, previous to the wedding day. They should be attractively arranged, and a card bearing the name of the giver placed on or close to each present.
Wedding Expenses. The chief expenses of a wedding fall on the bride's parents, or relative who stands in their place. The cost of the trousseau, dinners, and at homes given to introduce the bridegroom to the bride's family, the reception, whether given at the house or at an hotel, are all defrayed by them. A choral service, the fees of the organist, choirmaster, and choir, also the printing of leaflets for the special hymns to be sung on the occasion, and the newspaper announcements of the wedding, all floral decorations, the hire of the awning and felt at the church doors, and wedding buttonholes are paid for by them. The bridegroom provides the ring, and bouquets for bride and bridesmaids, and it is usual for him to make a present to each of the bridesmaids. He also provides the car to take himself and the bride from the church to the reception and away to the honeymoon destination or railway station for this afterwards. Should the bride's father have a car of his own,
suitable yarns may be obtained. The material would also make curtains, table runners, and cushions. By using three complete widths it might be employed for a bedspread; the widths could be joined either by a handwoven braid or trimming of narrow width, by a knitted insertion (see page 628) in silk to tone, or by faggoting (q.v.). Handwoven materials for upholstery and furnishing require little trimming as their decorative value lies in colour and texture. Heavy tassels, plain cords, narrow silk fringes, gimps and tinsel galons are suitable finishes for cushions. curtains and runners.

WEBBING: In Upholstery. In uphol stery, webbing in the form of a wide tape is used for supporting the stuffing and springs of chairs. There are two kinds, the best being English, which is recognized by its black and white diagonal pattern. Its strength is known by numbers, Nos. 10,12 , and 14 being in general use. English web is put up in pieces of 18 yd . A cheaper quality is woven in stripes, and the sizes are known by the number of stripes of colour in the width. It is usually put up in pieces of 36 yd .
Although webbing is a closely woven material, it stretches in use, and when it is attached to a chair frame it is necessary to stretch it as much as possible. The upholsterer uses special pliers for this purpose (illustrated in use on page 1353), but it is generally possible to use a short length of generaly possib
wood as a lever.

## Wedding Arrangements and Etiquette

## How to Plan the Reception and the Refreshments

## This contribution dea's 'with the ceremonial and social observances for the occasion. References should be made to the article on Marriage. See also the entries on At Home; Banns; Best Man; Bouquet; Bride; Bridegroom; Bridesmaid; Cake; Ice; Luncheon; Sandwich; Supper

it is sometimes lent for the latter purpose. The bridegroom also pays the fees connected with the ceremony. It is also customary for him to provide the furniture and accessories for the new home, though these are often supplemented by the wedding presents.

The Ceremony. Afternoon weddings are usually at 2.30 o'clock. Quieter weddings take place in the mornings, the hours when marriages can be solemnised being from 8 a.m. to 3 p.m. The best man, usually a bachelor, should either accompany the bridegroom to the church or meet him there. They both await the bride at the right-hand side of the chancel gates. The best man stands on the right of the bridegroom during the wedding ceremony; he should sign the register in the vestry afterwards and pay the fees if the bridegroom does not do so on arrival.

The bride is driven to church with either her father or mother. Should the father be dead, the bride is given away by a near male relative, who meets her at the church door. Should there be sisters who are acting as bridesmaids, the mother often precedes the bride to church and with the bridesmaids awaits her inside the doors. When the bride and her father arrive she takes his right arm while walking up to the chancel. At choral weddings the clergy and choir head the bridal procession to the chancel, singing a hymn. The bridesmaids follow the bride, and her mother walks next with a near male relative.

The relatives in either family seat themselves in pews, the bridegroom's relatives on the right-hand side of the nave, the bride's on the left. The bride stands at the bridegroom's left hand, with the person who is to give her away on her left. The bridesmaids stand immediately behind the bride, and the chief bridesmaid holds her gloves, if she has these, and bouquet from the commencement of the service. After the service is over the bride takes the bridegroom's left arm, and, preceded
by the officiating clergyman, and followed b the chief bridesmaid, best man, father, mother, and most distinguished guests present, they enter the vestry to sign the register. After this the bride takes the bridegroom's left arm and passes down the aisle, followed by the bridesmaids. The married couple should leave the church without shaking hands, etc., with friends, if a reception is to follow The bride's mother should he the next to leave the church, in order that she may reach home to receive her guests.
In the case of $n$ widow, it is optional whether she is given away or not. She does not have bridesmains, but may have pages, should the wedding be a fashionable one. She may have a wodding calie, but it should not be decorated with orange blossoms.
Wedding Reception. Wedding luncheons are usually given at receptions only when the party is comparatively a small one, and the wedding has been held in the morning, or at country weddings. The menu is that of a seasonable luncheon. It is usual to begin the actual meal about half an hour after the guests have assembled at the bride's house or whereever the reception is being held Cocktails and appetizers are offered first and afterwards the luncheon is served. Wedding cake and champagne are included on the menu.

Plate for service, a wedding cake linife, and decorative accessories such as a houquet holder, flower vases, and a wedding cake stand can be hired inexpensively from a firm of caterers. Floral decorations are of first importance, and should tone with the colour scheme of the bridesmaids' dresses, or may be of all white flowers. China, glass, and silver ware and also the embroidered or lace rumer or lace trimmed cloth on the buffet or dining table should all be chosen with regard to the occasion. If white flowers are used, amber or green glasses will look well. A background of palnis, ferns, flowering plants and arrangements of cut flowers to tone with the other floral decorations is usually made in one part of the reception-room where the bridal pair will stand to receive congratulations before luncheon is served in the dining room, or the cake is cut and light refreshments provided.

When only a reception is given at an afternoon wedding, such refreshments are much the same as those at an At Home or supper party, with the exception of the wedding cake and champagne. Orangeade or lemonade should be provided for gucsts who do not drink wine. Whatever the nature of the entertainment the bride should put the knife into the cake, of which a wedge should have been previously cut and tied with a bow of satin ribbon to simplify the operation. While more cake is cut, either the chief bridesmaid or the hostess slices the wedge and the cake is handed round with champagne in glasses, so that the guests may drink the bricle's health.

On the buffet all kinds of sandwiches, lobster patties, fancy pnstries, small cakes, fruit, tea and coffee should be set out. Trifles, sundaes, and other ice creams may be also provided. Ahout 4 sandwiches, 1 pastry, and several small cakes can be allowed for each person, while 1 bottle of champagne is usual for 4 persons and 1 quart ice-cream will be sufficient for 12 persons. The buffet should be placed so that the maids who are helping to serve refreshments can pass easily behind it and also have access to the kitchen for supplies. Where there is a service hatch the buffet should be placed in front of this.

Wedding Cake. Bridal cakes are always rich both in their ingredients and decoration. Small silver bells and symbols of good luck are usually added, and occasionally a greeting is written across the top of the cake in icing of a contrasting shade. Many cake shops specialize in making them, but the following
is a good recipe for a home-made wedding cake Cream 1 lb . butter and $\frac{3}{4} \mathrm{lb}$. castor sugar till they are quite smooth; then add 6 eggs, one at a time, and beat thoroughly. Stir in 1 lb . flour. and gradually add 3 lb . currants, $1 \frac{1}{4} \mathrm{lb}$. sultanas, $1 \frac{1}{2} \mathrm{lb}$. finely cut mixed peel, $\frac{1}{2} \mathrm{lb}$. almonds blanched and chopped, $\frac{1}{4}$ oz. mixed spice a few drops of almond essence, $\frac{1}{2}$ gill rum, and 1 tablespoonful dark treacle. Beat well all the time to mix the ingredients thoroughly, nnd then put the mixture into a well-greased cake ring surrounded outside with several thicknesses of brown paper. The cake undernenth must be well protected also. Use a very thick baking sheet covered with sand under the tin on which the cake stands. Bake the cake for five or six hours in graduated heat and keep it for a month at least before icing See page 175 for icing directions and also the entries on Almond Paste and Icing.

To provide a cake of more imposing appearance increase the ingredients in the same proportions to four times the quantities given. Provide two tins, one about 10 in . and the other 6 in in diamcter, prepare them as already directed, and fill them with cake mixture, 3 parts full. Bake the smaller tin for about 4 and the larger for 5 hours on the sand-covered sheet. When cooked allow the cakes to cool and wrap them in white paper for storage in a tin. Ice the cakes when required with almond paste and then with royal icing. Place the smaller cake on the larger before decorating with fancy icing by means of a forcing bag (see page 481), or forcing pipe (see page 617), and completing the whole with the silver ornaments and satin ribbon. On the two ends of the bow the bride's initials can be worked on the left, the bridegroom's on the right, and a spray of white heather passed through the knot.
Wedding Ring. In Great Britain the wedding ring is worn on the third finger of the left hand. For legal purposes the bride has the ring put on her finger by the bridegroom during the ccremony. A widow remarrying usually removes her first wedding ring when she is about to go to the church or register office.

WEDGWOOD : The Chinaware. While old Wedgwood pottery, especially in its more characteristic forms, is not easy to procure the Etrurin factory, established in 1768-9 by Josiah Wedgwood, still produces as vigorously as ever, in some instances from the original moulds, wares which legitimately bear the Wedgwood name.
The term " old Wedgwood," may usually be taken to mean pieces produced before 1800.
These productions are more perfect in finish
than those made during the 19 th century, or even to day, though an excellent quality marks the present output of fine pieces.
The many wares which Josiah Wedgwood invented or improved include the fine creamware which achicved world-wide renown as Queen's ware, the famous jasper ware, black basalts or Egyptian black, several forms of variegated and pebble ware, besides fine red pottery and silver and gold lustre.
The dinner service made for Catherine II of Russia was in Queen's ware. Each of the 952 pieces was hand-painted with a different view of rural England. The black basalt ware, which was solidly black throughout and lent itsclf to finc incised or raised decoration owing to its beautiful texture, is another ware which has been extensively reproduced for Hower bowls and vases.
The distinctive qualities of old Wedgwood are its perfect potting and its fastidious accuracy of detail, extending to the fitting of the lids and the shapes of the spouts. The applied decorations are always sharply defined, the edges bcing undercut and the whole polished on the wheel, resulting in an unmistakable velvety fecl. Queen's ware and pearl ware set new standards of technical excellence which drove out of the market both saltglaze and delft. The early tea and coffee sets in these styles, as well as in basalts and other clay fabries, are highly prized.
Distinguishing Marks. During Josiah's lifetime the mark was impressed in the clay. At first the name Wedgwood appeared alone, but for twelve years after 1768 the partnership mark Wedgwood \& Bentley was used on jasper and crystalline vases except blue jasper, and also upon blue plaques and medallions, on some of which portraits were carried out in relief with exquisite precision of detail. Etruria was added for a brief period after 1840, England being added to meet American requirements in 1891. In 1879 a device of a vase was placed above the name. A threecharacter mark, used since 1846, was definitely established in 1907, when the figure 3 denoted the third alphabetical cycle, and J the letter for that year, preceded by the workman's initial.
The name Wedgwood \& Co. denotes the productions of Ralph Wedgwood, a cousin of Josiah, produced 1796-1800). Wedgwood was used deceptively by Smith, of Stockton, for some ycars, until stopped by a perpetual injunction granted in 1848. Apart from unscrupulous imitations, several pupils and rivals of Wedgwood have produced under their own marks styles of ware created by him, which are also in demand by collectors.

Porcelain made for about ten years after 1805 is distinguished from that produced since 1878 by the plain name Wedgwood, stencilled usually in red over the glaze. In 1848 Etruria took up the manufacture of Parian ware; after 1850 jasper was made with the well-known lavender ground; in 1860 reproductions of Italian majolica were introduced, and some painted ware was done. See China; Jasper Ware; Lustre Ware; Pebble Ware; Pottery; Queen'sWare: Staffordshire Ware.

WEEDS: Their Treatment. Every gardener has to deal from time to time with
weeds of various kinds. They may be annual. biennial, or perennial, and must therefore be combated by different methods according to their habit of growth.

Hand pulling digging with fork or spade and the tota! removal of the weeds are efficient methods of destruction. In every case the weeds collected should be burncd. If these methods are too laborious, owing to the accumulation of weeds, spraying may be tried. Poppies, groundsel, dandelions, and certain other weeds can be more or less crippled and prevented from seeding by spraying them with 25 per cent solution of copper sulphate or a 15 per cent solution of sulphate of iron.
When hand weeding of lawns becomes essential it must be systematically carried out, and clearance should be made square yard by square yard, the labourer kneeling on a pad and spudding out every available weed. Where tap-rooted weeds, or others with large crowns, are rampant, a skewer dipped into a bottle of sulphuric acid will be found a simple eradicator: when using the acid a pair of leather gloves should be worn. To deal with weeds in beds and borders the hoe should be in constant use.
The weeding of paths should be taken in hand during early spring. Hand-picking for such purpose is an antiquated business, whilst the old remedy of applying salt or brine is only effectual up to a point, and sometimes actually encourages a fresh crop of weeds. Proprictary weed-killers, poisonous and non-poisonous, are far more effective, especially when applied on dry, windless, and sunless days. It must be understood, however, that such preparations can only be used for weeds on paths and walks : if the liquid falls on grass or plants these may be destroyed.

Implements Used. Common implements for weeding, usually contained in the average gardener's equipment, are the hand-fork, Dutch hoe, rake, and spud. There are other articles for special purposes, including the daisy rake and certain proprietary tools known as weed extractors. The latter have forks to insert under the crown of a weed, which, by pressure, lift the root stock bodily from the soil. Some instruments are designed for the use of liquid weed-killer. Lawn sand is a preparation made to keep down weeds on lawns. See Dandelion; Dibber; Groundsel; Hoc: Poppy ; Spud.

WEEPING ROSE. A rambler or climbing rose, when budded on a brier 5 ft . or more high, is called a weeping rose ; such a specimen makes a handsome lawn trec. Weeping roses should be pruned as soon as the flowers have faded by cutting out parts of the old branches to make room for the new shoots. All brier shoots must be cut off ; they may develop not only on the stem but among the branches Each tree must be supported securely by a strong stake. Roses which make beautiful weeping standards are Alberic Barbier. Fraicheur, Lady Godiva, Hiawatha, Purity, and Dorothy Perkins. See Rose.
WEEVIL. This is the popular name given to a large number of beetles that have the anterior part of the head prolonged into a beak. They feed upon plants and are injurious to grain. Three types that should be noted by the gardener are the clay-coloured, the black: and the plum weevil ; they appear in late spring and early summer, attacking leaves, shoots, and bark, and causing much damage.
The clay-coloured, or raspberry, weevil is the most harmful of the three and is also the smallest. In habit it is mainly nocturnal, crawling out from its hiding place at night to fecd. It damages fruit blossoms and buds and the tender shoots of raspberries.
The black, or vine, weevil is more troublesome under glass than in the open. In the bcetle stages, it is chiefly injurious to vine shoots and to the shoots and foliage of fruit
trees or shrubs grown under glass. The larva is very injurious to plants in pots, notably to ferns, primulas, and cyclamens. It is not unusual to find six or eight grubs in one pot. The grub is injurious to many garden plants and also to strawberries. The red-legged, or the plum, weevil is a black, shining insect, $\frac{1}{2}$ in. long. It is very injurious to plums and also attacks peaches, nectarines, and apricots.

These weevils are extromely difficult to eradicate once they have become established, and it is therefore of great importance to prevent them from obtaining a foothold. The weevils cannot Hy, and can therefore only reach fresh ground by crawling or being carried in soil when in the grub stage.

In greenhouses devoted to growing ferns or primulas, the first stock should be carefully watched, and if the plants do not thrive the roots of the least healthy should be searched for the white grubs. Potting soil should be examined, and if grub-infested soil has to be used it should first be sterilized by heat.

Young trees and grafted stock can be protected from the adult weevils by banding, since the weevila spend the day in the soil and only crawl up at night. Apart from this, the only treatment is to catch the weevils at night by shaking them on to tarred trays or boards. Vast numbers can be caught in this way, but care is necessary, as the insects fall off readily when alarmed. No insecticide has proved of any use against them. See Apple Blossom; Gall Weevil ; Grease : Plum
WEIGELA. The bush honeysuckle, ca!led the weigela, is a beautiful, hardy leaf-losing shrub, 5 ft . or more high, which blooms in early summer and thrives in ordinary well-tilled land. The typical kind is rosea, with rose-coloured blooms. Improved varieties are Eva Rathké, crimson; Abel Carrière, rose crimson; Mont Blanc, white, and Van Houttei, rose and white. Propagation is by cuttings of young shoots under glass in May or by inserting woody cuttings out of doors in autumn and covering them with a handlight.

WEIGHT. The weight of an individua' depends on the height, age, and sex. The ratio of weight to height varics considerably in healthy people. The average weight for a man and woman about 25 years of age, and of a height of 5 ft . and over, is as follows
A few 1 b .
must be added for very addiional 10 years of age, more for a woman than for a man. If the weight of an individual is $1 \frac{1}{2}$ or 2 st. below the average for his height, and more particularly if there is a

| Height | Weight |  |
| :---: | :---: | :---: |
| it. in. | $\stackrel{\text { Man. }}{\text { st. }}$ | Woman st. Ib. |
| 0 | 8 |  |
| 1 | 88 | 83 |
| $\stackrel{2}{2}$ | 813 | 8 ? |
| 5 | 93 | $81 \%$ |
|  | $9 \quad{ }^{\circ}$ | 9 |
| 5 | 910 | 95 |
| $5 \quad 6$ | 10 | $9 \quad 9$ |
| 57 | $10 \quad 4$ | $8 \quad 13$ |
| 58 | $10 \quad 9$ | 103 |
| $5 \quad 8$ | $10 \quad 13$ | 107 |
| 510 | 114 | 1011 |
| 511 | 118 | 111 |
| 60 | 120 | 116 |
| 61 | 125 | 1111 |
| $6 \quad 2$ | 1210 |  |
|  | 13 | - |

loss of weight, there is need for a thorough overhaul by a doctor.
WEIGHTS AND MEASURES. In English law all weights and measures are based upon the pound and the yard, which are the only independent standards. The gallon, which is the standard of all measures of capacity, is based upon the pound. It is defined as the volume of ten standard pounds of distilled water weighed in air against brass weights, both water and air at the temperature of $62^{\circ} \mathrm{F}$ with the barometer at 30 in .

Legal Points Certain commodities have conditions about their sale. Coal must be sold
by weight tor domestic use. Where the quantity exceeds 2 cw ., the seller must deliver to the purchaser a weight ticket showing the net weight of the coal delivered before any part is unloaded. The sale of coal in quantities not exceeding 2 ewt is governed in most towns by the by-laws.

In selling any article of food by weight. measure or number, it is an offence to deliver a less weight, measure or number than is purported to be sold Tea, coffec beans, cocoa and potatoes must be sold by net weight. Certain other articles of food may be sold with the wrapper included, provided the weight of the wrapper does not exceed certain specified amounts. In the case of meat it is an offence to deliver to a purchaser any butcher's meat without a legible statement of weight upon which the purchase price is based, unless the delivery is made to the buyer on the premises of the seller immediately after the purchase has been made

If the meat is boned or trimmed and such boncs and trimmings are not delivered with the meat, the delivery note should then contain two statements of weight, (1) the weight on which the purchase price is based, i.e. before boning and trimming, (2) the net weight as sent out. All bread, excluding fancy bread, must be sold by net weight and must be made in weights of 1 lb or an integral number cf lbs.

No milk must be sold in bottles or containers except in quantities of $\frac{1}{2}$ pint or multiples of $\frac{1}{2}$ pint. This does not apply to dried or condensed milk. See Avoirdupois Weight: Bushel; Decimal System; Dry Measure; Gas; Liquid Mcasure: Measurement: Metre; Ruler: Therm; T Square, etc.

WELDING. A simplified process of welding or uniting ferrous metals consists in heating the parts to a white heat, placing them one upon the other, and hammering them into union. Autogenous welding has to a large extent taken the place of the older method, especially for small work. The apparatus consists of a blow pipe with oxygen and acetylene gas under high pressure. These gases are mixed within the blow pipe and cmerge at a high velocity from a small nozzle. Ordinary welding can be carried out by the a mateur, but considerable practice is required. Success depends on the proper heating of the metal, the direction of the hammer blows, and often the use of a suitable flux placed between the joint faces in order to assist adhesion.

While the practice of welding is generally limited to the ferrous metals, it can be employed with modifications for some others. Autogenous welding is particularly applicable to articles made of cast iron, which, by their nature, cannot be united by hammering. See Brazing; Flux: Forge: Metal Work; Soldering.

WELL : For Water Supply. In country districts the water well is vitally important, and it is necessary to give much attention to the subject when considering the purchase or renting of a country property.

There are several methods of ascertaining whether water is present bencath the surface. One is to employ a water diviner, who, with the aid of a hazel twig, is able to locate running water with considerable accuracy. A more scientific method is to use a regular waterdivining instrument or to call in a geological expert.

Although the diviner is able to say that water is present, it is impossible to krow whether it will be fit to drink until it is actually reached. Consequently, before incurring the expense of making a well, the surroundings should be carefully studicd. If stables or cowsheds are in the vicinity and on land slightly higher than the site of the well,
there is risk that the water may he contamin ated, and it is better to fincl another site.

When there is any choice in the matter, the most convenient site will be that which is highest in respect to the bnilding to be supplied with water, and also nearest to it, if about the same level. In hilly distriets there is often no nced for pumping water, the spring being at a sufficient altitude above the house. Such ideal conditions, however, are seldom realized in the more level parts of the country, and some means of mechanically raising the whter from the well is necessary

The plan commonly adopted is to employ the local well-digger to dig the well and to brick it up on the inside. An alternative plan is to use well-boring tools, boring only a small hole, perhaps 4 to 6 in in diameter, and sinking an iron pipe into the earth, but this is only practicable when the pipe would terminate in a stratum yielding a sufficiently voluminous supply, or when an attesian well can be madc. See Pump: Ram: Water.

WELSH CAKE. This refers to a currant cakc mixture made as stiff as short crust, rolled out into a sheet, and then cut into rounds with a cutter or the lid of a tin. These rounds are bated on a lightly greased girdle or bake-stone.

Take l lb. flour, a good teaspoonful of haking powder, a pinch of salt, 6 oz . lard or laril and butter mixed, 4 oz . castor sugar, 3 oz. currants and sufficient milk to mix all to a stiff dough. Sift the sait, baking powder, and flour togetlier, rul in the fat, add the sugnr and currants, and moisten with the milk.

Roll out about $\ddagger \mathrm{in}$. thick, cut into ciakes, and trake on the bake-stone. Turn the cakes when browned one side and brown the other side. 1 or 2 eggs may be added if a superior cake is required, but less milk would be noeded in that cease. Sour milk or butter milk improves these cakes. They are generally eaten hot for tea. See Girdle.


WELSH CORGI. This dog is regarded as having two centres of origin, namely, Pcmbrokeshire and Cardiganshire. The distinctive feature of the two is whilst the former have long tails the latter have short ones. Moreover, the Pembrokeshies variety are either red or red and white, whereas tne Cardiganshire dogs are any colour excepting white, and the latter are slightly heavier. The weight of the corgi is from 18 to 25 lb . The head is foxy and the ears erect or semi-ercet. The contour of body is also foxy, but the limhs are of sturdier build than that of the fox. The coat is smooth but harsh. Corgis make excellent workers for sheep and are good tempered and hardy.

WELSH DRESSER. This name is given to a picce of furniture that was made in Wales, the reason presumably being the abundance there of oak. This type of dresser is made of oak, frequently with a simple inlay of mahogany. It is polished dark, has plain rectangular mouldings, and also plain brass droppers for tho drawers.

Pieces labelled by the name Welsh dresser are often spurious. A useful test is the condi-
tion of the brass. If the piece is a genuine antique, time will have browned the handles : consequently those that look new should be suspected. See Dresser.
WELSH OMELETTE. Wash three small lecks, taking care to free them from grit: trim off the root ends and most of the green portion, and then cook them in stock or water until they are tender. Drain them, cut them into thin slices, and mix with a little butter and dust with pepper. Keep hot while making a plain omelette, and put leeks on one half and fold over. Sometimes a little grated checse is added. See Leck ; Omclette.

WELSH RAREBIT. A rich cheese such as Cheshire or Cheddar should be employed when making a rarebit. Glouccster chcese is sometimes substituted for Cheddar. Cut up 4 or 5 oz . cheese in thin slices and place them in a saucepan with 1 oz. hutter, 1 small mustard-spoonful made mustard, 3 tablespoonfuls draught mild ale, and scasoning of cayenne pepper and salt.

Stir the cheese over gentle heat until it is melted and the whole has the appearance of a creany mixture, then dish it immediatcly on hot buttered toast. The toast must be freshly made and the crust cut off, also it should be crisp and evenly browned, although not hard. Rarebit requires speedy preparation, and it must be served immediately it is cooked. Malt vinegar may be added instead of alc.
A second method consists of flaking into a small pan 5 oz . checse, adding $1 \frac{1}{2}$ oz. butter, a good pinch pepper, salt, and a small quantity of dry mustard. Stir these together and melt them in the oven, then serve on toast. Sometimes 2 tablespoonfuls milk are added to these ingredients before putting them in the oven.
WELSH TERRIER. Probably similar in origin to the wire-haired fox terrier, the Welsh terrier has the same sporting instincts and the desire to exterminate all four-footed vermin. But, as in the case of the fox terriers, this does not unfit him for human companionship, and he will be found to be a good house dog. of affectionate disposition, and not apt to quarrel with his own kind.

In many respects similar to the wirehaired terrier, his head is rather wider and the muzzle more powerful. He has a very close and abundant coat of hard, wiry hair of black and tan or grizzle and tan, without any black pencilling on the toes. The height at the shoulders should be about 15 in ., and weight about 20 lb .; less in each case for the bitch. See Dos.

WEST HIGHLAND TERRIER. This rather small but strongly built. hard-coated dog is often regarded as a white variety of the Scottish terrier, but it is a distinct and ancient breed, kept up for routing the fox, otter, and badger from their Iairs in rocky ground. To indomitable courage are added great intelligence and devotion to his owner. For the show bench he must be wholly white with the exception of his nose, his footpads and nails, which are black, yet he may be quite true to type even if he has a little red or yellow on his back or ears. He stands from 8 in . to 12 in . at the shoulder, and weighs



West Highland Terrier, a breed of small sporting dog which combines great courage with affection
not more than $18 \mathrm{lb} .$, the bitch 2 lb . less. There is a soft, close, furry undercoat, im pervious to wet. See Aberdeen Terrier; Dog.
WHAT-NOT. This term is used for a piece of furniture, something resembling a cabinct without doors, that was very frequently seen in English houses in the 19th century. It is made usually of slender pillars or uprights that support a number of shelves, suitable for displaying china. What-nots are made chiefly of walnut and mahogany, but the most decorative examples were of papier mâché japanned black, painted in Horal designs and often inlaid with mother-ofpcarl.

WHEAT. Most of the flour which is used in coolsery is produced from wheat, though cornflour, rice flour and maize flour are also employed. Flour varies in quantity, wheat that possesses a low percentage of gluten yielding soft flour, and that with a high proportion, a hard, strong flour that develops elasticity when mixed into dough. The colour of flour also depends upon the wheat from which it is obtained. White whent produces a pure white flour and red wheat a flour that has a yellowish tinge. See Flour.

WHEATMEAL BISCUIT. To make these, sieve $\frac{1}{2} \mathrm{lb}$. wheatmeal and one teaspoonful ground ginger into a clean, dry basin, rub in a lump of butter about twice the size of a hen's egg, and then add two tablespoonfuls sugar. Stir in first a beaten egg and then cnough milk to form the whole into a stiff paste; roll the mixture out on a floured board until it is about $\frac{1}{8}$ in. thick, and cut it into biscuits, baking these in a moderate oven until cooked through, and lightly browned.

WHEEL. In this Encyclopedia dif. fering types of wheel are dealt with under such headings as Bicycle; Gear; Mangle; Perambulator; and Scwing Machine. Change whecls used on the screw cutting lathe are described in the articles Lathe and Metal Turning. For hints on repairing whecls of toys sec the article Toys.
The road whecls of the motor vehicle arc dealt with in the contribution immediately follow. ing, and other information will be found in the articles on Cotter; Motor Car; Motor Cycle: Sprocket: Tire.

## WHEELS FOR MOTOR VEHICLES

## Modern Tendencies in Design and Construction

## Other articles in this work that are of interest to the motorist include Motor Car; Motor Cycle and

 Motoring. See also Brake; Gear; Tire; TransmissionConsiderable changes in wheel construction have occurred during the last few years as the result largely of the introduction of largesection low-pressure tires the use of wired or straight-sided tires instead of bcaded tires, and the substitution of pneumatic tires for solid tires on commercial vehicles. Overall diameters of tires have not increased: the tendency is in fact in the reverse direction and wheels have become smaller and lighter.

Motor-car wheels carrying pneumatic tires may be classified broadly as spoke, wire and disk. Further, the design depends upon whether the wheel is detachable as a whole or whether only the rim with the tire is detach able from the wheel. A complete fixed wheel with detachable rim is heavier than a detachable wheel carrying the same size of tire. Also in the event of accident such as a wheel striking the kerb, a fixed wheel, if broken, will disable the ear completely, whereas a detachable wheel may bend or collapse without damaging the axle, so that it is only necessary to fit the spare wheel. The detachable wheel is generally used in Great Britain, while the detachable rim has been used largely in America, but is now yielding place to the detachable wire or disk wheel. The steel spoke wheel after many years of popularity has to some extent yielded precedence to the wire wheel with a well-type rim on ordinary motor cars and on the lighter commercial vehicles, but special disk wheels with flat base rims are largely used on the heavier commercia vehicles. Such wheels have largely replaced cast steel wheels with solid tires. In the ordinary motor-car industry changes in the popularity


Wheel for Motor Vehicles. Fig. 1. Steel detachable spoked wheel with brake drum and hub cap
of different types of wheel are often due to fashion rather than to technical superiority.

Wooden wheels with detachable steel rims are still largely used on American cars, these wheels being of the artillery type ; that is, the inner ends of the spokes are clamped between two circular steel plates forming the boss or nave. The circular rim or felloe (pronounced felly) is of wood, with a light metal rim which supports the steel rim carrying the tire. This type of wheel was long ago superseded in Great Britain by detachable steel wheels of similar appearance but of radically different zonstruction, the Sankey steel wheel shown in Fig. ] being an example of this type. The drawing shows a


Fig. 4. Heavy disk wheel as used with giant
light sheet-metal plated cap N with a flanged edge entering the recess. Spring-pressed plungers 0 on flange retain the cap in position.

Detachable disk wheels consisting of a stcel rim riveted to a slightly coned disk are much less used to-day than the other types on ordinary cars, but a similar appearance has been obtained by securing light conical disks on the outside and inside of wire wheels. Apart from the matter of appearance, these disks reduce the labour of washing the many wire spokes and thus remove the most serious disadvantage from which wire wheels suffer in comparison with other types. Modern wire wheels are. however, constructed with a smaller number of thicker spokes more widely spaced, so that the cleaning difficulty is thereby reduced.
Although not very popular on passenger cars and light vehicles. specially designer disk whecls are widely em. ployed on the heavier commercial vehicles, a Sankey wheel being shown in Fig. 4. The rim of this wheel is of the flat-base type as distinct from the wellbase type, but it carries similar wired or straightsided tires of large size known commercially as giant pneumatics. A disk $P$ is secured to the end of the axle by a number of studs and its outer edge is flanged and is riveted to a rim having an integral flange Q on one side. The other

also coned to bear against a cone G on the axle. The coned surfaces are pressed into engagement by a lock nut H with two ears, which may be tightencd up by a lead or raw hide hammer or a wooden mallet, but not by a metal ham mer. The lock nut screws on to the axle and is formed with a double conical recess $J$ which engages the end of the hub and is thereby locked securely against rotation, no other locking arrangements being necessary.

A modified type of wire wheel which has recently attained considerable popularity is secured to the axle by a number of studs and nuts as in the Sankey wheel described above, but the nuts are located inside the hub and are concealed by a large plated cap. A RudgeWhitworth construction is shown in Fig. 3. The large steel hub K, although very strong, is made of comparatively thin metal and is secured by wire spokes to the rim, many of these spokes being arranged tangentially to the hub so as to transmit the driving and braking forces. The inner face of the hub is secured by studs and nuts against the outside $L$ of the brake drum, the nuts M being rotated by the usual wheel brace. The opening on the outside of the hub is large enough to give proper access to the nuts and is closed by a

Wheel. Fig. 2. Detachable wire wheel with central locking nut. Fig. 3. Detachable wire wheel with studs and securing nuts concealed within the bollow buh by a covering disk
lange $R$ by which the tire is retained in position, is formed by a detachable rim held in place by a spring ring $S$.

With all types of wheels care should be taken, when placing thein in position, that the engaging surfaces are clean and free from mud or grit which might prevent them from being clamped up firmly.

WHEELBARROW. The wheelburrow is extremely handy for conveying all sorts of garden material. As it is easily tipped either sideways or on end, its contents may be shot at any point

## desired

without the
necessity of Fig. 1. Hand barrow consisting handling them of a flat shallow tray with four A hand barrow
is also useful, but needs two persons to carry it. In its simplest form (Fig. 1) the hand barrow is a flat, shallow tray fixed to two lengths of wood which are formed with handles at each end, where they project beyond the tray. Four legs enable the barrow to rest conveniently on the ground.
The wooden barrow shown at Fig. 2 can be easily made. The wheel, generally a stumbling point with the novice, is not difficult to construct, and when hooped it is quite satisfactory. The strines, or handles, should be of ash or oak; the mortise holes are bored out and then cut with the chisel to the sizes shown at Fig. 3. The sloats, or cross rails, made of oak, ash, or elm, are 3 in . wide in the centre, tapering to $2 \frac{3}{4} \mathrm{in}$. at the ends They thus form a wheelwright's self-wedging tenon.

Begin by making the barrow frame, as shown at Fig. 3 ; then fix the two legs F, by securing them with a long $\frac{3}{8} \mathrm{in}$. or $\frac{1}{2} \mathrm{in}$. bolt, which should run right through the frame and be secured with a washer and nut at the other side. This bolt and the hoop and axle

will coincide with the angle point on the cross rails Set out the ends of the cross rails and cut the tenons with bevelled shoulders, as shown at Fig. 4. The bevelled shoulders make an angle of $45^{\circ}$ with the edges of the cross rails. The next stcp is to slot mortise the rim rails $A$ to fit the tenons, knock them up in their positions, and again mark out the complete circle. Take the rails $A$ off the cross rails and saw and
will be all the metal work required from the local smithy, as all other portions are of timber

Fix in the bottom of the barrow out of ${ }_{5}^{5}$ in tongued and grooved boarding bottom portion is nailed on to the sloats: it hangs over the wheel about $\frac{1}{2}$ in. and over the handle sloat 1 in. Select suitable boarding for the barrow bottom before setting out for the mortisc holes. The worker will then be able to arrange for the sloata to stand down below the top edge of the strines exactly the correct thickiness of the bottom boarding
The two brackets B are now lixed in position by skew-nailing them from the top, as shown in the detail drawing, and putting a gond nail or screw from the under side of the strine The front piece $\mathbf{H}$ is planed slightly on the bevel at its bottom edge and nailed on to the brackets B. Next take the sides $G$, hevel the bottom edge so that it beds on the strine, whilst its side leans out. wards and berls on the leg F . When the siles are fitted in a satisfactory manner, nail them to the leg F from the inside of the
barrow, and nail their ends which engage with the front board $\mathbf{H}$ by nailing from the front of the barrow Fit the piece J, and nail it to the ends $H$, after which fix the brackets C . The piece D, which steadies the legs, is now nailed in position.
To fit L, take a piece of wood, about 6 in longer than you think will be required, and plane its edges ao as to bed against the side $G$ and the front board $H$. When neatly fitted to the required angle, sketch a line with your pencil to what appears to be the correct angle that will fit the strine. Saw the piece $L$ to the sketched line, and, holding it to bed against the barrow side and the front, slide it down and sec if it makes a good joint with the strine. It will probably be alightly out, but it will enable one to see the exact part that requires paring off with the chisel. Repeat this "cut-and-try" method until the desired joint is obtained, then cut off the surplus portion at the top of piece L , and nail L in position to the strine, front, and the side Ease off the corners of H and G, as shown.

Making the Wheel. The wood for the wheel should be of ash or oak. Plane up the two cross pieces and halve them, as shown at Fig. 4 Find the centre and mark out the diameter of the wheel: the circumference of the circle


Wheelbarrow. Fig, 2. Useful garden barrow which can be made at home. Fig. 3. Plan of frame and dimensions of the detail parts which are necessary for constructing the wheelbarrow shown in Fig. 2, Fig. 4 Showing method of constructing the wheel
spokeshave them to the required line. Fix
the wheel together by smearing the joints with thick paint and put a fine nail in the joints, so as to hold all together until the blacksmith hoops the wheel. A square hole is cut through the centre of the wheel after it is hooped; the axle is driven into this mortise and the wheel secured by a washer and nut
The small axle brackets K are bored only half-way through their thickness, and this hole receives the axle. These brackets should be of hardwood, such as ash. The brackets B and K are held at the front with a $\frac{3}{8} \mathrm{in}$. bolt and nut, which goes through the strine. The other end of bracket K is secured with two wrought-iron rails. Finish barrow with three coats of dark green paint.
The following particulars will assist the worker:
Whecl, all of ash, 2 in. thick, or, say, $1 \frac{1}{8}$ in. finish ; legs, ash or oak, $2 t$ in. qquare at liottom

Brackets, B, C, and D, English clin, 14 in thick
Sides (G), front (H) and back (J) of clin or other
vood, such as white deal, 1 in. thick
Brackets (K). ash, 18 in thick
Strines, English ash, size is drawing
Piece L, Heh or red deal, 1 in. by if in
Barrow hottom. elin, ach, oak, or deal, about \& in. or 4 in. thick, made in one piece or tongue-and-groove jointed

Many workers leave the sides, back and front boards roughly sawn with their ends
square until they are fitting their worls The overhanging portions of H and $J$ ar afterwards cut off to the required bevel, which will be proved by nailing on the sides. See Chisel; Joint; Mortise; Plane, etc.
WHELK. The small shellfish linown as a whelk has a twisted shell of a conical shape. There are several varicties, the ribbon, the red, and the dog whelk, all equally indigestible. Nevertheless, the whelk is eaten in the same vay as a winkle. See Shell lish
WHETSTONE. Used for sharpening scythes, hooks, axes, and other cutting tools, whetstones are made from stone, emery and carborundum, and in shape are either round or Hat, the former being smaller at the ends than in the centre. Gencrally a coarse stone is employed without a lubricant; those with a tine grain, especially if made of carborundum. should be used with a thin mineral oil.
To sharpen a tool, the side of the stone is placed Hat on the blade and moved along with a spiral motion. keeping it flat against the blade and placing the correct amount of pressure on the down stroke; the up stroke should be as light as possible to prevent the formation of a wirc edge. The whetstone should be kept quite dry when not in use. See Grindstone ; Hone ; Oilstone.
WHEY. The watery liquid that is known as whey, which remains in milk after the separation of the curd by coagulation, is composed of water and lactic acid with a sinall proportion of casein and butter and sometimes cream. It is used for making certain drinks, and is valuable also in intlammatory complaints. Rennet is used in producing whey, but there are several other methods which can be employed.
For whey with curds soak a small piece of rennet in $\frac{1}{2}$ teacupful warm water and let it stand 2 hours. Pour I dessertspoon. ful of this liquid into 2 pints boiling. milk and lieep it warm but not hot until the whey begins to separate and looks clear. This dish is the old-fashioned curds and whey and usually is eaten with crean and sugar. Prepared rennet may be used in place of soaking a piece of rennet from the calf.
To make lemon whey, pour as much of the strained juice of a lemon into $\frac{1}{2}$ pint boiling milk as will produce a curd. The whey is then strained off and sweetened. Whey is sometimes flavoured with mint or other aromatic herbs and taken as a summer drink. It is not lowering like some of the acid preparations. Pigs are fed occasionally on food mixed with whey and are then termed whey pigs. See Cheese ; Junket; Rennet.

WHIELDON : The Ware The Stafiordshire earthenware produced at Fenton by Thomas Whieldon for about 40 years after 1740 is in demand by collectors. It is of interest in association with that of Spode, Wedgwood, and other 18th century potters.
Whicldon ware consists largely of the variegated or clouded pottery which preceded the great developments of creamware and jasper, especially imitations of agate and tortoiseshell, as well as those based upon the forms and colours of caulitlowers, maize, pineapples, and melons Especially prized are handsome octagonal plates finely mottled, with purplish browns, yellows, and greens, and old Staffordshire pieces of this type, when not otherwise identified, arc usually classed as Whicldon. His earliest pieces were agate
knife-handles and snufl boxes, now rarely met with except in spurious inita tions Other classes com prised tea, chocolate and coffee pots in a fine black ware which was the preoursor of black basalt ware.

Although the greates part of Whieldon's output consisted of useful articles, he also turned out image toys and chimney ornamentsafter the style of the exampleillustrated. Whieldon's saltglaze pieces of this type are often called Astbury figures, theconfusion being aided by the circunstance that neithei potter made a systematic practice of marking his name. The two malies can be distinguished by the fact that Whieldon did not use red or brown clays, and his bodics are usually harder than Astbury's.

Much so-called Whieldon ware probably includes pieces actually made by Wedgwood, l3ooth Warburton, Ralph Wood, and others. He was especially fond of modelling animals, including clephants, squirrels, parnkeets, nnd poultry; in addition, groups of musicians and mounted soldicrs are found in his pieces. See Pottery; Wedgwood

WHIPPET. Although this hreed was brought into existence by the colliers in the N. of England especially for the purpose of coursing rabbits, the whippet, or snap dog, has always bcen accustomed to a domestic life, and is an affectionatc compnnion. The coat may be of almost any colour-black, white, red, tawn. brindle, blue, or a mixture of any of


Whippet. Champion of this sporting breed
them. In size he is variable, but should be about 17 lb . in weight, the bitch a pound or so less See Dog.

WHISKY. Whisky is a spirit distilled from grain. It is made from malt, mnlted barley, or from a mixed grist of barley inalt and dried barley and oats or from a mixture of other malted and unnialted cereals.
Pure malt whisky is made almost exclusively in Scotland. Irish whisky is made of about $\frac{1}{3}$ malt to $\frac{3}{3}$ oats and maize; it neerls longer cepping than Scotch whisky and should be at least 10 years old. Blending and diluting take place in the bonded warehouses. Whisky, like brandy, is naturally white, and takes its colour and, to a certain extent, its Havour. from the sherry casks in which it is matured It is also coloured by the addition of caramel (burnt sugar) or adding a matured wine. The older whiskies were darker in colour from. being


kept in golden sherry or Madeira casks, and rather heavier in texture. The newer whiskies are lighter and drier in taste.
Medicinal Value. Whisky has merlicinal valuc principally for chills, fevers, colds, intluenza, and malaria. As a heverage. diluted with plain water or with mbineral water, it can be taken by gouty and rheumatic people when wine is not advisable. It is important to note that whisky should not be drunk with oysters or any hind of shellisish. See Alcohol; Brandy ; Stimulant.

WHIST. The game of whist is played by tour persons, two against two, although there are variants of the game suitable for two or three. Two paclis of cards are clesirable, onc being used in dealing by each sirle. The players cu. for partners. the two who cut lowest playing against the two highest, and the lowest of all deals first. In these cuts the ace counts as the lowest, not as the highest, card. If two players draw cards of equal value, not being the two highest or the two loweat, they must draw again

The cards should then be shuffled, cut, and dealt. the shuffling being done by an opponent of the dealer and the cutting by the opponent on his right. The deal begins with thr: player who cuts the lowest card, afterwards passing to the one on his left, and so on mntil the end of a rubber, when the procedure begins nll over again. In case of a misdeal the carcls nust be shuffled and dealt again. The full pack is used, nnd all the cards are dealt out, I3 to each player:
The four cards that are played out in a single round form a triek, and this is taken for his side by the player who plays the highest of its four cards. Players must follow the suit led, whenever possible, and the highest card of that suit wins, ponvided it is not trumped. The trump euit is decided for each game by the last card dealt out, this indicating the trump suit. This should be laid upon the table face upward, by the denter and left there untit the first round has been played, when he talies it up.
Seoring. A game consists of live points and a rubber of three games. A point is scored for every trick made in excess of six. Thus if two players win nine tricks they score shrec points. If the same players win the first two games it is unnecessary to play the third Honours may be scored. They are ace, king,
queen nid knave, but not ten, ae at bridge. If two players hold in one hand or in two the four honours they score four points; if they hold three they score two. Those players who, at the beginning of a deal, have a score of four cannot score honours.

The winners score two points, in addition to the value of their games, for winning the rubber. They also score a treble, or game of three points, when their opponents have made no score; a double, or game of two points, when their opponents have scored one or two: and a single, or game of one point when their opponents have scored threc or four. If the rubber has gone to the full threc games, the final score is male by deducting the value of the game won by the losers from the gross number of points made by the winners.

For revoling, or playing a card of a differeni suit when holding one or more of the suit led, the penalties are: The opponents, at the end of the hand may either take three tricks from the revoking player and add them to their own tricks, or deduct three points from the opponents' score, or add three to their own score. This penalty can be claimed for as many revokes as occur during the hand, and a different one may be exacted for each revolie. The penalty, however, cannot be divided.

Cards must be placed on the table, or exposed, under the following couditions: If two or more have been played face upward at one time; if a card has been dropped, face upward, in any way on the table, even though it has been picked up again so quickly that no one has really scen it ; nnd any card that the player holding it has named. The exposed cards must be left on the table and can be called, or played, by the opponents at any time. If two or more cards are played at once, the opponents have the right to call the remainder. It should be noted that a card does not hecome an exposed card if it is dropped on the floor or clsewhere beneath the table

Whist Drive. Although hridge has supplanted whist as the popular card game, $n$ whist party or drive on the progressive principle is sometimes hcld in connexion with clubs of all kinds, and sonuctimes as a means of raising moncy for charitable purposes. In the latter case persons buy tickets in order to attend. At all kinds of whist drives it is usual to give prizes to those who score the greatest number of points. There may be one, two, or more prizes for men, and the same for women.
The hostess should lirst decide how many persons she can accommodate or proposes to ask, and should then send out the invitations. The number invited must be a multiple of four, and if any persons refuse their places must be filled, unless the refusals happen to number exactly four or eight. Women and men should if possible be equal in number. Sometimes the bostess does not include berself in the number of players, and so is able to fill a vacancy if one arises at the last minute.
On entcring, each guest is given a card, on which the scores will be entered. This bears also a number indicating the table at which the player vilil play first. The four players at cach table cut for partners. One game only is played before the players move on. Each player puts down on his or her card the nuwber of tricks scored, and has it initialled by his or her partiner.

The usnal plan is for the winning lady to go forward, that is to go from table 4 to table 5 , for example, and the winning man to go back: ward, i.e. from table 3 to table 2. Other arrangements, however, are sometimes made, this matter being decided by the hostess beforehand. Half-way through the programme refreshments should be served. Thus, if an evening's play consists of 24 games, refreshments will be taken after the completion of the twelfith. At the end of the play each player
adds up his or her score. and the host on someone clsc asks for high figures, say, in excess of 100 . Eventually he gets to know the highest scores, and, having examined the cards, announces the winners. The prizes, provided by the hostcas, are then giren awny. At some whist drives a hoohy prize is given for the owest score, for instance, a wooden spoon.
In order to break the monotony of the scoring, rarious devices are introduced into the programme, and these are usually indisated on the scoring cards: if not, they can be announced hy the host. For instance, in one round, instead of trumps leeing decided by a turned-up carl, they are fixed at a certain suit all over the room, e.g. clubs. Again, the winners in one round are pllowed to score double, or for a change each pair is credited with the score of the opponents, thus inaking the particular game one in which sach ainas at making as few tricks as possible. See Bridge Party; Evening Party : Progressive Party

WHITEBAIT. When in good condition, whitebait, which are the fry of sprats and herring, have a silvery sheen. They must be eaten aoon after they are caught. They should be kept on ice until time for cooking. Whitebait are in scason from March till September.

The fish must be handled as little as possible and the fat used must be at the exact heat neces. sary to crisp them. Drain the whitebait in a clean cloth and see that all the water is absorbed, then turn them on to a Houred sieve. dredge them with Hour, and shalic them gently.

Have the fat heating ready for tho whitebait, and when it reaches 4) $0^{\circ}$ turn the prepared fish into a frying basket and plunge them into the boiling fat. Fry for 2 or 3 min., turn the fish on to a sieve to drain and serve very hot. They should be dished on a folded tish napkin and aprinkled well with salt. Cut brown bread and butter, quarters of lemon, and cayenne pepper should be handed round.

To devil whitebait prepare as above, then scason with cayenne pepper, raise the temperature of the fat rather higher than it was for the first time of frying, and plunge the fish into the fat, and after 1 min . drain, season, and serve very hot. See Fish.

WHITE CURRANT. The white or pale yellow currant is less commonly planted than the red varieties of this popular bush froit. It needs exactly the samc treatment as the red currant. Some of the hest varicties are Whitc Dutch, White Transparent, and White Versaillaise. See Red Currant.

White Lead. See Paint. WHITEMICE. The albino and the black-eyed white mice thrive in captivity if kept in a clean, dry cage and fed once or twice daily. Apart from a little vegetable food and brend soaked in mill, the stock food is composed of equal quantities of canary seed, nillet seed, and oats, the daily allowance being a small teaspoonful per head. The cage must be cleaned very thoroughly three times a week and food pans must be kept scrupulously clean.

Mice should always he kept in couples, as they do not thrive singly. If several are kept in one cagu, care should he taken that there is only one male. If a litter is expect rd, a small supply of clean hay should be provided and the doe removed to a separate cage. Mice should


White Currant.
variety known as $\begin{gathered}\text { Ripuit of the }\end{gathered}$ Dutch
he lifted up by grasping the tail firmly about. half-way up. The best covering for the floor of the cages is dry sawdust mixed with a little sanitas powder.
WHITENING. The name of whitening or whiting is usually given to the well-washed residue of chalk. It should form, when crushed. a tine powder. and when placed in water should separate into fine particles at the bottom of the vessel and is not soluble. It is used for many purposes in the workshop and the home. In making whitewash it is mixed with size ; it is used for polishing and it forms the basis of several linds of wood-filler.

## White Sauce. See Sauce

WHITEWASH. Whitewash is usuallv a mixture of slaked lime and water. Whitening is also used. The ingredients that are required for internal work are the whitening, some size, and a little ivory black or blue to keep the colour white.

To prepare the whitewash, break up a guantity of the whitening, say, about 6 lb ., in the pail, which should contain sufficient water to cover it. Allow the whitening to hecome thoroughly soaked or dissolved, and pour off any surplus water. Having stirred it, add a quart of hot double size, previously prepared. The mixture is then given a thorough stirring. and set aside to cool, when it will form a jellylike compound. Blue or other material should be added at the same time as the size.
When required for use, the mixture is diluted with cold water and applied immedintely. For exterior work ordinary lime may be used as paste and sufficient of ihis used with water to form a thick liquid. The fraste is best kept in a box or pail sank in a hole in the ground and covered with water to keep it from drying. When required for use, the water is poured off and the lime, a smooth, white mixture, is emiployed.
Whitewash or limewash made in this way can be applied dircetly to the exterior surface of brickwork with a large, old whitewash or distemper hrush, one good coat being usually sufficient. It should not be applied too thickly or it will be liable to flake off, nor should the mixture the too weak or it will not dry with a clear surface. If the brickwork has not previously been whitewashed, it should be brushed down with a stiff bristled brush. If the surface has already been whitewashed, it is desirable to wash it down with copious supplies of water and brush it thoroughly.

Ceilings. To whitewash a ceiling more preliminary preparation is necessary, cither covering the floor with old newspaper or clust shects, or entirely removing the lloor covering. All small furniture should be placed in another room, the larger pieces being assembled in the centre of the room or in any other convenient position and covered with dust shects. To keep
the whitew ash from spatterthe whitellash from spattering over the hoor and the
walls, it is a good plan to fix walls, it is a good prant covering over the walls, or at least those portions where whitewashing is in progress.

The whitewash is then prepared as already described. Another pail or bucket tilled with clear water will be needed for the preliminary washing down, which simply consists of brushing the ceiling vigorously with a disused whitewash brush. This re-
previous coat of Whitewash. The ceiling is allowed to dry, and if very good results are required it may be covered with clearcole, a thin liquid obtained by dissolving some size and a sinall quantity of alum in hot water and adding a little whiting. When brushed over the ceiling, this stops the suction and makes the whitewash take better, but it is often omitted on ceilings in good condlition.

As soon as the clearcole or the washing off is dry, any cracks are made good with Keen's cement or a plaster, and the whitewashing proper is commenced. It ought to be continued uninterruptedly until the whole of the ceiling is linished. The work should commence at one corner of the room and may include the cornice and frieze, if desired. The whitewash can probably be applied by the amateur to the cornice and mouldings with a small brush, but the bulk of the ceiling is best dealt with by the large distemper brush.
There is a knack in applying whitewash which it is not easy to describe. The cssential thing is to charge the brush with suflicient colour to enable the largest area to be covered without refilling the brush. To do this the brush must be immersed fully in the whitewash; any surplus is wiped off by stroking the brush on the edge of the pail, any surplus at the tip being similarly wiped off on the ellge of the pail or on a bar placed across it. Under thesc conditions, the brush will be found to hold a considerable quantity of whitewash. which may be applied to the ceiling with n kind of slapping and stroking motion. In a sense, the whitewash is Hicked on the ceiling on the first part of the stroke, and the other part of the stroke is a smoothing operation.
Whitewash is practically transparent while it is wet. The quantity that is applied can be judged by the feel of the brush while it is being wiped over the surface of the cciling. At the first application of the brush the feeling is that there is too much of the lluid, whereas towards the end of the stroke there is a drag. The correct quantity is that which is applied when the brush is ahout half full. The manner in which the brush works then should be taken as the standard to be adhered to throughout.

WHITEWOOD. The timber that is known as whitewood is really spruce. It is less stmang and durable, and therefore less suited for outdoor work, than is red timber, but has a number of indoor uscs. When emploved for joinery purposes it requires keen tools for its proper manipulation, but when it is tinished it presents a fine lustrous surface with a creamy colour. It thus forms an excellent material for table tops, dressers, cupboards and other fitments of a house : also for Hoor boartls, as it will keep its clean appearance. The narre whitewood is also given to hass (q.v.).

WHITING : How to Cook. Small had docks are sometimes substituted for this fish, but they do not possess its delicate Havour. When unskimed, the haddock may be easily distinguished by its dark markings and the barbule on the chin. The whiting when skinned looks compact, and the head is small. Rock whiting is the best kind.

For frying, the whiting should be skimned after heing gutted; the head should be turned round and the tail thrust through the eyes so that a circle is formed. When trussed, dip each fish into seasoncd Hour. Then brush with beaten egg and cover with brcadcrumbs.

It is better to use a frying hasket when cooking whiting, as the shape will be preserved intact. Fry the fish, according to size, from 5 to 7 min., then drain and dish it on a folded fish napkin or paper. If three or four whiting are to be served, stand them up on the dish with the tails and heads uppermost, and gar nish with pieces of lemon and fried parsley Serve with shrimp or anchovy sauce.
To bake whiting, prepare three tish, skin and fillet them, making two tillets out of each
whiting. Dry the pieces well, and arrange them in a well-buttered baking or gratin dish. Season them with salt and cayenne, and add a little ground mace. Work together $\frac{1}{2} \mathrm{oz}$. butter with the same quantity of flour into a paste and distribute this over the fish. Then pour on to them $\frac{1}{2}$ a wineglassful port, the juice of $\frac{1}{2}$ a lemon, and $\frac{1}{2}$ a teaspoonful chilli vinegar. Cover them entirely with a thick buttered paper and bake them in a moderate oven for 15 min . When cooked, remove the paper and serve in the gratin dish. While the fish is baking. baste it once or twice.
Whiting can be fried, dipped in batter instead of egg and crumbs. Fillet three fish and place the pieces in a deep dish with three shallots pceled and chopped, a bouquet garni, seasoning, $\frac{1}{2}$ gill vinegar, and rather more of salad oil. Steep the fish in this mixture for 3 hours, turning it two or three times. Then drain the fillets, dip each in a fritter batter, and fry till a good golden brown colour. Garnish the dish with fried parsley and serve with parsley and butter sauce.

WHITLOW. The term whitlow is applied to intlammation of the fingers or toes, caused by the entrance of septic microbes. These may make their way into the tissues through scratches or puncturcs.
The septic poisoning may extend from the finger up the hand and forearm, along the lymphatic vessels to the lymphatic glands in the armpit. The infection may now extend into the blood vessels. giving rise to blood poisoning. In other cases there is a formation of pus or matter in the fingers. It should be let out at once, otherwise serious danger threatens the usefulness of the hand.
Rest in bcd, with a splint on the front of the forearm and reaching from the elbow to beyond the tips of the fingers, and poulticing, help to make the patient more comfortable.

WHITLOW GRASS. This is the name of a group of small early-flowering evergreen rock garden plants. They must be planted in gritty well-drained soil and a sunny place. The botanical name is draba. Draba aizoides, 3 in., which bears yellow flowers in April, is a favourite kind; others are bruniaefolia, 3 in., yellow; and pyrenaica, 3 in., lilac-rose : the last-named is usually grown in a mixture of stone chips and soil. These plants are best propagated by seeds sown in spring; they should be protected by raised pieces of glass in winter to throw off excessive rain.
WHOLEMEAL. Wholemeal differs from ordinary flour in that it retains the bran removed from flour in the course of milling. It is consequently darker and does not keep so well, but, on the other hand, it is more nourishing because the bran contains a large proportion of cellulose and salts.
Wholemeal bread is an ideal food for growing children, because it supplies them with certain indispensable organic phosphates. See Bread; Diet; Flour; Wheatmeal Biscuit.

## WHOOPING COUGH. Pertussis, or

 whooping cough, is an acute infectious disease, in which there is catarrh of the respiratory tract and a characteristic cough. This comes on in spasms of 10 to 20 short coughs, succeeded by a long, deep breath which is accompanied by a whooping sound, caused by spasm of the vocal cords.It is a dangerous disease when it occurs in infancy, or in older children who are debilitated from any cause. The disease is infectious from the beginning of signs of irritation of the bronchial tubes. The incubation period lasts usually about 10 days, and then the child may appear simply to have a bad cold.
The cough may assume its spasmodic form in from a few days to three weeks from the onset. During the cough the child's face may become blue and the eyes may bulge and become bloodshot. The cough may bring up
some thick mucus and often causes vomiting. If vomiting is very frequent, the child's nutrition will suffer. Someone should always be at hand to help the child during a paroxysm and to reassure it.
It often happens that a child suffering from measles develops whooping cough, and the converse is also true. The most serious complication is broncho-pneumonia.

Immediately a child who has not already suffered from whooping cough shows signs of catarrh of the nose and bronchial tubes, during an epidemic of the disease, it should be isolated. If confined in bed it is of the greatest importance that the sick room should be kept ventilated rlay and night. The doctor will advise upon the use of drugs and fumigations.

The patient should be fed with easily digested food, and if there is much tendency to vomit should have frequent meals of milk. When convalescing, malt and cod-liver oil will be bencficial, and a tonic may also be given. Children who have suffered from whooping cough are not supposed to go back to school till the end of five weeks at least, and only then if the characteristic cough has been gonc for two weeks. See Cough.

WHORTLEBERRY. This belongs to a group of dwarf shrubs, known botanically as vaccinium. Known also as bilberry and blaeberry, it bears blue berries valued for cooking purposes. The cowberry (Vaccinium vitisidaea), with red berries, is another British shrub. One of the best of the exotic kinds is the American blueberry (Vaccinium corymbosum), which grows 2 ft . high and bcars pale rose-coloured blooms in early summer. All need moist, peaty soil and slight shade, and can be propagated by cuttings or seeds.

WICKERWORK. This is another name for basketwork made with osiers, and is applied to baskets, stands, tables and chairs. Wickerwork repairs are often not worth troub ling about, owing to the limitations of the material. After being in usc for some time, the osiers become very dry and brittle, and if replaced with new material there is always a risk that the new stuff will prove too strong for the old portions left in. This is particularly noticeable when new lengths are woven between the old stakes.

If wicker chairs are danaged, the better plan is to effect repairs with a suitable thickness of pith cane rather than with osicr rods. The material can be rendered quite pliable by soaking it in water just before use, and it will dry out without straining the existing portions.

White wickerwork should be washed with a strong cold solution of salt and water then wiped as dry as possible and left in the sun to bleach. Hot water, which destroys the natural polish of the wood, should not be used; neither should soap nor soda, both of which have a detrimental effect. Brown wicker furniture is best cleaned by rubbing it with a rag dipped in paraffin. See Basket; Cane; Osier.

WIDGEON. The season for the widgeon is from early autumn till March. The birds should be selected by pressing the pinions; if these are pliable the flesh is tender. To prepare them for table, pluck, draw, and truss as for ducks, but do not stuff them.

To roast widgeon, brush the bird well over with butter and roast it in front of the fire, if possible basting frequently. A Dutch oven (q.v.) may be used with advantage. From 15 to 25 min . is considered sufficient to cook widgeon, as they are supposed to be of superior flavour if underdone. When ready, score the breast lightly and sprinkle over it lemon-juice and seasoning. Serve very hot with a made gravy, and garnish with watercress. The gravy should he rich, and flavoured with port wine and red currant jelly. When carving, remove the whole of each side of the breast. in the slice. See Game.

WIFE : Legal Position. As against her husband, a wife has a right to be maintained according to the husband's rank and means, and for this purpose, unless the husband is making her an adequate allowance, she may pledge his credit for necessaries. The word necessaries in this connexion is interpreted very widely.
What is neccssary for one wife would be a mere luxury for another. For instance, the wife of an earl would be entitled to order evening dresses at an expensive dressmaker's but not so the wife of a small tradesman or agricultural labourer. If a husband and wife are living apart, the wife, unless she has an adequate allowance, can support herself in this way so long as she can find tradespeople who will supply her with goods on her husband's credit. She forfeits this right, however, if she commits misconduct.

With regard to the guardianship and custody of children, when a husband and wife are living together the husband is the guardian, and if they separate he has a prima facie right to the custody of the infants; but this right is more nominal than real, because on the application of the wife the court will, unless she is an unfit person. invariably order that she have the custody of very young children and all girls of any age. At the same time the husband remains, in law, the guardian of the children.
A wife cannot compel her husband, whether living with her or not, to grant her an allowance, nor has she on her husband's death any right to any part of his property unless he dies intestate. By the law of England her husband can make a will and leave all his property away from his wife. If he dies intestate, whether there are children or not she has the right to take all the personal chattels, i.e. the household furniture and effects, including such things as motor cars which are not used for business, and the sum of $£ 1,000$ free of all death duties and costs. If there is no issue, she also takes a life interest in the rest of his estate ; and if there is issue, then a life interest in half of the estate. A husband possesses a similar right in the property of his deceased wife. See Child; Divorce ; Guardian ; Husband; Marriage.

WILD DUCK. Probably the best way to choose a wild duck is to examine the feet and press the pinions. The feet should be supple and the legs limber, and the pinions when pressed should not be rigid. These birds are in scason from August to February. The only objection is a slight fishy taste, which is easily removed if the bird is put into the oven in a tin of salted water and cooked for 10 min . The tin should be covered. After this the duck is trussed and roasted in the same manner as tame duck. See Duck.

WILD GARDEN. Many gardens of fair size have a portion where aspect, soil, and other conditions are not favourable for the choicer plants. Such positions will accommodate a host of shrubs and plants of somewhat grosser habit at small cost and with comparatively little labour. However rough the spot may be, there is opportunity for planting bulbs, perennials, and shrubs, and, as bold grouping is of the essence of this form of natural gardening, it follows that the greater the space that is available the more effective will be the result.

Spring-flowering bulbs may be naturalized among the trees and shrubs, and some of the lilies are suitable for planting in partiallyshaded places. where also the Japanese primrose and the common primrose still flourish. Some of the shrub roses are splendid plants for the wild garden, especially the musk roses named Felicia, Penelope, Prosperity and Pax; Rosa Moyesii, which bears rose-red single flowers and large red hips, and the

Japanese briar (Rosa rugosa), valued both for its flowers and fruits. Other shrubs suitable for planting in the wild garden are Berberis Darwinii, Berberis stenophylla, mock orange, Spanish broom (Genista hispanica), the common broom (Spartium junceum), double gorse, the common Rhododendron ponticum, heather, Mahonia (Berberis aquifolium) and the pheasant berry (Leycesteria). See, Rock Garden ; Water Garden, etc.

WILL : How to Make. A will is a declara tion of the person making it with regard to matters which he wishes to take effect upon, or immediately after, his death. It need not necessarily be a disposition of property. be cause a man may make a will merely to appoint guardians of his children, or to appoint an executor. But as a rule a will is a document by which the person making it, who is called the testator. disposes of his property after his death

In England anybody of the age of 21 years and upward may make a will, and by it he may dispose of any property he has, or to which he is entitled, or over which he has a power of appointment. Except as to the wills of soldiers on actual military service or mariners actually at sea, every will must be in writing and signed by or on behalf of the testator. Such signature must be either made or acknowledged in the presence of two witnesses who are both present at the same time and both affix their signatures in each other's presence as well as in the presence of the testator. A will may be written on anything which is capable of receiving writing and either in pencil, ink, chalk, or any othes substance that can make a mark. A testator who cannot write may make his mark, which will be accepted if it is duly witnessed
Valid and Invalid Wills. It is essential to the validity of a will that the testator should act voluntarily, i.e. of his own free will, and be of sound disposing mind, which means that he must know he is making a will and know what the effect of the will is. For this reason a lunatic cannot make a will unless in a lucid interval. Further, if it be proved that a will was made under undue pressure, eithe physical or mental, the court will upset it. At the same time there is nothing to prevent. for instance, a wife requesting her husband to make proper provision for her or her children in his will.

The kind of case where a will is upset owing to undue influence is where some person very old or feeble in mind or body is more or less compelled by someone who has great influence over him to make a will in that person's favour, or to give favour to someone through whom that person derives some benefit. A will induced by fraud will also be avoided, e.g. where a man made a will in favour of $\mathrm{X}, \mathrm{X}$ having fraudulently told him that his, the testator's, only son, who was on a voyage, had been drowned.

Until 1926 a will was revoked by the marriage of the testator, but now a will which is made in contemplation of marriage is not avoided by that marriage taking place. A young man about to marry, and wishing to make a will to provide for his future wife before the ceremony, should begin somewhat in this form: This is the last will of me, John Jones, of 490, High Street, Peckham Whereas I have arranged to marry Annie Robinson, now I make this will in contem plation of such marriage. He should then go on to dispose of his property according to his wishes and responsibilities.

A gift by will which is illegal, or against public policy or morality, is not good, e.g. where a man left a fortune to his son on condi tion that the son separated from his wife or a gift for some superstitious purpose, as where someone left money for the education of spiritualistic mediums. Everyone who
makes a will should take great care to begin by appointing an executor, or even more than one, because if no executor is appointed a great deal of extra trouble and expense is incurred in proving the will.

A will is, by the law of England, always revocable, even though it is expressed to be irrevocable. It can always be revoked by a later will or codicil which purposes to revoke the former, and, indeed, most wills begin with the words, "I revoke all former wills and testamentary dispositions by me made." It can also be revoked by cancellation or destruc tion ; but the mere destruction of a will, if it is done without the intention of revoking it does not revoke it, and it can be proved by evidence, such as a solicitor's draft or even a verbal recollection of anyone who has seen it as was done in the famous case of the will of Lord St. Leonards. In the same way. if the testator tears up his will when he is insane or drunk, it is no revocation. As a will can only be revoked by the testator himself, it follows that he cannot delegate to somebody else the power of revoking after his death.

Alterations in Wills. If it is desired to make an alteration in some of the dispositions of a will already made, it is not necessary to make an entirely fresh will. The testator can execute what is called a codicil, which ought to begin with the words: This is a codicil to my will dated the $X$ day of $X$. He can then, for instance, revoke a particular legacy or appoint a fresh executor or give an addi tional gift

If he intends to make an additional gift to someone who already benefits, he should be careful to make it quite clear that it is addi tional. Thus, if he has left $£ 500$ to his son John and wishes to increase it to $£ 1,000$, be should say: Instead of the $£ 500$ given to my son John, I bequeath the sum of $£ 1,000$. Or he should say: In addition to the $£ 500$ bequeathed by my will I give him another £500. If he simply says: I give my son John $£ 1,000$, the question will arise whether be means John to have the original $£ 500$ and the $£ 1,000$ as well. Clearness is the very essence of making a will, and technical terms are not at all necessary.
The ordinary family man who makes a will to divide his property amongst his children will generally find it best to divide it in proportion rather than in sums of money, because sometimes investments diminish or increase in value, and although the testator may think that his invest ments are worth $£ 5,000$, and that he is safe in saying that he gives $£ 1,000$ to each of his sons, it may turn out that the investments cannot be sold for more than $£ 4,000$, and very often complications arise.

If a testator intends that a business which he has shall be carried on for the benefit of his wife or family he should make it very clear that his trustees are to have that power. He should also make it quite clear if be intends his money to remain in any particular kind of investment, e.g colliery shares, otherwise the executors and trustees will be bound to convert all the shares into money and invest it in trustee funds.


William and Mary Style. Fig. 1. Chair of carved walnut, an early piece of this period
permissinn of the Director. Victor

Scots Law. As in other matters the law of Scotland on the subject of wills differs in some respects from that of England. Mutual wills, or wills made by two persons jointly, are per missible in Scotland although not in England More important is the provision of Scots law by which a will is valid, although it is not witnessed, provided the testator hay written it wholly in his own hand. See Administration Executor: Estate l)uty; Intestacy ; Legacy

WILLIAM AND MARY STYLE. It has been said that the decorative arts in the reign of William and Mary reached a gorgeous ness and beauty that has ncver been surpassed The style was the culmination of the baroque period in English decoration, marked by a development of the lavish ornament in fashion during the later Stuart times, and also of the Dutch influence, which had already been seen in the furniture of the reign of Charles II, made after 1670, when a number of Dutch craftsmen, particularly cabinet makers. were employed in England by rich patrons

Architectural changes also showed Dutch design or inspiration. In some of the earlier houses built in the reign of William III the characteristic feature of the scrolled outlines to the gables at each end of the roof is found, while towards the close of the reign and during that of Queen Anne, Dutch architects had considerable influence on English house planning.

Reception rooms in the great houses were spacious and magnificent. Wall panels were large, with richly carved mouldings surmounted by applied swags of flowers, fruit and foliage. after the manner of the Grinling Gibbons carvings. Pilasters Hanking doors. windows and chimney pieces, also pediments to these, and the ceiling cornices were decorated with carving. Oak. walnut and pine were used for panelling, the last wood being sometimes painted green and the carved enrichments gilded. Cedar, pear and lime werc the woods chiefly employed for the applied carvings on oak or walnut. Fireplaces were smaller than in the Jacobean period and usually had marble rectangular surrounds. The hearths were provided with large fire dogs, as logs were stil! the fuel employed.

Floors were of parquet, often inlaid and partially covered with small carpets. These were usually imported, but at the Wilton factory English carpets had begun to be woven. Lighting fittings included central chandeliers of metal or painted wood and candle sconces with reflectors of bright metal or mirror glass.

Characteristic Furniture Chinese lacquer was fashionable at this period, beautiful cabincts being mounted on gilt or silvered stands after the style of the somewhat carlier piece illustrated in Fig. 1 of the article on Lacquer Work. Lacquer cabinets were imported from Japan. done in the Chincse manner, and though the finest examples were not allowed to be exported from the Imperial factory in Japan, some good pieces were made there for the foreign market. The carved wooden stands were made in England, later pieces of the 17 th century showing
the ornate stretcher work which is sucb a Oyster veneering is typich of this style, and feature of the William and Mary style. A so is the finest arabesque marquetry. See heautiful writing table in black and gold Jacobean Style Marquetry: Oyster Grain Incquer is illustrated in Fig. 2. The Hat, shaped atretcher is most characteristic. as also are the heavy bun feet.
Dutch influence is noted in the furniture by the more extensive use of upholatery and cortly textiles, and by the introduction of the cabriole leg. although this latter was not the typical furniture leg of the earlier pieces of this period, a good example of which is here illustrated on the chair of beautifully carved walnut. This chair is 4 ft .3 in . high and is upholstered in groen figured velvet Twisted spiral, baluster and spindle logs are also found

Queen Annc Style
WILLOW. This is one of the hest trees for planting in damp or even wet land; the weeping willow (Salix babylonica) is a most beautiful watcrside tree. The blue willow (Salix caerulea) provides the wood from which cricket bats are made. Several of the willows have coloured bark which is most ornamental in winter: the best of these are vitellina, which has yellow, nnd cardinalis, which has red hark; these must bo hard pruned each spring. Willows are largely grown for the purpose of basket making, and one kind, Salix frngilis, is used in the manulacture of riddles or sieves. Salix alba is one of the hest willows for general planting. The catkins of two British willows (Salix caprea and cinerea) provide the popular "palm" in spring. Willows arc easily propagated by cuttings 12 inches long inserted out of doors in autunin.

Uses of the Wood. Willow is a soft, light woorl with smooth, lustrous surface, tough and pliable, brownish or yellowish white in colour; it may he bruised by a blow but is not likely to split. Its most important use is for cricket hats,
William and Mary. Fir. . . Writing table in black and
on the earlier chairs, tables and stands. In some of the chairs the barks were entirely upholstered, while in others the framing was exposed. Some had cane panels. Beech or walnut was used for frames, the former being often painted or gilded. Fringe and galons were employed to trim both chair and settee covfrings of damask hrocade, velvet and needlework.
The cabriole leg seen at the end of this period was pronounced in curve. and usually terminated in a heavy bun foot. The idea of these feet originated in the blocks of wood placed by Dutch housewives to save the legs of their furniture from being rotted by the constant damp arising from well-washed tiled flonrs.

Cabriole legs were united by hooped or curved stretchers, often with a turned finish in the centre. This system of under-framing chairs replaced the carved deep rail below the seat directly connecting the two front legs, with simple turned rails running at the sides and back Completely upholstered settees had high arched hacks and six or eight legs braced by crossed serpentine stretchers.

During the later period of the style carving gave way to marquetry for the decoration of cabinets, secretaires, table tops and chests of drawers. Such ornamentation was helped by the arrival of fine woods from the Dutch Indies. Entire surfaces were covered with thin veneer, the pattern and background being fretted out by cutting through two or more sheets of wood at a time and interchanging pattern and background. The carcasses were of pinewood. In cases where the geometrical design was relieved by floral work the motif is frequantly seen to be the jasmine, treated conventionally, a form of decoration which dates a piece fairly accurately as belonging to this period.
but only the hest parts of the tree are
er About 170 good nough for this instead of sawn. Willow as tlooring wears well and has a smooth surface susceptible of a fine polish. hesides being non inflammable. It is employed for hurdles, poles, cutting boards, knife boards, and by the cooper and turner; scrap willow is used in toymaking. Sometimes spade and shovel handles are of willow, and next to alder it is the best wood for clogs.

The chief varieties are known as white and red willow; the latter, which has a red tinge is generally preferred, but it is not plentiful The willow is much cultivated for wickerwork and basket making and is not allowed to grow beyond the stage of osier or withy rods With this are used the twigs and small branches which are cut periodically from growing pollnrd willows. Another way in which young willow is used is by splitting it into thin slices for making woven crates, hampers. haskats, and hats. See Osier; Wood.

WILLOW HERB. The common name of a group of hardy plants, of which the most familiar is the rose bay (Epilobium angustifolium), which grows wild in many parts of this country: it reaches a height of 4 feet and bears rose-purple flowers in early summer.

WILLOW PATTERN. Hased on severa! Chinese originals, the willow pattern was evolved by Thomas Minton, the engraver, for use on china dinner ware. In the earliest version, dater 1780 , there were only two figures on the bridge, no flying doves, and no cedar trees bearing the so-called apples. It was introduced at Caughley by Thomas Turner, who printed it uncler the glaze, gencrally with a blue crescent mark, and also with $C$ nnd $S$ or even the crossed swords device.
The engraver and his assistants supplied copper-plates of the pattern to other works.
after varying the details and introducing the doves and the fruit. Josiah Spode, who printed his willow pattern by transfer in 1784 , had a design with a pagoda on the left and a buttertly border. and another with $n$ dagge horder The willow pattern sprang into favour from the first and was applied to a wide rangc of wares. Davenport plates have 25 apples, with a special fret pattern round the rise. Spode has 32 and Wedgwood 34, while Adams plates have 32 and the dishes 50. Both Spode and Wedgwood did the Caughley pattern as well as their own. Differences are ohservable in the depth of the blue tint in the printing the Adams cobalt being especially sought after. During the early 19th century the pattern was produced on various bodies, often marked with the Staffordshire knot, and not always in blue. It remains one of the standard designs of the modern potter and is still made by Mintons and other historic factorics in the traditional form. See China : Davenport Ware: Pottery; Spode etc.

WINCEY. This fabric is a wool and cotton mixture. It is obtainable in white, some colours and stripes, and is especially suitable for children's light-weight pyjamas The little wool that it contains makes it warmer than cotton of equal substance and less perilous than fannelette.
WINCH. The use of a winch is for winding up rope, etc. on a revolving drum in various kinds of apparatus used in hauling. It comprises a crank with a handle and geared by means of coggcd wheels to a drum A winch is commonly seen in the apparatus used to draw water from a well: it is used for winding the rope on a crane and is generally provided with a pawl to prevent unwinding.
Wind : In the Body. See Flatulence.
Windflower. This name is given to plants of the genus anemone (q. $\mathrm{\nabla}$.).
WINDOW. The form of a window dipends chiefly upon its position in the building and the room which it is to light. Its proportion necessarily varies, and the type will be chosen to suit the design of the building.

The various types of window include the bay. which may be square, angular, or curved, the cascment, plain and transomed in hoth metal and wood, the dormer, the French, also made in metal and wood, the gable, the jut, the mullion, and the oriel. The sash window is more commonly fitted than any other, but in modern construction it is being superseded by the more convenient casement. The mullioned window with transoms. the hay with latticed casements and the oriel in a simple form are all adapted to Tudor styles in huilding.

Typical examples of most of the above types have been fully described and illustrated in this Encyclopedia under their respective


Willow Pattern. Plate decorated with this quaint pattern derived from Cbina and now a standard English design
headings. (See Glass and Glazing: leaded Lights; Stained Glass.)

An inexpensive glass is obtainable through local glaziers or builders which transmits the vital ultra-riolet rays shut out by ordinary window glass. Many people have this glass fitted to the windows of nursery and living rooms It is made up in clear sheet, plate and catherlral forms for sash windows or leaded lights. This glass is belpful in counteracting the ill effects of a badly lighted hasement flat.

Vindows may be recessed, Hush, or may project : in all cases they should fit into a rebate in the wall, which may be formed by a depression in the brickwork or by an iron har fixed into the mortar joints. For recessed windows the rebate is in the interior side of the wall and in Hush windows on the outside.

All wood windlow frames should he kept in good condition by applying periodical coats o: paint to make them weatherproof. Certain forms of metal frame are provided with small grooves or troughs in which the rainwater is caught, and this prevents it from collecting at the liottom of the window.

Properly constructed windows should not rattle If the meeting railo are made such a width that the sash fastencr. on pulling them tightly together, also pulls them tightly to the parting beads the window sashes will not rattle If, however. when the meeting rails are close together, there is a space of $\frac{1}{2}$ in. between the stile of the top sash and the line of the stile of the bottom snsliand the parting bead is cnly ${ }^{3} \mathrm{in}$. thick, the window will shake considerably in the slightest wind On the other hand, if the stiles of the saslics are within in of each other, the fastener will pull all tight togethor, and so, no matter how high the wind, tile windows will be silent.

Window Cleaning. In most towns there are window clesners who will do the windows of the whole house at a modernte charge, and who are usually called in, at any rate, for the less accessible ones. Those that can be done by the ordinary domestic ataff sliould be cleaned on a dull day, or at least when the sun is off the window: they should not be cleaned in cold or frosty "eather. The materials required are a pail of clean warm water with a little paraftin in it. a wash-leather or cloth for applying the water to the window : a soft cloth, preferably linen, for drying, and a dry selvet, soft duster, or wash-leather for polishing Before starting, the frames should be brushed.

The water should be sluiced over lightily, so as not to scratch the panes with any dirt that has adhered to them, but care should be taken that all dirt is removed before they are wiped over with the drying cloth. When all the wet has been dried off with clean, swecping movements. the panes may be polished with the polishing clath, and any smears loft by the damp cloth removed. A little methy!ated apirit on the cloth will ensure a fine polish, but the paraffin in the washing water is also excellent for this purpose, and it keeps flies a way When no suitable cloth or selvet is available for polishing, a piece of clean newspaper rolled up into a loose pad will be found to make an excellent substitute. Sec Bay Window; Blinds Burglar Alarm; Casement; Curtain: Fiench Window; Glass; House; Lead Art Craft: Pelmet : Sash; Transom, etc

WINDOW BOX. Plants may be grown upon the window-sills of flats, town houses and other buildings by the use of window boxes Such a box may be made of wood, about I in. thick; it should be the length of the sill upon which it is to stand, and ahout 1 in . vider A dejpth of 9 in . is suficient.

Ridges or runners of wood should be placed at each end in order that the box may not rest directly upon the sill A few holes should be bored in the bottom and shallow tins or trays such as the lids of discarded biscuit boxcs may be slid under the bottoms of the
boxes to catch any superiluous moisture. Before being placed in position, window boxes should be hurned or charred inside so as to present a resisting surface to the decaying qualities of moisture

A simple form of window box is made with 9 in. by 3 in boards cut out to the size of the sill and nalled together, with due allowance for the slope of the sill. The latter aljustment can he made by inaking the front board wider than the back one, or by fitting wedges under. neath. If flower pots only are placed in the hox there will be no need to do more than bore a few holes for drainage, but if the box is filled with soil the inside can be lined with sheet zinc Metal flower boxes can be hought which are inexpensive and requirs no lining, but such boxesare ugly unless it is intended completely o cover their outer sides with 1 railing creepers.

Preparation and Planting. In preparing the box to receive plants, the botton is first filled to a depth of about I in. witl broken brick, crock, or ot her material in order to form a drainage. On this is placed a layer of turf or rough soil and the remaining space is filled with n compost of loam leaf-mould and sand

In the spring nasturtiums may be planted to droop over the front of the box. or creeping jenny. or canary creeper. Behind theso, ycllow or brown calceolarias, white daisies, or heliotrope Lard Roberts may be planted. Combinations of colour must be care fully thought out White, yellow and bronze or mauve look well together, while pink geraniums will be charming with either lobelia, catmint or mauve violas in front. Begonia Lloydi is most attractive, as it droops over the front of the box and has double flowers in yellow. scarlet or pink:

When the summer flowering subjects are over, the boxes should be cleaned out and refilled for the winter display, consisting of plain and variegated cuonymus and other small evergreens.

WINDOW SEAT. A window seat generally lakes the form of a Hat bonrl fitted to the shape of the window recess, supported on a suitable framework: and fitted with cushions or upholstered.

In a simple form of construction the seat board, measuring from 15 in . to 18 in . wide, is


With the aid of plugs at a height of about 16 in . The lillets should be at least 1 in . thick, and chamfered on the front and lower edges. If the recoss is a long one. one or two bracket sup. ports will be required for the seat, and in making them due allowance must be made for the skirting hoard as shown in Fig. l. Having fitted the end fillets, as at, A. from? 2 in . by 1 in. wood. a length of similar wood B, which can be obtained machine planell, should be fitted between and secured to the wall, great carc being taken that the back strip is exactly equal in thickness to the skirting : otherwise it, will have a faulty appearance.

The brackele as shown in side elevation in Fig. 2 should be framerl up from 2 in by 1 in . wood on a back picce C, which should be the same height as the top of the fillets. The horizontal piece 1) forming the top of the bracket is dovetailed to the top of the back piece, as in the plan in Fig. 3 : it should he cut


Fig. 5. In the old-world hall of a converted tarmbouse a suitade window seat has been constructed with panelled back and solid shaped brackets

Ilumphren \& Vera Joel
to a length that will bring the end 1 in. from the front edge of the scat board. The strut is fitted as at $\overline{\mathrm{E}}$. The brackets are screwred to the back fillet, as in Fig. 1.

If it is not clesired to make the seat a fixture, a light framework as in lrig. 4 can support the seat hoard, the wood used being at least 2 in . by 1 in. : corners and rail can be jointed with the lapped halving joint or the frame mortised and tenoned. For long seats it is better to use $1 \frac{1}{2} \mathrm{in}$. square materia!, the joints being mortised and tenoned. To prevent the supports from moving, one or two rails are tenoned into them and further secured by pinning or fox wedging. The top hoard in all cases should be 1 in. thick, and as the width of the seat will be greater than the average width of the muterial, two lengths must be glued together. Information on srats of a similar type will he found in the articles in this work on Corner Seat and Ingle Nook.

A winciow seat inten-


Window Seat. Fip. 1. Recess ready for seat board. Fig. 2. Bracket. Fig. 3. Plan of bracket.
wax polished and having a simple panelled bark and solid shaped brackets, as shown in lig. 5. Any form of upholstery would be out of place in such a setting, though one or two flat velvet cushions, edged with cord and trimmed with heary tassels, would be permissible.

For a more up-to-date style the most convenient covering for a window seat is a fitted cushion like the one illustrated in Fig. 6. Velvet has been selected as the fabric for the cushion in this case to match the upholstered


Window seat. Fig. 6. The most convenient way of furnishing a wo fancy cushions to suit the general colour scheme
of the ordinary Windsor chair were niade of beech or birch. The seat was made of elm, which was cut up into rough planke. An adze was used for the hollowing process and the scat made smooth with a spokeshave. Each p!ank was then cut up into the required number of chair seats and cach seat shaped with a band saw. A bit bored the holes that received the rungs. The picces were allowed to dry before they were put together with glue.
These chairs were also made of yew, walnut, and cherry wood. Yew ones are very valuable as age gives the wood a heautifu! tortoisealiell colour and a finc patina.

## See Chair.

WINE. All wines possess a peculiar aroma or perfume which constitutes onc of their most valued propertics. The way to tell good wine is by its appearancc, its smell, and its taste. Re the wine young or old, it should be clear and brilliant in colour, not dull or thick. It should be clean-smelling and of a pleasant aroma. Its taste should also be clean and pleasant.
Wines are often classified into natural and made or manufactured and fortified wines, but these class:fications are not absolute. The white and still wincs of France, Germany and Italy are matured gencrally according to natural processes, and untouched thercafter. Made wincs arc all sparkling wines, such as champagnes,
chnirs, but tapestry, damask, printcd liuens, cretonne or clintz would all be equally suitable in correct relation to the curtains and chairs of the particular room. See Bay Window.

WINDSOR CHAIR. This type of chair, a real English production, was first made in the 17th century, and good examples are much valued. The characteristic features are the hollowed wooden seat and the complete separation between the uprights forming the back and those forming the legs. The method of putting it together also was new. This was the boring of circular holes by means of a bit, and the fitting in of cylindrical spars, fastened by wedges and glue.
In the oldest form, the backs are composed of simple turned spindles, or spars, that run into a curved top rail. The arms are continuations of the back centre rail. Another type has a stretcher hack in the form of a V . This is fixed by two extra spindles fitted in the back for additional strength. These are put in behind the others, which they cross trans. versely, and are fixed in a tailpiece to the seat.
The fiddle splat back type was seen early in the 18th century, the splat probably having been copied from that in the ordinary Queen Anne chair. In thesc cahriole front legs are often seen and they possess stretchers. About 1750 the Windsor chair with an arch back was made. In this the cabriole leg is used, and the front stretcher is curved away towards the back legs, being connected therewith by two turned stretchers. The back is in the form of an arch and is usually supported by six spars with a centre splat laid on, which may or may not be pierced. The arnss are often horseshoc in shape.
A variation of the splat in the arch back is the wheel back. The centre has a circular pierced ornament in the form of a wheel made by fretting out six triangular holes. The legs
which have added a liqueur composed of fine wine-brandy and sugar.
Port and sherry are very often fortified by an addition of alcohol, but the finest vintage port is a natural wine free from added alcohol, thereby enabling the wine to keep and rendering it wholesome. Well-made winc improves with age. Port or sherry will last for 80 or 90 years or more, a good burgundy or claret for 40 or even 50 years. Channpagne is at its best at from 12 to 15 years after bottling.
The Wine Cellar. Every lover of wine should keep a wine cellar. It need not be an elaborate affair. A good-sized cupboard will do provided it is dry, or any underground cellar that has not outside walls. The temperature should be from $53^{\circ}$ to $58^{\circ} \mathrm{F}$., and this can be obtained by means of a gas jet. The great thing is to keep the temperature uniform.

Bins made of iron and wood in two.dozen units for holding the bottles car be obtained inexpensively at any ironnonger's. The bottles should be placed in the bin on their sides and, once binned, should be left undisturbed until required. On port bottles is a splash mark, and the bottles should be binned with this mark uppermost. Sparkling wines soon become flat if they are stood on end.
The Decanting of Wine. Great care should be taken in decanting old wines, especially old vintage wines. First of all the sealing wax should be


Wine Cooler. Antique silver wine cooler having a lid with a knob formed of vine leaves. Period of George III
sod to carefully. Then a brush should b A good corberew is or cork corks a double-liner extractor is nseful. When drawing a cork, a guard should always be used consisting of a piece of cloth or a leather guard which is slipped over the neck of the bottle. In the case of old wines, it is wise to decant through a decanting funnel or a piece of muslin. If a funnel is used, it should be warmed to the temperature of the wine.

When opening champagne, the wire and string should be entirely removed before un corking. The wine may be spoilt easily if poured out over string and rusty wire. Do not put more than one bottle of wine into a decanter. Each bottle of wine has its own eharacter and individuality. Do not decant more wine than you think will be consumed.
Temperature for Serving. As for the temperature, white wines should be a few degrees colder than the room, and in hot weather fullhodied wines may cven be iced. Red wines, on the other hand, should have had time to take the temperature of the room, a matter of two or three hours, and there is no objection to their being a degree or two above it. But it must be remembered that if wine is at too high a temperature all its finer qualities will disappear, and the particles which it gives off will be so loaded with alcohol that perfume, bouquet, and aroma will become indistinguishable. The wine glass should be as thin as possible so that the wine may be affected by the heat of the hand without delay, and it should be of a bulging shape, with its opening smaller than its body, so that the perfumed particles given off by the wine may be inhaled, as it were, concentrated through a funnel.

At amall, informal dinner parties it is now usually the practice to serve only one or two wincs throughout, claret, burgundy, or champagne. But at big dinner parties and banquets there is a recognized order, as follows: With oysters, graves or chablis ; with soup, sherry, marsala, or madeira : with fish, a glass of sauterne or chablis; with the entrée and roast, claret or burgundy ; with game, champagne: with pastry, madeira ; with checse and fruit, port should be served. See Burgundy; Champagne; Dinner ; Port Wine; Sherry, etc.

WINE BISCUIT. To make, sift 8 oz. fine flour with a pinch of salt, then rub in 2 oz. butter, add the same amount of castor sugar, and make all up into a dough with 1 small egg and about 1 tablespoonful cream. Add to the dough, mixing in lightly 2 oz . currants cleaned and picked or $\frac{1}{2} \mathrm{oz}$. caraway seeds. Lay aside for 1 hour to stiffen the dough. Cut it into shape with a fluted cutter and bake it on a greased and floured baking tin in a moderate oven.
WINE COOLER. This article, now mainly valued as an antique, developed from the tub or vat in which bottles of wine were placed for cooling. It was also known as the ice pail. These coolers or pails are often found in pairs, and the fact that their usual place was bencath the centre of the sideboard was not without influence on the design of that piece of furniture.
Silver bowls were used for cooling wine in Italy in the 16th century and something of the kind was used in England in the 17th, but the best examples, both in silver and in Sheffield plate, date from the 18th. Pien.es were made in the
shape of an urn or vasc, and some of them are corrections to be made in doubtful blendings of remarkably graceful in design. Some are provided with a lid and others with a handle or both lid and handles, but there are examples without either.

In some cases ring handles have lion mask supports and lie llat to the sides; in others, as in the one here illustrated, the handles are high and ornanented with twisted snalics or with vine branches. Bases were square, round or oval, and some of the earlier examples were on scrolled feet.

Probably the finest existing examples are those copied from the Warwick vasc. One beautiful specimen stands on a square base and is lecorated with bead elging and acanthus leaves on the body and a band of leaves round the top and along the sides of the basc. See Sheffield Plate ; Sidehoard.

WINE GLASS. Convention has decrecd that each wine shall have its particular pattern of glass. Claret glasses should have the sides sloping slightly outward and should hold about a third of a pint. For burgundy the glass should be slightly bevel shaped on a short stem; it should hold nearly half a pint.

Certain white wines, such as cliablis and sauterne, should be drunk from glasses of the ordinary goblet shape with straight sicles. The champagne glass had a very wide, shallow bowl, the idea being that this keeps the wine fresh by retaining its effervescence; modern champagne glasses are often unconventional in shupe, the same type being used for hock or moselle. These glasses arc sometinies gilded at the rims, decorated with black or coloured stems, or made in delicatc colours with cut stems. Sherry glasses arc tall and pyramidal in shape, and port is usually drunk from a somewhat smaller glass shaped like a cup. Sec Glass Ware.

WINKLE. The winkle or periwinkle is a small sbellfish which has little food valuc. The horny excrescence which surmounts the head should always be removed. Winkles are usually caten with vinegar and scasoning and accompanied by bread and butter. See Shellfish.

WINTER: In the Garden. Winter is chietly a period for repairing past crors and planning new schemes in the garden. Dead stems, leaves, and all sorts of rubbish may be cleared away and burned, but it is always desirable to establish the identity of each plant before removing the top hamper, otherwise the label may be lost, or illegible, and doubt may arise in the futurc.

Roses and fruit trees may be planted when the weather is open, and other operations carried out according to the calendar for the rarious months of the season.

Quite a number of slirubs and plants are in full bcauty during the winter months. The yellow winter jasmine is charming on a house wall or fence, and the pink buds and white flowors of the evergreen laurustinus arc cheerful. The Chinese witch hazel (Hamamelis mollis) bears fragrant ycllow blooms in midwinter and the heather named Erica darleyensis is also in flower. The spring heather (Erica carnea) shows colour carly in the new year, and on n sunny wall the old red Pyrus japonica and the fragrant winter swect (calycanthus) then begin to llower. The earliest and best of the Christmas roses (Helleborus altifolius), the winter-llowering Iris stylosa, stray blooms from the winter-llowering pansies and poppy ancmones, snowdrop and winter aconite-all these help to invest the garden with intercst in the depth of winter. Then also the trees and shrubs grown for the sake of their coloured bark or showy fruits are in full heauty.

Systematic gardeners will propare and map out on paper new plans for heds and borders to be established in the spring, or not
corrections to be made in doubtful blendings of
heights or colours. See Autumin ; December ; January; Spring.
WINTER ACONITE. This is a charming low-growing, spring-flowering bulb, the first to open in the new year. The yellow blooms surrounded ly a ruff of green are on stallis about 2 in. high. It looks well in grass, or may be set among shrubs where it will spread and provide a carpet of colour early in the ycar. The bulbs should be set 2 or 3 in . deep in August and September The botanical name of the common kind of winter aconite is Eranthis hyemalis.

WINTER CHERRY. A
hardy herhaccous plant, known also as Chinese lantern, the winter charry is prized for its large orange yellow "fruits" which are so popular for room decoration in sutumn and winter. These "fruits" are really enlarged calyces. The two best linds arc Physalis Franchetti and Bunyardii; they grow 2 ft. or morc high, may be planted in autumn or spring, and thrive in ordinary well-drained soil. Propagation is by division in autumn. See Solanum.

WINTER GARDEN. In the ordinary acceptance of the torm this is simply an claborate and large conservatory attached to a house, with sufficient space for indoor beds and borders, and roof-roon of an altitude that will accommodate the loftiest palms. The winter garden is usually heated by hot water pipes, and is often utilized as an after-dinner lounge. An outdoor winter garden suitably arranged would include such flowering shrulis as winter swect, winter-floweling jasmine, heaths, dogwood, hamamelis, laurustinus and the carliest bulbs, See Conservatory; Dogwood; Lounge.
WINTER GREEN : The Plant. Two useful evergreen slirubs are known by the name of winter green-Gaultheria shallon and green procumbicns. The former grows 2 to 3 ft . high, bears blush-coloured flowers in spring and purplish-black fruits in nutumn; it is often planted as an undergrowth beneath trecs. The partridge berry (Gaultheria procumbens) is a crecping shrub suitable for planting in shade; it has white Howers and red berrics; the latter provide the winter green oil used in the treatment of rhcumatism. Propagation is by sceds and cuttings.

Oil of winter green consists mainly of methyl salicylate, and has the same effects on rheumatism as other salicylates. It is chiefly used as an external application.

WINTER GREENS. In the vegetable garden it is very important to provide for winter use a supply of grecnstuff or winter greens, such as cabbages, Brussels sprouts, broccoli, kale, savoys, and sprouting broccoli. To avoid any glat, sowings sliould be made in small lots in March and April. A fresh sowing can be made "hen plants sown previously are just showing through the soil, thus providing plants which will mature in succession instead of all coming 10 harvest at one time. As a rule amateurs will not sow in this way, and consequently huge quantities of green vegetables either rot or run to seed cvery winter. See Brussels Sprouts; Kitchen Garden, etc.

WINTER JASMINE. This charming hardy winter-flowering, climbing shrub of slender growth is suitable for training on a house wall, fence or trellis. It flourishes in ordinary soil, and should be pruned as soon as the flowers lave faded. The flowers of the winter jasmine are ycllow and open we! in water, if spravs hearing buds are cut and brought indoors. See Jasmine.

WINTER MOTH. One of the worst pests of fruit trces is the winter moth, its caterpillars devouring leaves and blossom. Grease banding in antumn is necessary to trap the wingless females, which crawl up the stems of trees to deposit their eggs in crevices of branches and shoots, these hatching out into destructive !arvae as buds begin to burst. In addition to grase-handing, trees may be sprayed with a tar-oil wash in winter, and the poisonous arsenate of lead wash as soon as the fruits are sct. See Grease: Spraying.

WIRE : Its Uses. Wire can be obtained in many different shapes and sizes, and is machined commercially when means of powerful through a series of holes of gradually diminish. ing si\%e in a metal plate. Wire is employed for innumerable purposes in the home. It can be used for binding and repairing, for clothes lines, for supports for Howers in the garden or in pots and for hanging pictures and curtains. It can be kept straight. for the latter purpose by usitg wire strainers, and it is niso obtainable in coiled spiral form for the same purpose. It is made up in the form of nails, pins, hooks, staples, and tacks. Wire is found in the form of gauze, netting, fencing and is also made up ¡nto many houschold utensils.
In the Garden. Wire is uscful for sup)porting climbing plants and trained fruit trees, and for binding joints or pergolas and arches. Ordinary wire is liable, however, to liecome sun-hot during summer, scorching shoots and tender growth. In high winds, too it is apt to tear tendrils and young branches. Multi-stranded wire wiih a composition covering is best suited for garden use.
Wire Gauges. Gauges for measuring the thickness of wire are made in several shapes, and there are a number of different systems employed in measuring. The thickness of the wire is denoted by numbers, except in the case of the Lancashire stecl wire gauge, in which letters are used. In most gauges the lowest number indicates the thickest wire, but in the Whitworth gauge the reverse is the case. The Whitworth gauge ranges from 5 in. (No. 500) to 001 (No. 1), and it has the advantage that the number of the gauge is a key to the dimension. In the other gauges in ordinary use the number is no indication of the size of the wirc. The British imperial standard gauge, indicated by the letters S.W.G., is the English legal standard for measurement, and its graduations extend from $7 / 0=\cdot 5$ in. to $36=0076 \mathrm{in}$., and include 43 numbers. The Birmingham wire gange is still in general use, and many wires are quoted as B.W.G. Its numbers range from $00004 / 0$ to 18, and with slight lifferences in the

aecond and third decimal point from 19 to 36 . Wire fromthe United States is mensured by the Brown and Sharge (B.\&S.W.G.). The disk gauge is gencrally used, being more convenient than those of oblong shape. See Fence; Gauge; Micrometer.

## Wireless Reception: The Choice of a Set

## Different Types and Their Leading Characteristics

The component apparatus are severally dealt with in this work under numerous specific headings, e.g. Value, and the complete receiver is discussed in detail under Broadcas Receiving Sets. Other contributions describe the accessories, e.g. Accumulator; Rectifier Sec also High Tension; Reaction; Selectivity

In the early days of broadcasting the hoterodyne and the short-wave receiver, must prohlem of wireless reception was, in one alro be considered The superheterodyne en sense. simpler than it is to day, because all the designer of a radio receiver had to hother about was the question of range There was no need for selectivity as the mumer of broadcasting stations was small. With the improvement in the efficiency of the valve ( $q \vee$. ) and also in coil design, distortion in reproduction and instability on the highfrequency side made their appearance.

The introduction of the screcn grid type of H F ralve overcame most of these difficulties.

Unfortunately, however, the screen-grid value did not fulfil its carly promise of selec

made to work successfully as a tigh-frequency amplifier on short waves Later, the knowledge gained from the development of the modern superhere:odyne for use on the ordinary broadcast waveband was applied to the solution of the short-wave problem. with the result that the superheterodyne, has now decinitely talien its place as the best form of short-wave receiver.
Single-Circuit Tuning Sets. There remains yet one more class of receiver which has hitherto not been mentioned, and that is the type using cascaded single-circuit tuners giving a high degrec of selectivity coupled with the incritable distortion caused by the resulting attenuation of the upper masical register. This distortion is "corrected" by n specially designed low frequency amplilicr, in which the attenuated frequencica are boosted up

It will, naturally, be appreciated that this method of obtaining distortionless selectivity is in direct opposition to the band pass principle which, as its name implies. "passes" the complete range or band of musical frequencies sent out by the transmitter. without any attenuation, so that no subsequent "correction " is necessary.

Choice of a Receiver. For those who contemplate purchasing or tuilding a modern instrument, it is necessary. first of all, to make quite clear the essential difference between a battery-operated and an "all-mains" receiver Apart from its obvious advantage of enabling all batteries to be dispensed with, the mains-driven receiver is more sensitive, and capable of greater output without discortion. This is due to the fact that the power obtainable from mains is not only cheap but also abundant, and it is possible on such receiver to use special
tivity. and, although its characteristics were gradually hettered, little was done to improve selectivity until designers turned their atten tion once more to the tuning circuits and eventually evolved the modern band-pass tuner, which not only solved to a very great cxtent the sclectivity problem, but enabled this very desirable fenture to be obtained without the loss of quality hitherto associated with it.

Power-Grid Rectification. Side by side with the developments enumerated above, efforts were mate to secure the best possible reproduction by the removal of various other causes of distortion In particular, the detector has been improved beyond all recog nition by the gradual evolution of the powergrid method of rectification, which calls for rather special values of grid condenser and leak, 0101 mfils. and $\cdot \underline{5}$ megohins being the values usually recommenderl. An H.T. supply voltage of not less than 201 is also necessary to maintain the rather high plate current value of the power grid detector, normally about 8 millianperes.

Owing, bowever, to its extravagance in the matter of H.T current consumption, the arrangement mentioned is really only suitable for those having mains at their disposal, and the same thing is true of many modern output valves. It musi not be thought however that this means that the battery nser is compelled to put up with distortion. It merely means that those having acces to supply mains are able to get somewhat better results, and presumably always wil be able to do so. In actual fact, the battery user has little to complain of since the recent clevelopment of specia! power pentode valves intended for battery use which have exceedingly low-current consumption in view of their exiraordinarily ligh undistorted power output.

The Superheterodyne Receiver. Two im portant classes of receivers, namely, the super
 valves having an indircetlyheated catliode, whereas if the power supply is restricted to batteries, the running costs of these valves would be prohibitive.

Those who desire to receive only theallernativeprogrammes of the local Regional transmitters need have no more than a simple two-vnlve receiver of the regenerative detector type, which even at very close range will be capable of completely separating the two transmissions. Those who desire programmes other than
highly specialized instru ments, employs only tive or six valves The frame aerial is no longer essential to secure selectivity, and its place has been taken by the mains, which are employed as an acrial as well as suppliers of encrgy. Whe" extreme ranges are desired, or when local receiving conditions are bad. an ordinary "open" aerial and earth system can be employed.
Short-wave Receivers. It is well known that short-wave reccivers, under favourable conditions, can bring in stations from the uttermost. ends of the earth with a simple two-valve arrangement, provided that a critical degree of reaction is used. As more and more short-wave stations sprang up there came a demand for greater reliability and greater simplicity is tuning, and tin. ally the screen grid valve was pressed into aervice, and really


Wireless. Fig. 1. The chassis for a modern battery operated superheterodyne receiver with one-dial control and band-pass tuning. Figs. 2 and 3. Showing a compact short-wave superheterodyne wave-band. This set is ftted with an interchangeable coil boxas
wale wave-band. This set is ftted with an interchangeable coil box Courtesy of 'Wireless World
that of the local station or who live some distance away from a broadcasting station, should choose a set having a yood high: frequency amplitying stage, or if extreme ranges are desired. a set having two or more stages of H.F amplification. A two-valve receiver should not be used for bringing in distant stations, even though it is capabile of doing it, the reason is that in most cases the sensitivity necessary for the successful reception of statione other than the local will call for a degree of reaclion which is incompatible with good quality. Apart from this, excessive use of reaction causes oscillation and leads to interference with other people's reccption.

The man who wants an ambitious receiver will naturally choose the superheterodyne. lt is by no means impossible for a superheterodyne to be used with batteries, and several designs are available in which by a judicious selection of valves, running costs have been kept down to a minimum without seriously undermining the performance of the receiver It must be admitted, however, that this type of receiver is one which is more likely to appeal to those with an electric supply.
Portable Sets. When one is considering the question of a portable receiver, it is a mistake to choose a set because of its exceptional lightness. A fair amount of weight in a portable, if it is by a good maker, means a suhstantia! type of H.T. baltery and, there fore, economy in upkeep.
Interference Troubles. With regard to ex traneous noises coming in from every conceivable form of electrical npparatus ranging from n tram to a fan, it will be found that the more sensitive the set, the greater the trouble from interference. The use of a frame aerial or the abandonment of the earth connexion in favour of a rough counterpoise will occasionally mitigate the evil, but in most cases the trouble can only be cured at the source

Interference from atinospherics is also n source of considerable trouble when attempt. ing distant reception, more especially in the summer, and there is no remedy at present available Atınospherics seldom interfere with the reception of the local or nearby stations, however, except in thundery weather, as the ratio of signal strength 10 atmospheric noise is overwhimingly great. $\mathrm{U}_{\mathrm{p}}$ to a point the same statcment holds good in the case of interference from electrical machinery, but the source of interfarence is oftes within a short distance of the receiver, and does not originate several hindreds of miles a way as is frequently the case with atmospheric disturbances.
Wireless Licence. In Grent Britain a licence must be procured before a wireless receiving set miny be worked. It costs 10s., and is valid for a year from the date of issue. In addition to n stationary receiving set, locnted at the licensce's address, the livence covers one portable receiver. The portable set must not be worked by any person other than the licensec or a person residing in the licensee's premises, and the licence must be carried by the person working the portable set. The apparatus must not be used in such n manner as to cause interference with the working of other stations. In particular, teaction must not be used to such an extent as to energize any neighbouring aerial.

The combined height and length of any external aerial must not be more than 100 feel. The apparatus must not be used for the receipt of messages other than those intended for receipt thereby, or sent out, for general reception Should any other message be unintentionally received, the licensee must not make known or allow to be made known its contents or origin, destination, existence, or the fact of its receipt. Such a message must not be copied, reproduced or made use of
WIRE NETTING: Its Uses. Galvanized wire netting is useful for a varicty of purposes.

It is obtainable in rolls of 50 ft . length in and examined every few days. If it is desired widths from 1 ft . to 6 ft ., increasing by 6 in ., to poison the wireworms. the slices of root, and with meshes varying from in., increasing or preferably smail pieces of rape cakr, may by $\frac{1}{8}$ in. to $\frac{3}{4} \mathrm{in}$, by $\frac{1}{4}$ in. to $\frac{1}{2}$ in., with addi- be dipped in a mixture of Paris green in tional sizes of $1 \frac{1}{8}$ in., 2 in ., 3 in . and 4 inf . In water ( 1 oz . in 2 gallons) and ther buried. the large mesh the selvages are 3-ply, otherwisc it is usial to have 2-ply twisted selv ages. Netting of 3 and 4 in. mesh can bc obtained in wilths of $3 \mathrm{ft} ., 3 \mathrm{ft} .6 \mathrm{in}$. and 4 ft ., with a 3 -ply twistexd selvage at the top and bottom and a 3-ply strand woven in the centre. Mixed mesh wire netting is made up of two widths laced together and afterwards galvanized.

The gauge of the wire used in the netting depends on the size of the mesh; except the sniallest mesh, which is gencrally No. 21, all sizes can be obtained in several gauges. The best quality should always be purclinsed.
In securing wire netting to framing, it is generally advis. able to fasten one of the selvage edges lirst, straining it as tightly as possible. The opposite edge is similarly secured, leaving the ends to be neatly turned in and secured nt frequent intervals. In using wire netting for fencing, it can be attached to stakes of wood or iron, the latter being generally nore convenient and lasting. Stakes should be placed at intervals of from 6 ft . to 9 ft . apart. Wooden stakes should be round for preference, pointed, and entirely creosot, failing this the


The adult beeties may lee trapped in spring and summer by means of small heaps of cut clover, sainfoin, or broken rape cake covered with a tile. See Insecticido.

## Tomnto.

WIRING DIAGRAM. This piece of mechanism is a pistorial or practical representation of the connexions to the various component parts of a circuit, as distinct from a circuit diagram, which latter is simply a theoretical conception. IIn wircless the wiring diagram may take the form of a blue print, or alternatively a black and white drawing to scale, the panel and baseboard usually being shown in plan and the components in their correct rela. tive positions. The circuit connexions are then indicated by means of lines joining the terminals on the various components. Set Circuit 1)iagram.
WISTARIA. This is onc of the most beantiful of all hardy climbling plants. It is seen to the best arlvantage on antarch or pergola, though it may be planted against a wal!: it is verystriking when trained on a circular trellis in the open gardet. This shrub thrives in ordinary exp wood should lie coated with tar and the exposed portion treated with a wood preser. vative. Sawnstakes, unless of stout material, are liable to snap. Iron stakes of circular section are obtainable provided with an extra prong for fixing in the ground. They are made in several lengths, giving a height above ground ranging from 18 in . by 6 in . to 6 ft . and 7 ft ., with thicknesses varying from in. to $\frac{8}{4} \mathrm{in}$ diameter. For strong fences 1 in angle iron is obtainable in lengths of 4 ft . or 4 ft .6 in ., and 5 ft , with riveted plate for pressing into the ground with the foot, and a hook top and bottom for holding the netting in position. See Aviaiy; Chicken; Fence; Poultry ; Tennis Court, etc.

WIREWORM. This word is eniployed somewhat lonsely for pests that attack crops. True wireworms, however, are the young of certain species of the elick beetle or skipjack, and are easily distinguished by their yellow colouring. They are common and very widely distributed.
To combat this pest the following hints are givesn in Leaflet 10 issued by the Ministry of Agriculture. If it is not desired to use a propristary compound, experiments may be made in the use of naphthalene alone. "This substance in the crude or semi-refined form can be obtained from gasworks or makers of insecticides. The nuphthalene in powider, at the rate of from 1 to ? oz. jeer $\mathrm{sig}_{\mathrm{g}}$, 叉d., should be worked into the soil as thoroughly as pos sible, and its effects stem to be inuch greater if the application is followed by a heaver rainfall or drenching by artificial means.

If the land is not badly infested, or if soil insecticides are considered unsatisfactory, wireworms may be either trapped ot dealt with by poisoned haits. In the former case pieces of potato, beet, or carrot should be spitted on short sticke, buried ir, the ground,
soil; it is rather slow growing for the first year or two. The way to prune is to allow sufficient shoots to develop to form the main branches and to shorten the side shoots in summer und again in winter to ensure the development of blossom buds.

The common kind is Wistaria sinensis One with longer Hower bunches is Wistaria multijuga ; this provides a remarkatle display when trained on a pergola. Both have lilac-mauve blooms in carly summer. The white variety of multijuga is particularly beautiful. Wistarias grown in pots can le forced into bloom in the greenhouse in spring. See Climbing Plant: .Japanese Garden; Roof Garden

WITCH HAZEL. This is the popular name of a group of leaf-losing, autumn, winter and spring lloweriny shrubs of which the botanical name is hamamelis. They are slow


Wistaria. Beautiful drooping racemes of the species sinensis, one of the most valuable of all climbing shrubs. See article above
rowing, but eventually form large bushes. Ordinary soil suita them, and they need very little pruning: it is necessary merely to thin them out occasionally. The best is Hamamellis mollie, which bears frugrant pale yellow Howers in mid-winter: arhoren has deep yellow Howers in Februay and virginica bears rale gellow hlooms in late autumn. They are most interesting and easily managed hardy shrubs. L.ayering is the best method of propagation.
Medicinal Uses. Witch hazel is an active hacmonstatic much used for controlling blecding. A few drops of the liquid extract in water snuffed up the nose :s an excellent treatment for nose bleeding. Hamamelis, on account of its astringent action, is a useful home remedy for hapinorrhoids.
WOLF. The fur of the wolf is longer and coarser than fox, but it is also cleaper. The wool ies soft and very liable to felt, but on the whole wolf wears fairly well and is less frapile than many of the more expensive pelts The colour varies from yellowish grey to blue, but some skins are ao dark that they almost apprar to te black Th.e general directines given for the care of long-haired furs may be applied tos wolf See Fur.
WOLFHOUND. The three varietics of this dog that are most usually seen in Great Britain are the Alsatian, tho Irish and the Borzoi. See Alsatian; Borzoi: Dog; Irish Wolflound Kennel, etc.
WOLVERTNE. The fur known as wolverne is obtained from the carciaiou or skunkbear. It is soft and thick, and of a dark. brown colnur, a whoic skin usanlly measering 3 to 4 ft . in length. A patch of dark fur in the centre of the back is known as the sadille. Around it there is a band of lighter fur, and then another dark ring. the latter ia not quite so dark, however, as the saddle, which risembles fine sable tail, and is usually cut out and used for the same purposes. After the sarldle has been removed, the gap is filled with bearskin, and the whole used for rug. making.
WOOD. Wood as used by the cabinet maker and the woodworker in general is the seasoned product of the timber tree. and as such is divided into two classes, roftwoods and hardwoods. It is usual to describe as softiroods those obtained from trecs bearing needlepointed leaves, and to classify as hardwoods those from trees bcaring hroad leaves. Only a very small quantity of the wood used in this country is home grown; the main supplies come from all parts of the world, gencrally cut into recognized sizes and partly seasoned.
The principle varietics of timber are dealt with in this work under specific headings. Other information is given under such head!ngs as Grain ; Timber, etc. Surface treatment is described in Paint; Stain; and Varnish.
The most commonly used wood is known as deal, but this is the name of the size into which several varieties of pine or fir arc cut. Under the one species of pine there are several entirely different woods, ranging from one of the softest to one of the hardest. The same difference is found among the hardwoods; for example, lime is soft and even textured, and lignum vitac is exceedingly hard and difficult to work.
The matter of shrinkage is of importance in all forms of cabinet making, and it can be taken as a general rule that the softer the wood the more liable it is to shrink. There are other faults which generally go with a liability to excessive shrinkage. Anong them are shakes. These are splits in the direction of the grain at right and other angles to the annual rings as well as along the line of the rings, the latter being known as cup shakes The pines arc liable to knots, and it is rarely possible to obtain a board of yellow deal with. out knots, but if they are only small it does
not matter very much; large knots, however are liable to fall out, especially in thin boards.
The difference between heartwood and sap wood can generally be noted by a difference in colour and in the brilliancy of the planed wool. The heartwood is the fully developed portion of the tree, and the sapwood is only partly lignified. Satin walnut is a case in point for the iree produces very wide sapwood which is imported under the name of hazel pine. The heartwood of ycllow deal is of a bright golden colour and has a distinct lustre while the sapwood is of a bluish shade and planes up to $n$ rough spongy surface.

Timber for Carpentry. The timbers used for carpentry are mostly softwoods, such as red deal, white deal or sprice, and red or yellow pine. Red deal is in gencral use for window frames, cold frames, doors, and similar out. side work which is to be finished by painting White deal is used principally for flooring boards, tongued and grooved partition work, and common inside tixings, such as shelving The better type of work, such as table tops, the ends of cupboards, pancls, ctc., calls for a medium quality of yellow pine. Tongued and grooved inatchboarding and Hooring boardy are sold by the square, a square being nomin ally 100 sq ft; but amaller quantities may be purchased at per sq. yd White deal shelv ing, machine-planed on both sides and both cdgce, can be obtained in varying widths from 9 to 11 in wide at per foot super.

There is a large variety of ready-made mouldings for picture rails, hat and coat rails, cornices, sash hars and skirtings; these are obtainable at the rate of per Jofl for small quantities of mixed woods, such as mahogany, walnut and canary, the amatcur is advised to purchase what are called cuttings at the local manufacturing cabinet shop. Some kincls of wood are obtainable in wider widths than others. For example oak is not generally obtainable in wider widths than 11 in. and avernges 8 in . wide: satin walnut averages 9 in., but can be obtainer if in wide. Black walnut a verages 7 in , and is obtainable up to 11 in., while American whitewond and nahogany. with an average width of 10 in ., are available up to 23 and 24 in . wide Yellow dral does not run more than 11 in., but Oregon pine is easily obtainable in widths up to $2 f$ in. It does not follow, however, that the wider widths are more suitable for all wide work, for it is often an advantage to glue up several narrow widths as they are then much less liable to warp.

Colour and Grain. The colour of the wood is another consideration in the choice of wood and in this respect there is great variety. A choice can be made from the alnost pure white woods such as sycamore, spruce, and holly, to the black of ebony. Yellow woods are numerous in both soft and hard varietics, e.g. ycllow deal and boxwood. Red woods include red pine, sequoia, radouk, mahogany, and rosewood. Brown woods are obtainable in the form of satin walnut, chestnut, and snakewood, while walnut is of a purplish tint
In addition to the actnal colour of the wood, the peculiarities of the grain enter into considerations of choice, not only the distinguishing grain of the wood, but the accidental formations and inalforinations. As a rule, any wood cut parallel with the diameter is even in grain and when there is a difference between spring and autumn growth, as cxampled in yellow deal, this contrast of colour can be accentuated by cutting the wood at rarious angles. The commonest example of the cross grain cutting of wood is scen in the silver grain of oak, which owes its effect to the method of sawing the woor diagonally to the medullary rays, those lines of hard cells which radiate from the centric of the tree.

The burr cllect in such woods as wh!nut amboyna, and thuya is produced by the growth of small branches on the lower portion of the trunk, which do not pierce the bark. A type of figuring known as the curl is caused hy the natural llow of the grain, which originates at the commencing growth of a branch. The grain effect in the pollard oak and other woods, as well as in bird's-eye inaple, is due to malformation ; in the former casc it is duc to a fungus growth, and also by cutting the branches close to the trunk, and in the latter to the ravages of a boring insect. It will be seen, then, that the figuring of wood is due either to the method of conversion, which is often wasteful, or to mallormations, which are rate.

Surface Treatment. Owing to the comparatively porous nature of the grain, the un treated surface of wood is liable to discase especially when exposed to damp. External constructional work should be cither painted or coated with a wood preservative, and all internal woolwork, in cases where it is not usual to treat in this way, should be kept dry and surrounded with a current of air.

Wood Ash. See Fertilizer.
Woodbine. See Honeysuckle.

## Wood Carving: Principles and Practice

## With Some Beautiful Examples of this Decorative Work

The amateur, whether man or woman, will find much scope in this handicraft for manual dexterity, skill and arlistic expression, while it can be carried out with an ir expensive equipment. Furthe assistance can be obtained from perusing suchentries as Gouge; Grindstorie; Tools; Wood

Wood carving is the one branch of sculpture that the amateur craftsman can follow with little expense and considerable chance of success. It is not, however, gencrally con. sidered as an end in itself, but as a means of decorating wood. Chip carving is a simple method of decoration. In this article he methods of dealing with carving in the round or in high relief from the simplest beginnings will be dealt with.

The heginner will be well advisod to purchase tools as they are required, and, although most of the tools illustrated at Fig. l are essential for advanced work, there is no need to purchase thein all at once. Much preliminary practicc can be obtained by the use of a tirmer gouge and a veiner, and with the former tool a series of cuts should be made on a piece of even-grained woorl, as shown at Fig. 2. It does not matter very much what the size is, anything from $\frac{3}{8} \mathrm{in}$. to $\frac{3}{4} \mathrm{in}$. will do, but lines should he made on the wood as a guide before
the cutting is commenced by the worker. The simplest cuts arc made by pressing the gouge into the wood in a vertical position. The gouge is now set back $\frac{1}{\frac{1}{2}} \mathrm{in}$. and inclined slightly backward, this having the effect of removing a chip of wood of segmental shape. This is followed by a similar commencing cut a little farther back, with the distance of the second cut increased. Several cuts should be made thus, each time increasing the distance until it is possible to scoop out a space of 1 in. long up to the first vertical cut talien.

On slowly turning the gouge round on its own curve, a circular cut can be made, and when this is accomplished the scooped cuts can be made each side, as at A and B, Fig. 2. A pattern combining the first and sccond methods is shown at C and D.

The next stage is to cut a circular space and combine it with the cuts at $D$ to form the patterns at $E$ and $F$. The use of the veiner in conjunction with the first practised cuts


Wood Carving. Fig. 1. Selection of tools which are necessary to the wood carver Courlesu of The Manual truinina Toal Co (Shelfield)
enables a variety of patterns to be formed, as indicated at $G$. This provides an effective method of wood decoration.
Another form of pattern is shown at H , and is more difficult, but with a perfectly sharp gouge the cuts can he made quite clean. It should be noted at this stage that a considerable a mount of early carved decoration was effected by the ahove means, and numerous examples can be seen on old chests, settles, and other furniture. Most of the cuts illustrated at Fig. 2 are done in the direction of the grain, but practice in other directions of the grain must he acquired when some confidence has been gained in the use of the gouge
The licen edge of the tool soon becomes dull, even when working with softwood. and unless the keenness is frequently renewed it will be impossible to obtain clean cuts.
Owing to the extra licenness required, a leather strop or two should be provided, so that the sharpened edge can be stropped Leather helting is useful, one piece being thick, and the other thin enough to fold so that it can conform with the inner curve of the tool.

A Simple Panel. Having hecome proficient in making simple gouge cats in all directions, a simple pattern form, as at Fig. 3, may be attempted, and for this purpose a parting tool and a llat gonge will he required. The shape of the centre diamond space with the triangular corners should be drawn out first, and the work can be sciewed to a small block of wood so that it can he placed in the vice. Generally the height of the bench is too low for convenient carving, and it will he convenient to make a stand with 1 in . or $1 /$ in wood.
The first stage in working out the pattern at Fig. 3 is to outline the inner parallel with a parting tool. The wood should be cut away to the centre hoss with the flat gouge, and then the hoss can be shaped with the latter tool. The leaf formation is indicated with the parting tool, and with the addition of the veiner the whole of the work can be effectively done.
It is a good plan to endeavour to do as much cutting as possible with the fewest number of tools, and if the pattern can be effectively done with the above mentioned tools much valuable practice will have been accomplished. A further example of simple carving is shown at Fig. 4. This is a spray of oak leaves with a few acorns

The first stage after the drawing has been transferred to the wool is to cut out the background and leave the pattern standing out.

In the first place, the outline should be cut down with a vertical cut, and the waste removed with a flat gouge. It will be seen that
e stalk of the lower acorn is missing. This is the result of careless outlining. In approaching a thin stalk, the lirst cut sliould be at least $\frac{1}{8}$ in. away from the required line, and the ground should be removed before the wood is out back to the correct line. If this is omitted, it is quite possible for the gouge to slip and entirely remove all across grain stalks, or, if it does not actually cut into them, the grain may he sufficiently raised to cause them to break off in the subsequent finishing.

The leaves should be finished with a veiner, and a slight amount of modelling effected with a flat gouge. A development of this form of work is shown at Fig. 5, which is an adaptation of a piece of early wood carved ormament. The design is quite straightforward, but a gouge or two with quicker curves should he utilized. The ground is stamped with a punch to provide a suitable tinish, but this should not be overdone, as it detracts from the general effect in some kinds of work

Bold work with broader cuts should now be attenipted, and a good example is shown at l'ig. 6. The wood should be of even grain about 12 in . by 9 in . or 10 in . by 7 in , and 1 ! in thick at least. The pattern should be marked out and then cut down, leaving the pattern standing out. The first stage is to cut the inner portion down and then the top and hottom portions, leaving the two side leaves to be roughly shaped with suitable gouges and flat chisels. In work of this description each portion should be roughed out in turn, making no attemplt to obtain any finish until the general shape of the curves has been worked. A


Fig. 2. Preliminary cuts with gouge and veiner, showing method of forming a simple pattern. Explanations of the lettering will be found in the text tools in the suggested outfit.
at the top of the curves will be necessary, but the finishing of these portions should be left until the top rounded portions of the work are practically tinished
This exercise is to gain command over the tools, and not primarily to produce a piece of ornament. The left hand should be used just as much as the right, for the latter will hold the tool and give the necessary guidance to it, but the left hand is essential for purposes of resistance. Sweeping cuts with both gouge and chisel should be practised, and considerable skill will be required to enable the tool to be stopped before the cut becomes deep and perhaps begins to pull the grain apart. This must be avoided or inlinite trouble may be caused. It is in the latter that the left hand will be most helpful, and it can be taken as a general rule that the tool should never be driven forward with one hand without apply ing the counter-resistance of the other

Another important point which experience will teach is not to put too much force on the tool when working in the direction of the grain, or near a delicate piece of cutting, the method heing to remove the material by a scries of small cuts. Another use of the exercise is in enabling hine carver to give texture to the surface.

The finishing cuts on the rounds should conform to the main direction. This is not so evident in the photograph at Fig is. except in the swcep of the hollows, lut the main idea of the finishing marks should be to convey to the eye the main form of the shape.

Preliminary practice in the formation of curved surfaces can hardly be carried to excess. It is the best means of obtaining a command over the tools and gaining an intimate knowledge of the material. The shaping of leaves, as shown at Fig. 7, indicates a line of work which provides invaluable experience. The general method of tackling the outlining is the sams as in the previous example, but the great variety of curves, running in all directions of the grain, should provide opportunities for the use of all the

In dealing with the carving of natural forms, much depends on the position of the finished work, and as the carver is limited by the grain of the wood in exactly imitating many forms, it bccomes necessary to utilize the ellect of light and shade. It is impossible to represent exactly any natural form in wood by means of carving tools. Some slight alteration here or there must be made to conform with the limitations of the matcrial and with the effect of light and shade, so that the representation must be conventional. The beginner, modelling leaf and flower shapes, need not conventionalize to any extent until the difficul. ties of technique have been overcome. The laurel leaf, shown in Fig. 7, is capable of providing unlimited surface modelling.

In working out the shape, the first stage consists in forming the main slape and cutting away to form the hack. ground. The main direction of the curves shoula be roughed out with suitable gouges, and the final shaving effected with suitable llat gouges and chisels. The lightest possible touch should $J_{x}$ used, and the tool held in complete restraint as


Wood Carving. Fig. 3. Simple panel which will glve the amsteur practice in the use of a flat gouge and parting tool
a veiner, and then to ornamentation, and the lowness of the relief work each side to the does not detract from the shield, which is the approximate depth main object.
The beginner, unless The surface finishing of all parts should be thoroughly conversant with the formation of the lenf. should work from an actual cast, or at least a photograph of a finished piece of work. Failing this. a pencil drawing can be used if the effect of light and shade is shown.
An clahorated form of the same kind of leaf is shown at Fig. 9 ; it introduces animal forms treated in the more or less grotesque
shown. This is particularly required when approaching the edges of the leaves, and as far as possible the shape should be completed on the top surface before the undercutting is attempted. The exact position of the tool cannot be stated, os it should be changed cut by cut to conform with the direction of the grain, hut in the main the fibres of the word should be sliced

All cuts should be made entirely with the hands directing the tool, the mallet being rescrsed for such work as outlining and cutting out large nuter surfaces. Some very hard woods may require such pressure that is beyond hand power to perform : but, generally. if the tool is kept perfectly sliarp, and small, thin cuts are made. there will be no need for mallet work

Where necessary the left hand should hold the chisel and continually restrain it, while the mallet is usod to give a number of light taps. Nothing in the way of heavy blows should he allowed, even with the hardest woods. It is far better to attend carefully to the keenness of the cutting edges of the carving trols The conventionalized treatment of leaf forms is shown at Fig. 8, and work of this sort makes an excellent exercise for the beginner It will be seen that the main line of the con

manner so often scen in medicval work. In this exainple the curvature of the leaves renders the carving much more difficult, and incidentally provides excellent practice in the control of the tools in finishing the surface.
The best method of dealing with the panel is to form the main curves without attempiting to do any of the actual shaping, either on the surface or on the edges As much of the ground as possible should be removed, keeping it llat. and in this con. nexion it is an advantage to use a strip of thin wood to rest across the panel from side to side, and to drive wire nail through it, to project when filed off Ilat, to the reqnired depth. This rough depth gauge can be used in all positions, and will help in obtaining an even surface. The curves leading to the tips of the serrations of the leaves should be made as flowing as possible, and although a distinct depth is necessary. it should not be overdone. The raised portions of the edgos should he slightly undercut, in order to emphasize them, but generally the a minunt should not exceed $\frac{1}{\frac{1}{8}}$ in

It should not be necessary in continuing the exercises in carving to use n plaster model, and, with a view of training originality of treatment. the better plan is to work from a drawing shaded with charcoal or crayon. Assistance can be gained by studying carvings in museums, and by making pencil sketches of details.

The shield at Fig. 10 is an example of finished surface modelling. and the craftsmanship involved forms a valuable training The leaf horder should lie done first and carried to not more than $y^{\prime \prime}$ in. deep, ns the whole effect is one of low relief The horder is well filled without an excess of carried out as smoothly as possible, and, however carefully the shield itself is linished and curved, with the use of scraper and possibly glass paper, the tool marks on the foliage should not le ohliterated

Decoration of Furniture. The application of carving to furniture will be the main object of the home craftsman in learning the craft, and some appreciation of the particular form required is necessary. The florid decoration of the so-called dark oak antique furniture should be avoided. Many examples of excessive carving can often be seen, and in these cases the furniture in question has been made with the idea of providing as much carving surface as possible.

The piecc of furniture on which it is desired to execute carved ornamentation should be designed primarily for its correct purpose, and the carved decoration should be sccondary and not prominent. Small carsed panels in a framed door may be made entircly decorative and yet, on the other hand, by the use of unsuitable designs, the cye will not be able to take in the proportions and lincs of the framing. but is attracted by the weight of the decoration. It is difficult to say exactly what proportion of the space should be lecorated in any article of furniture. this is a matter of training in the laws of design and the appreciation of good form, but the first cesential is restraint, the second being proportion.
Many beautifu: examples of wond earving can be seen in old oak chests where the stiles and rails only are carved with a simple patterı in gouge cuts: in other chests the panels only are carved, the rails and stiles giving an idea of solidity and strength. The classic style of ornament is valued by many woodcarvers as providing a suludued form of decoration, and the example of acenthus-leaf ornamentation at Fig. 11 is a type of what can be done

Animsl and figure forms in the round should not he attempted by the amateur craftsman without some considerable preliminary work in modelling. A sculptor finds it necessary to use clay to enable him to a ppreciate form, and, apart from the technique of dealing with the materials, there is very littlc difference between the stone and wood sculptor. The stonccarver works on similar lines to the woodearver, and generally would be unable to tackle the figure, although a head, particularly a grotesque head, may be attempted

Many woods are suitable for carving, but they sliould be of even and uniform grsin, free from knots and shakes, and have been thoroughly seasoned. The grain should be as close as possible and free from strong markings. Of the softer woods mone suitable to the beginner, but still useful for many forms of carting, arc yellow pinc. American whitewood, hasswood, lime, and Kauri pine, and of these gellow pine will le found the best for


Wood Carving. Fig. 7. Method of using a fat ROuge in shaping natural forms, such as a leaf
preliminary work. Of slightly harder woods there arc sycamore, satin walnut, beech, and holly, and of hardwoods, onk, walnut, and sometimes mahogany can be used.

It is generally casier to obtain suitably scasoned yellow pine, and if used in at least 1 in . thick ness no trouble should be experienced in working it, but it is not snitable for high relief. American whitewood and basswood are good for preliminary practice, but tools require more sharpening than is necessary with yellow pinc. Lime is not so easily procurable, hut if it is properly sawn and thoroughly scasoned it forms an ideal material for the begenner, especially when working out such examples as shown at Fig. 3. The intermediate woods can be used for the examples given in Figs. 4 and 5.

The kind of walnut known as Italian is more suitable than the home-grown variety. Much of the waluut supplicd by timber merchants is sawn so as to show the figured grain, and this is especially evident in the English wood. The grain should be as close and as straight as possible, and wood for carving must be cut from the heartwood, sapwood being distinguished by light streaks or markings. The wood is nore suited to lowrelief carving, hut with selected specimens it is possible to obtain effective high relief.

As a rule carring should not he polished ; the only treatment allowable is that of oiling or
place of a skewer. The pinions slould always suberosa, with greyish leaves and pink llowers be cut off at the first joint. and the feet is a charming little spring flowering plant crossed after the lega have been secured excellent for the rock garden, where it should in place. The bird is cooked undrawn and be set in very gritty soil must never be overdone.

Roasting is the usual methorl of cooking woodenck. After trussing, hrush the bird all over with oiled butter, then tie over the breast a slice of bacon, and roast from 10 to 15 inin ., hasting frequently. Woodcocky should liang when rousting with the feet downwards, anul a piece of toasted bread should he placed underneath for the purpose of catching the trails. If hanging the birds to roast is not possible let them rest on bars in a baking-tin, and in the bottom of the tin underneath the bars lay loast. The birds are served on this toast with a good brown gravy and a garnish of hot acasoned watercress and cut lemon. To carve, split the bird right in half through the centre, cutting from neck to tail, and with each portion give a piece of the toast. See Game.

WOODLOUSE. Because of its slaty colour the woodlouse is often called a rlater. Noclurnal in habit, it feeds upon plants and seedlings and may do considerable damage. When its presence is suspected nll rublish and crevices of dry wood slould be searched in the neigh. bourhood of the plants affected, and if necessary treated with boiling water. Traps may be prepared with hay-filled flower pots, the sides being smeared with treacle. Borax or beetle poison may be used, and there are also proprietary preparations.
WOODRUFF. This is a pretty low growing plant which spreads very quickly and is suituble for planting in odd corners, whether shady or sunny. It becoines smothered in smill white flowers in spring, and if planted with forget-me-nots provides a charming display. It shonld not be set among choice plants owing to the rapidity with which it spreads. Any little rooted piece pulled off and replanted will grow. Ite botanical name is Asperula odoratn; the leaves have a haylike scent whell dry. The blue wondruff (Asperula azurea) is a hardy annual 9 in. high with pale blue fowers in sum. mer; seeds are sown out of doors in sprïng. Asperula

WOODSIA. The hardy kincls of this fem require a leafy or peaty soil, and a position in shady borders or banlis. Greenhouse species are best grown in pots of peat, loum and silver sand. The plants should be placed in a shaded position, and watered freely from March till October. The maximum height of the plants is about 12 in . The liardy sorts are all suitable for greenhouse cultivation. Propagation is by division. See Eern.

WOOD SORREL. This is a pretty, low growing plant suitable for the rock garden and for sumny corners. One of them (Oxalis acctose!la), which grows wild in woods in Britain, bears white Howers in spring and is


Fragrant clumps of the pink Asperula suberosa, a favourite spring flowering rockery plant
suitable for planting in the rock garden. It is however, k:Bs attractive than two kinds from the Falkland Islands, adenophylla and eneaphylla, which have grey leaves, and pink and blush-colourel blooms respectively, and thrive in a compost of sandy loam and leaf-mould among the rocks. A popular wood sorrel which is often sern in cottage gardens is that known as Conniculata rubra. It is a low growing spreading plant with copper coloured leaves and yellow flowers. The wood sorrel is propagated by division during the spring.
waxing, and these are used to protect the surface and not for polishing.

WOODCOCE. The season for woodcock extends from August to March. In choos ing a bird press the breastand pinions: the fect, also. will be supple if the bird is fresh and in good condition, the head and throat clean and the Hesh firm. The bird does not usually weigh more than llb. It is pre pared and trussed like the snipe, with the head left on and the long beak thrust through the legs and body in


Figs. 8 and 9. Methods of treating conventional forms. Fig. 10. Shield with low relief border carried out in a conventional design Fig. 11. Showing the method of treating the classic form of the acanthus leal in wood

## WOOD TURNING FOR THE BEGINNER

## The Use of the Tools and the Results Produced

The important operation of Turning is described in this work under two main headings, each corresponding to one of its branches. Thus the manipulation of metal is dealt with in the arricle Mctal Turning. See also Lathe: Mandrel, and the many articles that deseribe items of furniture, etc., the component members of which are turned, e.g. Candlestick; Chair; Table

Wood turning consists chielly in fashioning tool is V-pointed and ground and sharpened wood to circular shapes by revolving it in $\Omega$ on the outside of the $V$. lathe and applying cutting tools to the surface. It has many and varied applications in the home, being the only practical method of producing chair and table legs, little columins with turned bases, candlesticks and a host of other articles which are circular in section.

The amateur should commence by prac tising on such material as boxwood or heech.


Using the Gouge. The method of holding the gouge is illustrated in Fig. I, the blade being grasped in the left hand near to the cutting end of the tool. The outer part of the first linger of the left hand is pressed against the back of the T-rest, while the fingers of the left hand hold the gouge tirmly to the top of the rest. The right hand grasps and manipulates the handle. To use the gouge, the piece of worls is first lixed and the lathe started.
It is necessary to rememher that as the wood revolves it appears to the eye to be solid and circular, but as a matter of fact it will be

half-twist is given to the blade directly it commences its cut, and the tool is traversed bodily towards the headstock, taling care to maintain full control over its movements.
It is usual to terminate the cut at some distance from the chuck or face plate, except in those cases where the end of the wood is overhanging and there will be no risk of the tool catching up on the chuck The same operation is repeated with the same caution until the general diameter of the material has been reduced to its proper size, when it will be circular in section and more or less cylindrical in shape from end to end. From this stage the pattern of the object can be turned.
Turning with the Grain. To ensure turning with the grain of the wood, always work downward, as in Fig. 3, traversing the tool from the larger diamater towards the smaller. When the material has been reduced to a cylindrical shape it may be smoothed with a chisel. This should be held in the same way as the gouge, but the left thumb should be interposed between the underside of the chisel hlade and the upper surface of the T-rest, so that the part of the chisel which will actually cut the wood is about the middle part of the cutting edge. The chisel is traversed along the work in a similar manner to the gouge.
The shavings soon tell whether the chisel is cutting properly or not. They should come away clean cut, and not look as if they had been scraped or rubbed off. In the latter event, it is almost cerfain that the tool is not sufficiently sharp, that the speed of rotation is not high enough, or the tool itself is not being held in the proper manner. Quite slight variations in the position will make a big difference in the turning.
Supposing that the work is comparalively long and slender-for example, a sma!! leg for il footstool-a good plan is to prepare a full-size drawing of the desired shape. Then take a lath of wood and drive sliarppointed nails through it at those places where the shape of the ohject changes. When this is applied to the revolving cylinder the points of the nails scratch a series of rings, as in lig. 4, which indicate the points where hollows or curves are to be turned. In order to turn a hollow, as in Fig. 5, the gouge is used first from one side towards the valley and then from the other side, working downward, and compelling the cutting edge of the

To avoid accidents he must always see that more or less square the material is properly tixed in the lathe, so and running out of that there is no risk of its flying out. He should truth. Consequently, hold the tool firmly, and bring it near the by approaching the revolving wond with caution. The turning gouge to the inatools are provided with a long liandle very ginary face of the securely attached to the shank. They must material, it will, in be kept absolutely keen and sharp. A hlunt fact, only cut off the tool is a danger.

A gouge, chisel, and $V$-point or veiner are the principal tools required. A gouge ahout $\frac{6}{8} \mathrm{in}$. wide is suitable, although it is an ad. vantage to have one rather smaller, and also a thickier one. The gouges are ground on the outside of the curved part. The cutting end of the chisel is inclined and the cdge comes in the middle of the thickness of the blade. both sides being ground off to a taper and sharpened on an oilstone. The veiner or parting-off high spols or corners, as in lrig. 2, and it is at this stage that the utmost care must be exerciser!. The tool should be pointed to. wards the work and held with the blade pointing at a small angle torvards the headstock. A peculiar


Wood Turning. Fig. 1. Correct way to hold the gouge. Fig. 2. Gouge shown cutting of high spots or corners of the rough material. Fig. 3. Working downward in order to avoid splitting the grain. Fig. 4. Applying scratch gauge to show points where hollows or curves are to be turned. Fig. 5. Turning a
concave surface. Fig. 6. Parting off with chisel held vertill concave surface. Fig. 6. Parting off with chisel held vertically. Fig. 7.
gouge to describe an are of the ciecle or follow a curverl part by moving the handle of the tool sideways while resting the major portion of the weight on the hand rest. Flats are usually shaped with a chisel, and parts at right angles to the axis of rotation by holding the chisel with ita narrow edge resting on the hand rest, as in Fig. 6. The breadth of the blado is vertical, the cutting edge thus inclining bac'sward. It has to be worked very carefully, and a little cut marle on each side of the valley so that the tool will not jam in the groores. Fine lines and beadings are oftien lurned witl the point of the chisel.

If it is desited to turn to dimensions calipers should be used in the ordinary way It is assumed that the work is mounted between centres on the usual prong or fork centre or on a small face plate with a taper screw centre, screwing it to the latter or driving it on to the prong chuck with a few strokes of a mallet The opposite erd is then supported with the point centre of the tailstock, the latter being forced into the end grain of the wood and locked firmly in that position. When a piece of flat material is to be turned inlo a disk to form a base or support, the best method is to secure it by screws to a suitable metal face plate, which screws on to the mandrel nose A similar mode of chucking can be used for various aorts of bowls and similar work.


Fig. 10. Example of a simple lathe, suitable for the amateur Courles॥ ol J. Sagar \& Co.. Lld
Internal work is caried out in much the same manner as external wood turning. With a suliall bowl, for example, such as thit illustrated in lig. 7, the best plan is to tum up the centre first and work outward. The testing of the size of the work is accomplished by the use of inside calipers, but with intricate or important shapes a simple teinplate may be used and applied to the work from time to time (Fig. 8), as a check to the eye. The work should be linished with glass paper, a small piece being grasped between the finger and thumb and worked over the curved surfaces, as in Fig. 9. In the case of flat work the paper should be wrapped around a Hat wooden block or rubber and used with a slight forward and backward motion while the work is being rolated at the highest possible speed. When deaigning parts to be turned, and it is necessary to join two or more pieces loget her, the beat plan to ensure keeping them all in line is to turn a small projecting peg on the end of one part, and to bore a similar sized hole centrally in the other part. This will sarve to centre both parta and keep them in their proper relative axial line.

Choice of Lathe. The article on Lathe discusses the principles governing the design and construction of this appliance, as modified by the specitic purpose for which it is intended.
The inain considerations in a lathe for wood turning are a good headstock with bearings suitable for prolonged working at high speeds, an adjustable tailstock, and a suitable rest for the turning tools.

An example is given in Fig. 10. The red, which is flat topped, is accurately machined
and bolted to two inassive supports. On the left is the headstock, which is holted to the bed by plates passing underneath. The spindle is fitted with a four-speed cone pulley for flat belt drive. Bearings of heavy phosphor bronze are used, adjustable for wear. while luhricators are a.ttached The hand


Wood 'lurning. Fig. 8. Use ol template consisting of a piece of card or zinc cut to the correct profile. Fig. 9. Smoothink the work with glass paper before the fnal operation of polishing
rest is adjustable in every
direction, and can be fixed in lirection, and can be fixed in any position along the whole length of the bed. The T portion is sulficiently long to allow of a good sweep of the turning tool. The tailstock is of the pattern fitted to many metal turning lathes. It is adjustable as regards disposition along the bed, and has a spindle capable of adjustment by the hand wheel provided. A locking screw is also fitted. The chucks enable all classes of wood turning to be accomplished. In the main, most chucks consist of a flat disk or plate, to the centre of which is attached a steel wood screw. The chucks screw on to the mandrel nose, as is usual.

Such lathes may be driven by treadle or power, and with the latter a countersbaft of the type illustrated is necessary. This is fitted with a fast and loose pulley mechanism, and a cone pulley similar to that on the lathe itself. The countershaft should be arranged on staging above the lathe, and the belt should be inclined away from the operator The striking gear will normally come with its handle or chain within easy reach of the operator's hands thus making his task easier.

Woodworm. See W'orm.

WOOL. There are numerous grades of wool, but, generally speaking, it comes under two great divisions, morimo and cross-bred. The merino sheep is bret in Australia chicelly for its wool, while the crossbred sheep is largely bred in New Zealand, partly for its fiecee and partly for its carcass.
The two different kinds of yarn produced from wool are known as woollen and worsted, anll, generally speaking, all woven goods made from wool come under one of these two classes. lior woollen cloths the yarn is not so fine, strong or elastic as for worsteils, which require the longest fibres of wool spun into smooth yarn. Molton and pilot cloths, savonics, twects, cheviots and blankets are cxamples of woollen piece goods, while worsteds include Botany scrges, suitings, gabardines, Becliord cords and hopsacke.

For some yarns hair is used in combination with worsteds, as, for instance, camel's hair, goat's hair and alpaca. Owing to the greater length of fibre in the formation of worsted yarns, worsted fabrics wash better than woollens. The latter have a tendency to felt, anil bleaching powders should not be used, as they eventually dissolve the yarn.
Knitting wool bought in skeins is best 'e: t in that form until wanted. When winding $t$ into balls the thread should not be wound too tight. The softer kinds of wool are warmest in wear, but the harder sorts of worsted yarns last longer and shrink less. Three-ply and four-ply wools are bullier than 1 wo-ply.

Mendiug wools may be bouglit by the skein or on cards. Special wools are sold for tapestry needlework. Berlin wools are a softer, coarser kind. Very durable and heavy wools are manufactured for rug making. See Crochet : Knitting; Rug ; Shawl ; Stocking. cte.
Woolly Aphis. See American Blight.

## WOOLWORK AND WOOL EMBROIDERY

## Quick and Effective Methods in Ornamental Needlecraft

This article deals chiefly with pictorial and conventional des:gns worked in wools on linen fabrics. Solid embroidery on canvas is dealt with in the contribution on Tapcstry Needlework, end other special forms of woolwork are described under the headings Crochet; Knitting; Rug. See also Appliqué Work; Embroidery; Laid Work Needlework Pic!ur=

Used in its bronder sense, the term woolwork includes all work done with wool yarn and needles, or special hooks, from darning and knitting to crochet and knotted rugmaking. In particular it is applied to pictorial designs and necdlework pictures carried eut partly or wholly in coloured wools.

The term wool embroidery is also a broad one, covering any (lecorative stitchery in wools, but in particular the term is employed for fancy work in which naturalistic or conventional designs are partia! ly cmbroidered in wools !eaving portions of the background fabric exposed.

Woolwork pictures as carried out in the 17 th and 18 ih centuries would be too tedious for most needlewomen of to day, although smaller pictorial designs are still exquisitely worked in pettit point for bags.

Materials and Designs. Very effective woo!work or embroidery can, liowever, be quickly achieved on rather coarse linen, coloured or of an unbleached sharle, using skeins of tapestry wools, or penny balls of embroidery wools with crewel needles.

An cmbroidery frame will be necded by most workers for a solid pictorial design
such as that illustrated in Fig. I. which could be charmingly adapted and worked in natoral colours on linen for a cushion, screen or blotter panel, or framed and glazed for wall decoration. An embroidery frame cousisting of two wooden hoops would lie a suitable one on which to work a panel of small size, but if the panel is a large one the regulation embroidery (rame with rollers, on which the work can be evenly stretched, will be needed. For work of less solid design, a frame is not necessary, but to prevent puckering a good method is to pass the needle up and down through the embroidery as if on a frame.

A great variety oi transfer designs can be bought either for flowers tigure or geometrical embroidery or many different


Woolwork. Fig. 1. Pictorial design of polyanthus grouped in a bowl worked in natural colours on grey linen. Fig. 2 Details for working fowers and leaves. The dower on the ripht is embroidered in atin stitch, that on the left partly in long and
short stitch and partly in satin stitch
ideas can be utilized. Flower, bird, animal or Japanese prints can be traced and transferred by means of carbon paper to the material to be embroidered. Dircctions for transferring designs are given in page 418.
Interesting conventional designs can be worked out by pencilling the outlines of coins to mark rounds tor Howers and evenly spacing a number of these on u piece of paper the size of the work, then transferring the drawing to the material. Larger Howers can be worked in buttonhole stitch with an inner ring of chain stitch and centre of French knots. Smaller ones in lazy-daisy stitch and rose stitch. The intervening spaces can be filled in with trellis (q.v.) stitch, or with diamond or diaper stitch (see page 684). Instcad of work ing these dcsigns al over
a cushion, bedspread or duchesse set, they may be enclosed in a circle made by drawing round a plate of the size requircd and outlining the edge of the circle with chain stitch in black wool bordered with back stitch. The rest of the work can be speedily carried out in l3erlin wools in Victorian shades of bright blue, grass green, nagenta and foxglove pink, and can be done on felt or hessian, crash, rattine or linen.
Most of the stitches used for woo!work are given in the page of stitches illustrated in the article on Enibroidery. When starting a piece of work it is a good plan to select the stitches which will be most useful tor the various portions of the dosign. Fig. 2 shows the stitches which may be used for the polyanthus tlowers and leaves in Fig. 1. The flower on the right can be worked in satin stitch. as shown, and then outlined in back stitch; that on the left in long and short stitch on the outer portion of the petals, and with satin stitch in different shades for the inner portion and centre. The leaves can also be worked in satin stitch, with the veins in stem stitch, back stitch or crewel stitch, in a darker shade of green. The bowl may be outlined in crewel stitch with one or two lines of sbading. Each group of Howers is worked

in one ol two ways; a glance at lig. 1 will show which method is applied to each.
Jacobean Designs. A big selection ol effective designs are obtainable in which conventional llower, leaf and fruit forms are partially worked with tapestry wools in solid embroidery, and partially with outlining and light filling stitches. These designs arc copied and adapted from old Jacobean needle work. Fig. 3 shows a typical corner piece of such conventional form for a cushion or runner, while Fig. 4 gives the outlines to be trunsicred, filling stitches being lelt to the taste of the worker. Suitable transfers are obtainable for cosies and other accessories in this style of embroidery.

Jacobean designs are worked in strong colours, but not too brilliant in tone, as they should look mellowed by age. The large leaf at lower corner of design is first worked in grcen chain stitch and a greenish-blue outline stitch just outside the chain stitch. The veining and stem of leaf, fruit, and Hower are all worked in old gold and brown stem stitch. The small leaf to the right is tilled in with two rows of green herringbone stitch, the stitches lengthening towards the centre of leaf and tapering at point. The sprays of grass at each side of the design are represented by fish-bone stitch, and the round dots are covered with satin stitch, with an outline of black back stitches. The large centre blossom has the four-pointed petals worked in long and short stitch in deep crimson round the tip and a rose-red below.

The other four petals are worked in two shades of greenish-bluc sloping satin stitch, dark blue at the centre of each leaf and medium blue buttonhole stitch all round. with the

stitches about one-eighth of an inch apart. The centre has a cluster of dark-red French knots surrounded with two rows of black chain stitch set square. The solid work at the base of the fruit is carried out in two modium shades of red long and short stitch, while the sides are buttonholed and the centrc tilled in with $\Omega$ couched pattern, such as diamond couching or diaper couching (see page 684), and in cach little division is a French knot. The shades of red used should be intermediate between the crimson and rose-red of the Hower petals. The threc leaves at top of lefthand fruit aro worked in outline stitch, while tho right-band one has the leaves in chain stitch, with fish-bone on the centre veining.

Wool embroidery may be used to ornament woven raffia table-mats or on raflia cloth. Small electric light shades or shields made of linen stretched on wire frames suitable for wall brackets can also be decorated in wool. Care should be taken that the stitchery is neat on the reverse side. Directions for makingup are given ( p . 690) under Lampshade.
Fig. 3. Corner design in dacobean style suitable for cushion, bedspread. or other square piece of house-linen. Fig. 4. Design enlarged. By omitting the left-hand spray an
medallion is obtained

WORCESTER CHINA. Both useful and type of work box which is useful in a sittingdecorative porcelain lias been produced at roon is the titted box pouffe with a strip for Worcester continuously since the niddle of holding scissors, ctc, and a pincushion attached to the lining of the lid and pockets for reels, skeins of silk and other accessories in the lower part.

In the 18th century a great deal of care and time was spent in producing beautiful workboxes, and some examplesof that period are very fine pieces of craftamanship. Their bcauty was enhanced by the costly woods used for them. Work tables were also made with a receptacle in the shape of a bag under them for holding materials. Such tables wore designed by Sheraton and others and were known as pouch tables. Our illustration shows a work box made the 18th century. Although china figures are in the early part of the 19th century. It is of virtually absent from the range of early wood covered with red morocco and fitted with Worcester, the number of the patterns of tea and coffee services and other useful pieces far excceded that of any contemporary factory in England. In recent years figures and vases have predominated.
The dominant mark until 1793 was the crescent, although down to 1783 many pieces bore a cursive $\mathbf{W}$ and others a square mark some pseudo-Chincse devices, and even the Dreaden croswed-swords. The syuare mark frequently appears on spurious blun-scale Worcester. The second periokl is mostly recog. nizable by the initials or names of the Flights and Barrs, with a crown after 1788. The words Chamberlain's, Worecster, with various devices, serve to identify that factory's out put. Grainger used (i \& Co. in a shield, with Royal China Works, Worcester. The company mark is a crowned circlet enclosing a central creseent or C surrounded by four W's.
Wall's copics of Chinese bluc-and-white, as well as his egg-shell, were supreme. The mugs had vertical sides, and the carly cups usually no handles. Caughley mugs in imitation of Worcester, with a $\mathbf{C}$ sinulating the crescent mark, are recognizable by having splayed instead of straight bases. Vases and jugs with scale-blue grounds have been prized at all times. Hancock's line-engraved prints, which reached their highest level when done on Worcester bodics, were often signed by him, but have no factory mark.
The latter part of the first period coincided with the arrival of artists from Chelsea, and the adoption of marone, canary, apple-green and other grounds, with panels of exotic flowers and birds, or Watteau scenes. There were also wild roses in relief on white, and open-work borders. This carly ware usually contained steatite in the body, and appears greenish when held to the light. The standard English bone porcelain was not established at Worcester until after the year 1840. See China. Worcester Sauce. See Saucc.
WORE BASKET AND BOX. Obtainable in a large variety of shapes and prices, work baskets are made in osier, cane, plaited rush and raffia. Generally they are fitted with the necessary articles used for plain needlework; these are attached directly to the lining, which is provided with pockets to hold cottons, etc.
The large wooden work box fitted with trays and compartments is less in use to-day than some forn of work basket or a work table, which is really a work box on legs. Another forming a small spiral with thr tapered end of a by threading the raffia first round the cane and then carrying it across the cane adjoining, and between it and the one beyond it nearer the centre.
Fig. 3 shows the third round completed, and the commencement of the fourth round. As the work progresses it is necessary to bind the
raffia twicc round the cane in order to cover it in the spaccs between the connecting stitches, which should not be too far apart. Having completed a flat circular mat of the desired size, say 8 in . to 10 in ., for the loottom of the work basket, the cane is continued, but it is placed on the top of the outaide ring instead of on the sides, and continued in the same way, each round being placed on the top of the one below to form the sides of the basket, as in Fig. 4.
Having reached the required height, from 4 in . $t 06$ in., the cane should be sliced to a long taper and gradually worked out so that the top of the sides is llat. A lid is made in the same way as the bottom. and, when the diameter is sufficiently large to fit on top of the sides and slightly overlap them, the end of the canc is tapered and finished off, the raffia being continued for a complete round to give a neat and strong edge. A raffia-eovered ring or bunch of raffia Howers for a handle, or one after the style illustrated on the raffia cosy in page 1035, is secured to the top of the lid, which can be hinged with raffia to the side. The inside of the basket should be lined and padded: if the exterior is to be varnished this should be done before the interior is fitted. The lining niay be of silk or a good printed sateen over a layer of wadding. Separate pockets may be added for recls, tapes, needles and buttons.

Wool embroidery can be effectively used to ornament the cheap rush baskets sold for shopping bags The hand!e is removed and the basket, when em broidered, is lined with sateen. allowing sufficient depth of material to draw up into bag shape at the top after a slot has been made in the sateen to take a ribbon or cord. Buttonhole the lining to the top of the rush basket to keep both together neatly. Any bold flower design may be worked cffectively in bright, rather coarse wools.

A rush or cane waste paper basket makes an excellent mending basket, lined in the same way with $n$ bag top and trimmed with raffia flowers, wool embroidery or appliqué of linen. felt or cretonne flowers
moants. Early loth centary
By dermision of the Direcior. Vicioria \& Albert Museum.
S. Kenainglon


Work Box in wood, covered with red morocco, with gilt brass length of cane, tying the cane together as the in the manner indicated in page 30 . See sides join. Two complete rounds are formed, Mending; Needlework; Osier: Raffia Work; and then the work is continued, as in Fig. 2, Rush Work; Scissors; Woolwork.

## WOREMISN'S COMPENSATION.

 All householders should insure against liability to pay workmen's compensation to scrvants. The term servants includes not only those who are emploved permanently in and about the household, but also anyone who has regular engagement, e.g. the washerwoman who cones
once a week. There is no liability towards " merely casual person employed otherwise than in the way of the employer's trade.

The amount of compensation payable depends upon the remuneration of the servant. Tips and any board supplied are taken into account. The compensation is 50 per cent of the remuneration for total incapacity with a maximum of 30 s . a week, and a smaller sum fixed either by agreement or by the count. v court judge for partial incapacity : but there are certain percentages which are to be added in the case of both total and partial incapacity where the half wages do not amount to 258 . a week. If a servant is injured or makes a clain for compensation, the employer should at once forward it to the insurance company, and should take great care not to make any admissions which can be used by the servant in support of his or her case should it come into court. See Employers' Liability.

WORKSHOP. The hone worker may be confronted with the problem of finding a place wherein he can do his work with some measure of convenience. He will need a shed or room where he can work at odd moments and, more important still, where his partly completed job can be left in safety. A bench is a necessity, and unless one of the collapsible structures is used, this demands a room or building set aside for its accommodation. Work which has been glued up must be left to set and harden in a place where it will not be interfered with, or be subject to chance knocks. Tools must be housed where they are out of the way of children.

Of course, a sectional building of some sort, as illustrated under the heading Shed, can be purchased, but the home worker will derive pleasure, experience and profit from making his own workshop. Those who decide to follow this latter course could well use a lean-to construction, built into the corner of two walls, as illustrated and described on page 1141.

Much helpful information about the framing, joints, ctc., will be found in such other articles of our Encyclopedia as Garage : Roof: etc., and, of course, the appropriate woodworking contributions can he referred to.

WORM: In Furnitwre. Old lurniture is sery liable to attack by the wondworm, a tiny insect that burrows into the material. Beech, birch and walnut are, perhaps, the most liable to attack, but it is also found in mahogany and other hardwoods.

A good remedy for the worm is a 40 per cent solution of formalin injected into the holes with a small glass syringe. Paraffin is also used and there are a number of patent preparations. Another remedy is to swab the worm-caten wood with perchloride of mercury or corrosive sublimate. This deadly poison must not be allowed to come into contact with the skin. Other remedies include aiternative applications of carbolic acid and paraffin applied to the bucks of wardmber, the insides of chests of drawers, and other places where any ill effects from the acid will not be noticed. Another recommended remedy is paraffin and thymol.
liunligation is another preventive method. Carbon bisulphide is a good furnigant. One way of using this, only suitable, however, for small ficces, is to make an airtight box. to put the article inside this, and to leave it exposed to the fumes for two or three days. The whole surface of the piece is then painted over with a solution of sodium arsennte, a poison which prevents the insects from entering again.

Iarge pieces of furniture, such as sideboards and wardrobee, can be funnigated iuside a tent made of closely woven cotton sluceting, the porousness of which can be reduced by applying to it a linseed oil varnish. Sce Furniture Beetle.

with moss, and the Howers are secured through this to the framework by means of stub wires, which pierec the blossoms.
A withered wreath may be renewed by removing flowers and moss, packing the framework with fresh moss over which trails of cvergreens may be secured with fine reel wire. On one side a bunch of flowers and fuliage can be arranged. If Howers with firm stalks, such as dafforils, hyacinths, carnations, or chrysanthemums, are chosen stub wiring will not be needed. The bouquet can be
WORM : In the Garden. Worms do good arranged and secured to the wreath with wire. by acrating the soil of garden beds and borders, and their preauce shou!d be regarlerl as bencficial. On lawns, however, their casts are a nuisance, disfiguring the grass and giving it a dull, muddy appearance. They can be destroyed by purchasing a worm killer powder from seedsmen.

WORMS : In Human Beings. A great variety of worms infest human beings and domestic and other animals, as well as birds. Intestinal worms aro found in children far more frequently than in adults, and cspecially in weakly children. Parasitic worms come from many sources: thus one species of tapeworm is swallowed in measly pork.

For the prevention of worm infestation, people should avoid underdone or raw meat, water whose purity is doublful, and raw vegetables. particularly watercress, unless beyond suspicion. Intestinal worms are got rid of by means of vermicide drugs, such as oil of male fern and santonin.

WORMWOOD. This is an attractive herbaceous plant or sinall shrub which has fragrant foliage. It prefers light soil and a sunny place. Tlie favourite kind is the southernwood or Old Man (Artemisia abrotanum), 2-3 ft. high, with grey, scented leavea and yellow flowers in summer; it is a common plant in cottage gardens. Artemisia absinthium is the wormwood and dracunculoides is the tarragon. Lactiflora is an excellent plant for the herbaceous border; it grows 4-5 ft. high and bears cream-white flowers in September. Stelleriana, which has grey-white leavcs and yellow flowers, is a trailing plant suitable for the rock garden.

Worsted. See Wool.
Wound. See Antiseptic ; Banaage; Blceding; Cut; Dressing; First Aid: Shock; Tourniquet.

WREATR. Funeral or commemoration wreaths are composed generally of natural Howers and foliage. Occasionally everlasting Howers are used, or a mixture of artificial flowers such as Flanders poppies with evergreens, or a wreath is carricd out in porcelain. A special wire foundation is used in the making of thoral wreaths. It is packed


Wringer. Combinod table and rubber wringer. The reeiliont rollers squeese out moistare efrciently, and at the same time break no buttons or festoners Ewbank Rubber Wringer and Table

Sometimes a bow of ribbon is used to finish off the wreath, or to add a touch of colour to a laurel or palm wreath. The latter are sometimes silvered with metallic paint.

An Easter commemoration wreath may be made on a stout wirc ring, bound round with strips of green crepe paper to which palm leaves are wired; a trimming is provided by a bunch of Howering willow, fir concs on twigs, and purple ribbon artistically arranged. Christmas wreaths of holly can be made in the same manner and completed by bunches of mistletoe and scarlet ribbon.

Wreath designs are popular in all forms of decorative art. Success depends on a sense of balance and colour. Wreaths are composed of every kind of artificial Hower, lcaves and many fruits: and are carried out in appliqué, leather, raffia, ribbon, barbolą and woolwork.

WRENCE. The form of lever known as a wrench is made in many patterns. The screw wrench or adjustable spanner employed to turn a nut on a bolt varics in size from 8 in . to 18 in . and upward, and is either made entirely of steel or fitted with a wooden handle.

Pipo wrenches are made in several forms, the simplest being siniilar to a Hat spanner, but provided with a V-shaped opening with serrated edges. For heavy work the form in general use is composed of a stout handle with a curved and scrrated end, to which is attached a movable clip of circular form. Similar wrenches ano made for use with large tubing.
Tap wrenches for operating serew taps are generally provided with two square holes: the smaller sizes have holes differing by It in., and the larger ones by $\frac{1}{}$ in., and in some cases there are four holes varying in size. There is also an adjustable form in which a pinching serew is turned to closo up the aperture and grip the shank of the tap in use. See Nut; Pipe; Spanner; Stocks and Dics; also illus. above.

WRINGER. This is an inst rument made for forcing water out of wet clothes during laundering operations. It is practically the same as the one known as the mangle, although, strictly speaking, there are slight differences bet ween the two.

The wringer proper docs not roll out the garments or articles washed, as the mangle docs. There are comhined wringers and mangles obtainable, and also washing machines with wringers attacherd.
leollers of rubber am desirable one adran tage of this materinl locing that it is less likely than wood to brata the buttons of the garments. A model of the type illustrated is casy to use for heavy washing, being perfectly rigid and at the amme time constructed to denl gently with light articles. It is convertible into a table.

A smaller type of rubber wringer is manufactured which can be kept on a shelf. A patent reversible drain kecps all water from the lloor, and the machine possesses an attachment which conrerts it into n table mangle. Special littings are made for sink. draining hoard and hath. large wring. ers, like mangles, can be driven clec trically This saving of labour is often cconomically justilied where there is a great deal of home laundering.

A wringcr, whether electrically or hand operatedl, not only en ves time and labour, butalao wrings out the moisture more effectirely than could be done without its aid, and thus enables the clothes to Iry more quickly. Wringers need no ajecial care to lieep them in goodcondition, hut, to avoid straining the rollers, thick materials aliould be folded only once or twice hefore passing through. See Laundry; Mangle; Washer.

WRIST. The the hand and forcarm, contains eight amall hones, called the carpal bones, which above form joints with the lower ends of the two forearm lones, the radius and ulna, and below with the five metacarpal bones. The wrist joint is capable of a wide range of morement, and from its position and structure is very liable to sprains. In Colles fracture (q.v.) the whole wrist is more or less dislocnted backwnril.

Dropped Wrist. Loss of power in the muscleas at the hack of the forearm is the cause of dropped wrist; it may follow any injury to the musculo-spinal nerve which supplies the muscles. It may also be due to the piressure of the head of a crutch. Treat. ment is ly support, massage, electricity, cto

WRITING DESK AND TABLE. The name writing desk is employerl sometimes as if synonymous with writing table. The differences between the two, although these are now somewhat obliterated, are that the desk is a sloping piece of furniture, while the table is not, and that the desk is also a receptacle.
The early writing desk was just a plain piece of carpentry made to slope towards the writer and to stand on the top of $n$ table. It was therefore portable, but lost this advantage when someone formed the iden of fitting legs to it and so making it the writing desk of modern times. The space beneath the top rests are panclled as

Writing Desk and Table. Fig. 1. Writing desk in carved oak. dating from the 17th century. Fig. 2. Beautiful Hepplewhite writing table in mabogang, with tambour tod Fig. 1. bl" permisalon of the Director, Vietorla and dbert

Beautiful kneehole walnut early in the other writing tables were decorated in Chinese lacquer. An example of the latter is illustrated in the article on William and Mary Style. From the kncehole table developed the pedestal writing table. Such tables were designed by William Kent, and came into general use ahout 1735 and onwards for libraries. They were enriched by carving, sometimes by gilding and intended for a central position in the ronm. In some cases the pedestals on which

drawers, but actually open as cuphoards.

W'riting tables of the pedeatal type werc made ly Chippendale. Sometimes their angles werc rounded and ocea. sionally they had serpentine fronts. In claborate cxamples engaged columna are seen at the angles. Hepplewhite made writing tables on the lines of the roll-top desk. An example of his work is illustrated in Fig. 2, notable both for the elegance of its line and its compact was utilized as a re- usefulness. Known as tambour writing tables, ceptacle for papers, theso were fitted with n sliding shutter to and the desk was slip down when the article was out of use also a lox; the ex. Inlaid satinwood was much used for amall pression desk box writing tables of this period, some of these was sometimes used. being made with folding tops and fitted with
In time desks drawers underneath, while others are circular became more elabor with a hinged drawer that swings out and ate, and some are contains writing materials.
fine examples of the cabinct maker's art. A lonautiful specimen of what may he called the writing desk proper is illustrated in Fig. 1 Made of onk enrly in the 17 th century, it is notalile for its magnificent carving

Tables sprecially designed for writing have been made for centuries in the form of an ordinary table of medium size with drawers or additions for requisites.
The first writing tables had a drawer ortwo in the underframing, and the tops were covered with a eoarsely were covered and wasat first blue in colour hut afterivards green. From the word bure developed the word bureau. Morocco was employed for covering the tops of writing tables in the 17th century.


Writugh Dest set. Fig. 1. Yet decorated in modern lacquer work, adapted uom
an old Indian design in delicate colouring
sticks and inkstandy in combination with lacquored wood fol the stationery rack and blotter cover. Gesso and barbola work on gilded or silvered whitewool articles would be most attractive in a prettily furnished sitting. room, while leather in a bright or rich colour would be suitable for most of the articles on a man's desk, with attractive ash tray and ink or pen stand in modern style uf marble or in metal

A whitewood set painted in soft colour. ing, and adapting an old Cashmere design, is illustrated in Fig. I, and executed in poster colours on a brush lacquer foundation. Fig. 2 shows a group of inexpensive accessories ready for painting, which can be bought covered with imitation parchment imitation parchment articles seem to and decorated with coloured prints, with greasy to be casily painted, this can be stencilled designs, or by painting them with remedied by rubbing the surface with tissue waterproof inks, which can be bought paper and also by stroking the paintbrush cheaply and used as described for parch- lightly on a piece of damp yellow soap beforo ment shades in the article on Lampshade. dipping the brush into the ink. See Gesso ; When decorated the accessories should be Lacquer Work; Lampshade; Leather; Stencilvarnished with clear white varnish. If these ling; Telephone Cover; Waste Paper Basket.

## Wrought Iron Work

## The Making of Articles both Decorative and Useful

Other metal working processes are dealt with In our work under the headings Bent Iron Work; Metil Work; Silver Work; Tinplate. See further the entries on the associnted processes employed, e.g. Brazing; Drilling: Forglng; Riveting; Soldering

The manipulation of iron in bar and sheet to make objects of utility and beauty has been superseded by cast iron and machine presswork to a considerable degree. Generally wrought iron work requires the provision of a forge and an anvil as well as a vice, together with suitable hammers, tongs, pliers, and other tools belonging to the metal-worker. Information about forging, together with details of the construction of a simple portable forge, is given in the article Forge.

The particular processes in the manipulation and treatment of wrought iron are forging, welding, flattening, upsetting, bending, cmbossing, impressing, and punching. Forging is done when the iron is heated to a bright red. Welding consists in forging two separate pieces into one when the iron is at white heat. The parts to be joined are cleaned and sprinkled with borax or sal-ammoniac to prevent oxidization. The striking should be light at first and gradually heavier. Flattening consists of lengthening or widening a picce of bar. This is done with the narrow edge of the hammer, and the grooves so wrought are smoothed out with the large end.

Upsetting consists of thickening the bar and is the opposite of flattening. The method is to strike the red-hot iron on the anvil or to hammer the end. Behding can be done cold as well as when the metal is hot; right-angle bends are done over the edge of the anvil or the square part of the beak: while curves are done on the round end of the beak or on a conical mandrel or stake fitted in the vico. Embossing is the process of making bosses by hammering the hot metal into suitable cavities or by using a ball-faced hammer on a piece of hardwood when the metal is cold. Impressing is a means
of arriving at similar shapes by pressure either with the vice or a press. Punching is used for marking points for drilling and cutting as well as for providing decoration.

Welding and Bracing. There are several methods of joining ironwork, welding being the principal and most generally used in large work, but brazing can be carried out with matcrial of small size. Riveting is necessary in places where welding is not practicable.
There are various ways of joining with rivets, the simplest being where two pieces are to be attached, as at Fig. I. In dealing with curves, another method of riveting is shown at Fig. 2, and consists of cutting away sufficient material to allow the second piece to fit flush. Intersections of bars are carried out as shown at Fig. 3; in this case the top piece is shaped, while hot, between two project. ing blocks. A neat method of intersecting is shown at Fig. 4, and consists of filing out half the thickness of each piece, as at A, so that they may fit flush.


The methods followed in passing one bar through another are shown at Figs. 5, 6, 7, and 8. In the first two the metal is punched and widened out cach side; in the latter examples the hole is drilled and filed to take the bar. When several lengths of bar are to be held, the method used (Fig. 9) consists of forming a collar to bind them together. The collar can be of flat bar or half-round, as at Fig. 10 ; a counbination of the two, shown at Fig. 11, is cffected by placing a collar of half-round bar on a wider Hat collar. Round bars are held together with a collar, as at Figs. 12 and 13.
Straight bar can be decorated by simple means by using a file and a punch, as at Fig. 14. An claboration is shown at Fig. 15. Another method suitable for square bar is shown at Fig. 10 ; the angle cuts are made with a three-cornered filo and the curves with a half-round file. Simple twists (Fig. 17) can be done whilo the metal is red hot, by placing one end in the vice and turning it with the tongs. Square bar can also be $t$ wisted, but it is heavier work and requires the help of a screw wrench. Slitting and opening out, as at Fig. 18, is cffective. The simplest method is to cut the rod to the centre from throe sides, upset it to open out, and then twist. It is, however, a difficult operation for the beginner. Interlacings arc fairly simple, as at Fig. 19, but in Fig. 20 the main rod is split and opened out with the ends forged to a knob form.

The spear shape at Fig. 21 is indicative of Hattening and wclding in the casc of the side picces, otherwiso the lower portion would require considerable cutting away. This form of treatment is used with square bar in railings and similar work, and it can be worked out in many different forms. The formation of the volute, at Fig. 22, is termed scrolling, and is one of the main effects obtainable in wrought iron work. It can be done cold or while the metal is hot, either on the anvil or (usually) with a scroll wrench or round a scrolling iron, which enables an even curve to be formed; these are obtainable in several shapes and sizes. The end of the volute can be flattened, as at Fig. 23, or the widened end can be slit and formed into scparate volutes, as at Fig. 24.

A simple piece of work for the beginner in ecrolling is shown at Fig. 25, and consists of a

Wrought Iron Work. Pigs. 1 and 2. Two ample rivet joints. Pigi. 3 and 4 wethods of internecting. Figs. 5-8. Methods of paasing one bas throagh another. Fig. 9. Forming a collar to bind several lengthe together. Fie. IQ Collar of haip-round bar. Fig. 11. Anothor method of forming a collar. Figu. 12 and 13. Boand bars held together by collar
 it is usual to weld straight lengths and then form the ends to the required shapes. portion of a grill. The curves are made as flowing as possible, and the nim of the designer of a grill should be to fill the space as decoratively as possible without crowding. Spaces should be well balanced, and the riveted joints just sufficient to hold the work together.

As a rule, wrought iron designs should be highly conventional, and suggest strength. A good finish for wrought iron is to heat the metal and then rub on linseed oil: a black Ginish can be obtained by covering thoroughly with linseed oil and burning it off over a fire.

WYANDOTTE. Amongst exhibitors of poultry the Wyandotte is without doubt the most popular of all the American breeds. There are 13 varieties, namely: white, black, blue, buff, Columbian, blue-laced, buff-laced, black-laced, gold-laced, silver-laced, pile, silver-pencilled and partridge. The favourites are the white, black. silver-laced, gold-laced and the Columbian.


Wrandotte. Pullet of the white variety of this Amerioan breed

An example of welding, intersecting, and reu combs, faces, wattles, and lohes. They riveting is shown at Fig. 27 in the form of a are all rose-combed. See Fowl: Poultry.


ERANTEEMUM, This is the name of an annual everlasting flower or :mmortelle which is useful for indoor decorstion in winter. It is grown from seeds sown out of doors in spring. Of this flower the chief kind is Xcranthemum annum, 18 in.
Wrought Iron Work. Figs. 14-16. Ornamentation on atraight Dars. Pig. 17. simple twist. Figs. 18-20. Decorative forms of alitting and opening ouk. Pig. 21. Bpear derign. Fig. 22 How to lorm a volute. Fig. 23. End fattened. Fig. 2A. End gith Fig. \&5. Teapot stand. Fig. 28. Use of wolding in lormation of acrolls. Fig. 27. Example of welding, intersecting, and siveting high, of which there are several varieties.

E-RAY: The Rönt gen rays, which are inore commonly known as the X-rays, have some very important uses in diagnosis, and also in the cure or relief of certain diseases. For the purpose of diagnosis, they are employed to reveal the presence and situation of foreign bodies, for fractures, dislocations and for various diseased conditions.

What is shown on a photograph is not the actual object or tissue, but the shadows of theso thrown on the photo. graphic plate. The interpretation of these photographs requires special skill and experience.

Un the cells of the body the rays have a stimulating cffect, which becomes irritating and destructive when the application is prolonged. A large number of affections are successfully treated by X-rays. These include ringworm and many other skin diseases. With regard to cancer, apart from rodent ulcer, X-rays should not be used if an opera. tion is possible; but when it is too late for a successful operation they often give great relief and prolong the life of the patient.

EYLONITE. A manufactured form of celluloid, xylonite is made in various colours and in imitation of ivory, tortoiseshell, etc. It is manufactured in sheets of various thicknesses and can be used for many purposes. Owing to its inflammable nature it should never be placed near a flame nor exposed to heat. See Celluloid.

YACET : How to Make. The design of a model sailing yacht must follow certain definite rules too numerous to include in this short description, but they aro followed in the design shown in the side elevation at Fig. 1. The hull is shaped from a 36 in. by 9 in . by $3 \frac{1}{\mathrm{i}} \mathrm{in}$. block of sound wellseasoned wood planed to the dimensions given, yellow pine, spruce or cedar being suitable.
The first thing to do is to prepare ternplates of the sections indicated by the lines on the deck plạn at Fig. 2, the section at Fig. 3, and the section lines at Fig. 4, the latter being drawn out full size, together with the sheer plan outlined at Fig. 1, and deck plan at Fig. 2. The templates can be of stiff paper, as at Fig. 5, and represent the shape of the hull at intervals of 6 in ., being marked $B, C, D, E$, and $F$. In order to nold the wood securely in the vice, a 2 in . by 2 in . by 12 in . block should be screwed to the top so that the jaws of the vice can grip it and allow the whole of the hall to be worked. The plane, spokeshave and chisel should be used to cut away the waste, and great care must be taken to fit the templates at the correct places, as shown.
The surface, when correctly shaped,-must be thenoughlv smnothed. libet-with a scraper and finally with glaor paper. Tho most suitable wood for tho kcol is beech; it should be prepared to the shape shown from 1 in. board with a length of 25 in . and a depth of 69 in . The lower edges are rounded off to a sharp edge except that purtion at the bottom which is covered with lead. A horizontal groove is now cut along the centro of the hull to a centre depth of $1 \frac{1}{6}$ in., so that the kecl will fit tightly and can be glued in position. The top is now curved with a drop of $\frac{t}{z} \mathrm{in}$. in the centre and the inside of the hull is removed, by boring a number of holes with a large centre bit and then using one or two sizes of firmer gouges; the sides should be left to a thickness of $\frac{1}{\frac{1}{2}} \mathrm{in}$. until the inside is neatly shaped, and in order not to cut down too deep, three or four inside templates should be uscd. The greatest thickness at the bnttom should be $1 \frac{1}{4} \mathrm{in}$. to allow for the depth of the groove; in any case, this should not be less than 1 It in.

When the shaping is finished, a $\frac{A}{A}$ in. linc should be gauged from the top and a $\ddagger$ in. line from the outside to enable the rebate to be cut for the deck; the latter being shaped from in. wood. The keel is now further secured with screws driven in from the inside of the hull and the two lead weights made and screwed to the bottom of the keel. The easiest way of providing the picces of lead is to model the shape with a piece of plasticine and make a plaster of Paris mould; two separatc castings can be made and fastened to the sides of the keel.

An alternative method is to cast the bulb with a groove in the top so that the planed off
ked can be fitted and the lead attached with gaff are threaded through tho gaff side the cap, or hatch uncovered when the yacht screws driven in from the bottom. The at $U$ and $T$ and carried through the first of is not being used. It is advisable to have a approximate weight of the lead should be ll lb. three small cyes at $V$, and secured to the spare set of spars, and the wise yachtsman with several coats of good oil paint, rubbing down the outside coats and finishing with cnamel or carnish. The spars should be made from a close and straight grained wood, and generally pitch pino is used. The mast is 58 in. long, $\frac{1}{8}$ in. diameter at deck level, squared at the bottom to $\frac{1}{2} \mathrm{in}$. side and tapered to in. at the top. The surface should be carefully finished and made perfectly smooth. A block of wood is placed inside for the heel of the mast to fit in, and a hole bored in the deck and surrounded on both sides as at H with a 2 in . by $1 \frac{1}{2} \mathrm{in}$. by $\frac{\mathrm{i}}{\mathrm{in}}$. strip of wood.

The centre of the hole in the deck should he 13 in . from the bow of the boat; the centre of the hole in the block inside should be stepped back to allow a rake of 2 in . in all. However tightly the mast is fitted through the deck it is hardly possible to kecp the inside quite watertight; it is therefor necessary to fit a brass screw cap, as used in gas fitting, at the stern as at K , so that any accumulation of water can be emptied out.
A shallow deck house, composed of a $3 \frac{1}{2}$ in by $2 \frac{1}{2} \mathrm{in}$. by 1 in ., and a $1 \frac{1}{8} \mathrm{in}$. by 1 in . by $\frac{1}{2} \mathrm{in}$ piece of wood glued together, is secured to the deck as shown at 1, in Figs. 1 and 2. Cleats measuring $2 \frac{1}{2} \mathrm{in}$. long and made from $\frac{1}{2} \mathrm{in}$. by $\ddagger$ in. wood are fastened on as at $M, N$, and $P$ but the thickness of the deck is inereased by in. at the bow by a shaped piece glued and bradded to it. The deck can now be nitached to the hull and the remaining spars and rigging completed. The bowsprit is 13 in . long, tapering from $\frac{1}{2} \mathrm{in}$. to in., and secured to the deck by fitting the heel in a serew eye and binding wire round it and fastening to a small screw eye at $Q$. The boom is 26 in . by in. diameter and is attached to the mast by two screw eyes.

The mainsheet is secured to the end, run through a block attained as at R. with n closed S hook to a horse made of wire, and through another block as at S. and then through a serew eyo in front of the horse direct to the cleat at M. The mainsail measures 25 in . at the foot, 31 in. along the leach, 18 in. at the head, and 183 in. along the luff. Three brass rings are slipped on the mast and the sail is then sewn to them.

The gaff is shaped to $\frac{8}{\text { in. by }}$ $\frac{1}{2} \mathrm{in}$. by 20 in . It is provided with small screw cuce, one at the throat, another 8 in., and another 6 in. further on. lt is hold in position ns shown at Fig. 1, the serew cye at T being 21 in . up the mast and those at $U$ being $2 \frac{1}{2} \mathrm{in}$. above. The jincs securing the

The hull should be painted inside and out cleats at $P$ and $N$ respectively. The top. will carry a length of cord, sonce wire and a sail measures 30 in . by 24 in . by 15 in . : it is pair of plicrs, so that repairs can be carried secured to an eyc at the top of the mast, to a out on the spot when urgent. Sce Boat.

YARD : The Measure. The yard is the standard English measure of length. A yard is divided into 3 ft . or 36 in . A square yard contains 9 square feet and a cubic yard contains 27 cubic feet. There are 220 yards in a furlong and 1,760 in a mile ; 4,840 square yards make an acre.

YEAST. Yeast is a plant of the fungus order which is formed in fermenting liquids and plays an important part in brewing and also in baking. Fermentation takes place when yeast is added to sugar, alcohol and carbonic acid gas being given off. Yeast is added to dough in baking in order to make the bread light and porous, the gas causing it to swell up into the consistency of a sponge. A tepid liquid must be used, as yeast is inactive when dry and cold, while too great heat kills it.

Yeast has various uses in medicinc. It is sometimes given to patients suffering from boils, acne, and tuberculosis, as it appears to increase the number of white corpuscles in the blood. The dose is about 2 teaspoonfuls in a little milk once or twice a day. Yeast cells are rich in anti-ncuritic vitanin, as are also extracts of yeast. The latter resemble meat extract in their propertics, and arc used in diet.

Yeast Cake. This cakc is made with 3 lb . flour, 4 oz. each lard, margarine, dricd currants and sultanas, 4 oz. moist sugar, 2 o7. chopped lemon peel, 3 pint each of milk and water, $\frac{1}{2}$ oz. ycast, a littlo brown sugar and a pinch of salt. Put the flour inte a basin, add the salt, and rub in the lard and mar. garinc. Put in the fruit, sugar and peel, mix the yeast with a little warm water and brown sugar, pour this into the centre of the mixture and leave it for 10 min . Then pour in the milk and water and beat all well together. Put
it in a warm place to rise for 2 hours, and then bake it in a hot oven.
YEW. This is a most valuable evergreen suitable for hedges, for planting as specimen trees on the lawn and for topiary work, for it bears clipping well. It flourishes in ordinary soil that is not water. logged. The common yew is Taxus baccata: it lives to a great age1,000 years or more.
The branches and leaves, especially when withered, are poisonous to cattle.
lew is largely planted as a hedge though it grows slowly for the first few years. The Irish yow (Taxus bacYachl. Fig. 1. Side elovation of a model asiling yachh which can be made by the amateur by follomine the cata fastigiata) inatructions given in the tert. Pig. 2. Plan of deck. Fig. 8. Sectional view of yazht. Fig. 4. Seetion lines of
evergreen tree of upright conical habit of growth and is often planted on lawns; the variety aurca has golden ycllow leaves. The yow named Douastonii is of graceful drooping growth. The best time to transplant yew trees is in May or September.

Yew trees ought to be clipped carly in May and again in Allgust. If an old, overgrown hedge has to be cut back the work should be done in April.

Uses of the Wood. This wood is very hard and lasting. Susceptible of a high polish, it is insect proof. It is not greatly used for furniture to-day, but is sometimes employed for marquetry. See Hedge : Topiary.

YOGHOURT. Curdlel milk has long been largely used in the diet of many countries in south-castern Europe. The best known pre paration is Bulgarian yoghourt or yohourth, in which the souring is produced by the bacillus named bacillus llulgaricus. Metehnikoff suggested the use of this preparation in the treat. ment of disease, the acclinatisation of the Bulgarian bacillus lessening intestinal putrefaction. Nince its introduction this method of treat. ment has attained high popularity, and it has been recommended in cases of chronic ill-hcalth without obvious cause. neurasthenia, and certain intestinal affections such as colitis, diarrhoea and constipation. See Sour Milk.


YORESEIRE PUDDING. There are sercial methods of preparing this batter, which is a usual accompaniment of hot roast beef. The tin or dish must be prepared by melting in it plenty of good dripping, which should be well heated before the batter is poured into it. Before serving, the pudding should be turned out and cut into neat pieces, which are arranged on a hot dish. For an economical Yorkshire pudding sift 8 oz . Hour with $\frac{1}{2}$ teaspoonful salt into a basin, make a well in the centre and break in two rgga. Beat these with a portion of Hour till light. Then add by degrees 1 pint milk and water. beating all the while. Jet the batter stand I hour. then pour it into a heated and greased tin. It should be baked 30 to 40 minutes.

Occasionally the pudding is cooked in the same tin in which a joint is being baked. If eo, the meat must be raised on a trivet and the batter should not be poured in until the meat has been partly cooked. The ohjection to this tuethod is that much of the gravy

Antwerp Piogon. The Illustration shows a racino hoiner.
Bath. Iu Illustration (Fig. 3) the overflow plpe should not empty lito the head. but project through the wall so that timely warning of waste is givell to the householder.
BeEF. P. 84. Illuatration of forequarter, only a pirition of the brisket ix shown.
Bealute. The one who draws the lower card deals.
Blliards. Composition, not Ivory, balls are now used in all linportant matches.
Beend. P', 139, line 7. For " pint of water " read Beivge. P. 146. There are no two cards of the same value.
BrilitiNo. IP. 158, col. 3, line 11. For " exceeds
£5060
btrolary instrance. The legal definition of burglary is " Breaking into a dwelling house by niglit witil intent to conmita a felony.


Yorkehire Terrier. Champion of this long and zilkyhaired breed of toy dos
and dripping from the nicat is absorbed hy the batler. A portion of dripping may bo poured of before batter is put in. See Batter.

YORESHIRE TERRIER. This is the name of a pretty little loy dog. It possesses a vigorous and well-proportioncd body, and carries it eompletely hidden bencath the close straight veils of silky hair that fall from the parting along the middle of the back to the ground on cither side. The coat should be uniformly of a bright sterl bluc without a fawn or tan hair : but the long and abundant hair on the head cars and under the chin should be tan. The nose should be perfectly black. See Dog ; Terrier.

YUCCA. This is an evergreen shrub of triking appcarance with long leaves and upright panicles of white or cream white flowers. They like well drained soil and are propagated by offsetes in spring: these are taken off the old plants, potted and kept in a frame until rooted. Yuccas flourish in town as well as in country gardens. The favourite kind ir Adam's ncedle (yueca gloriosa), which has stiff leaves and an immense spike of bloon. Yucer recurvifolia and yucca filamentosa, the latter almost stemlers, arc among the other kinds.


Zinnia. Gaily coloured blossoms again becomes brittle. Soldering.
brittle, but it is mallcable when heater to a temperature between $100^{\circ} \mathrm{C}$. and $150^{\circ} \mathrm{C}$.; when it is heated abovo that temperature it

Zinc is scarcely affected by dry air ; in damp air the exposed surface is converted into a basic carbonate of zinc, owing to the presence of carbonic acid gas, and this effectively protects the metal from further changc. On account of this property zinc is employed for rooting and also for tanks. It is used to a much greater extent in "galvanizing" iron andl stecl; the metal is cleaned with acid to remove the scale, and is dipped into the molten zine. The result is to protect the iron, which is quickly oxidized by exposure to air and water, and provides a rustless surface. See I3oat; I)utch Metal; German Silver; Ice Nafe; Ormolu.

Medicinal Uses. Numerous compounds of zinc are used in medicine. Zinc chloride is a powerful caustic, and at one time was commonly used as an antiseptic. The acctate carbonate, oxide, and sulphate of zinc all act as astringents when applied to raw or ulecrated surfaces, and are therefore often of valuc in solution as astringent lotions. Lotions of zine sulphate or other zinc salts provide the best remedy for one form of conjunctivitis.
Powdered oxide of zinc and powdered cartonate of zinc are commonly used as dusting powders where a mild astringent effect is required. Calamine ointment, much used in skin diseases, is made with native zinc carbonate, otherwisc known as calamine. Interually, zinc sulphate is a prompt and valuable emetic in certain cases of prisoning.

ZanNLA. The zinnia is a half-hardy annual bearing flower of rich colours, some of double form, including crimson, scarlet, bronze, white, buff. violet, and mauve. The plant is prolific and long. lasting, but demands all the sunshinc possible and well. enriched soil. Sced should be sown in heat during March, transplanting sced. lings once or twice to makic good stocky plants.

ZITHBK. As a stringerl instrument the zither stands in a class by itself, for the strings are plucked both with the. fingers and with a plictrum. It consists of a wooden body, about 1 ft .

ZEPHYR CLOTA. Zephyr cloth is a 8 in . long, 10 in . wide, and 3 in . dcep, which, cotton fabric somewhat resembling when played, is placed upon a table. Ufo: gingham in texture, and of light or the side farthest from the performer the medium weight; it usually contains two or body has a very pronounced bulge beyond more colours, woven in a variety of patterns. the strings, the object being to increase ZINC. A bluish-white metal, zinc is harder the resonance of the instrument. In the than aluminium and softer than silver. It is upper table of the body there is a large, stronger than lead or tin, and has a bright circular sound-hole. The 30 strings, which run lustre when polished. Being mallcable, it can from left to right, fall into thrce distinct be hammered and rolled into thin sheets. classes, namely, the melody, the accompaniCommercial zinc, which is called spelter, is ment, and the bass strings.

## ERRATA AND ADDENDA

Cayphorated Oil. P. 182, col. 3, line 3. For "formerly was official " milbstitute "Ia ufficial." I.Inea 6 and 7. For ". The oflicial Inlinent now contalna " subsiltute "A nother olficial llulment contalns almo."
Concrete. [P. 286. Mlxture for partition slaba, delete or granite.
Colotr Photioraphy. Speclal plateholders are nol neceasary for all colour plates.
Differential Gear. Col. 2. Ine 14. Delcte "revense
the direction-remaining atatlonary " and read In the same direction but at doubie the apeed.: Door. P. 377. Illustration (Fis 4) thic thresd Door. P. 370. Ihuatration ( kis. d) the thread is aliown left-handed Instcad of right-handed.
EMERALD. There is no nynt hetic emerald.
Exection. !". 439, Une 29 . For "accused " read
оот. LIne 6. For " squarc " read "c cublc."
Ha NKER. A hawker's licence costa $£ 2$ a year, and a pedlar's certificate 58.

INECRANCE. CNRMPLOYMENT. In Oct. 1931 the weekly contribulfons wire Increased. The inaxlmilm ls now 1a. Nd. per heri.
LEMON CAKE. P. 715. In lliee 2 add " 2 equs."
Net ball. The gainc is now atarted by one centre pasing the ball, not bouncing it In the centre of the field.
'arcel Post. P. 0u3. Charges for regiatration are 3d. and $4 d$. nut 2 d . and 3 dd .
RabHit. Y. 1031 , col. 1. 8 IInes from bottom. Hor khenish reai Flcinish.
Rannit Wool. Does not need any brishing.
RaIsin WINE. Add at bexinning of article. "To make this allow cqual quantitlea of fruit and EvOLER
REVOLVER. For " renewetl on Jan. 31 every sear" read "every third ycar."
Savinos bank. A person can nuw have more than one account In his own name.
tarter. 1'. 1206, col. 1, line 29. For "acceas" ras:l "excess."

## DETAILED INDEX TO SECTIONS AND SUBJECTS

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[^0]:    A doust 1.- Iammas quarter day in Scofland
    AUGUST 4 -Great Britain declared war on Gerinany, 1914 August 5.-Oyster scason opens
    AdGUST 11.-Half gliarter day
    A UGUST 12.-Grousc shooting hegins
    The first Monday in August is a banli honliday in England and Wales

[^1]:    Liquid extract
    Tincture
    Compound thecture
    5-15 minims
    -15 min
    -
    -1 dram
    dram

[^2]:    $\qquad$

[^3]:    
    
    
    
    $\qquad$
    $\qquad$
    
    
    

[^4]:    

[^5]:    Haemorrhage. See Bleeding.
    Haemorrhoids. See I'iles.

[^6]:    Mushroom Growing. 1. Outdoor bed against wall: $u$, top manare: $b$, well trod bottom manure. 2. Same with spawn in position: $a$, top atraw ; $b_{1}$ soil : $c$, spawn. 3. Ontdoor mound: $a$, top manure; $b_{\text {, firmly packej }}$ cellars: 4. Same completed: a, straw : b soil: $c$, spawn. 5. Hothed for
     Bn special arrangement with Amateur Gardening

[^7]:    

[^8]:    The poultry keeper will find further practical info:mation under the headings Chicken Ireubatcr. The en ry Fowl anl those on ti.e various hreds. e.g. Leghorn; Minore 1 , inay also he consulted. Attention is a'so drawn to the colour plate

[^9]:    

[^10]:    wing. Fig. 1 Swing that may be erected out of doors. Fig. 2. Front elevation of framework. Fig. 3. Side elevation. Parts marked with the same distinguishing

